MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2011

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

Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

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December 2011

MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

WETLAND MITIGATION MONITORING REPORT:

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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:

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1. INTRODUCTION

The 2011 US 93 wetland monitoring report documents the fifth year of monitoring at the Bouchard Property, the fourth year of monitoring at the Peterson property, and the third year of monitoring at the Mud Creek site. The US Highway 93 Wetland Mitigation Sites were developed to mitigate for wetland impacts associated with eight Montana Department of Transportation (MDT) segments of the US 93 Evaro to Polson highway reconstruction project. The 2009 US 93 Wetland Mitigation Monitoring Report included monitoring results for the Jocko Spring Creek and Mission Creek mitigation sites. These sites were excluded from US 93 monitoring activities in 2010 after MDT received acknowledgement from the US Army Corps of Engineers (USACE) 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 situated between Mileposts 20 and 25, south of Ravalli, along a segment identified as Project 4, White Coyote Road (Figure 1). The Mud Creek site is located south of Pablo near Milepost 50, along a segment identified as Project 7, Spring Creek Road to Minesinger Trail (Figure 2). The Peterson site is located north of St. Ignatius near Milepost 35, along the segment identified as Project 6 (Figure 3). Figures 4 through 9 (Appendix A) show the monitoring activity locations and mapped site features for each site, respectively. 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.

The CSKT regulated wetlands were to mitigate for 22.01 acres of impacts and the USACE regulated wetlands were to mitigate for 19.63 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

