
**MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2010**

*US Highway 93 Onsite: Bouchard, Mud Creek, and Peterson
Property
Lake County, Montana*



Prepared for:



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December 2010

Prepared by:



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MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

WETLAND MITIGATION MONITORING REPORT:

YEAR 2010

*US Highway 93 Onsite:
Bouchard, Mud Creek, and Peterson Property*

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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1. INTRODUCTION

The 2010 US 93 wetland monitoring report documents the fourth year of monitoring at the Bouchard Property, the third year of monitoring at the Peterson property, and the second year of monitoring at the Mud Creek site. The US Highway 93 Wetland Mitigation Sites were developed to mitigate for wetland impacts associated with eight Montana Department of Transportation (MDT) segments of the US 93 Evaro to Polson highway reconstruction project. The 2009 US 93 Wetland Mitigation Monitoring Report included monitoring results for the Jocko Spring Creek and Mission Creek mitigation sites. These sites were eliminated from US-93 monitoring activities in 2010 as MDT had requested approvals from the USACE given that the sites had met all mitigation goals and objectives (MDT 2010).

The three US 93 wetland mitigation sites are located in Lake County within Watershed 3 (Lower Clark Fork), north of Arlee, Montana between Mileposts 20 and 50. Bouchard Property is situated between Mileposts 20 and 25, south of Ravalli, along a segment identified as Project 4, White Coyote Road (Figure 1). 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 2). The Peterson site is located north of St. Ignatius near Milepost 35, along the segment identified as Project 6 (Figure 3). Figures 4 through 9 (Appendix A) show the mapped site features and monitoring activity locations for each site, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring Form, the US Army Corps of Engineers (USACE) Routine Wetland Determination Data Forms (Environmental Laboratory 1987), and the MDT Montana Wetland Assessment Forms for each site. Appendix C contains relevant site photographs and Appendix D includes the project plan sheets for each site.

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 (PBS&J 2009). The impact totals for this report were based on information included in the 2004 mitigation plan and 2007 monitoring report and on further clarification with MDT (PBS&J 2009). The 2004 wetland mitigation plan provided wetland mitigation concepts, identified wetland community types targeted for establishment, and calculated the wetland mitigation credits expected to be obtained from each site. The mitigation plan also 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 USACE regulated wetlands. Mitigation crediting systems vary between the two agencies and are described in more detail in following sections.

Approximately 22.01 acres of impacts were calculated for the CSKT regulated wetlands and 19.63 acres were calculated for the USACE 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

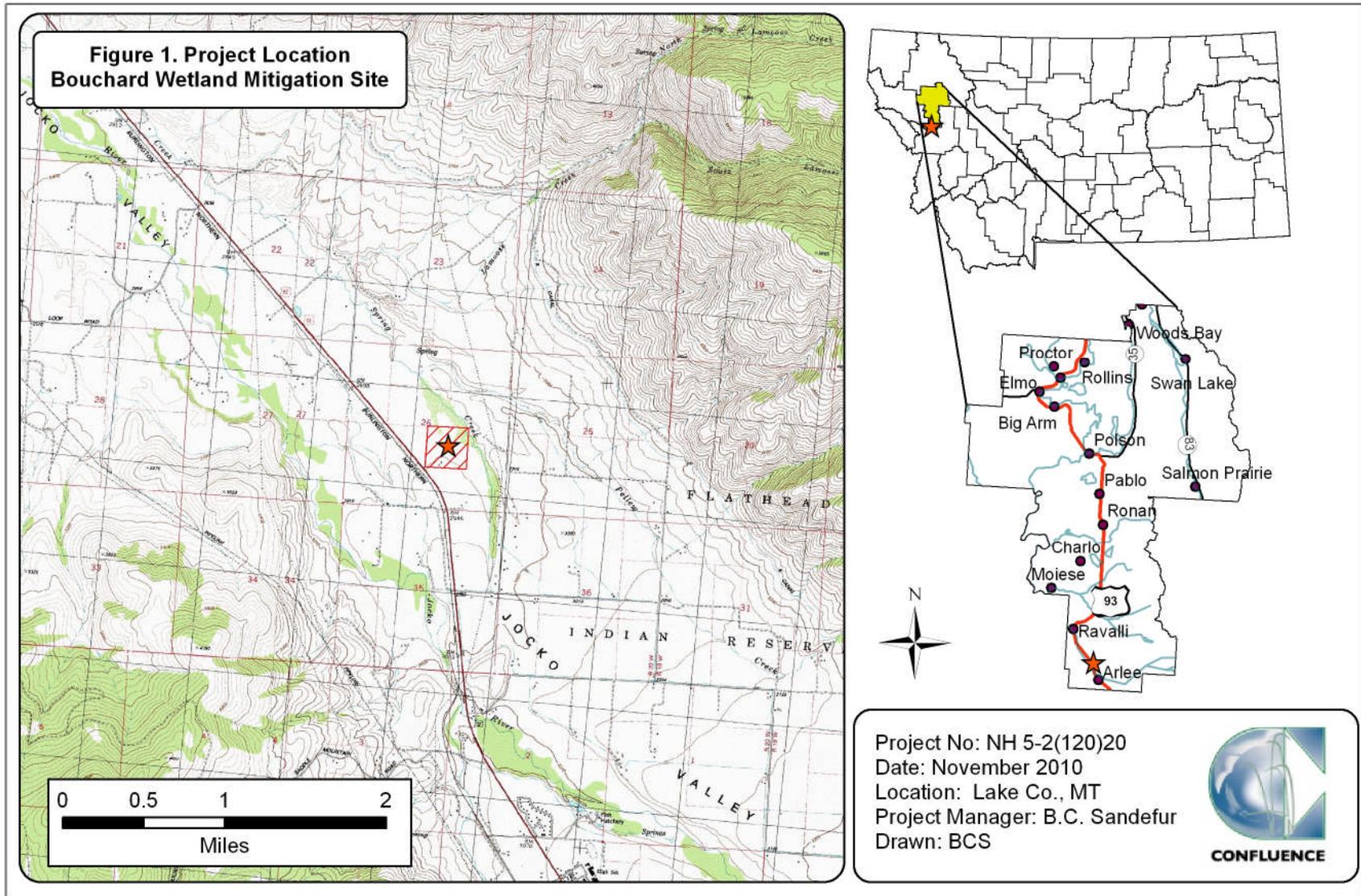


Figure 1. Project location of Bouchard Wetland Mitigation Site.

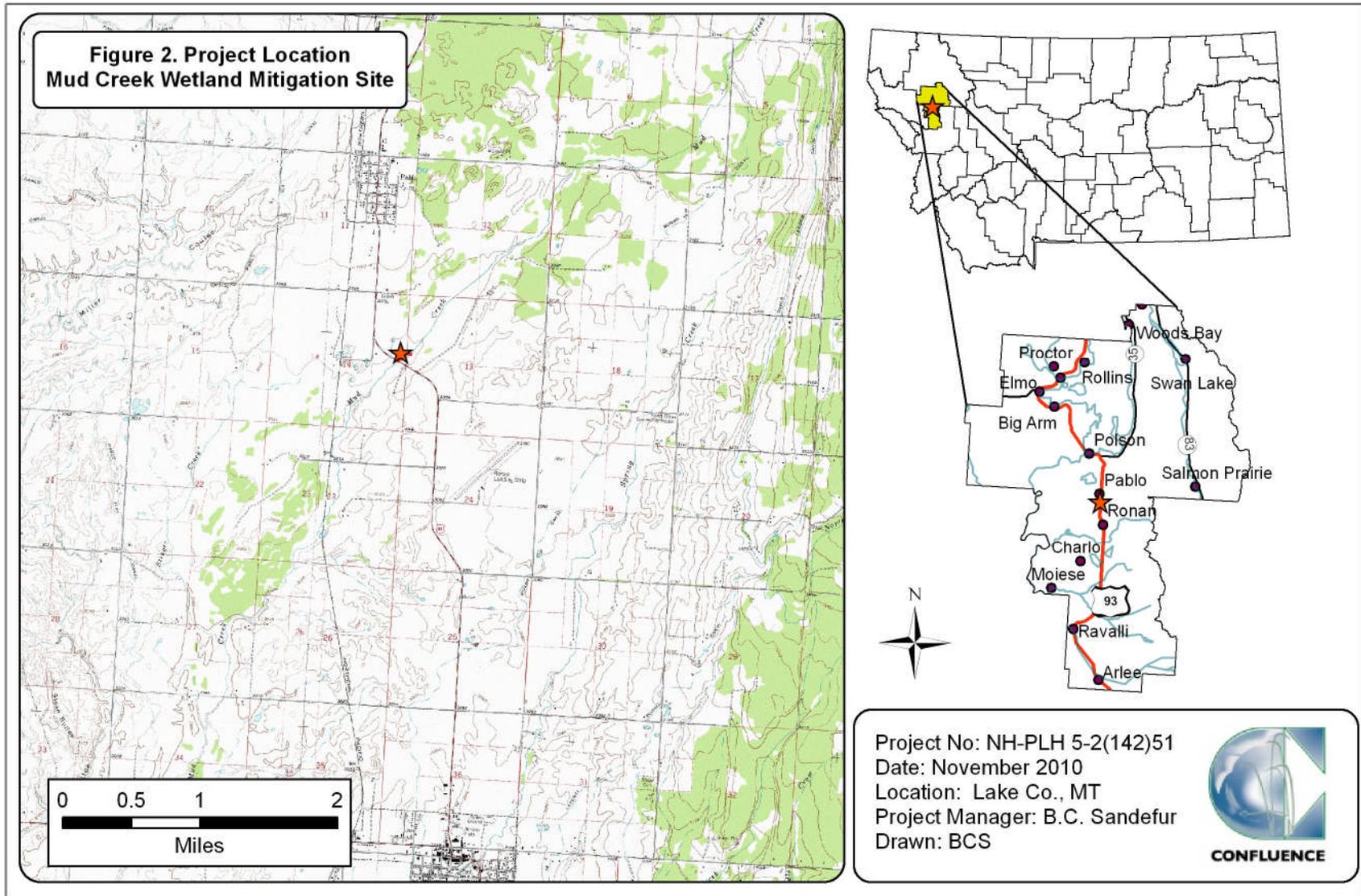


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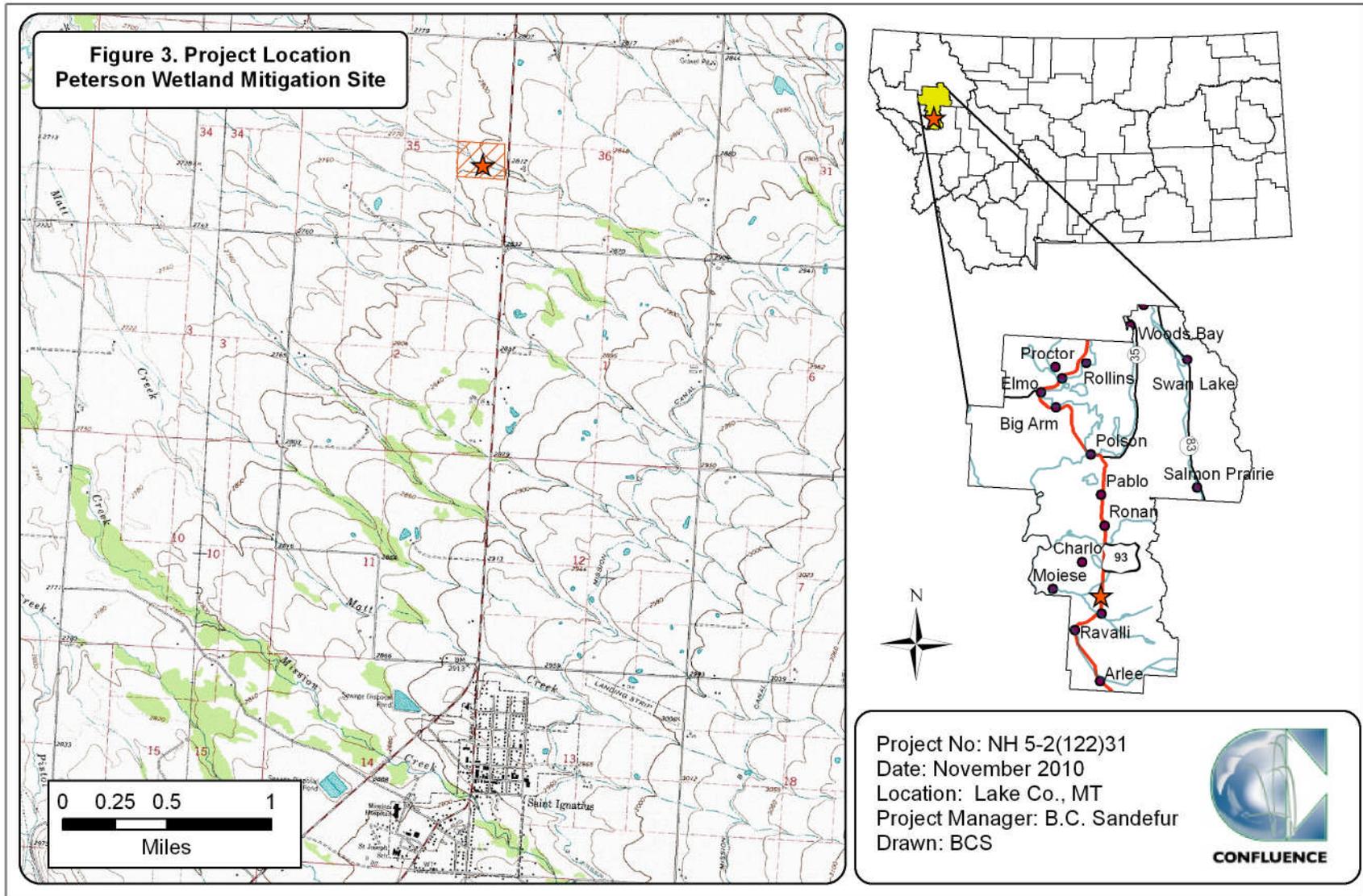


Figure 3. Project location of Peterson Wetland Mitigation Site.

segment, wetland mitigation site, mitigation types, and expected wetland mitigation credits for both the CSKT and USACE. The expected credits are discussed in more detail in the results section for each mitigation site. Although Jocko Spring Creek and Mission Creek were included in the original mitigation credit determination, the sites are no longer being monitored.

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	USACE 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		Expected USACE	
		Wetland Mitigation Credits ^{1,2,3}		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 Enhancement	0.59 ⁴ 0.01
Project Total		1.49	Project Total	2.77	
Project 6 Medicine Tree (Old US 92) 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 (PBS&J 2009).

² MDT Wetland Mitigation Monitoring Report: Year 2007 (PBS&J 2009).

³ Personal communication with MDT (PBS&J 2009).

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 (2002), which determines the final acres of credit based on an equation that calculates a weighted ratio for restoration for 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. Appendix E – CSKT Mitigation Ratios from Wetland Conservation Plan (Parker 2002) contains specific details on how the ratios are calculated.

Table 3. Mitigation credit ratios 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

¹From MDT Wetland Mitigation Monitoring Report: Year 2007 (PBS&J 2009).

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 (PBS&J 2009). Mitigation crediting systems and current credits are discussed for each individual mitigation site under the respective Current Credit Summary sections.

1.2. Mitigation Sites

The US Highway 93 Onsite project originally included five wetland mitigation sites located on the Flathead Indian Reservation and managed by the CSKT. Two sites, Jocko Spring Creek and Mission Creek, were eliminated from the monitoring schedule in 2010 based on MDT discussions with the USACE regarding the full release of these sites from further monitoring requirements. The following sections provide a general discussion of the three remaining wetland mitigation sites, Bouchard Property, Mud Creek, and the Peterson Property. The discussion includes location, site topography, mitigation objectives, and targeted wetland community goals.

1.2.1. Bouchard Property

The Bouchard Property mitigation site is a 40-acre parcel located adjacent to US 93 at approximately Milepost 20.5 in Section 26 of Township 17 North and Range 20 West. The site occurs east of US Highway 93, between the highway and Jocko Spring Creek. Jocko Spring Creek runs along the east side of the parcel boundary, providing 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 surface water flow on the property. The site is near the headwaters of Jocko Spring Creek and exhibits a high groundwater table that seasonally inundates a large portion of the site. The elevation is approximately 2,960 feet above mean sea level (amsl). The monitoring area boundary is shown on Figure 4: Bouchard (Appendix A). Mitigation plan sheets are presented in Appendix D. 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 classes, dominated by an extensive cover of Bebb willow (*Salix bebbiana*) and bog birch (*Betula glandulosa*) and beaked sedge (*Carex utriculata*) communities with a less dominant layer of a quaking aspen (*Populus tremuloides*) and red osier dogwood (*Cornus stolonifera*). Site construction was completed in summer 2006 and the revegetation was completed from August through October 2006 (PBS&J 2009).

1.2.2. Mud Creek

The 2.54-acre Mud Creek mitigation site is located in the Project 7 segment south of Pablo. The site is situated near Milepost 50 in Section 13 of Township 21 North and Range 20 West. The mitigation site encompasses Mud Creek and adjacent wetlands dominated by emergent vegetation and remnant stands of hawthorne (*Crataegus*) shrubs. Site hydrology is provided by Mud Creek that flows under the newly constructed wildlife underpasses through the southeast corner of the site. These underpasses were constructed to facilitate the movement of wildlife safely through the area. The monitoring area boundary is illustrated on Figure 6 Mud Creek (Appendix A). Site plans are included in Appendix D. 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 the diversity of wetland plants;
- Constructing and realigning the Mud Creek channel to provide higher surface water elevations 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 was a palustrine forested and scrub-shrub system dominated by black cottonwood (*Populus trichocarpa*), thin-leaf alder (*Alnus incana*), and Bebb willow with an understory of emergent wetland habitat. Initial construction of the new channel and floodplain was completed in summer 2007 including the installation of pre-vegetated coir mats along the channel. Revegetation was completed in summer 2008.

1.2.3. Peterson

The 30-acre Peterson mitigation site is situated 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 16 North and Range 20 West. The Peterson site consists of a wetland swale dominated by herbaceous vegetation. Site hydrology is provided by an unnamed perennial tributary to Post Creek. The monitoring area boundary is illustrated on Figure 4: Peterson (Appendix A). Site plans are included in Appendix D. Mitigation objectives included the following (PBS&J 2009):

- 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 was scrub-shrub and emergent vegetation classes, encompassing thin-leaf alder (*Alnus incana*) and red osier dogwood (*Cornus stolonifera*) and Nebraska sedge (*Carex nebrascensis*) and Baltic rush (*Juncus balticus*) communities. Revegetation was completed in October 2006.

Created wetlands within the project corridor are to meet the three parameter criteria for hydrology, vegetation, and soils established for wetland determination as outlined in the 1987 *Corps of Engineers Wetland Delineation Manual for the Determination of Wetlands* (Environmental Laboratory 1987).

2. METHODS

Bouchard was monitored on August 9, 2010, and Peterson and Mud Creek were monitored on August 10, 2010. Information contained on the Monitoring Form and Wetland Data Forms was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity locations for Bouchard, Mud Creek, and Peterson, were mapped with a global positioning system (GPS) as illustrated on Figures 4, 6, and 8, respectively (Appendix A). Information collected included wetland delineation, vegetation community mapping, vegetation transect monitoring, soil data, hydrology data, bird and wildlife use documentation, photographs, functional assessments, planted woody species monitoring, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

Hydrological indicators as outlined on the Wetland Data Forms were documented at nine data points within Bouchard, four data points within Mud Creek, and six data points within Peterson. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on electronic

field data sheets (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation and saturation requirements.

No groundwater monitoring wells were present on the sites. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded electronically on the Wetland Data Form (Appendix B). The boundary between wetlands and open water was mapped on the aerial photograph and an estimate of the average water depth at the boundary was recorded.

2.2. Vegetation

The boundaries of general dominant species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (less than 1 percent); 1 (1 to 5 %); 2 (6 to 10 %); 3 (11 to 20 %); 4 (21 to 50 %); and 5 (less than 50 %) (Appendix B).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects (Figures 3, 5, and 7, Appendix A). Vegetation composition was assessed and recorded along new vegetation belt transects established at all sites during the 2008 and 2009 reconnaissance visits for Bouchard, Jocko, Spring Creek, Mud, and Peterson sites (PBJ&J 2009). Jocko was eliminated from monitoring in 2010. The new transects replaced any previously-located transects to better represent and capture future vegetative changes at each of the sites. The transects are 10 feet wide and vary in length at each site. The transect locations were recorded with a GPS unit.

Spatial changes in the dominant vegetation communities were documented along the stationed transect. The percent cover of each vegetation species within the transect was estimated using the same values and cover ranges listed in the above paragraph (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C). The number of live individuals observed for each species planted was recorded during the monitoring event.

The location of noxious weeds was noted in the field during the investigation and mapped on the aerial photo (Figures 5, 7, and 9, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol “+”, “▲”, or “■” representing 0.0 to 0.1 acres, 0.1 to 1.0 acres, or greater than 1.0 acre in extent, respectively. Cover classes are represented by a T, L, M, or H, for less than 1 percent, 1 to 5 percent, 2 to 25 percent, and 25 to 100 percent, respectively.

2.3. Soil

Soil information was obtained from the Soil Survey for Lake County and *in situ* soil descriptions (NRCS 2010). Soil cores were excavated using a hand auger

and evaluated according to procedures outlined in the USACE 1987 Wetland Manual. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the US including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Wetland Manual. In order to delineate a representative area as wetland, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology, as described in the 1987 Manual, must be satisfied. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas within the project boundaries. The information was recorded electronically on a USACE Routine Wetland Delineation Data Form (Appendix B).

Consultation with the USACE (PBS&J 2009 Monitoring Report) determined that the 1987 manual should continue to be used at MDT mitigation sites where baseline wetland conditions had been established prior to 2008. Consequently, the use of the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010) was not required.

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was an atypical situation, problem area, or special aquatic site. The wetland boundary was identified on the aerial photograph. Wetland areas were estimated using geographic information system (GIS) methodology.

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the wetland monitoring form during the site visit. Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of wildlife species observed on the site annually was compiled.

2.6. Functional Assessment

The 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999) was used to complete functional assessments at the three sites since the onset of monitoring. The assessment method provides an objective means of assigning wetlands an overall rating and a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values (Berglund 1999).

Field data for this assessment were collected during the site visit. A Functional Assessment Form was completed for each wetland or group of wetlands (Assessment Areas [AA]; Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland condition, trends, current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transects. Photographs were taken at established photo points throughout the mitigation site during the site visit and at the endpoints of the transects (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figures 4, 6, and 8, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS (Global Positioning System) unit during the 2010 monitoring season. Points were collected using WAAS-enabled differential corrected satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, subsequently exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto an aerial photograph and then digitized. Site features and survey points that were mapped included fence boundaries, photograph points, transect endpoints, wetland boundaries, vegetation community boundaries, and soil sample locations.

2.9. Maintenance Needs

Channels, engineered structures, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. This was a cursory examination and not an engineering-level structural inspection.

3. RESULTS

3.1. Bouchard Property

3.1.1. Hydrology

The main source of hydrology at the Bouchard site is seasonal inundation from the high groundwater table associated with perennial flows in Jocko Spring Creek (PBS&J 2009). Irrigation flows previously entered the site through a series of ditches and berms. Mitigation objectives included filling the ditches and

removing berms and other water-control features. A secondary source of hydrology is groundwater influenced by regional irrigation and the Jocko River. The average total annual precipitation recorded at the Saint Ignatius weather station (247286) from February 1896 to April 2010 was 15.89 inches (WRCC 2010). Cumulative precipitation recorded at the Bureau of Reclamation AgriMet station at Saint Ignatius (SIGM) was 18.16 inches through August 30, 2010, well above the annual precipitation averages of 11.44 inches recorded through December 2009 and 13.59 inches recorded through December 2008 (USBR 2010).

Approximately 30 percent of the Bouchard site was inundated. The constructed shallow depression exhibited an average depth of 0.5 feet. The range of surface water depths across the site was 0.5 to 4 feet, with an average depth of 0.5 feet. Areas that were not inundated that met the wetland criteria exhibited saturation within one foot of the ground surface.

Nine data points, SP-1 to SP-9, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points SP-1 through SP-8 were located within areas that met the wetland criteria. Positive indicators of wetland hydrology at SP-1 were saturation at 2 inches below the ground surface (bgs) and a water table (free water in the pit) at 8 inches bgs. Saturation at 12 inches bgs was a positive indicator of wetland hydrology at sites SP-2 and SP-6. Surface inundation to a depth of 1 inch, 3 inches, and 5 inches, and saturation of the soil profile were positive indicators of wetland hydrology at SP-3, SP-4, and SP-7, respectively. Data points SP-5 and SP-8 exhibited saturation at 10 inches bgs, a positive indication of wetland hydrology.

3.1.2. Vegetation

A comprehensive list of 80 vegetation species identified from 2007 to 2010 is shown in Table 4. A majority of the species are herbaceous although the site contains small stands of black cottonwood and quaking aspen (*Populus tremuloides*) near or adjacent to the ponds. One upland and eight wetland communities were identified and mapped within the project boundaries (Figure 5, Appendix A). The eight community types were Type 1 – *Agropyron* spp./*Agrostis alba* Upland, Type 2 – *Deschampsia cespitosa*/*Juncus* spp. Wetland, Type 3 – *Juncus* spp./*Eleocharis palustris* Wetland, Type 4 – *Juncus balticus*/*Cirsium arvense* Wetland, Type 5 – *Carex* spp., Wetland, Type 6 – *Betula occidentalis*/*Juncus balticus* Wetland, Type 7 – *Alnus incana*/*Glyceria striata* Wetland, Type 8 – *Populus* spp. Wetland, and Type 9 – *Typha latifolia* Wetland. The eight wetland communities occurred within the wetland creation, rehabilitation, and re-establishment areas. The species composition for each community is discussed below and included on the Monitoring Form (Appendix B). The open water areas associated with the constructed wetland depressions are identified by the number 10 on Figure 5 (Appendix A).

Table 4. Vegetation species observed from 2007 to 2010 for the Bouchard Property Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator ¹
<i>Achillea millefolium</i>	yarrow,common	FACU
<i>Agropyron repens</i>	quackgrass	FACU
<i>Agropyron trachycaulum</i>	wheatgrass,slender	FAC
<i>Agrostis alba</i>	redtop	FACW
<i>Alnus incana</i>	alder,speckled	FACW
<i>Alopecurus pratensis</i>	foxtail,meadow	FACW
<i>Alyssum alyssoides</i>	pale madwort	NL
<i>Angelica arguta</i>	angelica,Lyall's	FACW
<i>Anthemis cotula</i>	mayweed	FACU
<i>Artemisia ludoviciana</i>	sagebrush,white	UPL
<i>Betula occidentalis</i>	birch,spring	FACW
<i>Bromus carinatus</i>	California brome	NL
<i>Bromus tectorum</i>	cheatgrass	NL
<i>Calamagrostis canadensis</i>	reedgrass,blue-joint	FACW+
<i>Campanula rotundifolia</i>	bellflower,scotch	FACU+
<i>Carduus nutans</i>	musk thistle	NL
<i>Carex lanuginosa</i>	sedge,wooly	OBL
<i>Carex nebrascensis</i>	sedge,Nebraska	OBL
<i>Carex praegracilis</i>	sedge,clustered field	FACW
<i>Carex retrorsa</i>	sedge,retrorse	FAC
<i>Carex stipata</i>	awlfruit sedge	NL
<i>Carex rostrata (utriculata*)</i>	beaked sedge	OBL
<i>Carex vesicaria</i>	sedge,inflated	OBL
<i>Centaurea maculosa</i>	spotted knapweed	NL
<i>Chara spp.</i>		NL
<i>Chenopodium album</i>	goosefoot,white	FAC
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	NL
<i>Cichorium intybus</i>	chicory	NL
<i>Cirsium arvense</i>	thistle,creeping	FACU+
<i>Cirsium vulgare</i>	thistle,bull	FACU
<i>Cornus stolonifera</i>	dogwood,red-osier	FACW
<i>Crataegus douglasii</i>	hawthorn,Douglas'	FAC
<i>Cynoglossum officinale</i>	gypsy-flower	NL
<i>Deschampsia cespitosa</i>	hairgrass,tufted	FACW
<i>Dodecatheon spp.</i>		NL
<i>Eleocharis palustris</i>	spikerush,creeping	OBL
<i>Epilobium ciliatum</i>	willow-herb,hairy	FACW-
<i>Epilobium spp.</i>		NL
<i>Equisetum arvense</i>	horsetail,field	FAC
<i>Geum macrophyllum</i>	avens,large-leaf	FACW+
<i>Glyceria grandis</i>	American mannagrass	NL
<i>Glyceria striata</i>	grass,fowl manna	OBL

¹Region 9 Northwest (Reed 1988)

New species identified in 2010 are show in **bold** type.

* Commonly accepted name not included on 1988 list.

Table 4. (Continued). Vegetation species observed from 2007 to 2010 for the Bouchard Property Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator ¹
<i>Hordeum jubatum</i>	barley, fox-tail	FAC+
<i>Hypericum perforatum</i>	common St. John's wort	NL
<i>Juncus balticus</i>	rush, Baltic	OBL
<i>Juncus ensifolius</i>	rush, three-stamen	FACW
<i>Juncus mertensianus</i>	rush, Merten's	OBL
<i>Juncus spp.</i>		NL
<i>Juncus tenuis</i>	rush, slender	FAC
<i>Lactuca serriola</i>	lettuce, prickly	FAC-
<i>Lychnis alba</i>	bladder campion	NL
<i>Medicago sativa</i>	alfalfa	NL
<i>Mentha arvensis</i>	mint, field	FAC
<i>Mimulus guttatus</i>	monkey-flower, common large	OBL
<i>Nepeta cataria</i>	catnip	FAC
<i>Phalaris arundinacea</i>	grass, reed canary	FACW
<i>Phleum pratense</i>	timothy	FACU
<i>Plantago major</i>	plantain, common	FAC+
<i>Poa palustris</i>	bluegrass, fowl	FAC
<i>Poa pratensis</i>	bluegrass, Kentucky	FACU+
<i>Polygonum amphibium</i>	smartweed, water	OBL
<i>Populus tremula (tremuloides*)</i>	quaking aspen	FAC+
<i>Populus balsamifera (trichocarpa*)</i>	black cottonwood	FAC
<i>Potentilla anserina</i>	silverweed	OBL
<i>Potentilla fruticosa</i>	cinquefoil, shrubby	FAC-
<i>Ranunculus spp.</i>		NL
<i>Ribes spp.</i>		NL
<i>Rosa woodsii</i>	rose, Woods	FACU
<i>Rubus idaeus</i>	raspberry, common red	FACU
<i>Rumex crispus</i>	dock, curly	FACW
<i>Salix bebbiana</i>	willow, bebb	FACW
<i>Salix exigua</i>	willow, sandbar	OBL
<i>Salix geyerana</i>	willow, geyer	FACW+
<i>Salix lutea</i>	willow, yellow	OBL
<i>Solanum dulcamara</i>	nightshade, climbing	FAC
<i>Solidago canadensis</i>	golden-rod, Canada	FACU
<i>Sonchus arvensis</i>	sowthistle, field	FACU+
<i>Symphoricarpos albus</i>	snowberry	FACU
<i>Typha latifolia</i>	cattail, broad-leaf	OBL
<i>Verbascum thapsus</i>	common mullein	NL
<i>Vicia spp.</i>		NL

¹Region 9 Northwest (Reed 1988)

New species identified in 2010 are show in **bold** type.

* Commonly accepted name not included on 1988 list.

Community Type 1 was located in the upland area in the southwest portion of the site and in isolated upland islands located in the north half of the site. The slender wheatgrass (*Agropyron trachycaulum*), quackgrass (*Agropyron repens*), redtop (*Agrostis alba*), common yarrow (*Achillea millefolium*), and Canada thistle (*Cirsium arvense*) were dominant species in this community.

Type 2 – *Deschampsia cespitosa*/*Juncus* spp. was identified in a constructed wetland in southwest portion of the site where water levels ranged from inundation to saturation within 12 inches bgs. The species were predominantly emergent although there were some planted shrubs. The community was dominated by tufted hairgrass (*Deschampsia cespitosa*), slender rush (*Juncus tenuis*), three-stamen rush (*Juncus ensifolius*), and red top. Planted woody species included speckled alder (*Alnus incana*), red-osier dogwood, and Bebb willow.

Wetland Type 3 – *Juncus* spp./*Eleocharis palustris* was located within a constructed, saturated wetland located in the southwest quadrant of the site. Slender rush, three-stamen rush, and creeping spikerush (*Eleocharis palustris*), dominated the community. Red-osier dogwood was planted within the community boundaries.

Community Type 4 – *Juncus balticus*/*Cirsium arvense* was located in three small isolated wetlands. The cover was dominated by Baltic rush, Canada thistle, and redtop. The community was associated with an existing wetland area infested with Canada thistle.

Wetland Type 5 – *Carex* spp. was identified in a rehabilitated wetland located in the north half of the site dominated by emergent vegetation. The dominant cover species were beaked sedge (*Carex utriculata*), Nebraska sedge, inflated sedge (*Carex vesicaria*), wooly sedge (*Carex lanuginosa*), Baltic rush, and Bebb willow.

