MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2013

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

Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

CONFLUENCE

PO Box 1133
Bozeman, MT 59771-1133

December 2013

MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

WETLAND MITIGATION MONITORING REPORT:

YEAR 2013

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)

Prepared for:

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

Prepared by:

Confluence Consulting, Inc.
P.O. Box 1133
Bozeman, MT 59771

December 2013

CCI Project No: MDT.006

TABLE OF CONTENTS

TABLES

CHARTS

FIGURES

APPENDICES

Cover: Wetland and wildlife friendly road crossing under US 93 North at the Mud Creek Wetland Mitigation site.

1. INTRODUCTION

The 2013 US 93 wetland monitoring report documents the sixth year of monitoring at the Bouchard Property, the fifth year of monitoring at the Peterson property, and the fourth year of monitoring at the Mud Creek site. These sites were not monitored in 2012. The US Highway 93 Wetland Mitigation Sites were developed in cooperation with the permitting and natural resources staff from the Confederated Salish and Kootenai Tribes of the Flathead Nation (CSKT) to mitigate wetland impacts associated with eight segments of the US 93 Evaro to Polson highway reconstruction project by the Montana Department of Transportation (MDT). The 2009 US 93 Wetland Mitigation Monitoring Report included monitoring results for the Jocko Spring Creek and Mission Creek mitigation sites. These sites were excluded from US 93 monitoring activities in 2010 after MDT received acknowledgement from the US Army Corps of Engineers (USACE) and the CSKT Shoreline Protection Program that the sites had met the 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 located east of mileposts 20, south of Ravalli, along a segment identified as Project 4, White Coyote Road (Figure 1). The Peterson site is located north of St. Ignatius near milepost 35, along the segment identified as Project 6 (Figure 2). 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 3). Figures 4 through 9 (Appendix A) show the monitoring activity locations and mapped site features for each site. Appendix B contains the MDT Wetland Mitigation Site Monitoring Forms, the USACE Routine Wetland Determination Data Forms (Environmental Laboratory 1987), and the 2008 MDT Montana Wetland Assessment Forms for each site. Appendix C contains photographs of the project area 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. 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. 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 were 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 paragraphs.

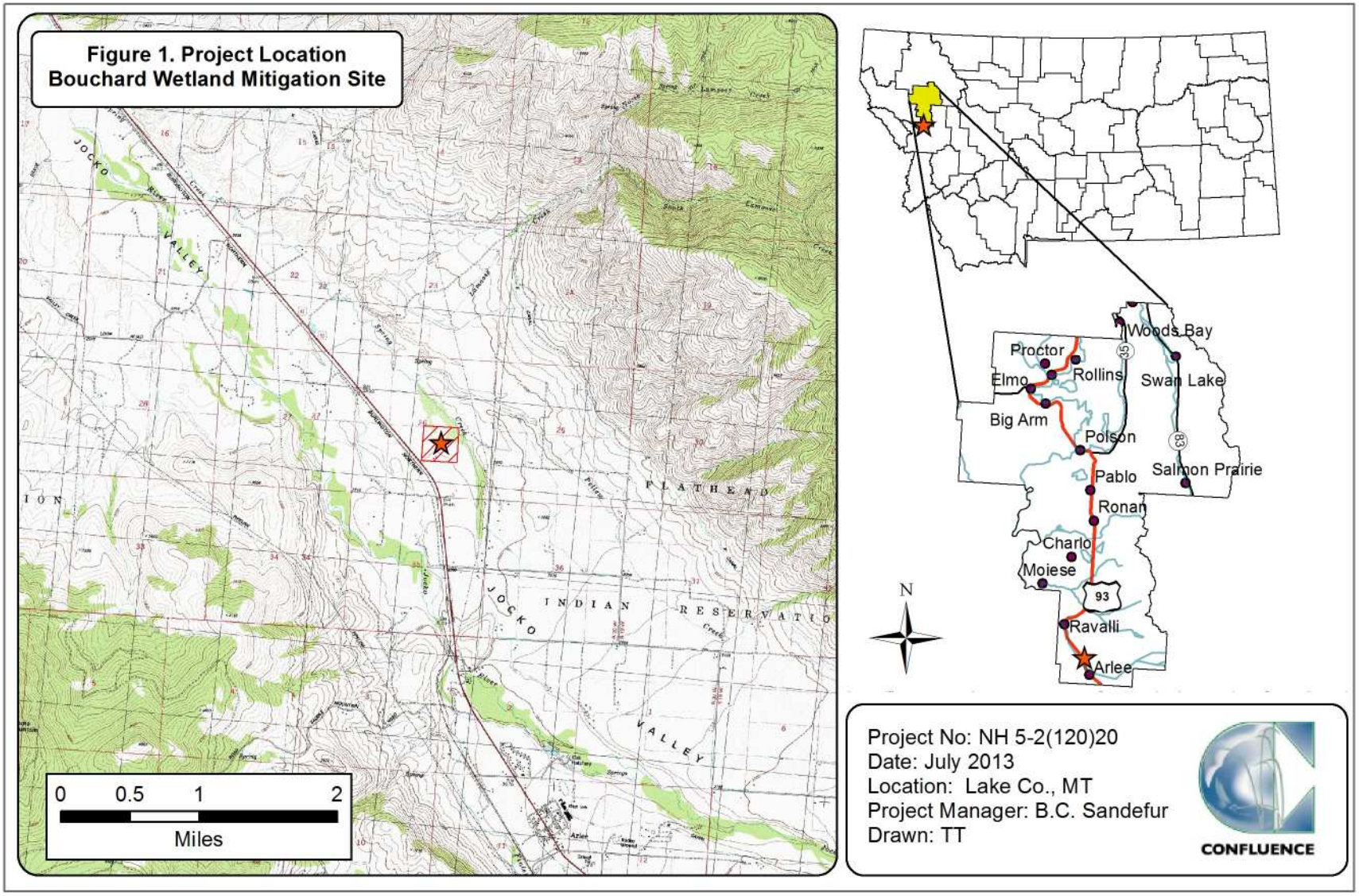


Figure 1. Project location of Bouchard Wetland Mitigation Site.

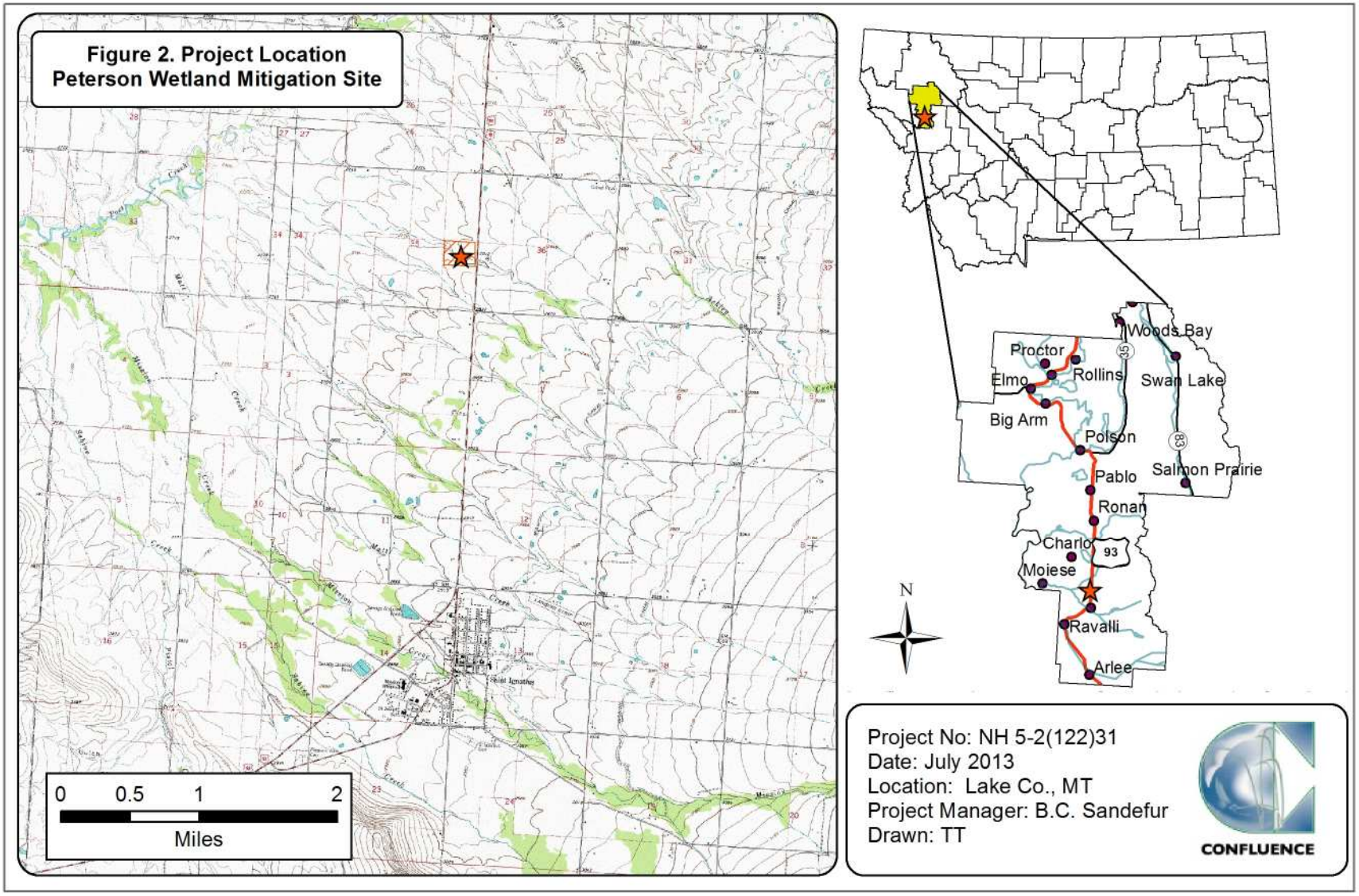


Figure 2. Project location of Peterson Wetland Mitigation Site.

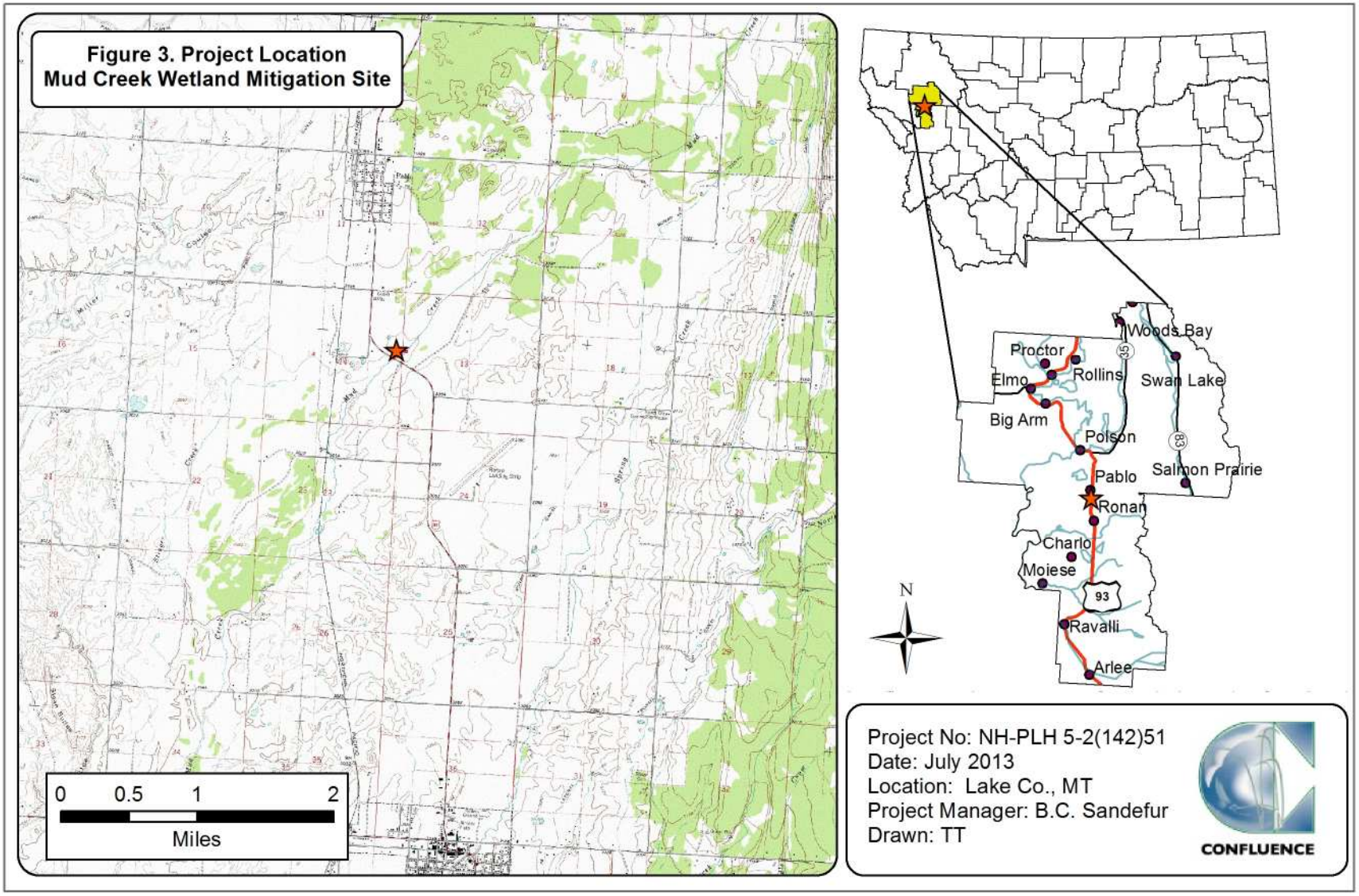


Figure 3. Project location of Mud Creek Wetland Mitigation Site.

The CSKT regulated wetlands were to mitigate for 20.70 acres of impacts and the USACE regulated wetlands were to mitigate for 18.32 acres of impacts. Table 1 shows the acreage of wetlands impacted within the three project segments. Table 2 lists each project segment, wetland mitigation site, mitigation type, and expected CSKT and USACE wetland mitigation credits. The expected credits are discussed in more detail in the Current Credit Summary sections 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 based on the success acknowledge by the USACE and CSKT Shoreline Protection Program.

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 White 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	5.74	5.74
TOTAL	**20.70**	**18.32**

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

Project	Wetland Mitigation Site	Expected CSKT Wetland Mitigation Credits[1,2,3]		Expected USACE 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 93) Red Horn Road	Mission	Primary Restoration	0.22	Re-establishment	0.15
		Project Total	**0.22**	**Project Total**	**0.15**
	Peterson	Creation	0.64	Creation	2.14
		Secondary Restoration	0.67	Rehabilitation	0.25
		Project Total	**1.31**	**Project Total**	**2.39**
Project 7 Spring Creek Road to Minesinger Trail	Mud Creek	Creation	0.49	Creation	1.63
		Secondary Restoration	0.28	Rehabilitation	0.15
		Project Total	**0.77'[4]**	**Project Total**	**1.78'[4]**

[1]Onsite Wetland Mitigation Plan, US 93 Evaro to Polson.
[2]Personal communication with MDT.
[3]Corrected from values presented in the 2007 US 93 mitigation monitoring report; revised figures are based on the site plan.
[4]Erroneous values for the Mud Creek site in pre-2013 monitoring reports have been corrected in this report based on surveyed acreages.

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

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

The USACE crediting approach for the US 93 Onsite project is based on a crediting system developed by Herrera Environmental Consultants and approved by the USACE. 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 project originally included five wetland mitigation sites located on the Flathead Indian Reservation and managed by the CSKT. The Jocko Spring Creek and Mission Creek sites were excluded from further monitoring as these sites had achieved mitigation goals and objectives. Accordingly, the Corps and CSKT agreed to release these sites from further monitoring. 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 an approximately 40 acre parcel located adjacent to US 93 at approximately Milepost 20 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 flows along the east side of the parcel boundary, providing a source of surface water to the Bouchard property. Groundwater is the primary hydrology source at this mitigation site. 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 the 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 Gray willow (*Salix bebbiana*), bog birch (*Betula glandulosa),* and Northwest Territory sedge (*Carex utriculata*) communities with a less dominant layer of a quaking aspen (*Populus tremuloides*) and red osier dogwood (*Cornus alba*). Site construction was completed in summer 2006 and the revegetation was completed from August through October 2006.

1.2.2. Mud Creek

The 2.61 acre Mud Creek mitigation site is located south of Pablo in Segment 7 of the overall US 93 project. The site is situated near Milepost 50 in Section 13, Township 21 North, and Range 20 West. The mitigation site encompasses Mud Creek and adjacent wetlands dominated by emergent vegetation and remnant stands of hawthorn (*Crataegus*) shrubs. Site hydrology is provided by Mud Creek that flows under the newly constructed wildlife underpasses at 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 and non-desirable weedy species such as pale-yellow iris and reed canary grass;
- 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 recharge of adjacent wetlands; and
- Grading and revegetating the abandoned portion of Mud Creek located within the proposed US Highway 93 median.

The proposed wetland community for this site is anticipated to be a palustrine forested and scrub-shrub system dominated by black cottonwood (*Populus balsamifera*), thin-leaf alder (*Alnus incana*), and Gray willow with an understory of

emergent wetland habitat. Initial construction of the new channel and floodplain was completed in summer 2007 and included the installation of soil lifts along the channel in the form of pre-vegetated coir mats. Revegetation was completed in summer 2008.

1.2.3. Peterson

The 25 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 southwest of Milepost 36 in Section 2 of Township 16 North and Range 20 West. The Peterson site consists of a riparian/wetland corridor associated with an unnamed perennial tributary to Post Creek and is dominated by herbaceous and woody 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:

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

Created wetlands within the project corridor were 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 July 30 and August 7, 2013, Peterson was monitored on August 15, 2013, and Mud Creek was monitored on August 17, 2013. Information contained on the Mitigation Monitoring Forms 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 a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird and wildlife use documentation, photographic documentation, functional assessments, planted woody species monitoring, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

The presence of hydrological indicators as outlined on the Wetland Data Forms was assessed at six data points within Bouchard, three data points within Mud Creek, and four data points within Peterson. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Data Forms (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation and saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season" (USACE 2010). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is defined for purposes of this report as the number of days when there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit (Environmental Laboratory 1987). Temperature data recorded for the meteorological station at Saint Ignatius weather station, Montana (247286) has a median (5 years in 10) growing season length of 120 days. Areas defined as wetlands would require 15 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded on the Wetland Determination Form (Appendix B).

No groundwater monitoring wells were present at these 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 GPS-surveyed and an estimate of the average water depth at the emergent/open water 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 the 2013 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 percent), 2 (6 to 10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Appendix A).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects (Figures 4, 6, and 8, Appendix A). Vegetation composition was assessed and recorded along vegetation belt transects established at Bouchard, Mud Creek, and Peterson sites. The transects are intended to

capture vegetative changes at each of the remaining sites. Transects are 10 feet wide and vary in length at each site. The transect endpoints were recorded with a resource grade GPS unit.

Spatial changes in the dominant vegetation communities were documented along the stationed transect. The percent cover of each vegetation species within transects was estimated using the same values and cover ranges listed for the vegetation community data (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 woody species planted was recorded during the monitoring event.

The Montana State Noxious Weed List (September 2010), prepared by the Montana Department of Agriculture, was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field during the investigation and mapped on the 2013 aerial photos (Figures 5, 7, and 9, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**x**", "▲", 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, 6 to 25 percent, and 26 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 and the 2010 Regional Supplement. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Determination 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. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 1987 Wetland Manual must be satisfied to delineate a representative area as a wetland. The name and indicator status of plant species was derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). Previous years' reports used the 1988 National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The 2012 NWPL scientific plant names were used in this report. 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 the Wetland Determination Data Form (Appendix B).

Consultation with the USACE 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 classified as an atypical situation, potential problem area, or special aquatic site, i.e., mudflat. The wetland boundary was GPS surveyed and identified on the 2013 aerial photograph. Wetland areas were calculated using geographic information (GIS) methods.

2.5. Wildlife

Observations of use of mammal, reptile, amphibian, and bird species were recorded on the Mitigation 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 has been compiled in each report.

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. Wetland Assessment Forms were completed for three separate assessment areas (AA), with one AA located at each mitigation site (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland and upland conditions, site trends, current land uses surrounding the site, and the status of the vegetation transects. Photographs were taken at established photo points throughout the mitigation site during the site visit (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 Trimble Geo Explorer GPS (Global Positioning System) unit during the 2013 monitoring season. Points were collected using WAAS-enabled differential correction 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. Site features and survey points that were mapped included fence boundaries, photographic points, transect endpoints, wetland 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 average total annual precipitation recorded at the Missoula 2NE weather station, Montana (245735) from October 1966 to December 2012 was 17.10 inches (WRCC 2013). Total precipitation from January to August recorded at this station was 12.03 inches (long-term average), 13.01 inches (2010), 13.63 inches (2011), 11.1 inches (2012), and 6.3 inches (2013). The cumulative precipitation through August was above-average in 2010 and 2011 with below-average precipitation recorded in 2012 and 2013.

The main source of hydrology at the Bouchard site is seasonal inundation from a high groundwater table associated with perennial flows in Jocko Spring Creek. Irrigation flows previously entered the site through a series of ditches and berms. Mitigation objectives included filling the ditches and removing the berms and other water-control features. A secondary source of hydrology is groundwater influenced by local irrigators up gradient from the site. In addition, the Jocko River contributes to hydrology with recharge to groundwater system.

Approximately 70 percent of the entire Bouchard site was inundated in 2013. The constructed shallow depression exhibited an average depth of 0.5 feet with a maximum depth of about 1 foot within the excavated depressions. The range of surface water depths across the site was 0.5 to 4.0 feet, with the deepest surface water identified within the existing depressions. The depth of water at the emergent vegetation and open water boundary was approximately 1.0 foot. Wetland areas that were not inundated were generally saturated within 12 inches of the ground surface (see discussion below).

Six data points, B-1u to B-3u, and B-1w to B-3w, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points B-1w, B-2w, and B-3w were located within areas that met the wetland criteria. Positive hydrology indicators of wetland hydrology at B-1w were saturation and water table present at 6 inches below the ground surface (bgs) and passed the FAC-Neutral test. Sample plot B-2w was saturated at 12 inches bgs with a positive FAC-Neutral test. Test pit B-3w exhibited 2 inches of surface water, inundation and soil saturation to the surface, and passed the FAC-Neutral test. Data points B-1u, B-2u, and B-3u did not exhibit any positive indicators of wetland hydrology.

3.1.2. Vegetation

Six new plant species were identified during the 2013 monitoring season. A comprehensive list of 97 vegetation species identified from 2007 to 2013 is shown in Table 4. A majority of the species are herbaceous although the site contains small stands of black cottonwood and quaking aspen. Two upland and eight wetland communities were identified and mapped within the project boundaries (Figure 5, Appendix A). The ten community types were upland Type 1 – *Elymus repens*/*Agrostis stolonifera*, wetland Type 2 – *Deschampsia cespitosa/Juncus* spp., wetland Type 3 – *Juncus* spp./*Eleocharis palustris,* wetland Type 4 – *Juncus arcticus/Cirsium arvense*, wetland Type 5 – *Carex* spp., wetland Type 6 – *Betula occidentalis/Juncus arcticus*, wetland Type 8 – *Populus* spp., wetland Type 10 – Aquatic Macrophytes, upland Type 11 – *Cirsium arvense/Elymus repens*, and wetland Type 12 – *Alnus incana*/*Carex* spp. The species composition for each community is discussed below and included on the Monitoring Form (Appendix B).

Upland Community Type 1 was found along higher grounds within the site. This community type was mapped across 5.61 acres and was generally distributed along the southern and western site boundaries, a couple isolated islands, and along the north central boundary. Creeping wild rye (*Elymus repens*) and spreading bentgrass (*Agrostis stolonifera*) were the dominant species in this community. Twenty-one species were identified in this community in 2013 and generally consisted of common pasture grasses with patches of noxious weeds including Canadian thistle (*Cirsium arvense*), gypsy-flower (houndstongue-*Cynoglossum officinale*), and spotted knapweed (*Centaurea maculosa*).

Table 4. Vegetation species identified from 2007 to 2011 and 2013 for the Bouchard Property Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Achillea millefolium	Common Yarrow	FACU
Agrostis gigantea	Black Bent	FAC
Agrostis stolonifera	Spreading Bent	FAC
Algae, brown	Algae, brown	NL
Algae, green	Algae, green	NL
Alnus incana	Speckled Alder	FACW
Alopecurus pratensis	Field Meadow-Foxtail	FAC
Alyssum alyssoides	Pale Madwort	UPL
Angelica arguta	Lyall's Angelica	FACW
Anthemis cotula	Stinking Chamomile	FACU
Argentina anserina	Common Silverweed	OBL
Artemisia ludoviciana	White Sagebrush	FACU
Aster sp.		
Bassia scoparia	Mexican-Fireweed	FAC
Betula occidentalis	Water Birch	FACW
Bromus carinatus	California Brome	UPL
Bromus inermis	Smooth Brome	FAC
Bromus tectorum	Cheatgrass	UPL
Calamagrostis canadensis	Bluejoint	FACW
Campanula rotundifolia	Bluebell-of-Scotland	FACU
Carduus nutans	Nodding Plumeless Thistle	UPL
Carex pellita	Woolly Sedge	OBL
Carex lasiocarpa	**Woolly-Fruit Sedge**	**OBL**
Carex nebrascensis	Nebraska Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex retrorsa	Retrorse Sedge	OBL
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Carex vesicaria	Lesser Bladder Sedge	OBL
Centaurea maculosa	Spotted knapweed	UPL
Chara spp.	Muskgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canadian Thistle	FAC
Cirsium vulgare	Bull Thistle	FACU
Cornus alba	Red Osier	FACW
Crataegus douglasii	Black Hawthorn	FAC
Cynoglossum officinale	Gypsy-Flower	FACU

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Table 4 (Continued). Vegetation species identified from 2007 to 2011 and 2013 for the Bouchard Property Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Dasiphora fruticosa	Golden-Hardhack	FAC
Deschampsia caespitosa	Tufted Hairgrass	FACW
Dipsacus fullonum	Fuller's Teasel	FAC
Dodecatheon spp.	Shootingstar	NL
Eleocharis palustris	Common Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Epilobium spp.	Willowherb	NL
Equisetum arvense	Field Horsetail	FAC
Equisetum hyemale	**Tall Scouring-Rush**	**FACW**
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Hordeum jubatum	Fox-Tail Barley	FAC
Hypericum perforatum	Common St. John's-Wort	FACU
Juncus acuminatus	**Knotty-Leaf Rush**	**OBL**
Juncus arcticus	Arctic Rush	FACW
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus mertensianus	Mertens' Rush	OBL
Juncus spp.	Rush	NL
Juncus tenuis	Lesser Poverty Rush	FAC
Lactuca serriola	Prickly Lettuce	FACU
Lemna minor	Common Duckweed	OBL
Lepidium campestre	Field Pepperweed	UPL
Lepidium perfoliatum	**Clasping Pepperwort**	**FACU**
Leucanthemum vulgare	Ox-Eye Daisy	FACU
Lycopus americanus	**Cut-Leaf Water-Horehound**	**OBL**
Medicago sativa	Alfalfa	UPL
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Nepeta cataria	Catnip	FACU
Persicaria amphibium	Water Smartweed	OBL
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Plantago major	Great Plantain	FAC
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Table 4. (Continued). Vegetation species identified from 2007 to 2011 and 2013 for the Bouchard Property Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Populus balsamifera	Balsam Poplar	FAC
Populus tremuloides	Quaking Aspen	FACU
Ranunculus spp.	Buttercup	NL
Ribes hudsonianum	**Northern Black Currant**	**FACW**
Rosa woodsii	Woods' Rose	FACU
Rubus idaeus	Common Red Raspberry	FACU
Rumex crispus	Curly Dock	FAC
Salix bebbiana	Gray Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Salix geyerana	Geyer Willow	FACW
Salix lutea	Yellow Willow	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Silene latifolia	Bladder Campion	NL
Sinapis arvensis	Charlock Mustard	UPL
Solanum dulcamara	Climbing Nightshade	FAC
Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FACU
Symphoricarpos albus	Common Snowberry	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Verbascum thapsus	Great Mullein	FACU
Vicia spp.		

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Wetland Type 2 – *Deschampsia cespitosa/Juncus* spp. was identified in a constructed wetland in southwest portion of the site where inundation was consistent. The species were predominantly emergent, although some planted shrubs were present and surviving. The community was dominated by tufted hairgrass (*Deschampsia cespitosa),* three-stamen rush (*Juncus ensifolius*), Arctic rush (*Juncus* arcticus), lesser poverty rush (*Juncus tenuis*), bluejoint grass (*Calamagrostis canadensis*), field meadow-foxtail (*Alopecurus pratensis*), woolly-fruit sedge (*Carex lasiocarpa*), and Northwest Territory sedge (*Carex utriculata*). This wetland community has expanded to the south since the previous 2011 monitoring event.

Wetland Type 3 – *Juncus* spp*./Eleocharis palustris* was located within a constructed, saturated wetland located in the southwest quadrant of the site. Arctic rush, lesser poverty rush, dagger-leaf rush, creeping spikerush (*Eleocharis palustris*), and Nebraska sedge (*Carex nebrascensis*) dominated the community. Red-osier dogwood was planted within the community boundaries.

Wetland Type 4 – *Juncus arcticus/Cirsium arvense* was located in nine wetland areas throughout the site. The cover was dominated by Arctic rush, Canadian thistle, Kentucky bluegrass, and creeping wild rye. This community was associated with existing wetlands that commonly contained infestations of Canadian thistle.

Wetland Type 5 – *Carex* spp. was identified in a rehabilitated wetland located in the north, west, and southeast portions of the site. The community 5 polygon located in the southeast quarter of the site was named Type 9 – *Typha latifolia* from 2008 to 2010. It was renamed Type 5 – *Carex* spp. in 2011 based on the low percent cover of broad-leaf cat-tail (*Typha latifolia*) and high percent cover of six *Carex* spp. This community occupies approximately 9.66 acres of the mitigation area. The emergent vegetation included six species of sedges and four species of rush. Developing shrubs within this community included gray willow (*Salix bebbiana*), black hawthorn (*Crataegus douglasii*), water birch (*Betula occidentalis*), golden-hardhack (*Dasiphora fruticosa*), and northern black currant (*Ribes hudsonuanum*).

Wetland Type 6 – *Betula occidentalis/Juncus arcticus* characterized an existing wetland targeted for rehabilitation and dominated by scrub-shrub and emergent vegetation types. The woody overstory is visible on Figure 5 (Appendix B). The community was dominated by water birch, Arctic rush, Northwest Territory sedge, lesser bladder sedge (*Carex vesicaria*) and golden-hardhack. This community was mapped across 14.19 acres of the site.

Wetland Type 8 – *Populus* spp., found on approximately 1.09 acres of existing wooded areas across the site, was dominated by black cottonwood and quaking aspen. The understory consisted of Nebraska sedge and Northwest Territory sedge. These areas are expanding gradually and support regeneration of cottonwoods within the understory.

Wetland Type 10 – Aquatic Macrophytes was identified in small inundated depressions throughout the site. The community was dominated by open water with thick brown and/or green algae mats and lower levels of lesser duckweed (*Lemna minor*) and broad-leaf cat-tail (*Typha latifolia*). This community type covered approximately 0.36 acres of the site.

Upland Type 11 – *Cirsium arvense/Elymus repens* was identified across 0.37 acres in two upland inclusions located near the north central and south central project boundaries. The community was dominated by Canadian thistle and creeping wild rye, with less percent cover of Kentucky bluegrass (*Poa pratensis*), Arctic rush, spreading bentgrass (*Agrostis stolonifera*), and Canadian goldenrod (*Solidago canadensis*). Eight other species were identified in this community at trace amounts (less than one percent).

Wetland Type 12 – *Alnus incana*/*Carex* spp. was identified on 0.92 acres in the northwest corner and was dominated by speckled alder (*Alnus incana*), Northwest Territory sedge, lesser bladder sedge, woolly-fruit sedge, fowl manna grass (*Glyceria striata*), water birch, and broad-leaf cat-tail.

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-11 in Appendix C.

The 2013 community types identified on the 526-foot Transect 1 included wetland community Type 2, upland Type 1, wetland Type 3, and wetland Type 5. Approximately 95.6 percent of this transect was dominated by hydrophytic vegetation communities, a considerable increase from 2011. Wetlands along the southern boundary expanded increasing overall wetland area along the transect. A total of thirty-three vegetative species were identified along this transect in 2013 and represent a continued increase of diversity in hydrophytic species.

Table 5. Bouchard Transect 1 data summary from 2008 to 2011 and 2013.