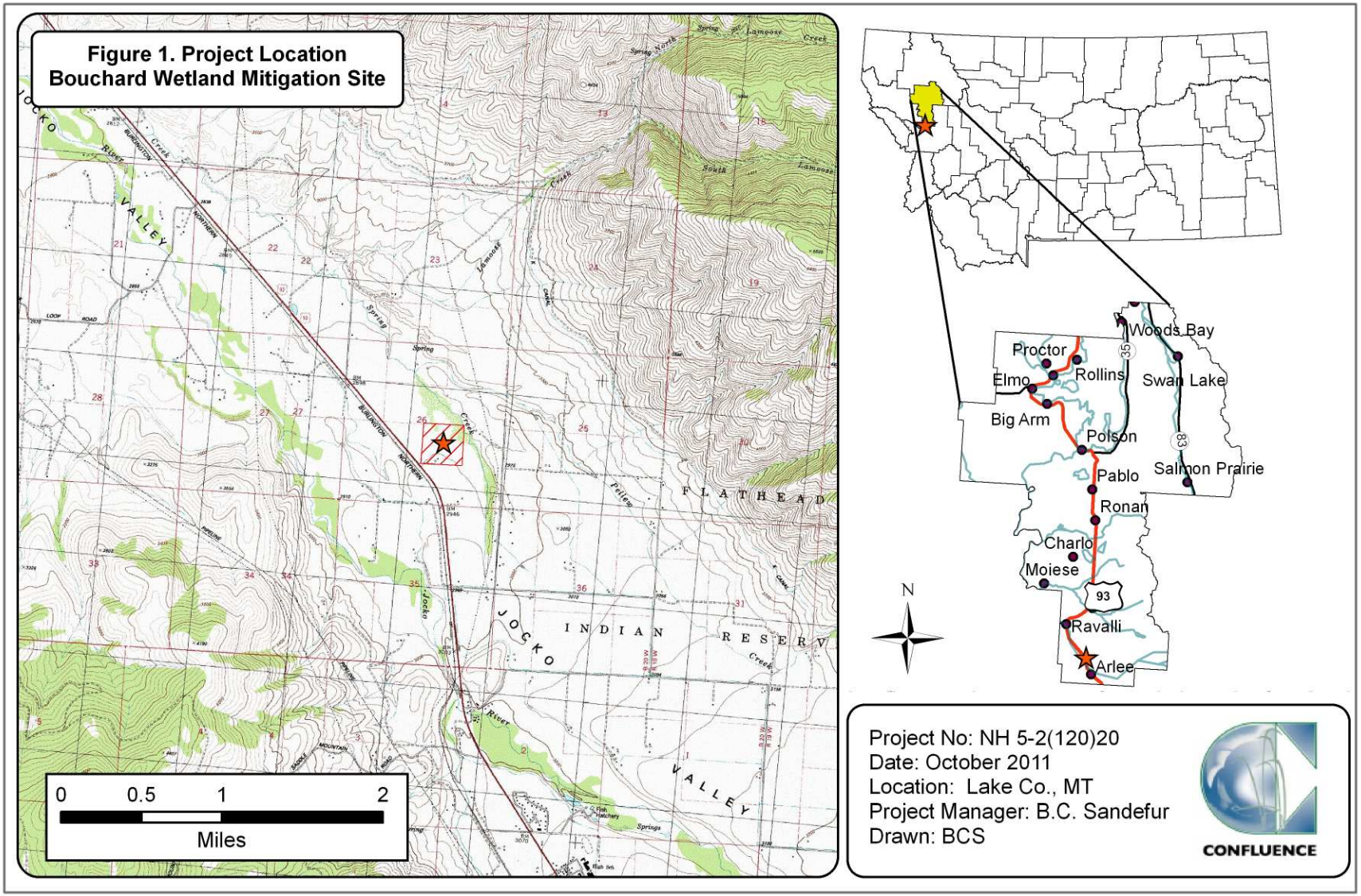

Figure 1. Project location of Bouchard Wetland Mitigation Site.