Community Type 6 – *Betula occidentalis*/*Juncus balticus* characterized an existing wetland targeted for rehabilitation and dominated by scrub-shrub and emergent vegetation. The woody overstory is visible on Figure 5 (Appendix B). The community was dominated by spring birch (*Betula occidentalis*), Baltic rush and shrubby cinquefoil (*Potentilla fruticosa*).

Wetland Type 7 – *Alnus incana*/*Glyceria striata* identified in the northwest corner was dominated by speckled alder, fowl mannagrass (*Glyceria striata*), beaked sedge, red-osier dogwood, spring birch, and inflated sedge.

Community Type 8 – *Populus* spp. found in existing wooded areas across the site was dominated by black cottonwood and quaking aspen

Wetland Type 9 – *Typha latifolia* was located in existing wetlands dominated by a monoculture of broad-leaf cattail (*Typha latifolia*). The open water areas were dominated by aquatic bed vegetation.

Vegetation transect results were detailed on the Bouchard Monitoring Form (Appendix B) and summarized in tabular and graphic formats on Tables 5 through 7 and Charts 1 through 6. Photographs of the Bouchard photo points and transect end points are shown on pages C-1 to C-6 in Appendix C. The 2007 data was excluded from the report following a change in the transect location in 2008 (PBS&J 2009).

The 2010 community types identified on the 526-foot Transect 1 were similar to 2009. Upland Type 1 and wetland Types 2, 3, and 4 were identified on the transect from 2008 to 2010. The length of the interval dominated by Type 2 – *Juncus/Eleocharis* increased in 2010. Hydrophytic vegetation communities dominated 76.8 percent of the transect intervals.

Table 5. Bouchard Transect 1 data summary from 2008 to 2010.

Monitoring Year	2008	2009	2010
Transect Length (feet)	526	526	526
Vegetation Community Transitions along Transect	5	5	3
Vegetation Communities along Transect	4	4	4
Hydrophytic Vegetation Communities along Transect	3	3	3
Total Vegetative Species	28	28	29
Total Hydrophytic Species	19	18	22
Total Upland Species	9	10	7
Estimated % Total Vegetative Cover	95	96	96
% Transect Length Comprising Hydrophytic Vegetation Communities	77	77	76.8
% Transect Length Comprising Upland Vegetation Communities	33	33	23.2
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0

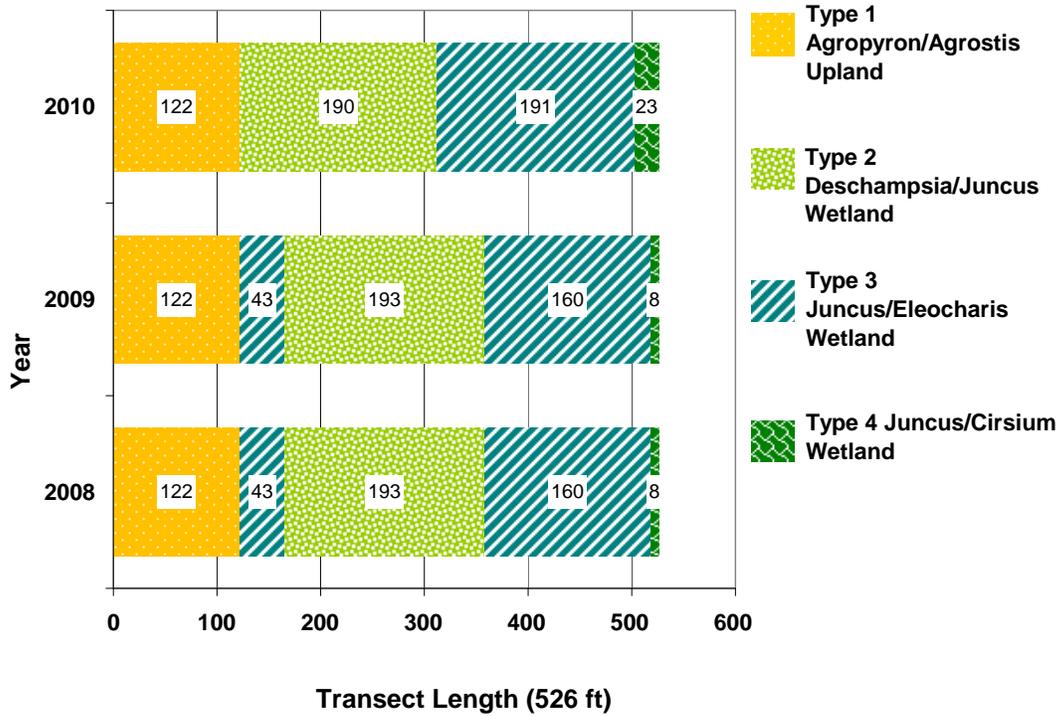


Chart 1. Bouchard Transect 1 maps showing vegetation types from transect start (0 feet) to end (526 feet) from 2008 to 2010.

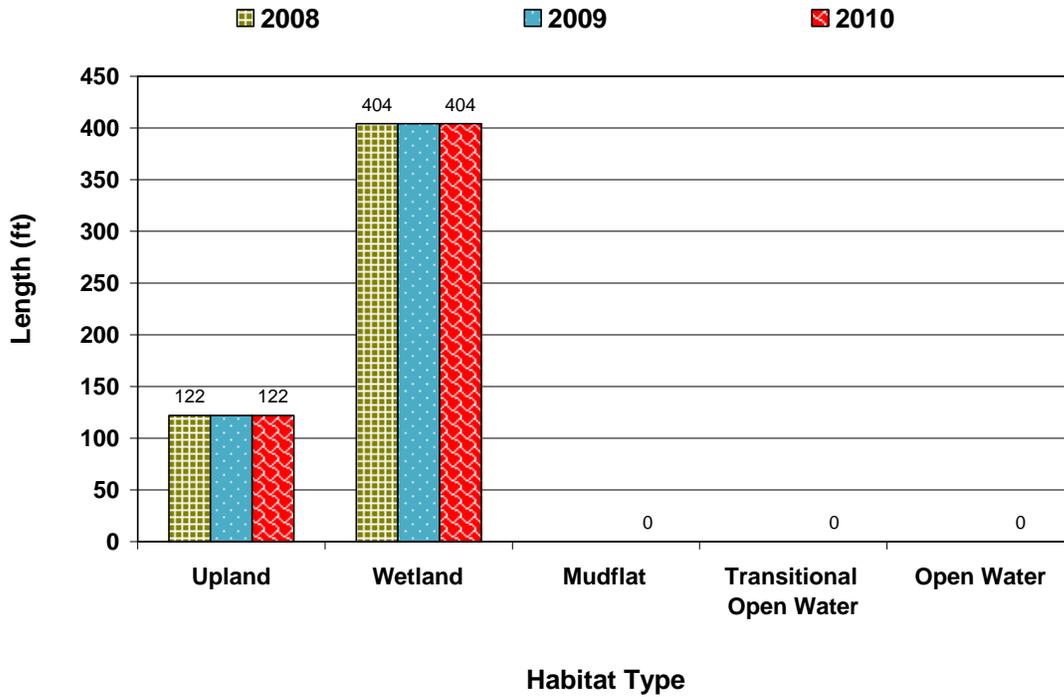


Chart 2. Length of vegetation habitats within Transect 1 from 2008 to 2010.

The community types and transect lengths identified on Transect 2 were the same from 2008 to 2010. Wetland Types 5 and 6 dominated the transect intervals. Four more species were identified on the transect in 2010. Hydrophytic vegetation communities covered 100 percent of the transect intervals.

Table 6. Bouchard Transect 2 data summary from 2008 to 2010.

Monitoring Year	2008	2009	2010
Transect Length (feet)	313	313	313
Vegetation Community Transitions along Transect	2	2	1
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	2	2	2
Total Vegetative Species	16	18	22
Total Hydrophytic Species	13	15	17
Total Upland Species	3	3	5
Estimated % Total Vegetative Cover	98	98	98
% Transect Length Comprising Hydrophytic Vegetation Communities	100	100	100
% Transect Length Comprising Upland Vegetation Communities	0	0	0
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0

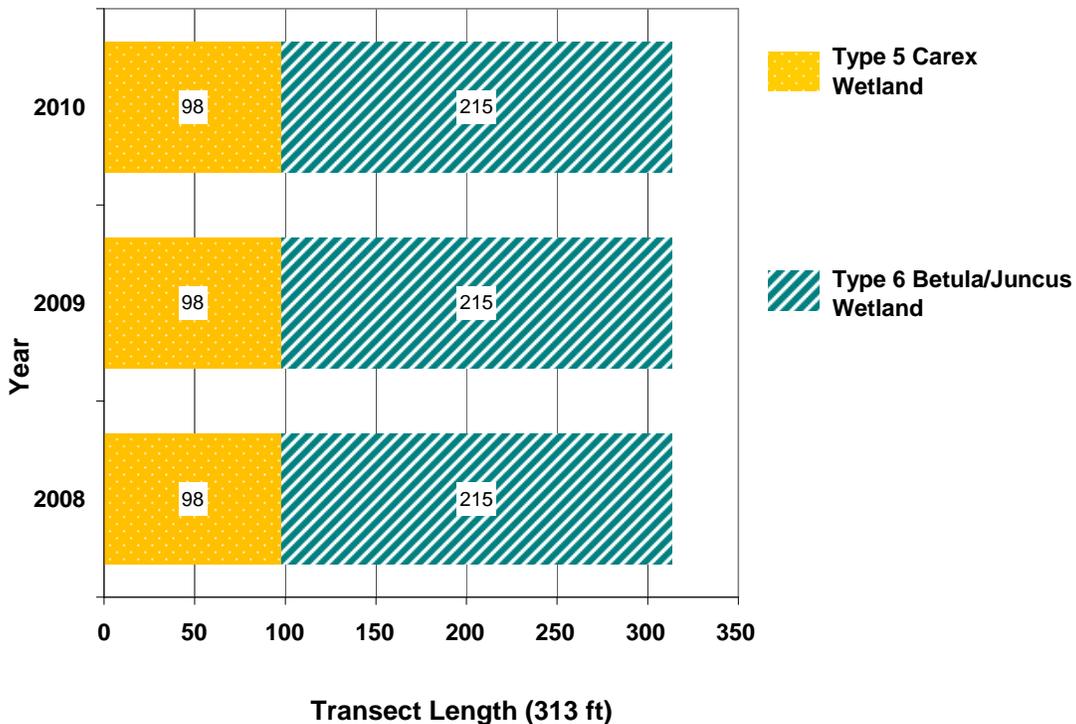


Chart 3. Bouchard Transect 2 maps showing vegetation types from transect start (0 feet) to end (313 feet) in 2008 to 2010.

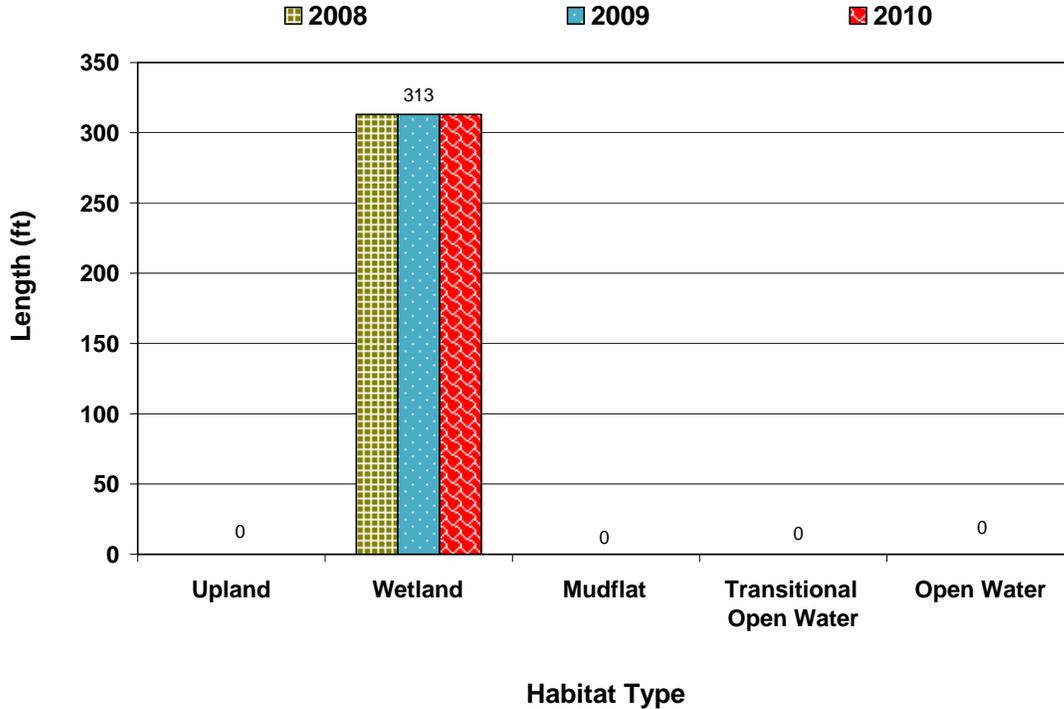


Chart 4. Bouchard length of vegetation habitats within Transect 2 in 2008 to 2010.

The same community types and transect lengths were identified on Transect 3 from 2008 to 2010. This transect was established to monitor the transition of the area from cleared pasture to scrub areas. Upland Type 1 and wetland Type 4 dominated the transect intervals. Four more species were identified on the transect in 2010. Hydrophytic vegetation communities comprised 7 percent of the transect intervals. Transect 3 is located within an upland area located between pre-existing wetlands.

Table 7. Bouchard Transect 3 data summary from 2008 to 2010.

Monitoring Year	2008	2009	2010
Transect Length (feet)	133	133	133
Vegetation Community Transitions along Transect	2	2	1
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	13	13	14
Total Hydrophytic Species	3	4	5
Total Upland Species	10	9	9
Estimated % Total Vegetative Cover	80	95	95
% Transect Length Comprising Hydrophytic Vegetation Communities	7	7	7
% Transect Length Comprising Upland Vegetation Communities	93	93	93
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0

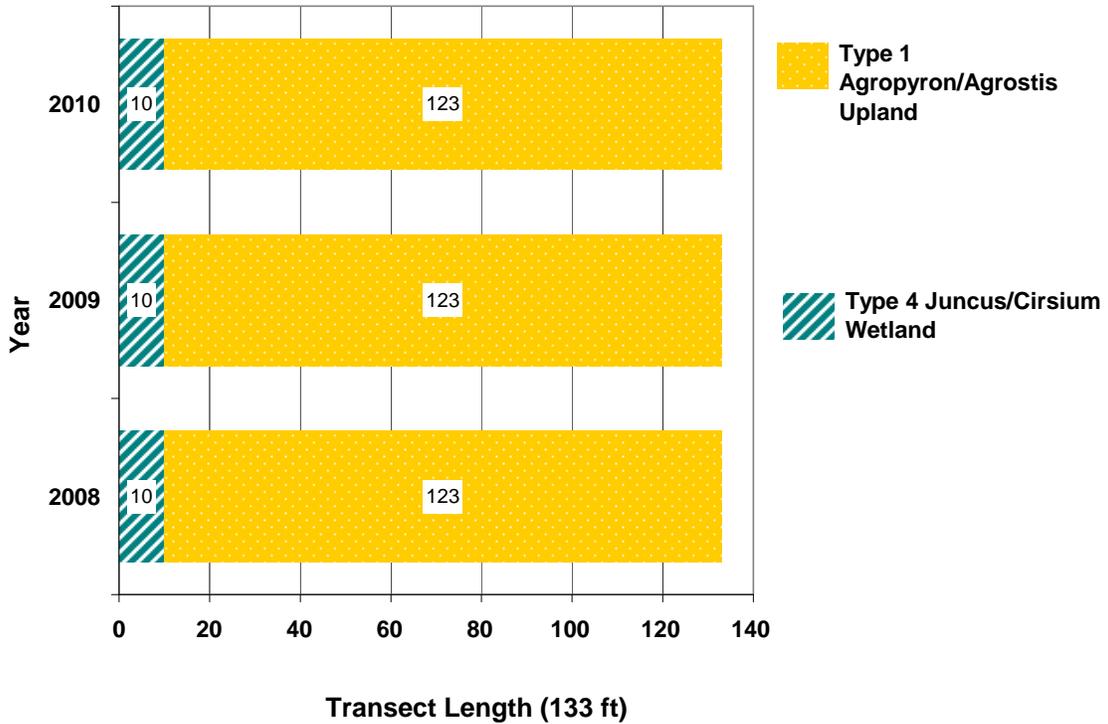


Chart 5. Bouchard Transect 3 maps showing vegetation types from transect start (0 feet) to end (133 feet) in 2008 to 2010.

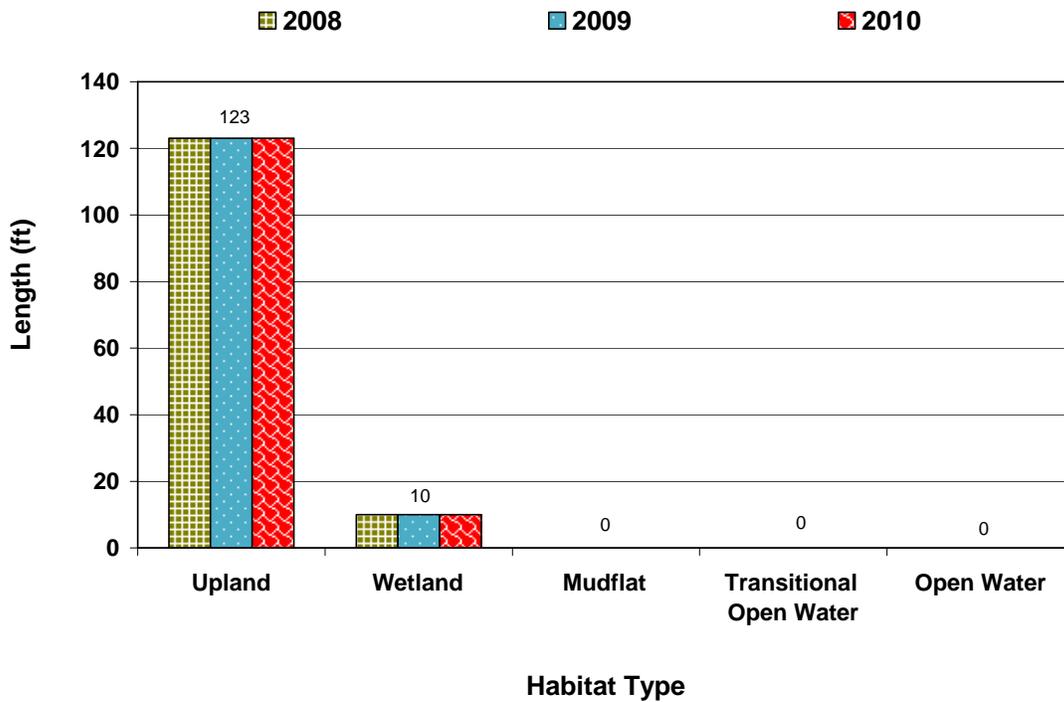


Chart 6. Bouchard length of vegetation habitats within Transect 3 from 2008 to 2010.

Infestations of Priority 2B noxious weeds, including Canada thistle (*Cirsium arvense*), spotted knapweed (*Centaurea maculosa*), and musk thistle (*Carduus nutans*) were mapped on Figure 5, (Appendix A). Canada thistle was identified across the site, particularly in community Type 1. The size of the Canada thistle infestations ranged from 0.1 to 1.0 acre to 1.0 to 5.0 acres with a moderate (5 to 25 percent) to high (25 to 100 percent) cover class. Spotted knapweed infestations ranged from 0.1 to 1.0 acre in size with a moderate cover class. Musk thistle was located in the south half of the site at less than 0.1 acre in size and a low (1 to 5 percent) cover class. The MDT sprayed the noxious weeds in spring 2010.

Native containerized shrubs and herbaceous plugs were planted during spring 2006 (PBS&J 2009). The shrubs were planted in clusters to simulate the natural distribution of native scrub-shrub species. First-year survival of the shrub plantings was assessed in summer 2009. The original planting numbers listed on the Monitoring Form (Appendix B) were taken from the Bouchard Wetland – Wetland Planting Summary (PBS&J 2009). Actual planting numbers and prescribed species varied from the original plan. Percent survival could not be calculated accurately based on the inability to quantify and locate every individual plant installed in 2006 (PBS&J 2009).

Shrub planting survival data were collected along ten, 240-foot long, 6.6-foot wide belt transects that totaled approximately 0.35 acres (15,600 square feet). Transects were randomly established across the wetland creation area perpendicular to the south project area boundary. Transects were assessed from south to north. Species survival evaluated in 2010 was based on visual estimates and counts for each live species. Actual planting numbers and prescribed species varied from the original plan. Douglas hawthorn, Wood's rose, and common snowberry (*Symphoricarpos albus*) plants were identified in 2010 although they were not listed on the original planting summary, suggesting these woody species are volunteers into the mitigation area. Changes were made to the revegetation design during construction based on the availability of species. Overall survival in 2010 was considered moderate to high based on the visual assessment. Plant growth was vigorous and healthy with few discolored leaves. The majority of browse protection was intact and functioning properly; however, approximately 10 browse protection systems were damaged and not functioning. These protectors have been in place for four growing seasons and removal from established plants should be considered.

3.1.3. Soil

Soils are mapped in the Lake County Soil Survey as Lamoose loam, Borochemists, and Colake loam; these soils are listed nationally as hydric soils (USDA 2010). Borochemist soils are very poorly drained and occur on low stream terraces and floodplains. Colake series soils are poorly drained and occur in swales and depressions on plains and stream terraces. Lamoose series soils are poorly drained and occur in floodplains.

Test pits SP-1 to SP-8 were located in areas that met the wetland criteria. Test pit SP-9 was not classified as a wetland although the soil was classified as hydric. Test pits SP-1 to SP-8 were black (10YR 2/1) loams. All data points exhibited low chroma colors in the matrix and the soil map units were listed as hydric on the local soils list. Test pit SP-9 was a very dark (10YR 2/2) brown loam. The soil map unit was listed as a local hydric soil.

3.1.4. Wetland Delineation

Data points SP-1 to SP-9 were used to determine the wetland and upland boundaries (Bouchard Figures 4 and 5, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Bouchard Wetland Data Forms (Appendix B). Aquatic habitat totaled 30.46 acres including 30.19 acres of emergent and scrub-shrub wetland and 0.27 acres of open water. This represented an increase of 1.93 acres in aquatic habitat since 2009 and an increase of 11.43 acres since 2004.

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

Aquatic Habitat	2004 (acres)	2007 (acres)	2009 (acres)	2010 (acres)
Wetland Area	19.03	29.26	28.14	30.19
Open Water	---		0.39	0.27
Total Aquatic Habitat	19.03	29.26	28.53	30.46

3.1.5. Wildlife

A list of wildlife species observed directly or indirectly from 2007 to 2010 is presented in Table 9 (Monitoring Form, Appendix B). Two American goldfinch (*Spinus tristus*), two black-capped chickadee (*Poecile atricapillus*), two Bohemian waxwing (*Bombycilla garrulus*), and one ring-necked pheasant (*Phasianus colchicus*) were observed in 2010. A white-tail deer (*Odocoileus virginianus*) was also observed.

Table 9. Wildlife species observed at the Bouchard Mitigation Site from 2007 to 2010.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog	<i>Rana luteiventris</i>
BIRD	
American Crow	<i>Corvus brachyrhynchos</i>
American Goldfinch	<i>Spinus tristis</i>
Black-billed Magpie	<i>Pica hudsonia</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>
Bohemian Waxwing	<i>Bombycilla garrulus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Cordilleran Flycatcher	<i>Empidonax occidentalis</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
Killdeer	<i>Charadrius vociferus</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh Wren	<i>Cistothorus palustris</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Flicker	<i>Colaptes auratus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Ring-necked Pheasant	<i>Phasianus colchicus</i>
Song Sparrow	<i>Melospiza melodia</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Wilson's Snipe	<i>Gallinago delicata</i>
Wilson's Warbler	<i>Wilsonia pusilla</i>
Wood Duck	<i>Aix sponsa</i>
Yellow Warbler	<i>Dendroica petechia</i>
MAMMAL	
Coyote	<i>Canis latrans</i>
Deer Spp.	
Meadow Vole	<i>Microtus pennsylvanicus</i>
Muskrat	<i>Ondatra zibethicus</i>
White-tailed Deer	<i>Odocoileus virginianus</i>

Species first identified in 2010 are listed in **bold** type.

3.1.6. Functional Assessment

Results of the 2004 (baseline), 2009, and 2010 functional assessments are summarized in Table 10. The 2010 Bouchard Wetland Assessment Form (1999) is included in Appendix B. The Bouchard Property was evaluated as one assessment area (AA-1) that encompassed 30.46 acres in 2010. The AA was rated as a Category II wetland in 2010 with 74 percent of the total possible points. The 2010 percent score shown in Table 10 was five percentage points higher than 2009 as a result of a recreation/education potential rating. The 2010 increase in the extent of aquatic habitat resulted in a corresponding increase in functional units. The site exhibited a net acreage gain of 11.4 acres since 2004 and a functional unit gain of 116.54.

Functional ratings were high for general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, production export/food chain support, groundwater discharge/recharge, and recreation/education potential.

Table 10. Summary of 2004 (Baseline) and 2009 and 2010 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 (AA-1)	2009 (AA-1)	2010 (AA-1)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	High (0.8)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	NA	NA	NA
Short and Long Term Surface Water Storage	High (0.8)	High (0.9)	High (0.9)
Sediment/Nutrient/Toxicant Removal	NA	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	NA	NA	NA
Production Export/Food Chain Support	High (0.9)	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Mod (0.6)	Mod (0.6)	Mod (0.6)
Recreation/Education Potential	Low (0.1)	Mod (0.5)	High (1.0)
Actual Points / Possible Points	4.6 / 8	6.2 / 9	6.7/9
% of Possible Score Achieved	56%	69%	74%
Overall Category	III	II	II
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	19.03	28.53	30.46
Total Functional Units (acreage x actual points) (fu)	87.54	176.89	204.08
Net Acreage Gain (ac)	NA	9.5	11.4
Net Functional Unit Gain	NA	89.35	116.54

3.1.7. Photo Documentation

Photographs of photo points PP1 to PP11 (Figure 2, Appendix A) and of the transect endpoints are shown on pages C-1 to C-6 of Appendix C.

3.1.8. Maintenance Needs

Infestations of Priority 2B noxious weeds, including Canada thistle (*Cirsium arvense*), spotted knapweed (*Centaurea maculosa*), common St. Johnswort (*Hypericum perforatum*) and houndstongue (*Cynoglossum officinale*) were mapped on Figure 5, (Appendix A). The MDT sprayed the noxious weeds in spring 2010. Weed infestations should be continued to be sprayed in the future. Consideration should be given to the removal of the woody plant protectors for plants which are well-established to prevent stunting the growth.

3.1.9. Current Credit Summary

Approximately 30.46 aquatic habitat acres consisting of 30.19 acres of wetlands and 0.27 acre of shallow open water were delineated in 2010. The pre-project

wetland delineation documented 19.03 acres of wetland and open water. The net increase in aquatic habitat acres to date is 11.4 acres.

The calculated acreage credits presented in Table 11 were separated by individual mitigation types with appropriate credit ratios applied for both the CSKT and USACE crediting systems. The Bouchard Property mitigation types were creation, re-establishment (USACE) / primary restoration (CSKT), and rehabilitation (USACE)/secondary restoration (CSKT).

The USACE enhancement credit ratio of 3.33 to 1 for rehabilitation activities was based on functional point scores and calculated using the following equation:

Enhancement factor = $(F_{\text{post}} - F_{\text{pre}}) / F_{\text{pre}}$ where: F_{post} = projected post-mitigation project functional point score; and F_{pre} = pre-project functional point score.

Enhancement factor = $(6.2 - 4.6) / 4.6$; Enhancement factor = 0.35
 Enhancement Ratio = $1 / 0.35$; Enhancement Ratio = 2.86

The 2010 enhancement ratio was calculated as 2.86. Using this ratio of 2.86, the site earned 18.08 USACE credit acres and 14.76 CSKT credit acres in 2010. Both credit estimates are higher than the projected credit acres as the site is improving exceeding credits projected.

Table 11. Credit summary in 2010 at the Bouchard Property Wetland Mitigation Site.

Targeted Mitigation Type	2009 Wetlands (Acre)	2010 Wetlands (Acre)	Credit Ratio		2009 Credit (acre)		2010 Credit (acre)		Projected Credit (acre)	
			USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	4.79	6.72	1:1	3.36:1	4.79	1.43	6.72	2.00	5.16	1.54
Re-establishment / primary restoration	4.71	4.71	1:1	1.86:1	4.71	2.53	4.71	2.53	2.94	1.58
Rehabilitation / secondary restoration	19.03	19.03	2.86:1	1.86:1	6.65	10.23	6.65	10.23	4.05	10.23
Total	28.53	30.46			16.15	14.19	18.08	14.76	12.15	13.35

3.2. Mud Creek

3.2.1. Hydrology

The average total annual precipitation recorded at the Saint Ignatius weather station (247286) from February 1896 to April 2010 was 15.89 inches (WRCC 2010). Cumulative precipitation recorded at the Bureau of Reclamation AgriMet station at Saint Ignatius (SIGM) was 18.16 inches through August 30, 2010, well above the precipitation averages of 11.44 inches recorded through December 2009 and 13.59 inches recorded through December 2008 (USBR 2010).

The main source of hydrology at the Mud Creek site is perennial flows in Mud Creek and increased groundwater elevations as a result of the restoration. The mitigation site is located on the west side of the highway within an existing depression wetland that exhibits shallow groundwater and overbank flow from the restored Mud Creek. The site receives seasonal flooding during spring runoff and sustained flows during summer from irrigation return and groundwater sources.

Emergent wetlands are developing with the post-construction increases in wetland hydrology and the removal of grazing. The surface water depths range from 0 to 3 feet with an average depth of approximately 1.5 feet. Overall, 20 percent of the area is inundated with water. The depth of water at the emergent vegetation and open water boundary is approximately 0.5 feet. Areas that were not inundated met the saturation criteria (see below).

Four data points, SP-1 to SP-4, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). All the data points were located within areas that met the three wetland criteria. Data points SP-1 and SP-2 were saturated to the ground surface and revealed free water in the pit (water table) at 10 inches below the ground surface (bgs). Data point SP-2 had a positive FAC-neutral test. Data point SP-3 was saturated at 8 inches bgs, a positive indication of wetland hydrology. Test pit SP-4 was inundated to a depth of 0.5 inches and saturated within 12 inches bgs, and exhibited drainage patterns. One secondary indicator was the positive FAC-neutral test.

3.2.2. Vegetation

A comprehensive list of 82 species identified onsite in 2009 and 2010 is presented in Table 12. One upland and six wetland community types were identified in 2010 (Mud Creek Figure 7, Appendix A). The community types were Type 1 – *Juncus balticus*/*Agrostis alba* Wetland, Type 2 – *Phalaris arundinacea*/*Agrostis alba* Wetland, Type 3 – *Scirpus microcarpus* Wetland, Type 4 – *Juncus* spp./*Carex* spp. Wetland, Type 5 – *Carex* spp. Wetland, Type 6 – *Crataegus douglassii*/*Phalaris arundinacea* Wetland, and Type 7 – *Phalaris arundinacea*/*Melilotus officinalis* Upland. The species composition is detailed by type below and on the Monitoring Form (Appendix B). Open water areas were identified as number 8 on Figure 7 (Appendix A).

Table 12. Vegetation species observed in 2009 and 2010 for the Mud Creek Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator ¹
<i>Achillea millefolium</i>	yarrow,common	FACU
<i>Agropyron repens</i>	quackgrass	FACU
<i>Agropyron smithii</i>	wheatgrass,Western	FACU
<i>Agropyron spp.</i>		NL
<i>Agropyron trachycaulum</i>	wheatgrass,slender	FAC
<i>Agrostis alba</i>	redtop	FACW
<i>Alnus incana</i>	alder,speckled	FACW
Aquatic Macrophytes		NL
<i>Bidens cernua</i>	beggar-ticks,nodding	FACW+
<i>Bromus inermis</i>	smooth brome	NL
<i>Bromus japonicus</i>	brome,Japanese	FACU
<i>Bromus tectorum</i>	cheatgrass	NL
<i>Carex bebbii</i>	sedge,Bebb's	OBL
<i>Carex nebrascensis</i>	sedge,Nebraska	OBL
<i>Carex praegracilis</i>	sedge,clustered field	FACW
<i>Carex spp.</i>		NL
<i>Carex stipata</i>	awlfruit sedge	NL
<i>Carex rostrata (utriculata*)</i>	beaked sedge	OBL
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	NL
<i>Cirsium arvense</i>	thistle,creeping	FACU+
<i>Cirsium vulgare</i>	thistle,bull	FACU
<i>Cornus stolonifera</i>	dogwood,red-osier	FACW
<i>Crataegus douglasii</i>	hawthorn,Douglas'	FAC
<i>Cynoglossum officinale</i>	gypsy-flower	NL
<i>Dactylis glomerata</i>	grass,orchard	FACU
<i>Deschampsia cespitosa</i>	hairgrass,tufted	FACW
<i>Descurainia sophia</i>	common tansymustard	NL
<i>Dianthus spp.</i>		NL
<i>Dipsacus sylvestris</i>	teasel	NI
<i>Eleocharis palustris</i>	spikerush,creeping	OBL
<i>Elodea spp.</i>		NL
<i>Epilobium ciliatum</i>	willow-herb,hairy	FACW-
<i>Festuca arundinacea</i>	fescue,Kentucky	FACU-
<i>Festuca spp.</i>		NL
<i>Geum macrophyllum</i>	avens,large-leaf	FACW+
<i>Glyceria grandis</i>	American mannagrass	NL
<i>Glyceria striata</i>	grass,fowl manna	OBL
<i>Impatiens ecalcarata</i>	touch-me-not,spurless	FACW
<i>Iris pseudacorus</i>	iris,yellow	OBL
<i>Juncus articulatus</i>	rush,jointed	OBL
<i>Juncus balticus</i>	rush,Baltic	OBL
<i>Juncus ensifolius</i>	rush,three-stamen	FACW
<i>Juncus spp.</i>		NL

¹Region 9 Northwest (Reed 1988).