Monitoring Year	2008	2009	2010	2011	2013
Transect Length (feet)	526	526	526	526	526
Vegetation Community Transitions along Transect	5	5	3	3	4
Vegetation Communities along Transect	4	4	4	4	4
Hydrophytic Vegetation Communities along Transect	3	3	3	3	3
Total Vegetative Species	28	28	29	31	33
Total Hydrophytic Species	19	18	22	23	31
Total Upland Species	9	10	7	8	2
Estimated % Total Vegetative Cover	95	96	96	96	96
% Transect Length Comprising Hydrophytic Vegetation Communities	77	77	76.8	80.6	95.6
% Transect Length Comprising Upland Vegetation Communities	33	33	23.2	19.4	4.4
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

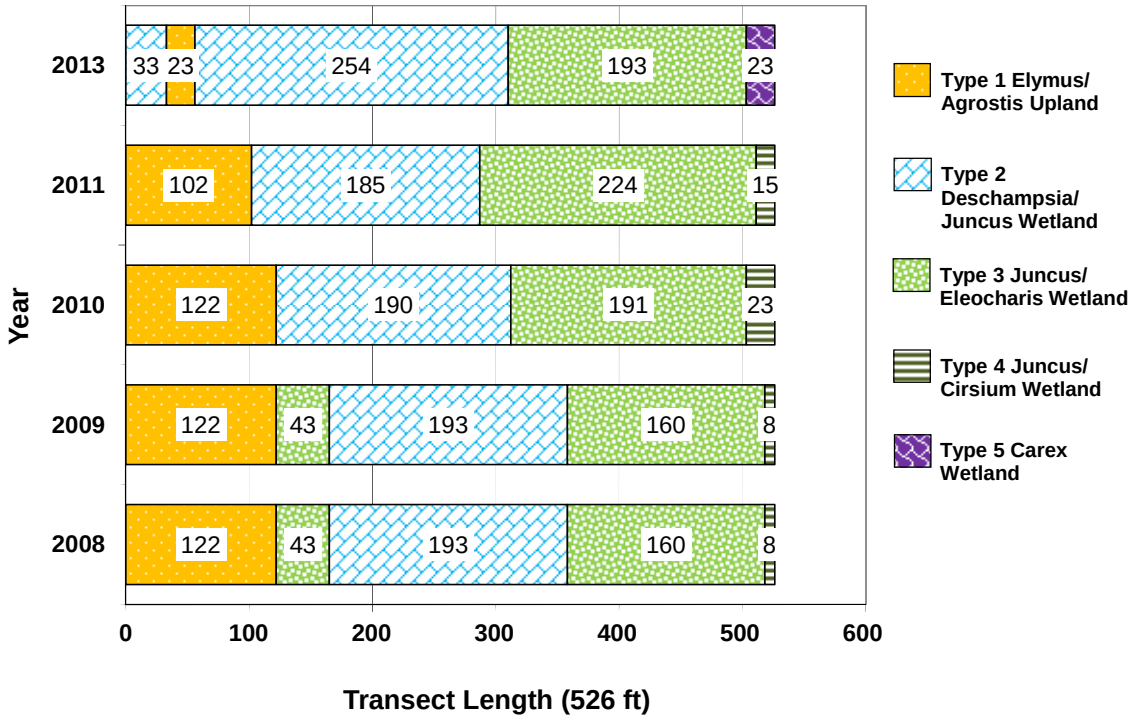


Chart 1. Bouchard Transect 1 maps showing vegetation types from transect start (0 feet) to finish (526 feet) from 2008 to 2011 and 2013.

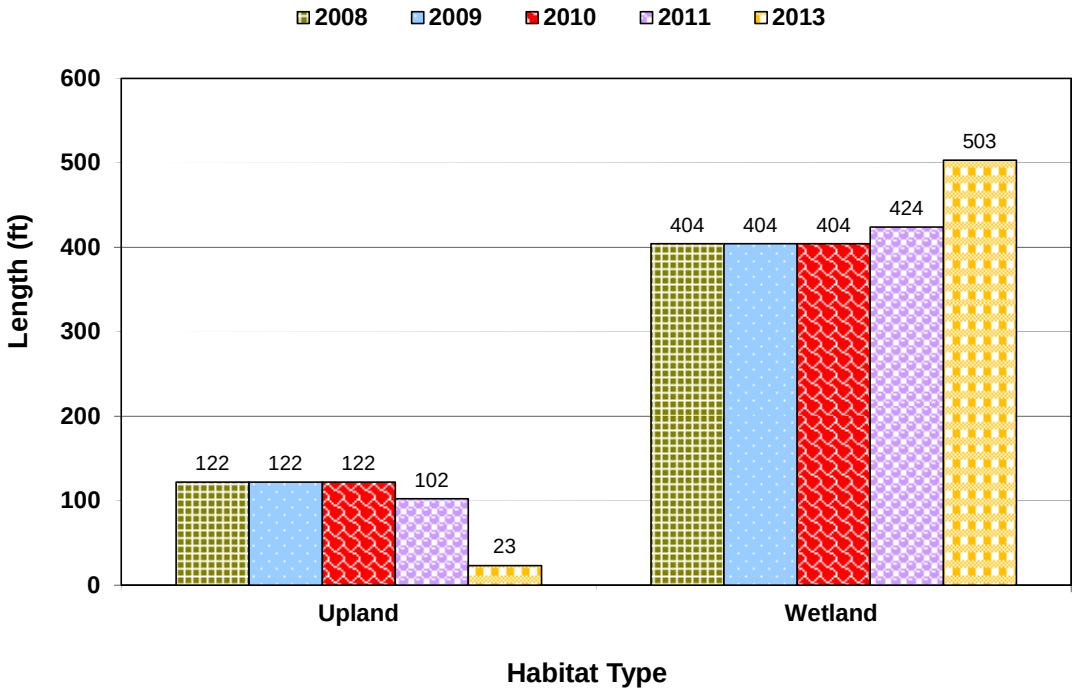


Chart 2. Length of vegetation habitats within Bouchard Transect 1 from 2008 to 2011 and 2013.

Community types and transect lengths identified on Transect 2 were the same from 2008 to 2010. In 2011, wetland Types 5 *Carex* spp. and 6 *Betula/Juncus* dominated the transect intervals. The 2010 wetland Type 9 *Typha* transitioned to wetland Type 5 *Carex* spp. in 2011. The community Type 6 – *Betula/Juncus* expanded between 2010 and 2011 and has remained relatively consistent between 2011 and 2013. Hydrophytic vegetation communities covered 100 percent of the transect intervals and included a total of fourteen vegetative species.

Table 6. Bouchard Transect 2 data summary from 2008 to 2011 and 2013.

Monitoring Year	2008	2009	2010	2011	2013
Transect Length (feet)	313	313	313	313	313
Vegetation Community Transitions along Transect	2	2	1	1	1
Vegetation Communities along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities along Transect	2	2	2	2	2
Total Vegetative Species	16	18	22	22	14
Total Hydrophytic Species	13	15	17	17	11
Total Upland Species	3	3	5	5	3
Estimated % Total Vegetative Cover	98	98	98	100	100
% Transect Length Comprising Hydrophytic Vegetation Communities	100	100	100	100	100
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

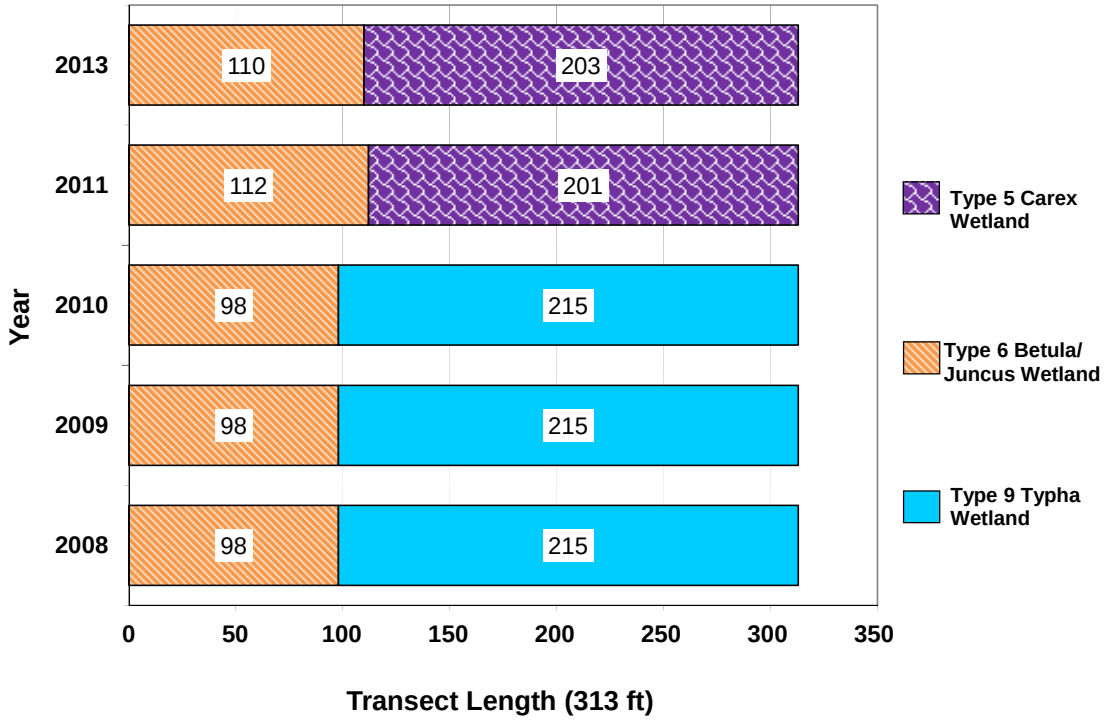


Chart 3. Bouchard Transect 2 maps showing vegetation types from transect start (0 feet) to finish (313 feet) from 2008 to 2011 and 2013.

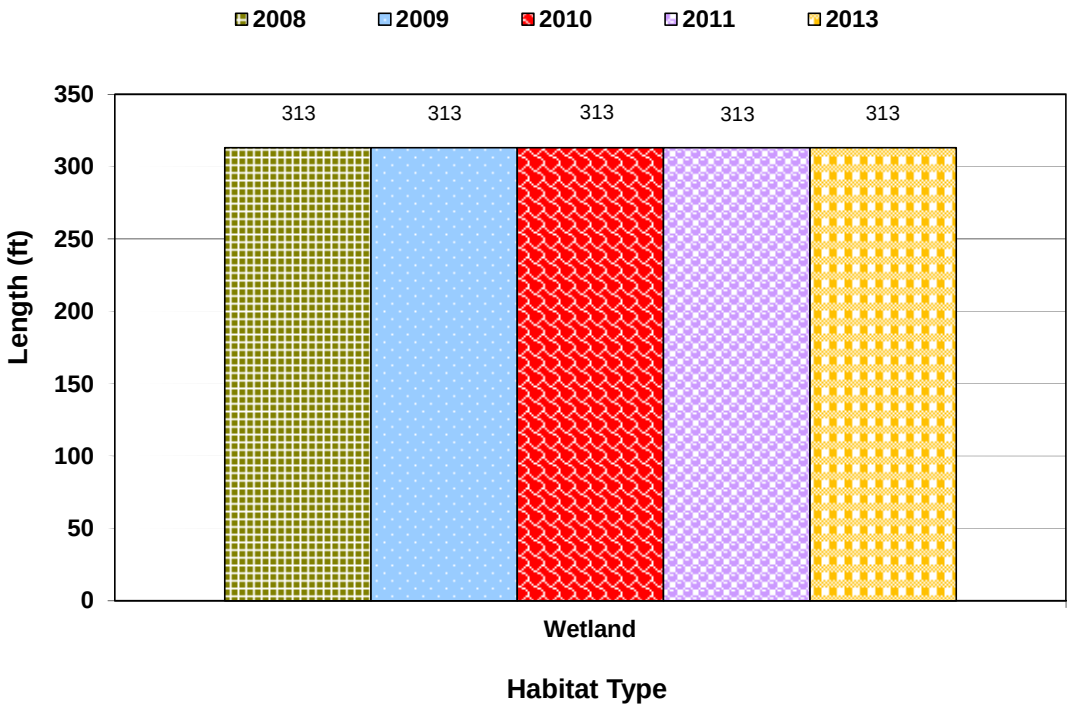


Chart 4. Length of vegetation habitats within Bouchard Transect 2 from 2008 to 2011 and 2013.

Transect 3 was established to monitor the anticipated transition from cleared pasture to scrub/shrub wetland in an area located near the north boundary between pre-existing wetlands. The transect starts adjacent to a shallow pond and is located towards the north across a berm and then into pre-existing upland areas. The beginning of the transect captures wetland species along the fringe of the pond. These wetland species quickly transition into uplands along the berm itself, which is dominated by mostly noxious weed species and aggressive non-desirables species. A majority of the transect was dominated by upland Type 11 *Cirsium/Elymus* in 2011 and 2013. This represented a shift in dominant species from upland Type 1 *Elymus/Agrostis* identified from 2008 to 2010 to Canadian thistle and wild rye in 2011. Upland vegetation communities dominated 89.5 percent of the transect intervals.

Table 7. Bouchard Transect 3 data summary from 2008 to 2011 and 2013.

Monitoring Year	2008	2009	2010	2011	2013
Transect Length (feet)	133	133	133	133	133
Vegetation Community Transitions along Transect	2	2	1	1	1
Vegetation Communities along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1	1	1
Total Vegetative Species	13	13	14	9	9
Total Hydrophytic Species	3	4	5	3	5
Total Upland Species	10	9	9	6	4
Estimated % Total Vegetative Cover	80	95	95	90	90
% Transect Length Comprising Hydrophytic Vegetation Communities	7	7	7	10.5	10.5
% Transect Length Comprising Upland Vegetation Communities	93	93	93	89.5	89.5
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

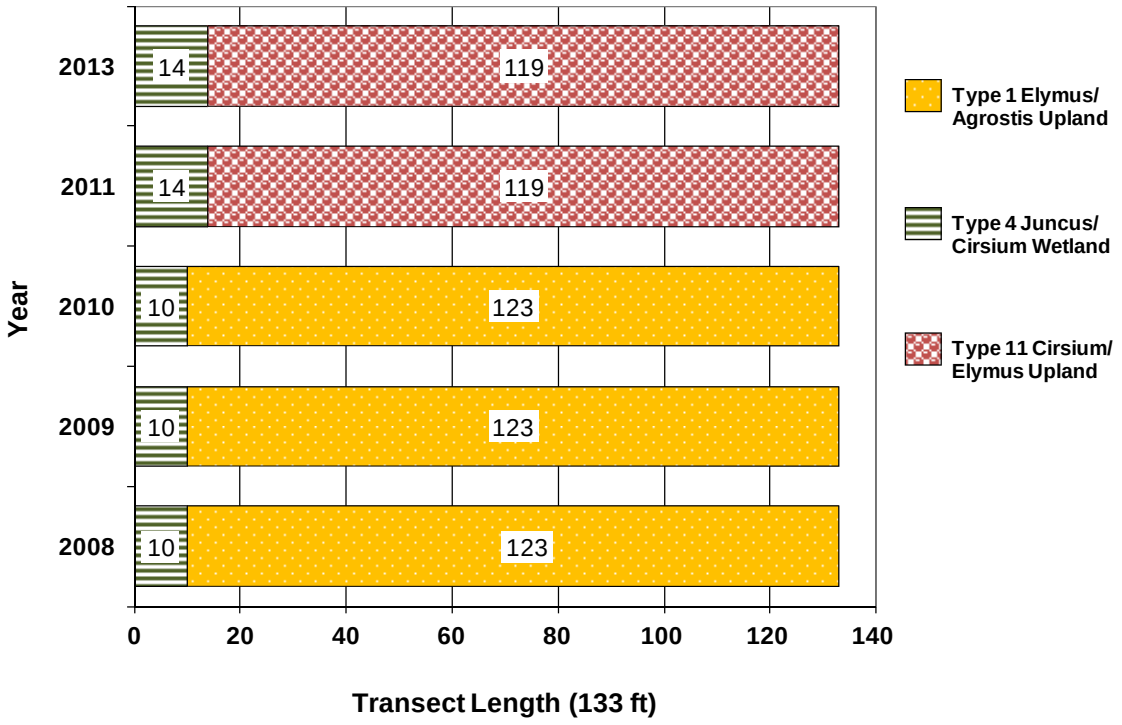


Chart 5. Bouchard Transect 3 maps showing vegetation types from transect start (0 feet) to finish (133 feet) from 2008 to 2011 and 2013.

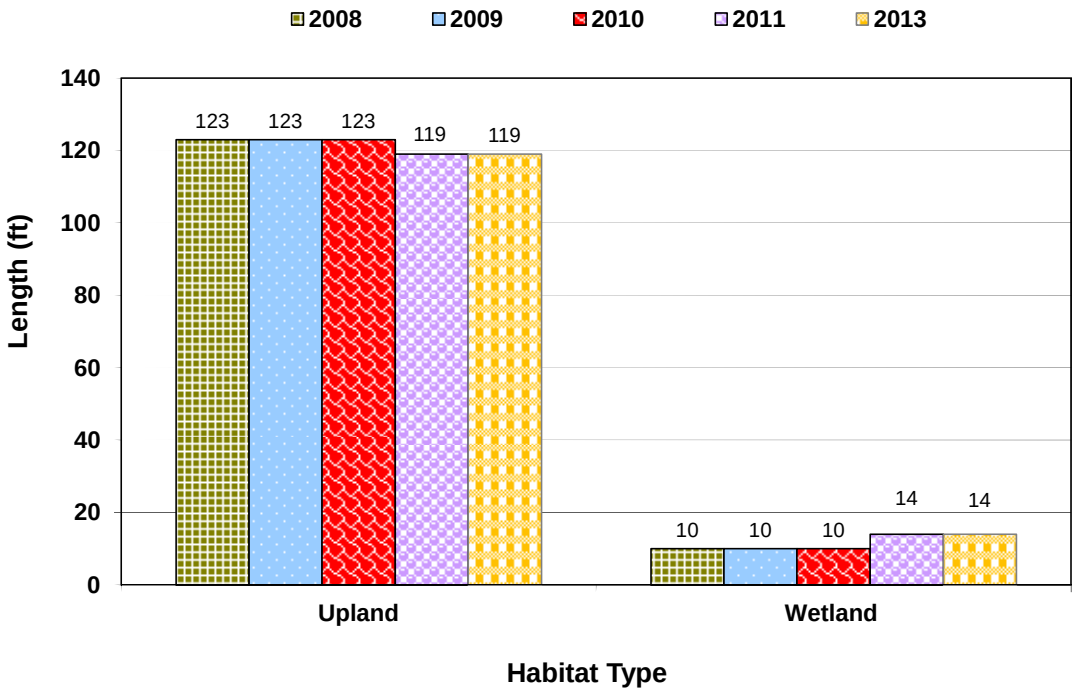


Chart 6. Length of vegetation habitats within Bouchard Transect 3 from 2008 to 2011 and 2013.

Infestations of Priority 2B noxious weeds, including Canadian thistle, spotted knapweed, common St. John's wort (*Hypericum perforatum*), gypsy-flower (houndstongue), and oxeye daisy (*Leucanthemum vulgare*) were mapped on Figure 5 (Appendix A). Canadian thistle was identified across the site, particularly in community Types 1, 4, 5, and 11. The size of the Canadian thistle infestations ranged from less than 0.1 acre to 5.0 acres with a trace (<1 percent) to high (25 to 100 percent) cover class. One spotted knapweed infestation ranged from 0.1 to 1.0 acre in size with a moderate (6 to 25 percent) cover. Houndstongue, St. John's wort, and oxeye daisy infestations inhabited less than 0.1 acre with a trace (<1) to low (1 to 5 percent) cover. The MDT sprayed the weed colonies within the site annually from 2010 to 2013. It is suggested that weed control continue in 2014.

Native containerized shrubs and herbaceous plugs were planted in spring 2006. 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. 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.

Shrub planting survival data were collected along ten, 240-foot long, 6.6-foot (2.0 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 south project area boundary. Transects were assessed from south to north. Species survival evaluated in 2013 was based on visual estimates and counts for each live species. Forty-nine speckled alder, sixty-five spring birch, fifty-six red osier dogwood, five currant (*Ribes* sp.), two Wood's rose, nine gray (Bebb) willow, and thirty-three yellow willow plants were identified in 2013. Two hundred seventeen plants were observed in 2013. Plant growth was good to excellent and the plant condition was vigorous and healthy. The majority of browse protectors were intact and functioning properly. The protectors have been in place for five growing seasons and appear to be effective. Natural recruitment of woody species is providing supplement shrub/tree regeneration within this site.

3.1.3. Soil

Soils were mapped in the *Lake County Soil Survey* as Lamoose loam, Borohemists, and Colake loam. The three map units are included on the Montana Hydric Soil list (USDA 2010). Borohemist 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. The map units are taxonomically classified as Typic Endoaquolls or Typic Calciaquolls.

Test pits B-1u to B-3u and B-1w to B-3w were located in areas that met the hydric soil criteria. Test pit B-1u was a black (10 YR 2/1) silt loam without redoximorphic features. Data point B-2u and B-3u were black (10 YR 2/1) clay loam soils, also lacking redox features. The profile at test pit B-1w revealed a very dark gray (10 YR 3/1) clay loam with dark yellowish brown (10 YR 4/4) redox concentrations in the matrix. The soil profile at data point B-2w exhibited a dark gray (10 YR 4/1) clay with dark yellowish brown (10 YR 4/4) redoximorphic concentrations in the soil matrix. The soil profile at test pit B-3w contained a black (10 YR 2/1) clay loam soil with dark yellowish brown (10 YR 4/6) redox concentrations. The six data points met the wetland criteria for hydric soil based on the presence of low chroma colors. The units mapped for the site were listed on the local hydric soil list and were generally confirmed by the test pit soils.

3.1.4. Wetland Delineation

Data points B-1u to B-3u and B-1w to B-3w were used to determine the wetland and upland boundaries in 2013 (Bouchard Figures 4 and 5, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Bouchard Wetland Data Forms (Appendix B). The total acreage of aquatic habitat at Bouchard was 35.14 acres in 2013 (Table 8). This represented an increase of 1.36 acres of wetland habitat since 2011 and an increase of 16.11 acres since 2004. Wetlands expanded along the southern edge between 2011 and 2013.

Table 8. Aquatic habitat acreages delineated at the Bouchard Wetland Mitigation Site for 2004 (Baseline), 2009 to 2011, and 2013.

Aquatic Habitat	2004	2009	2010	2011	2013
Wetland Area (acres)	19.03	28.14	30.19	33.78	35.14
Open Water (acres)	---	0.39	0.27	---	---
Total Aquatic Habitat (acres)	**19.03**	**28.53**	**30.46**	**33.78**	**35.14**

3.1.5. Wildlife

A list of wildlife species observed directly or indirectly from 2007 to 2013 is presented in Table 9 (Monitoring Form, Appendix B). Four bird species one plains gartersnake (*Thamnophis radix*), and tracks of an unidentified deer (*Odocoileus* sp.) were observed in 2013. There are no nesting structures currently installed at the site.

Table 9. Wildlife species observed at the Bouchard Wetland Mitigation Site from 2007 to 2011 and 2013.

COMMON NAME	SCIENTIFIC NAME
MAMMAL	
Coyote	*Canis latrans*
Deer sp.	***Odocoileus* sp.**
Meadow Vole	*Microtus pennsylvanicus*
Muskrat	*Ondatra zibethicus*
Raccoon	*Procyon lotor*
Red Fox	Vulpes vulpes
White-tailed Deer	*Odocoileus virginianus*
BIRD	
American Crow	*Corvus brachyrhynchos*
American Goldfinch	*Spinus tristus*
American Kestrel	*Falco sparverius*
American Robin	***Turdus migratorius***
Barn Swallow	*Hirundo rustica*
Black-billed Magpie	*Pica hudsonia*
Black-capped Chickadee	*Poecile atricapillus*
Bohemian Waxwing	*Bombycilla garrulus*
Brown-headed Cowbird	*Molothrus ater*
Cordilleran Flycatcher	*Empidonax occidentalis*
Eastern Kingbird	*Tyrannus tyrannus*
Great Blue Heron	*Ardea herodias*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Marsh Wren	*Cistothorus palustris*
Mourning Dove	*Zenaida macroura*
Northern Flicker	*Colaptes auratus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-necked Pheasant	*Phasianus colchicus*
Sandhill Crane	*Grus canadensis*
Song Sparrow	***Melospiza melodia***
Swainson's Hawk	***Buteo swainsoni***
Tree Swallow	*Tachycineta bicolor*
Unknown Flycatcher	
Western Meadowlark	*Sturnella neglecta*
Wilson's Snipe	*Gallinago delicata*
Wilson's Warbler	*Wilsonia pusilla*
Wood Duck	*Aix sponsa*
Yellow-Rumped Warbler	*Dendroica coronata*
Yellow Warbler	*Dendroica petechia*

Species identified in 2013 are listed in **bold** type.

Table 9 (cont.). Wildlife species observed at the Bouchard Wetland Mitigation Site from 2007 to 2011 and 2013.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog	*Rana luteiventris*
REPTILE	
Plains Gartersnake	***Thamnophis radix***
Western Painted Turtle	*Chrysemys picta*

Species identified in 2013 are listed in **bold** type.

3.1.6. Functional Assessment

Results of the 2004 (baseline), 2009, 2010, 2011, and 2013 functional assessments are summarized in Table 10. The 2013 Bouchard Wetland Assessment Form is included in Appendix B. The Bouchard Property was evaluated as one assessment area (AA-1) that encompassed 35.14 acres in 2013. The AA was rated as a Category II wetland in 2013 with 71 percent of the total possible points. The extent of aquatic habitat within the Bouchard AA increased and the site achieved 224.90 functional units in 2013. The site has shown a net acreage gain of 16.11 acres since 2004 and a functional unit gain of 137.36. Functional ratings were high for short and long term surface water storage, sediment/nutrient/toxicant removal, production export/food chain support, and groundwater discharge/recharge.

3.1.7. Photo Documentation

Photographs from photo points PP1 to PP11 (Figure 2, Appendix A) the transect endpoints, and wetland determination data points are shown on pages C-1 to C-14 of Appendix C.

3.1.8. Maintenance Needs

Infestations of Priority 2B noxious weeds, including Canadian thistle, spotted knapweed, common St. John's wort, gypsy-flower (houndstongue), and oxeye daisy were mapped on Figure 5, (Appendix A). Canadian thistle was identified across the site, particularly in community Types 1, 4, 5, and 11. The size of the Canadian thistle infestations ranged from less than 0.1 acre to 5.0 acres with a trace (<1 percent) to high (25 to 100 percent) cover class. One spotted knapweed infestation ranged from 0.1 to 1.0 acre in size with a moderate cover class. Gypsy-flower, St. John's wort, and oxeye daisy infestations inhabited less than 0.1 acre with a trace (<1 percent) to low (1 to 5 percent) cover. The MDT has conducted weed control at this site from 2010 to 2013. Weed spraying is suggested for 2014.

Table 10. Summary of 2004 (Baseline), 2009 to 2011, and 2013 wetland function/value ratings and functional points at the Bouchard Wetland Mitigation Site.

Function and Value Parameters from the MDT Montana Wetland Assessment Method (1999)	2004 (AA-1)	2009 (AA-1)	2010 (AA-1)	2011 (AA-1)	2013 (AA-1)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	High (0.8)	High (0.9)	High (0.9)	High (0.9)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA
Flood Attenuation	NA	NA	NA	NA	NA
Short and Long Term Surface Water Storage	High (0.8)	High (0.9)	High (0.9)	High (1.0)	High (0.9)
Sediment/Nutrient/Toxicant Removal	NA	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	NA	NA	NA	NA	NA
Production Export/Food Chain Support	High (0.9)	High (0.9)	High (0.9)	High (1.0)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.5)
Recreation/Education Potential	Low (0.1)	Mod (0.5)	High (1.0)	High (1.0)	Mod (0.5)
Actual Points / Possible Points	**4.6 / 8**	**6.2 / 9**	**6.7 / 9**	**7.4 / 9**	**6.4 / 9**
% of Possible Score Achieved	**56%**	**69%**	**74%**	**82%**	**71%**
Overall Category	**III**	**II**	**II**	**II**	**II**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	**19.03**	**28.53**	**30.46**	**33.78**	**35.14**
Total Functional Units (acreage x actual points) (fu)	**87.54**	**176.89**	**204.08**	**249.97**	**224.90**
Net Acreage Gain (ac)	NA	**9.5**	**11.4**	**14.8**	**16.1**
Net Functional Unit Gain	NA	**89.35**	**116.54**	**162.43**	**137.36**

3.1.9. Current Credit Summary

Approximately 35.14 aquatic habitat acres consisting of 34.78 acres of emergent and scrub/shrub wetlands and 0.36 acre of aquatic bed wetland were delineated in 2013. The pre-project wetland delineation documented 19.03 acres of wetland and open water. The net increase in aquatic habitat acres to date is 16.11 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 2.56 to 1 for rehabilitation/secondary restoration was based on functional point scores and calculated using the following equation. The formula was developed to measure the post-construction functional lift expected to occur after creation and restoration of the mitigation site.

Enhancement factor = $(F_{post} – F_{pre})/ F_{pre}$ where: F_{post} = projected post-mitigation project functional point score; and F_{pre} = pre-project functional point score. The formula was developed to measure the post-construction functional lift expected to occur after creation and restoration of the mitigation site.

Enhancement factor = (6.4 – 4.6) / 4.6; Enhancement factor = 0.39
Enhancement Ratio = 1/ 0.39; Enhancement Ratio = 2.56

Using this ratio, the site earned 23.54 USACE credit acres and 16.16 CSKT credit acres in 2013. An increase of wetland acreage above the projected estimate has resulted in exceeding both USACE and CSKT credit estimates for the Bouchard site.

The areas delineated as wetlands met the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. The overall estimated vegetation cover of hydrophytic species exceeds 90 percent. Noxious weed cover increased in 2011 and remained steady through 2013, although it is less than 10 percent site wide.

Table 11. Credit summary for 2009 to 2011 and 2013 at the Bouchard Property Wetland Mitigation Site.

Targeted Mitigation Type	2009 Wetlands (acre)	2010 Wetlands (acre)	2011 Wetlands (acre)	2013 Wetlands (acre)	Credit Ratio		2009 Credit (acre)	
					USACE	CSKT	USACE	CSKT
Creation	4.79	6.72	10.04	11.40	1:1	3.36:1	4.79	1.43
Re-establishment / primary restoration	4.71	4.71	4.71	4.71	1:1	1.86:1	4.71	2.53
Rehabilitation / secondary restoration	19.03	19.03	19.03	19.03	2.86:1 (2009) 2.17:1 (2010) 1.64:1 (2011) 2.56:1 (2013)	2.56:1	6.65	10.23
Total	**28.53**	**30.46**	**33.78**	**35.14**	--	--	**16.15**	**14.19**

Table 11 (continued). Credit summary for 2009 to 2011 and 2013 at the Bouchard Property Wetland Mitigation Site.

Targeted Mitigation	2010 Credit		2011 Credit		2013 Credit		Projected	
	USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	6.72	2.00	10.04	2.99	11.40	3.39	5.16	1.54
Re-establishment / primary restoration	4.71	2.53	4.71	2.53	4.71	2.53	2.94	1.58
Rehabilitation / secondary restoration	8.77*	10.23	11.60	10.23	7.43	10.23	4.05	10.23
Total	**20.20**	**14.76**	**26.35**	**15.75**	**23.54**	**16.16**	**12.15**	**13.35**

*Credit acres corrected from previous report.

3.2. Mud Creek

3.2.1. Hydrology

The average total annual precipitation recorded at the Missoula 2NE weather station, Montana (245735) from October 1966 to December 2012 was 17.10 inches (WRCC 2013). Total precipitation from January to August recorded at this station was 12.03 inches (long-term average), 13.01 inches (2010), 13.63 inches (2011), 11.1 inches (2012), and 6.3 inches (2013). The cumulative precipitation through August was above-average in 2010 and 2011 with below-average precipitation recorded in 2012 and 2013.

The main source of hydrology at this mitigation site is the perennial flow from Mud Creek and increased groundwater elevations that resulted from mitigation construction. The Mud Creek site is located on the west side of the highway within a pre-existing depression wetland. The site receives seasonal flooding during spring runoff and sustained flows during summer from irrigation return and groundwater sources.

The extent of emergent wetlands has continued to expand in response to the post-construction increase in groundwater and the removal of grazing. Maximum surface water depths in the Mud Creek channel in 2013 was recorded at 3.0 feet. Within the wetland areas, surface water depths ranged from 0.0 to 3.0 feet with an average depth of 0.5 feet. Twenty-five percent of the mitigation area was inundated with water in 2013. The depth of water at the emergent vegetation along the channels open water boundary was approximately 1.0 foot. Wetland areas that were not inundated were saturated within 12 inches of the ground surface. No wells were installed at the site.

Three data points, MC-1, MC-2, and MC-3 were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points MC-1 and MC-3 were located within areas that met the three wetland criteria. The data points were saturated at the soil surface. Data point MC-2 showed no evidence of wetland hydrology.