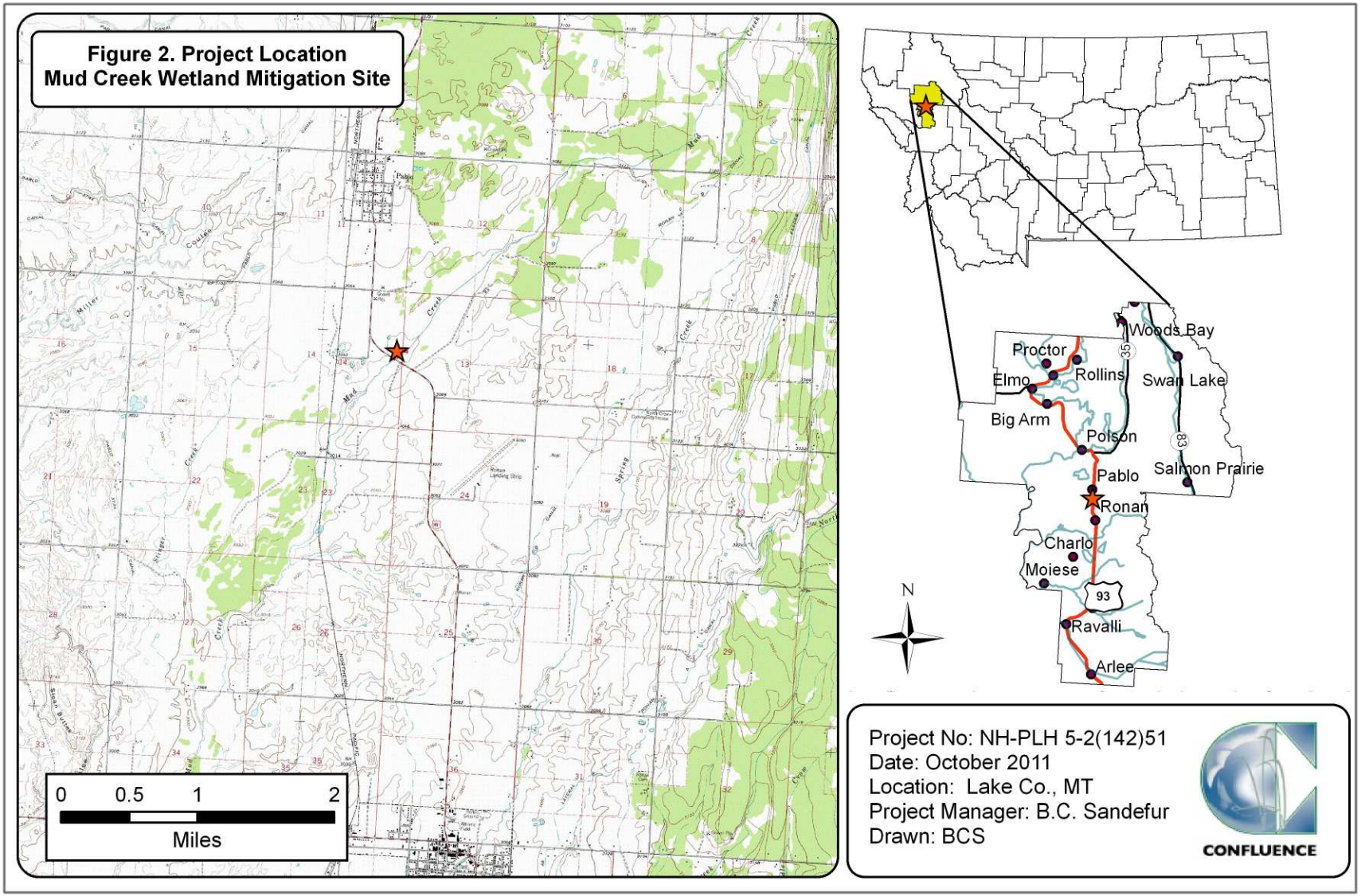

Figure 2. Project location of Mud Creek Wetland Mitigation Site.