New species identified in 2010 are show in **bold** type.

*Commonly accepted name not included in 1988 list.

Table 12. (Continued). Vegetation species observed in 2009 and 2010 for the Mud Creek Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator ¹
<i>Lactuca serriola</i>	lettuce, prickly	FAC-
<i>Lemna minor</i>	duckweed, lesser	OBL
<i>Lepidium campestre</i>	field pepperweed	NL
<i>Lepidium perfoliatum</i>	pepper-grass, clasping	FACU+
<i>Lychnis alba</i>	bladder campion	NL
<i>Lysichiton americanum</i>	skunk-cabbage, yellow	OBL
<i>Malva neglecta</i>	common mallow	NL
<i>Medicago sativa</i>	alfalfa	NL
<i>Melilotus officinalis</i>	sweetclover, yellow	FACU
<i>Mentha arvensis</i>	mint, field	FAC
<i>Mimulus guttatus</i>	monkey-flower, common large	OBL
<i>Nasturtium officinale</i>	water-cress, true	OBL
<i>Nepeta cataria</i>	catnip	FAC
<i>Oenanthe spp.</i>		NL
<i>Phalaris arundinacea</i>	grass, reed canary	FACW
<i>Phleum pratense</i>	timothy	FACU
<i>Poa pratensis</i>	bluegrass, Kentucky	FACU+
<i>Poa spp.</i>		NL
<i>Polygonum bistortoides</i>	bistort, American	FACW+
<i>Polygonum spp.</i>		NL
<i>Populus tremula</i>	aspen, quaking	FAC+
<i>Populus balsamifera (trichocarpa)*</i>	black cottonwood	FAC
<i>Potentilla recta</i>	sulfur cinquefoil	NL
<i>Ranunculus aquatilis</i>	butter-cup, white water	OBL
<i>Rosa woodsii</i>	rose, Woods	FACU
<i>Rumex crispus</i>	dock, curly	FACW
<i>Salix bebbiana</i>	willow, bebb	FACW
<i>Salix drummondiana</i>	willow, drummond	FACW
<i>Scirpus microcarpus</i>	bulrush, small-fruit	OBL
<i>Sisymbrium altissimum</i>	mustard, tall tumble	FACU-
<i>Solanum dulcamara</i>	nightshade, climbing	FAC
<i>Sonchus arvensis</i>	sowthistle, field	FACU+
<i>Tragopogon dubius</i>	yellow salsify	NL
<i>Trifolium pratense</i>	clover, red	FACU
<i>Trifolium repens</i>	clover, white	FACU+
<i>Trifolium spp.</i>		NL
<i>Typha latifolia</i>	cattail, broad-leaf	OBL
<i>Verbascum thapsus</i>	common mullein	NL
<i>Veronica americana</i>	speedwell, American	OBL

¹Region 9 Northwest (Reed 1988).

New species identified in 2010 are show in **bold** type.

*Commonly accepted name not included in 1988 list.

Wetland Type 1 – *Juncus balticus*/*Agrostis alba* was found in a small area located in the southwest portion of the site dominated by emergent vegetation. Baltic rush, reedtop, reed canary grass (*Phalaris arundinacea*), and Kentucky bluegrass (*Poa pratensis*) dominated the cover.

Community Type 2 – *Phalaris arundinacea*/*Agrostis alba*, the largest wetland community, was dominated by reed canary grass, reedtop and awlfruit sedge.

Type 3 – *Scirpus microcarpus* (small-fruited bulrush) was found in the north half of the site. Canada thistle contributed less than one percent of the total cover.

Community Type 4 – *Juncus* spp./*Carex* spp. was found at the north boundary. Baltic rush, three-stamen rush, Nebraska sedge, beaked sedge, Bebb's sedge (*Carex bebbii*), and awlfruit sedge dominated the cover.

Wetland Type 5 – *Carex* spp. characterized the wetland areas along the reconstructed banks of Mud Creek. Woody species were planted along the stream corridor. The community was dominated by beaked sedge, awlfruit sedge, reedtop, American mannagrass (*Glyceria grandis*), and reed canary grass.

Community Type 6 – *Crataegus douglassii*/*Phalaris arundinacea* was identified in wetlands adjacent to Mud Creek and dominated by scrub-shrub and emergent species. The species included Douglas hawthorne, reed canary grass, Canada thistle, and climbing nightshade (*Solanum sulcamara*).

Type 7 – *Phalaris arundinacea*/*Melilotus officinalis* was found in upland areas adjacent to the creek was predominantly vegetated by reed canary grass, yellow sweet clover (*Melilotus officinalis*), and white clover (*Trifolium repens*).

The open water (Community 8) contained aquatic macrophytes including true water cress (*Nasturtium officinale*), American speedwell (*Veronica americana*), and white water butter-cup (*Ranunculus aquatilis*).

Vegetation transect results were detailed on the Mud Creek Monitoring Form (Appendix B) and summarized in Table 13 and Charts 7 and 8. Photographs of the transect end points are shown on pages C-8 through C-16 of Appendix C. The 2010 transect intervals were the same as in 2009. The transect was dominated by wetland community Types 2, 3, and 4. Ninety-eight percent of the transect intervals were dominated by hydrophytic species and two percent of the transect intersected open water.

The location of Priority 2B noxious weed infestations Canada thistle (*Cirsium arvense*), oxeye daisy (*Chrysanthemum leucanthemum*), and spotted knapweed (*Centaurea maculosa*) are shown on Figure 7 (Appendix A). Canada thistle was located at less than 0.1 acre in size and at a low cover class. A small amount of oxeye daisy was noted along the project boundary near southbound US93. Spotted knapweed was located at the south end of the project at less than 0.1 acre in size and at a moderate cover class. Canada thistle was also present in the Type 6 community.

Table 13. Mud Creek Transect 1 data summary.

Monitoring Year	2009	2010
Transect Length (feet)	494	494
# Vegetation Community Transitions along Transect	6	6
# Vegetation Communities along Transect	5	4
# Hydrophytic Vegetation Communities along Transect	5	4
Total Vegetative Species	29	32
Total Hydrophytic Species	22	20
Total Upland Species	7	12
Estimated % Total Vegetative Cover	96	96
% Transect Length Comprising Hydrophytic Vegetation Communities	100	98
% Transect Length Comprising Upland Vegetation Communities	0	0
% Transect Length Comprising Unvegetated Open Water	0	2
% Transect Length Comprised of Bare Substrate	0	0

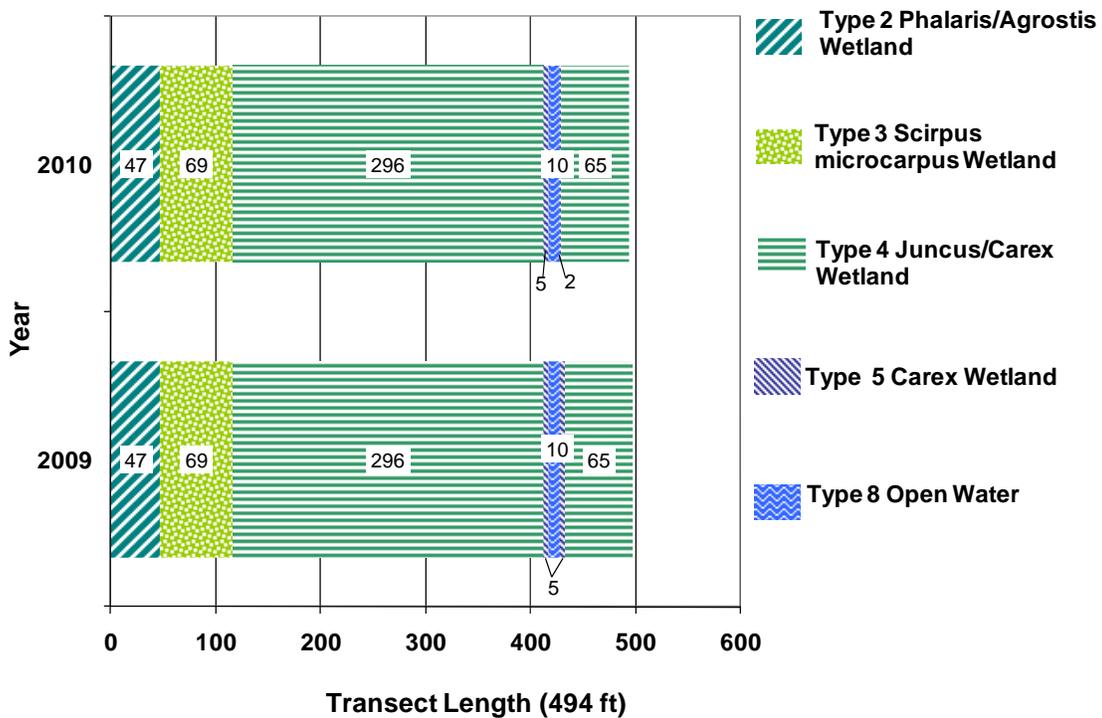


Chart 7. Mud Creek Transect 1 maps showing vegetation types from transect start (0 feet) to end (494 feet) in 2009 and 2010.

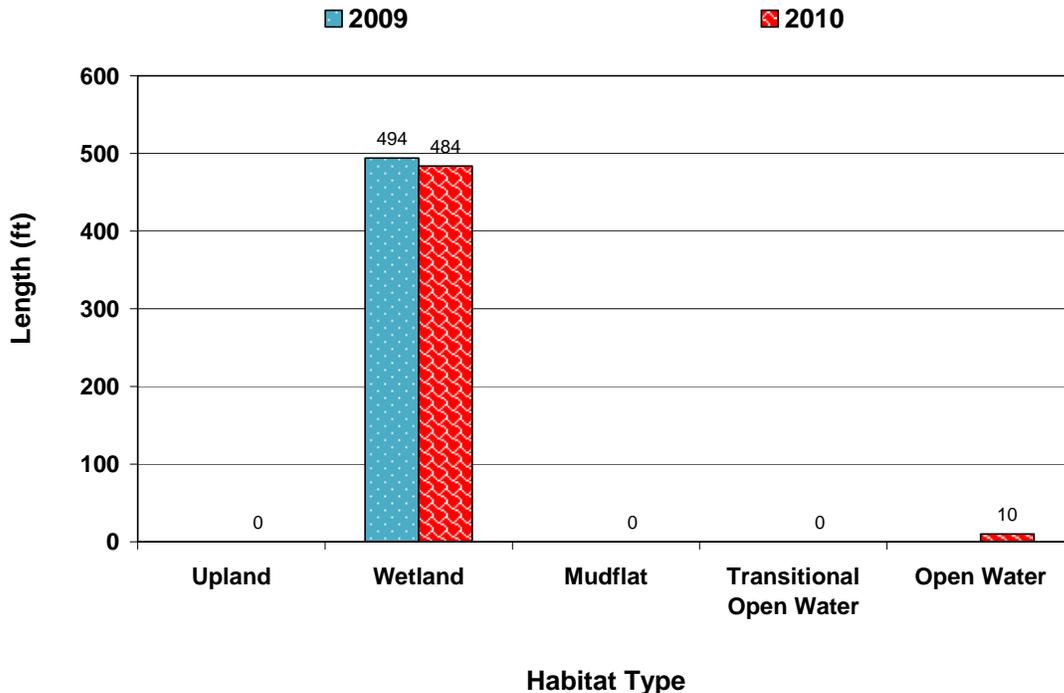


Chart 8. Mud Creek length of vegetation communities within Transect 1 from 2009 to 2010.

Wetland and riparian vegetation was planted in 2008. The vegetated soil lifts and wetland sod matting used for the creek restoration were well established with deep-rooted emergent vegetation providing a dense cover on a majority of the stream banks.

Woody species survival including the number of live plants was recorded on the Monitoring Form (Appendix B). Shrub and tree planting survival data were collected along one 428-foot long, 6.6-foot wide, belt transect that encompassed approximately 2,808 square feet. The transect was established along the reconstructed creek and floodplain margins. The plantings looked healthy with vigorous growth for the season and few discolored leaves. Thin-leaf alder and black cottonwood species exhibited the highest survival rates. Species survival in 2010 was based on visual estimates and counts for each live species. The original plant numbers listed on the Monitoring Form were referenced from the Wetland Mitigation Planting Details and Schedule (PBS&J 2009). Actual planting numbers and prescribed species varied from the original plan as changes were made to the revegetation design during construction based on the availability of plant materials. Overall survival was considered high based on the visual assessment. No volunteer woody species were noted in 2010.

3.2.3. Soil

Soils at the Mud Creek site were mapped as Borohemists, 0 to 1 percent slopes (NRCS 2010). Borohemists are very poorly drained soils that occur on low stream terraces and floodplains. The soil series is listed on local and national hydric soils lists.

All four test pits, SP-1 through SP-4, were located in areas that met the three wetland criteria. Test pit SP-1, SP-3 and SP-4 were black (10YR 2/1) loams. SP-2 is a black (10YR 2/1) loam with a mucky peat surface horizon. Hydric soil indicators at the four data points were low chroma colors in the matrix and the inclusion of the soil map unit on local and national hydric soils lists. There was no evidence of redoximorphic features.

3.2.4. Wetland Delineation

Four data points (Figure 6, Appendix A) were used to determine the upland and wetland boundaries of delineated wetlands. The Mud Creek Wetland Data Forms are included in Appendix B and the wetland boundaries are shown on Figure 7 (Appendix A). The total aquatic habitat developed to date within the 2.6-acre project area was 2.16 acres, which included 0.08 acres of open water (Table 14). There was an increase of 0.14 wetland acres from 2009 to 2010.

Table 14. Aquatic habitat acreages delineated in 2010 at the Mud Creek Wetland Mitigation Site.

Habitat	2009 (acres)	2010 (acres)
Wetland Area	2.02	2.08
Open Water	--	0.08
Total Aquatic Habitat Area	2.02	2.16

3.2.5. Wildlife

A list of the bird and mammal species observed in 2009 and 2010 at the Mud Creek Site is shown in Table 15 (Monitoring Form, Appendix B). An Eastern kingbird (*Tyrannus tyrannus*), song sparrow (*Melospiza melodia*), and striped skunk (*Mephitis mephitis*) were noted at the mitigation site during 2010 monitoring.

Table 15. Wildlife species observed at the Mud Creek Wetland Mitigation Site in 2009 and 2010.

COMMON NAME	SCIENTIFIC NAME
BIRD	
American Robin	<i>Turdus migratorius</i>
Black-billed Magpie	<i>Pica hudsonia</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>
European Starling	<i>Sturnus vulgaris</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Song Sparrow	<i>Melospiza melodia</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Wilson's Snipe	<i>Gallinago delicata</i>
MAMMAL	
Deer Spp.	
Feral cat	
Raccoon	<i>Procyon lotor</i>
Red Fox	<i>Vulpes vulpes</i>
Striped Skunk	<i>Mephitis mephitis</i>

Species first identified in 2010 are listed in **bold** type.

3.2.6. Functional Assessment

Results of the 2004 (baseline), 2009, and 2010 functional assessments (Berglund 1999) are summarized in Table 16. The 2010 Mud Creek Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 2.6-acre project area was 2.16 acres, which included 0.08 acres of open water. There was an increase of 0.14 acres from 2009 to 2010.

The Mud Creek Property was evaluated as one assessment area (AA-1) that encompassed 2.16 acres in 2010. The AA was rated as a Category III wetland in 2010 with right at 65 percent of the total possible points. The actual points and ratings were identical between 2009 and 2010. The site increased in total functional units due to an increase in wetland acreage. Baseline acreages from 2004 and functional units were not available for comparison. Functional ratings were high for short and long term surface water storage, sediment/shoreline stabilization, sediment/nutrient/toxicant removal, production export/food chain support, and groundwater discharge/recharge. The 2010 functional assessment yielded 16.85 functional units in 2010.

Table 16. Summary of 2004 Baseline and 2009 and 2010 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)	2009 (AA-1)	2010 (AA-1)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)*	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.3)	Mod (0.7)	Mod (0.7)
Flood Attenuation	Low (0.4)	Mod (0.4)	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	Mod (0.7)	High (1.0)	High (1.0)
Production Export/Food Chain Support	High (0.9)	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Mod(0.4)	Mod (0.5)	Mod (0.5)
Recreation/Education Potential	Low (0.1)	Mod (0.5)	Mod (0.5)
Actual Points / Possible Points	6.1 / 12	7.8 / 12	7.8 / 12
% of Possible Score Achieved	50%	65%	65%
Overall Category	III	III	III
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	NA	2.02	2.16
Total Functional Units (acreage x actual points)	NA	15.76	16.85

*Should be 0.1 for suspected/incidental habitat.

3.2.7. Photo Documentation

Photographs of photo points PP1 to PP13 (Figure 2, Appendix A) and of the transect endpoints are shown on pages C-8 to C-16 of Appendix C.

3.2.8. Maintenance Needs

The location of Priority 2B noxious weed infestations Canada thistle, musk thistle, and spotted knapweed, are shown on Figure 7 (Appendix A). The noxious weeds were sprayed by MDT in spring 2010. Weed infestations should be continued to be sprayed in the future to control the weed population.

3.2.9. Current Credit Summary

The wetland delineation identified 2.16 acres of wetland and open water in 2010. The functional assessment yielded 16.85 functional units in 2010. The 2010 estimated credit acres for the Mud Creek site were calculated based on the individual mitigation type and credit ratios from the CSKT and USACE crediting

systems. The mitigation types were creation and rehabilitation (USACE) and secondary restoration (CSKT).

The following equation was used to calculate the USACE enhancement ratio for rehabilitation activities based on the functional assessment point scores summarized in Table 17.

Enhancement factor = $(F_{\text{post}} - F_{\text{pre}}) / F_{\text{pre}}$; Enhancement Ratio = 1/ EF.
 Enhancement factor = $(7.8 - 6.1) / 6.1$; Enhancement factor = 0.0.28
 Enhancement Ratio = $1 / 0.28 = 3.57$

Table 17 lists the current credits based on USACE and CSKT credit ratios, including this year’s calculated ratio for the rehabilitation areas at the Mud Creek site. The 2009 enhancement ratio was 4.35. At the 3.57:1 ratio calculated in 2010, the site has earned 1.78 USACE credit acres and 0.77 CSKT credit acres to date.

The 2010 estimated credits are less than the projected credits as a result of an apparent discrepancy in the original acreage calculation in the mitigation plan (PBS&J 2009). The mitigation plan proposed a total of 6.81 acres of mitigation. The total area of the post-construction site is 2.6 acres including 0.44 acres of uplands.

Table 17. Current credits from 2009 to 2010 at the Mud Creek Wetland Mitigation Site.

Targeted Mitigation Type	2009 Wetland (acres)	2010 Wetland (acres)	Credit Ratio		2009 Credit (acre) Projected Credit		2010 Credit (acre) Projected Credit		Projected Totals (acre)	
			USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	1.49	1.63	1:1	3.36:1	1.49	0.44	1.63	0.49	6.18	3.22
Rehabilitation / secondary restoration	0.53	0.53	3.57:1	1.86:1	0.12	0.28	0.15	0.28	0.63	0.33
TOTAL	2.02	2.16			1.61	0.72	1.78	0.77	6.81	3.55

3.3. Peterson Property

3.3.1. Hydrology

The main source of hydrology at the Peterson site comes from an unnamed perennial tributary of Post Creek (PBS&J 2009). The mitigation site is located within a long wetland swale that runs east to west. The project is exposed to seasonal flooding during spring runoff and sustained flows during summer from irrigation return. Twelve log crib structures were installed to create shallow inundation behind the structures. The site exhibited shallow inundation of varying depths behind these impoundments during monitoring. Each crib structure was designed to allow surface flow to spill through a designated overflow (PBS&J 2009).

The average total annual precipitation recorded at the Saint Ignatius weather station (247286) from February 1896 to April 2010 was 15.89 inches (WRCC 2010). Cumulative precipitation recorded at the Bureau of Reclamation AgriMet station at Saint Ignatius (SIGM) was 18.16 inches through August 30, 2010, well above the precipitation averages of 11.44 inches recorded through December 2009 and 13.59 inches recorded through December 2008 (USBR 2010).

Approximately 15 percent of the project area was inundated. Surface water depths ranged from 0 to 3 feet with an average depth of approximately 0.5 feet. The water depth at the emergent vegetation and open water boundary was approximately 0.5 feet.

Six data points, SP-1 to SP-6 were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points SP-1, SP-2, SP-4, and SP-5 were located within areas that met the wetland criteria. Data point SP-1 had a water table at 10 inches. SP-2 was inundated to a depth of 4 inches and data point SP-4 was inundated to a depth of one inch. All three were saturated to the soil surface, positive indicators of wetland hydrology. Data point SP-5 was saturated within 6 inches of the ground surface. SP-6 was located in an upland and did not display wetland hydrology.

3.3.2. Vegetation

A comprehensive vegetation species list compiled from 2008 to 2010 is presented in Table 18. Three wetland and one upland community types were identified and mapped at the mitigation site in 2010 (Peterson Figure 9, Appendix A). The community types were Type 1 – *Agropyron* spp./*Poa pratensis* Upland, Type 2 – *Phalaris arundnacea* Wetland, Type 3 – *Phalaris arundinacea*/*Typha latifolia* Wetland, and Type 4 – *Carex nebrascensis*/*Poa palustris* Wetland. The species composition is detailed by type on the Peterson Monitoring Form (Appendix B) and below.

Upland community Type 1 – *Agropyron* spp./*Poa pratensis* covers most of the site outside the riparian corridor. Quackgrass, crested wheatgrass, and Kentucky bluegrass dominated the cover.

Wetland Type 2 – *Phalaris arundnacea* was identified at the east end of the stream corridor. The species were dominated by a monoculture of reed canary grass.

Type 3 – *Phalaris arundinacea*/*Typha latifolia* was the prevalent wetland type within the riparian corridor. Broad-leaf cattail, reed canary grass, beaked sedge, American mannagrass, and three-stamen rush dominated the vegetation cover.

Table 18. Vegetation species identified from 2008 to 2010 at the CSKT Peterson Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator ¹
<i>Agropyron cristatum</i>	crested wheatgrass	NL
<i>Agropyron repens</i>	quackgrass	FACU
<i>Alnus incana</i>	alder, speckled	FACW
<i>Bromus tectorum</i>	cheatgrass	NL
<i>Carex nebrascensis</i>	sedge, Nebraska	OBL
<i>Carex stipata</i>	awlfruit sedge	NL
<i>Carex rostrata (utriculata*)</i>	beaked sedge	OBL
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	NL
<i>Cirsium arvense</i>	thistle, creeping	FACU+
<i>Cirsium vulgare</i>	thistle, bull	FACU
<i>Cornus stolonifera</i>	dogwood, red-osier	FACW
<i>Cynoglossum officinale</i>	gypsy-flower	NL
<i>Dactylis glomerata</i>	grass, orchard	FACU
<i>Descurainia sophia</i>		NL
<i>Dianthus spp.</i>		NL
<i>Dipsacus sylvestris</i>	teasel	NI
<i>Eleocharis palustris</i>	spikerush, creeping	OBL
<i>Elodea spp.</i>		NL
<i>Epilobium ciliatum</i>	willow-herb, hairy	FACW-
<i>Festuca arundinacea</i>	fescue, Kentucky	FACU-
<i>Festuca spp.</i>		NL
<i>Geum macrophyllum</i>	avens, large-leaf	FACW+
<i>Glyceria grandis</i>	American mannagrass	NL
<i>Impatiens ecalcarata</i>	touch-me-not, spurless	FACW
<i>Iris pseudacorus</i>	iris, yellow	OBL
<i>Juncus balticus</i>	rush, Baltic	OBL
<i>Juncus ensifolius</i>	rush, three-stamen	FACW
<i>Juncus spp.</i>		NL
<i>Lactuca serriola</i>	lettuce, prickly	FAC-
<i>Lemna minor</i>	duckweed, lesser	OBL
<i>Lepidium campestre</i>	field pepperweed	NL
<i>Lepidium perfoliatum</i>	pepper-grass, clasping	FACU+
<i>Lychnis alba</i>	bladder campion	NL
<i>Malva neglecta</i>	common mallow	NL
<i>Medicago sativa</i>	alfalfa	NL
<i>Melilotus officinalis</i>	sweetclover, yellow	FACU
<i>Nasturtium officinale</i>	water-cress, true	OBL
<i>Nepeta cataria</i>	catnip	FAC
<i>Oenanthe spp.</i>		NL
<i>Phalaris arundinacea</i>	grass, reed canary	FACW

¹Region 9 Northwest (Reed 1988).

New species identified in 2010 are show in **bold** type.

*Commonly accepted term for species not included on 1988 list.

Table 18. (Continued). Vegetation species identified from 2008 to 2010 at the CSKT Peterson Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator ¹
<i>Plantago lanceolata</i>	plantain,English	FACU+
<i>Poa palustris</i>	bluegrass,fowl	FAC
<i>Poa pratensis</i>	bluegrass,Kentucky	FACU+
<i>Poa spp.</i>		NL
<i>Polygonum amphibium</i>	smartweed,water	OBL
<i>Polygonum bistortoides</i>	bistort,American	FACW+
<i>Polygonum spp.</i>		NL
<i>Potentilla recta</i>	sulfur cinquefoil	NL
<i>Rosa woodsii</i>	rose,woods	FACU
<i>Rumex crispus</i>	dock,curly	FACW
<i>Salix bebbiana</i>	willow,bebb	FACW
<i>Salix drummondiana</i>	willow,drummond	FACW
<i>Scirpus microcarpus</i>	bulrush,small-fruit	OBL
<i>Sisymbrium altissimum</i>	mustard,tall tumble	FACU-
<i>Solanum dulcamara</i>	nightshade,climbing	FAC
<i>Sonchus arvensis</i>	sowthistle,field	FACU+
<i>Thlaspi arvense</i>	penny-cress,field	NI
<i>Tragopogon dubius</i>	yellow salsify	NL
<i>Trifolium pratense</i>	clover,red	FACU
<i>Trifolium spp.</i>		NL
<i>Typha latifolia</i>	cattail,broad-leaf	OBL

¹Region 9 Northwest (Reed 1988).

New species identified in 2010 are show in **bold** type.

Community Type 4 – *Carex nebrascensis*/*Poa palustris* was located in the transition area between wetland and upland. The cover was dominated by Nebraska sedge, fowl bluegrass (*Poa palustris*), and reed canary grass.

Vegetation results for Transects 1 and 2 at are detailed on the Peterson Monitoring Form (Appendix B) and summarized in Tables 19 and 20 and Charts 9 to 12, respectively. Photographs of the transect end points are shown on pages C-17 to C-21 of Appendix C.

Two community types, Type 1 and Type 3, dominate Transect 1 (Chart 9). The overall percentage of upland versus wetland remained the same from 2009 to 2010 (Table 19). Approximately 45.1 percent of the transect intervals were dominated by hydrophytic species.

Upland Type 1 and wetland Types 3 and 4 have been identified along the transect from 2008 to 2010 (Chart 11). Hydrophytic species dominated approximately 90.5 percent of the transect (Table 20, Chart 12).

Table 19. CSKT Peterson Transect 1 data summary for 2008 to 2010.

Monitoring Year	2008	2009	2010
Transect Length (feet)	144	144	144
Vegetation Community Transitions along Transect	3	3	2
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	19	24	25
Total Hydrophytic Species	9	14	13
Total Upland Species	10	10	12
Estimated % Total Vegetative Cover	100	87	90
% Transect Length Comprising Hydrophytic Vegetation Communities	45	45	45.1
% Transect Length Comprising Upland Vegetation Communities	55	55	54.9
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0

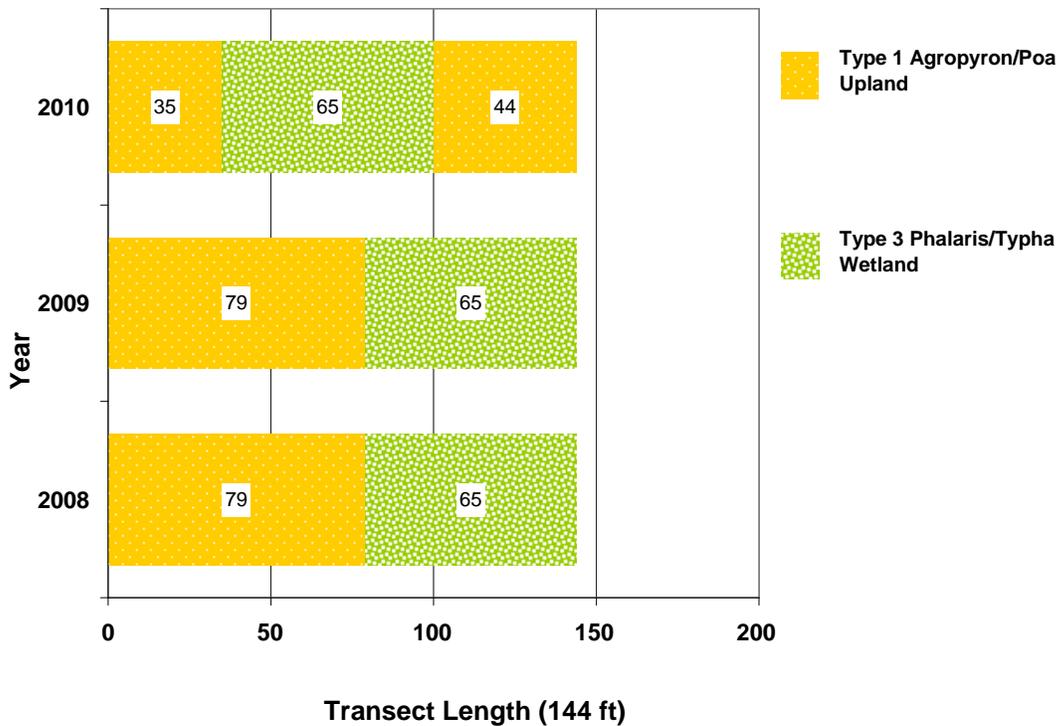


Chart 9. CSKT Peterson Transect 1 maps showing vegetation types from transect start (0 feet) to end (144 feet) for 2008 to 2010.

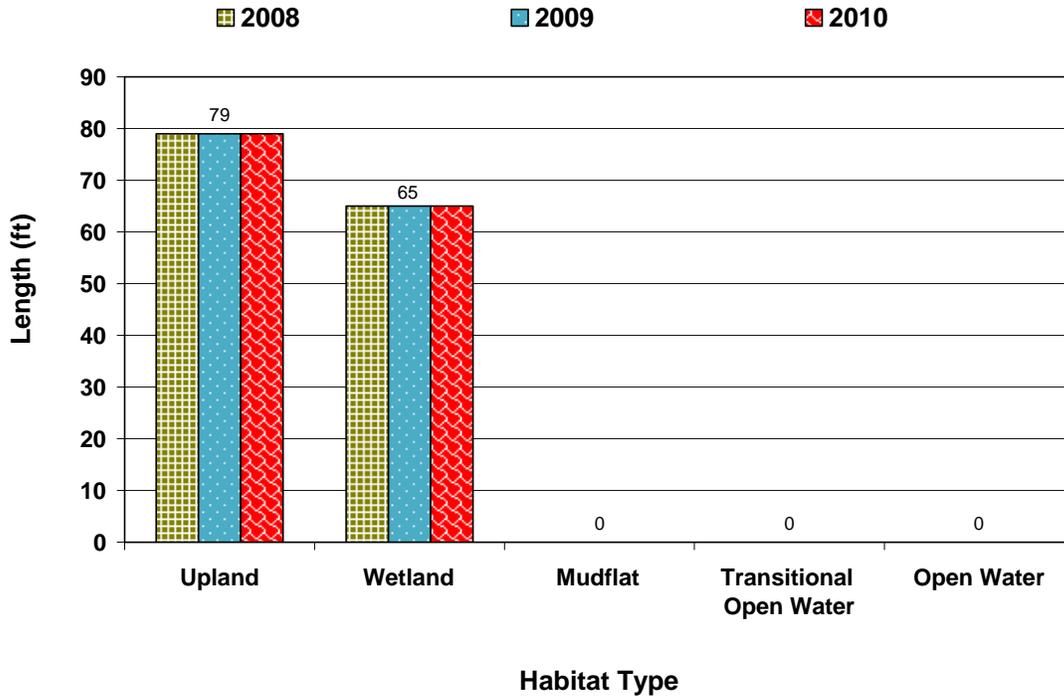


Chart 10. CSKT Peterson - Length of vegetation habitats within Transect 1 for 2008 to 2010.