3.2.2. Vegetation

A comprehensive list of 100 species identified onsite from 2009 to 2013 is presented in Table 12. Nine community types were identified in 2013, one upland and seven wetland community types (Mud Creek Figure 7, Appendix A). The community types were wetland Type 1 – *Juncus arcticus/Agrostis stolonifera*, wetland Type 4 – *Juncus* spp./*Carex* spp., wetland Type 5 – *Carex* spp., wetland Type 6 – *Crataegus douglasii/Phalaris arundinacea*, wetland Type 9 – *Cirsium arvense/Juncus arcticus*, wetland Type 10 – *Phalaris arundinacea*, wetland Type 11 – *Scirpus microcarpus/Phalaris arundinacea*, and upland Type 12 - *Phalaris arundinacea/Bromus inermis*. The species composition is detailed by type below and on the Monitoring Form (Appendix B).

Table 12. Vegetation species identified from 2009 to 2011 and 2013 for the Mud Creek Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Achillea millefolium	Common Yarrow	FACU
Agropyron spp.	Wheatgrass	NL
Agrostis gigantea	Black Bent	FAC
Agrostis stolonifera	Spreading Bent	FAC
Algae, green	Algae, green	NL
Alnus incana	Speckled Alder	FACW
Aquatic Macrophytes	Aquatic macrophytes	NL
Artemisia cana	Coaltown Sagebrush	FACU
Bidens cernua	Nodding Burr-Marigold	OBL
Bromus inermis	Smooth Brome	FAC
Bromus arvensis	Japanese Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Carex bebbii	Bebb's Sedge	OBL
Carex nebrascensis	Nebraska Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex sp.	Sedge	NL
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Centaurea maculosa	Spotted Knapweed	UPL
Cirsium arvense	Canadian Thistle	FAC
Cirsium vulgare	Bull Thistle	FACU
Cornus alba	Red Osier	FACW
Crataegus douglasii	Black Hawthorn	FAC
Cynoglossum officinale	Gypsy-Flower	FACU
Dactylis glomerata	Orchard Grass	FACU
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Herb Sophia	UPL
Dianthus spp.	Pink	NL
Dipsacus fullonum	Fuller's Teasel	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elodea sp.	Waterweed	NL
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum arvense	Field Horsetail	FAC
Festuca arundinacea	Tall fescue	FAC
Festuca spp.	Fescue	NL
Geum macrophyllum	Large-Leaf Avens	FAC

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Table 12. (Continued). Vegetation species identified in 2009 and 2011 and 2013 for the Mud Creek Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Hordeum jubatum	Fox-Tail Barley	FAC
Impatiens ecalcarata	Spurless Touch-Me-Not	FACW
Iris pseudacorus	Pale-Yellow Iris	OBL
Juncus arcticus	Arctic Rush	FACW
Juncus articulatus	Joint-Leaf Rush	OBL
Juncus effusus	Lamp Rush	FACW
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus nodosus	Knotted Rush	OBL
Juncus spp.	Rush	NL
Juncus tenuis	Lesser Poverty Rush	FAC
Lactuca serriola	Prickly Lettuce	FACU
Lemna minor	Common Duckweed	OBL
Lepidium campestre	Field Pepperweed	UPL
Lepidium perfoliatum	Clasping Pepperwort	FACU
Leucanthemum vulgare	Ox-Eye Daisy	FACU
Silene pratensis	Bladder Campion	UPL
Lysichiton americanus	Yellow-Skunk-Cabbage	OBL
Malva neglecta	Common Mallow	UPL
Medicago sativa	Alfalfa	UPL
Melilotus alba	White Sweet-Clover	FACU
Melilotus officinalis	Yellow Sweet-Clover	FACU
Melilotus sp.	Sweet Clover	NL
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Nasturtium officinale	Watercress	OBL
Nepeta cataria	Catnip	FACU
Oenanthe spp.	Waterdropwort	NL
Pascopyrum smithii	Western-Wheat Grass	FACU
Persicaria amphibia	Water Smartweed	OBL
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Plantago major	Great Plantain	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa spp.	Bluegrass	NL
Polygonum bistortoides	American Bistort	NL
Polygonum spp.	Smartweed	NL

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Table 12. (Continued). Vegetation species identified in 2009 and 2011 and 2013 for the Mud Creek Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Populus tremuloides	Quaking Aspen	FACU
Populus balsamifera	Balsam Poplar	FAC
Potentilla recta	Sulphur Cinquefoil	UPL
Ranunculus aquatilis	White Water-Crowfoot	OBL
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Salix bebbiana	Gray Willow	FACW
Salix drummondiana	Drummond's Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Sinapis Arvensis	Charlock Mustard	UPL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solanum dulcamara	Climbing Nightshade	FAC
Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FACU
Tragopogon dubius	Yellow Salsify	UPL
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FAC
Trifolium spp.	Clover	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Urtica dioica	Stinging Nettle	FAC
Verbascum thapsus	Great Mullein	FACU
Veronica americana	American-Brooklime	OBL

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Wetland Type 1 – *Juncus arcticus/Agrostis stolonifera* (previously *Juncus balticus/Agrostis alba*) was found in a small area (0.07 acres) located in the southwest portion of the site dominated by emergent vegetation. Arctic rush, spreading bentgrass, and reed canary grass (*Phalaris arundinacea*) were the predominant species.

Wetland Type 4 – *Juncus* spp./*Carex* spp. was found on 0.22 acres at the north boundary. Arctic rush, dagger-leaf rush (*Juncus ensifolius*), knotted rush (*Juncus nodosus*), Nebraska sedge, Northwest Territory sedge, Bebb's sedge (*Carex bebbii*), clustered field sedge (*Carex praegracillis*), stalk-grain field sedge (*Carex stipata*), spreading bentgrass, and reed canary grass dominated the cover.

Wetland Type 5 – *Carex* spp. was located across 0.36 acres of the site and characterized the wetland areas along the reconstructed banks of Mud Creek.

Woody species were planted along the stream corridor. The community was dominated by Northwest Territory sedge, Nebraska sedge, stalk-grain sedge, Bebb's sedge, red-tinge bulrush (*Scirpus microcarpus*), broad-leaf cat-tail, and reed canary grass dominated the community. *Salix* spp. within this community continued to increase in percent cover between 2011 and 2013.

Wetland Type 6 – *Crataegus douglasii/Phalaris arundinacea* was identified in three wetlands adjacent to Mud Creek and dominated by scrub-shrub and emergent species. The dominant species in this 0.18-acre community included black hawthorn, reed canary grass, and climbing nightshade (*Solanum dulcamara*) with lesser amounts of Canadian thistle, red-tinge bulrush, catnip (*Nepeta cataria*), large-leaf avens (*Geum macrophyllum*), charlock mustard (*Sinapis arvensis*), and stinging nettle (*Urtica diocia*).

Community Type 8 – Open Water characterized the 0.08-acre area within the ordinary high water mark (OHWM) of the Mud Creek channel, defined as a water of the US. Aquatic macrophytes observed within the open water areas of the channel included white water-crowfoot (*Ranunculus aquatilis*), watercress (*Nasturtium officinale*), American-brooklime (*Veronica americana*), and water weed (*Elodea* sp.).

Wetland Type 9 – *Cirsium arvense/Juncus arcticus* was found on 0.04 acres in the central section of the mitigation area. Canadian thistle, Arctic rush, spreading bentgrass, fringed willowherb (*Epilobium ciliatum*), Nebraska sedge, stalk-grain sedge, large-leaf avens, reed canary grass, tall hedge-mustard (*Sisymbrium altissimum*), and black hawthorn were common components of this community.

Wetland Type 10 – *Phalaris arundinacea* encompassed 0.98-acres, the largest community within the mitigation area. Reed canary grass, Arctic rush, field sowthistle (*Sonchus arvensis*), great plantain (*Plantago major*), and pale-yellow iris (*Iris pseudacorus*) were common species within the herbaceous cover and black hawthorn and Drummond willow (*Salix drummondiana*) were present within the developing scrub shrub layer.

Wetland Type 11 – *Scirpus microcarpus/Phalaris arundinacea* was identified on 0.27 acres in the north half of the project area. The predominant herbaceous species were red-tinge bulrush, reed canary grass, stalk-grain sedge, and clustered field sedge.

Upland Type 12 – *Phalaris arundinacea/Bromus inermis* was found across 0.41 acres in upland areas adjacent to the creek. It was predominantly vegetated by reed canary grass, smooth brome, and yellow sweet clover (*Melilotus officinalis*).

Results of monitoring the vegetation transect in 2013 are detailed in the Mud Creek Monitoring Form (Appendix B) with comprehensive results of 2009 through 2013 summarized in Table 13 and Charts 7 and 8. Photographs of the transect

end points are shown in Appendix C. This transect bisects the mitigation area, starting in the northwest corner and finishing in the southeast corner of the monitoring boundary. This 494-foot transect intercepted five different community types and the restored channel of Mud Creek. The wetland community Types 9 and 10 dominated the transect, with fewer species represented by communities 4, 5, and 11. The communities documented along this transect in 2013 were similar to the results of the 2011 survey. The community dominance shifted between 2010 and 2011 to reflect the increase in reed canary grass site wide and the decrease in redtop and bulrush species. An isolated inclusion of Type 9, characterized by rush spp. and Canadian thistle, developed within Type 10 in 2011. Ninety-four percent of the transect intervals were dominated by hydrophytic species and six percent of the transect intersected the open water associated with the Mud Creek channel. No upland communities were documented along this transect

Table 13. Mud Creek Transect 1 data summary from 2009 to 2011 and 2013.

Monitoring Year	2009	2010	2011	2013
Transect Length (feet)	**494**	**494**	**494**	**494**
# Vegetation Community Transitions along Transect	6	6	10	10
# Vegetation Communities along Transect	5	4	5	5
# Hydrophytic Vegetation Communities along Transect	5	4	5	5
Total Vegetative Species	29	32	27	28
Total Hydrophytic Species	22	20	20	24
Total Upland Species	7	12	7	4
Estimated % Total Vegetative Cover	96	96	96	96
% Transect Length Comprising Hydrophytic Vegetation Communities	100	98	94	94
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0
% Transect Length Comprising Open Water	0	2	6	6
% Transect Length Comprised of Bare Substrate	0	0	0	0

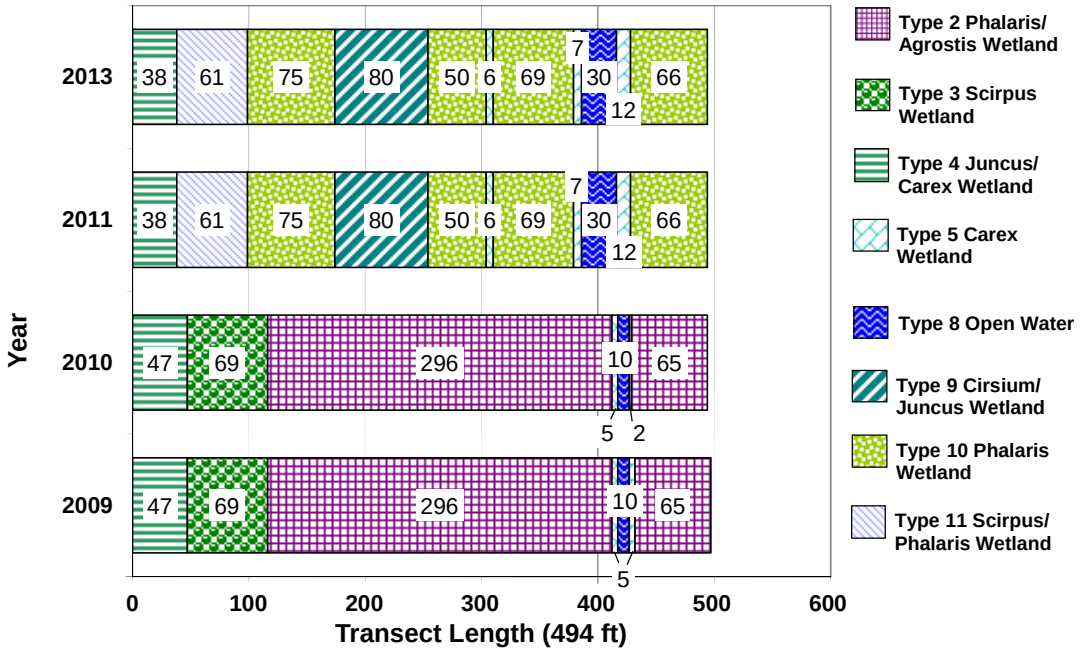


Chart 7. Mud Creek Transect 1 maps showing vegetation types from transect start (0 feet) to finish (494 feet) from 2009 to 2011 and 2013.

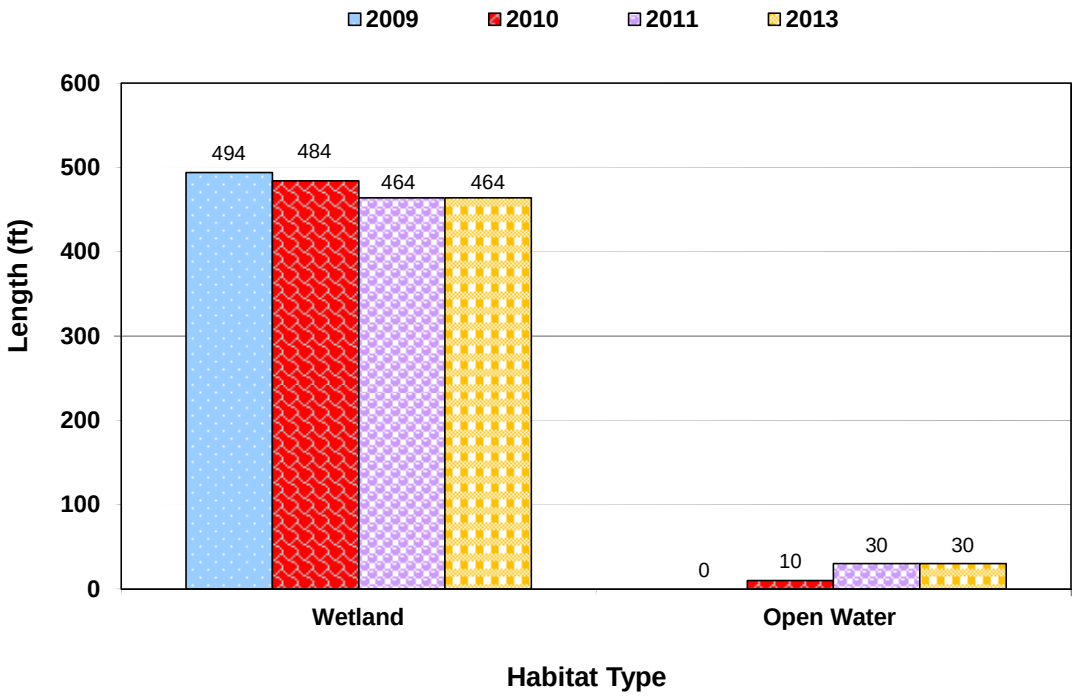


Chart 8. Length of vegetation habitats within Mud Creek Transect 1 from 2009 to 2011 and 2013.

The locations of Priority 2A yellowflag iris (*Iris pseudacorus*), and 2B noxious weed infestations Canadian thistle, oxeye daisy, and spotted knapweed are shown on Figure 7 (Appendix A). The two yellow flag iris infestations were identified as covering less than 0.1 acre with trace (<1 percent) cover. The size of Canadian thistle infestations ranged from less than 0.1 acre to 1.0 acre in size with a trace (<1 percent) to high (26 to 100 percent) cover. Greater than 50 percent of the vegetation cover in Type 9 was identified as Canadian thistle. One small oxeye daisy infestation was noted near the west project boundary at southbound US 93. Spotted knapweed was located at the south end of the project at less than 0.1 acre in size with moderate (6 to 25 percent) cover. MDT has conducted weed-spraying efforts at this mitigation site from 2010 to 2013. Weeds were sprayed by MDT's contractor at the end of May and again in August of 2013.

Wetland and riparian vegetation was planted in 2008. The vegetated soil lifts and wetland sod mats used for the creek restoration were well established in 2013 with deep-rooted emergent vegetation providing a dense cover along a majority of the stream banks.

Shrub planting survival data were collected along ten, 240-foot long, 6.6-foot (2.0 meters) wide belt transects that totaled approximately 0.35 acres (15,600 square feet). Transects were randomly established across the wetland creation area located along the north side of Mud Creek between the bridges and east side of the bridge. Woody species survival including the number of live plants identified

was recorded on the Mitigation Monitoring Form (Appendix B). Species survival in 2013 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. 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. Thirty-eight Black cottonwood exhibited the highest survival rates. Thirty-two narrow-leaf willow species, nine gray (Bebb) willow, eight Wood's rose, six yellow willow, two red osier dogwood, and two Drummond's willow were also observed.

3.2.3. Soil

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

Three test pits (MC-1, MC-2 and MC-3) were examined to determine hydric soil parameters. Test pits MC-1 and MC-3 were located in areas that met all three wetland criteria. Data point MC-1 was a black (10YR 2/1) peat. This data point had a histic epipedon with low chroma colors and is listed on local hydric soils lists. The soil profile at test pit MC-3 revealed a black (10YR 2/1) silt loam. This test pit was located in an area periodically exposed to flooded/ponded conditions. The soil had low chroma colors and is listed as a local hydric soil. Data point MC-2 was a brown (10YR 4/3) sand with dark yellowish brown (10 YR 4/6) redox concentrations in the matrix. This data point did not meet hydric soils criteria based on the value of the chroma.

3.2.4. Wetland Delineation

Three data points (Figure 6, Appendix A) were used to determine the upland and wetland boundaries of delineated wetlands. The completed Mud Creek Wetland Determination 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 2.20 acres, which included 0.08 acres of water of the US associated with Mud Creek (Table 14). There was an increase of total wetland acreage of 0.04 acres from 2011 to 2013.

Table 14. Aquatic habitat acreages delineated from 2009 to 2011 and 2013 at the Mud Creek Wetland Mitigation Site.

Aquatic Habitat	2009	2010	2011	2013
Wetland Area (acres)	2.02	2.08	2.08	2.12
Open Water (acres)	--	0.08	0.08	0.08
Total Aquatic Habitat (acres)	**2.02**	**2.16**	**2.16**	**2.20**

3.2.5. Wildlife

A comprehensive list of wildlife species observed directly and indirectly from 2009 to 2013 at the Mud Creek Site is shown in Table 15 (Monitoring Form, Appendix B). One red-winged blackbird (*Agelaius phoeniceus*), a meadow vole (*Microtus pennsylvanicus*), and tracks of unidentified deer species (*Odocoileus* sp.) were observed at the site during 2013 monitoring.

3.2.6. Functional Assessment

Results of the 2004 (baseline), 2009, 2010, 2011, and 2013 functional assessments (Berglund 1999) are summarized in Table 16. The completed 2013 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 2.20 acres, which included 0.08 acres of open water with aquatic macrophytes associated with the Mud Creek channel. The Mud Creek property was evaluated as one assessment area (AA-1) that encompassed 2.20 acres in 2013.

The AA was rated as a Category III wetland in 2013 with 65 percent of the total possible points. The points and ratings have remained consistent from 2009 to 2013. 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 2013 functional assessment yielded 17.16 total functional units.

Table 15. Wildlife species observed at the Mud Creek Wetland Mitigation Site from 2009 to 2011 and 2013.

COMMON NAME	SCIENTIFIC NAME
BIRD	
American Robin	*Turdus migratorius*
Black-billed Magpie	*Pica hudsonia*
Brewer's Blackbird	*Euphagus cyanocephalus*
Canada Goose	*Branta canadensis*
Cliff Swallow	*Petrochelidon pyrrhonota*
Eastern Kingbird	*Tyrannus tyrannus*
European Starling	*Sturnus vulgaris*
Mallard	*Anas platyrhynchos*
Red-winged Blackbird	***Agelaius phoeniceus***
Song Sparrow	*Melospiza melodia*
Tree Swallow	*Tachycineta bicolor*
Wilson's Snipe	*Gallinago delicata*
MAMMAL	
Deer Sp.	**Odocoileus sp.**
Feral cat	
Meadow Vole	***Microtus pennsylvanicus***
Raccoon	*Procyon lotor*
Red Fox	*Vulpes vulpes*
Striped Skunk	*Mephitis mephitis*

Species identified in 2013 are listed in **bold** type.

3.2.7. Photo Documentation

Photographs of photo points PP1 to PP13, the transect endpoints, and wetland determination data points (Figure 6, Appendix A) are shown on pages C-12 to C-21 in Appendix C. Of note, photo point 10 has been omitted as the original intent was to show the channel and banks in this area. Currently, the banks and adjacent areas are obscured by tall reed canarygrass.

3.2.8. Maintenance Needs

The locations of Priority 2A, yellowflag iris (*Iris pseudacorus*), and 2B noxious weed infestations Canadian thistle, oxeye daisy, and spotted knapweed are shown on Figure 7 (Appendix A). The two yellowflag iris infestations were identified as covering less than 0.1 acre with trace (<1 percent) cover. The size of Canadian thistle infestations ranged from less than 0.1 acre to 1.0 acre in size with a trace (<1 percent) to high (26 to 100 percent) cover. Greater than 50 percent of the vegetation cover in Type 9 was identified as Canadian thistle. One small oxeye daisy infestation was noted near the west project boundary at southbound US 93. Spotted knapweed was located at the south end of the project at less than 0.1 acre in size with moderate (6 to 25 percent) cover. MDT has conducted weed-spraying efforts at this mitigation site from 2010 to 2013. Weeds were sprayed by MDT's contractor at the end of May and again in August of 2013. The wildlife-friendly fence installed around the perimeter of the site was in good condition.

3.2.9. Current Credit Summary

The wetland delineation identified 2.20 acres of emergent and aquatic bed wetlands in 2013. The functional assessment yielded 17.16 functional units in 2013. The 2013 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 (USACE and CSKT) and rehabilitation (USACE)/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 16. The formula was developed to measure the post-construction functional lift expected to occur after creation and restoration of the mitigation site.

Enhancement factor = $(F_{post} – F_{pre})/ F_{pre}$; Enhancement Ratio = 1/ EF
Enhancement factor = (7.8 – 6.1) / 6.1; Enhancement factor = 0.28
Enhancement Ratio = 1/ 0.28=3.57

Table 16. Summary of 2004 (Baseline), 2009 to 2011, and 2013 wetland function/value ratings and functional points at the Mud Creek Wetland Mitigation Site.

Function and Value Parameters from the MDT Montana Wetland Assessment Method (1999)	2004 (Baseline) (AA-1)	2009 (AA-1)	2010 (AA-1)	2011 (AA-1)	2013 (AA-1)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.3)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Flood Attenuation	Low (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Production Export/Food Chain Support	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Mod(0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
Recreation/Education Potential	Low (0.1)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
Actual Points / Possible Points	**6.1 / 12**	**7.8 / 12**	**7.8 / 12**	**7.8 / 12**	**7.8 / 12**
% of Possible Score Achieved	**50%**	**65%**	**65%**	**65%**	**65%**
Overall Category	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	NA	**2.02**	**2.16**	**2.16**	**2.20**
Total Functional Units (acreage x actual points)	NA	**15.76**	**16.85**	**16.85**	**17.16**

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 site has earned 1.82 USACE credit acres, based on the 3.57:1 enhancement ratio and 1:1 creation ratio. CSKT credit acres estimated in 2013 included 0.5 acres for creation (3.36:1 ratio) and 0.28 acres for rehabilitation credit (1.86:1 ratio) for a total of 0.78 CSKT credit acres to date.

The original mitigation plan proposed a total of 6.81 acres of mitigation; however, a scaling error by the original design consultant was identified during construction of this segment. As such, this value has been revised to reflect actual projected acreage. The total area of the post-construction site is 2.6 acres including 0.44 acres of uplands. With the projected credit acres corrected, the 2013 estimated credits exceed the projected credit acres for both USACE and CSKT and has achieved mitigation goals.

The areas delineated as wetlands (2.20 acres out of 2.61 acres) met the criteria for vegetation, soil, and hydrology. The overall estimated vegetation cover of hydrophytic species exceeds 90 percent. Reed canary grass, an aggressive native species originally present in site, contributed greater than 50 percent cover to community types 6, 10, 11, and 12. Although these communities have reed canary grass as a dominant, each of these communities has demonstrated an increase in diversity through yearly monitoring. Noxious weed cover increased in 2013 although it remains less than 10 percent site wide.

Table 17. Credit summary for 2009 to 2011 and 2013 at the Mud Creek Wetland Mitigation Site.

Targeted Mitigation Type	2009 Wetland (acre)	2010 Wetland (acre)	2011 Wetland (acre)	2013 Wetland (acre)	Credit Ratio		2009 Credit (acre)		2010 Credit (acre)		2011 Credit (acre)		2013 Credit (acre)		Projected Credit* (acre)	
					USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	1.49	1.63	1.63	1.67	1:1	3.36:1	1.49	0.44	1.63	0.49	1.63	0.49	1.67	0.50	1.63	0.50
Rehabilitation/ secondary restoration	0.53	0.53	0.53	0.53	3.57:1	1.86:1	0.15*	0.28	0.15	0.28	0.15	0.28	0.15	0.28	0.15	0.28
Total	**2.02**	**2.16**	**2.16**	**2.20**	**--**	**--**	**1.64**	**0.72**	**1.78**	**0.77**	**1.78**	**0.77**	**1.82**	**0.78**	**1.78**	**0.78**

*Credit acres corrected from original desing calculations.

3.3. Peterson Property

3.3.1. Hydrology

The average total annual precipitation recorded at the Missoula 2NE weather station, Montana (245735) from October 1966 to December 2012 was 17.10 inches (WRCC 2013). Total precipitation from January to August recorded at this station was 12.03 inches (long-term average), 13.01 inches (2010), 13.63 inches (2011), 11.1 inches (2012), and 6.3 inches (2013). The cumulative precipitation through August was above-average in 2010 and 2011 with below-average precipitation recorded in 2012 and 2013.

The main source of hydrology at the Peterson site comes from an unnamed perennial tributary of Post Creek. The mitigation site is located within a long wetland corridor aligned east to west that follows topographic slope towards Post Creek. The project is exposed to seasonal flooding during spring runoff, seasonal high groundwater, and sustained flows during summer from irrigation return. Twelve log crib structures were installed to impound water behind the structures similar to a natural beaver dam. Each crib structure was designed to allow surface waters to flow over the structure. The site exhibited inundation of varying depths behind these impoundments during monitoring. Approximately five of the twelve cribs were not impounding water and appeared to allow water flow through the structure. The MDT temporarily repaired several of these structures in 2010.

Approximately 10 percent of the project area was inundated in 2013. Surface water depths ranged from 0 to 3.0 feet with an average depth of approximately 0.5 feet. The water depth at the emergent vegetation and open water boundary was approximately 1.0 foot.

Four data points, P-1 to P-4 were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points P-2 and P-4 were located within areas that met the wetland criteria. Data points P-2 and P-4 were saturated to the soil surface, exhibited drainage patterns, and satisfied the FAC-neutral test. The water table was present at P-4 at a depth of 6 inches below the ground surface (bgs). Data points P-1 and P-3 did not show evidence of wetland hydrology.

3.3.2. Vegetation

A comprehensive list of 73 species was compiled from 2008 to 2013 and is presented in Table 18. Six community types, four wetland and two upland, were identified and mapped at the mitigation site in 2013 (Peterson Figure 9, Appendix A). The community types were wetland Type 2 - *Phalaris arundinacea*, wetland Type 4 - *Carex nebrascensis/Poa palustris*, wtland Type 5 – *Epilobium ciliatum*, upland Type – 6 *Sisymbrium altisimum*, upland Type 7 - *Elymus repens /Poa pratensis*, and wetland Type – 8 *Typha latifolia/Phalaris arundinacea*. The species composition is detailed by community type on the Peterson Monitoring Form (Appendix B) and discussed below.

Table 18. Vegetation species identified from 2008 to 2011 and 2013 at the CSKT Peterson Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Agropyron cristatum	Crested Wheatgrass	UPL
Alnus incana	Speckled Alder	FACW
Asparagus officinalis	Asparagus	FACU
Bassia scoparia	Mexican-Fireweed	FAC
Bromus arvensis	**Japanese Brome**	**UPL**
Bromus inermis	Smooth Brome	FAC
Bromus tectorum	Cheatgrass	UPL
Cardaria draba	Whitetop	UPL
Carex nebrascensis	Nebraska Sedge	OBL
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Carex vesicaria	Lesser Bladder Sedge	OBL
Cirsium arvense	Canadian Thistle	FAC
Cirsium vulgare	Bull Thistle	FACU
Cornus alba	Red Osier	FACW
Cynoglossum officinale	Gypsy-Flower	FACU
Dactylis glomerata	Orchard Grass	FACU
Descurainia sophia	Herb Sophia	UPL
Dianthus spp.	Pink	NL
Dipsacus fullonum	Fuller's Teasel	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elodea spp.		
Elymus repens	Creeping Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Festuca arundinacea	Tall fescue	FAC
Festuca spp.	Fescue	NL
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria grandis	American Manna Grass	OBL
Impatiens ecalcarata	Spurless Touch-Me-Not	FACW
Iris pseudacorus	Pale-Yellow Iris	OBL
Juncus arcticus	Arctic Rush	FACW
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus spp.	Rush	NL
Juncus tenuis	Lesser Poverty Rush	FAC
Lactuca serriola	Prickly Lettuce	FACU
Lemna minor	Common Duckweed	OBL
Lepidium campestre	Field Pepperweed	UPL
Lepidium perfoliatum	Clasping Pepperwort	FACU

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Table 18. (Continued). Vegetation species identified from 2008 to 2011 and 2013 at the CSKT Peterson Wetland Mitigation Site.

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Leucanthemum vulgare	Ox-Eye Daisy	FACU
Malva neglecta	Common Mallow	UPL
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Nasturtium officinale	Watercress	OBL
Nepeta cataria	Catnip	FACU
Oenanthe spp.	Waterdropwort	NL
Persicaria amphibia	Water Smartweed	OBL
Phalaris arundinacea	Reed Canary Grass	FACW
Plantago lanceolata	English Plantain	FACU
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa spp.	Bluegrass	NL
Polygonum bistortoides	American Bistort	FACW
Polygonum spp.	Smartweed	NL
Potentilla recta	Sulphur Cinquefoil	UPL
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Salix bebbiana	Gray Willow	FACW
Salix drummondiana	Drummond's Willow	FACW
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Silene latifolia	Bladder Campion	NL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solanum dulcamara	Climbing Nightshade	FAC
Sonchus arvensis	Field Sow-Thistle	FACU
Suaeda calceoliformis	Paiuteweed	FACW
Thlaspi arvense	Field Penny-Cress	UPL
Tragopogon dubius	Yellow Salsify	UPL
Trifolium pratense	Red Clover	FACU
Trifolium spp.	Clover	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Verbascum blattaria	Moth Mullein	UPL
Verbascum thapsus	**Great Mullein**	**FACU**

[1] *Draft 2012 NWPL (Lichvar and Kartesz, 2009)*

New species identified in 2013 are shown in bold type.

Wetland Type 2 – *Phalaris arundinacea* was identified on 0.31 acres at the east end of the stream corridor. The species were dominated by reed canary grass, and spurless touch-me-not (*Impatiens ecalcarata*) with low to trace percent cover of 15 additional species.

Wetland Type 4 – *Carex nebrascensis/Poa palustris* was located in transition areas along the west end of the wetland corridor. Nebraska sedge, fowl bluegrass (*Poa palustris*), and reed canary grass dominated the vegetation cover. Teasel (*Dipsacus sylvestris*) and English plantain (*Plantago lanceolata*) each inhabited six to ten percent of the community. A total of twelve vegetation species were identified in this 0.76-acre community.

Upland Type 7 – *Elymus repens/ Poa pratensis* dominated a majority of the area north and south of the creek corridor and encompassed 20.57 acres of the site. Dominant vegetation consisted of creeping wild rye, Kentucky bluegrass, smooth brome, hoary cress (*Cardaria draba*), teasel, and paiuteweed (*Suaeda calceoliformis*).

Wetland Type 8 – *Typha latifolia/Phalaris arundinacea* was located adjacent to the unnamed perennial tributary that flows through the mitigation site. In 2013, broad-leaf cat-tail dominated this community. Reed canary grass, speckled alder, Northwest Territory sedge, and fringed willow-herb each contributed between six and twenty percent to the vegetation cover of this wetland community. An additional eighteen vegetative species were identified in this 1.67-acre community.

Wetland Type 9 –*Nasturtium officinale/Carex nebrascensis* replaced wetland Type 5 – *Epilobium ciliatum* in 2013. This 0.35-acre community was located in the northwest corner of the mitigation site. Dominant vegetation consisted of watercress (*Nasturtium officinale*), Nebraska sedge, and teasel with lesser amounts of Canadian thistle, field mint (*Mentha arvensis*), water smartweed (*Persicaria amphibia*), reed canary grass and three other species.