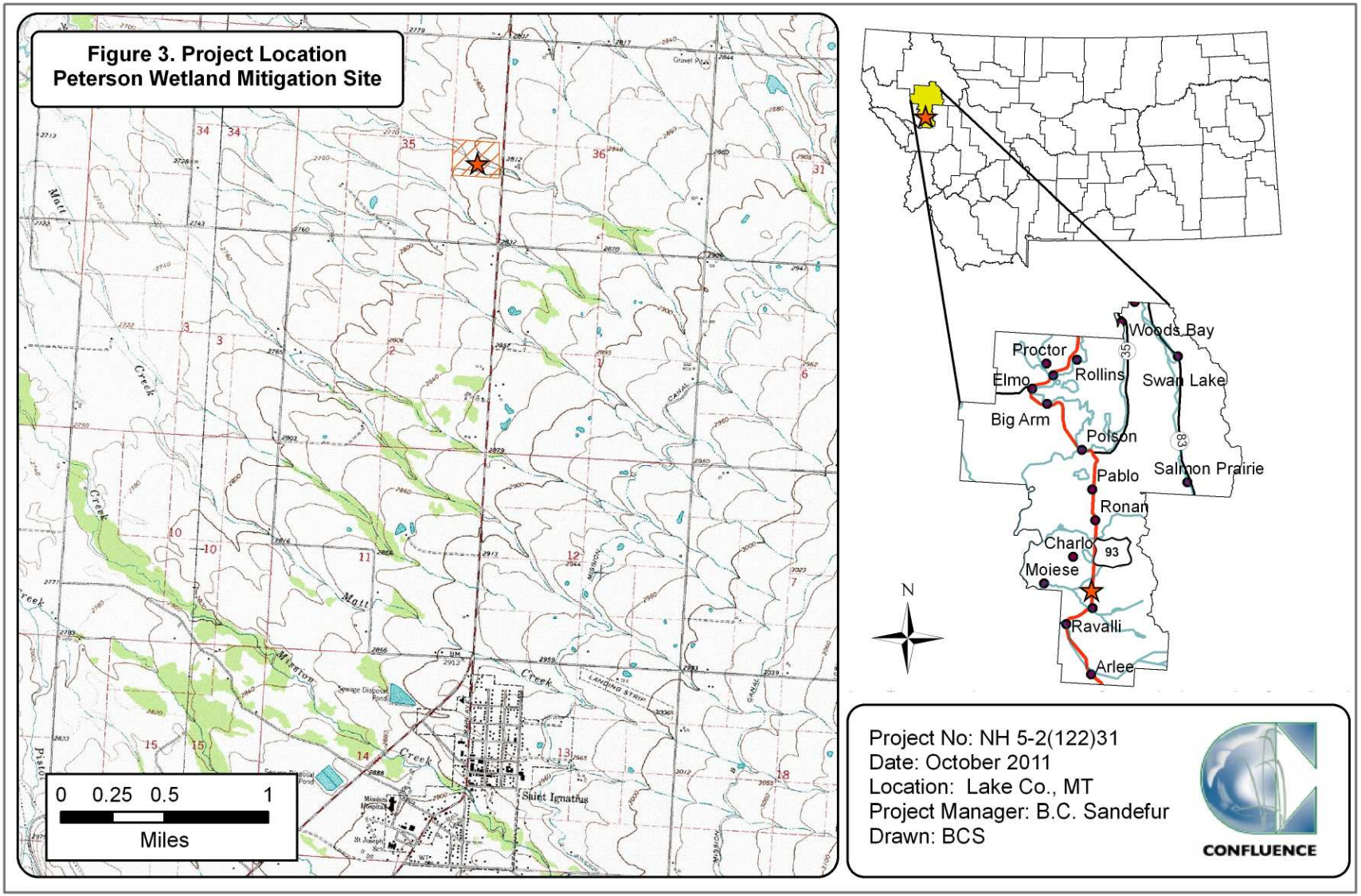

Figure 3. Project location of Peterson Wetland Mitigation Site.

type, and expected CSKT and USACE wetland mitigation credits. The expected credits are discussed in more detail in the Currant 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.

Table 1. Wetland impacts for project segments 4, 6, and 7 at the US 93 Evaro to Polson Highway Reconstruction Project.

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

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

Project	Wetland Mitigation Site	Expected CSKT 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 92) Red Horn Road	Mission	Primary Restoration	0.22	Re-establishment	0.15
		Project Total	**0.22**	**Project Total**	**0.15**
	Peterson	Creation	0.64	Creation	2.14
		Secondary Restoration	0.67	Rehabilitation	0.25
		Project Total	**1.31**	**Project Total**	**2.39**
Project 7 Spring Creek Road to Minesinger Trail	Mud Creek	Creation	3.22	Creation	6.18
		Secondary Restoration	0.33	Rehabilitation	0.63
		Project Total	**3.55**	**Project Total**	**6.81**

[1] Onsite Wetland Mitigation Plan, US 93 Evaro to Polson.

[2] MDT Wetland Mitigation Monitoring Report: Year 2007.

[3] Personal communication with MDT.

[4] Corrected from values presented in the 2007 US 93 mitigation monitoring report; revised figures are based on the site plan

The CSKT crediting approach is based on the CKST Wetlands Conservation Plan (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 a 40-acre parcel located adjacent to US 93 at approximately Milepost 20.5 in Section 26 of Township 17 North and Range 20 West. The site occurs east of US Highway 93, between the highway and Jocko Spring Creek. Jocko Spring Creek flows along the east side of the parcel boundary, providing a major source of surface water to the Bouchard property. The parcel previously included an abandoned home site, fish rearing ponds, and a system of drainage ditches and berms used to control surface water flow on the property. The site is near the headwaters of Jocko Spring Creek and exhibits a high groundwater table that seasonally inundates a large portion of the site. The elevation is approximately 2,960 feet above mean sea level (amsl). The monitoring area boundary is shown on Figure 4: Bouchard (Appendix A).

Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Plug drainage ditches and remove berms adjacent to the existing fish ponds;
- Excavate topography in the southeast corner of the property to lower 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 Bebb willow (*Salix bebbiana*), bog birch (*Betula glandulosa),* and beaked sedge (*Carex utriculata*) communities with a less dominant layer of a quaking aspen (*Populus tremuloides*) and red osier dogwood (*Cornus stolonifera*). Site construction was completed in summer 2006 and the revegetation was completed from August through October 2006.