Table 20. CSKT Peterson Transect 2 data summary for 2008 to 2010.

Monitoring Year	2008	2009	2010
Transect Length (feet)	325	325	325
Vegetation Community Transitions along Transect	3	3	2
Vegetation Communities along Transect	3	3	3
Hydrophytic Vegetation Communities along Transect	2	2	2
Total Vegetative Species	21	23	22
Total Hydrophytic Species	11	11	11
Total Upland Species	10	12	11
Estimated % Total Vegetative Cover	93	85	85
% Transect Length Comprising Hydrophytic Vegetation Communities	90	90	90.5
% Transect Length Comprising Upland Vegetation Communities	10	10	9.5
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0

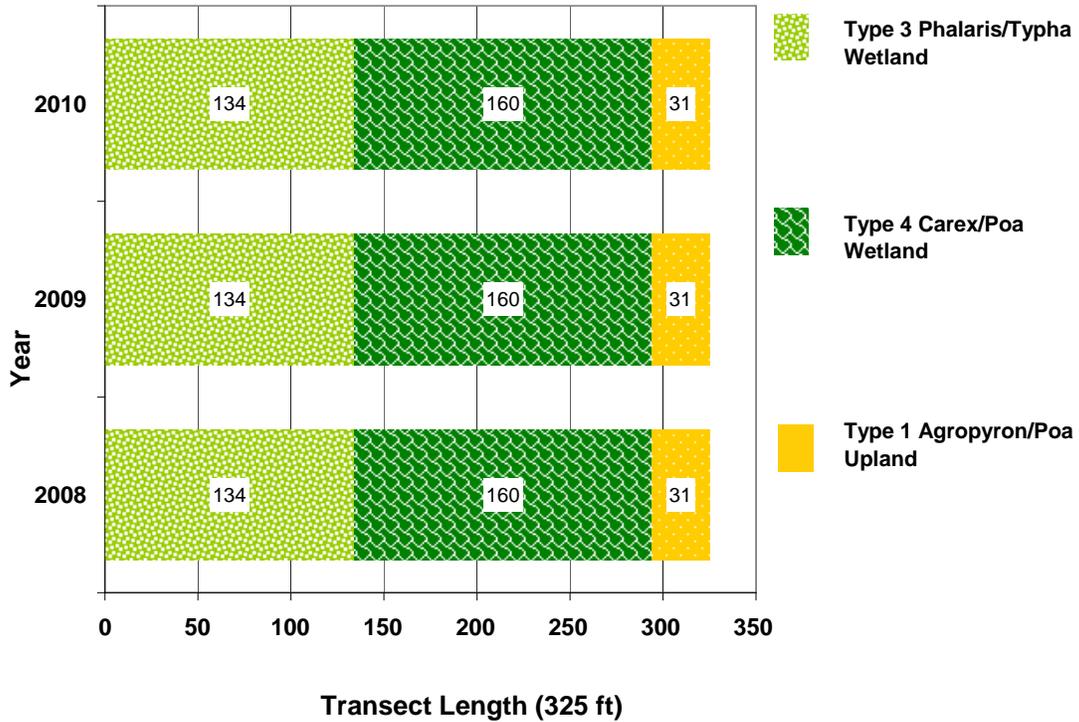


Chart 11. CSKT Peterson Transect 2 map showing vegetation types from transect start (0 feet) to end (325 feet) for 2008 to 2010.

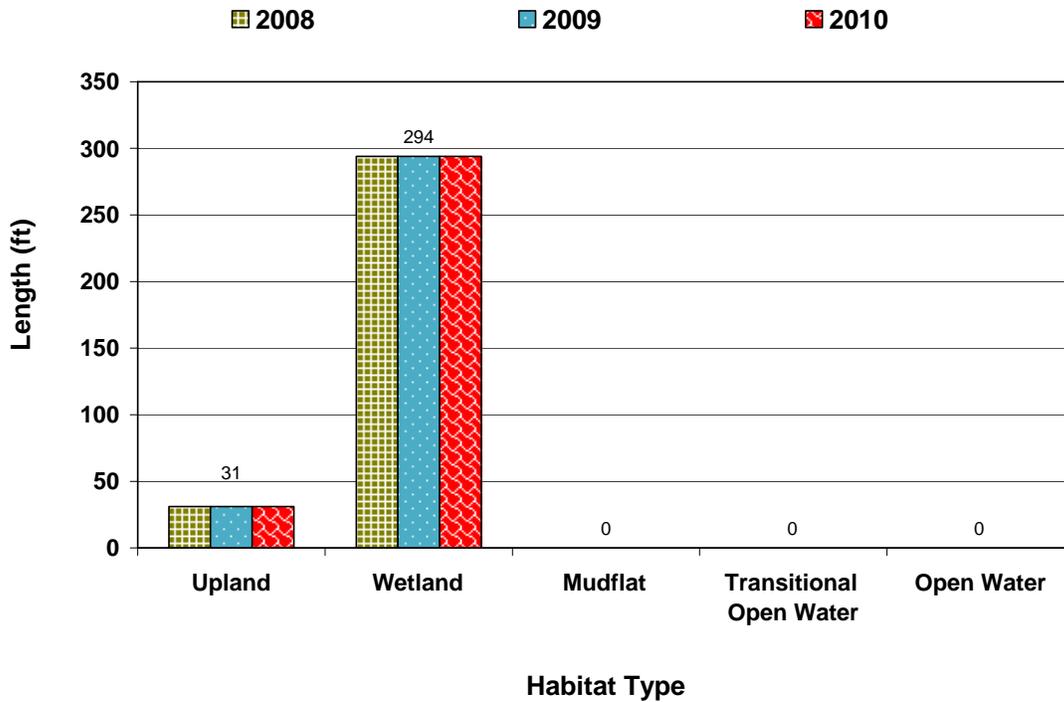


Chart 12. CSKT Peterson - Length of vegetation habitats within Transect 2 for 2008 to 2010.

The location of Priority 2B noxious weed infestations of Canada thistle (*Cirsium arvense*), whitetop (*Cardaria draba*), and sulfur cinquefoil (*Potentilla recta*), observed during 2010 field monitoring were mapped on Peterson Figure 9 in Appendix A. The size of the Canada thistle infestations ranged from less than 0.1 acre to 0.1 to 1.0 acre. The cover was low to moderate. Whitetop was found across the site at less than 0.1 acre to 1.0 and at low to moderate cover. Sulfur cinquefoil was identified at less than 0.1 acre and at a low cover. It was also identified in Type 1. Extensive weed control was conducted on this site prior to the 2010 monitoring event to control these species, and also yellowflag iris (*Iris pseudacorus*), which has been observed along the moist riparian corridor. Yellowflag iris was not mapped in 2010 as existing stems were not recognized as part of the actively growing vegetation community.

Wetland and riparian vegetation was planted in 2007. The plants included native containerized shrubs, cuttings, and grass-like seedlings. Plants were installed along the constructed log crib structures, excavated oxbow depressions, wetlands fringes, and disturbed areas.

Woody species survival including the number of live plants was recorded on the Peterson Monitoring Form (Appendix B). Shrub and tree planting survival data were collected along several 6.6-foot wide belt transects that encompassed approximately 7,500 square feet. Transects were established along the edges of the wetland draw encompassing creation and enhancement mitigation areas. One transect was placed along the log crib structure. The plantings looked healthy with moderate to vigorous growth for the season and few discolored leaves. Thin-leaf alder and Wood's rose exhibited the highest survival. Species survival in 2010 was based on visual estimates and counts for each live species. The original plant numbers listed on the Monitoring Form were referenced from the Wetland Mitigation Planting Details and Schedule (PBS&J 2009). Actual planting numbers and prescribed species varied from the original plan. Changes were made to the revegetation design during construction based on the availability of plant materials. Overall survival was considered high based on the visual assessment.

3.3.3. Soil

The project site was mapped in the Lake County Soil Survey (NRCS 2010) as Colake loam, 0 to 1 percent slopes. The Colake series are poorly drained, occurring in swales and depressions on plains and stream terraces.

Data points SP-2, SP-4, and SP-5 were located in areas that met the wetland criteria and revealed black (10YR 2/1) loam soils. Hydric soil indicators were low chroma colors in the matrix and mapped soils listed as hydric on the local soils list. Data points SP-1, SP-3, and SP-6 exhibited hydric soils although they did not meet the wetland criteria for vegetation and hydrology. Test pits SP-1, SP-3, and SP-6 revealed black (10YR 2/1) loam soils. Hydric soil indicators were low

chroma colors and soil map units listed as hydric on the local soils list. There was no evidence of redoximorphic features.

3.3.4. Wetland Delineation

Six data points were collected in 2010 to determine the wetland and upland boundaries at the site (Wetland Data Forms, Appendix B). The wetland boundaries were delineated and mapped on Figure 9 in Appendix A. The delineation identified 4.18 acres of wetland in 2010, an increase of 0.47 acre since 2009 (Table 21). A pre-construction wetland delineation was not available.

Table 21. Wetland acreages delineated in 2009 and 2010 at the CSKT Peterson Wetland Mitigation Site.

WETLAND HABITAT	2009 (acre)	2010 (acre)
Wetland	3.71	4.18
Total Wetland Area	3.71	4.18

3.3.5. Wildlife

A list of wildlife species observed at the site from 2008 to 2010 is presented in Table 22. Four red-wing blackbirds (*Agelaius phoeniceus*) were observed in 2010. Signs observed and bird activity codes were recorded on the Monitoring Form in Appendix B. The animal species observed in 2010 are listed in bold type.

3.3.6. Functional Assessment

Results of the 2004 (baseline), 2009, and 2010 functional assessments were summarized in Table 23. The 2010 Peterson Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 25-acre project area is 4.18 acres, an increase of 0.47 acres from 2009 to 2010.

The Peterson Property was evaluated as one assessment area (AA-1) that encompassed 4.18 acres in 2010. The AA was rated as a Category II wetland in 2010 with 67 percent of the total possible points. Increases in functional ratings between 2009 and 2010 occurred the uniqueness and recreation/educational potential as a result of the low disturbance at this protected wetland. The net functional unit gain was 24.25. Functional ratings were high for short and long term surface water storage, sediment/shoreline stabilization, sediment/nutrient/toxicant removal, production export/food chain support, groundwater discharge/recharge, and recreation/educational potential.

Table 22. Wildlife species observed at the Peterson Wetland Mitigation Site from 2008 to 2010.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog	<i>Rana luteiventris</i>
BIRD	
American Kestrel	<i>Falco sparverius</i>
American Robin	<i>Turdus migratorius</i>
Barn Swallow	<i>Hirundo rustica</i>
Canada Goose	<i>Branta canadensis</i>
Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Gray Partridge	<i>Perdix perdix</i>
Killdeer	<i>Charadrius vociferus</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh Wren	<i>Cistothorus palustris</i>
Mourning Dove	<i>Zenaida macroura</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Ring-necked Pheasant	<i>Phasianus colchicus</i>
Sora	<i>Porzana carolina</i>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Western Bluebird	<i>Sialia mexicana</i>
Western Meadowlark	<i>Sturnella neglecta</i>
MAMMAL	
Black Bear	<i>Ursus americanus</i>
Deer Spp.	
Meadow Vole	<i>Microtus pennsylvanicus</i>
Muskrat	<i>Ondatra zibethicus</i>
Raccoon	<i>Procyon lotor</i>
REPTILE	
Terrestrial Gartersnake	<i>Thamnophis elegans</i>
INVERTEBRATE	
Unk crayfish	<i>Crayfish spp.</i>

Species first identified in 2010 are listed in **bold** type.

Table 23. Summary of 2004 baseline and 2009 and 2010 wetland function/value ratings and functional points at the Peterson Wetland Mitigation Project.

Function and Value Parameters from the MDT Montana Wetland Assessment Method (1999)	2004 Baseline (AA-1)	2009 (AA-1)	2010 (AA-1)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	Low (0.5)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.1)	NA	NA
Flood Attenuation	Low (0.2)	Mod (0.4)	Mod (0.4)
Short and Long Term Surface Water Storage	Mod (0.4)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	High (0.7)	High (1.0)	High (1.0)
Production Export/Food Chain Support	High (0.8)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.3)	Low (0.4)
Recreation/Education Potential	Low (0.1)	Mod (0.5)	High (1.0)
Actual Points / Possible Points	5.3 / 12	6.8 / 11	7.4/11
% of Possible Score Achieved	44%	61%	67%
Overall Category	III	III	II
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	1.26	3.71	4.18
Total Functional Units (acreage x actual points) (fu)	6.68	25.23	30.93
Net Acreage Gain (ac)	NA	2.45	2.92
Net Functional Unit Gain	NA	18.55	24.25

3.3.7. Photo Documentation

Photographs of photo points PP1 to PP6 (Figure 9, Appendix A) and of the transect endpoints are shown on pages C-17 to C-21 of Appendix C).

3.3.8. Maintenance Needs

The location of Priority 2B noxious weed infestations of Canada thistle, whitetop and sulfur cinquefoil, observed during 2010 field monitoring were mapped on Figure 9, Appendix A. The MDT sprayed noxious weeds in spring 2010. Spraying of noxious weed should continue in the future to help control populations.

The log crib structures were generally considered to be operational and did not appear to be compromised or undermined. A majority of the browse protection was intact and functioning while some were partially damaged. Consideration should be given to removal of these browse covers to prevent vegetation growth from being stunted.

3.3.9. Current Credit Summary

The wetland acreage delineated in 2010 totaled 4.18 acres, an increase of 0.47 acres since 2009. The net acreage gain from 2004 to 2010 was 2.92 acres and the functional unit gain was 24.25.

Table 24 summarizes the 2010 estimated credits for the Peterson site. The 2010 estimated credits were separated into individual mitigation types. The acreages were calculated for each type and credit ratios were applied for both the CSKT and USACE crediting systems. The Peterson mitigation types were creation, and rehabilitation for the USACE system and secondary restoration for the CSKT system.

The following equation was used to calculate the USACE enhancement ratio for rehabilitation activities based on the total functional assessment point scores listed in Table 23.

$$\text{Enhancement factor} = (F_{\text{post}} - F_{\text{pre}}) / F_{\text{pre}}$$

Enhancement factor = (7.4 – 5.3) / 5.3; Enhancement factor = 0.40
 Enhancement ratio = 1/ 0.40 = 2.52

The 2009 enhancement ratio was listed as 3.57. In 2010, the enhancement ration was calculated at 2.52. The site has earned 3.42 USACE credit acres and 1.54 CSKT credit acres to date. The 2010 credit estimates have exceed the projected acreages for the mitigation site.

Table 24. Credit summary estimated in 2010 at the CSKT Peterson Property Wetland Mitigation Site.

Targeted Mitigation Type	2009 Wetland (acre)	2010 Wetland (acre)	Credit Ratio		2009 Credit (acre) Projected Credit		2010 Credit (acre) Projected Credit		Projected Totals (acres)	
			USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	2.46	2.93	1:1	3.36:1	2.46	0.73	2.93	0.87	2.14	0.64
Rehabilitation / secondary restoration	1.25	1.25	3.57:1 (2009) 2.52:1 (2010)	1.86:1	0.35	0.67	0.49	0.67	0.25	0.67
Total	3.71	4.18	--	--	2.81	1.40	3.42	1.54	2.39	1.31

4. REFERENCES

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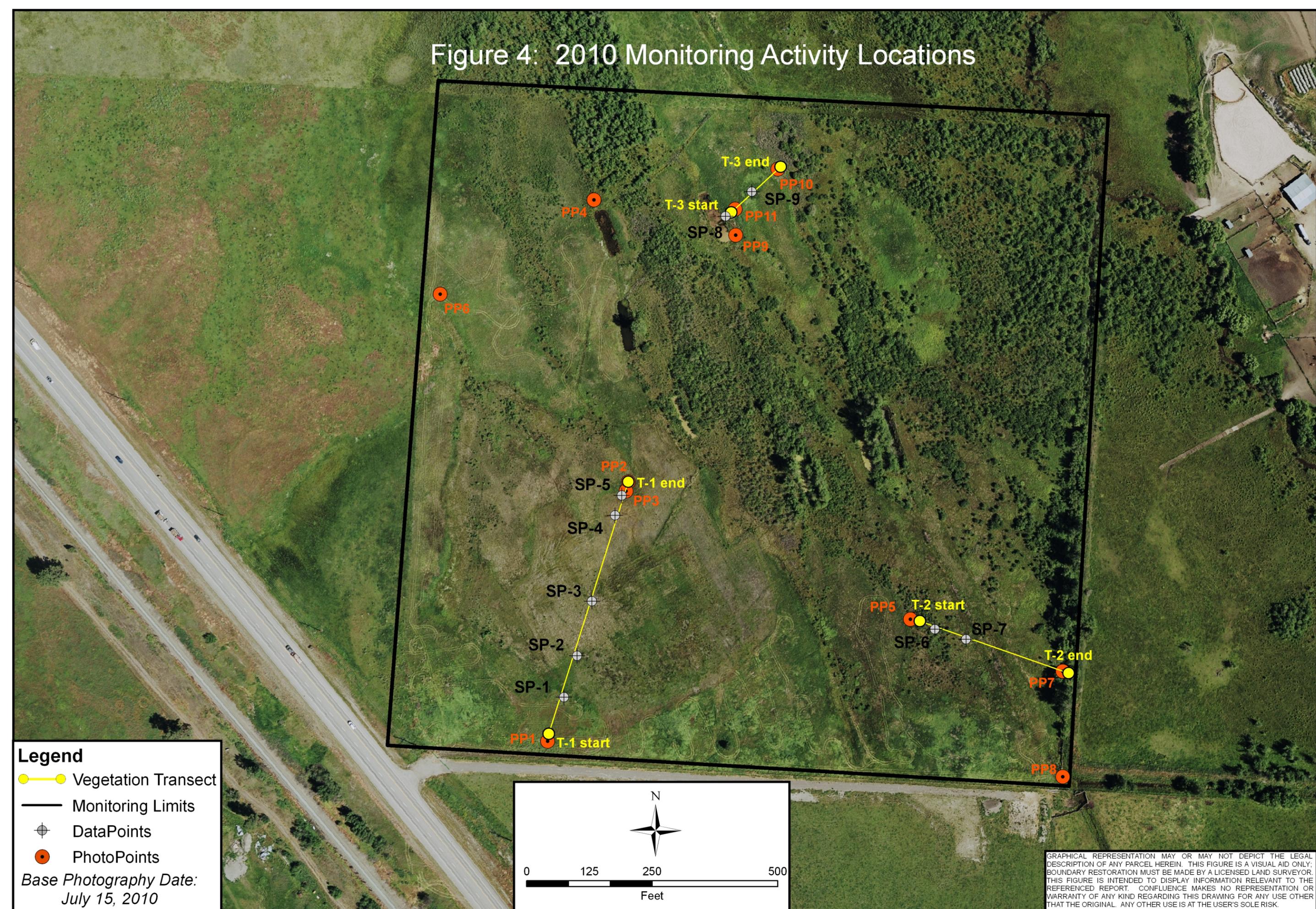
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Appendix A

Figures 4 through 9

MDT Wetland Mitigation Monitoring
Bouchard Property, Mud Creek, and Peterson Property
Lake County, Montana

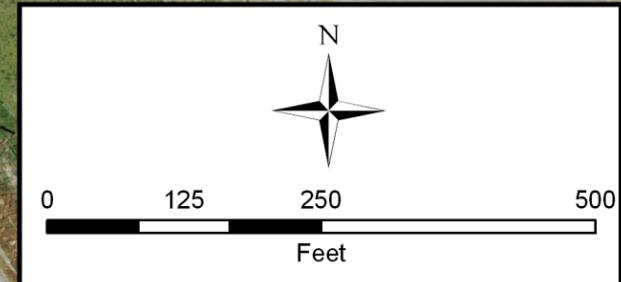
Figure 4: 2010 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- + DataPoints
- PhotoPoints

Base Photography Date:
July 15, 2010



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

Project Name		LOCATION: Lake Co., MT	
Drawing Title		PROJ NO: NH 5-2(120)20	
Project Name		Bouchard Wetland Mitigation Site	
Drawing Title		2010 Monitoring Activity Locations	
DRAWN BCS	CHECKED BV	APPROVED JL	SCALE: Noted
Drawn: November 8, 2010		PROJ MGR: B Sandefur	
		<p>Figure 4</p>	
REV -			

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities
- Open Water (10)

Base Photography Date: July 15, 2010

- Noxious Weeds
- Hypericum perforatum
 - ▲ *Cirsium arvense*
 - X *Cynoglossum officinale*
 - X *Centaurea maculosa*

- Infestation Size
- X = <0.1 acre
 - ▲ = 0.1 to 1 acre
 - = 1 to 5 acre

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

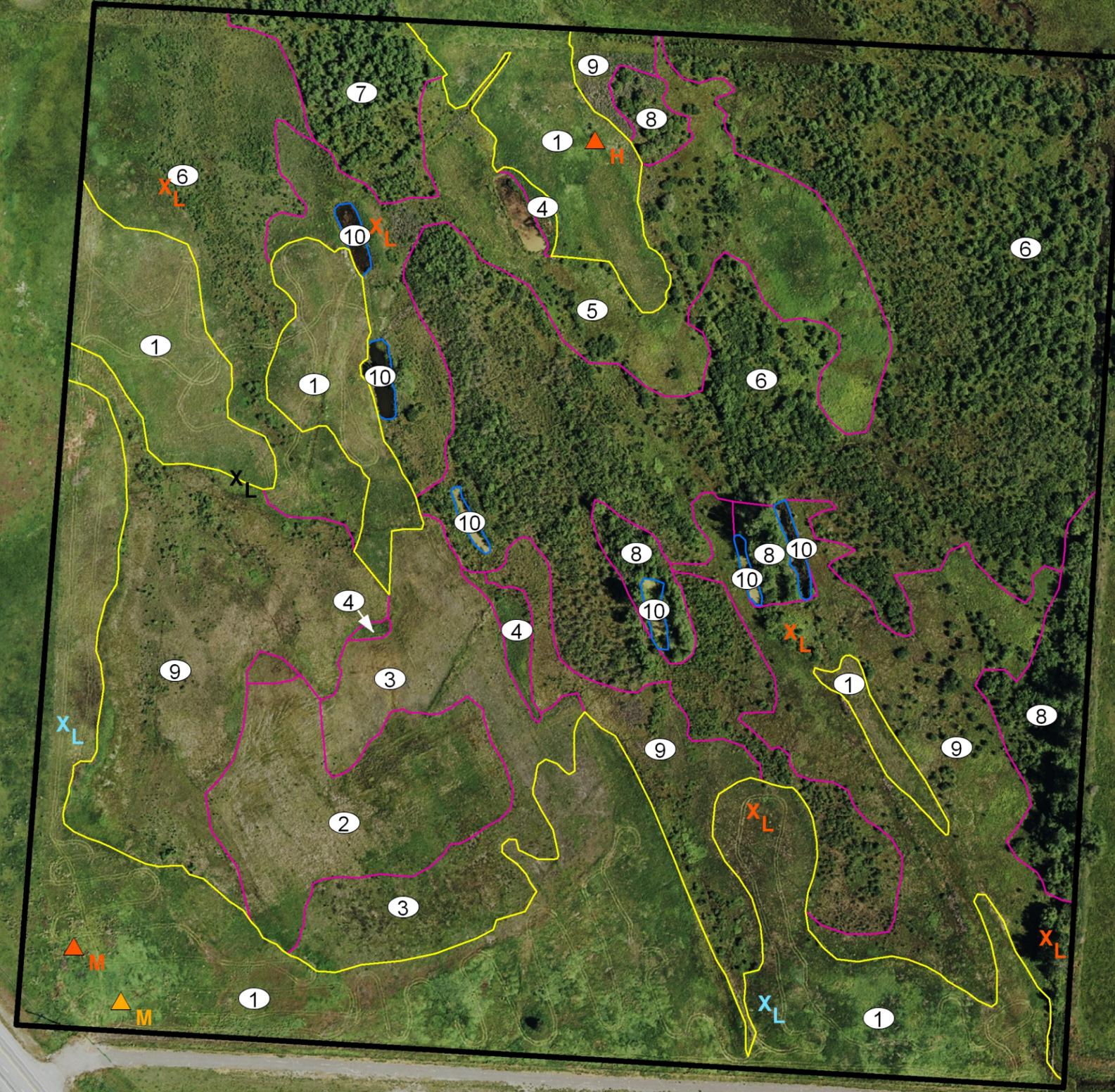
Vegetation Community Types

- 1 Agropyron spp./Agrostis alba
- 2 Deschampsia cespitosa/Juncus spp.
- 3 Juncus spp./Eleocharis palustris
- 4 Juncus balticus/Cirsium arvense
- 5 Carex spp.
- 6 Betula occidentalis/Juncus balticus
- 7 Alnus incana/Glyceria striata
- 8 Populus spp.
- 9 Typha latifolia

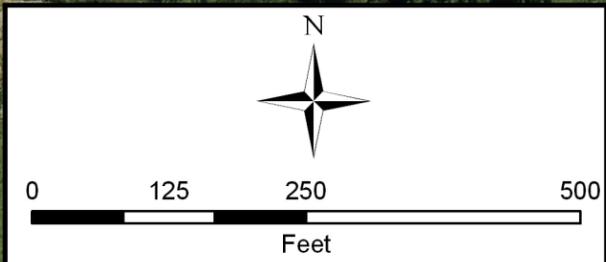
Acreages

Project Area	41.12 acres
Gross Wetlands	30.46 acres
Open Water (10)	0.27 acres
Net Wetlands	30.19 acres
Uplands	10.66 acres

Figure 5: 2010 Mapped Site Features



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



LOCATION: Lake Co., MT
 PROJECT NO: NH 5-2(120)20
 FILE: Bouchard/Veg2010.mxd

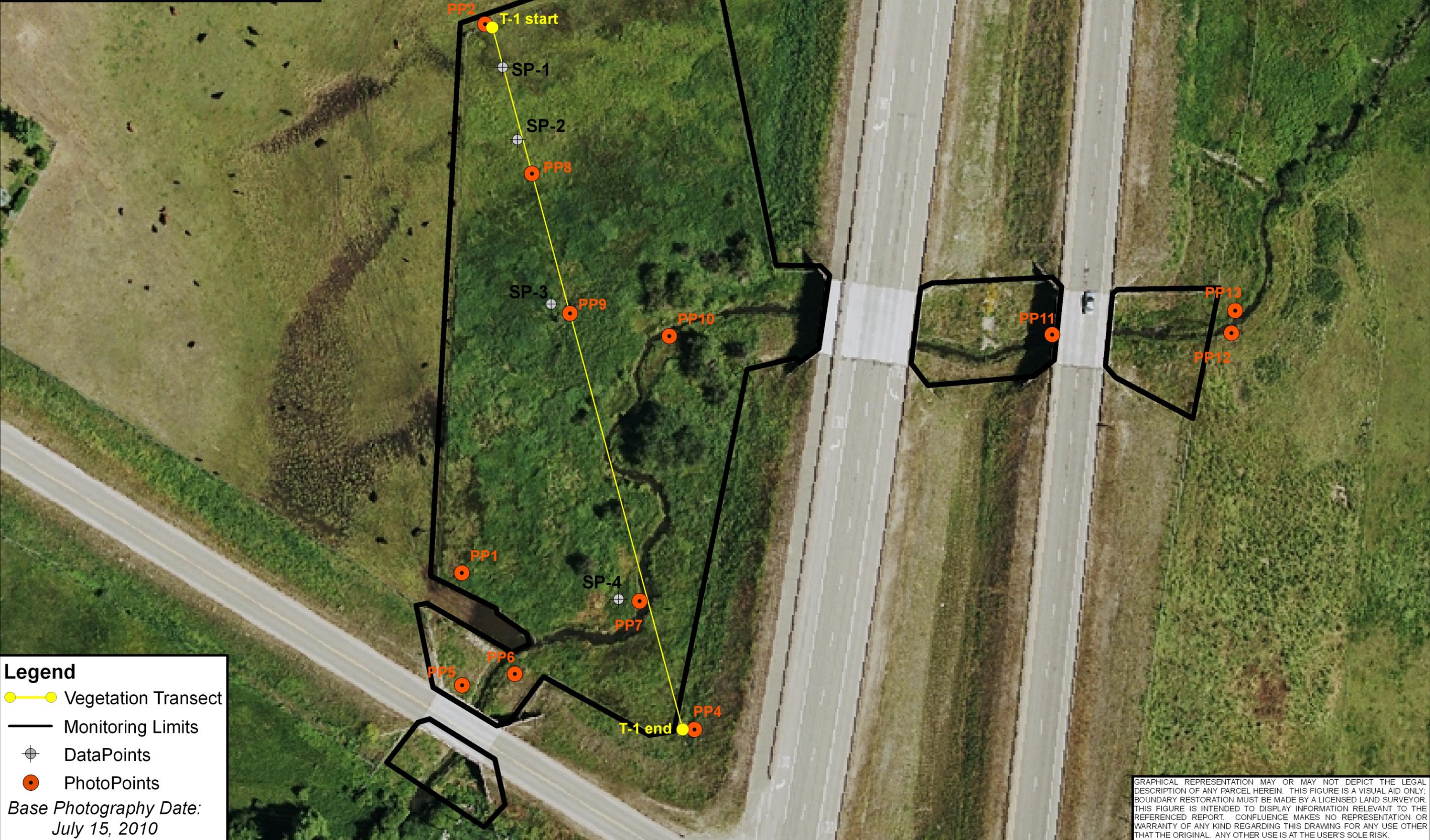
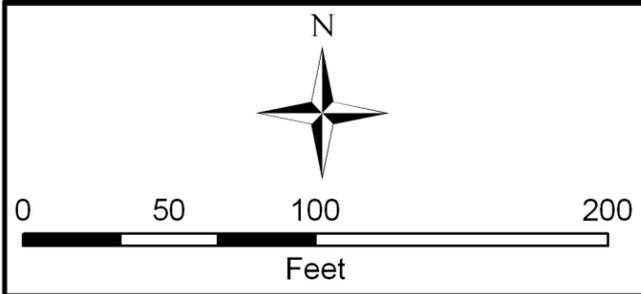
Project Name
Bouchard Wetland Mitigation Site
 Drawing Title
2010 Mapped Site Features

DRAWN: BCS
 CHECKED: BV
 APPROVED: JL
 SCALE: Noted
 Drawn: November 8, 2010
 PROJ MGR: B Sandefur



Figure 5
 REV -

Figure 6: 2010 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- DataPoints
- PhotoPoints

Base Photography Date:
July 15, 2010

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

LOCATION: Lake Co., MT		PROJECT NO: NH 5-2(122)31		FILE: MudCreek/Monitor2010.mxd	
Project Name Mud Creek Wetland Mitigation Site			Drawing Title 2010 Monitoring Activity Locations		
DRAWN BCS	CHECKED BV	APPROVED JL	SCALE: Noted	Drawn: November 12, 2010	PROJ MGR: B Sandefur
			Figure 6		
REV -					

Legend

- Monitoring Limits ———
- Wetland Limits ———
- Vegetation Communities ———
- Mud Creek ———