Upland Type 10 – *Elymus repens/Sisymbrium altissimum* replaced upland Type 6 – *Sisymbrium altissimum* in 2013. This 1.36 acre community was identified in the northeast corner of the site. The community was dominated by quackgrass with low amounts of tall tumble mustard (*Sisymbrium altissimum*), smooth brome, and bull thistle (*Cirsium vulgare*).

Vegetation results for Transects 1 and 2 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 in Appendix C.

Community Type 7 upland and wetland Type 8 dominated Transect 1 in 2013 (Chart 9). The community structure was slightly different from communities Type 1 upland and Type 3 wetland seen in 2009 and 2010. Community types along

this transect were consistent with the 2011 results. Approximately 70.8 percent of the transect was dominated by hydrophytic species in 2013, an increase of 15.2 percent from 2011. This transect has displayed a steady trend of wetland habitat development since 2009.

Table 19. CSKT Peterson Transect 1 data summary for 2008 to 2011 and 2013.

Monitoring Year	2008	2009	2010	2011	2013
Transect Length (feet)	144	144	144	144	144
Vegetation Community Transitions along Transect	3	3	2	2	2
Vegetation Communities along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1	1	1
Total Vegetative Species	19	24	25	16	17
Total Hydrophytic Species	9	14	13	10	13
Total Upland Species	10	10	12	6	4
Estimated % Total Vegetative Cover	100	87	90	95	95
% Transect Length Comprising Hydrophytic Vegetation Communities	45	45	45.1	55.6	70.8
% Transect Length Comprising Upland Vegetation Communities	55	55	54.9	44.4	29.2
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

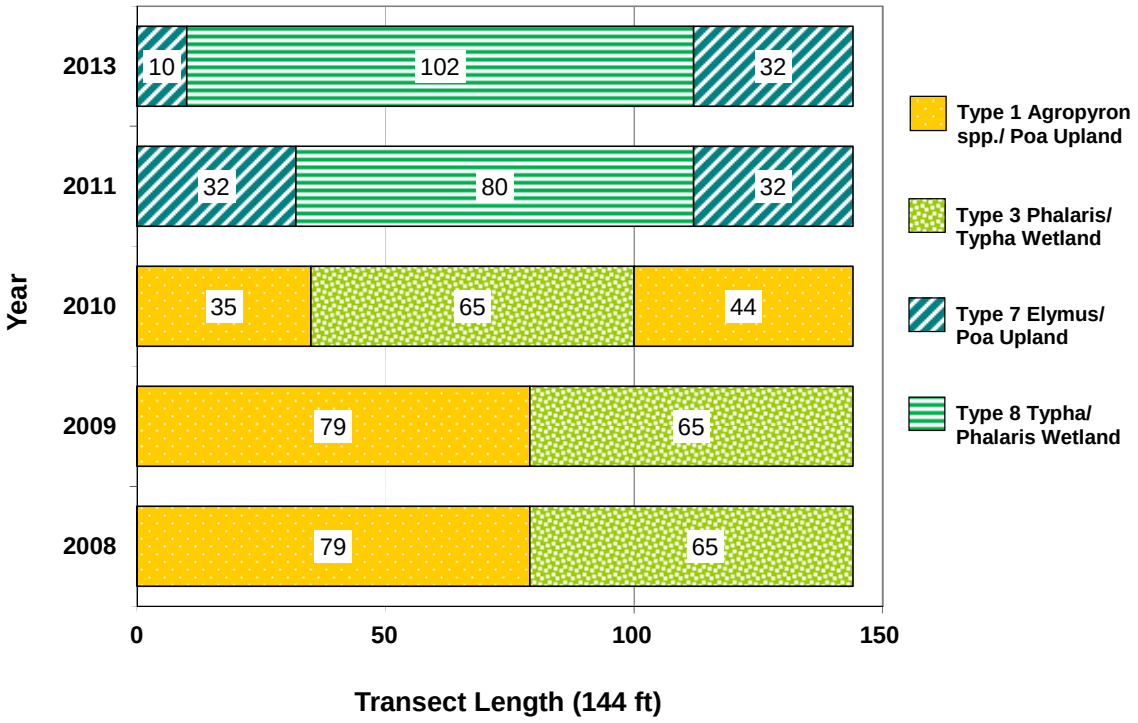


Chart 9. CSKT Peterson Transect 1 maps showing vegetation types from transect start (0 feet) to finish (144 feet) from 2008 to 2011 and 2013.

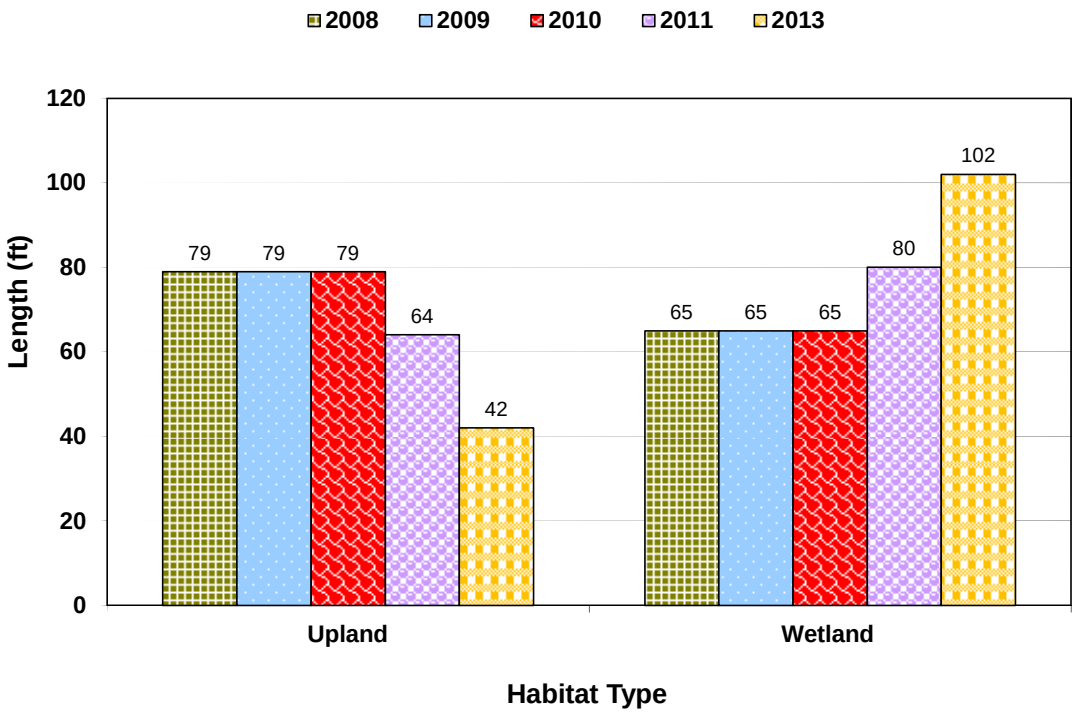


Chart 10. Length of vegetation habitats within CSKT Peterson Transect 1 from 2008 to 2011 and 2013.

Wetland communities Types 4 and 8 and upland community Type 7 dominated Transect 2 in 2013 (Chart 11). The community types were similar to those observed from 2008 to 2011 except for a decrease in the extent of wetland Type 4 *Carex/Poa* and a corresponding increase in upland Type 7 *Elymus/Poa*. Approximately 54.8 percent of the transect was occupied by hydrophytic species, a 16 percent decrease from 2011 and over 35 percent decrease since 2010 (Table 20, Chart 12). This decrease of wetland habitat along this transect may be the result of the contraction of the wetland exacerbated by the establishment of this transect along the wetland border. The decrease of wetland habitat along this transect may be the result of failure of the crib dam at this location to impound water behind this structure.

Table 20. CSKT Peterson Transect 2 data summary for 2008 to 2011 and 2013.

Monitoring Year	2008	2009	2010	2011	2013
Transect Length (feet)	325	325	325	325	325
Vegetation Community Transitions along Transect	3	3	2	3	3
Vegetation Communities along Transect	3	3	3	3	3
Hydrophytic Vegetation Communities along Transect	2	2	2	2	2
Total Vegetative Species	21	23	22	18	15
Total Hydrophytic Species	11	11	11	10	10
Total Upland Species	10	12	11	8	5
Estimated % Total Vegetative Cover	93	85	85	90	90
% Transect Length Comprising Hydrophytic Vegetation Communities	90	90	90.5	70.8	54.8
% Transect Length Comprising Upland Vegetation Communities	10	10	9.5	29.2	45.2
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

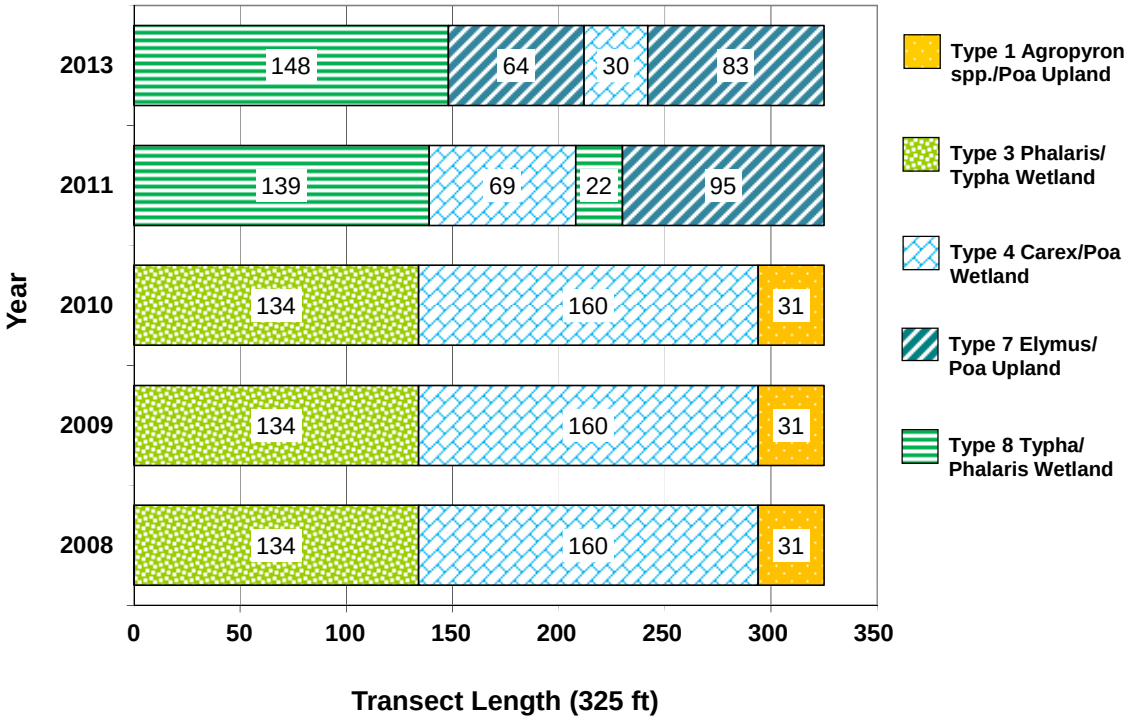


Chart 11. CSKT Peterson Transect 2 maps showing vegetation types from transect start (0 feet) to finish (325 feet) from 2008 to 2011 and 2013.

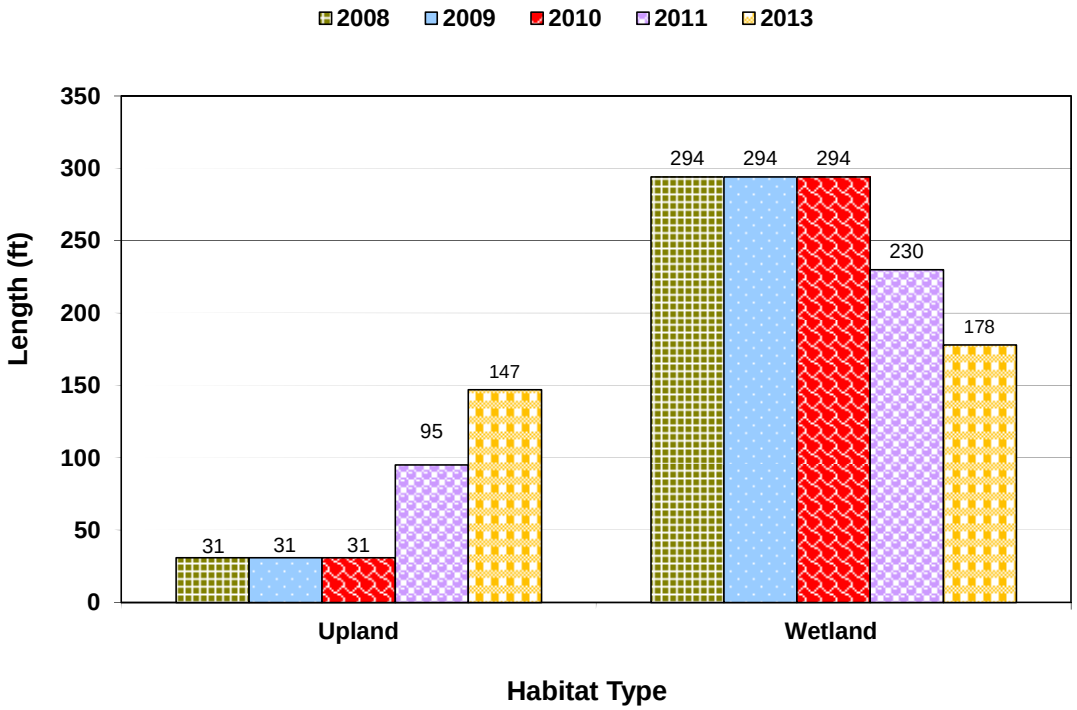


Chart 12. Length of vegetation habitats within CSKT Peterson Transect 2 from 2008 to 2011 and 2013.

The location of Priority 2A, yellowflag iris, and Priority 2B noxious weed infestations of Canadian thistle, sulfur cinquefoil (*Potentilla recta*), and oxeye daisy and gypsy-flower (houndstongue), observed during 2013 field monitoring were mapped on Peterson Figure 9, Appendix A. The size of the eight Canadian thistle infestations were generally less than 0.1 acre in 2013. The percent cover ranged from trace (<1 percent) to moderate (6 to 25 percent) coverage. Gypsy-flower, oxeye daisy, and yellowflag iris were found at trace (<1) percent cover at less than 0.1 acre in size. Eight infestations of gypsy-flower, two areas of oxeye daisy, and one area of yellowflag iris were mapped. Sulfur cinquefoil was identified in two areas at less than 0.1 acre to 1.0 acre, and a range of low (1 to 5 percent) to moderate (6 to 25 percent) cover in 2013. Extensive weed control has been conducted on this site every year since 2009. Weed control was conducted at this site in June and again in late July of 2013.

Wetland and riparian vegetation were 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 transects established along the edges of the wetland swale encompassing creation and enhancement mitigation areas. Woody species plantings occurred along the edge of the wetland corridor and on the berms associated with log crib structures constructed within the site. The majority of the planted species along the upland/wetland boundary have died over the monitoring period. Approximately 15 live speckled alder, 20 live Wood's rose, and 3 red-osier dogwood were observed in 2013. The living plantings looked healthy with moderate to vigorous growth for the season and few discolored leaves. Speckled alder and Wood's rose exhibited the highest survival. Overall survival was considered low based on the visual assessment conducted in 2013.

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 and Ronan silty clay loam. The Colake series are poorly drained soils, occurring in swales and depressions on plains and stream terraces. This series is included on the Montana Hydric Soil List. The Ronan series consists of very deep, well drained soils and was not identified on either the national or Montana hydric soil lists. The map units were generally confirmed by test pit soils at wetland data points.

Data points P-1 through P-4 met the hydric soil criteria. Test pits P-1 and P-3 displayed a black (10 YR 2/1) clay loam soil. The low chroma color was indicative of wetland hydrology according to the 1987 USACE Protocol. The profiles at P-2 and P-4 revealed a black (10 YR 2/1) clay loam with two percent dark grayish brown (10 YR 4/2) depletions in the soil matrix. According to the

1987 USACE Protocols, low chroma colors and presence of redox features were indicative of wetland hydrology at P-2 and P-4.

3.3.4. Wetland Delineation

Four data points were collected in 2013 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 3.09 acres of wetland in 2013, a decrease of 1.41 acres since 2011 (Table 21). Approximately 1.1 acres of this decrease is attributed to previously delineated marginal wetlands being classified as upland habitat in 2013. A portion of this decrease may be associated with refinement in mapping techniques of the wetland boundary along the approximate ¼-mile riparian corridor. Previous mapping efforts at this site were conducted by hand-drawing the wetland boundary on non-orthorectified aerial photographs; the current wetland boundary as presented in this report was GPS'd during the 2013 field survey to provide increased accuracy of this boundary.

Table 21. Aquatic habitat acreages delineated from 2009 to 2011 and 2013 at the CSKT Peterson Wetland Mitigation Site.

Aquatic Habitat	2009	2010	2011	2013
Wetland Area (acres)	3.71	4.18	4.25	3.09

3.3.5. Wildlife

A list of wildlife species observed directly and indirectly at the site from 2008 to 2013 is presented in Table 22. Four red-wing blackbirds and fifteen to twenty Canada geese were observed in 2013. The bird species observed in 2013 are listed in bold type. Two white-tailed deer, a meadow vole, and a plains gartersnake were also observed on site in 2013. Sign and bird activity codes were recorded on the Monitoring Form in Appendix B.

Table 22. Wildlife species observed at the CSKT Peterson Wetland Mitigation Site from 2008 to 2011 and 2013.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog	*Rana luteiventris*
REPTILE	
Plains Gartersnake	***Thamnophis radix***
Terrestrial Gartersnake	*Thamnophis elegans*
INVERTEBRATE	
Unknown crayfish	*Crayfish sp.*
BIRD	
American Kestrel	*Falco sparverius*
American Robin	*Turdus migratorius*
Barn Swallow	*Hirundo rustica*
Canada Goose	***Branta canadensis***

Species identified in 2013 are listed in **bold** type.

Table 22 (continued). Wildlife species observed at the CSKT Peterson Wetland Mitigation Site from 2008 to 2011 and 2013.

COMMON NAME	SCIENTIFIC NAME
BIRD	
Grasshopper Sparrow	*Ammodramus savannarum*
Gray Partridge	*Perdix perdix*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Marsh Wren	*Cistothorus palustris*
Mourning Dove	*Zenaida macroura*
Northern Harrier	*Circus cyaneus*
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-necked Pheasant	*Phasianus colchicus*
Sora	*Porzana carolina*
Sparrow Sp.	
Vesper Sparrow	*Pooecetes gramineus*
Western Bluebird	*Sialia mexicana*
Western Meadowlark	*Sturnella neglecta*
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*
MAMMAL	
Black Bear	*Ursus americanus*
Deer Sp.	
Meadow Vole	***Microtus pennsylvanicus***
Muskrat	*Ondatra zibethicus*
Raccoon	*Procyon lotor*
White-tailed Deer	***Odocoileus virginianus***

Species identified in 2013 are listed in **bold** type.

3.3.6. Functional Assessment

Results of the 2004 (baseline), 2009 to 2011, and 2013 functional assessments are summarized in Table 23. The 2013 Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 25-acre project area is 3.09 acres, a decrease of 1.16 acres from 2011 to 2013.

The Peterson Property was evaluated as one assessment area (AA-1) that encompassed 3.09 acres in 2013. The AA was rated as a Category II wetland in 2013 with 71 percent of the total possible points and 24.10 total functional units. The functional unit gain in 2013 was 17.42. The decrease in total functional units between 2011 and 2013 corresponds with an overall decrease of wetland acreage at the Peterson mitigation site. Functional ratings were high for general wildlife habitat, 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 23. Summary of 2004 (Baseline), 2009 to 2011, and 2013 wetland function/value ratings and functional points at the CSKT Peterson Wetland Mitigation Site.

Function and Value Parameters from the MDT Montana Wetland Assessment Method (1999)	2004 (Baseline) (AA-1)	2009 (AA-1)	2010 (AA-1)	2011 (AA-1)	2013 (AA-1)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	Low (0.5)	Mod (0.7)	Mod (0.7)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	Low (0.1)	NA	NA	NA	NA
Flood Attenuation	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.5)
Short and Long Term Surface Water Storage	Mod (0.4)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (1.0)
Sediment/Shoreline Stabilization	High (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Production Export/Food Chain Support	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.3)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	Low (0.1)	Mod (0.5)	High (1.0)	High (1.0)	High (1.0)
Actual Points / Possible Points	**5.3 / 12**	**6.8 / 11**	**7.4 / 11**	**7.6 / 11**	**7.8 / 11**
% of Possible Score Achieved	**44%**	**61%**	**67%**	**69%**	**71%**
Overall Category	**III**	**III**	**II**	**II**	**II**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	**1.26**	**3.71**	**4.18**	**4.25**	**3.09**
Total Functional Units (acreage x actual points) **(fu)**	**6.68**	**25.23**	**30.93**	**32.30**	**24.10**
Net Acreage Gain (ac)	NA	**2.45**	**2.92**	**2.99**	**1.83**
Net Functional Unit Gain	NA	**18.55**	**24.25**	**25.62**	**17.42**

3.3.7. Photo Documentation

Photographs of photo points PP1 to PP6 (Figure 8, Appendix A) and of the transect endpoints are shown on pages C-22 to C-27 of Appendix C.

3.3.8. Maintenance Needs

The location of Priority 2A, yellowflag iris, and Priority 2B noxious weed infestations of Canadian thistle, sulfur cinquefoil (*Potentilla recta*), and oxeye daisy and gypsy-flower (houndstongue), observed during 2013 field monitoring were mapped on Peterson Figure 9, Appendix A. The size of the eight Canadian thistle infestations were generally less than 0.1 acre in 2013. The percent cover ranged from trace (<1 percent) to moderate (6 to 25 percent) coverage. Gypsy-flower, oxeye daisy, and yellowflag iris were found at trace (<1) percent cover at less than 0.1 acre in size. Eight infestations of gypsy-flower, two areas of oxeye daisy, and one area of yellowflag iris were mapped. Sulfur cinquefoil was identified in two areas at less than 0.1 acre to 1.0 acre, and a range of low (1 to 5 percent) to moderate (6 to 25 percent) cover in 2013. MDT had conducted weed control efforts at this site every year since 2009. Weed control was conducted in June and again in late July of 2013. It is suggested that weed control efforts continue in 2014.

Per conversation with MDT personnel, five of the twelve log crib structures have failed. Water has been observed flowing under or through the log cribs and are not impounding water behind the structures and spreading the water across the floodplain. A subsequent decrease in wetland areas around these structures has been documented and it is recommended that MDT repair the impaired log cribs. A majority of the browse protection was intact and functioning. Some of the protectors were partially damaged. The vegetation growth may be stunted by some of the browse covers and removal is recommended.

3.3.9. Current Credit Summary

The wetland acreage delineated in 2013 totaled 3.09 acres, a decrease of 1.16 acres since 2011. The net acreage gain from 2004 to 2013 was 1.83 acres and the functional unit gain was 16.80. Table 24 summarizes the 2013 estimated credits for the Peterson site. The 2011 estimated credits were separated into individual mitigation types. The acreages were calculated for each type and credit ratios were applied for the CSKT and USACE crediting systems. The Peterson mitigation types were creation and rehabilitation for the USACE system and creation 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. The formula was developed to measure the post-construction functional lift expected to occur after rehabilitation of the mitigation site.

Enhancement factor = $(F_{post} - F_{pre}) / F_{pre}$
Enhancement factor = (7.6 – 5.3) / 5.3; Enhancement factor = 0.43
Enhancement ratio = 1/ 0.43 = 2.33

The site has earned 2.38 USACE credit acres and 1.22 CSKT credit acres to date. The 2013 credit estimates have not yet exceeded the USACE and CSKT projected acreages for the mitigation site.

Table 24. Credit summary for 2009 to 2011 and 2013 at the CSKT Peterson Property Wetland Mitigation Site.

Targeted Mitigation Type	2009 Wetland (acre)	2010 Wetland (acre)	2011 Wetland (acre)	2013 Wetland (acre)	Credit Ratio	
					USACE	CSKT
Creation	2.46	2.93	3.00	1.84	1:1	3.36:1
Rehabilitation/ secondary restoration	1.25	1.25	1.25	1.25	3.57:1 (2009) 2.50:1 (2010) 2.33:1 (2011) 2.33:1 (2013)	1.86:1
Total	**3.71**	**4.18**	**4.25**	**3.09**	**--**	**--**

Table 24 (Continued). Credit summary for 2009 to 2011 and 2013 at the CSKT Peterson Property Wetland Mitigation Site.

Targeted Mitigation Type	2009 Credit (acre)		2010 Credit (acre)		2011 Credit (acre)		2013 Credit (acre)		Projected Credit (acre)	
	USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	2.46	0.73	2.93	0.87	3.00	0.89	1.84	0.55	2.14	0.64
Rehabilitation/ secondary restoration	0.35	0.67	0.50	0.67	0.54	0.67	0.54	0.67	0.25	0.67
Total	**2.81**	**1.40**	**3.43**	**1.54**	**3.54**	**1.56**	**2.38**	**1.22**	**2.39**	**1.31**

4. REFERENCES

Berglund, J. and R. McEldowney. 2008. MDT Montana Wetland Assessment Method. Prepared for Montana Department of Transportation, Helena, Montana. Post, Buckley, Schuh, & Jernigan, Helena, Montana. 42pp.Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. U.S. Army Corps of Engineers. Washington, DC.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. U.S.D.I Fish and Wildlife Service. Washington D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers. Washington, DC.

Lichvar, Robert W. and Kartesz, John T. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, Downloaded from National Wetland Plant List website 5/9/12. Effective June 1, 2012 through September 1, 2013.

Reed, P.B. 1988. *National list of plant species that occur in wetlands: North West (Region 9)*. Biological Report 88(26.9), May 1988. U.S. Fish and Wildlife Service, Washington, DC.

US Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3.Vicksburg, MS: US Army Engineer Research and Development Center

WEBSITES:

United States Department of Agriculture-Natural Resource Conservation Service. Web Soil Survey for Lake County, Montana. Accessed in September 2013 at: http://websoilsurvey.nrcs.usda.gov/app/.

Weather Underground. Provisional Precipitation Data for Missoula 2NE Weather Station. Accessed in December 2013 at: http://www.wunderground.com/

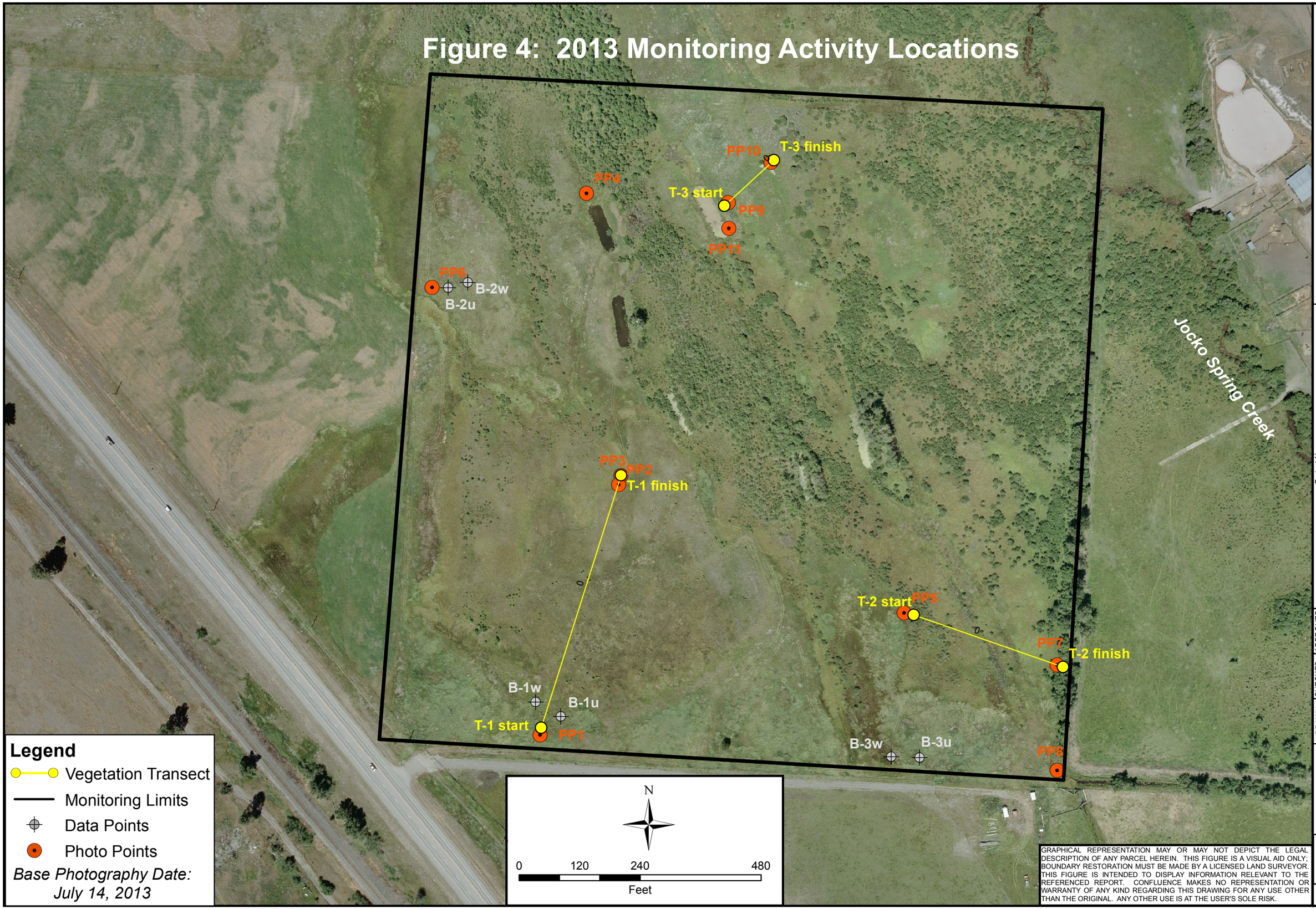
Western Regional Climate Center. United States Historical Climatology Network. Reno, Nevada. Accessed in December 2013 at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mt5735.

Appendix A

Figures 4 through 9

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

Figure 4: 2013 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Data Points
- Photo Points

Base Photography Date: July 14, 2013

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

PROJ NO: NH 5-2(120)20

FILE: Bouchard/Monitor2013.mxd

Project Name
Bouchard Wetland Mitigation Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	GH	LU

SCALE: Noted

Drawn: September 30, 2013

PROJ MGR: B Sandefur

CONFLUENCE
consulting Incorporated

Figure 4

REV -

Figure 5: 2013 Mapped Site Features

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 14, 2013

Noxious Weeds
- Hypericum perforatum
- Cirsium arvense
- Cynoglossum officinale
- Centaurea maculosa
- Leucanthemum vulgare

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 (6-25% cover)
- H = High (26-100% cover)

Acreages

Project Area	41.13 acres
Wetlands	35.14 acres
Uplands	5.89 acres

Vegetation Community Types

1 Elymus repens/Agrostis stolonifera
2 Deschampsia cespitosa/Juncus spp.
3 Juncus spp./Eleocharis palustris
4 Juncus arcticus/Cirsium arvense
5 Carex spp.
6 Betula occidentalis/Juncus arcticus
8 Populus spp.
10 Aquatic Macrophytes
11 Cirsium arvense/Elymus repens
12 Alnus incana/Carex spp.