1.2.2. Mud Creek

The 2.54-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 (*Cretaegus*) 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 weedy species such as reed canarygrass;
- Performing wetland mitigation planting to increase the diversity of wetland plants;
- Constructing and realigning the Mud Creek channel to provide higher surface water elevations allowing 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 trichocarpa*), thin-leaf alder (*Alnus incana*), and Bebb willow with an understory of emergent wetland habitat. Initial construction of the new channel and floodplain was completed in summer 2007 including the installation of pre-vegetated coir mats along the channel. Revegetation was completed in summer 2008.

1.2.3. Peterson

The 30-acre Peterson mitigation site is situated in the Project 6 segment approximately 3 miles north of St. Ignatius and west of the highway. The site is located south of Milepost 36 in Section 2 of Township 16 North and Range 20 West. The Peterson site consists of a riparian wetland corridor associated with an unnamed perennial tributary to Post Creek and is dominated by herbaceous vegetation. Site hydrology is provided by an unnamed perennial tributary to Post Creek. The monitoring area boundary is illustrated on Figure 4: Peterson (Appendix A). Site plans are included in Appendix D. Mitigation objectives included the following:

- 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 Baltic rush (*Juncus balticus*) 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

Mud Creek was monitored on August 3, 2011, Bouchard was monitored on August 4, 2011, and Peterson was monitored on August 5, 2011. 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 documented at five data points within Bouchard, two 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.

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 mapped on the 2011 aerial photographs 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 2011 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 (Figure 3, Appendix).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects (Figures 3, 5, and 7, Appendix A). Vegetation composition was assessed and recorded along vegetation belt transects established at all sites during the 2008 and 2009 reconnaissance visits for Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson sites. The new transects replaced any previously-located transects to better represent and capture future 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 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 community polygon 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 location of noxious weeds was noted in the field during the investigation and mapped on the 2011 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, 2 to 25 percent, and 25 to 100 percent, respectively.

2.3. Soil

Soil information was obtained from the *Soil Survey for Lake County* and *in situ* soil descriptions (NRCS 2010). Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the USACE 1987 Wetland Manual. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the US including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Wetland Manual. In order to delineate a representative area as wetland, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology, as described in the 1987 Manual, must be satisfied. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas within the project boundaries. The information was recorded electronically on the Wetland 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 considered an atypical situation, problem area, or special aquatic site. The wetland boundary was identified on the 2011 aerial photographs. Wetland areas were estimated using geographic information system (GIS) methodology.

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the wetland monitoring form during the site visit. Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of wildlife species observed on the site annually 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. A Wetland Assessment Form was completed for each wetland or group of wetlands (Assessment Areas, AA, Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland 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 and at transect endpoints (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figures 4, 6, and 8, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS (Global Positioning System) unit during the 2011 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. In addition to GPS, some site features within the site were hand-mapped onto the 2011 aerial photograph, then digitized. Site features and survey points that were mapped included fence boundaries, photographic points, transect endpoints, wetland boundaries, vegetation community boundaries, and soil sample locations.

2.9. Maintenance Needs

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

3. RESULTS

3.1. Bouchard Property

3.1.1. Hydrology

The average total annual precipitation recorded at the Saint Ignatius weather station, Montana (247286) from February 1896 to December 2010 was 15.83 inches (WRCC 2011). Total precipitation from January to August 2011 recorded

at the Bureau of Reclamation AgriMet station at Saint Ignatius (SIGM) was 18.32 inches (USBR 2011). The cumulative precipitation thru August 2011 was 2.49 inches above the mean annual precipitation.

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 regional irrigation and the Jocko River.

Approximately 65 percent of the entire Bouchard site was inundated in 2011. The constructed shallow depression exhibited an average depth of 0.5 feet. The range of surface water depths across the site was 0.0 to 4.0 feet with an average depth of 0.2 feet. 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 (1.0 foot) of the ground surface (see discussion below).

Five data points, SP-1 to SP-5, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points SP-1, SP-2, SP-4, and SP-5 were located within areas that met the wetland criteria. Positive secondary indicators of wetland hydrology at SP-1 were water stained leaves and the FAC-Neutral test. Sample plot SP-2 was inundated with 2 inches of surface water, saturated to the ground surface, and contained water-stained leaves. Test pit SP-4 exhibited saturation at 4 inches below the ground surface (bgs), a water table at 5 inches bgs, water-stained leaves, and passed the FAC-neutral test. Saturation at 12 inches bgs was a positive indicator of wetland hydrology at site SP-5. Data point SP-3 did not exhibit any positive indicators of wetland hydrology.