Base Photography Date: July 15, 2010

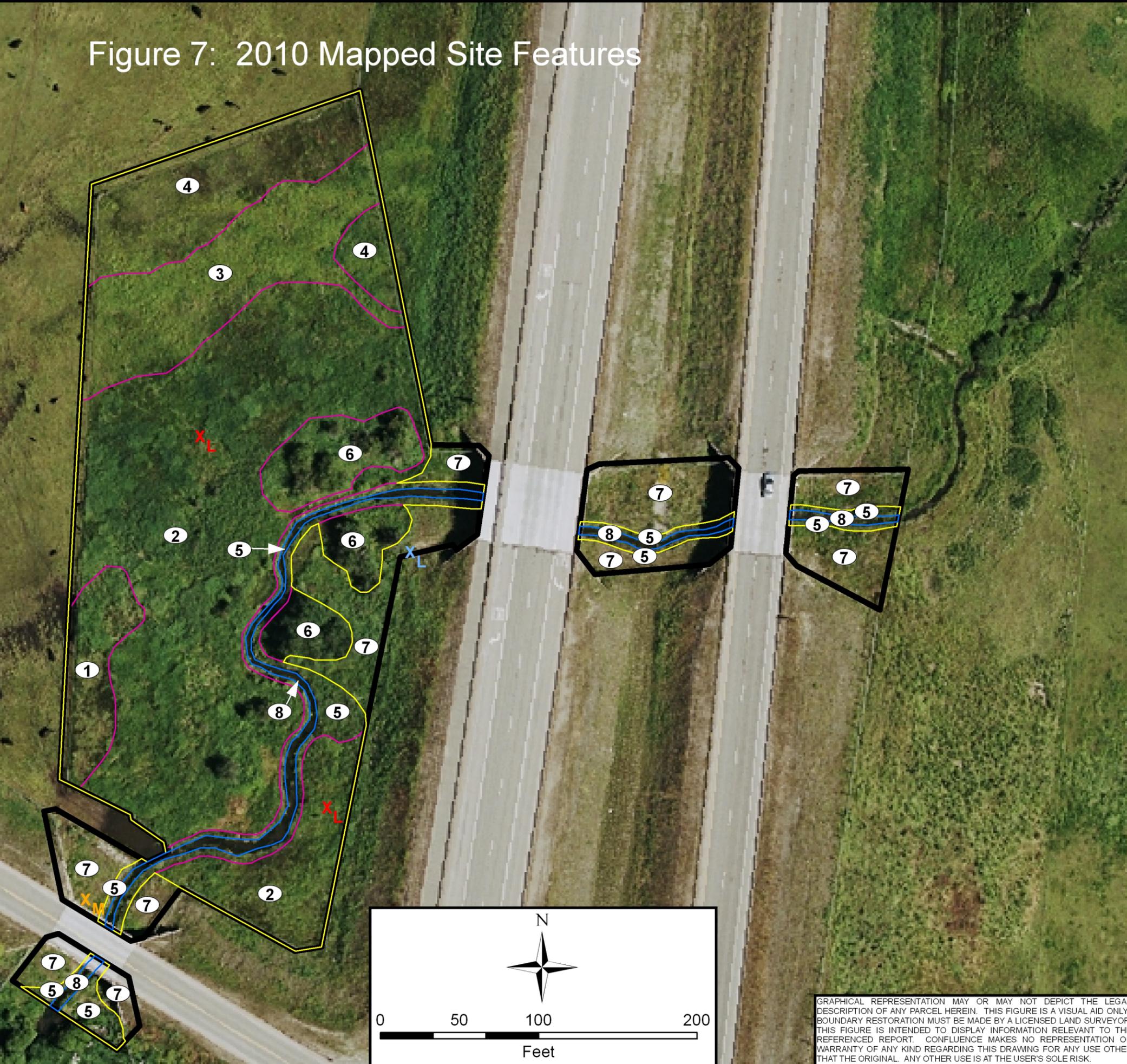
Figure 7: 2010 Mapped Site Features

- Vegetation Community Types**
- 1 Juncus balticus/Agrostis alba
 - 2 Phalaris arundinacea/Agrostis alba
 - 3 Scirpus microcarpus
 - 4 Juncus spp./Carex spp.
 - 5 Carex spp.
 - 6 Crataegus douglasii/Phalaris arundinacea
 - 7 Phalaris arundinacea/Melilotus officinalis

Acreeages

Project Area	2.60 acres
Gross Wetlands	2.16 acres
Open Water (8)	0.08 acres
Net Wetlands	2.08 acres
Uplands	0.44 acres

- Noxious Weeds**
- X *Cirsium arvense*
 - X *Chrysanthemum leucanthemum*
 - X *Centaurea maculosa*
- Infestation Size**
- X = <0.1 acre
- Cover Class**
- L = Low (1-5% cover)
 - M = Moderate (5-25% cover)



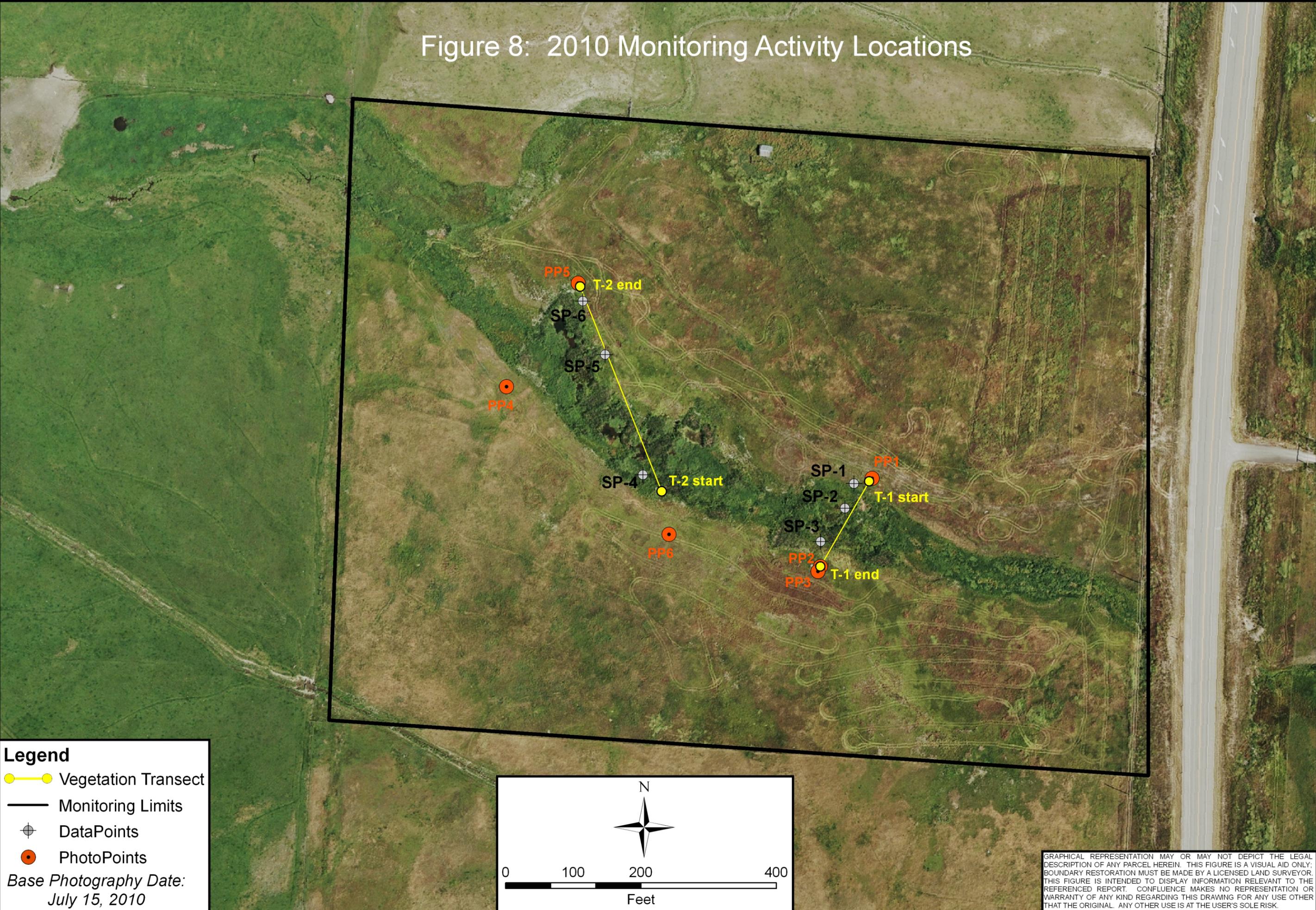
Project Name	Mud Creek Wetland Mitigation Site
Drawing Title	2010 Mapped Site Features
Project No.	NH 5-2(122)31
File Name	MudCreekVeg2010.mxd
Location	Lake Co., MT
Checked	BV
Approved	JL
Scale	Noted
Drawn	November 12, 2010
Proj MGR	B Sandefur



Figure 7

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

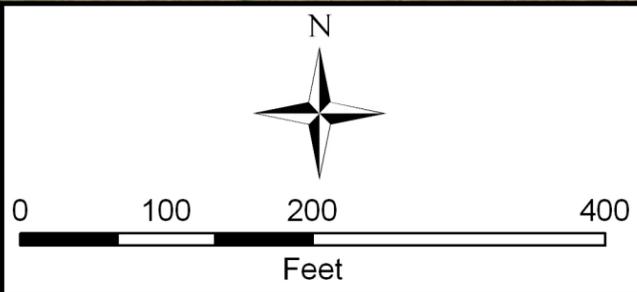
Figure 8: 2010 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- DataPoints
- PhotoPoints

Base Photography Date:
July 15, 2010



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

LOCATION: Lake Co., MT		Project Name	
PROJECT NO: NH 5-2(122)31		US-93 Peterson Mitigation Site	
FILE: Peterson/Monitor2010.mxd		Drawing Title	
		2010 Monitoring Activity Locations	
DRAWN BCS	CHECKED BV	APPROVED JL	SCALE: Noted
Drawn: November 12, 2010		PROJ MGR: B Sandefur	
		Figure 8	
		REV -	

Legend

Monitoring Limits ———

Wetland Limits ———

Vegetation Communities ———

Base Photography Date: July 15, 2010

Noxious Weeds

- *Cirsium arvense*
- *Cardaria draba*
- *Potentilla recta*

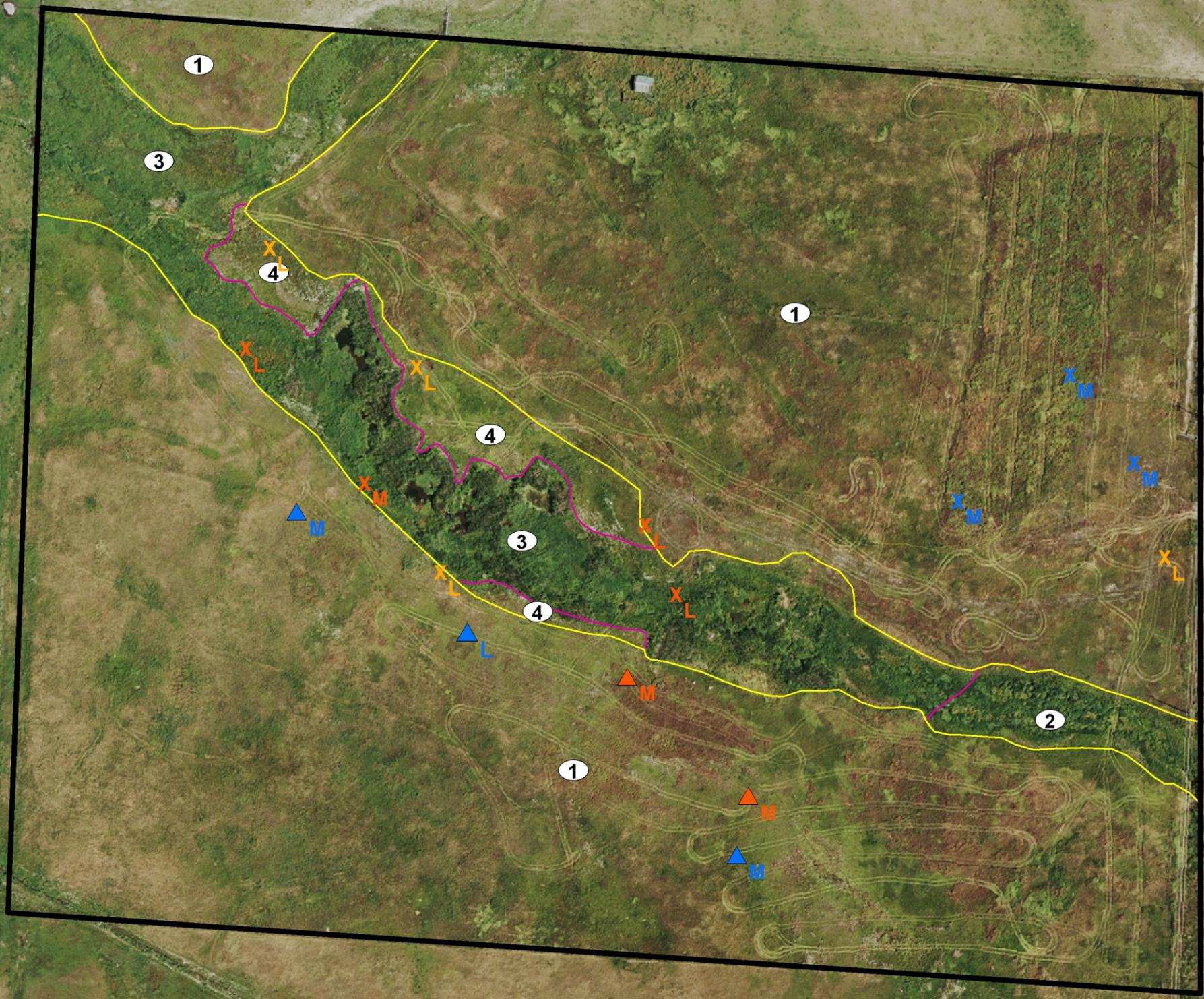
Infestation Size

- X = <0.1 acre
- ▲ = 0.1 to 1 acre
- = 1 to 5 acre

Cover Class

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

Figure 9: 2010 Mapped Site Features



North arrow pointing up.

Scale bar: 0, 100, 200, 400 Feet

Vegetation Community Types

1	Agropyron spp./Poa pratensis
2	Phalaris arundinacea
3	Phalaris arundinacea/Typha latifolia
4	Carex nebrascensis/Poa palustris

Acreages

Project Area	25.02 acres
Wetland Area	4.18 acres
Uplands	20.84 acres

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

	Figure 9	APPROVED J/L	PROJECT NAME US-93 Peterson Mitigation Site
DRAWN BCS	CHECKED BV	SCALE: Noted	LOCATION: Lake Co., MT
Drawn: November 12, 2010 PROJ MGR: B Sandefur		DRAWING TITLE 2010 Mapped Site Features	PROJECT NO: NH 5-2(122)31 FILE: US93PetersonVeg2010.mxd

Appendix B

2010 MDT Wetland Mitigation Site Monitoring Form
2010 USACE Wetland Determination Data Form
2010 MDT Wetland Assessment Form

MDT Wetland Mitigation Monitoring
Bouchard Property, Mud Creek, and Peterson Property
Lake County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Bouchard Assessment Date/Time 8/9/2010

Person(s) conducting the assessment: E. Nyquist

Weather: Mostly sunny, 20% cloud cover 8 Location: Arlee

MDT District: Missoula Milepost: 0

Legal Description: T 17N R 20W Section(s) 26

Initial Evaluation Date: 7/29/2008 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 41 (acres)

Land use surrounding wetland:

Rural residential, agriculture

HYDROLOGY

Surface Water Source: groundwater (Spring Creek)

Inundation: Average Depth: 0.5 (ft) Range of Depths: 0.5 - 4 (ft)

Percent of assessment area under inundation: 30 %

Depth at emergent vegetation-open water boundary: 0.5 (ft)

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

Groundwater Monitoring Wells

Record depth of water surface below ground

Well ID	Water Surface Depth
NA	(ft)

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.

Hydrology Notes:

No monitoring wells on this site. This site consists of 40-acre parcel dominated by emergent, scrub-shrub, and forested vegetation types; lies directly west of Jocko Spring Creek and influenced by groundwater. Several depressions are present within the site; areas were previously sourced by irrigation water and a canal that traversed the property. Site conditions are similar to those observed in 2009 with an increase in inundation noted in the created wetlands.

VEGETATION COMMUNITIES

Site Bouchard

(Cover Class Codes 0 = < 1%, 1 = 1-5%, 2 = 6-10%, 3 = 11-20%, 4 = 21-50% , 5 = >50%)

* Indicates accepted spp name not on '88 list.

Community # 1 Community Type: Agropyron spp. / Agrostis alba

Species	Cover class	Species	Cover class
Achillea millefolium	2	Agropyron repens	2
Agropyron trachycaulum	4	Agrostis alba	3
Carduus nutans	1	Centaurea maculosa	1
Cirsium arvense	2	Cynoglossum officinale	1
Lychnis alba	0		

Comments:

Upland plant community surrounding wetland areas. Several noxious weeds present. Weedy fringe around wetlands.

Community # 2 Community Type: Deschampsia cespitosa / Juncus spp.

Species	Cover class	Species	Cover class
Agrostis alba	2	Alnus incana (p)	1
Alopecurus pratensis	1	Carex stipata	0
Cornus stolonifera (p)	1	Deschampsia cespitosa	5
Juncus ensifolius	0	Juncus tenuis	2
Salix bebbiana (p)	1		

Comments:

(p) - planted shrubs
Vegetation community located within the wetland creation areas. Type 2 dominated by herbaceous species.

Community # 3 Community Type: Juncus spp. / Eleocharis palustris

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agropyron trachycaulum	0
Agrostis alba	2	Alopecurus pratensis	1
Cirsium arvense	1	Cornus stolonifera (p)	0
Eleocharis palustris	3	Juncus ensifolius	4
Juncus tenuis	3		

Comments:

(p) Planted shrubs
Vegetation community located within the wetland creation areas. Type 2 dominated by herbaceous species.

Community # 4 Community Type: Juncus balticus / Cirsium arvense

Species	Cover class	Species	Cover class
Agrostis alba	3	Cirsium arvense	3
Cynoglossum officinale	1	Geum macrophyllum	2
Hypericum perforatum	0	Juncus balticus	4
Solanum dulcamara	2	Sonchus arvensis	1

Comments:

Existing wetland areas with high cover value of weedy species. One noxious weed species present (Canada thistle).

Community # 5 Community Type: Carex spp. /

Species	Cover class	Species	Cover class
Betula occidentalis	1	Carex lanuginosa	1
Carex nebrascensis	2	Carex utriculata*	4
Carex vesicaria	3	Cornus stolonifera	1
Geum macrophyllum	1	Glyceria striata	1
Juncus balticus	2	Salix bebbiana	2
Solidago canadensis	1		

Comments:

Unaltered wetland area dominated by emergent vegetation.

Community # 6 Community Type: Betula occidentalis / Juncus balticus

Species	Cover class	Species	Cover class
Betula occidentalis	5	Carex nebrascensis	1
Hypericum perforatum	2	Juncus balticus	4
Potentilla fruticosa	3	Salix bebbiana	2

Comments:

Existing wetlands dominated by scrub-shrub and emergent vegetation types.

Community # 7 Community Type: Alnus incana / Glyceria striata

Species	Cover class	Species	Cover class
Alnus incana	5	Betula occidentalis	2
Carex utriculata*	2	Carex vesicaria	2
Cornus stolonifera	2	Geum macrophyllum	1
Glyceria striata	4	Solanum dulcamara	0

Comments:

Existing wetlands dominated by scrub-shrub and emergent vegetation types.

Community # 8 Community Type: Populus spp. /

Species	Cover class	Species	Cover class
Populus tremula	3	Populus trichocarpa*	5

Comments:

Small forested stands surrounding and near the shallow open water ponds.

Community # 9 Community Type: Typha latifolia /

Species	Cover class	Species	Cover class
Typha latifolia	5		

Comments:

Area dominated by a monoculture of cattails.

Community # 10 Community Type: Open Water /

Species	Cover class	Species	Cover class
Open Water	5		

Comments:

VEGETATION TRANSECTS

Site: Bouchard Date: 8/9/2010

Transect Number: 1 Compass Direction from Start: 0

Interval Data:

Ending Station 122 **Community Type:** Agropyron spp. / Agrostis alba

Species	Cover class	Species	Cover class
Achillea millefolium	4	Agropyron repens	2
Agropyron trachycaulum	3	Agrostis alba	2
Cirsium arvense	2	Cynoglossum officinale	1
Rumex crispus	0		

Ending Station 312 **Community Type:** Deschampsia cespitosa / Juncus spp.

Species	Cover class	Species	Cover class
Agrostis alba	1	Carex lanuginosa	0
Carex nebrascensis	2	Carex praegracilis	0
Carex stipata	0	Deschampsia cespitosa	5
Eleocharis palustris	2	Epilobium ciliatum	0
Equisetum arvense	1	Juncus balticus	0
Juncus tenuis	2	Salix bebbiana	0

Ending Station 503 **Community Type:** Juncus spp. / Eleocharis palustris

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agropyron trachycaulum	2
Agrostis alba	0	Alnus incana	0
Alopecurus pratensis	1	Carex lanuginosa	1
Carex nebrascensis	1	Deschampsia cespitosa	0
Eleocharis palustris	3	Equisetum arvense	1
Equisetum arvense	1	Glyceria striata	1
Juncus balticus	1	Juncus ensifolius	3
Juncus tenuis	4	Plantago major	0
Sonchus arvensis	0	Typha latifolia	1

Ending Station 526 **Community Type:** Juncus balticus / Cirsium arvense

Species	Cover class	Species	Cover class
Agrostis alba	3	Carex utriculata*	2
Cirsium arvense	3	Cirsium vulgare	0
Cynoglossum officinale	0	Geum macrophyllum	0
Juncus balticus	3	Solanum dulcamara	3
Sonchus arvensis	2		

Transect Notes:

Vegetation community 3 transitioned from increased amounts of Agrostis alba between 312

and 378 feet to increased amounts of eleocharis palustris between 378 and 503 feet.

Transect Number: 2 Compass Direction from Start: 90

Interval Data:

Ending Station 98 **Community Type:** Betula occidentalis / Juncus balticus

Species	Cover class	Species	Cover class
Agrostis alba	2	Betula occidentalis	3
Carex nebrascensis	0	Carex utriculata*	2
Cirsium arvense	1	Cirsium vulgare	0
Epilobium ciliatum	1	Geum macrophyllum	2
Juncus balticus	2	Mentha arvensis	1
Salix bebbiana	4	Sonchus arvensis	2

Ending Station 313 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Agrostis alba	2	Alopecurus pratensis	2
Angelica arguta	0	Carex lanuginosa	1
Carex stipata	1	Carex utriculata*	4
Cirsium arvense	1	Epilobium ciliatum	1
Glyceria grandis	1	Glyceria striata	2
Juncus balticus	3	Juncus ensifolius	0
Juncus tenuis	1	Polygonum amphibium	0
Typha latifolia	1		

Transect Notes:

Transect Number: 3

Compass Direction from Start: 45

Interval Data:

Ending Station 10 **Community Type:** Juncus balticus / Cirsium arvense

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron repens	4
Bromus tectorum	1	Carduus nutans	3
Cirsium arvense	4	Cynoglossum officinale	2
Geum macrophyllum	1	Typha latifolia	1
Verbascum thapsus	0		

Ending Station 133 **Community Type:** Agropyron spp. / Agrostis alba

Species	Cover class	Species	Cover class
Agropyron repens	4	Alopecurus pratensis	3
Cirsium arvense	3	Geum macrophyllum	0
Juncus balticus	3	Mentha arvensis	0
Poa pratensis	2	Sonchus arvensis	1
Typha latifolia	0		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Bouchard

Planting Type	#Planted	#Alive	Notes
ALNINC			90 Shrub planting survival data was collected along ten (241 foot-long) 2-meter-wide belt transects that totaled approximately 0.35 acres (15,600 square feet). Transects were randomly established across the wetland creation area perpendicular to the southern project area boundary. Transects were walked from south to north across the mitigation site. During the 2010 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers as listed above were referred from the Bouchard Wetland - Wetland Planting Summary. Actual planting numbers and prescribed species may vary from the original plan. Three species were identified 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 the visual assessment. Plant growth was vigorous and looked healthy with few discolored leaves. The majority of browse protection were intact and properly functioning. However, a small number of brows protection (10) were damaged and not functioning.
BETOCC	817	110	
CORSTO	408	90	
CRADOU			5 Plantings looked healthy with growth for the season with few discolored leaves. Browse protection were predominantly intact and functioning properly but a small amount of the browse protection was damaged.
RIBHUD	245	20	
ROSWOO		3	
Salix Bebbiana			
SALSPP	408	55	
SYMALB		8	

Comments

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Goldfinch	2		
Black-capped Chickadee	2		
Bohemian Waxwing	2	L	
Ring-necked Pheasant	1	L	

Bird Comments

BEHAVIOR CODES

BP = One of a breeding pair **BD** = Breeding display **F** = Foraging **FO** = Flyover **L** = Loafing **N** = Nesting

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
White-tailed Deer	1	No	No	No	

Wildlife Comments:

PHOTOGRAPHS

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.

Photo #	Latitude	Longitude	Bearing	Description
1			0	Photo Point 1. View north along vegetation transect #1. Upland vegetation transitioning into created wetlands (Type 2).
11			0	Photo Point 5. View north across wetland transition between emergent (Type 5) and scrub-shrub (Type 6) vegetation types.
12			135	Photo Point 5. View southeast along transect #2.
14			270	Photo Point 7. View facing west along transect #2 at emergent and scrub-shrub vegetation types within the wetland.
16			45	Photo Point 9. View northeast along vegetation transect #3.
18			230	Photo Point 9. View southwest facing the weedy fringe of pond dominated by musk thistle and weedy species.
21			230	Photo Point 10. View southwest along vegetation transect #3 from end of transect.
24			320	Photo Point 9. View northwest at the start of Transect #3. Shallow open water located in the background and weedy vegetation around the fringe.
26			135	Photo Point 9. View southeast at the start of Transect #3. Shallow open water located in the background and weedy vegetation around the fringe.
27			320	Photo Point 11. View northwest across the shallow open water.
3			0	Photo Point 2. View north towards the end of transect #1.
33			180	Photo Point 4. View south along a shallow open water pond and adjacent emergent vegetation types. Community Type 6 in the background with areas

36	90	Photo Point 6. View east at transition between emergent vegetation and scrub-shrub vegetation.
39	180	Photo Point 6. View south along transition between emergent wetland vegetation and upland buffer along western project area boundary.
4	270	Photo Point 3. View west across the transtion between the wetland creation (Type 2 and 3) and the existing rehabilitation areas (Type 5).
5	180	Photo Point 3. View south across the wetland creation areas (Type 2 and 3).
7	0	Photo Point 8. View north from the southeast corner of the mitigation area. Spring creek runs adjacent to the parcel along the boundary.

Comments:

ADDITIONAL ITEMS CHECKLIST

Hydrology

- Map emergent vegetation/open water boundary on aerial photos.
- Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

- One photo from the wetland toward each of the four cardinal directions
- One photo showing upland use surrounding the wetland.
- One photo showing the buffer around the wetland
- One photo from each end of each vegetation transect, toward the transect

Vegetation

- Map vegetation community boundaries
- Complete Vegetation Transects

Soils

- Assess soils

Wetland Delineations

- Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
- Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

- Complete and attach full MDT Montana Wetland Assessment Method field forms.

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired? No

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? No

If no, describe the problems below.

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-1
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Lamoose
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: _____ _____ _____	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
_____ = Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
_____ = Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Carex lanuginosa</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
2. <u>Juncus balticus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
3. <u>Deschampsia cespitosa</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
4. <u>Carex nebrascensis</u>	<u>10</u>	<input type="checkbox"/>	<u>OBL</u>		
5. <u>Equisetum arvense</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC</u>		
6. <u>Agrostis alba</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC+</u>		
7. <u>Sonchus arvensis</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU+</u>		
8. <u>Cirsium arvense</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU+</u>		
9. <u>Achillea millefolium</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>		
10. <u>Mentha arvensis</u>	<u>5</u>	<input type="checkbox"/>	<u>FAC</u>		
11. _____		<input type="checkbox"/>			
<u>130</u> = Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
_____ = Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks: _____

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Lamoose loam, 0 to 2 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Endoaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 8

Saturation Present? Yes No Depth (inches): 2

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: _____ Sampling Point: SP-2
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Lamoose
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. <u>Cornus stolonifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
2. <u>Betula occidentalis</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Deschampsia cespitosa</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
2. <u>Eleocharis palustris</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
3. <u>Carex lanuginosa</u>	<u>10</u>	<input type="checkbox"/>	<u>OBL</u>		
4. <u>Juncus balticus</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>		
5. <u>Juncus tenuis</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>		
6. <u>Carex nebrascensis</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>		
7. <u>Epilobium ciliatum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW+</u>		
8. _____		<input type="checkbox"/>			
9. _____		<input type="checkbox"/>			
10. _____		<input type="checkbox"/>			
11. _____		<input type="checkbox"/>			
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
= Total Cover					
% Bare Ground in Herb Stratum _____					
Remarks:				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Lamoose loam, 0 to 2 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Endoaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed-Low Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 8

Saturation Present? Yes No Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-3
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Lamoose
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
_____ = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Deschampsia cespitosa</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Eleocharis palustris</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Juncus tenuis</u>	<u>15</u>	<input type="checkbox"/>	<u>FACW</u>	
4. <u>Juncus balticus</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>	
5. <u>Typha latifolia</u>	<u>10</u>	<input type="checkbox"/>	<u>OBL</u>	
6. <u>Carex nebrascensis</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>	
7. <u>Epilobium ciliatum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>	
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____		<input type="checkbox"/>		
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1					Loam	Lamoose loam, 0 to 2 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Endoaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low Chroma colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input checked="" type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): 1

Water Table Present? Yes No Depth (inches): 0

Saturation Present? Yes No Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-4
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Lamoose
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	<input type="checkbox"/>	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
5. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Eleocharis palustris</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
2. <u>Juncus tenuis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		
3. <u>Juncus ensifolius</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
4. <u>Typha latifolia</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>		
5. _____	_____	<input type="checkbox"/>	_____		
6. _____	_____	<input type="checkbox"/>	_____		
7. _____	_____	<input type="checkbox"/>	_____		
8. _____	_____	<input type="checkbox"/>	_____		
9. _____	_____	<input type="checkbox"/>	_____		
10. _____	_____	<input type="checkbox"/>	_____		
11. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
% Bare Ground in Herb Stratum <u>15</u>					

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR	2/1		100			Clay Loam	Lamoose loam, 0 to 2 percent slopes
8-10	2.5Y	3/1		100			Clay Loam	
10+	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Endoaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low-Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input checked="" type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): 3

Water Table Present? Yes No Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-5
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Lamoose
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.66</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
= Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Cirsium arvense</u>	40	<input checked="" type="checkbox"/>	FACU+	
2. <u>Juncus balticus</u>	40	<input checked="" type="checkbox"/>	FACW	
3. <u>Sonchus arvensis</u>	15	<input type="checkbox"/>	FACU+	
4. <u>Carex rostrata var utriculata</u>	10	<input type="checkbox"/>	OBL	
5. _____		<input type="checkbox"/>		
6. _____		<input type="checkbox"/>		
7. _____		<input type="checkbox"/>		
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. <u>Solanum dulcamara</u>	30	<input checked="" type="checkbox"/>	FAC+	
2. _____		<input type="checkbox"/>		
= Total Cover				
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR	3/3		100			Loam	Lamoose loam, 0 to 2 percent slopes
6-20	10YR	2/1		100			Clay Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Endoaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): 10

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-6
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Borochemists
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. <u>Salix bebbiana</u>	20	<input checked="" type="checkbox"/>	FACW	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. <u>Betula occidentalis</u>	15	<input checked="" type="checkbox"/>	FACW		
3. <u>Salix geyerana</u>	10	<input checked="" type="checkbox"/>	FACW+		
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Carex rostrata var utriculata</u>	40	<input checked="" type="checkbox"/>	OBL		
2. <u>Juncus balticus</u>	30	<input checked="" type="checkbox"/>	FACW		
3. <u>Mentha arvensis</u>	15	<input type="checkbox"/>	FAC		
4. <u>Cirsium arvense</u>	10	<input type="checkbox"/>	FACU+		
5. _____		<input type="checkbox"/>			
6. _____		<input type="checkbox"/>			
7. _____		<input type="checkbox"/>			
8. _____		<input type="checkbox"/>			
9. _____		<input type="checkbox"/>			
10. _____		<input type="checkbox"/>			
11. _____		<input type="checkbox"/>			
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____		<input type="checkbox"/>			
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input checked="" type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Borochemists

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low-Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-7
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Borochemists
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
5. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Carex rostrata var utriculata</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
2. <u>Agrostis alba</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
3. <u>Juncus balticus</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>		
4. <u>Geum macrophyllum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>		
5. <u>Epilobium ciliatum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>		
6. <u>Cirsium arvense</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU+</u>		
7. _____	_____	<input type="checkbox"/>	_____		
8. _____	_____	<input type="checkbox"/>	_____		
9. _____	_____	<input type="checkbox"/>	_____		
10. _____	_____	<input type="checkbox"/>	_____		
11. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
% Bare Ground in Herb Stratum _____					

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: SP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Borochemists, 0 to 1 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input checked="" type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Borochemists

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low-Chroma colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-8
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.66</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Ribes aureum</u>	10	<input checked="" type="checkbox"/>	FAC+	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
= Total Cover					
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Carduus nutans</u>	15	<input type="checkbox"/>	NI		
2. <u>Verbascum thapsus</u>	10	<input type="checkbox"/>	NS		
3. <u>Agropyron repens</u>	40	<input checked="" type="checkbox"/>	FACU		
4. <u>Cirsium arvense</u>	15	<input type="checkbox"/>	FACU+		
5. <u>Geum macrophyllum</u>	5	<input type="checkbox"/>	FACW		
6. <u>Typha latifolia</u>	20	<input checked="" type="checkbox"/>	OBL		
7. _____		<input type="checkbox"/>			
8. _____		<input type="checkbox"/>			
9. _____		<input type="checkbox"/>			
10. _____		<input type="checkbox"/>			
11. _____		<input type="checkbox"/>			
= Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:
 Berm area along open water transitioning into upland only immediate fringe of open water maintains wetland vegetation.