Jocko Spring Creek

N

0 120 240 480
Feet

LOCATION: Lake Co., MT
PROJECT NO: NH 5-2(120)20
FILE: Bouchard/Veg2013.mxd

Project Name: Bouchard Wetland Mitigation Site
Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	GH	LU

SCALE: Noted
Drawn: September 17, 2013
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 5

REV -

Figure 6: 2013 Monitoring Activity Locations

N

0 50 100 200

Feet

PP3
PP2
T-1 start
MC-1
PP8
PP9
PP10
PP11
MC-2
MC-3
PP13
PP12
PP1
PP7
PP6
PP5
PP4
T-1 finish

Legend

- Vegetation Transect
- Monitoring Limits
- Data Points
- Photo Points

Base Photography Date: July 14, 2013

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/Monitor2013.mxd

Project Name
Mud Creek Wetland Mitigation Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	GH	LU

SCALE: Noted

Drawn: September 30, 2013

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 6

REV -

Figure 7: 2013 Mapped Site Features

Legend

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

Base Photography Date: July 14, 2013

Noxious Weeds
- Cirsium arvense
- Chrysanthemum leucanthemum
- Centaurea maculosa
- Iris pseudacorus

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 (6-25% cover)
- H= High (26-100% cover)

Vegetation Community Types

1 Juncus arcticus/Agrostis stolonifera
4 Juncus spp./Carex spp.
5 Carex spp.
6 Crataegus douglasii/Phalaris arundinacea
9 Cirsium arvense/Juncus arcticus
10 Phalaris arundinacea
11 Scirpus microcarpus/Phalaris arundinacea
12 Phalaris arundinacea/Bromus inermis

Acreages

Project Area	2.60 acres
Gross Wetlands	2.20 acres
Mud Creek (8)	0.08 acres
Net Wetlands	2.12 acres
Uplands	0.40 acres

N

0 50 100 200

Feet

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/Veg2013.mxd

Project Name: Mud Creek Wetland Mitigation Site

Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	GH	LU

SCALE: Noted

Drawn: September 30, 2013

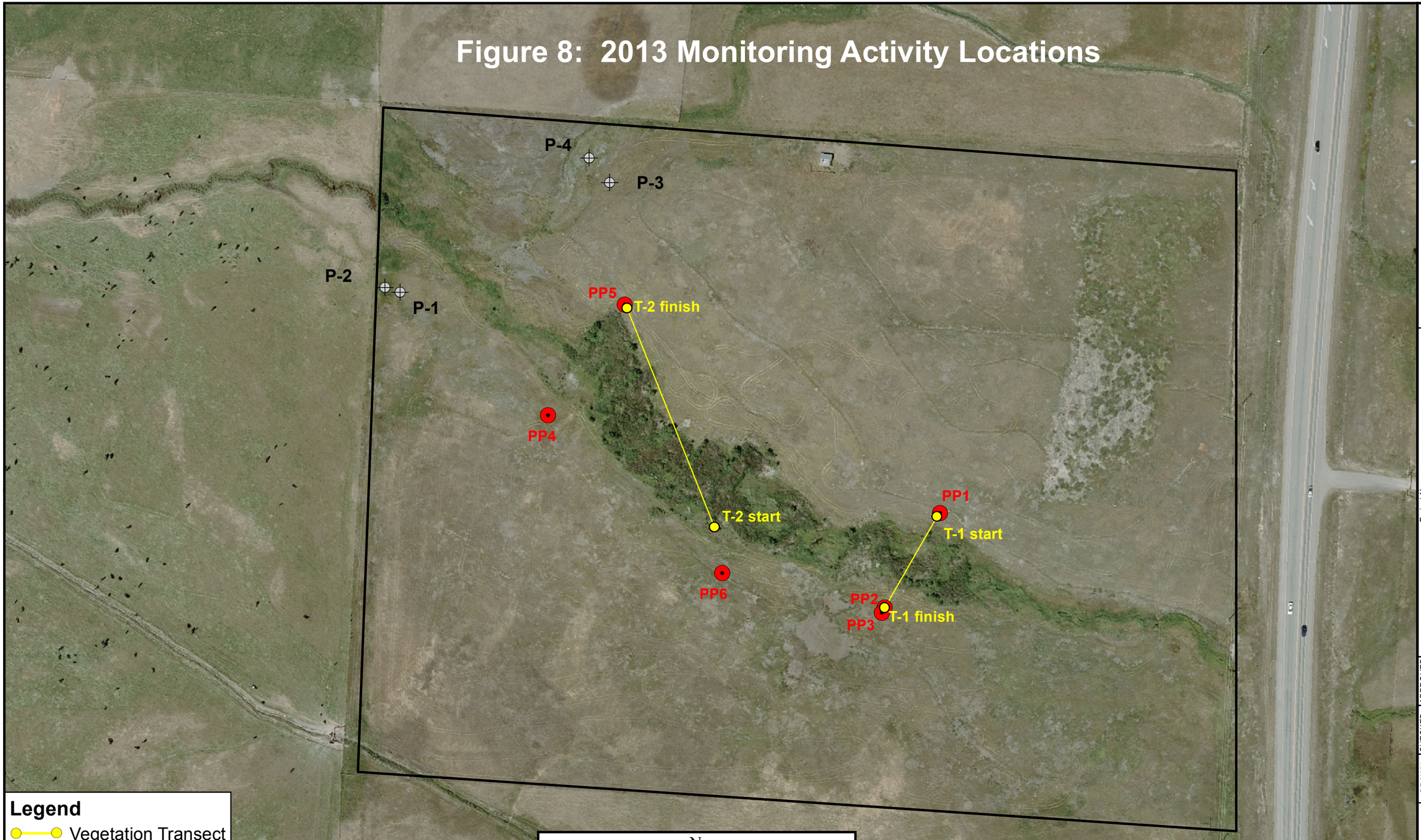
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 7

REV -

Figure 8: 2013 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Data Points
- Photo Points

Base Photography Date: July 14, 2013

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: Peterson/Monitor2013.mxd

Project Name: US-93 Peterson Mitigation Site

Drawing Title: 2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	GH	LU

SCALE: Noted

Drawn: September 17, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 8

REV -

Figure 9: 2013 Mapped Site Features

Legend

Monitoring Limits

Wetland Limits

Vegetation Communities

Base Photography Date: July14, 2013

Noxious Weeds

Cirsium arvense

Cynoglossum officinale

Chrysanthemum leucanthemum

Iris pseudacorus

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 (6-25% cover)

H = High (26-100% cover)

Vegetation Community Types

2 Phalaris arundinacea

4 Carex nebrascensis/Poa palustris

7 Elymus repens/Poa pratensis

8 Typha latifolia/Phalaris arundinacea

9 Nasturtium officinale/Carex nebrascensis

10 Elymus repens/Sisymbrium altissimum

N

0 100 200 400

Feet

Acreages

Project Area	25.01 acres
Wetland Area	3.09 acres
Uplands	21.92 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.

LOCATION: Lake Co., MT

PROJECT NO: NH 5-2(122)31

FILE: US93Peterson/Veg2013.mxd

Project Name: US-93 Peterson Mitigation Site

Drawing Title: 2013 Mapped Site Features

DRAWN BCS | CHECKED GH | APPROVED LU

SCALE: Noted

Drawn: September 30, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 9

REV -

Appendix B

2013 MDT Wetland Mitigation Site Monitoring Form
2013 USACE Routine Wetland Determination Data Form
2013 MDT Montana Wetland Assessment Form

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

BOUCHARD DATA FORMS

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Bouchard Assessment Date/Time 7/30/2013 9:00:00 AM

Person(s) conducting the assessment: G. Howard

Weather: Sunny with smoky haze, high 80' Location: Arlee, MT

MDT District: Missoula Milepost: 20.5

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

Initial Evaluation Date: 7/29/2008 Monitoring Year: 5 #Visits in Year: 1

Size of Evaluation Area: 41 (acres)

Land use surrounding wetland:

Roadway (US 93); Agriculture / pasture land; and residential housing

HYDROLOGY

Surface Water Source: Jocko Spring Creek

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

Percent of assessment area under inundation: 70 %

Depth at emergent vegetation-open water boundary: 1 **(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**:**

Water-stained leaves.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

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:

Expanded inundated areas on the south side of the project. Hydrology sourced by groundwater seepage.

VEGETATION COMMUNITIES

Site Bouchard

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

Community # 1 **Community Type:** Elymus repens / Agrostis stolonifera **Acres** 5.61

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agrostis stolonifera	4
Alyssum alyssoides	1	Bassia scoparia	0
Bromus carinatus	1	Bromus inermis	3
Bromus tectorum	0	Carduus nutans	0
Centaurea maculosa	0	Cirsium arvense	1
Cynoglossum officinale	0	Deschampsia cespitosa	0
Dipsacus sylvestris	0	Elymus repens	5
Elymus trachycaulus	2	Hypericum perforatum	0
Lepidium perfoliatum	3	Phleum pratense	0
Plantago major	0	Poa pratensis	2
Verbascum thapsus	1		

Comments:

Upland community dominated by pasture grasses with inclusion of noxious weeds in patches. Upland island added in NW corner.

Community # 2 **Community Type:** Deschampsia cespitosa / Juncus spp. **Acres** 2.17

Species	Cover class	Species	Cover class
Alnus incana	0	Alopecurus pratensis	1
Betula occidentalis	0	Calamagrostis canadensis	1
Carex lasiocarpa	1	Carex nebrascensis	0
Carex praegracilis	0	Carex retrorsa	0
Carex utriculata	1	Carex vesicaria	0
Cirsium arvense	0	Cornus alba	0
Dasiphora fruticosa	0	Deschampsia cespitosa	5
Eleocharis palustris	0	Elymus repens	1
Epilobium ciliatum	0	Geum macrophyllum	0
Hypericum perforatum	0	Juncus arcticus	2
Juncus ensifolius	2	Juncus tenuis	2
Salix bebbiana	0	Solanum dulcamara	0
Typha latifolia	0		

Comments:

Wetland area has expanded to the south since previous monitoring. Increase in C.T. 2 areas.

Community # 3 **Community Type:** Juncus spp. / Eleocharis palustris **Acres** 2.24

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Alnus incana	0
Betula occidentalis	0	Carex lasiocarpa	0
Carex nebrascensis	3	Carex stipata	0
Carex utriculata	1	Cornus alba	0
Eleocharis palustris	3	Epilobium ciliatum	0
Equisetum arvense	2	Glyceria striata	0
Juncus arcticus	3	Juncus ensifolius	2
Juncus tenuis	3	Salix bebbiana	0
Scirpus microcarpus	0	Typha latifolia	0

Comments:

Community # 4 **Community Type:** Juncus arcticus / Cirsium arvense **Acres** 4.51

Species	Cover class	Species	Cover class
Carduus nutans	0	Cirsium arvense	2
Cynoglossum officinale	1	Dasiphora fruticosa	0
Elymus repens	2	Geum macrophyllum	1
Hypericum perforatum	0	Juncus arcticus	4
Leucanthemum vulgare	1	Plantago major	1
Poa pratensis	3	Solanum dulcamara	1
Solidago canadensis	1	Sonchus arvensis	0

Comments:

Community # 5 **Community Type:** Carex spp. / **Acres** 9.66

Species	Cover class	Species	Cover class
Alnus incana	1	Alopecurus pratensis	0
Angelica arguta	1	Betula occidentalis	2
Calamagrostis canadensis	0	Carex lasiocarpa	1
Carex nebrascensis	1	Carex praegracilis	1
Carex retrorsa	1	Carex utriculata	5
Carex vesicaria	1	Cirsium arvense	0
Cornus alba	0	Crataegus douglasii	0
Dasiphora fruticosa	1	Deschampsia cespitosa	0
Eleocharis palustris	0	Epilobium ciliatum	0
Geum macrophyllum	1	Hypericum perforatum	0
Juncus acuminatus	2	Juncus arcticus	2
Juncus ensifolius	0	Juncus tenuis	0
Lycopus americanus	0	Mentha arvensis	1
Ribes hudsonianum	0	Ribes sp.	0
Rubus idaeus	0	Rumex crispus	0
Salix bebbiana	2	Solanum dulcamara	0
Typha latifolia	1		

Comments:

Community # 6 **Community Type:** Betula occidentalis / Juncus arcticus **Acres** 14.19

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alnus incana	1
Betula occidentalis	5	Carex nebrascensis	0
Carex retrorsa	1	Carex utriculata	3
Carex vesicaria	2	Cirsium arvense	0
Cornus alba	1	Dasiphora fruticosa	3
Epilobium ciliatum	1	Equisetum hyemale	0
Geum macrophyllum	0	Hypericum perforatum	0
Juncus arcticus	3	Juncus tenuis	2
Mentha arvensis	0	Mimulus guttatus	0
Salix bebbiana	2	Solanum dulcamara	0
Solidago canadensis	1		

Comments:

Community # 8 **Community Type:** Populus spp. / **Acres** 1.09

Species	Cover class	Species	Cover class
Carex nebrascensis	1	Carex utriculata	2
Populus balsamifera	5	Populus tremuloides	3

Comments:

Community # 10 Community Type: Aquatic macrophytes / **Acres** 0.36

Species	Cover class	Species	Cover class
Algae, brown	2	Algae, green	2
Lemna minor	1	Open Water	5
Typha latifolia	0		

Comments:

Community # 11 Community Type: Cirsium arvense / Elymus repens **Acres** 0.37

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis stolonifera	2
Alopecurus pratensis	0	Carduus nutans	0
Carex utriculata	0	Cirsium arvense	5
Cynoglossum officinale	0	Elymus repens	4
Juncus arcticus	1	Leucanthemum vulgare	0
Mentha arvensis	0	Poa pratensis	1
Rumex crispus	0	Salix bebbiana	0
Solidago canadensis	1	Verbascum thapsus	0

Comments:

Community # 12 Community Type: Alnus incana / Carex spp. **Acres** 0.92

Species	Cover class	Species	Cover class
Alnus incana	5	Betula occidentalis	2
Carex lasiocarpa	1	Carex utriculata	5
Carex vesicaria	2	Cornus alba	0
Glyceria striata	0	Typha latifolia	1

Comments:

Total Vegetation Community Acreage **41.12**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.

VEGETATION TRANSECTS

Site: Bouchard Date: 7/30/2013 9:00:00 AM

Transect Number: 1 **Compass Direction from Start:** 135

Interval Data:

Ending Station 33 **Community Type:** Deschampsia cespitosa / Juncus spp.

Species	Cover class	Species	Cover class
Alnus incana	1	Betula occidentalis	2
Carex nebrascensis	1	Carex retrorsa	1
Carex utriculata	5	Carex vesicaria	1
Dasiphora fruticosa	1	Deschampsia cespitosa	2
Geum macrophyllum	1	Juncus arcticus	2
Juncus tenuis	2	Salix bebbiana	2
Solanum dulcamara	1	Typha latifolia	1

Ending Station 56 **Community Type:** Elymus repens / Agrostis stolonifera

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agrostis stolonifera	3
Bromus inermis	3	Cirsium arvense	0
Deschampsia cespitosa	1	Elymus repens	5
Elymus trachycaulus	2		

Ending Station 310 **Community Type:** Deschampsia cespitosa / Juncus spp.

Species	Cover class	Species	Cover class
Alnus incana	1	Alopecurus pratensis	1
Betula occidentalis	1	Calamagrostis canadensis	1
Carex lasiocarpa	1	Carex utriculata	2
Cirsium arvense	0	Cornus alba	0
Deschampsia cespitosa	5	Eleocharis palustris	1
Epilobium ciliatum	1	Hypericum perforatum	1
Juncus arcticus	1	Juncus ensifolius	2
Juncus tenuis	3		

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

Species	Cover class	Species	Cover class
Alnus incana	0	Betula occidentalis	1
Carex lasiocarpa	1	Carex stipata	0
Carex utriculata	1	Cornus alba	0
Eleocharis palustris	3	Equisetum arvense	2
Glyceria striata	0	Juncus arcticus	3
Juncus ensifolius	2	Juncus tenuis	4
Salix bebbiana	0	Scirpus microcarpus	0
Typha latifolia	0		

Ending Station 526 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Alnus incana	0	Alopecurus pratensis	1
Betula occidentalis	0	Calamagrostis canadensis	1
Carex lasiocarpa	0	Carex praegracilis	0
Carex utriculata	2	Cirsium arvense	0
Cornus alba	0	Crataegus douglasii	
Deschampsia cespitosa	5	Eleocharis palustris	1
Epilobium ciliatum	0	Hypericum perforatum	1
Juncus arcticus	1	Juncus ensifolius	2
Juncus tenuis	3		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 75

Interval Data:

Ending Station 110 **Community Type:** Betula occidentalis / Juncus arcticus

Species	Cover class	Species	Cover class
Betula occidentalis	0	Carex nebrascensis	0
Equisetum hyemale	0	Geum macrophyllum	1
Hypericum perforatum	0	Solidago canadensis	0

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

Species	Cover class	Species	Cover class
Alnus incana		Angelica arguta	0
Carex nebrascensis	2	Carex utriculata	5
Cirsium arvense	0	Lycopus americanus	0
Mentha arvensis	0	Ribes hudsonianum	0
Rubus idaeus	1		

Transect Notes:

Transect Number: 3 **Compass Direction from Start:** 40

Interval Data:

Ending Station 14 **Community Type:** Juncus arcticus / Cirsium arvense

Species	Cover class	Species	Cover class
Carduus nutans	4	Cirsium arvense	5
Elymus repens	2	Juncus arcticus	3

Ending Station 133 **Community Type:** Cirsium arvense / Elymus repens

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Carduus nutans	0
Cirsium arvense	5	Cynoglossum officinale	0
Elymus repens	4	Juncus arcticus	1
Leucanthemum vulgare	2	Mentha arvensis	1
Verbascum thapsus	0		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Bouchard

Planting Type	#Planted	#Alive	Notes
Alnus incana		49	Vigorous growth for the season
Betula occidentalis	817	65	Vigorous growth for the season
Cornus alba	408	56	Vigorous growth for the season
Crataegus douglasii			
Ribes hudsonianum	245	5	
Rosa woodsii		2	
Salix bebbiana		9	Vigorous growth for the season
Salix lutea		33	Vigorous growth for the season
Salix spp.	408		
Symphoricarpos albus			

Comments

The woody plantings continue to increase in stature and cover values. Vigorous growth for the season on survivors.

Bouchard

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 Robin	1	F, FO	UP
Red-winged Blackbird	7	L	MA
Song Sparrow	10	N	SS
Swainson's Hawk	1	FO	SS

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
Deer Sp.		Yes	Yes	No	
Plains Gartersnake	1	No	No	No	

Wildlife Comments:

Bouchard

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
2054	47.199974	-114.106392	0	PP-1, T-1 start
2056	47.201225	-114.1054	0	PP-2, T-1 end
2057	47.201469	-114.105797	270	PP-3
2058-61	47.201427	-114.105797	90	PP-3, pano
2062	47.199974	-114.106415	0	B-1u
2063	47.200226	-114.106407	0	B-1w
2064	47.200695	-114.103531	135	PP-5, T-2 start
2065	47.200695	-114.103531	180	PP-5
2066	47.200504	-114.10231	270	PP-7
2067	47.199936	-114.102272	100	PP-8
2068	47.199936	-114.102272	0	PP-8
2069	47.20282	-114.104996	135	PP-9
2070-72	47.202946	-114.1045	320	PP-9
2073	47.202961	-114.104965	135	PP-10
2074	47.202728	-114.105202	320	PP-11
2075	47.202927	-114.106178	140	PP-4
2076	47.20237	-114.107521	140	PP-6

Comments:

Bouchard

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

Wetland areas expanded on the south side. Paired sampling points (SP7) completed for expanded wetlands. Pair sampling points (SP6 [labeled as C1-u & -w in the subs_MVC DB) completed for the new upland island and expansion of uplands with C.T. 4.

Functional Assessments

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

Functional Assessment Comments:

The functional ratings for the site remained similar with a category II rating.

Maintenance

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

If yes, do they need to be repaired?

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 in need of repair?

If yes, describe the problems below.

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

Project/Site: Bouchard | City/County: Arlee - Lake | Sampling Date: 7/30/2013

Applicant/Owner: MDT | State: MT | Sampling Point: B-1u

Investigator(s): G. Howard | Section, Township, Range: S 26 T 17N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): LLR E | Lat: 47.200071 | Long: -114.1061889 | Datum: WGS84

Soil Map Unit Name: Lamoose loam, 0 to 2% slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Sampling point considered within an upland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Elymus repens	85	☑	FAC
2. Agrostis stolonifera	10	☐	FAC
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	95 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Sampling plot calculated as hydrophytic vegetation, but considered as marginal wetland species due to dominance of mostly FAC rated species.

SOIL

Sampling Point: B-1u

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					Silt Loam	
16-24	10YR 2/1	100					Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Endoaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Thick dark surface, hit restrictive layer at 24 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): _____

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: No indication of surface water or moisture in pit.

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

Project/Site: Bouchard | City/County: Arlee - Lake | Sampling Date: 7/30/2013

Applicant/Owner: MDT | State: MT | Sampling Point: B-1w

Investigator(s): G. Howard | Section, Township, Range: S 26 T 17N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): flat | Slope (%): 0

Subregion (LRR): LLR E | Lat: 47.20014 | Long: -114.106395 | Datum: WGS84

Soil Map Unit Name: Lamoose loam, 0 to 2% slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Carex utriculata	50	☑	OBL
2. Carex praegracilis	5	☐	FACW
3. Agrostis stolonifera	15	☐	FAC
4. Juncus arcticus	25	☑	FACW
5. Achillea millefolium	1	☐	FACU
6. Cirsium arvense	1	☐	FAC
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	97 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation considered hydrophytic.

SOIL

Sampling Point: B-1w

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					Silt Loam	
16-20	10YR 3/1	97	10YR 4/4	3	C	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Endoaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Hydric soils indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☑	No ☐	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 6

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Hydrology indicator present with soil saturated to 6in below ground surface.

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

Project/Site: Bouchard | City/County: Arlee - Lake | Sampling Date: 8/7/2013

Applicant/Owner: MDT | State: MT | Sampling Point: B-2u

Investigator(s): G. Howard | Section, Township, Range: S 26 T 17N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): flat | Slope (%): 0

Subregion (LRR): LLR E | Lat: 47.202377 | Long: -114.107294 | Datum: NAD 83

Soil Map Unit Name: Lamoose loam, 0 to 2% slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Sampling plot considered wtihin an upland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Elymus repens	90	☑	FAC
2. Poa pratensis	5	☐	FAC
3. Agrostis stolonifera	5	☐	FAC
4. Carduus nutans	1	☐	UPL
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	101 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Sampling plot calculated as hydrophytic vegetation, but considered as marginal wetland species due to dominance of mostly FAC rated specie.

SOIL

Sampling Point: B-2u

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	100					Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Endoaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Soil profile was dry and crumbly. No color change throughout the profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): _____

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: Hydrology indicators not present.

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

Project/Site: Bouchard | City/County: Arlee - Lake | Sampling Date: 8/7/2013

Applicant/Owner: MDT | State: MT | Sampling Point: B-2w

Investigator(s): G. Howard | Section, Township, Range: S 26 T 17N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): flat | Slope (%): 0

Subregion (LRR): LLR E | Lat: 47.202406 | Long: -114.107137 | Datum: NAD 83

Soil Map Unit Name: Lamoose loam, 0 to 2% slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Juncus arcticus	70	☑	FACW
2. Poa pratensis	20	☑	FAC
3. Cirsium arvense	5	☐	FAC
4. Elymus repens	1	☐	FAC
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	96 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation considered hydrophytic.

SOIL

Sampling Point: B-2w

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Clay Loam	
8-12	10YR 4/1	98	10YR 4/4	2	C	M	Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Endoaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 12

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Hydrology indicator present with soil saturated approx 12 in below the ground surface

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

Project/Site: Bouchard | City/County: Arlee - Lake | Sampling Date: 8/7/2013

Applicant/Owner: MDT | State: MT | Sampling Point: B-3u

Investigator(s): G. Howard | Section, Township, Range: S 26 T 17N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): LLR E | Lat: 47.199884 | Long: -114.103313 | Datum: NAD 83

Soil Map Unit Name: Lamoose loam, 0 to 2% slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Sampling point considered within an upland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Elymus repens	70	☑	FAC
2. Agrostis stolonifera	15	☐	FAC
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	85 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Sampling plot calculated as hydrophytic vegetation, but considered as marginal wetland species due to dominance of mostly FAC rated species.

SOIL

Sampling Point: B-3u

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Endoaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Hydric soils indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): _____

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: Hydrology indicators not present.

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

Project/Site: Bouchard | City/County: Arlee - Lake | Sampling Date: 8/7/2013

Applicant/Owner: MDT | State: MT | Sampling Point: B-3w

Investigator(s): G. Howard | Section, Township, Range: S 26 T 17N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): LLR E | Lat: 47.19987 | Long: -114.10353 | Datum: NAD 83

Soil Map Unit Name: Lamoose loam, 0 to 2% slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Carex lasiocarpa	40	☑	OBL
2. Elymus repens	25	☑	FAC
3. Agrostis stolonifera	20	☐	FAC
4. Carex nebrascensis	10	☐	OBL
5. Juncus arcticus	10	☐	FACW
6. Alopecurus pratensis	5	☐	FAC
7. Poa pratensis	1	☐	FAC
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	111 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: B-3w

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	95	10YR 4/6	5	C	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Endoaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Hydric soil indicators present with mottling

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☑ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2

Water Table Present? Yes ☐ No ☑ Depth (inches):

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Hydrology indicator present with soil saturated to the ground surface

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

1. Project name US 93 - Bouchard **2. MDT project#** NH 5-2(120)20 **Control#**

3. Evaluation Date 7/30/2013 **4. Evaluators** G. Howard **5. Wetland/Site# (s)** AA-1

6. Wetland Location(s): T 17N **R** 20W **Sec1** 26 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 17010212 **Watershed/County** Flathead Watershed/ Lake County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 35.14

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 35.14

How assessed: Measured e.g. by GPS

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	Emergent Wetland	Excavated	seasonally flooded	45
Riverine	Palustrine	none	Scrub-Shrub Wetland		seasonally flooded	40
Riverine	Palustrine	none	Forested Wetland		seasonally flooded	10
Depressional	Palustrine	none	Aquatic Bed	Excavated	Permanently flooded	5

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

12. General Condition of AA

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

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)

AA consists of a complex of created and enhanced emergent, scrub-shrub, and forested wetland communities located adjacent to the Jocko Spring Creek. Site construction completed in 2006 and AA managed in a natural state since construction.

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

Cirsium arvense, Cynoglossum officinale, Centaurea maculosa, Leucanthemum vulgare, and Hypericum perforatum.

iii. Brief descriptive summary of surrounding land use/habitat

The AA is bordered by the US 93 Corridor to the west, and pasture, agricultural buildings and farmland to the north, south, and east.

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: Vegetation classes include emergent, forested, scrub-shrub, and aquatic bed.

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 basedon definition contained in instructions):

Primary or critical habitat (list species)	**D S**	
Secondary habitat (list Species)	**D S**	
Incidental habitat (list species)	**D S**	Grizzly Bear (LT); Canada Lynx (LT)
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 USFWS County List; MNHP

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species)	**D S**	
Secondary habitat (list Species)	**D S**	Great Blue Heron
Incidental habitat (list species)	**D S**	Western Toad (S2); Bobolink (S3B)
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 MNHP Species of Concern Report. Great blue heron rookery located nearby on the Jocko River, suspected use of the site for foraging and feeding.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA Moderate

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			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #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 Moderate wildlife use of the site by birds and animals.

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		
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
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		
% of flooded wetland classified as forested, scrub/shrub, or both	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		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	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: AA routinely ponds with water from groundwater seepage.

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.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
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: AA well-vegetated with evidence of ponding.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body 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 **wetland** 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: No shoreline or ponding subject to wave action.

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					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	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: The high category rating is based on structural diversity, size of the AA and perennial hydrology source.

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: Groundwater influenced by adjacent Jocko Spring Creek and up valley irrigators.

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)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
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)

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

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

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

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

Final Rating:

.5M

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	10.542
B. MT Natural Heritage Program Species Habitat	M	.6	1	21.084
C. General Wildlife Habitat	M	.7	1	24.598
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	31.626
G. Sediment/Nutrient/Toxicant Removal	H	1	1	35.14
H. Sediment/Shoreline Stabilization	NA	0	0	0
I. Production Export/Food Chain Support	H	.9	1	31.626
J. Groundwater Discharge/Recharge	H	1	1	35.14
K. Uniqueness	M	.5	1	17.57
L. Recreation/Education Potential	M	.5	1	17.57
Totals:		6.4	9	224.896
Percent of Possible Score		**71.11** %		

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**

MUD CREEK DATA FORMS

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Mud Creek Assessment Date/Time 8/17/2013 9:00:00 AM

Person(s) conducting the assessment: G. Howard

Weather: Partly cloudy, high 80's Location: Pablo

MDT District: Missoula Milepost: 51

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

Initial Evaluation Date: 7/23/2009 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 2.6 (acres)

Land use surrounding wetland:

Pasture land, residential and roadway (US 93 and Old US 93)

HYDROLOGY

Surface Water Source: Mud Creek; groundwater seeps on the west side of the mitigation area

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

Percent of assessment area under inundation: 25 %

Depth at emergent vegetation-open water boundary: 1 **(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**:**

Drainage pattern, drift lines and water-stained leaves

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
No Wells	

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:

VEGETATION COMMUNITIES

Site Mud Creek

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

Community # 1 **Community Type:** Juncus arcticus / Agrostis stolonifera **Acres** 0.07

Species	Cover class	Species	Cover class
Agrostis stolonifera	3	Alnus incana	1
Carex bebbii	0	Carex utriculata	0
Cirsium arvense	1	Cynoglossum officinale	0
Geum macrophyllum	1	Juncus arcticus	5
Lactuca serriola	1	Phalaris arundinacea	2
Poa pratensis	0		

Comments:

Community # 4 **Community Type:** Juncus spp. / Carex spp. **Acres** 0.22

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Carex bebbii	2
Carex nebrascensis	2	Carex praegracilis	2
Carex stipata	2	Carex utriculata	2
Cirsium vulgare	0	Epilobium ciliatum	0
Geum macrophyllum	1	Juncus arcticus	4
Juncus effusus	1	Juncus ensifolius	2
Juncus nodosus	2	Phalaris arundinacea	2
Poa pratensis	0	Typha latifolia	0

Comments:

Community # 5 Community Type: Carexs spp. / **Acres** 0.36

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alnus incana	1
Carex bebbii	1	Carex nebrascensis	2
Carex stipata	1	Carex utriculata	3
Epilobium ciliatum	0	Equisetum arvense	1
Geum macrophyllum	0	Glyceria grandis	2
Impatiens ecalcarata	0	Iris pseudacorus	0
Juncus arcticus	0	Juncus articulatus	2
Juncus ensifolius	1	Juncus tenuis	0
Mentha arvensis	0	Mimulus guttatus	0
Nasturtium officinale	1	Persicaria amphibia	1
Phalaris arundinacea	2	Salix bebbiana	1
Salix drummondiana	0	Salix exigua	1
Schoenoplectus acutus	0	Scirpus microcarpus	3
Typha latifolia	2		

Comments:

Vegetation communities remained mostly similar to previous monitoring. The wetland boundary was modified along Mud Creek near the bridges along C.T. 5 and 12 boundaries. C.T. 5 expanded further up the bank reducing upland areas within C.T. 12 and slightly increasing wetland area.

Community # 6 Community Type: Crataegus douglasii / Phalaris arundinacea **Acres** 0.18

Species	Cover class	Species	Cover class
Cirsium arvense	1	Crataegus douglasii	5
Epilobium ciliatum	0	Geum macrophyllum	1
Nepeta cataria	0	Phalaris arundinacea	5
Scirpus microcarpus	1	Sinapis arvensis	1
Solanum dulcamara	2	Urtica dioica	0

Comments:

Community # 8 Community Type: Mud Creek / **Acres** 0.08

Species	Cover class	Species	Cover class
Elodea sp.	2	Nasturtium officinale	2
Open Water	5	Ranunculus aquatilis	4
Typha latifolia	2	Veronica americana	2

Comments:

Cat-tails growing within the channel.

Community # 9 Community Type: Cirsium arvense / Juncus arcticus **Acres** 0.04

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Carex nebrascensis	1
Carex stipata	1	Cirsium arvense	5
Crataegus douglasii	1	Descurainia sophia	0
Epilobium ciliatum	1	Geum macrophyllum	1
Juncus arcticus	4	Phalaris arundinacea	1
Poa pratensis	1	Sisymbrium altissimum	1
Verbascum thapsus	0		

Comments:

Community # 10 Community Type: Phalaris arundinacea / **Acres** 0.98

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Alnus incana	0
Carex bebbii	0	Carex stipata	0
Carex utriculata	0	Cirsium arvense	0
Cirsium arvense	0	Cirsium vulgare	0
Cirsium vulgare	0	Crataegus douglasii	1
Epilobium ciliatum	0	Geum macrophyllum	0
Glyceria grandis	0	Iris pseudacorus	1
Juncus arcticus	2	Lactuca serriola	0
Leucanthemum vulgare	0	Lysichiton americanus	0
Phalaris arundinacea	5	Plantago major	1
Salix drummondiana	1	Scirpus microcarpus	0
Sisymbrium altissimum	0	Sonchus arvensis	1
Typha latifolia	0		

Comments:

Community # 11 Community Type: Scirpus microcarpus / Phalaris arundinacea **Acres** 0.27

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Carex nebrascensis	1
Carex praegracilis	2	Carex stipata	2
Cirsium arvense	0	Cirsium vulgare	0
Epilobium ciliatum	0	Geum macrophyllum	1
Glyceria striata	0	Phalaris arundinacea	3
Scirpus microcarpus	5		

Comments:

Community # 12 **Community Type:** Phalaris arundinacea / Bromus inermis **Acres** 0.41

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis stolonifera	1
Artemisia cana	0	Bromus inermis	3
Centaurea maculosa	0	Cirsium arvense	0
Cornus alba	0	Dactylis glomerata	0
Deschampsia cespitosa	1	Elymus repens	0
Equisetum arvense	1	Hordeum jubatum	0
Medicago sativa	1	Melilotus officinalis	2
Melilotus sp.	1	Pascopyrum smithii	0
Phalaris arundinacea	4	Poa pratensis	1
Rosa woodsii	0	Solidago canadensis	0

Comments:

Total Vegetation Community Acreage **2.61**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Mud Creek Date: 8/17/2013 9:00:00 AM

Transect Number: 1 **Compass Direction from Start:** 165

Interval Data:

Ending Station 38 **Community Type:** Juncus spp. / Carex spp.