3.1.2. Vegetation

Twelve new plant species were identified during the 2011 monitoring season. A comprehensive list of 90 vegetation species identified from 2007 to 2011 is shown in Table 4. A majority of the species are herbaceous although the site contains small stands of black cottonwood and quaking aspen near or adjacent to the inundated depressions. Two upland and eight wetland communities were identified and mapped within the project boundaries (Figure 5, Appendix A). The ten community types were Type 1 – *Agropyron* spp./*Agrostis alba* Upland, Type 2 – *Deschampsia cespitosa/Juncus* spp. Wetland, Type 3 – *Juncus* spp./*Eleocharis palustris* Wetland, Type 4 – *Juncus balticus/Cirsium arvense* Wetland, Type 5 – *Carex* spp. Wetland, Type 6 – *Betula occidentalis*/*Juncus balticus* Wetland, Type 8 – *Populus* spp. Wetland, Type 10 – Aquatic Macrophytes Wetland, Type 11 – *Agropyron repens*/*Cirsium arvense* Upland, and Type 12 – *Alnus incana*/*Carex* spp. Wetland.

The eight wetland communities occurred within the wetland creation, rehabilitation, and re-establishment areas. The species composition for each community is discussed below and included on the Monitoring Form (Appendix B).

Upland community Type 1 was located in the upland area in the southwest portion of the site and in isolated upland islands located in the north half of the site. Slender wheatgrass (*Agropyron trachycaulum*), quackgrass (*Agropyron repens*), redtop (*Agrostis alba*), smooth brome (*Bromus inermis*), and Kentucky bluegrass (*Poa pratensis*) dominated the community.

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. The community was dominated by tufted hairgrass (*Deschampsia cespitosa),* three-stamen rush (*Juncus ensifolius*), beaked sedge, and field horsetail (*Equistem arvesnse)*. Planted woody species included speckled alder, red-osier dogwood, and Bebb willow.

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

Wetland Type 4 – *Juncus balticus/Cirsium arvense* was located in six wetlands throughout the site. The cover was dominated by Baltic rush, Canada thistle (*Cirsium arvense*), Kentucky bluegrass, and quackgrass. This community was associated with existing wetlands that commonly contained infestations of Canada 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 cattail and high percent cover of six *Carex* spp. The emergent vegetation cover included beaked sedge, Nebraska sedge, inflated sedge (*Carex vesicaria*), wooly sedge (*Carex lanuginosa*), retrorse sedge (*Carex retrorsa*), Baltic rush, slender rush, and Bebb willow.

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

Wetland community Type 8 – *Populus* spp*.,* found in existing wooded areas across the site, was dominated by black cottonwood and quaking aspen. These areas are expanding gradually and support regeneration of cottonwoods within the understory.

Wetland community 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 trace cover levels of lesser duckweed (*Lemna minor*) and broad-leaf cattail (*Typha latifolia*).

Upland community Type 11 – *Cirsium arvense/Agropyron repens* was identified in two upland inclusions located near the north central and south central project boundaries. The community was dominated by Canada thistle and quackgrass with less percent cover of redtop, Baltic rush, Kentucky bluegrass, and Canada goldenrod (*Solidago canadensis*).