SOIL

Sampling Point: SP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-14	10YR	2/1		100			Loam	Borochemists, 0 to 1 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low-Chroma Soils; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): 10

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Bouchard City/County: Lake Co. Sampling Date: 8/9/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-9
 Investigator(s): E. Nyquist Section, Township, Range: S 26 T 17N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): undulating Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Upland data point	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B) Dominance Test is >50% <input type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
_____ = Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>		Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
_____ = Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Agropyron repens</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>		
2. <u>Cirsium arvense</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU+</u>		
3. <u>Alopecurus pratensis</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>		
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
6. _____		<input type="checkbox"/>			
7. _____		<input type="checkbox"/>			
8. _____		<input type="checkbox"/>			
9. _____		<input type="checkbox"/>			
10. _____		<input type="checkbox"/>			
11. _____		<input type="checkbox"/>			
_____ = Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
_____ = Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:
 Hydrophytic vegetation not present

SOIL

Sampling Point: SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/2		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicators not present in field

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks: No wetland hydrology indicators present

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project name 2. MDT project# Control#

3. Evaluation Date 4. Evaluators 5. Wetland/Site# (s)

6. Wetland Location(s): T R Sec1 T R Sec2

Approx Stationing or Mileposts

Watershed County Lake

7. Evaluating Agency 8. Wetland size acres

Purpose of Evaluation

Wetlands potentially affected by MDT project

Mitigation Wetlands: pre-construction

Mitigation Wetlands: post construction

Other

How assessed:

9. Assessment area (AA) size (acres)

How assessed:

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	System	Subsystem	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Palustrine	none	Aquatic Bed	Excavated	Permanently flooded	5
Slope	Palustrine	none	Emergent Wetland	Excavated	seasonally flooded	50
Slope	Palustrine	none	Scrub-Shrub Wetland		seasonally flooded	40
Slope	Palustrine	none	Forested Wetland		seasonally flooded	5

11. Estimated Relative Abundance: (of similarly classified sites within the same major Montana Watershed Basin, see definitions)

12. General Condition of AA
i. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	Predominant conditions adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ?15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ?30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ?15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ?30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Adjacent parcels farmed and grazed

ii. Prominent noxious, aquatic nuisance, other exotic species:

Cirsium arvense, Cynoglossum officinale, Carduus nutans, Centaurea maculosa, and Hypericum perforatum

iii. Brief descriptive summary of surrounding land use/habitat

AA is located within slope and depressional wetlands consisting of emergent, aquatic bed, scrub-shrub, and forested habitat types. On-site hydrology is provided by groundwater and spring creek adjacent to the property.

13. Structural Diversity: (Based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	> 3 vegetated classes (or > 2 if one is forested)	2 vegetated classes (or 1 if forested)	< 1 vegetated class
Rating (circle)	H	M	L

Comments:

SECTION PERTAINING TO FUNCTION VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is documented (D) or suspected (S) to contain (circle one based on definition contained in instructions):

Primary or critical habitat (list species) D S

Secondary habitat (list Species) D S

Incidental habitat (list species) D S

No usable habitat S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.5L	.3L	0L

Sources for documented use

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

i. AA is documented (D) or suspected (S) to contain (circle one based on definition contained in instructions):

Primary or critical habitat (list species) D S

Secondary habitat (list Species) D S

Incidental habitat (list species) D S

No usable habitat S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for the function)

Highest Habitat Level	Doc./primary	Sus./primary	Doc./secondary	Sus./secondary	Doc./incidental	Sus./incidental	None
Functional Points and Rating	1H	.8H	.7M	.6M	.2L	.1L	0L

Sources for documented use

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA

Substantial (based on any of the following [check]):

- 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

Minimal (based on any of the following [check]):

- 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 the AA

Moderate (based on any of the following [check]):

- 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, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)																				
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 #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments

14D. General Fish/Aquatic Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is “correctable” such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., click (NA) here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], the Habitat Quality [i below] should be marked as “Low”, applied accordingly in ii below, and noted in the comments.)

i. **Habitat Quality** (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating.)

Duration of surface water in AA	Permanent/ Perennial			Seasonal/ Intermittent			Temporary/ Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.									
Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading - 50 to 75% of streambank or shoreline within AA contains rip. Or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - <50% of streambank or shoreline within AA contains rip. Or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E=H, H=M, M=L, L=L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* Y N Modified habitat quality rating = (circle)

E	H	M	L
---	---	---	---

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E=exceptional, H=high, M=moderate, L=low] for this function)

Types of fish known or suspected within AA	Modified Habitat Quality (ii)			
	Exceptional	High	Moderate	Low
Native game fish	1E	.9H	.7M	5M
Introduced game fish	.9H	.8H	.6M	.4M
Non-game fish	.7M	.6M	.5M	.3L
No fish	.5M	.3L	.2L	.1L

Comments:

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, check **NA** here and proceed to the next function.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function.)

Estimated wetland area in AA subject to periodic flooding	≥ 10 acres			<10>2 acres			≤ 2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains not outlet or restricted outlet	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? Y N

Comments:

14F. Short and Long Term Surface Water Storage: (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** here and proceed to 14G.)

i. **Rating** (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
	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	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive 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** here and proceed to 14H.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels 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 with 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.			
	≥ 70%		< 70%		≥ 70%		< 70%	
% cover of wetland vegetation in AA Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click **NA** here and proceed to 14I.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of <u>wetland</u> streambank or shoreline by species with stability ratings of ≥6 (see Appendix F).	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: _____

14I. Production Export/Food Chain Support:

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = Structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P=permanent/perennial; S/I=seasonal/intermittent; T/E/A=temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments: _____

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- The AA is a slope wetland
- Springs or seeps 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
- Shallow water table and the site is saturated to the surface
- Other: _____

ii. Recharge Indicators

- Permeable substrate present without underlying impeding layer
- Wetland contains inlet but no outlet
- Stream is a known 'losing' stream; discharge volume decreases
- Other: _____

iii. **Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H=high, L=low] for this function.

Criteria	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of D/R present	1H
No Discharge/Recharge indicators present	0.1L
Available Discharge/Recharge information inadequate to rate AA D/R potential	NA

Comments: _____

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

<i>Replacement potential</i>	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		
	rare	common	abundant	rare	common	abundant	rare	common	abundant
<i>Estimated relative abundance (#11)</i>									
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. Site Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

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

ii. **Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use?** Y N (If yes, i to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iii. **Rating** (use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function)

<i>Ownership</i>	<i>Disturbance at AA (#12i)</i>		
	Low	Moderate	High
Public ownership	1H	.5M	.2L
Private ownership	.7M	.3L	.1L

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S) AA-1

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	.3	1	9.138
B. MT Natural Heritage Program Species Habitat	L	.1	1	3.046
C. General Wildlife Habitat	H	.9	1	27.414
D. General Fish Habitat	NA	0	0	0
E. Flood Attenuation	NA	0	0	0
F. Short and Long Term Surface Water Storage	H	.9	1	27.414
G. Sediment/Nutrient/Toxicant Removal	H	1	1	30.46
H. Sediment/Shoreline Stabilization	NA	0	0	0
I. Production Export/Food Chain Support	H	.9	1	27.414
J. Groundwater Discharge/Recharge	H	1	1	30.46
K. Uniqueness	M	.6	1	18.276
L. Recreation/Education Potential	H	1	1	30.46
Totals:		6.7	9	204.082
Percent of Possible Score		74.44 %		

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go 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**
 Total actual functional points > 80% (round to nearest whole #) of total possible functional points

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go 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**
 Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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 does not satisfy criteria go to Category III)
 "Low" rating for Uniqueness; **and**
 "Low" rating for Production Export/Food Chain Support; **and**
 Total actual functional points < 30% (round to nearest whole #) of total possible functional points

OVERALL ANALYSIS AREA RATING:
(circle appropriate category based on the criteria outlined below)

I
 II
 III
 IV

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Mud Creek Assessment Date/Time 8/10/2010

Person(s) conducting the assessment: E. Nyquist

Weather: Sunny approximately 65 degrees Location: Pablo

MDT District: Missoula Milepost: 0

Legal Description: T 21N R 20W Section(s) 13

Initial Evaluation Date: 7/23/2009 Monitoring Year: 2 #Visits in Year: 1

Size of Evaluation Area: 2.5 (acres)

Land use surrounding wetland:

Agriculture and residential

HYDROLOGY

Surface Water Source: Mud Creek

Inundation: Average Depth: 1.5 (ft) Range of Depths: 0-3 (ft)

Percent of assessment area under inundation: 20 %

Depth at emergent vegetation-open water boundary: 0.5 (ft)

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

Groundwater Monitoring Wells

Record depth of water surface below ground

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.

Hydrology Notes:

No wells at this mitigation site. Mitigation site consists of emergent wetlands, restored Mud Creek, riparian areas, and uplands. The vegetated soil lifts and wetland sod matting used in creek restoration are well established with dense emergent vegetation cover along most of the stream banks. Several noxious weed species identified including Canda thistle (*Cirsium arvense*), oxeye daisy (*Chrysanthemum leucanthemum*), and spotted knapweed (*Centaurea maculosa*).

VEGETATION COMMUNITIES

Site Mud Creek

(Cover Class Codes 0 = < 1%, 1 = 1-5%, 2 = 6-10%, 3 = 11-20%, 4 = 21-50% , 5 = >50%)

* Indicates accepted spp name not on '88 list.

Community # 1 Community Type: Juncus balticus / Agrostis alba

Species	Cover class	Species	Cover class
Agrostis alba	3	Carex utriculata*	0
Epilobium ciliatum	0	Festuca arundinacea	0
Geum macrophyllum	0	Juncus balticus	5
Phalaris arundinacea	2	Phleum pratense	0
Poa pratensis	2		

Comments:

Small wetland area dominated by emergent vegetation.

Community # 2 Community Type: Phalaris arundinacea / Agrostis alba

Species	Cover class	Species	Cover class
Agrostis alba	3	Carex stipata	3
Glyceria striata	1	Phalaris arundinacea	4

Comments:

Wetland area dominated by emergent vegetation

Community # 3 Community Type: Scirpus microcarpus /

Species	Cover class	Species	Cover class
Carex stipata	1	Cirsium vulgare	0
Epilobium ciliatum	0	Geum macrophyllum	1
Glyceria striata	1	Phalaris arundinacea	1
Populus tremula	0	Scirpus microcarpus	5

Comments:

Wetland area dominated by emergent vegetation

Community # 4 Community Type: Juncus spp. / Carex spp.

Species	Cover class	Species	Cover class
Agrostis alba	1	Carex bebbii	2
Carex nebrascensis	3	Carex stipata	2
Carex utriculata*	3	Epilobium ciliatum	0
Geum macrophyllum	1	Juncus balticus	3
Juncus ensifolius	3		

Comments:

Wetland area dominated by emergent vegetation.

Community # 5 Community Type: Carex spp. /

Species	Cover class	Species	Cover class
Agrostis alba	2	Alnus incana (p)	1
Carex stipata	2	Carex utriculata*	5
Glyceria grandis	2	Impatiens ecalcarata	0
Juncus balticus	1	Juncus ensifolius	1
Phalaris arundinacea	2	Populus trichocarpa* (p)	0

Comments:

Wetland areas dominated by emergent vegetation along the reconstructed banks of Mud Creek. Woody plants planted along the stream corridor. (p) = planted woody vegetation.

Community # 6 Community Type: Crataegus douglasii / Phalaris arundinacea

Species	Cover class	Species	Cover class
Cirsium arvense	2	Crataegus douglasii	5
Epilobium ciliatum	1	Lysichiton americanum	1
Phalaris arundinacea	4	Solanum dulcamara	2

Comments:

Wetland area dominated by scrub-shrub and emergent vegetation types.

Community # 7 Community Type: Phalaris arundinacea / Melilotus officinalis

Species	Cover class	Species	Cover class
Agropyron repens	0	Bromus inermis	2
Cirsium vulgare	0	Melilotus officinalis	3
Phalaris arundinacea	4	Sisymbrium altissimum	1
Solanum dulcamara	1	Trifolium repens	3
Verbascum thapsus	1		

Comments:

Upland areas between and underneath the new bridges along Mud Creek reconstruction. Dry slopes outside the creek's floodplain margin.

Community # 8 Community Type: Open Water /

Species	Cover class	Species	Cover class
Aquatic Macrophytes	5	Nasturtium officinale	2
Ranunculus aquatilis	1	Veronica americana	2

Comments:

Aquatic vegetation within the reconstructed channel.

VEGETATION TRANSECTS

Site: Mud Creek Date: 8/10/2010

Transect Number: 1 Compass Direction from Start: 315

Interval Data:

Ending Station 47 **Community Type:** Juncus spp. / Carex spp.

Species	Cover class	Species	Cover class
Carex nebrascensis	3	Carex stipata	3
Carex utriculata*	4	Deschampsia cespitosa	0
Epilobium ciliatum	0	Juncus balticus	2
Juncus ensifolius	0	Phalaris arundinacea	1

Ending Station 116 **Community Type:** Scirpus microcarpus /

Species	Cover class	Species	Cover class
Carex praegracilis	0	Cirsium arvense	0
Geum macrophyllum	2	Glyceria striata	1
Mentha arvensis	0	Phalaris arundinacea	2
Scirpus microcarpus	5		

Ending Station 412 **Community Type:** Phalaris arundinacea / Agrostis alba

Species	Cover class	Species	Cover class
Agrostis alba	4	Carex nebrascensis	2
Cirsium arvense	3	Cirsium vulgare	0
Cornus stolonifera	0	Crataegus douglasii	1
Epilobium ciliatum	0	Geum macrophyllum	0
Juncus balticus	2	Phalaris arundinacea	4
Phleum pratense	1	Poa pratensis	2

Ending Station 417 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Carex stipata	1	Carex utriculata*	5
Epilobium ciliatum	0	Geum macrophyllum	0
Glyceria grandis	1	Juncus ensifolius	0
Phalaris arundinacea	0		

Ending Station 427 **Community Type:** Open Water / Elodea

Species	Cover class	Species	Cover class
Elodea spp.	5	Nasturtium officinale	0
Veronica americana	2		

Ending Station 429 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Agrostis alba	1	Carex nebrascensis	3
Carex praegracilis	3	Carex stipata	3
Carex utriculata*	1	Epilobium ciliatum	1
Juncus articulatus	4	Mimulus guttatus	0

Ending Station 494 **Community Type:** Phalaris arundinacea / Agrostis alba

Species	Cover class	Species	Cover class
Agrostis alba	4	Chrysanthemum leucanthe	0
Cirsium arvense	0	Deschampsia cespitosa	2
Festuca arundinacea	3	Phalaris arundinacea	4
Rosa woodsii	0	Sonchus arvensis	2
Typha latifolia	0	Verbascum thapsus	0

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Mud Creek

Planting Type	#Planted	#Alive	Notes
ALNINC	85	28	
CORSTO	32	6	
CRADOU	10	5	
POPTRE	0	3	
POPTRI	83	26	
ROSWOO	31	8	
SALAMY	0	1	
SALBEB	56	10	
SALEXI	0	12	
SALLUT	54	4	

Comments

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. Shrub/tree planting survival data were collected along one 428-foot-long, 2-meter-wide belt transect that totaled approximately 0.06 acre (2,808 square feet). Transect was established along reconstructed creek and floodplain margins. During the 2010 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. 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 to be high based on visual assessment.

Mud Creek

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Eastern Kingbird	1		
Song Sparrow	1		

Bird Comments

BEHAVIOR CODES

BP = One of a breeding pair **BD** = Breeding display **F** = Foraging **FO** = Flyover **L** = Loafing **N** = Nesting

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Striped Skunk	1	No	No	No	dead skunk within mitigation site

Wildlife Comments:

Mud Creek

PHOTOGRAPHS

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.

Photo #	Latitude	Longitude	Bearing	Description
51			340	Photo Point 4. View northwest from the end of vegetation Transect #1.
53			90	Photo Point 13. View east towards the adjacent parcel along Mud Creek before it enters the mitigation site.
56			230	Photo Point 12. View southwest along the reconstructed Mud Creek and adjacent floodplains.
58			130	Photo Point 3. View southeast across the site and the eastern boundary/emergent vegetation type in foreground.
60			130	Photo Point 2. View southeast along the start of vegetation Transect #1.
61			60	Photo Point 2. View looking northeast along the northern boundary of the mitigation site. Area dominated by emergent vegetation.
64			90	Photo Point 10. View east along Mud Creek/restoration of the stream bank and vegetation.
65			135	Photo Point 8. View southeast along Transect #1 toward Mud Creek.
66			340	Photo Point 8. View northwest towards the beginning of Transect #1.
67			340	Photo Point 9. View northwest towards the beginning of Transect #1.
68			135	Photo Point 9. View southeast along Transect #1 towards Mud Creek.
69			135	Photo Point 7. View southeast at the end of Transect #1 near the fence boundary.
70			90	Photo Point 1. View looking east across the mitigation site near the southern end.

72	45	Photo Point 1. View northeast across the mitigation site/vegetation Community Type 1 dominated by Baltic rush.
73	45	Photo Point 6. View northeast along Mud Creek.
74	180	Photo Point 6. View south towards the southern boundary of the Mud Creek site.
74	90	Photo Point 11. View east along Mud Creek as it flows under the new bridge structure.
75	0	Photo Point 5. View north along the western property boundary of Mud Creek mitigation site.
76	34	Photo Point 5. View northeast of the Mud Creek mitigation site.
77	80	Photo Point 5. View northeast of the Mud Creek Mitigation site.

Comments:

ADDITIONAL ITEMS CHECKLIST

Hydrology

- Map emergent vegetation/open water boundary on aerial photos.
- Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

- One photo from the wetland toward each of the four cardinal directions
- One photo showing upland use surrounding the wetland.
- One photo showing the buffer around the wetland
- One photo from each end of each vegetation transect, toward the transect

Vegetation

- Map vegetation community boundaries
- Complete Vegetation Transects

Soils

- Assess soils

Wetland Delineations

- Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
- Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

The emergent portions of the mitigation area are thriving with the removal of grazing and increased hydrology.

Functional Assessments

- Complete and attach full MDT Montana Wetland Assessment Method field forms.

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired? No

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? No

If no, describe the problems below.

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Mud Creek City/County: Lake Co. Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-1
 Investigator(s): E. Nyquist Section, Township, Range: S 13 T 21N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Borochemists
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
= Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Carex stipata</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Juncus balticus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Agrostis alba</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
4. <u>Phalaris arundinacea</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
5. <u>Juncus tenuis</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC</u>	
6. _____		<input type="checkbox"/>		
7. _____		<input type="checkbox"/>		
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____		<input type="checkbox"/>		
= Total Cover				
% Bare Ground in Herb Stratum _____				

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Borochemists, 0 to 1 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input checked="" type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Borochemists

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low Chroma Color; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input checked="" type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 10

Saturation Present? Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Mud Creek City/County: Lake Co. Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-2
 Investigator(s): E. Nyquist Section, Township, Range: S 13 T 21N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Borochemists
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
= Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Scirpus microcarpus</u>	<u>45</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Phalaris arundinacea</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Juncus tenuis</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC</u>	
4. <u>Epilobium ciliatum</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW-</u>	
5. <u>Geum macrophyllum</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>	
6. _____		<input type="checkbox"/>		
7. _____		<input type="checkbox"/>		
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
= Total Cover				
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR	2/1	100				Mucky Peat	
6-20	10YR	2/1	100				Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input checked="" type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Borochemists

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input checked="" type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Mud Creek City/County: Lake Co. Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-3
 Investigator(s): E. Nyquist Section, Township, Range: S 13 T 21N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Borochemists
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. <u>Crataegus douglasii</u>	10	<input checked="" type="checkbox"/>	FAC	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____		<input type="checkbox"/>			
3. _____		<input type="checkbox"/>			
4. _____		<input type="checkbox"/>			
5. _____		<input type="checkbox"/>			
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Phalaris arundinacea</u>	45	<input checked="" type="checkbox"/>	FACW		
2. <u>Agrostis alba</u>	20	<input checked="" type="checkbox"/>	FACW		
3. <u>Poa pratensis</u>	15	<input type="checkbox"/>	FAC		
4. <u>Cirsium arvense</u>	10	<input type="checkbox"/>	FACU+		
5. <u>Cirsium vulgare</u>	5	<input type="checkbox"/>	FACU		
6. <u>Lychnis alba</u>	5	<input type="checkbox"/>	NS		
7. _____		<input type="checkbox"/>			
8. _____		<input type="checkbox"/>			
9. _____		<input type="checkbox"/>			
10. _____		<input type="checkbox"/>			
11. _____		<input type="checkbox"/>			
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____		<input type="checkbox"/>			
2. _____		<input type="checkbox"/>			
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Borochemists, 0 to 1 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input checked="" type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Borochemists

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low-Chroma colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____ 8

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: Mud Creek City/County: Lake Co. Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-4
 Investigator(s): E. Nyquist Section, Township, Range: S 13 T 21N R 20W
 Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Borochemists
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Alnus incana</u>	10	<input checked="" type="checkbox"/>	FACW	
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
= Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>carex stipata</u>	30	<input checked="" type="checkbox"/>	OBL	
2. <u>Phalaris arundinacea</u>	30	<input checked="" type="checkbox"/>	FACW	
3. <u>Glyceria grandis</u>	10	<input type="checkbox"/>	NS	
4. <u>Scirpus microcarpus</u>	10	<input type="checkbox"/>	OBL	
5. <u>Epilobium ciliatum</u>	10	<input type="checkbox"/>	FACW	
6. <u>Cirsium arvense</u>	10	<input type="checkbox"/>	FACU+	
7. _____		<input type="checkbox"/>		
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
= Total Cover				
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Borochemists, 0 to 1 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input checked="" type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Borochemists

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Gleyed or Low Chroma Colors; Listed on Local Hydric Soils List

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|---|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input checked="" type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input checked="" type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): 0.5

Water Table Present? Yes No Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

Remarks:

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project name 2. MDT project# Control#

3. Evaluation Date 4. Evaluators 5. Wetland/Site# (s)

6. Wetland Location(s): T R Sec1 T R Sec2

Approx Stationing or Mileposts

Watershed County Lake

7. Evaluating Agency 8. Wetland size acres

Purpose of Evaluation
 Wetlands potentially affected by MDT project
 Mitigation Wetlands: pre-construction
 Mitigation Wetlands: post construction
 Other

How assessed:

9. Assessment area (AA) size (acres)

How assessed:

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	System	Subsystem	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% 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
Depressional	Palustrine	none	Emergent Wetland		seasonally flooded	75
Depressional	Palustrine	none	Scrub-Shrub Wetland		seasonally flooded	5

11. Estimated Relative Abundance: (of similarly classified sites within the same major Montana Watershed Basin, see definitions)

12. General Condition of AA

i. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	Predominant conditions adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ?15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ?30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ?15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ?30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Adjacent parcels grazed and farmed.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Centaurea maculosa, Cirsium arvense, Cirsium vulgare, Carduus nutans, Chrysanthemum leucanthemum, Cynoglossum officinale, Iris pseu

iii. Brief descriptive summary of surrounding land use/habitat

AA is located along Mud Creek riparian corridor and adjacent depressional wetlands. Surrounding land use includes Highway 93, agriculture, and low-density residential

13. Structural Diversity: (Based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	> 3 vegetated classes (or > 2 if one is forested)	2 vegetated classes (or 1 if forested)	< 1 vegetated class
Rating (circle)	H	M	L

Comments:

SECTION PERTAINING TO FUNCTION VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is documented (D) or suspected (S) to contain (circle one based on definition contained in instructions):

Primary or critical habitat (list species) D S

Secondary habitat (list Species) D S

Incidental habitat (list species) D S

No usable habitat S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.5L	.3L	0L

Sources for documented use

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

i. AA is documented (D) or suspected (S) to contain (circle one based on definition contained in instructions):

Primary or critical habitat (list species) D S

Secondary habitat (list Species) D S

Incidental habitat (list species) D S

No usable habitat S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for the function)

Highest Habitat Level	Doc./primary	Sus./primary	Doc./secondary	Sus./secondary	Doc./incidental	Sus./incidental	None
Functional Points and Rating	1H	.8H	.7M	.6M	.2L	.1L	0L

Sources for documented use

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA

Substantial (based on any of the following [check]):

- 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

Minimal (based on any of the following [check]):

- 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 the AA

Moderate (based on any of the following [check]):

- 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, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)																				
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 #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments

14D. General Fish/Aquatic Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is “correctable” such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., click (NA) here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], the Habitat Quality [i below] should be marked as “Low”, applied accordingly in ii below, and noted in the comments.)

i. **Habitat Quality** (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating.)

Duration of surface water in AA	Permanent/ Perennial			Seasonal/ Intermittent			Temporary/ Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.									
Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading - 50 to 75% of streambank or shoreline within AA contains rip. Or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - <50% of streambank or shoreline within AA contains rip. Or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E=H, H=M, M=L, L=L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* Y N Modified habitat quality rating = (circle)

E	H	M	L
---	---	---	---

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E=exceptional, H=high, M=moderate, L=low] for this function)

Types of fish known or suspected within AA	Modified Habitat Quality (ii)			
	Exceptional	High	Moderate	Low
Native game fish	1E	.9H	.7M	5M
Introduced game fish	.9H	.8H	.6M	.4M
Non-game fish	.7M	.6M	.5M	.3L
No fish	.5M	.3L	.2L	.1L

Comments:

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, check **NA** here and proceed to the next function.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function.)

Estimated wetland area in AA subject to periodic flooding	≥ 10 acres			<10>2 acres			≤ 2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains not outlet or restricted outlet	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? Y N

Comments:

Bridge and ag structures downstream

14F. Short and Long Term Surface Water Storage: (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** here and proceed to 14G.)

i. **Rating** (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
	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	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive 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** here and proceed to 14H.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels 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 with 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.			
	≥ 70%		< 70%		≥ 70%		< 70%	
% cover of wetland vegetation in AA Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click **NA** here and proceed to 14I.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of <u>wetland</u> streambank or shoreline by species with stability ratings of ≥6 (see Appendix F).	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: _____

14I. Production Export/Food Chain Support:

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = Structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P=permanent/perennial; S/I=seasonal/intermittent; T/E/A=temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments: _____

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- The AA is a slope wetland
- Springs or seeps 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
- Shallow water table and the site is saturated to the surface
- Other: _____

ii. Recharge Indicators

- Permeable substrate present without underlying impeding layer
- Wetland contains inlet but no outlet
- Stream is a known 'losing' stream; discharge volume decreases
- Other: _____

iii. **Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H=high, L=low] for this function.

Criteria	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of D/R present	1H
No Discharge/Recharge indicators present	0.1L
Available Discharge/Recharge information inadequate to rate AA D/R potential	NA

Comments: _____

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

<i>Replacement potential</i>	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		
	rare	common	abundant	rare	common	abundant	rare	common	abundant
<i>Estimated relative abundance (#11)</i>									
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: _____

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. Site Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

- i. Check categories that apply to the AA: Educational/scientific study; Consumptive rec.; Non-consumptive rec.; Other
- ii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use? Y N (If yes, i to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])
- iii. **Rating** (use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function)

<i>Ownership</i>	<i>Disturbance at AA (#12i)</i>		
	Low	Moderate	High
Public ownership	1H	.5M	.2L
Private ownership	.7M	.3L	.1L

Comments: _____

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S) AA-1

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	.3	1	0.648
B. MT Natural Heritage Program Species Habitat	L	.1	1	0.216
C. General Wildlife Habitat	M	.7	1	1.512
D. General Fish Habitat	M	.7	1	1.512
E. Flood Attenuation	M	.4	1	0.864
F. Short and Long Term Surface Water Storage	H	.8	1	1.728
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	1.944
H. Sediment/Shoreline Stabilization	H	1	1	2.16
I. Production Export/Food Chain Support	H	.9	1	1.944
J. Groundwater Discharge/Recharge	H	1	1	2.16
K. Uniqueness	M	.5	1	1.08
L. Recreation/Education Potential	M	.5	1	1.08
Totals:		7.8	12	16.848
Percent of Possible Score		65 %		

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go 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**
 Total actual functional points > 80% (round to nearest whole #) of total possible functional points

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go 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**
 Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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 does not satisfy criteria go to Category III)
 "Low" rating for Uniqueness; **and**
 "Low" rating for Production Export/Food Chain Support; **and**
 Total actual functional points < 30% (round to nearest whole #) of total possible functional points

OVERALL ANALYSIS AREA RATING:
(circle appropriate category based on the criteria outlined below)

I	II	III	IV
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MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: US-93 Peterson Assessment Date/Time 8/10/2010

Person(s) conducting the assessment: E. Nyquist

Weather: Sunny, approximately 80 degrees Location: St. Ignatius

MDT District: Missoula Milepost: 0

Legal Description: T 19N R 20W Section(s) 35

Initial Evaluation Date: 8/15/2008 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 25 (acres)

Land use surrounding wetland:

Agriculture and residences

HYDROLOGY

Surface Water Source: Unnamed tributary to Post Creek

Inundation: Average Depth: 0.5 (ft) Range of Depths: 0-3 (ft)

Percent of assessment area under inundation: 15 %

Depth at emergent vegetation-open water boundary: 0.5 (ft)

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

Groundwater Monitoring Wells

Record depth of water surface below ground

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.

Hydrology Notes:

No groundwater wells at this site. Mitigation site consists of a draw running east to west with the hydrology source from an unnamed perennial 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 2009.

VEGETATION COMMUNITIES

Site US-93 Peterson

(Cover Class Codes 0 = < 1%, 1 = 1-5%, 2 = 6-10%, 3 = 11-20%, 4 = 21-50% , 5 = >50%)

* Indicates accepted spp name not on '88 list.

Community # 1 Community Type: Agropyron spp. / Poa pratensis

Species	Cover class	Species	Cover class
Agropyron cristatum	4	Agropyron repens	5
Bromus tectorum	1	Dipsacus sylvestris	1
Lepidium perfoliatum	1	Poa pratensis	3
Potentilla recta	1	Sisymbrium altissimum	1

Comments:

Upland plant community on each side of the wetland.

Community # 2 Community Type: Phalaris arundinacea /

Species	Cover class	Species	Cover class
Dipsacus sylvestris	1	Phalaris arundinacea	5

Comments:

Wetland community type dominated by a monoculture of reed canarygrass.

Community # 3 Community Type: Phalaris arundinacea / Typha latifolia

Species	Cover class	Species	Cover class
Carex utriculata*	2	Dipsacus sylvestris	1
Glyceria grandis	2	Impatiens ecalcarata	1
Iris pseudacorus	0	Juncus ensifolius	2
Nasturtium officinale	1	Phalaris arundinacea	4
Scirpus microcarpus	1	Typha latifolia	4

Comments:

Wetland community type dominated by a variety of species

Community # 4 Community Type: Carex nebrascensis / Poa palustris

Species	Cover class	Species	Cover class
Carex nebrascensis	5	Dipsacus sylvestris	1
Phalaris arundinacea	2	Poa palustris	4
Polygonum bistortoides	1		

Comments:

Wetland community type located along the vegetation transition between the wetland and upland boundary.

VEGETATION TRANSECTS

Site: US-93 Peterson Date: 8/10/2010

Transect Number: 1 Compass Direction from Start: 230

Interval Data:

Ending Station 35 **Community Type:** Agropyron spp. / Poa pratensis

Species	Cover class	Species	Cover class
Bromus tectorum	2	Cirsium arvense	0
Cirsium vulgare	0	Descurainia sophia	0
Dipsacus sylvestris	3	Phalaris arundinacea	3
Plantago lanceolata	1	Poa pratensis	3

Ending Station 100 **Community Type:** Phalaris arundinacea / Typha latifolia

Species	Cover class	Species	Cover class
Carex stipata	1	Carex utriculata*	2
Dipsacus sylvestris	1	Epilobium ciliatum	2
Impatiens ecalcarata	1	Iris pseudacorus	0
Juncus balticus	4	Nasturtium officinale	1
Phalaris arundinacea	4	Polygonum amphibium	2
Rumex crispus	1	Typha latifolia	2

Ending Station 144 **Community Type:** Agropyron spp. / Poa pratensis

Species	Cover class	Species	Cover class
Agropyron repens	3	Alnus incana	0
Cirsium arvense	0	Cornus stolonifera	0
Dactylis glomerata	0	Descurainia sophia	1
Dipsacus sylvestris	1	Geum macrophyllum	0
Phalaris arundinacea	1	Plantago lanceolata	2
Poa pratensis	4	Rosa woodsii	0
Thlaspi arvense	0		

Transect Notes:

Rock to Rock

Transect Number: 2

Compass Direction from Start: 320

Interval Data:

Ending Station 134 **Community Type:** Phalaris arundinacea / Typha latifolia

Species	Cover class	Species	Cover class
Carex nebrascensis	3	Cirsium arvense	1
Dipsacus sylvestris	2	Epilobium ciliatum	1
Glyceria grandis	1	Impatiens ecalcarata	1
Juncus ensifolius	1	Lepidium perfoliatum	1
Phalaris arundinacea	4	Scirpus microcarpus	2
Typha latifolia	3		

Ending Station 294 **Community Type:** Carex nebrascensis / Poa palustris

Species	Cover class	Species	Cover class
Alnus incana	1	Carex nebrascensis	2
Dipsacus sylvestris	2	Juncus balticus	2
Lepidium perfoliatum	1	Poa palustris	4
Polygonum bistortoides	4	Rosa woodsii	1

Ending Station 325 **Community Type:** Agropyron spp. / Poa pratensis

Species	Cover class	Species	Cover class
Bromus tectorum	3	Lactuca serriola	2
Lepidium perfoliatum	2	Poa pratensis	1
Polygonum bistortoides	2	Potentilla recta	1
Sisymbrium altissimum	1	Thlaspi arvense	1

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

US-93 Peterson

Planting Type	#Planted	#Alive	Notes
ALNINC	1163	25	Plantings looked healthy with moderate to vigorous growth for the season with few discolored leaves. A majority of the browse protection was intact and functioning but there were partially damaged browse protection observed. Thin-leaf alder and woods rose had the highest observations.
CORSTO	226	14	Shrub planting survival data were collected along several (lengths varied) 2-meter-wide belt transects that totaled approximately 0.17 acre (7,500 square feet). Transects were established along the edges of the wetland draw encompassing creation and enhancement mitigation areas. One transect was placed along the log crib structure. During the 2010 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers as listed were referenced from Peterson Tract Wetland Mitigation Site - 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 are considered moderate based on visual assessment. Plant growth was moderate with plants looking predominantly healthy with few discolored leaves. Browse protection was mostly intact but some damaged protection was observed.
CRADOU	75	8	
PRUAME	226	8	
RHAALN	207	0	
ROSWOO	450	45	
SALBEB	394	6	
SALEXI	0	6	
SALLUT	375	3	
SAMCER	19	0	
SYMALB	56	3	

Comments

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Red-winged Blackbird	4	L	

Bird Comments

BEHAVIOR CODES

BP = One of a breeding pair **BD** = Breeding display **F** = Foraging **FO** = Flyover **L** = Loafing **N** = Nesting

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Columbia Spotted Frog	2	No	No	No	
Meadow Vole	1	No	No	No	
Terrestrial Gartersnake	1	No	No	No	
Unk crayfish	4	No	No	No	

Wildlife Comments:

PHOTOGRAPHS

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.