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Carex bebbii	1
Carex praegracilis	1	Carex utriculata	2
Epilobium ciliatum	0	Juncus arcticus	5
Juncus ensifolius	1	Juncus nodosus	1
Phalaris arundinacea	1		

Ending Station 99 **Community Type:** Scirpus microcarpus / Phalaris arundinacea

Species	Cover class	Species	Cover class
Carex nebrascensis	3	Carex praegracilis	2
Carex stipata	1	Cirsium vulgare	0
Epilobium ciliatum	0	Geum macrophyllum	1
Phalaris arundinacea	1	Scirpus microcarpus	5

Ending Station 174 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Cirsium arvense	0
Cirsium vulgare	0	Epilobium ciliatum	3
Geum macrophyllum	3	Juncus arcticus	3
Phalaris arundinacea	5	Scirpus microcarpus	0

Ending Station 254 **Community Type:** Cirsium arvense / Juncus arcticus

Species	Cover class	Species	Cover class
Agrostis stolonifera	3	Carex nebrascensis	1
Cirsium arvense	5	Crataegus douglasii	2
Epilobium ciliatum	0	Geum macrophyllum	0
Juncus arcticus	5	Phalaris arundinacea	2

Ending Station 304 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Alnus incana	2	Cirsium arvense	1
Crataegus douglasii	2	Iris pseudacorus	0
Phalaris arundinacea	5		

Ending Station 310 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Carex nebrascensis	1	Carex stipata	2
Carex utriculata	4	Epilobium ciliatum	0
Glyceria grandis	1	Juncus arcticus	2
Juncus ensifolius	1	Mentha arvensis	2
Phalaris arundinacea	0	Scirpus microcarpus	2

Ending Station 379 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Alnus incana	2
Carex stipata	1	Carex utriculata	1
Cirsium vulgare	0	Glyceria grandis	0
Phalaris arundinacea	5		

Ending Station 386 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Carex stipata	1	Carex utriculata	4
Epilobium ciliatum	1	Glyceria grandis	1
Juncus ensifolius	0	Phalaris arundinacea	2
Typha latifolia	1		

Ending Station 416 **Community Type:** Mud Creek /

Species	Cover class	Species	Cover class
Elodea sp.	2	Nasturtium officinale	2
Ranunculus aquatilis	3	Typha latifolia	1
Veronica americana	2		

Ending Station 428 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Carex bebbii	1	carex stipata	3
Carex utriculata	3	Geum macrophyllum	0
Glyceria grandis	1	Iris pseudacorus	0
Juncus ensifolius	2	Phalaris arundinacea	3
Typha latifolia	0		

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

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Alnus incana	0
Carex bebbii	1	Cirsium arvense	0
Juncus arcticus	2	Lactuca serriola	0
Leucanthemum vulgare	0	Phalaris arundinacea	5
Salix drummondiana	0	Typha latifolia	0

PLANTED WOODY VEGETATION SURVIVAL

Mud Creek

Planting Type	#Planted	#Alive	Notes
Cornus alba	32	2	New vigorous growth for the season.
Populus balsamifera	83	38	New vigorous growth for the season.
Rosa woodsii	31	8	New vigorous growth for the season.
Salix bebbiana	56	9	New vigorous growth for the season.
Salix drummondiana	0	2	New vigorous growth for the season.
Salix exigua	0	32	New vigorous growth for the season.
Salix lutea	54	6	New vigorous growth for the season.
Salix sp.	0	1	New vigorous growth for the season.

Comments

Plantings have moderate browse from wildlife. Survival transect located along the north side of the Mud Creek between the bridges and east side of the bridge.

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
Red-winged Blackbird	1	L	MA

Bird Comments

Minimal observations of birds during the monitoring visit. A red-winged blackbird was loafing on cattails growing within the Mud Creek channel.

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
Deer Sp.		Yes	Yes	No	
Meadow Vole	1	No	No	No	

Wildlife Comments:

Deer tracks and scat observed below the bridge crossings where wildlife crosses underneath.

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
1_(photo id 212	47.58090545	-114.114549916	90	PP1
1_(photo id 212	47.58090545	-114.114549916	0	PP1
1_(photo id 212	47.58090545	-114.114549916	0	PP1
L1_(photo id 213	47.581432709	-114.112993405	90	PP11
L2_(photo id 214	47.581491424	-114.112460697	230	PP12
L3_(photo id 214	47.581491424	-114.112460697	90	PP13
2_(photo id 213	47.581926819	-114.114557992	60	PP2
2_(photo is 213	47.581926819	-114.114557992	130	PP2
3_(photo id 213	47.58211682	-114.113918488	130	PP3
3_(photo id 213	47.58211682	-114.113918488	0	PP3
3_(photo id 213	47.58211682	-114.113918488	270	PP3
4_(photo Id 212	47.58065726	-114.113877584	0	PP4
4_(photo Id 212	47.58065726	-114.113877584	340	PP4
4_(photo Id 212	47.58065726	-114.113877584	340	PP4
5_(photo Id 214	47.581926221	-114.114558058	0	PP5 panoramic
5_(photo Id 214	47.581926221	-114.114558058	0	PP5 panoramic
5_(photo Id 214	47.581926221	-114.114558058	0	PP5 panoramic
5_(photo Id 214	47.581926221	-114.114558058	0	PP5 panoramic
5_(photo Id 214	47.581926221	-114.114558058	0	PP5 panoramic
5_(photo Id 215	47.581926221	-114.114558058	0	PP5 panoramic
5_(photo Id 215	47.581926221	-114.114558058	0	PP5 panoramic
6_(photo id 212	47.580763215	-114.114395148	180	PP6
6_(photo id 214	47.580763215	-114.11439515	45	PP6
7_(photo id 212	47.580809	-114.114282	135	PP7

8_(photo id 212	47.581631844	-114.11438773	340	PP8
9_(photo id 212	47.581442191	-114.114287485	135	PP9

Comments:

Photo Point 10 (PP10) was omitted. The original intent of PP10 was to show the channel and banks in these areas. Currently the banks and adjacent areas in the PP10 view have tall reed canarygrass and the channel is no long visible in the picture view. Photo Point 7 shows a better view of the Mud Creek channel.

Mud Creek

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

Wetland areas expanded along Mud Creek near the bridges and C.T. 5. Paired sampling points (SP4-w & -u) were completed.

Functional Assessments

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

Functional Assessment Comments:

Functional ratings remained the same as previous years.

Maintenance

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

If yes, do they need to be repaired?

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 in need of repair?

If yes, describe the problems below.

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

Project/Site: Mud Creek | City/County: Pablo - Lake Co. | Sampling Date: 8/17/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MC-1

Investigator(s): G. Howard | Section, Township, Range: S 14 T 21N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 1

Subregion (LRR): LLR E | Lat: 47.581916453 | Long: -114.11445431 | Datum: NAD 83

Soil Map Unit Name: Borohemists, 0 to 1 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:
Sampling point considered wtihin a wetland area. Area dominated by emergent vegetation type.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Juncus arcticus	70	☑	FACW
2. Carex praegracilis	25	☑	FACW
3. Poa pratensis	1	☐	FAC
4. Geum macrophyllum	1	☐	FAC
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	97 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation considered hydrophytic.

SOIL

Sampling Point: MC-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Peat	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☑ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Borohemists

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Soils consisting of peat.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

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

Project/Site: Mud Creek | City/County: Pablo - Lake Co. | Sampling Date: 8/17/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MC-2

Investigator(s): G. Howard | Section, Township, Range: S 13 T 21N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 1

Subregion (LRR): LLR E | Lat: 47.581486804 | Long: -114.11256386 | Datum: NAD 83

Soil Map Unit Name: Borohemists, 0 to 1 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Sampling point considered within an upland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Equisetum arvense	60	☑	FAC
2. Phalaris arundinacea	20	☑	FACW
3. Elymus repens	1	☐	FAC
4. Hordeum jubatum	10	☐	FAC
5. Lactuca serriola	1	☐	FACU
6. Agrostis stolonifera	1	☐	FAC
7. Juncus arcticus	1	☐	FACW
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	94 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Sampling plot calculated as hydrophtic vegetation, but considered as marginal wetland species due to the dominance of mostly FAC rated species.

SOIL

Sampling Point: MC-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100	10YR 4/6	5	C	CS	Sand	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☑ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Borohemists

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Soils considered non-hydric due to high chroma matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): _____

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: Hydrology indicators not present.

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

Project/Site: Mud Creek | City/County: Pablo - Lake Co. | Sampling Date: 8/17/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MC-3

Investigator(s): G. Howard | Section, Township, Range: S 13 T 21N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 1

Subregion (LRR): LLR E | Lat: 47.581451572 | Long: -114.112572523 | Datum: NAD 83

Soil Map Unit Name: Borohemists, 0 to 1 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Glyceria grandis	60	☑	OBL
2. Persicaria amphibia	20	☐	OBL
3. Phalaris arundinacea	10	☐	FACW
4. Carex praegracilis	10	☐	FACW
5. Typha latifolia	5	☐	OBL
6. Carex stipata	3	☐	OBL
7. Juncus ensifolius	1	☐	FACW
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	109 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation considered hydrophytic.

SOIL

Sampling Point: MC-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Silt Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☑ Listed on National Soils List
- ☑ Other (explain in remarks)

Taxonomy Subgroup: Borohemists

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Hydric soils present based on NRCS Criteria # 4 - ponded or flooded for long duration. Area flooded by surface waters of Mud Creek.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

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

1. Project name US 93 - Bouchard **2. MDT project#** NH 5-2(120)20 **Control#**

3. Evaluation Date 7/30/2013 **4. Evaluators** G. Howard **5. Wetland/Site# (s)** AA-1

6. Wetland Location(s): T 17N **R** 20W **Sec1** 26 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 17010212 **Watershed/County** Flathead Watershed/ Lake County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 35.14

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 35.14

How assessed: Measured e.g. by GPS

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	Emergent Wetland	Excavated	seasonally flooded	45
Riverine	Palustrine	none	Scrub-Shrub Wetland		seasonally flooded	40
Riverine	Palustrine	none	Forested Wetland		seasonally flooded	10
Depressional	Palustrine	none	Aquatic Bed	Excavated	Permanently flooded	5

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

12. General Condition of AA

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

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)

AA consists of a complex of created and enhanced emergent, scrub-shrub, and forested wetland communities located adjacent to the Jocko Spring Creek. Site construction completed in 2006 and AA managed in a natural state since construction.

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

Cirsium arvense, Cynoglossum officinale, Centaurea maculosa, Leucanthemum vulgare, and Hypericum perforatum.

iii. Brief descriptive summary of surrounding land use/habitat

The AA is bordered by the US 93 Corridor to the west, and pasture, agricultural buildings and farmland to the north, south, and east.

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: Vegetation classes include emergent, forested, scrub-shrub, and aquatic bed.

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 basedon definition contained in instructions):

Primary or critical habitat (list species) ◉ **D** ◉ **S**

Secondary habitat (list Species) ◉ **D** ◉ **S**

Incidental habitat (list species) ○ **D** ◉ **S** Grizzly Bear (LT); Canada Lynx (LT)

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 USFWS County List; MNHP

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species) ◉ **D** ◉ **S**

Secondary habitat (list Species) ○ **D** ◉ **S** Great Blue Heron

Incidental habitat (list species) ○ **D** ◉ **S** Western Toad (S2); Bobolink (S3B)

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 MNHP Species of Concern Report. Great blue heron rookery located nearby on the Jocko River, suspected use of the site for foraging and feeding.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA Moderate

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			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #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 Moderate wildlife use of the site by birds and animals.

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		
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
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		
% of flooded wetland classified as forested, scrub/shrub, or both	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		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	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: AA routinely ponds with water from groundwater seepage.

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.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
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: AA well-vegetated with evidence of ponding.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body 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 **wetland** 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: No shoreline or ponding subject to wave action.

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					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	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: The high category rating is based on structural diversity, size of the AA and perennial hydrology source.

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: Groundwater influenced by adjacent Jocko Spring Creek and up valley irrigators.

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)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
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)

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

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

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

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

Final Rating:

.5M

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	10.542
B. MT Natural Heritage Program Species Habitat	M	.6	1	21.084
C. General Wildlife Habitat	M	.7	1	24.598
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	31.626
G. Sediment/Nutrient/Toxicant Removal	H	1	1	35.14
H. Sediment/Shoreline Stabilization	NA	0	0	0
I. Production Export/Food Chain Support	H	.9	1	31.626
J. Groundwater Discharge/Recharge	H	1	1	35.14
K. Uniqueness	M	.5	1	17.57
L. Recreation/Education Potential	M	.5	1	17.57
Totals:		6.4	9	224.896
Percent of Possible Score		**71.11** %		

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**

PETERSON DATA FORMS

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Peterson Assessment Date/Time 8/15/2013 9:00:00 AM

Person(s) conducting the assessment: G. Howard

Weather: Overcast - mid 80's Location: St. Ignatius

MDT District: Missoula Milepost: 35.5

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

Initial Evaluation Date: 8/15/2008 Monitoring Year: 0 #Visits in Year: 0

Size of Evaluation Area: 25 (acres)

Land use surrounding wetland:

Pasture land and agricultural uses to the north, south, west. US 93 Corridor to the east.

HYDROLOGY

Surface Water Source: Unnamed tributary to Post Creek; irrigation ditch diversion

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

Percent of assessment area under inundation: 10 %

Depth at emergent vegetation-open water boundary: 1 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: No

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

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

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:

Drainage pattern, water-stained leaves, FAC-neutral test

VEGETATION COMMUNITIES

Site Peterson

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

Community # 2 **Community Type:** Phalaris arundinacea / **Acres** 0.31

Species	Cover class	Species	Cover class
Alnus incana	0	Carex utriculata	0
Cirsium arvense	0	Cirsium vulgare	0
Dipsacus sylvestris	1	Epilobium ciliatum	0
Impatiens ecalcarata	2	Iris pseudacorus	0
Juncus arcticus	1	Mentha arvensis	0
Nasturtium officinale	0	Phalaris arundinacea	5
Rosa woodsii	0	Schoenoplectus acutus	1
Sisymbrium altissimum	0	Solanum dulcamara	1
Sonchus arvensis	0		

Comments:

Community # 4 **Community Type:** Carex nebrascensis / Poa palustris **Acres** 0.76

Species	Cover class	Species	Cover class
Alnus incana	0	Carex nebrascensis	4
Cirsium arvense	1	Cirsium vulgare	1
Dipsacus sylvestris	2	Geum macrophyllum	0
Leucanthemum vulgare	0	Phalaris arundinacea	3
Plantago lanceolata	2	Poa palustris	3
Rosa woodsii	1	Sonchus arvensis	0

Comments:

Community # 7 Community Type: Elymus repens / Poa pratensis **Acres** 20.57

Species	Cover class	Species	Cover class
Alnus incana	0	Bromus arvensis	1
Bromus inermis	2	Cardaria draba	2
Carex nebrascensis	0	Cirsium arvense	1
Cynoglossum officinale	0	Dactylis glomerata	0
Descurainia sophia	0	Dipsacus sylvestris	2
Elymus repens	5	Lepidium perfoliatum	0
Phalaris arundinacea	0	Plantago lanceolata	0
Poa palustris	0	Poa pratensis	3
Potentilla recta	0	Rosa woodsii	1
Sisymbrium altissimum	1	Sonchus arvensis	1
Suaeda calceoliformis	2	Thlaspi arvense	0
Verbascum thapsus	0		

Comments:

Community # 8 Community Type: Typha latifolia / Phalaris arundinacea **Acres** 1.67

Species	Cover class	Species	Cover class
Alnus incana	2	Carex nebrascensis	0
Carex utriculata	2	Cirsium arvense	1
Dipsacus sylvestris	1	Epilobium ciliatum	2
Geum macrophyllum	0	Glyceria grandis	1
Impatiens ecalcarata	0	Iris pseudacorus	0
Juncus arcticus	0	Juncus ensifolius	1
Juncus tenuis	0	Mentha arvensis	0
Persicaria amphibia	0	Phalaris arundinacea	3
Plantago lanceolata	0	Poa pratensis	1
Rosa woodsii	1	Rumex crispus	0
Sonchus arvensis	1	Suaeda calceoliformis	0
Typha latifolia	5		

Comments:

Community # 9 Community Type: Nasturtium officinale / Carex nebrascensis **Acres** 0.35

Species	Cover class	Species	Cover class
Carex nebrascensis	3	Cirsium arvense	1
Dipsacus fullonum	2	Epilobium ciliatum	0
Geum macrophyllum	0	Glyceria grandis	0
Mentha arvensis	1	Nasturtium officinale	4
Persicaria amphibia	1	Phalaris arundinacea	1

Comments:

Dominant species changed, old com 5. Site dominated by watercress and Nebraska sedge. Community boundary adjusted with the modified wetland boundary in the area.

Community # 10 **Community Type:** Elymus repens / Sisymbrium altissimum **Acres** 1.36

Species	Cover class	Species	Cover class
Bromus inermis	1	Cirsium vulgare	0
Elymus repens	3	Sisymbrium altissimum	1

Comments:

Change in dominant species of the vegetation community following weed control activities, old com
6. The vegetation community is currently dominated by quackgrass instead of tumble mustard.

Total Vegetation Community Acreage **25.02**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.

VEGETATION TRANSECTS

Site: Peterson Date: 8/15/2013 9:00:00 AM

Transect Number: 1 **Compass Direction from Start:** 210

Interval Data:

Ending Station 10 **Community Type:** Elymus repens / Poa pratensis

Species	Cover class	Species	Cover class
Cirsium arvense	1	Cynoglossum officinale	0
Descurainia sophia	1	Dipsacus sylvestris	1
Elymus repens	0	Phalaris arundinacea	3
Poa pratensis	4	Rosa woodsii	0

Ending Station 112 **Community Type:** Typha latifolia / Phalaris arundinacea

Species	Cover class	Species	Cover class
Carex utriculata	3	Cirsium arvense	0
Dipsacus sylvestris	0	Epilobium ciliatum	3
Impatiens ecalcarata	1	Iris pseudacorus	0
Juncus arcticus	1	Mentha arvensis	0
Persicaria amphibia	0	Phalaris arundinacea	2
Rosa woodsii	1	Typha latifolia	5

Ending Station 144 **Community Type:** Elymus repens / Poa pratensis

Species	Cover class	Species	Cover class
Alnus incana	0	Cirsium arvense	1
Descurainia sophia	0	Dipsacus sylvestris	2
Elymus repens	2	Phalaris arundinacea	1
Poa pratensis	4	Potentilla recta	0

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 340

Interval Data:

Ending Station 148 **Community Type:** Typha latifolia / Phalaris arundinacea

Species	Cover class	Species	Cover class
Alnus incana	2	Cirsium arvense	2
Dipsacus sylvestris	2	Geum macrophyllum	0
Impatiens ecalcarata	1	Phalaris arundinacea	3
Plantago lanceolata	0	Rosa woodsii	1
Sonchus arvensis	0	Typha latifolia	5

Ending Station 212 **Community Type:** Elymus repens / Poa pratensis

Species	Cover class	Species	Cover class
Bromus arvensis	0	Cirsium arvense	2
Elymus repens	1	Poa pratensis	5
Rosa woodsii	1	Thlaspi arvense	0

Ending Station 242 **Community Type:** Carex nebrascensis / Poa palustris

Species	Cover class	Species	Cover class
Alnus incana	1	Carex nebrascensis	3
Cirsium arvense	2	Dipsacus sylvestris	0
Geum macrophyllum	0	Poa palustris	5
Sonchus arvensis	0		

Ending Station 325 **Community Type:** Elymus repens / Poa pratensis

Species	Cover class	Species	Cover class
Bromus arvensis	0	Cirsium arvense	2
Elymus repens	1	Poa pratensis	5
Rosa woodsii	1	Thlaspi arvense	0

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Peterson

Planting Type	#Planted	#Alive	Notes
Alnus incana	1163	15	
Betula occidentalis	817	0	
Cornus alba	408	3	
Crataegus douglasii		0	
Ribes hudsonianum	245	0	
Rosa woodsii	450	20	
Salix bebbiana		0	
Salix spp.	408	0	
Symphoricarpos albus		0	

Comments

The majority of the planted species along the upland / wetland boundary have died over the monitoring period. General observations were recorded regarding woody vegetation located within the wetlands areas. Alder planted within the wetland boundaries and areas of inundation were observed to have vigorous grow and significant increase in height since previous monitoring.

Peterson

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
Canada Goose	15	FO	MA, UP
Red-winged Blackbird	4	L	MA

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
Meadow Vole	1	No	No	No	
Plains Gartersnake	1	No	No	No	
White-tailed Deer	2	No	No	No	

Wildlife Comments:

Peterson

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_(photo id 209	47.361565	-114.098856	135	View looking east along wetland / upland boundary
01_photo id 209	47.361565	-114.098856	215	Transect 1 start
2_(photo id 209	47.361194	-114.09913	110	View looking east along wetland / upland boundary
3_(photo id 209	47.361174	-114.099143	45	Transect 1 end
4_(photo id 210	47.361847	-114.101061	30	View looking northeast across C.T. 8
5_(photo id 211	47.362281	-114.100674	135	View looking south at Transect 2 end.
6_(photo id 201	47.361289	-114.100042	315	Transect 2 start
6_(photo id 210	47.361289	-114.100042	90	View looking NE across C.T. 8
-u_(photo id 21	47.362277	-114.101922	180	Sampling Point 5 - Upland
-w_(photo id 21	47.362293	-114.102005	180	Sampling Point 5 - Wetland
-u_(photo id 21	47.362738	-114.100797	90	Sampling Point 6 - Upland
-w_(photo id 21	47.362828	-114.100914	45	Sampling Point 6 - Wetland

Comments:

Peterson

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

Wetland areas were expanded to include a small seep on the hillside that drains into the primary wetland complex. Seep area is located along the lower extent of the complex along the western boundary. Paired sampling points (sp5-w & -u) were completed for the seep wetland. Wetland boundary was adjusted within the NW corner. Wetland areas consisting of C.T. 5 were reduced. Pair sampling points (sp6-w & -u) were completed.

Functional Assessments

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

Functional Assessment Comments:

The functional ratings for the site remained similar with a category II rating.

Maintenance

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

If yes, do they need to be repaired?

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 in need of repair? Yes

If yes, describe the problems below.

Per conversation with MDT personnel, several of the water control structures did not appear to be functioning as designed and were not impounding water. It is recommended MDT conduct repairs to the log cribs to prevent water from going under/through these structures.

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

Project/Site: Peterson | City/County: St. Ignatius - Lake Co. | Sampling Date: 8/15/2013

Applicant/Owner: MDT | State: MT | Sampling Point: P-1

Investigator(s): G. Howard | Section, Township, Range: S 35 T 19N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): LLR E | Lat: 47.362271 | Long: -114.101921 | Datum: NAD 83

Soil Map Unit Name: Colake silt loam, 0 to 1 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Sampling point considered within an upland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Poa pratensis	90	☑	FAC
2. Elymus repens	10	☐	FAC
3. Polygonium bistorta	1	☐	NI
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	101 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Sampling plot calculated as hydrophytic vegetation, but considered as marginal wetland species due to dominance of mostly FAC rated species.

SOIL

Sampling Point: P-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Calciaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): _____

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: Hydrology indicators not present.

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

Project/Site: Peterson | City/County: St. Ignatius - Lake Co. | Sampling Date: 8/15/2013

Applicant/Owner: MDT | State: MT | Sampling Point: P-2

Investigator(s): G. Howard | Section, Township, Range: S 35 T 19N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): LLR E | Lat: 47.362293 | Long: -114.102009 | Datum: NAD 83

Soil Map Unit Name: Colake silt loam, 0 to 1 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Carex nebrascensis	50	☑	OBL
2. Poa pratensis	50	☑	FAC
3. Nasturtium officinale	2	☐	OBL
4. Descurainia sophia	2	☐	NI
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	104 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation considered hydrophytic.

SOIL

Sampling Point: P-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	98	10YR 4/2	2	D	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Calciaquolls

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Hydric soil indicators present with depletions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☑ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

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

Project/Site: Peterson | City/County: St. Ignatius - Lake Co. | Sampling Date: 8/15/2013

Applicant/Owner: MDT | State: MT | Sampling Point: P-3

Investigator(s): G. Howard | Section, Township, Range: S 35 T 19N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): LLR E | Lat: 47.36274 | Long: -114.100792 | Datum: NAD 83

Soil Map Unit Name: Ronan silty clay loam, 4 to 8 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Sampling point considered within an upland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Poa pratensis	90	☑	FAC
2. Elymus repens	10	☐	FAC
3. Polygonium bistorta	1	☐	NI
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	101 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Sampling plot calculated as hydrophytic vegetation , but considered as marginal wetland species due to dominance of mostly FAC rated species.

SOIL

Sampling Point: P-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Natrixalfs

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Hydric soil indicator present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): _____

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: Hydrology indicators not present.

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

Project/Site: Peterson | City/County: St. Ignatius - Lake Co. | Sampling Date: 8/15/2013

Applicant/Owner: MDT | State: MT | Sampling Point: P-4

Investigator(s): G. Howard | Section, Township, Range: S 35 T 19N R 20W

Landform (hillslope, terrace, etc.): Valley Bottom | Local relief (concave, convex, none): concave | Slope (%): 2

Subregion (LRR): LLR E | Lat: 47.362829 | Long: -114.100917 | Datum: NAD 83

Soil Map Unit Name: Ronan silty clay loam, 4 to 8 percent slopes

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Nasturtium officinale	30	☑	OBL
2. Carex nebrascensis	25	☑	OBL
3. Dipsacus sylvestris	10	☐	NI
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	65 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation considered hydrophytic.

SOIL

Sampling Point: P-4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	98	10YR 4/2	2	C	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Frigid Typic Natrixalfs

Confirm Mapped Type?: ☑

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Hydric soil present with redox concentrations.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☑ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Field Observations:

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

Water Table Present? Yes ☑ No ☐ Depth (inches): 6

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Hydrology indicators present with soils saturated to the ground surface and free water in the pit.

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

1. Project name US 93 - Peterson **2. MDT project#** NH 5-2(122)31 **Control#**

3. Evaluation Date 8/15/2013 **4. Evaluators** G. Howard **5. Wetland/Site# (s)** AA-1

6. Wetland Location(s): T 19N **R** 20W **Sec1** 35 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 17010212 **Watershed/County** Flathead / Lake County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 3.09

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 3.09

How assessed: Measured e.g. by GPS

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	Emergent Wetland	Impounded	Permanently flooded	80
Riverine	Riverine	lower perennial	Aquatic Bed	Impounded	Permanently flooded	5
Riverine	Riverine	lower perennial	Unconsolidated Bottom	Impounded	Permanently flooded	5
Riverine	Palustrine	none	Emergent Wetland	Impounded	seasonally flooded	10

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

12. General Condition of AA

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

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)

AA includes an unnamed perennial stream channel and adjacent wetlands, including those associated with a stream diversion that enters mitigation site from the north. Wetlands within AA constructed in 2006 and managed in a natural state. Adjacent AA is subject to grazing. Approximately 5% of the AA classified as Riverine (HGM) based on topography and inferred hydrologic connection to the stream.

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

Cirsium arvense; Cirsium vulgare; Cardaria draba; Potentilla recta; Leucanthemum vulgare; & Iris pseudocorus.

iii. Brief descriptive summary of surrounding land use/habitat

Rangeland to the north, south, and west; US93 corridor to the east.

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: Emergent and aquatic bed vegetation types.

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 basedon definition contained in instructions):

Primary or critical habitat (list species) ◉ **D** ◉ **S**

Secondary habitat (list Species) ◉ **D** ◉ **S**

Incidental habitat (list species) ○ **D** ◉ **S** Grizzly Bear (LT)

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 USFWS T & E list, MNHP

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species) ◉ **D** ◉ **S**

Secondary habitat (list Species) ◉ **D** ◉ **S**

Incidental habitat (list species) ○ **D** ◉ **S** Great Blue Heron (S3); Black Tern (S3B)

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 MNHP

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA Moderate

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			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #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 General wildlife rated high based on low disturbance to the area and moderate habitat use.

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		
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
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 General fish habitat rating determined Not Applicable due to impassable barriers (log cribs) that prevent fish from using A

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		
% of flooded wetland classified as forested, scrub/shrub, or both	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: Lob cribs installed to restrict flow.

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		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	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: AA constructed with log cribs to serve as impoundments for short and long term water storage behind.

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.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
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: AA has restricted outlet and routinely floods.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body 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 **wetland** 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: Species within the streambanks of unnamed tributary consist of grasses and shrubs with high stability ratings.

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					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	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)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
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)

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

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

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

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

Final Rating:

1 H

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	0.927
B. MT Natural Heritage Program Species Habitat	L	.1	1	0.309
C. General Wildlife Habitat	H	.9	1	2.781
D. General Fish Habitat	NA	0	0	0
E. Flood Attenuation	M	.5	1	1.545
F. Short and Long Term Surface Water Storage	H	.8	1	2.472
G. Sediment/Nutrient/Toxicant Removal	H	1	1	3.09
H. Sediment/Shoreline Stabilization	H	1	1	3.09
I. Production Export/Food Chain Support	H	.8	1	2.472
J. Groundwater Discharge/Recharge	H	1	1	3.09
K. Uniqueness	M	.4	1	1.236
L. Recreation/Education Potential	H	1	1	3.09
Totals:		7.8	11	24.102
Percent of Possible Score		**70.91** %		

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 PHOTOGRAPHS

Photo Point 1 – *Photo 1* **Location:** Veg Tran 1, start
Bearing: 0 Degrees **Taken in 2009**

Photo Point 2 – *Photo 1* **Location:** Veg Tran 1, end
Bearing: 0 Degrees **Taken in 2009**

Photo Point 1 – *Photo 1* **Location:** Veg Tran 1, start
Bearing: 0 Degrees **Taken in 2011**

Photo Point 2 – *Photo 1* **Location:** Veg Tran 1, end
Bearing: 0 Degrees **Taken in 2011**

Photo Point 1 – *Photo 1* **Location:** Veg Tran 1, start
Bearing: 0 Degrees **Taken in 2013**

Photo Point 2 – *Photo 1* **Location:** Veg Tran 1, end
Bearing: 0 Degrees **Taken in 2013**

Photo Point 3 – *Photo 1*
Bearing: 270 Degrees

Location: Veg Tran 1, end
Taken in 2009

Photo Point 3 – *Photo 1a*
Bearing: 270 Degrees

Location: Veg Tran 1, end
Taken in 2011

Photo Point 3 – *Photo 1b*
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2011

Photo Point 3 – *Photo 1a*
Bearing: 270 Degrees

Location: Veg Tran 1, end
Taken in 2013

Photo Point 3 – *Photo 1b*
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2013

Photo Point 3 – *Photo 2*
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2009

Photo Point 3 – *Photo 2*
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2011

Photo Point 3 – *Photo 2*
Bearing: 180 Degrees

Location: Veg Tran 1, end
Taken in 2013

Photo Point 4 – *Photo 1* **Location:** NE project area
Bearing: 140 Degrees **Taken in 2009**

Photo Point 5 – *Photo 1* **Location:** Veg Tran 2, start
Bearing: 270 Degrees **Taken in 2010**

Photo Point 4 – *Photo 1* **Location:** NE project area
Bearing: 140 Degrees **Taken in 2011**

Photo Point 5 – *Photo 1* **Location:** Veg Tran 2, start
Bearing: 270 Degrees **Taken in 2011**

Photo Point 4 – *Photo 1* **Location:** NE project area
Bearing: 140 Degrees **Taken in 2013**

Photo Point 5 – *Photo 1* **Location:** Veg Tran 2, start
Bearing: 270 Degrees **Taken in 2013**

Photo Point 5 – *Photo 2* **Location:** Veg Tran 2, start
Bearing: 135 Degrees **Taken in 2009**

Photo Point 6 – *Photo 1* **Location:** West boundary
Bearing: 140 Degrees **Taken in 2009**

Photo Point 5 – *Photo 2* **Location:** Veg Tran 2, start
Bearing: 135 Degrees **Taken in 2011**

Photo Point 6 – *Photo 1* **Location:** West boundary
Bearing: 90 Degrees **Taken in 2010**

Photo Point 5 – *Photo 2* **Location:** Veg Tran 2, start
Bearing: 135 Degrees **Taken in 2013**

Photo Point 6 – *Photo 1* **Location:** West boundary
Bearing: 140 Degrees **Taken in 2013**

Photo Point 5 – *Photo 1*
Bearing: 0 Degrees

Location: Veg Tran 2, start
Taken in 2009

Photo Point 5 – *Photo 1*
Bearing: 0 Degrees

Location: Veg Tran 2, start
Taken in 2011

Photo Point 7 – *Photo 1* **Location:** Veg Tran 2, end
Bearing: 270 Degrees **Taken in 2009**

Photo Point 8 – *Photo 1* **Location:** SE corner of project area
Bearing: 0 Degrees **Taken in 2009**

Photo Point 7 – *Photo 1* **Location:** Veg Tran 2, end
Bearing: 270 Degrees **Taken in 2011**

Photo Point 8 – *Photo 1* **Location:** SE corner of project area
Bearing: 0 Degrees **Taken in 2011**

Photo Point 7 – *Photo 1* **Location:** Veg Tran 2, end
Bearing: 270 Degrees **Taken in 2013**

Photo Point 8 – *Photo 1* **Location:** SE corner of project area
Bearing: 0 Degrees **Taken in 2013**

Photo Point 9 – *Photo 1* **Location:** Fringe of pond
Bearing: 135 Degrees **Taken in 2009**

Photo Point 9 – *Photo 2* **Location:** Fringe of pond
Bearing: 320 Degrees **Taken in 2009**

Photo Point 9 – *Photo 1* **Location:** Fringe of pond
Bearing: 135 Degrees **Taken in 2011**

Photo Point 9 – *Photo 2* **Location:** Fringe of pond
Bearing: 320 Degrees **Taken in 2011**

Photo Point 9 – *Photo 1* **Location:** Fringe of pond
Bearing: 135 Degrees **Taken in 2013**

Photo Point 9 – *Photo 2* **Location:** Fringe of pond
Bearing: 320 Degrees **Taken in 2013**

Photo Point 9 – *Photo 3*
Bearing: 45 Degrees
Location: View toward T-3
Taken in 2009

Photo Point 9 – *Photo 4*
Bearing: 230 Degrees
Location: Weedy pond fringe
Taken in 2009

Photo Point 9 – *Photo 3*
Bearing: 45 Degrees
Location: View toward T-3
Taken in 2011

Photo Point 9 – *Photo 4*
Bearing: 70 Degrees
Location: Weedy pond fringe
Taken in 2011

Photo Point 9 – *Photo 3*
Bearing: 45 Degrees
Location: View toward T-3
Taken in 2013

Photo Point 9 – *Photo 4*
Bearing: 230 Degrees
Location: Weedy pond fringe
Taken in 2013

Photo Point 10 – *Photo 1*
Bearing: 230 Degrees
Location: Veg Tran 3, end
Taken in 2010

Photo Point 10 – *Photo 1*
Bearing: 40 Degrees
Location: Veg Tran 3, end
Taken in 2011

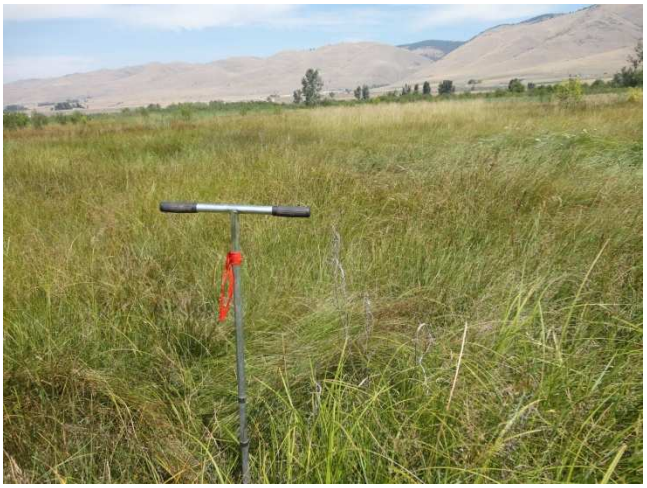
Photo Point 10 – *Photo 1*
Bearing: 225 Degrees
Location: Veg Tran 3, end
Taken in 2013

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 2011

Photo Point 11 – *Photo 1*
Bearing: 320 Degrees
Location: Veg Tran 3, start
Taken in 2013

Data Point – *B-1u*
Bearing: 0 Degrees
Location: Veg Com 2
Taken in 2013



Data Point – *B-1w*
Bearing: 0 Degrees
Location: Veg Com 4
Taken in 2013

Data Point –B-2u
Bearing:
Location: Veg Com 4
Taken in 2013

Data Point – B-2*w*
Bearing:
Location: Veg Com 4
Taken in 2013

MUD CREEK PHOTOGRAPHS

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees
Location: Livestock water gap
Taken in 2009

Photo Point 1 – *Photo 2*
Bearing: 45 Degrees
Location: PP1
Taken in 2009

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees
Location: Livestock water gap
Taken in 2011

Photo Point 1 – *Photo 2*
Bearing: 0 Degrees
Location: PP1
Taken in 2011

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees
Location: Livestock water gap
Taken in 2013

Photo Point 1 – *Photo 2*
Bearing: 0 Degrees
Location: PP1
Taken in 2013

Photo Point 2 – *Photo 1*
Bearing: 60 Degrees
Location: Northern project boundary
Taken in 2009

Photo Point 2 – *Photo 2*
Bearing: 130 Degrees
Location: Western project boundary
Taken in 2009

Photo Point 2 – *Photo 1*
Bearing: 60 Degrees
Location: Northern project boundary
Taken in 2011

Photo Point 2 – *Photo 2*
Bearing: 130 Degrees
Location: Western project boundary
Taken in 2011

Photo Point 2 – *Photo 1*
Bearing: 60 Degrees
Location: Northern project boundary
Taken in 2013

Photo Point 2 – *Photo 2*
Bearing: 130 Degrees
Location: Western project boundary
Taken in 2013

Photo Point 3 – *Photo 1*
Bearing: 130 Degrees
Location: NE corner of project area
Taken in 2009

Photo Point 4 – *Photo 1*
Bearing: 340 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 2011

Photo Point 4 – *Photo 1*
Bearing: 340 Degrees
Location: NE corner of project area
Taken in 2011

Photo Point 3 – *Photo 1*
Bearing: 130 Degrees
Location: NE corner of project area
Taken in 2013

Photo Point 4 – *Photo 1*
Bearing: 340 Degrees
Location: NE corner of project area
Taken in 2013

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 2011

Photo Point 5 – *Photo 1*
Bearing: 0 Degrees

Location: South project area
Taken in 2013

Photo Point 6 – *Photo 1* **Location:** Old US Hwy 93 Bridge
Bearing: 180 Degrees **Taken in 2009**

Photo Point 6 – *Photo 2* **Location:** Mud Creek
Bearing: 45 Degrees **Taken in 2009**

Photo Point 6 – *Photo 1* **Location:** Old US Hwy 93 Bridge
Bearing: 180 Degrees **Taken in 2011**

Photo Point 6 – *Photo 2* **Location:** Mud Creek
Bearing: 45 Degrees **Taken in 2011**

Photo Point 6 – *Photo 1* **Location:** Old US Hwy 93 Bridge
Bearing: 180 Degrees **Taken in 2013**

Photo Point 6 – *Photo 2* **Location:** Mud Creek
Bearing: 45 Degrees **Taken in 2013**

Photo Point 7 – *Photo 1*
Bearing: 135 Degrees
Location: Along T-1
Taken in 2009

Photo Point 8 – *Photo 1*
Bearing: 340 Degrees
Location: Along T-1
Taken in 2009

Photo Point 7 – *Photo 1*
Bearing: 135 Degrees
Location: Along T-1
Taken in 2011

Photo Point 8 – *Photo 1*
Bearing: 340 Degrees
Location: Along T-1
Taken in 2011

Photo Point 7 – *Photo 1*
Bearing: 135 Degrees
Location: Along T-1
Taken in 2013

Photo Point 8 – *Photo 1*
Bearing: 340 Degrees
Location: Along T-1
Taken in 2013

Photo Point 8 – *Photo 2* **Location:** Along T-1
Bearing: 135 Degrees **Taken in 2009**

Photo Point 9 – *Photo 1* **Location:** Along T-1
Bearing: 340 Degrees **Taken in 2009**

Photo Point 8 – *Photo 2* **Location:** Along T-1
Bearing: 135 Degrees **Taken in 2010**

Photo Point 9 – *Photo 1* **Location:** Along T-1
Bearing: 340 Degrees **Taken in 2010**

Photo Point 8 – *Photo 2* **Location:** Along T-1
Bearing: 135 Degrees **Taken in 2011**

Photo Point 9 – *Photo 1* **Location:** Along T-1
Bearing: 340 Degrees **Taken in 2011**

Photo Point 9 – *Photo 2*
Bearing: 135 Degrees
Location: Along T-1
Taken in 2009

Photo Point 10 – *Photo 1*
Bearing: 90 Degrees
Location: Mud Creek
Taken in 2009

Photo Point 9 – *Photo 2*
Bearing: 135 Degrees
Location: Along T-1
Taken in 2011

Photo Point 10 – *Photo 1*
Bearing: 90 Degrees
Location: Mud Creek
Taken in 2010

Photo Point 9 – *Photo 2*
Bearing: 135 Degrees
Location: Along T-1
Taken in 2013

Photo Point 10 – *Photo 1*
Bearing: 90 Degrees
Location: Mud Creek
Taken in 2011

Photo Point 11 – *Photo 1*
Bearing: 90 Degrees
Location: US Hwy 93 Bridge
Taken in 2009

Photo Point 12 – *Photo 1*
Bearing: 230 Degrees
Location: US 93 over Mud Creek
Taken in 2009

Photo Point 11 – *Photo 1*
Bearing: 90 Degrees
Location: US Hwy 93 Bridge
Taken in 2011

Photo Point 12 – *Photo 1*
Bearing: 230 Degrees
Location: US 93 over Mud Creek
Taken in 2011

Photo Point 11 – *Photo 1*
Bearing: 90 Degrees
Location: US Hwy 93 Bridge
Taken in 2013

Photo Point 12 – *Photo 1*
Bearing: 230 Degrees
Location: US 93 over Mud Creek
Taken in 2013

Photo Point 13 – *Photo 1* **Location:** Land use east of site
Bearing: 90 Degrees **Taken in 2009**

Data Point – MC-1 **Location:** Veg Com 4
Bearing: **Taken in 2013**

Photo Point 13 – *Photo 1* **Location:** Land use east of site
Bearing: 90 Degrees **Taken in 2011**

Data Point –MC-3 **Location:** Veg Com 5
Bearing: **Taken in 2013**

Photo Point 13 – *Photo 1* **Location:** Land use east of site
Bearing: 90 Degrees **Taken in 2013**

Data Point – MC-2 **Location:** Veg Com 12
Bearing: **Taken in 2013**

PETERSON PHOTOGRAPHS

Photo Point 1 – *Photo 1* **Location:** T-1 start
Bearing: 215 Degrees **Taken in 2009**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 135 Degrees **Taken in 2009**

Photo Point 1 – *Photo 1* **Location:** T-1 start
Bearing: 215 Degrees **Taken in 2011**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 135 Degrees **Taken in 2011**

Photo Point 1 – *Photo 1* **Location:** T-1 start
Bearing: 215 Degrees **Taken in 2013**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 135 Degrees **Taken in 2013**

Photo Point 2 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2009**

Photo Point 2 – *Photo 2* **Location:** PP2
Bearing: 35 Degrees **Taken in 2009**

Photo Point 2 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2010**

Photo Point 2 – *Photo 2* **Location:** PP2
Bearing: 35 Degrees **Taken in 2010**

Photo Point 2 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2011**

Photo Point 2 – *Photo 2* **Location:** PP2
Bearing: 35 Degrees **Taken in 2011**

Photo Point 2 – *Photo 3* **Location:** PP2
Bearing: 110 Degrees **Taken in 2009**

Photo Point 3 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2009**

Photo Point 2 – *Photo 3* **Location:** PP2
Bearing: 110 Degrees **Taken in 2011**

Photo Point 3 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2011**

Photo Point 2 – *Photo 3* **Location:** PP2
Bearing: 110 Degrees **Taken in 2013**

Photo Point 3 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2013**

Photo Point 4 – *Photo 1*
Bearing: 30 Degrees
Location: Looking across T-2
Taken in 2009

Photo Point 5 – *Photo 1*
Bearing: 135 Degrees
Location: Wetland boundary
Taken in 2009

Photo Point 4 – *Photo 1*
Bearing: 30 Degrees
Location: Looking across T-2
Taken in 2011

Photo Point 5 – *Photo 1*
Bearing: 135 Degrees
Location: Wetland boundary
Taken in 2010

Photo Point 4 – *Photo 1*
Bearing: 30 Degrees
Location: Looking across T-2
Taken in 2013

Photo Point 5 – *Photo 1*
Bearing: 135 Degrees
Location: Wetland boundary
Taken in 2013

Photo Point 6 – *Photo 1*
Bearing: 315 Degrees
Location: T-2 start
Taken in 2009

Photo Point 6 – *Photo 1*
Bearing: 315 Degrees
Location: T-2 start
Taken in 2011

Photo Point 6 – *Photo 1*
Bearing: 315 Degrees
Location: T-2 start
Taken in 2013

Data Point – P-1 **Location:** Veg Com 7
Bearing: 180 Degrees **Taken in 2013**

Data Point – P-2 **Location:** Veg Com 4
Bearing: 180 Degrees **Taken in 2013**

Data Point – P-3u **Location:** Veg Com 7
Bearing: 90 Degrees **Taken in 2013**

Data Point – P-4 w **Location:** Veg Com 9
Bearing: 45 Degrees **Taken in 2013**

Appendix D

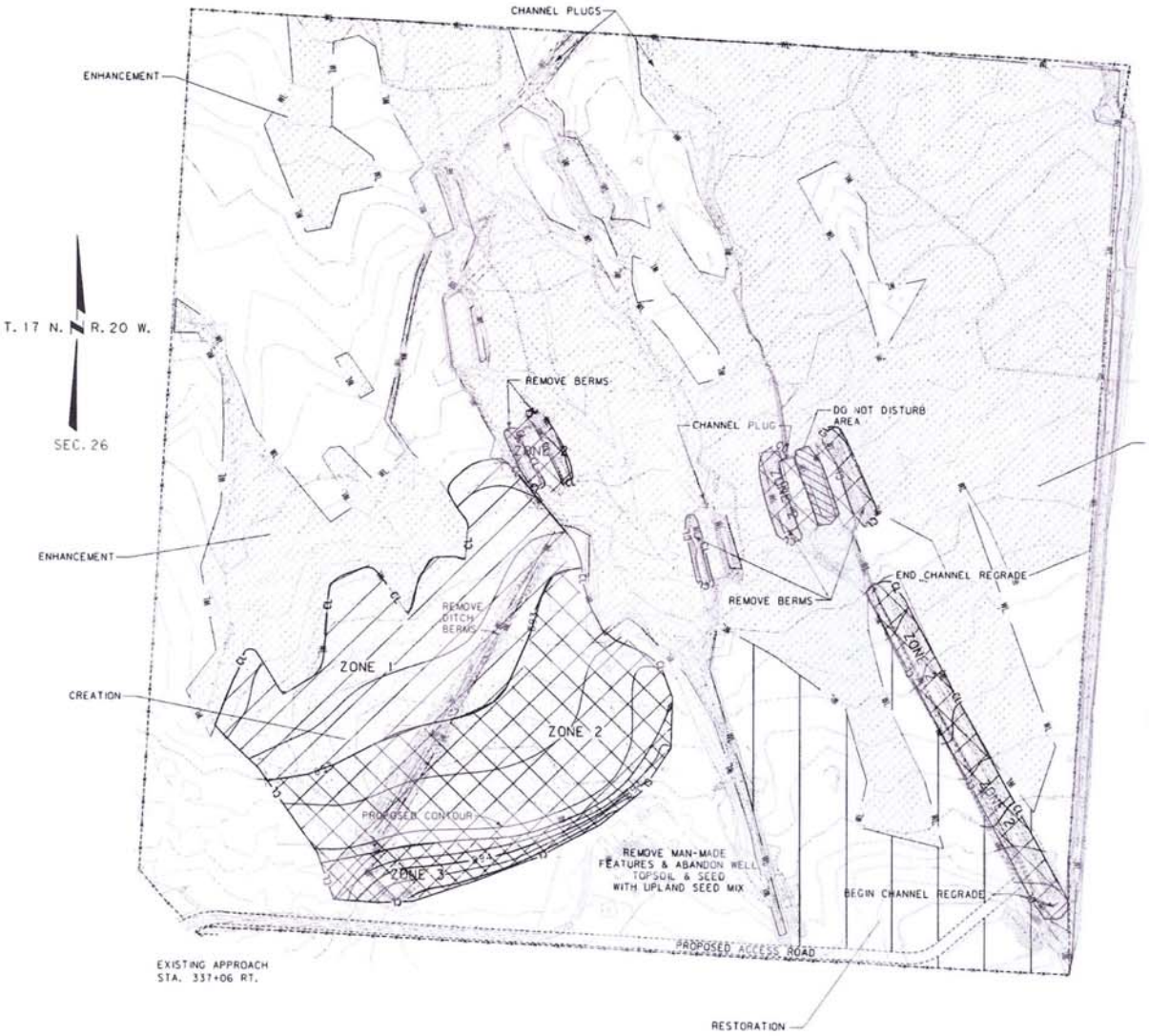
Original Site Plans

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

DETAIL

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)20	L-3A

CSF - 0.99926000



PLANTING NOTES:
1. PLANT WOODY & HERBACEOUS MATERIAL IN THE SPECIFIC HYDROLOGIC REGIME LISTED IN THE PLANT LIST (PLANTING ZONES 1-3).
2. USE 64 mm POT PERENNIAL HERBACEOUS PLANT MATERIAL IN WETLAND CREATION AREAS.
3. USE NUMBER ONE CONTAINER SHRUB MATERIAL FOR WETLAND PLANTINGS, EXCEPT FOR THE WILLOW (SALIX) SPECIES.
4. PLANT WILLOW (SALIX) SPECIES WITH 250 mm CYLINDER CONTAINER STOCK.
5. INSTALL SPRING PLANTED PERENNIAL PLANTS AND SHRUBS NO LATER THAN APRIL 15.
6. PLANT FALL PLANTED SHRUBS BETWEEN SEPTEMBER 15 AND OCTOBER 15.
7. SEED BETWEEN OCTOBER 1 AND APRIL 15 PROVIDED THE GROUND IS NOT FROZEN.
8. PLACE WOOD CHIP MULCH AROUND ALL #1 CONTAINER SHRUBS TO A DEPTH OF 150 mm AT THE SURFACE, 0.6 m IN DIAMETER, SURROUNDING THE BASE OF THE PLANT.
9. SEED UPLAND AREAS DISTURBED DURING WETLAND CONSTRUCTION IN THE WETLAND MITIGATION AREA WITH THE FESCUE PRAIRIE MIX DEVELOPED FOR HIGHWAY 93 ROADSIDE SEEDING.
10. PLACE WETLAND CREATION SHRUBS AT 1.2 m ON CENTER. SEE WETLAND PLANTING DETAIL.
11. APPLY SEED BY BROADCAST METHODS. RAKE OR HARROW THE SEED.
12. PLACE WETLAND CREATION HERBACEOUS PLUGS AT 0.5 m ON CENTER.

GENERAL NOTES:
1. PRIOR TO CONSTRUCTION COMMENCING, CONDUCT A PRE-CONSTRUCTION MEETING ON THE SITE BETWEEN THE CONTRACTOR, PROJECT MANAGER, MDT STAFF WETLANDS SPECIALIST AND WETLANDS ECOLOGIST TO DISCUSS THE DESIGN INTENT OF THE WETLANDS.
2. PLANT SCRUB/SHRUB, HERBACEOUS EMERGENT AND HERBACEOUS WET MEADOW SPECIES FOR WETLAND COMMUNITIES TO BE ESTABLISHED IN WETLAND CREATION AREAS.
3. PLACE PLANT MATERIAL IN THE APPROPRIATE ZONE AS DESCRIBED IN THE PLANT TABULATION COLUMN "PLANTING ZONE".
4. PLANT ZONES SHOWN ON THE PLANTING PLAN ARE APPROXIMATE AND MAY CHANGE BASED ON CONDITIONS AFTER FINAL GRADING.

EXISTING WETLAND / ENHANCEMENT 17.70 ha)

ZONE 1

ZONE 2

RESTORATION 11.19 ha)

CREATION 12.09 ha)

CONTOURS:

MAJOR INTERVAL 1.0 m
MINOR INTERVAL 0.2 m

SEE CONSTRUCTION PLANS FOR GRADING, WETLAND CREATION & RESTORATION DETAILS

BOUCHARD WETLAND DEVELOPMENT DETAIL

COE PERMITTING

SCALE = 1:1000

MONTANA DEPARTMENT OF TRANSPORTATION

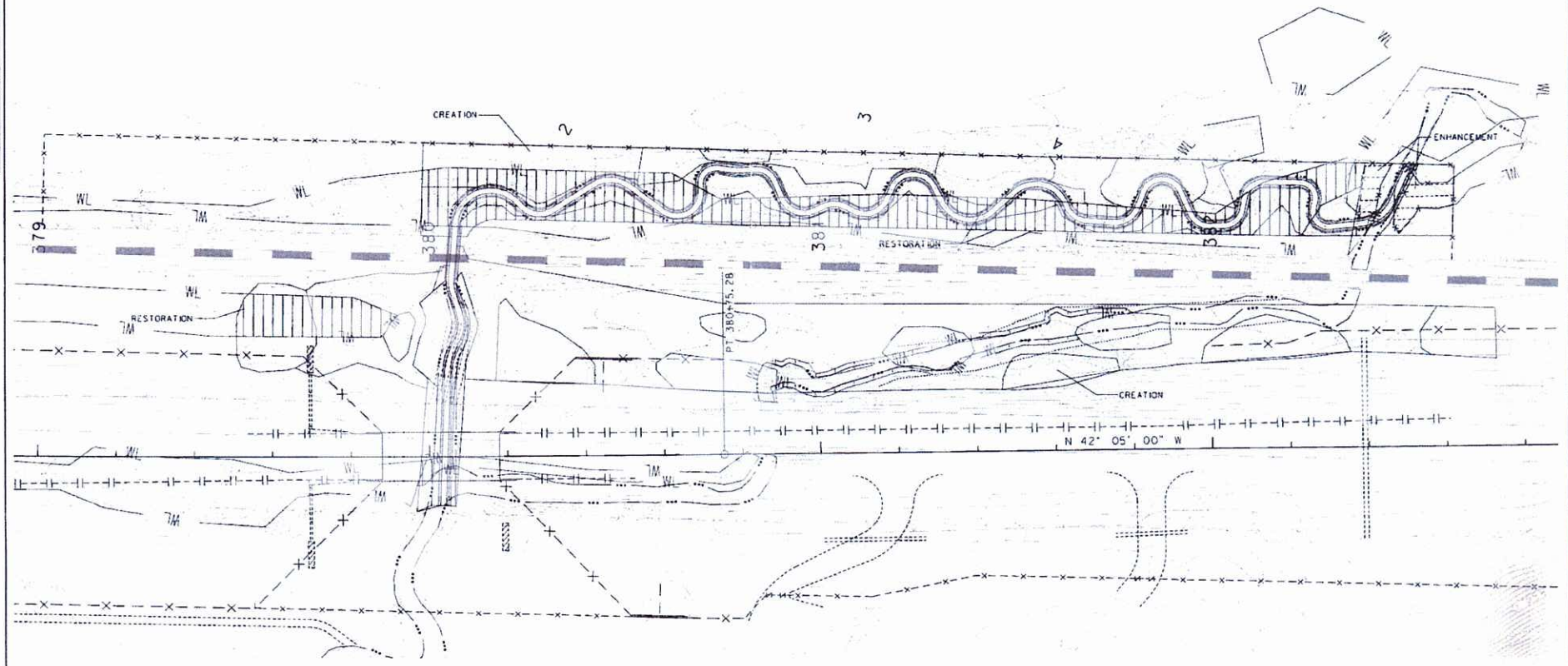
MONTANA CADD

GEOM ENVIRONMENTAL CONSULTING, INC.

DETAIL

STATE	PROJECT NUMBER	SHEET NO
MONTANA	NH 5-2(120)120	L-8A

CSF = 0.99926000



EXISTING WETLAND

RESTORATION (0.24 ha)

ENHANCEMENT (0.02 ha)

CREATION (0.68 ha)

CONTOURS:
MAJOR INTERVAL 2.0 m
MINOR INTERVAL 0.1 m

SPRING CREEK
WETLAND
DEVELOPMENT
DETAIL

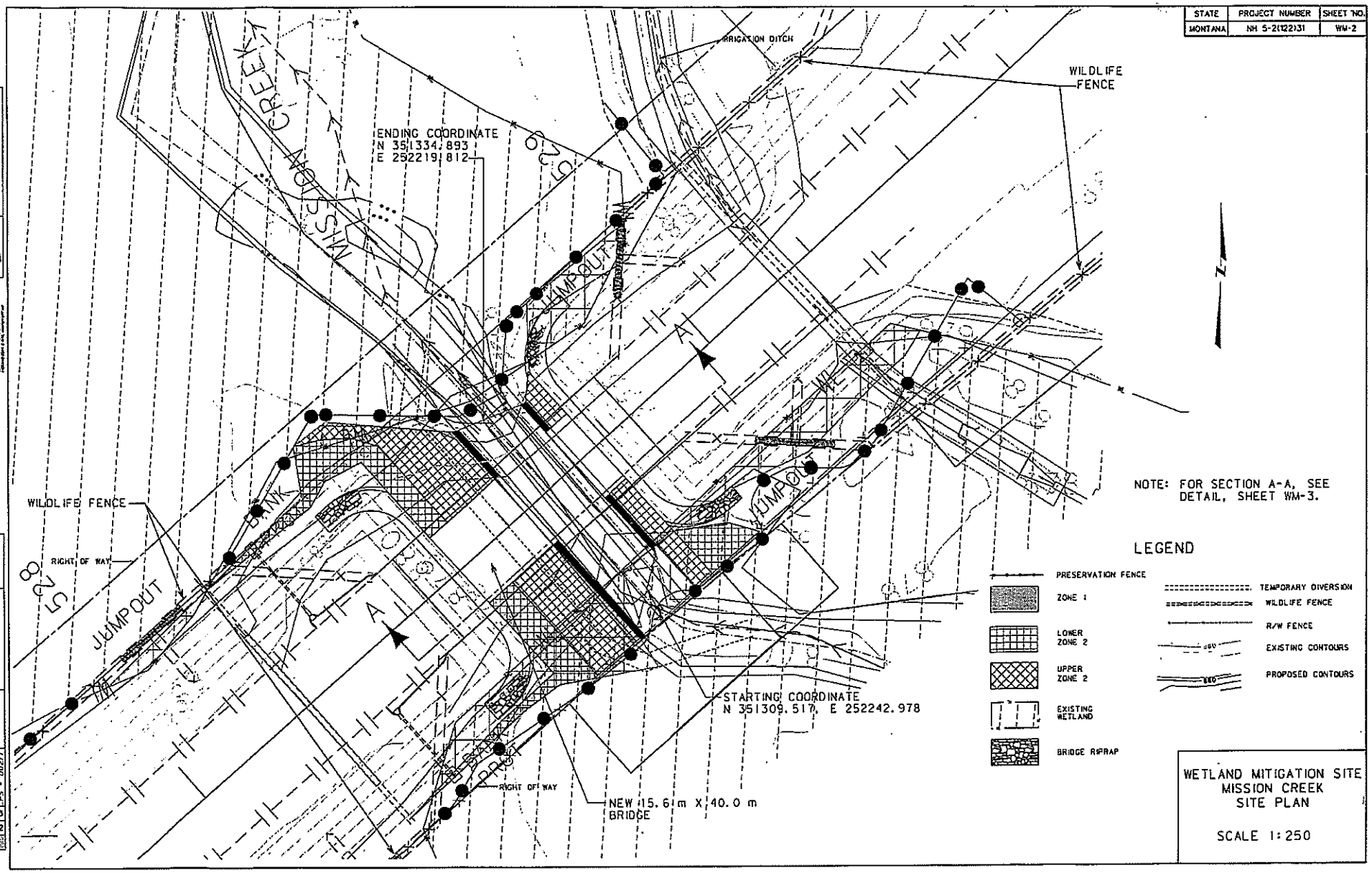
COE PERMITTING

SCALE = 1:500

MONTANA DEPARTMENT OF TRANSPORTATION

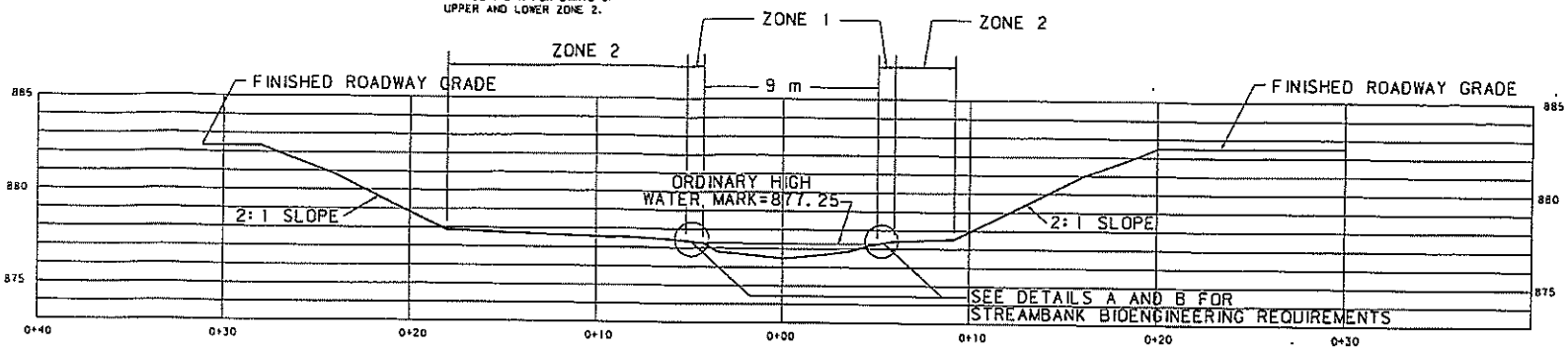
MONTANA CADD

GEOM ENVIRONMENTAL CONSULTING, INC.


STATE
PROJECT NUMBER
SHEET NO.
MONTANA
NH 5-2(122)31
WM-2
MISSION CREEK
IRRIGATION DITCH
WILDLIFE FENCE
ENDING COORDINATE
N 351334.893
E 252219.812
JUMPOUT
WILDLIFE FENCE
RIGHT OF WAY
CANAL
STARTING COORDINATE
N 351309.517, E 252242.978
NEW 15.6 m X 40.0 m BRIDGE
NOTE: FOR SECTION A-A, SEE DETAIL, SHEET WM-3.
LEGEND
PRESERVATION FENCE
ZONE 1
LOWER ZONE 2
UPPER ZONE 2
EXISTING WETLAND
BRIDGE RIPRAP
TEMPORARY DIVERSION
WILDLIFE FENCE
R/W FENCE
EXISTING CONTOURS
PROPOSED CONTOURS
WETLAND MITIGATION SITE
MISSION CREEK
SITE PLAN
SCALE 1:250

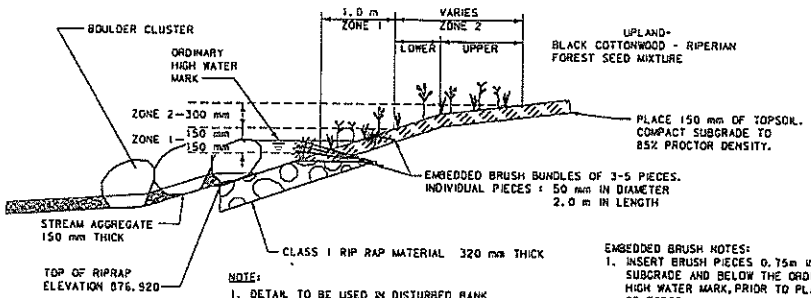
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-4

NOTE:
SEE DETAIL A FOR LIMITS OF UPPER AND LOWER ZONE 2.



SECTION A-A
TYPICAL SECTION

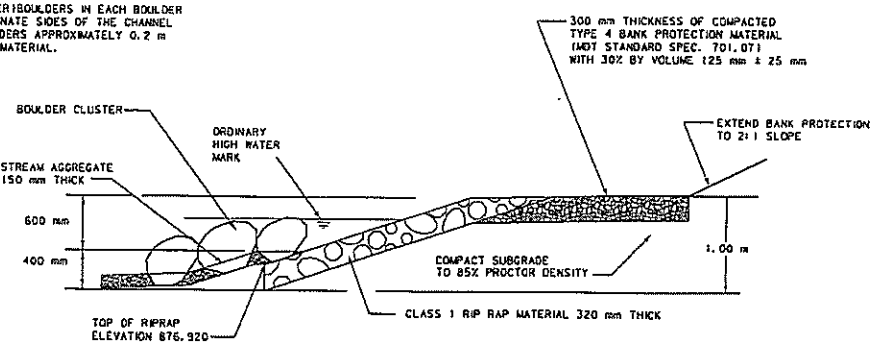
BOULDER CLUSTER NOTE:
1. PLACE NINE (0.5-0.75 m DIAMETER) BOULDERS IN EACH BOULDER GROUP. PLACE GROUPS ON ALTERNATE SIDES OF THE CHANNEL AT 6 m INTERVALS. EMBED BOULDERS APPROXIMATELY 0.2 m INTO THE RIPRAP OR STREAMBED MATERIAL.