Photo #	Latitude	Longitude	Bearing	Description
78			215	Photo Point 1. View southwest along Transect #1. Wetland area dominated by emergent vegetation type. Foreground shows transition between upland and wetland vegetation.
79			45	Photo Point 2. View northeast along Transect #1 at emergent wetland vegetation.
80			45	Photo Point 3. View northeast along Transect #1. Large rock represents end of vegetation transect.
81			135	Photo Point 1. View southeast across the mitigation site. Wetland site consists of draw dominated by emergent vegetation type.
85			110	Photo Point 2. View southeast along the wetland/upland boundary.
87			35	Photo Point 2. View northeast across mitigation site.
88			315	Photo Point 6. View northwest along Transect #2, beginning of transect.
89			135	Photo Point 5. View southeast from the end of transect #2 along the transect. Vegetation transition between wetland and upland boundaries.
92			30	Photo Point 4. View northeast across mitigation site.

Comments:

ADDITIONAL ITEMS CHECKLIST

Hydrology

- Map emergent vegetation/open water boundary on aerial photos.
- Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

- One photo from the wetland toward each of the four cardinal directions
- One photo showing upland use surrounding the wetland.
- One photo showing the buffer around the wetland
- One photo from each end of each vegetation transect, toward the transect

Vegetation

- Map vegetation community boundaries
- Complete Vegetation Transects

Soils

- Assess soils

Wetland Delineations

- Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
- Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

- Complete and attach full MDT Montana Wetland Assessment Method field forms.

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired? No

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

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

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

If no, describe the problems below.

Log cribs are present on site. No maintenance needs were recognized for these structures in 2010.

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: US93 Peterson City/County: Lake Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-1
 Investigator(s): E. Nyquist Section, Township, Range: S 35 T 19N R 20W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): convex Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: Upland habitat			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	<input type="checkbox"/>	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B) Dominance Test is >50% <input type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
5. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Poa pratensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU+</u>		
2. <u>Lepidium perfoliatum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU+</u>		
3. <u>Dipsacus sylvestris</u>	<u>15</u>	<input type="checkbox"/>	<u>NI</u>		
4. <u>Plantago lanceolata</u>	<u>10</u>	<input type="checkbox"/>	<u>FACU+</u>		
5. <u>Phalaris arundinacea</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>		
6. _____	_____	<input type="checkbox"/>	_____		
7. _____	_____	<input type="checkbox"/>	_____		
8. _____	_____	<input type="checkbox"/>	_____		
9. _____	_____	<input type="checkbox"/>	_____		
10. _____	_____	<input type="checkbox"/>	_____		
11. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicator present with low-chroma color. Sampling point within an area mapped as Hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks: No wetland hydrology indicators present.

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: US93 Peterson City/County: Lake Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-2
 Investigator(s): E. Nyquist Section, Township, Range: S 35 T 19N R 20W
 Landform (hillslope, terrace, etc.): Channel (active) Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
= Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Phalaris arundinacea</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Typha latifolia</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Carex rostrata var utriculata</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
4. <u>Nasturtium officinale</u>	<u>10</u>	<input type="checkbox"/>	<u>OBL</u>	
5. <u>Impatiens ecalcarata</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>	
6. <u>Epilobium ciliatum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW-</u>	
7. <u>Dipsacus sylvestris</u>	<u>5</u>	<input type="checkbox"/>	<u>NI</u>	
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
= Total Cover				
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicator = Low-chroma color; soil map unit listed on Local Hydric soils list

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input checked="" type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): 4

Water Table Present? Yes No Depth (inches): 0

Saturation Present? Yes No Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: US93 Peterson City/County: Lake Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-3
 Investigator(s): E. Nyquist Section, Township, Range: S 35 T 19N R 20W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____		<input type="checkbox"/>		Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____		<input type="checkbox"/>		Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____		<input type="checkbox"/>		Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
4. _____		<input type="checkbox"/>		Dominance Test is >50% <input type="checkbox"/>
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
_____ = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Agropyron repens</u>	<u>45</u>	<input checked="" type="checkbox"/>	<u>FACU+</u>	
2. <u>Poa pratensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Lepidium perfoliatum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU+</u>	
4. <u>Phalaris arundinacea</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>	
5. <u>Polygonum bistortoides</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW+</u>	
6. <u>Dipsacus sylvestris</u>	<u>5</u>	<input type="checkbox"/>	<u>NI</u>	
7. _____		<input type="checkbox"/>		
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks:
 Dominance of hydrophytic vegetation not present.

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicator present; low-chroma color and soil map unit listed on Local Hydric soils list

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): 10
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks: Hydrology indicator present

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: US93 Peterson City/County: Lake Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-4
 Investigator(s): E. Nyquist Section, Township, Range: S 35 T 19N R 20W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: sample point located in wetland	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	<input type="checkbox"/>	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
5. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Phalaris arundinacea</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
2. <u>Typha latifolia</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
3. <u>Carex nebrascensis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
4. <u>Scirpus acutus</u>	<u>10</u>	<input type="checkbox"/>	<u>OBL</u>		
5. <u>Glyceria maxima</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>		
6. <u>Epilobium ciliatum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW-</u>		
7. <u>Dipsacus sylvestris</u>	<u>5</u>	<input type="checkbox"/>	<u>NI</u>		
8. _____	_____	<input type="checkbox"/>	_____		
9. _____	_____	<input type="checkbox"/>	_____		
10. _____	_____	<input type="checkbox"/>	_____		
11. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	Colake silt loam, 0 to 1 percent slopes

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicator is low-chroma color; soil map unit listed on Local Hydric soils list

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input checked="" type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input checked="" type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): 1

Water Table Present? Yes No Depth (inches): 0

Saturation Present? Yes No Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: US93 Peterson City/County: Lake Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-5
 Investigator(s): E. Nyquist Section, Township, Range: S 35 T 19N R 20W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Colake
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	<input type="checkbox"/>	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Dominance Test is >50% <input checked="" type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Sapling/Shrub Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. _____	_____	<input type="checkbox"/>	_____		
3. _____	_____	<input type="checkbox"/>	_____		
4. _____	_____	<input type="checkbox"/>	_____		
5. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Herb Stratum (Plot size: _____)					
1. <u>Poa palustris</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		
2. <u>Carex nebrascensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
3. <u>Juncus balticus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		
4. <u>Polygonum bistortoides</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW+</u>		
5. <u>Mentha arvensis</u>	<u>10</u>	<input type="checkbox"/>	<u>FAC</u>		
6. <u>Dipsacus sylvestris</u>	<u>10</u>	<input type="checkbox"/>	<u>NI</u>		
7. _____	_____	<input type="checkbox"/>	_____		
8. _____	_____	<input type="checkbox"/>	_____		
9. _____	_____	<input type="checkbox"/>	_____		
10. _____	_____	<input type="checkbox"/>	_____		
11. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	<input type="checkbox"/>	_____		
2. _____	_____	<input type="checkbox"/>	_____		
= Total Cover					
% Bare Ground in Herb Stratum _____					

Remarks:

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicator is low-chroma color; soil map unit listed on Local Hydric soils list

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input checked="" type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): _____ ⁶

Wetland Hydrology Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Routine Wetland Delineation, 1987 COE Protocol

Project/Site: US93 Peterson City/County: Lake Sampling Date: 8/10/2010
 Applicant/Owner: MDT State: MT Sampling Point: SP-6
 Investigator(s): E. Nyquist Section, Township, Range: S 35 T 19N R 20W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): convex Slope (%): _____
 Subregion (LRR): LRR E Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____
 Do Normal Circumstances Exist on this site? Yes
 Is the site significantly disturbed (Atypical Situation)? Yes
 Is the area a potential Problem Area? Yes

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: Upland habitat			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____		<input type="checkbox"/>		Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B) Dominance Test is >50% <input type="checkbox"/>
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
3. _____		<input type="checkbox"/>		
4. _____		<input type="checkbox"/>		
5. _____		<input type="checkbox"/>		
= Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Poa pratensis</u>	40	<input checked="" type="checkbox"/>	FACU+	
2. <u>Lepidium perfoliatum</u>	35	<input checked="" type="checkbox"/>	FACU+	
3. <u>Lactuca serriola</u>	15	<input type="checkbox"/>	FAC-	
4. <u>Potentilla recta</u>	5	<input type="checkbox"/>	NI	
5. <u>Achillea millefolium</u>	5	<input type="checkbox"/>	FACU	
6. _____		<input type="checkbox"/>		
7. _____		<input type="checkbox"/>		
8. _____		<input type="checkbox"/>		
9. _____		<input type="checkbox"/>		
10. _____		<input type="checkbox"/>		
11. _____		<input type="checkbox"/>		
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____		<input type="checkbox"/>		
2. _____		<input type="checkbox"/>		
= Total Cover				
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks:
hydrophytic vegetation not present

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR	2/1		100			Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Listed on Local Soils List |
| <input type="checkbox"/> Aquatic Moisture Regime | <input type="checkbox"/> Listed on National Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (explain in remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> Concretions | |

Taxonomy Subgroup: Typic Calciaquolls

Confirm Mapped Type?:

Hydric Soil Present? Yes No

Remarks:

Hydric soil indicator is low-chroma color; soil map unit listed on Local Hydric Soils list

HYDROLOGY

Wetland Hydrology Indicators:

- | | |
|--|---|
| Primary Indicators | Secondary Indicators (2 or more required) |
| <input type="checkbox"/> Inundated | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots |
| <input type="checkbox"/> Saturated in upper 12 inches | <input type="checkbox"/> Water-Stained Leaves |
| <input type="checkbox"/> Water Marks | <input type="checkbox"/> Local Soil Survey Data |
| <input type="checkbox"/> Drift Lines | <input type="checkbox"/> FAC-Neutral Test |
| <input type="checkbox"/> Sediment Deposits | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Drainage patterns in wetlands | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Remarks: No hydrology indicators observed

13. Structural Diversity: (Based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	> 3 vegetated classes (or > 2 if one is forested)	2 vegetated classes (or 1 if forested)	< 1 vegetated class
Rating (circle)	<input type="radio"/> H	<input type="radio"/> M	<input type="radio"/> L

Comments:

SECTION PERTAINING TO FUNCTION VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is documented (D) or suspected (S) to contain (circle one based on definition contained in instructions):

Primary or critical habitat (list species) D S

Secondary habitat (list Species) D S

Incidental habitat (list species) D S

No usable habitat S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.5L	.3L	0L

Sources for documented use

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

i. AA is documented (D) or suspected (S) to contain (circle one based on definition contained in instructions):

Primary or critical habitat (list species) D S

Secondary habitat (list Species) D S

Incidental habitat (list species) D S

No usable habitat S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for the function)

Highest Habitat Level	Doc./primary	Sus./primary	Doc./secondary	Sus./secondary	Doc./incidental	Sus./incidental	None
Functional Points and Rating	1H	.8H	.7M	.6M	.2L	.1L	0L

Sources for documented use

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA

Substantial (based on any of the following [check]):

- 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

Minimal (based on any of the following [check]):

- 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 the AA

Moderate (based on any of the following [check]):

- 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, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)																				
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 #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments

14D. General Fish/Aquatic Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is “correctable” such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., click (NA) here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], the Habitat Quality [i below] should be marked as “Low”, applied accordingly in ii below, and noted in the comments.)

i. **Habitat Quality** (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating.)

Duration of surface water in AA	Permanent/ Perennial			Seasonal/ Intermittent			Temporary/ Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.									
Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading - 50 to 75% of streambank or shoreline within AA contains rip. Or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - <50% of streambank or shoreline within AA contains rip. Or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E=H, H=M, M=L, L=L]). Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support? Y N Modified habitat quality rating = (circle)

E	H	M	L
---	---	---	---

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E=exceptional, H=high, M=moderate, L=low] for this function)

Types of fish known or suspected within AA	Modified Habitat Quality (ii)			
	Exceptional	High	Moderate	Low
Native game fish	1E	.9H	.7M	5M
Introduced game fish	.9H	.8H	.6M	.4M
Non-game fish	.7M	.6M	.5M	.3L
No fish	.5M	.3L	.2L	.1L

Comments:

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, check **NA** here and proceed to the next function.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function.)

Estimated wetland area in AA subject to periodic flooding	≥ 10 acres			<10>2 acres			≤ 2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains not outlet or restricted outlet	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? Y N

Comments:

14F. Short and Long Term Surface Water Storage: (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** here and proceed to 14G.)

i. **Rating** (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
	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	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive 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** here and proceed to 14H.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels 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 with 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.			
	≥ 70%		< 70%		≥ 70%		< 70%	
% cover of wetland vegetation in AA Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click **NA** here and proceed to 14I.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of <u>wetland</u> streambank or shoreline by species with stability ratings of ≥6 (see Appendix F).	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments:

14I. Production Export/Food Chain Support:

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = Structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P=permanent/perennial; S/I=seasonal/intermittent; T/E/A=temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments:

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- The AA is a slope wetland
- Springs or seeps 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
- Shallow water table and the site is saturated to the surface
- Other:

ii. Recharge Indicators

- Permeable substrate present without underlying impeding layer
- Wetland contains inlet but no outlet
- Stream is a known 'losing' stream; discharge volume decreases
- Other:

iii. **Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H=high, L=low] for this function.

Criteria	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of D/R present	1H
No Discharge/Recharge indicators present	0.1L
Available Discharge/Recharge information inadequate to rate AA D/R potential	NA

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

<i>Replacement potential</i>	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		
	rare	common	abundant	rare	common	abundant	rare	common	abundant
<i>Estimated relative abundance (#11)</i>									
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. Site Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

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

ii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use? Y N (If yes, i to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iii. **Rating** (use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low] for this function)

<i>Ownership</i>	<i>Disturbance at AA (#12i)</i>		
	Low	Moderate	High
Public ownership	1H	.5M	.2L
Private ownership	.7M	.3L	.1L

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S) AA-1

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	.3	1	1.254
B. MT Natural Heritage Program Species Habitat	L	.1	1	0.418
C. General Wildlife Habitat	M	.7	1	2.926
D. General Fish Habitat	NA	0	0	0
E. Flood Attenuation	M	.4	1	1.672
F. Short and Long Term Surface Water Storage	H	.8	1	3.344
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	3.762
H. Sediment/Shoreline Stabilization	H	1	1	4.18
I. Production Export/Food Chain Support	H	.8	1	3.344
J. Groundwater Discharge/Recharge	H	1	1	4.18
K. Uniqueness	M	.4	1	1.672
L. Recreation/Education Potential	H	1	1	4.18
Totals:		7.4	11	30.932
Percent of Possible Score		67.27 %		

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go 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**
- Total actual functional points > 80% (round to nearest whole #) of total possible functional points

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go 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**
- Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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 does not satisfy criteria go to Category III)

- "Low" rating for Uniqueness; **and**
- "Low" rating for Production Export/Food Chain Support; **and**
- Total actual functional points < 30% (round to nearest whole #) of total possible functional points

OVERALL ANALYSIS AREA RATING:
(circle appropriate category based on the criteria outlined below)

I
 II
 III
 IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Bouchard Property, Mud Creek, and Peterson Property
Lake County, Montana

BOUCHARD PROPERTY MITIGATION SITE



Photo Point 1 – Photo 1
Bearing: 0 Degrees

Location: Veg Tran 1, start
Taken in 2009



Photo Point 1 – Photo 1
Bearing: 0 Degrees

Location: Veg Tran 1, start
Taken in 2010



Photo Point 2 – Photo 1
Bearing: 0 Degrees

Location: Veg Tran 1, end
Taken in 2009



Photo Point 2 – Photo 1
Bearing: 0 Degrees

Location: Veg Tran 1, end
Taken in 2010



Photo Point 3 – Photo 1
Bearing: 270 Degrees

Location: Veg Tran 1, end
Taken in 2009

BOUCHARD PROPERTY MITIGATION SITE



Photo Point 3 – Photo 1
Bearing: 270 Degrees

Location: Veg Tran 1, end
Taken in 2010



Photo Point 3 – Photo 1
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2010



Photo Point 3 – Photo 2
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2009



Photo Point 4 – Photo 1
Bearing: 180 Degrees

Location: NE project area
Taken in 2009



Photo Point 4 – Photo 1
Bearing: 180 Degrees

Location: NE project area
Taken in 2010

BOUCHARD PROPERTY MITIGATION SITE



Photo Point 5 – Photo 1
Bearing: 0 Degrees

Location: Veg Tran 2, start
Taken in 2009



Photo Point 5 – Photo 1
Bearing: 270 Degrees

Location: Veg Tran 2, start
Taken in 2010



Photo Point 5 – Photo 2
Bearing: 135 Degrees

Location: Veg Tran 2, start
Taken in 2009



Photo Point 5 – Photo 2
Bearing: 135 Degrees

Location: Veg Tran 2, start
Taken in 2010



Photo Point 6 – Photo 1
Bearing: 180 Degrees

Location: West boundary
Taken in 2010

BOUCHARD PROPERTY MITIGATION SITE



Photo Point 6 – Photo 1
Bearing: 90 Degrees
Location: West boundary
Taken in 2009



Photo Point 6 – Photo 1
Bearing: 90 Degrees
Location: West boundary
Taken in 2010



Photo Point 7 – Photo 1
Bearing: 270 Degrees
Location: Veg Tran 2, end
Taken in 2009



Photo Point 7 – Photo 1
Bearing: 270 Degrees
Location: Veg Tran 2, end
Taken in 2010



Photo Point 8 – Photo 1
Bearing: 0 Degrees
Location: SE corner of project area
Taken in 2009

BOUCHARD PROPERTY MITIGATION SITE



Photo Point 8 – Photo 1
Bearing: 0 Degrees
Location: SE corner of project area
Taken in 2010



Photo Point 10 – Photo 1
Bearing: 230 Degrees
Location: Veg Tran 3, end
Taken in 2010



Photo Point 9 – Photo 1
Bearing: 135 Degrees
Location: Fringe of pond
Taken in 2009



Photo Point 9 – Photo 1
Bearing: 135 Degrees
Location: Fringe of pond
Taken in 2010



Photo Point 9 – Photo 2
Bearing: 320 Degrees
Location: Fringe of pond
Taken in 2009



Photo Point 9 – Photo 2
Bearing: 320 Degrees
Location: Fringe of pond
Taken in 2010

BOUCHARD PROPERTY MITIGATION SITE



Photo Point 9 – Photo 3
Bearing: 45 Degrees

Location: View toward T-3
Taken in 2009



Photo Point 9 – Photo 3
Bearing: 45 Degrees

Location: View toward T-3
Taken in 2010



Photo Point 9 – Photo 4
Bearing: 230 Degrees

Location: Weedy pond fringe
Taken in 2009



Photo Point 9 – Photo 4
Bearing: 230 Degrees

Location: Weedy pond fringe
Taken in 2010



Photo Point 11 – Photo 1
Bearing: 320 Degrees

Location: Veg Tran 3, start
Taken in 2009



Photo Point 11 – Photo 1
Bearing: 320 Degrees

Location: Veg Tran 3, start
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 1 – Photo 1
Bearing: 90 Degrees

Location: Livestock water gap
Taken in 2009



Photo Point 1 – Photo 1
Bearing: 90 Degrees

Location: Livestock water gap
Taken in 2010



Photo Point 1 – Photo 2
Bearing: 45 Degrees

Location: PP1
Taken in 2009



Photo Point 1 – Photo 2
Bearing: 0 Degrees

Location: PP1
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 2 – Photo 1
Bearing: 60 Degrees

Location: Northern project boundary
Taken in 2009



Photo Point 2 – Photo 1
Bearing: 60 Degrees

Location: Northern project boundary
Taken in 2010



Photo Point 2 – Photo 2
Bearing: 130 Degrees

Location: Western project boundary
Taken in 2009



Photo Point 2 – Photo 2
Bearing: 130 Degrees

Location: Western project boundary
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 3 – Photo 1
Bearing: 130 Degrees

Location: NE corner of project area
Taken in 2009



Photo Point 3 – Photo 1
Bearing: 130 Degrees

Location: NE corner of project area
Taken in 2010



Photo Point 4 – Photo 1
Bearing: 340 Degrees

Location: NE corner of project area
Taken in 2009

MUD CREEK MITIGATION SITE



Photo Point 4 – Photo 1
Bearing: 340 Degrees

Location: NE corner of project area
Taken in 2010



Photo Point 5 – Photo 1
Bearing: 0 Degrees

Location: South project area
Taken in 2009



Photo Point 5 – Photo 1
Bearing: 0 Degrees

Location: South project area
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 6 – Photo 1
Bearing: 180 Degrees

Location: Old US Hwy 93 Bridge
Taken in 2009



Photo Point 6 – Photo 1
Bearing: 180 Degrees

Location: Old US Hwy 93 Bridge
Taken in 2010



Photo Point 6 – Photo 2
Bearing: 45 Degrees

Location: Mud Creek
Taken in 2009



Photo Point 6 – Photo 2
Bearing: 45 Degrees

Location: Mud Creek
Taken in 2010



Photo Point 7 – Photo 1
Bearing: 135 Degrees

Location: Along T-1
Taken in 2009



Photo Point 7 – Photo 1
Bearing: 135 Degrees

Location: Along T-1
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 8 – Photo 1
Bearing: 340 Degrees

Location: Along T-1
Taken in 2009



Photo Point 8 – Photo 1
Bearing: 340 Degrees

Location: Along T-1
Taken in 2010



Photo Point 8 – Photo 2
Bearing: 135 Degrees

Location: Along T-1
Taken in 2009



Photo Point 8 – Photo 2
Bearing: 135 Degrees

Location: Along T-1
Taken in 2010



Photo Point 9 – Photo 1
Bearing: 340 Degrees

Location: Along T-1
Taken in 2009



Photo Point 9 – Photo 1
Bearing: 340 Degrees

Location: Along T-1
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 9 – Photo 2
Bearing: 135 Degrees

Location: Along T-1
Taken in 2009



Photo Point 9 – Photo 2
Bearing: 135 Degrees

Location: Along T-1
Taken in 2010



Photo Point 10 – Photo 1
Bearing: 90 Degrees

Location: Mud Creek
Taken in 2009



Photo Point 10 – Photo 1
Bearing: 90 Degrees

Location: Mud Creek
Taken in 2010

MUD CREEK MITIGATION SITE



Photo Point 11 – Photo 1
Bearing: 90 Degrees

Location: US Hwy 93 Bridge
Taken in 2009



Photo Point 11 – Photo 1
Bearing: 90 Degrees

Location: US Hwy 93 Bridge
Taken in 2010



Photo Point 12 – Photo 1
Bearing: 230 Degrees

Location: US Hwy 93 crossing over Mud Creek
Taken in 2009

MUD CREEK MITIGATION SITE



Photo Point 12 – Photo 1
Bearing: 230 Degrees

Location: US Hwy 93 crossing over Mud Creek
Taken in 2010



Photo Point 13 – Photo 1
Bearing: 90 Degrees

Location: Landuse east of project area
Taken in 2009



Photo Point 13 – Photo 1
Bearing: 90 Degrees

Location: Landuse east of project area
Taken in 2010

PETERSON WETLAND MITIGATION SITE



Photo Point 1 – Photo 1
Bearing: 215 Degrees

Location: T-1 start
Taken in 2009



Photo Point 1 – Photo 1
Bearing: 215 Degrees

Location: T-1 end
Taken in 2010



Photo Point 1 – Photo 2
Bearing: 135 Degrees

Location: PP1
Taken in 2009



Photo Point 1 – Photo 2
Bearing: 135 Degrees

Location: PP1
Taken in 2010

PETERSON WETLAND MITIGATION SITE



Photo Point 2 – Photo 1
Bearing: 45 Degrees

Location: T-1 end
Taken in 2009



Photo Point 2 – Photo 1
Bearing: 45 Degrees

Location: T-1 end
Taken in 2010



Photo Point 2 – Photo 2
Bearing: 35 Degrees

Location: PP2
Taken in 2009



Photo Point 2 – Photo 2
Bearing: 35 Degrees

Location: PP2
Taken in 2010

PETERSON WETLAND MITIGATION SITE



Photo Point 2 – Photo 3
Bearing: 110 Degrees

Location: PP2
Taken in 2009



Photo Point 2 – Photo 3
Bearing: 110 Degrees

Location: PP2
Taken in 2010



Photo Point 3 – Photo 1
Bearing: 45 Degrees

Location: T-1 end
Taken in 2009



Photo Point 3 – Photo 1
Bearing: 45 Degrees

Location: T-1 end
Taken in 2010



Photo Point 4 – Photo 1
Bearing: 30 Degrees

Location: Riparian corridor along unnamed tributary to Post Creek
Taken in 2009

PETERSON WETLAND MITIGATION SITE



Photo Point 4 – Photo 1
Bearing: 30 Degrees
Location: Looking across T-2
Taken in 2010



Photo Point 6 – Photo 1
Bearing: 315 Degrees
Location: T-2 start
Taken in 2010



Photo Point 5 – Photo 1
Bearing: 135 Degrees
Location: Wetland boundary
Taken in 2009



Photo Point 5 – Photo 1
Bearing: 135 Degrees
Location: Wetland boundary
Taken in 2010



Photo Point 6 – Photo 1
Bearing: 315 Degrees
Location: T-2 start
Taken in 2009

Appendix D

Original Site Plans

MDT Wetland Mitigation Monitoring
Bouchard Property, Mud Creek, and Peterson Property
Lake County, Montana



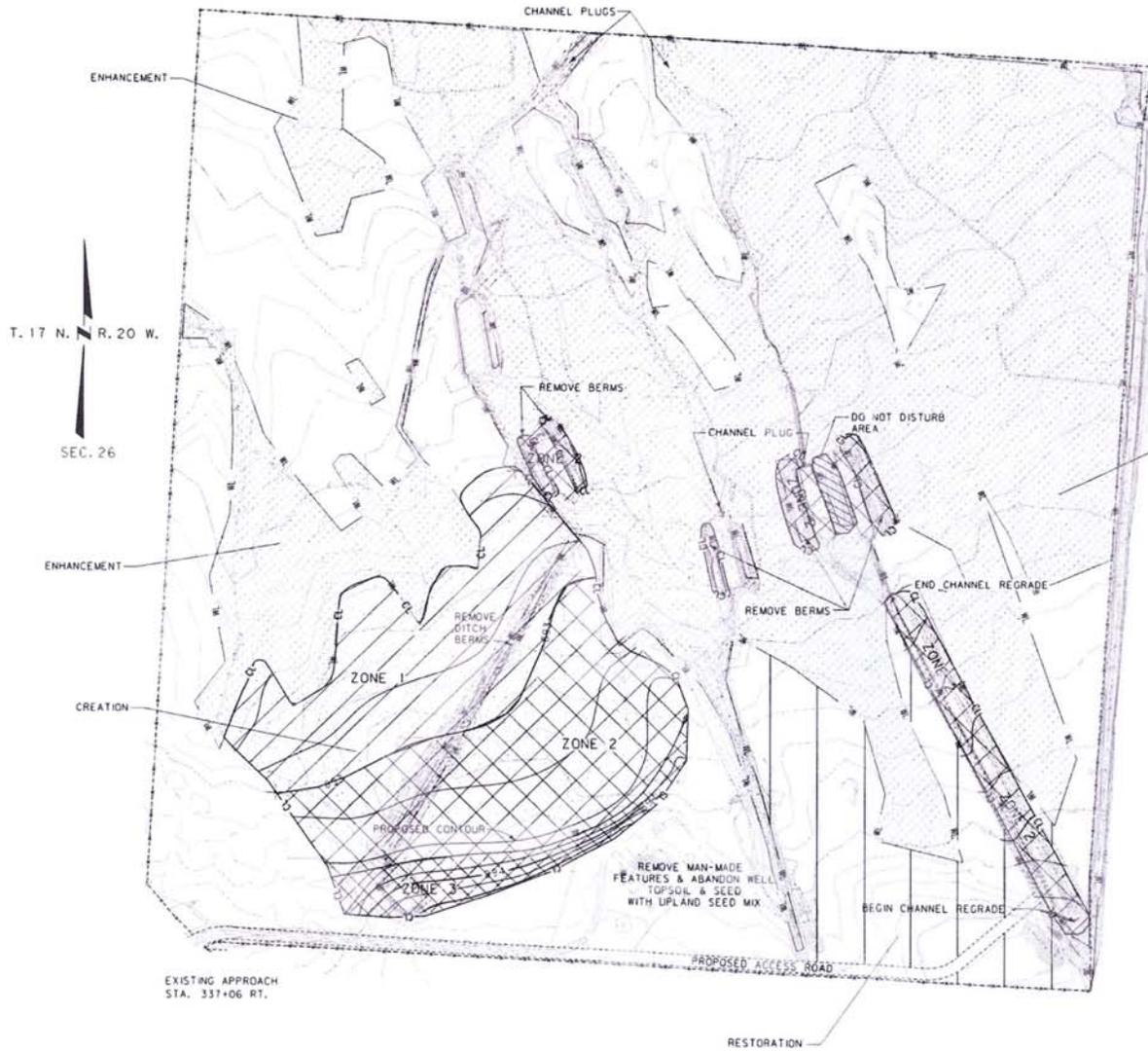
GEOM ENVIRONMENTAL CONSULTING, INC.

DATE	DESCRIPTION
11/10/10	REVISED

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-242020	L-3A

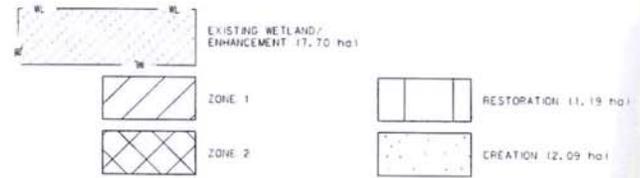
CSF - 0.99926000

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 LIPLAND 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.