NOTE:
1. DETAIL TO BE USED IN DISTURBED BANK AREAS UPSTREAM AND DOWNSTREAM FROM BRIDGE. EXTEND 2.0 m UNDERNEATH THE BRIDGE DRIPLINE.
2. USE DETAIL ON BOTH BANKS OF CREEK IN ZONE ONE.

DETAIL A — STREAM BANK BIOENGINEERING DETAIL - UPSTREAM AND DOWNSTREAM FROM MISSION CREEK BRIDGE
SCALE: NTS

EMBEDDED BRUSH NOTES:
1. INSERT BRUSH PIECES 0.75m INTO SUBGRADE AND BELOW THE ORDINARY HIGH WATER MARK, PRIOR TO PLACEMENT OF TOPSOIL.
2. SPACE PIECES AT 1.0m INTERVALS.
3. COMPACT SUBGRADE AROUND PIECES TO 85% OF PROCTOR.
4. TOPSOIL SHALL BE PLACED SUCH THAT 1.0m OF THE PIECES EXTEND FROM THE FINISHED STREAM BANK.



NOTE:
1. DETAIL TO BE USED IN DISTURBED BANK AREAS UNDER MISSION CREEK BRIDGE. OUTER LIMITS OF DETAIL ARE 2.0 m INSIDE BRIDGE DRIP LINE.
2. USE DETAIL ON BOTH BANKS OF CREEK
3. NO PLANTINGS.

DETAIL B — STREAM BANK BIOENGINEERING DETAIL - UNDER MISSION CREEK BRIDGE
SCALE: NTS

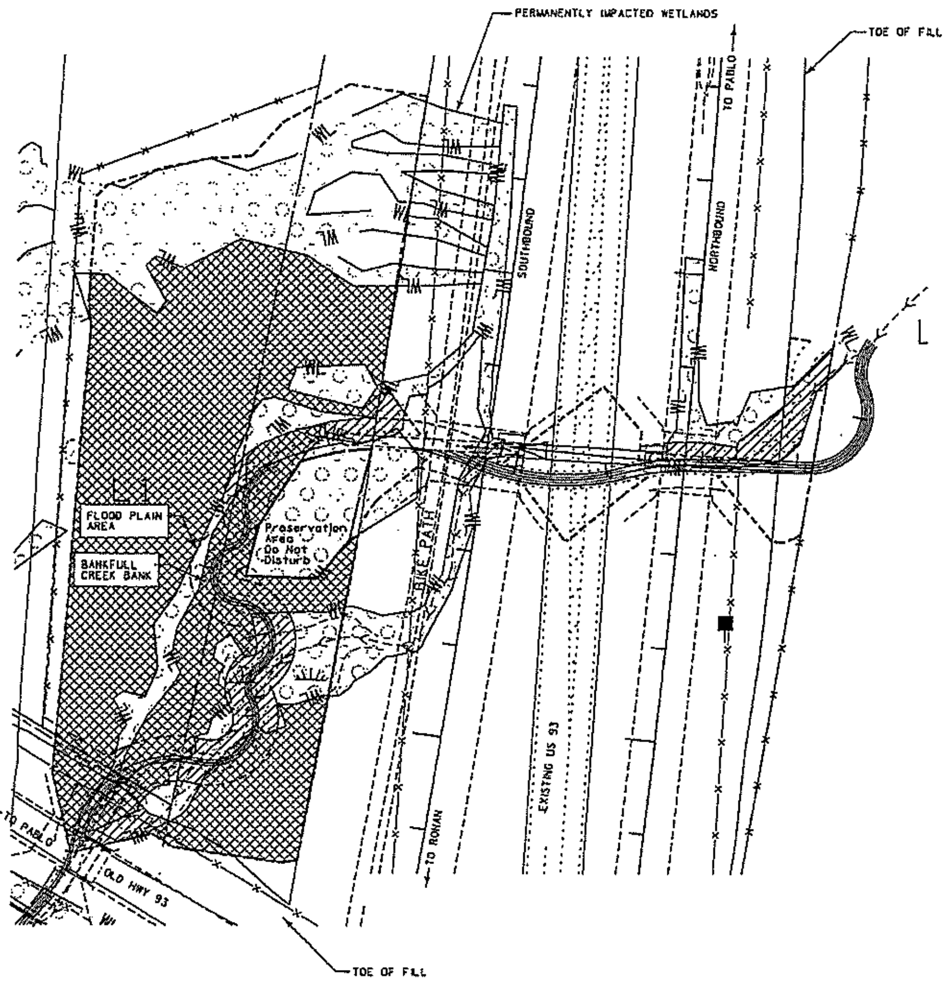
WETLAND MITIGATION SITE
MISSION CREEK
CHANNEL DETAILS

SCALE N. T. S.

DETAIL
MUD CREEK
WETLAND IMPACTS AND MITIGATION AREAS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(123)48	12

CSF = 0.99930000



Types of Compensatory Mitigation	Definition1	Corps Ratio2
Preservation	Protection. In perpetuity.	NA
Creation	Establishment of a wetland or other aquatic resource where one did not formerly exist	1:1
Re-establishment (Corps)	Restoration of wetland characteristics to existing non-wetland areas that were historically wetlands	1:1
Rehabilitaion	Restoration of wetland functions of existing wetland areas that exist in a substantially degraded state.	Based on exspected functional shift. A minimum 1.5:1 ratio applies
Enhancement (Corps)	Altering the physical characteristics (or land management - CSKT) of a jurisdictional wetland such that it permanently modifies and improves on or more specific functions.	Based on expected functional shift. a minimum 3:1 ratio applies
Re-establishment (Corps)	Restoration of wetland functions characteristics to existing non-wetland areas that were historically wetlands	

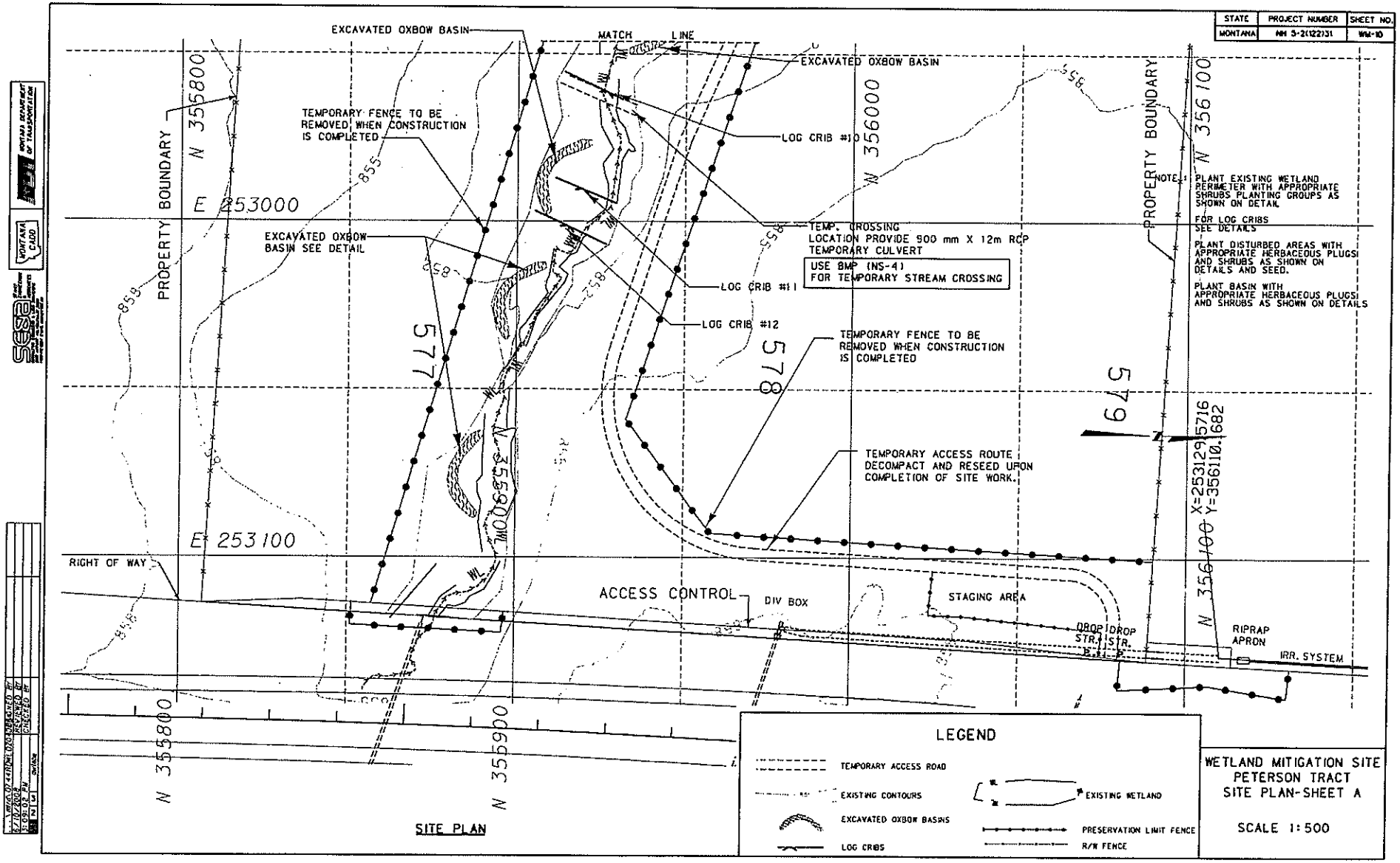
1. Source for Corps: Letter from Todd Tillinger (Corps) to Tom Parker (Herrera) dated December 18, 2002.
2. Ratios based on Memorandum from Herrera Environmental Consultants to US Army Corps of Engineers dated December 3, 2002 and the subsequent response from the Corps in a letter from Todd Tillinger to Herrera Environmental Consultants dated December 18, 2002.

LEGEND

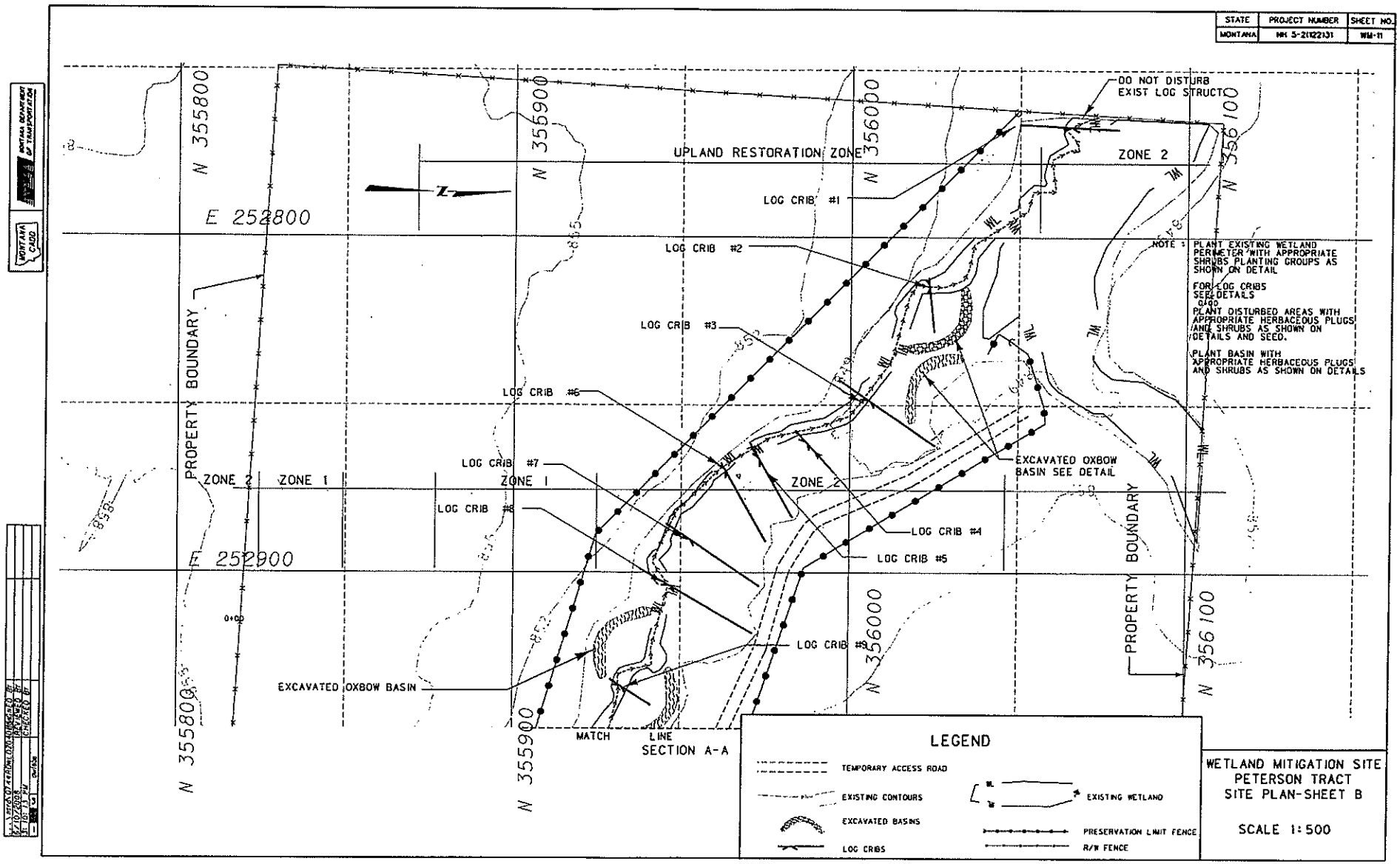
- EXISTING WETLANDS
- WETLAND MITIGATION BOUNDARY
- PERMANENTLY IMPACTED WETLAND = 8647.79 m²
- TEMPORARILY IMPACTED WETLAND
- CREATED WETLAND = 25 017 m²

Total Mitigation Area
Total area = 36072 m²
Existing Wetland area = 11055 m² (Enhancement)
Existing Upland area = 25017 m² (New Wetland)
Wetland area permanently impacted 8647.79 m²

Carter::Burgess
h744\rd\h744rdeld04.dgn

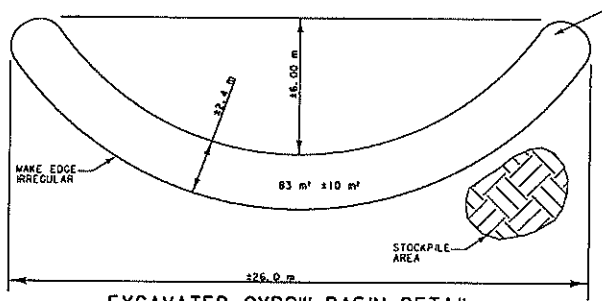


STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-10


STATE
MONTANA
PROJECT NUMBER
NH 5-2(122)31
SHEET NO.
WM-11
DO NOT DISTURB EXIST LOG STRUCTO
UPLAND RESTORATION ZONE
ZONE 2
LOG CRIB #1
LOG CRIB #2
LOG CRIB #3
LOG CRIB #6
LOG CRIB #7
LOG CRIB #8
LOG CRIB #4
LOG CRIB #5
LOG CRIB #9
EXCAVATED OXBOW BASIN SEE DETAIL
EXCAVATED OXBOW BASIN
PROPERTY BOUNDARY
ZONE 1
N 355800
N 355900
N 356000
N 356100
E 252800
E 252900
MATCH LINE
SECTION A-A
NOTE :
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 CONTOURS
EXCAVATED BASINS
LOG CRIBS
EXISTING WETLAND
PRESERVATION LIMIT FENCE
R/W FENCE
WETLAND MITIGATION SITE
PETERSON TRACT
SITE PLAN-SHEET B
SCALE 1:500

PETERSON TRACT WETLAND MITIGATION DETAILS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2112(33)1	WM-7



EXCAVATED OXBOW BASIN DETAIL

7 LOCATIONS

NOTE:

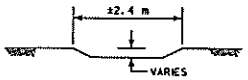
EXCAVATE APPROXIMATELY 12-18 m³ PER SITE AS DIRECTED BY PROJECT MANAGER. INCLUDE 100 mm OF TOPSOIL BELOW FINISHED GRADE

SALVAGE & PLACE 8 m³ OF TOPSOIL PER SITE

VARY DEPTH BETWEEN 150mm AND 300 mm

MINIMUM OF 2 m OF SEPARATION BETWEEN EXCAVATION AREA AND ZONE 1

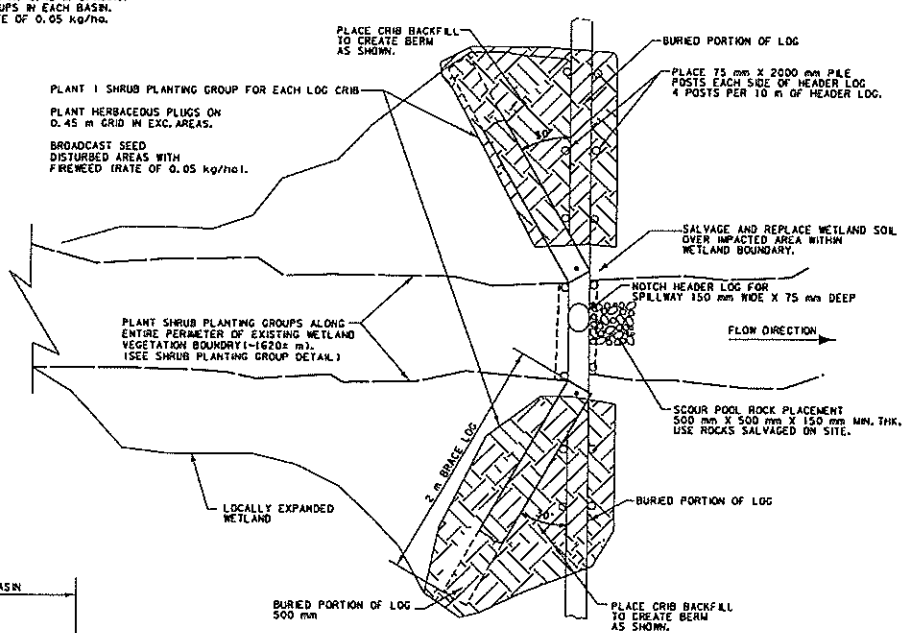
TYPICAL SECTION



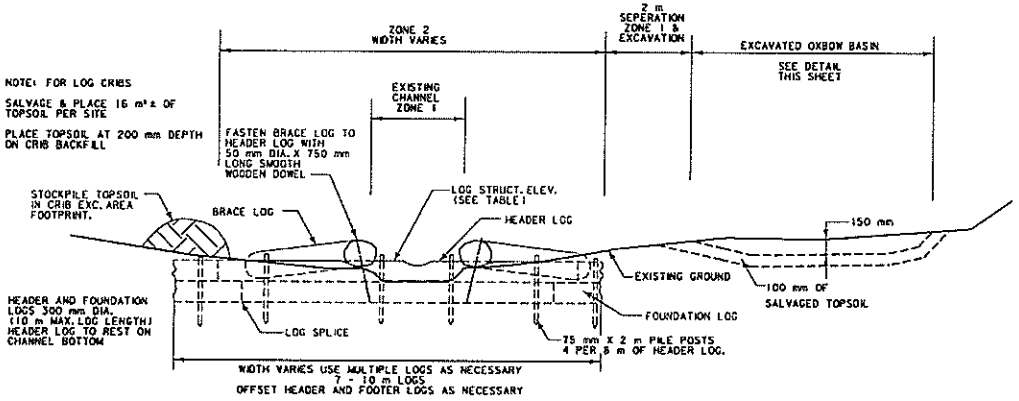
NOTE:

SEE SHEET WM-6 FOR PLANTING GROUP AND PLANTING DETAILS.

SEE SHEET WM-4 FOR LOG CRIB AND OXBOW SUMMARY.

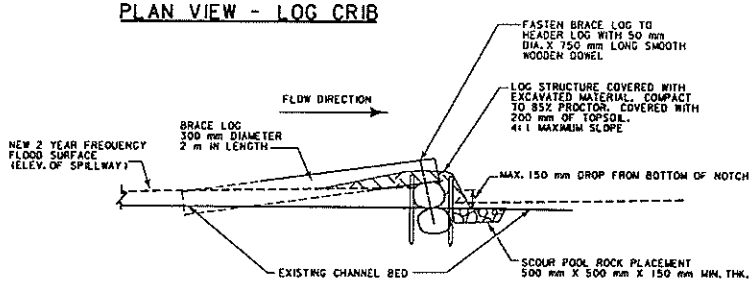


PLAN VIEW - LOG CRIB



SECTION VIEW - LOG CRIB

LOOKING DOWNSTREAM
SEE SUMMARY INFORMATION ON WM-4



PROFILE VIEW - LOG CRIB

WETLAND MITIGATION SITE
PETERSON TRACT
LOG CRIB AND OXBOW DETAILS

SCALE N. T. S.

Appendix E

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.

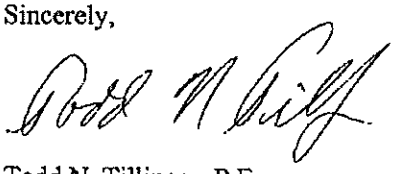
7.2.1 **Restoration (re-establishment)** of wetland characteristics to existing non-wetland areas that were historically wetlands will also result in a mitigation ratio of 1:1, with one acre of satisfactory wetland restoration of this type compensating for one acre of unavoidable wetland impact.

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:

$A_{created}$ = Created wetland acres (1)

Second, an enhancement component would be the number of existing wetland acres to be enhanced, multiplied by an enhancement factor. The enhancement factor represents the ratio of functional shift (the difference between pre-project functional score and projected post-project functional score) to the pre-project functional score. The enhancement factor can be expressed as:

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) \quad (2)$$

where:

F_{post} = Projected post-mitigation project functional score
F_{pre} = Pre-project functional score

Note: *The enhancement ratio is the inverse* $\left(\frac{1}{X}\right)$ *of the enhancement factor. The enhancement ratio is the term most frequently used to discuss crediting ratios for wetland mitigation projects. For example, an enhancement factor of 0.25 would be equal to an enhancement ratio of 4:1. This means that four enhanced acres at a particular site would be worth one acre of credit to offset wetland acres impacted by the project.*

The enhancement component of the equation can then be expressed as:

$$A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) \quad (3)$$

where:

$A_{existing}$ = Existing wetland acres to be enhanced
F_{post} = Projected post-mitigation project functional score
F_{pre} = Pre-project functional score

The following equation, which includes both a creation and enhancement component, can then be used to calculate wetland mitigation credits expressed as acres:

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) \quad (4)$$

where:

$A_{credited}$ = Wetland mitigation credits expressed as acres
$A_{created}$ = Wetland creation acres
$A_{existing}$ = Existing wetland acres to be enhanced
F_{post} = Projected post-mitigation project functional score
F_{pre} = Pre-project functional score

To demonstrate how these equations can be applied in the context of US 93 wetland mitigation, we have selected two proposed wetland mitigation sites as examples. The Bouchard property (Example 1) is a 40-acre parcel north of Arlee. The Ludwig property (Example 2) includes slightly less than 20 acres and is two miles north of St. Ignatius.

Example 1

The Bouchard property has been acquired recently by MDT. This site is near the headwaters of Spring Creek and supports a mixture of upland, emergent wetland and scrub/shrub wetland. A proposed wetland mitigation project at this site will include approximately 8 acres of wetland creation and up to 20 acres of wetland enhancement. A summary of pre- and post-project wetland functional scores is provided in Table 1.

Table 1. Expected change in wetland functions and values, Bouchard site.

	Functional Points Pre-Project	Functional Points Post-Project	Factors Affecting Score
A. Listed/proposed T&E species habitat	.3	.3	No populations in area, not likely corridor
B. Habitat for S1, S2, or S3 plants or animals	.1	.1	No populations in area
C. General wildlife habitat	.8	1	Decreased disturbance
D. General fish/aquatic habitat	N/A	N/A	Not historic fish habitat
E. Flood attenuation	N/A	N/A	No channel
F. Short- and long-term surface water storage	.8	.8	Seasonal surface water
G. Sediment/nutrient/toxicant retention and removal	N/A	N/A	Does not receive excess sediment, nutrient, toxicant inputs
H. Sediment/shoreline stabilization	N/A	N/A	No channel
I. Production export/food chain support	.9	.9	Vegetation at site already diverse
J. Ground water discharge/recharge	1	1	Discharge/recharge indicators present
K. Uniqueness	.6	.8	Decreased disturbance
L. Recreation/education potential	.1	1	Decreased disturbance
Totals	4.6	5.9	

The following example assumes that 8 ($A_{created}$) new wetland acres are created and the functional score of 20 ($A_{existing}$) existing wetland acres shifts from 4.6 (F_{pre}) to 5.9 (F_{post}). Using Equation (2):

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = \left(\frac{5.9 - 4.6}{4.6}\right) = 0.28$$

In this case, the enhancement factor equals 0.28. The corresponding enhancement ratio (1/0.28) would be 3.5 and would be expressed as 3.5 to 1, indicating 3.5 acres of enhancement replaces 1 impacted wetland acre.

Next, applying equation (3), it is possible to calculate the mitigation credits for the 20 acres of existing wetland that would be enhanced at the Bouchard site:

$$A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = 20(0.28) = 5.6 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Bouchard site.

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = 8 + 20(0.28) = \textbf{13.65 total acres of credit}$$

Example 2

The Montana Department of Transportation has requested an assessment of wetland mitigation potential on the Ludwig property north of St. Ignatius, Montana. Because the decision to acquire this property partly depends upon how many wetland mitigation credits it is feasible to generate there, we decided to use the Ludwig property as an example of how one might use a functional score approach to calculate an appropriate crediting ratio for enhancement projects. Tables 1 and 2 include summaries of functional scores for (1) existing conditions and (2) estimated post-mitigation project conditions at each of the two proposed mitigation projects on the Ludwig property. A tributary to Post Creek runs through the property and was assessed as one wetland site (Table 2). The second wetland site consists of a created stock pond and small adjacent wetlands supported by the pond (Table 3). Both sites are impacted by livestock grazing and altered hydrology.

Stream Site. The Post Creek portion of the site would increase from an estimated 1.3 ($A_{existing}$) acres of wetland to 5.2 acres, resulting in 3.9 ($A_{created}$) created wetland acres. From Table 2, the functional score would shift from 5.4 (F_{pre}) to 9.5 (F_{post}). Using Equation (2):

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = \left(\frac{9.5 - 5.4}{5.4}\right) = 0.76$$

Table 2. Expected change in wetland functions and values, Ludwig property, Post Creek Tributary.

MDT Assessment Method Functions and Values	Functional Points Pre-Project	Functional Points Post-Project	Factors Affecting Score
A. Listed/proposed T&E species	.3	.8	Grizzly, Sus/inc. to Doc/secondary
B. Habitat for S1, S2, or S3 plants or animals	.1	.7	Grizzly, Sus/inc. to Doc/secondary
C. General wildlife habitat	.5	.9	Increased cover
D. General fish/aquatic habitat	.1	.3	Increased cover and connectivity, but unlikely fish habitat
E. Flood attenuation	.2	.7	Increased size, woody component
F. Short- and long-term surface water storage	.4	.8	Increased size
G. Sediment/nutrient/toxicant removal	.9	.9	Close to highway, cattle removal
H. Sediment/shoreline stabilization	.7	1	Increase deep binding root mass
I. Production export/food chain support	.9	1	Increased size
J. Ground water discharge/recharge	1	1	
K. Uniqueness	.2	.4	Shift to shrub community
L. Recreation/education potential	.1	1	Not likely site
Total Functional Points	5.4	9.5	

Table 3. Expected change in wetland functions and values, Ludwig property, stock pond and adjacent wetlands.

MDT Assessment Functions and Values	Functional Points Pre-Project	Functional Points Post-Project	Factors Affecting Score
A. Listed/proposed T&E species	.3	.7	Grizzly bear use adjacent areas, increased cover may increase use
B. Habitat for S1, S2, or S3 plants or animals	.2	.2	No known occurrence
C. General wildlife habitat	.3	.9	Increased cover
D. General fish/aquatic habitat	N/A	N/A	No habitat
E. Flood attenuation	N/A	N/A	No overbank flow
F. Short- and long-term surface water storage	.7	.8	
G. Sediment/nutrient/toxicant removal	1	1	Close to highway, cattle removal
H. Sediment/shoreline stabilization	N/A	N/A	
I. Production export/food chain support	.6	.7	Increased structural diversity
J. Ground water discharge/recharge	1	1	
K. Uniqueness	.1	.4	Shift to shrub
L. Recreation/education potential	.1	1	Not likely site
Total Functional Points	4.3	6.7	

In this case, the enhancement factor equals 0.76. The corresponding enhancement ratio (1/0.76) would be 1.32 and would be expressed as 1.32 to 1, indicating 1.32 acres of enhancement replaces 1 impacted wetland acre.

Next, applying equation (3), it is possible to calculate the mitigation credits for the 1.3 acres of existing wetland that would be enhanced at the Ludwig stream channel site:

$$A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 1.3(0.76) \quad = 0.98 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Ludwig stream channel site.

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 3.9 + 1.3(0.76) \quad = \textbf{4.9 total acres of credit}$$

Stock Pond Site. The stock pond portion of the site would increase from an estimated 0.35 ($A_{existing}$) acres of wetland to 1.8 acres, resulting in 1.45 ($A_{created}$) created wetland acres. From Table 3, the functional score would shift from 4.3 (F_{pre}) to 6.7 (F_{post}). Using Equation (2):

$$\text{Enhancement factor} = \left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) \qquad = \left(\frac{6.7-4.3}{4.3}\right) \qquad = 0.56$$

In this case, the enhancement factor equals 0.56. The corresponding enhancement ratio (1/0.56) would be 1.79 and would be expressed as 1.79 to 1, indicating 1.79 acres of enhancement replaces 1 impacted wetland acre.

Next, applying equation (3), it is possible to calculate the mitigation credits for the 0.35 acres of existing wetland that would be enhanced at the Ludwig stock pond site:

$$A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 0.35(0.56) \quad = 0.20 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Ludwig stock pond site.

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 1.45 + 0.35(0.56) = \textbf{1.64 total acres of credit}$$

CSKT Mitigation Ratios from Wetlands Conservation Plan (pre-project only)

Prepared by Tom Parker, Ecologist, Herrera Environmental Consultants, Inc.
May 2, 2002

Impacted Wetland Type	Mitigation Type			
	Preservation	*Restoration*	*Enhancement*	*Creation*
Forested and Shrub	3:1	2.5:1	4:1	4:1
Emergent and Open Water	2:1	1.5:1	3:1	3:1

Equation for calculating required mitigation acres based on CSKT Mitigation Guidelines.

Required mitigation acres = $P(3\ I_{sf} + 2\ I_{oe}) + R(2.5\ I_{sf} + 1.5\ I_{oe}) + E(4\ I_{sf} + 3\ I_{oe}) + C(4\ I_{sf} + 3\ I_{oe})$

Where:
I_{sf} = # of scrub/shrub or forested impact acres = 18
I_{oe} = # of emergent or open water impact acres = 32

P = estimated **Preservation** proportion of mitigation area
R = estimated **Restoration** proportion of mitigation area
E = estimated **Enhancement** proportion of mitigation area
C = estimated **Creation** proportion of mitigation area

Example 1: To find required mitigation acres, assuming that mitigation projects will be distributed as follows based on area: Preservation = 30 percent; Restoration = 50 percent; Enhancement = 10 percent; Creation = 10 percent.

.3 (3*18 + 2*32) + .5(2.5*18+1.5*32) + .1(3*18 + 4*32) + .1(3*18 + 4*32) = 104.2 required acres

Example 2: To find required mitigation acres, assuming that mitigation projects will be distributed as follows based on area: Preservation = 10 percent; Restoration = 90 percent; Enhancement = 0 percent; Creation = 0 percent.

.1 (3*18 + 2*32) + .9(2.5*18+1.5*32) + 0(3*18 + 4*32) + 0(3*18 + 4*32) = 96.0 required acres

Example 3: Given 18 impacted acres (36% of total) of shrub or forested and 32 impacted acres (64 percent of total) of open water or emergent, what is the weighted ratio for restoration projects?

2.5(.36) + 1.5(.64) = 1.86

Therefore: A 20-acre restoration project will mitigate for 20/1.86 =10.75 impacted acres.