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

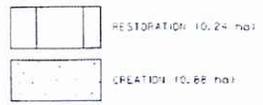
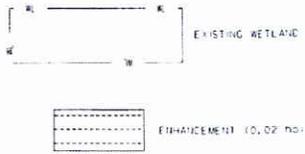
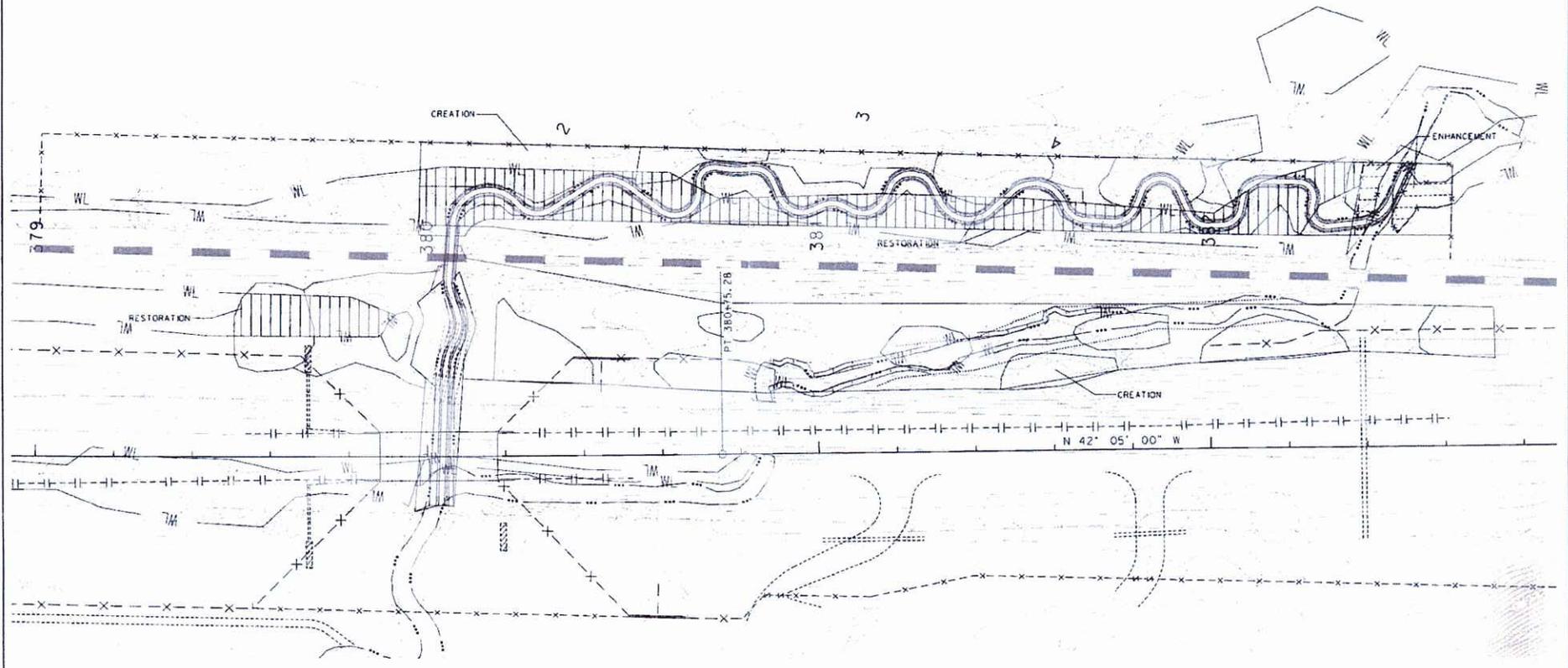
DETAIL

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-212020	L-8A
CSF - 0.99926000		

MONTANA DEPARTMENT OF TRANSPORTATION
MDOT
 WINTANA CAD

GEOM ENVIRONMENTAL CONSULTING, INC.

PROJECT NO. 447064210.04
 7/17/2005
 12:05:37 PM
 - TN 104 - 0271



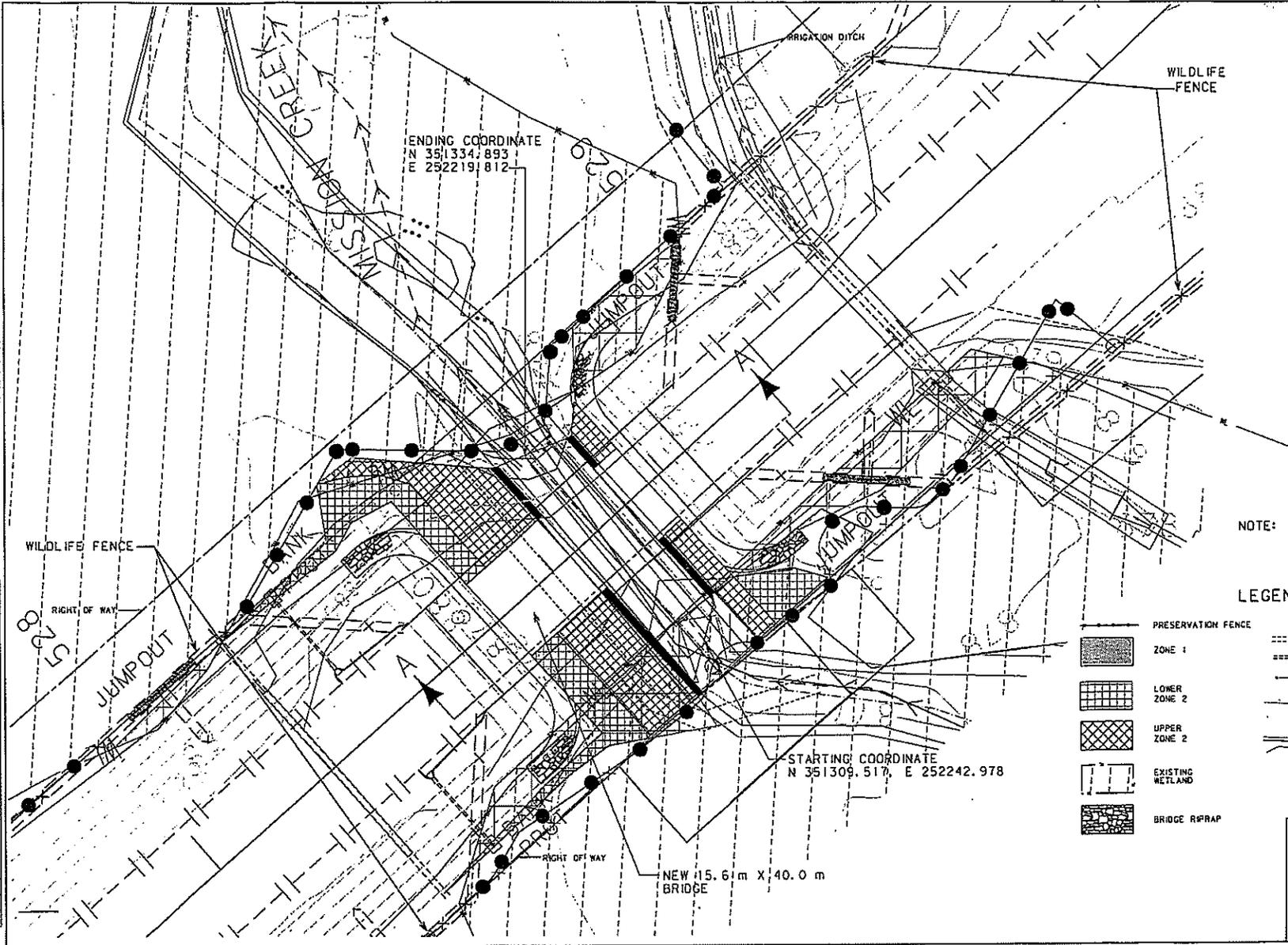
CONTOURS:
 MAJOR INTERVAL 2.0 m
 MINOR INTERVAL 0.1 m

SPRING CREEK
 WETLAND
 DEVELOPMENT
 DETAIL
 COE PERMITTING
 SCALE = 1:500

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(12)2131	WW-2

MONTANA DEPARTMENT OF TRANSPORTATION
 MONTANA CAD
 SESA
 SURVEYING & ENGINEERING
 1000 W. 10TH AVENUE, SUITE 100
 BUTTE, MONTANA 59717
 (406) 253-1111

DRAWN BY: J. J. HARRIS
 CHECKED BY: J. J. HARRIS
 DATE: 12/17/2003
 PROJECT NO.: NH 5-2(12)2131
 SHEET NO.: WW-2



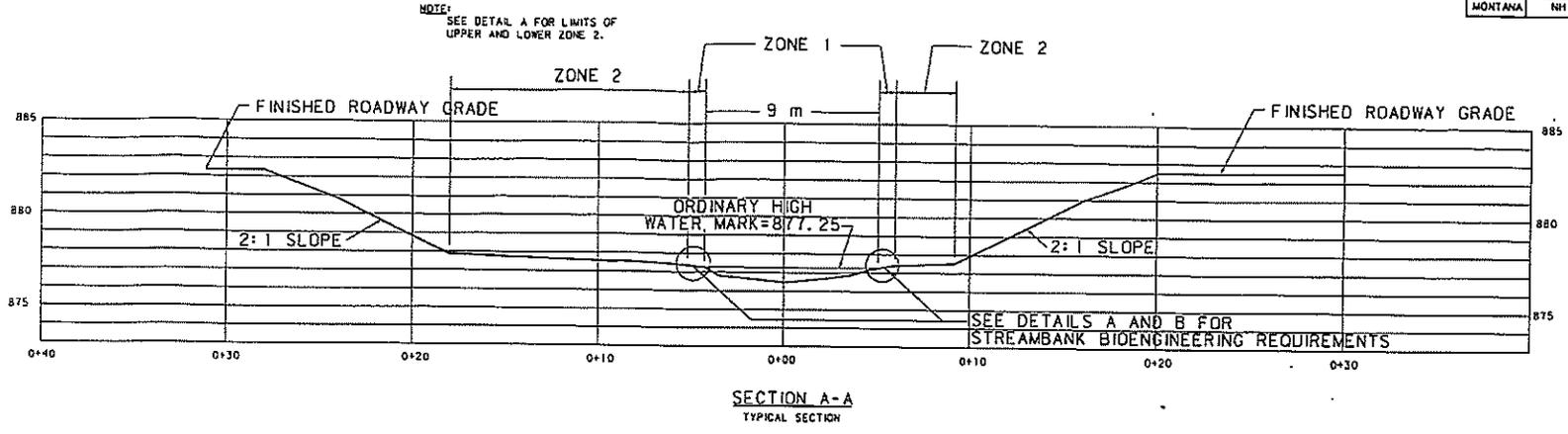
NOTE: FOR SECTION A-A, SEE
DETAIL, SHEET WM-3.

LEGEND

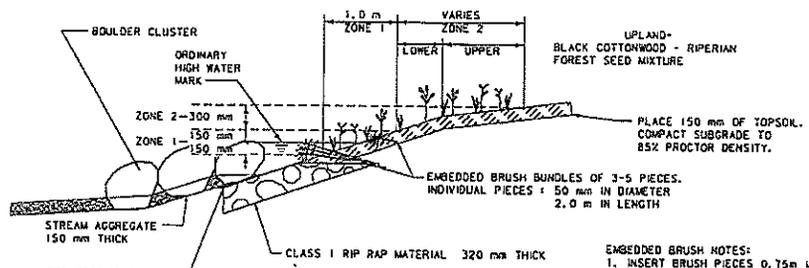
- | | | | |
|---|--------------------|---|---------------------|
|  | PRESERVATION FENCE |  | TEMPORARY DIVERSION |
|  | ZONE 1 |  | WILDLIFE FENCE |
|  | LOWER ZONE 2 |  | R/W FENCE |
|  | UPPER ZONE 2 |  | EXISTING CONTOURS |
|  | EXISTING WETLAND |  | PROPOSED CONTOURS |
|  | BRIDGE RIPRAP | | |

WETLAND MITIGATION SITE
MISSION CREEK
SITE PLAN
 SCALE 1:250

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-21(22)31	WM-4



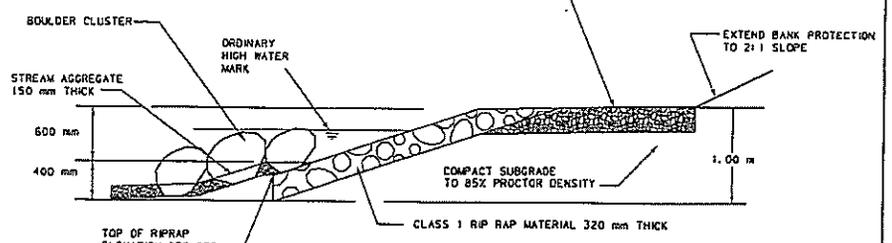
BOULDER CLUSTER NOTE:
 1. PLACE NINE 10.5-0.75 m DIAMETER BOULDERS IN EACH BOULDER GROUP. PLACE GROUPS ON ALTERNATE SIDES OF THE CHANNEL AT 6 m INTERVALS. EMBED BOULDERS APPROXIMATELY 0.2 m INTO THE RIPRAP OR STREAMBED MATERIAL.



NOTE:
 1. DETAIL TO BE USED IN DISTURBED BANK AREAS UPSTREAM AND DOWNSTREAM FROM BRIDGE. EXTEND 2.0 m UNDERNEATH THE BRIDGE DRIP LINE.
 2. USE DETAIL ON BOTH BANKS OF CREEK IN ZONE ONE.

DETAIL A STREAM BANK BIODESIGN DETAIL -
 SCALE: N.T.S.
 UPSTREAM AND DOWNSTREAM FROM MISSION CREEK BRIDGE

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 BIODESIGN DETAIL -
 SCALE: N.T.S.
 UNDER MISSION CREEK BRIDGE

WETLAND MITIGATION SITE
 MISSION CREEK
 CHANNEL DETAILS
 SCALE N. T. S.

DETAIL MUD CREEK WETLAND IMPACTS AND MITIGATION AREAS

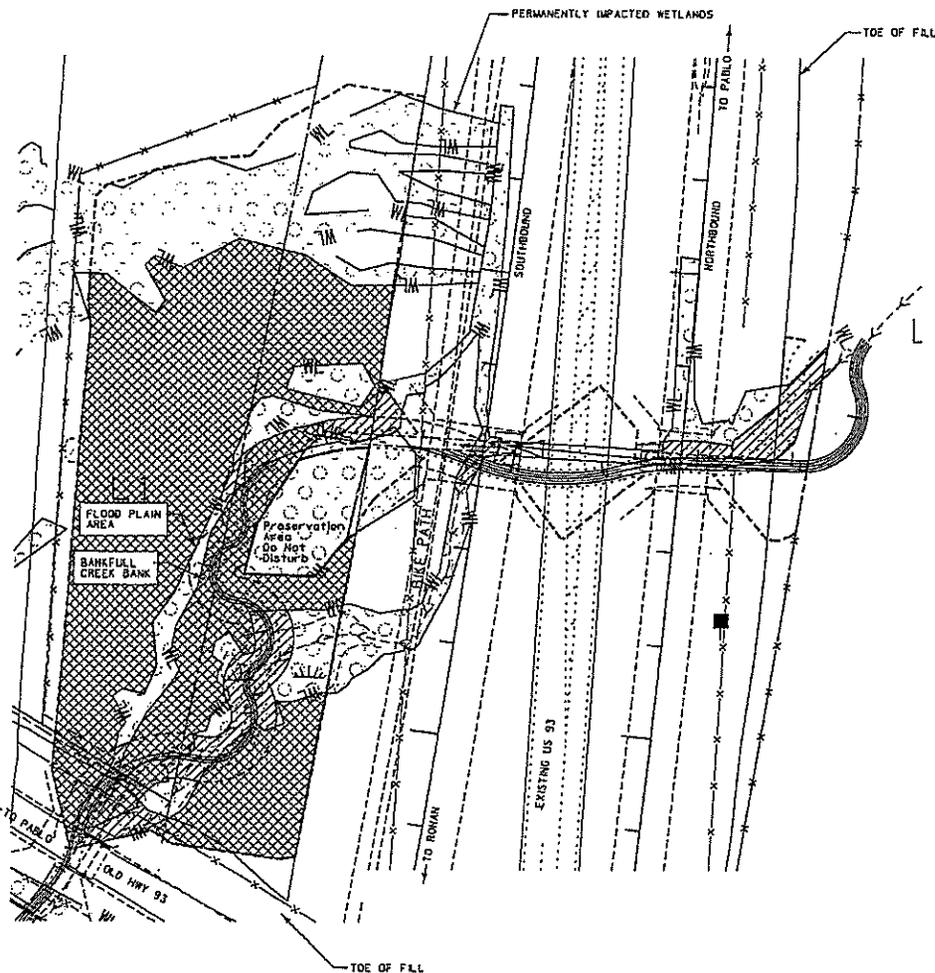
Types of Compensatory Mitigation	Definition	Corps Ratio
Preservation	Protection, in perpetuity.	NA
Creation	Establishment of a wetland or other aquatic resource where one did not formerly exist	1:1
Re-establishment (Corps)	Restoration of wetland characteristics to existing non-wetland areas that were historically wetlands	1:1
Rehabilitation	Restoration of wetland functions of existing wetland areas that exist in a substantially degraded state.	Based on expected functional shift. A minimum 1.5:1 ratio applies
Enhancement (Corps)	Altering the physical characteristics (or land management - CSMT) 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 Tilinger (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 Tilinger to Herrera Environmental Consultants dated December 19, 2002.

LEGEND

	EXISTING WETLANDS
	WETLAND MITIGATION BOUNDARY
	PERMANENTLY IMPACTED WETLAND = 8647.79 m ²
	TEMPORARILY IMPACTED WETLAND
	CREATED WETLAND = 25 017 m ²

Total Mitigation Area
 Total area = 36072 m²
 Existing Wetland area = 11055 m² (Enhancement)
 Existing Wetland area = 25017 m² (New Wetland)
 Wetland area permanently impacted 8647.79 m²



MONTANA DEPARTMENT OF TRANSPORTATION
 MDT AREA CADD

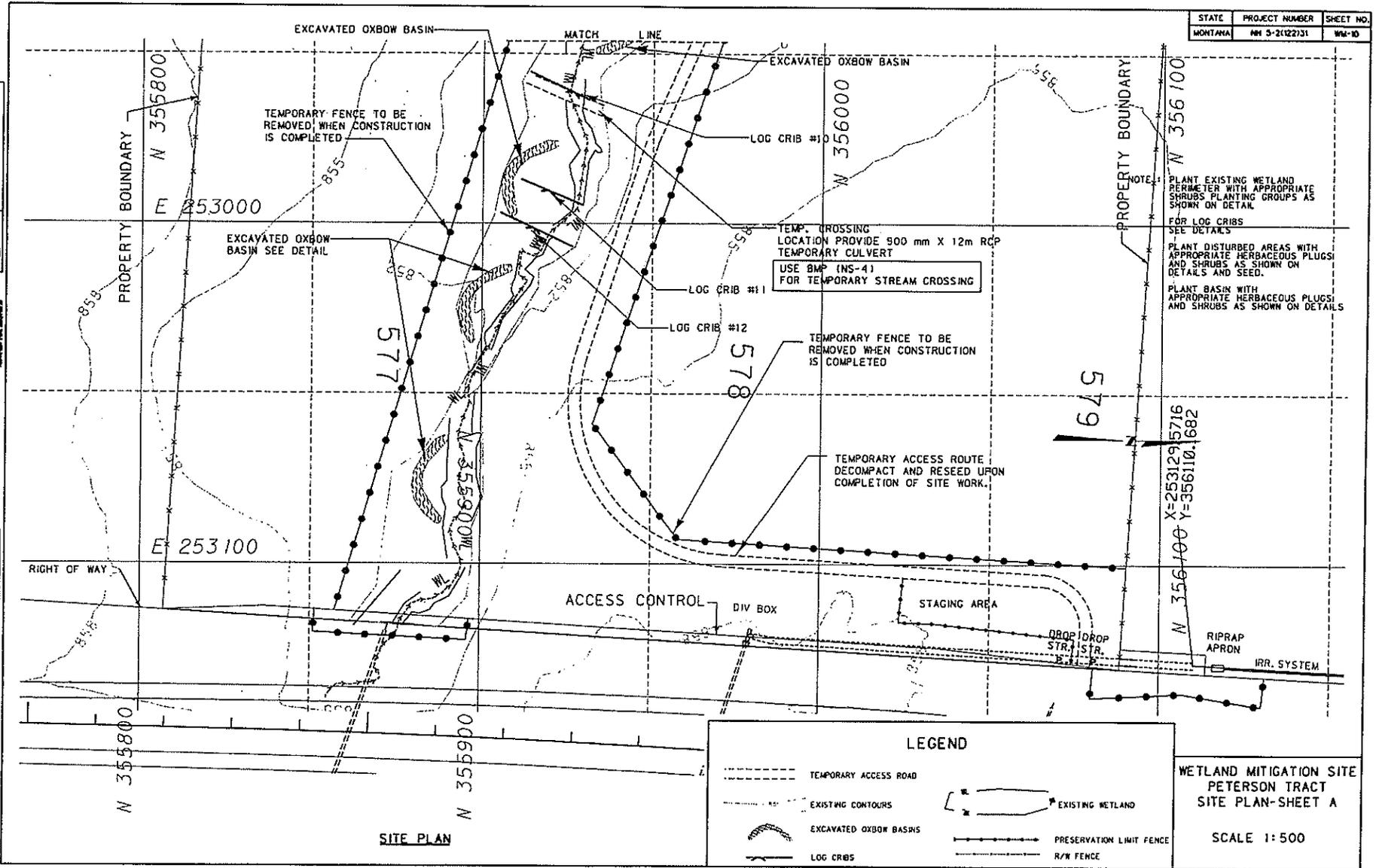
Carter Burgess
 1744 N. GARDEN AVENUE, SUITE 100
 BOZEMAN, MONTANA 59717-1000

DATE	BY	DESCRIPTION
7/27/2004	JAV	ISSUED FOR PERMIT
7/27/2004	JAV	ISSUED FOR PERMIT
7/27/2004	JAV	ISSUED FOR PERMIT
7/27/2004	JAV	ISSUED FOR PERMIT

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	MM 5-2(12)731	MM-10

DESIGNED BY: []
 CHECKED BY: []
 DATE: []

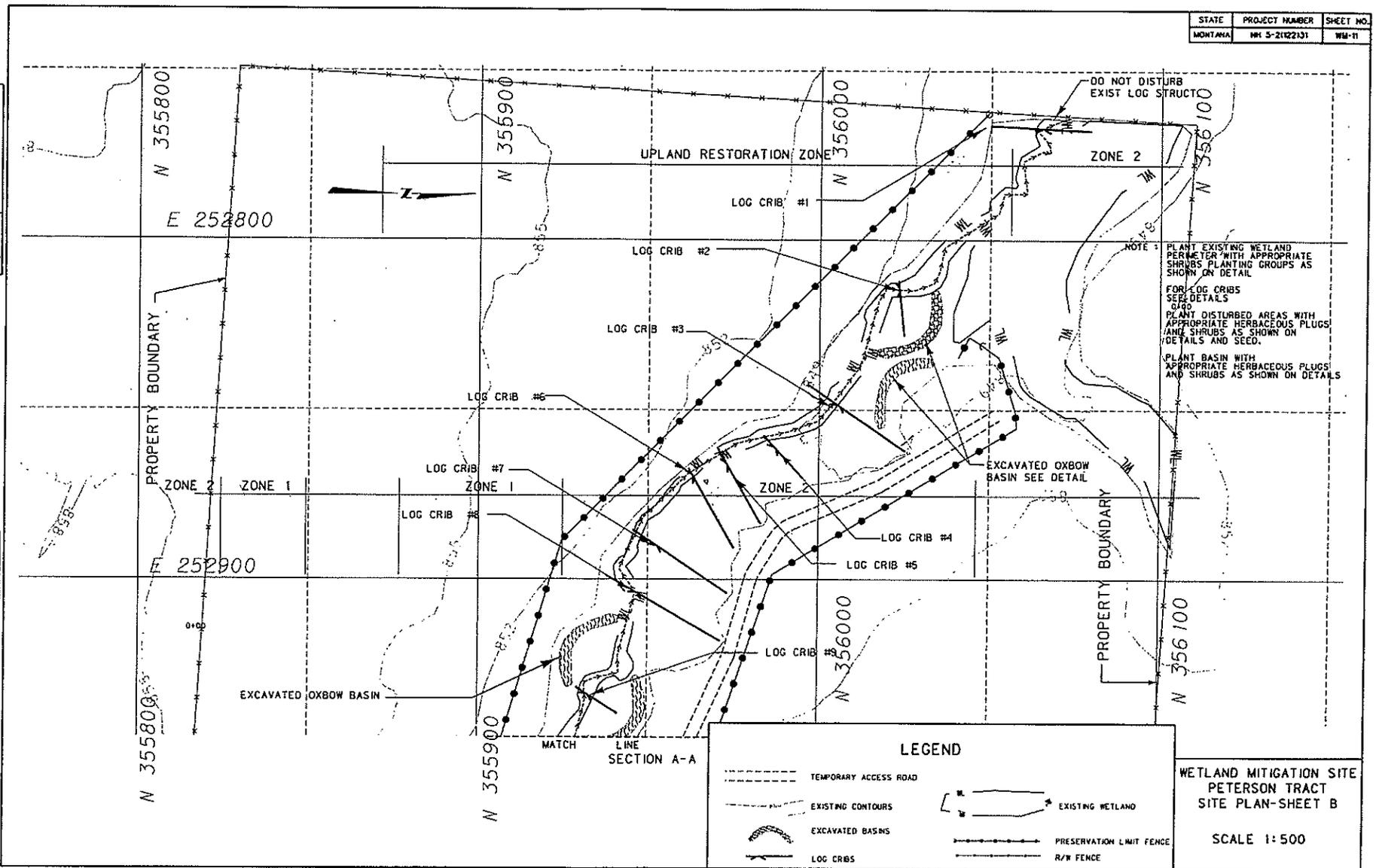
SESA
 STATE ENGINEERING SOCIETY OF AMERICA
 MONTANA CHAPTER
 LICENSE NO. []



STATE	PROJECT NUMBER	SHEET NO.
MONTANA	HR 5-21(2213)	WM-11

MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA ROAD

DATE	BY	CHECKED BY
11/17/2018	W. J.
11/17/2018
11/17/2018



NOTE 1
PLANT EXISTING WETLAND PERIMETER WITH APPROPRIATE SHRUBS PLANTING GROUPS AS SHOWN ON DETAIL.
FOR LOG CRIBS SEE DETAILS.
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.

LEGEND

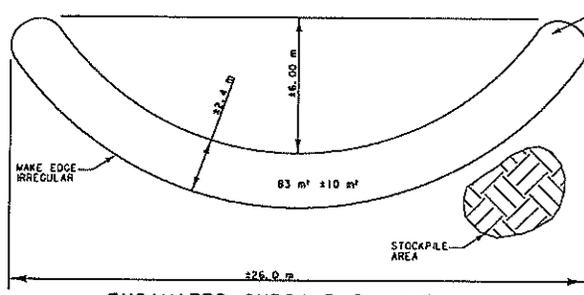
	TEMPORARY ACCESS ROAD		EXISTING WETLAND
	EXISTING CONTOURS		PRESERVATION LIMIT FENCE
	EXCAVATED BASINS		R/W FENCE
	LOG CRIBS		

**WETLAND MITIGATION SITE
PETERSON TRACT
SITE PLAN-SHEET B**

SCALE 1:500

PETERSON TRACT WETLAND MITIGATION DETAILS

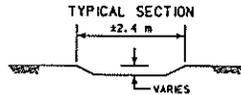
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	MM-5-2122331	WM-7



EXCAVATED OXBOW BASIN DETAIL

NOTE: 7 LOCATIONS

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.

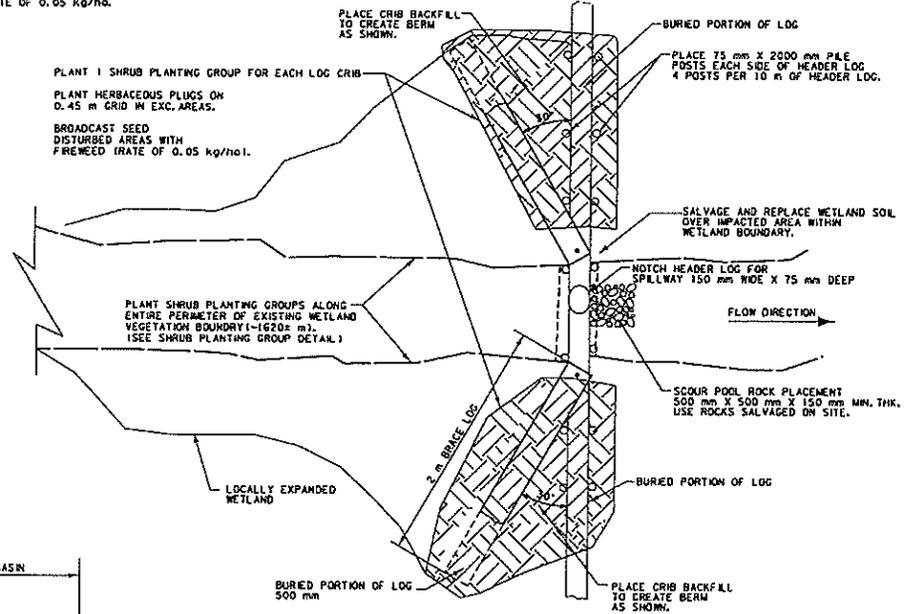


TYPICAL SECTION

NOTE: SEE SHEET WM-6 FOR PLANTING GROUP AND PLANTING DETAILS. SEE SHEET WM-4 FOR LOG CRIB AND OXBOW SUMMARY.

PLANT 300 HERBACEOUS PLUGS AT 0.45 m SPACING. PLANT 2 SHRUB PLANTING GROUPS IN EACH BASIN. SEED WITH FIREWEED AT A RATE OF 0.05 kg/ha.

PLANT 1 SHRUB PLANTING GROUP FOR EACH LOG CRIB. PLANT HERBACEOUS PLUGS ON 0.45 m GRID IN EXC. AREAS. BROADCAST SEED DISTURBED AREAS WITH FIREWEED (RATE OF 0.05 kg/ha).

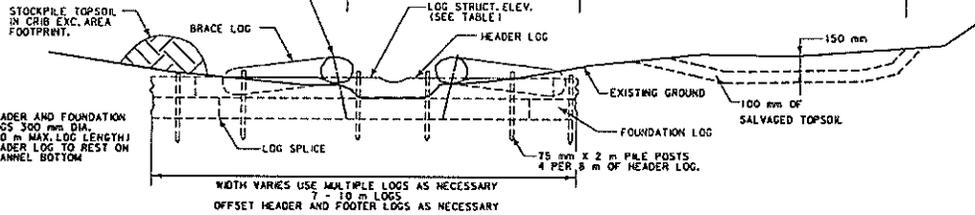


PLAN VIEW - LOG CRIB

NOTE: FOR LOG CRIBS

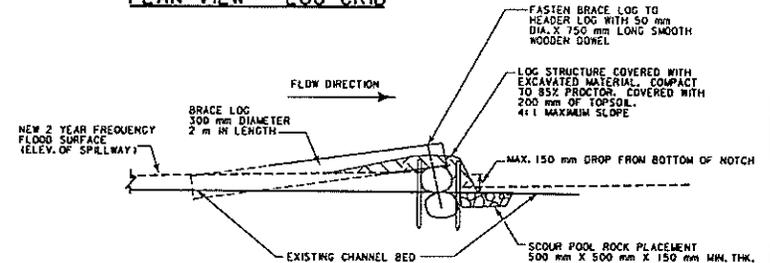
SALVAGE & PLACE 16 m³ ± OF TOPSOIL PER SITE. PLACE TOPSOIL AT 200 mm DEPTH ON CRIB BACKFILL.

FASTEN BRACE LOG TO HEADER LOG WITH 50 mm DIA. X 750 mm LONG SMOOTH WOODEN DOWEL. STOCKPILE TOPSOIL IN CRIB EXC. AREA FOOTPRINT. BRACE LOG. LOG STRUCT. ELEV. (SEE TABLE). HEADER LOG. EXISTING CHANNEL ZONE 1. EXCAVATED OXBOW BASIN. SEE DETAIL THIS SHEET. EXISTING GROUND. 150 mm. 100 mm OF SALVAGED TOPSOIL. FOUNDATION LOG. 75 mm X 2 m PILE POSTS 4 PER 8 m OF HEADER LOG. WIDTH VARIES USE MULTIPLE LOGS AS NECESSARY 7 - 10 m LOGS. OFFSET HEADER AND FOOTER LOGS AS NECESSARY.



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.

MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADS

S&S
SPECIALTY SERVICES

DESIGNED BY: [blank]
CHECKED BY: [blank]
DATE: [blank]
SCALE: [blank]

Appendix E

Mitigation Crediting Systems

MDT Wetland Mitigation Monitoring
Bouchard Property, Mud Creek, and Peterson Property
Lake County, Montana



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:

$$A_{created} = \text{Created wetland acres} \quad (1)$$

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 $\left(\frac{1}{\text{enhancement factor}}\right)$ 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:

$$A_{\text{credited}} = A_{\text{created}} + A_{\text{existing}} \left(\frac{F_{\text{post}} - F_{\text{pre}}}{F_{\text{pre}}} \right) \quad (4)$$

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.

$$A_{credited} = A_{created} + A_{existing} \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) = 8 + 20(0.28) = 13.65 \text{ total acres of credit}$$

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:

$$A_{existing} \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) = 1.3(0.76) = 0.98 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Ludwig stream channel site.

$$A_{credited} = A_{created} + A_{existing} \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) = 3.9 + 1.3(0.76) = 4.9 \text{ total acres of credit}$$

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):

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) = \left(\frac{6.7 - 4.3}{4.3} \right) = 0.56$$

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:

$$A_{existing} \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) = 0.35(0.56) = 0.20 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Ludwig stock pond site.

$$A_{credited} = A_{created} + A_{existing} \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) = 1.45 + 0.35(0.56) = 1.64 \text{ total acres of credit}$$

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			
	<i>Preservation</i>	<i>Restoration</i>	<i>Enhancement</i>	<i>Creation</i>
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.

$$\text{Required mitigation acres} = P(3 I_{sf} + 2 I_{oe}) + R(2.5 I_{sf} + 1.5 I_{oe}) + E(4 I_{sf} + 3 I_{oe}) + C(4 I_{sf} + 3 I_{oe})$$

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.

$$.3 (3*18 + 2*32) + .5(2.5*18+1.5*32) + .1(3*18 + 4*32) + .1(3*18 + 4*32) = 104.2 \text{ required acres}$$

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.

$$.1 (3*18 + 2*32) + .9(2.5*18+1.5*32) + 0(3*18 + 4*32) + 0(3*18 + 4*32) = 96.0 \text{ required acres}$$

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.