Table 4. Vegetation species observed from 2007 to 2011 for the Bouchard Property Wetland Mitigation Site*.*

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Achillea millefolium	yarrow,common	FACU
Agropyron repens	quackgrass	FACU
Agropyron trachycaulum	wheatgrass,slender	FAC
Agrostis alba	redtop	FACW
Algae, brown	**algae, brown**	**NL**
Algae, green	**algae, green**	**NL**
Alnus incana	alder,speckled	FACW
Alopecurus pratensis	foxtail,meadow	FACW
Alyssum alyssoides	pale madwort	NL
Angelica arguta	angelica,Lyall's	FACW
Anthemis cotula	mayweed	FACU
Artemisia ludoviciana	sagebrush,white	UPL
Aster sp.		**NI**
Betula occidentalis	birch,spring	FACW
Brassica kaber	**wild mustard**	**NL**
Bromus carinatus	California brome	NL
Bromus inermis	**smooth brome**	**NL**
Bromus tectorum	cheatgrass	NL
Calamagrostis canadensis	reedgrass,blue-joint	FACW+
Campanula rotundifolia	bellflower,Scotch	FACU+
Carduus nutans	musk thistle	NL
Carex lanuginosa	sedge,wooly	OBL
Carex nebrascensis	sedge,Nebraska	OBL
Carex praegracilis	sedge,clustered field	FACW
Carex retrorsa	sedge,retrorse	FAC
Carex stipata	awlfruit sedge	NL
*Carex utriculata**	beaked sedge	OBL

[1]Region 9 Northwest (Reed 1988)
New species identified in 2011 are shown in **bold** type.

*Commonly accepted name not included on 1988 list.

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Carex vesicaria	sedge,inflated	OBL
Centaurea maculosa	spotted knapweed	NL
Chara spp.		NL
Chenopodium album	goosefoot,white	FAC
Chrysanthemum leucanthemum	oxeye daisy	NL
Cichorium intybus	chicory	NL
Cirsium arvense	thistle,Canada	FACU+
Cirsium vulgare	thistle,bull	FACU
Cornus stolonifera	dogwood,red-osier	FACW
Crataegus douglasii	hawthorn,Douglas'	FAC
Cynoglossum officinale	gypsy-flower	NL
Deschampsia cespitosa	hairgrass,tufted	FACW
Dipsacus sylvestris	**teasel**	**NI**
Dodecatheon sp.		NL
Eleocharis palustris	spikerush,creeping	OBL
Epilobium ciliatum	willow-herb,hairy	FACW-
Epilobium sp.	willow-herb	NL
Equisetum arvense	horsetail,field	FAC
Geum macrophyllum	avens,large-leaf	FACW+
Glyceria grandis	American mannagrass	NL
Glyceria striata	grass,fowl manna	OBL
Hordeum jubatum	barley,fox-tail	FAC+
Hypericum perforatum	common St. John's wort	NL
Juncus balticus	rush,Baltic	OBL
Juncus ensifolius	rush,three-stamen	FACW
Juncus mertensianus	rush,Merten's	OBL
Juncus sp.		NL
Juncus tenuis	rush,slender	FAC
Kochia scoparia	**summer-cypress,Mexican**	**FAC**
Lactuca serriola	lettuce,prickly	FAC-
Lemna minor	**duckweed,lesser**	**OBL**
Lepidium campestre	**field pepperweed**	**NL**
Lychnis alba	bladder campion	NL
Medicago sativa	alfalfa	NL
Mentha arvensis	mint,field	FAC
Mimulus guttatus	monkey-flower,common large	OBL
Nepeta cataria	catnip	FAC
Phalaris arundinacea	grass,reed canary	FACW
Phleum pratense	timothy	FACU
Plantago major	plantain,common	FAC+
Poa palustris	bluegrass,fowl	FAC

[1]Region 9 Northwest (Reed 1988)

New species identified in 2011 are shown in **bold** type.

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Poa pratensis	bluegrass,Kentucky	FACU+
Polygonum amphibium	smartweed,water	OBL
Populus tremula	aspen,quaking	FAC+
*Populus tremuloides**	quaking aspen	FAC+
*Populus trichocarpa**	black cottonwood	FAC
Potentilla anserina	silverweed	OBL
Potentilla fruticosa	cinquefoil,shrubby	FAC-
Ranunculus sp.		NL
Ribes sp.		NI
Rosa woodsii	rose,Woods	FACU
Rubus idaeus	raspberry,common red	FACU
Rumex crispus	dock,curly	FACW
Salix bebbiana	willow,Bebb	FACW
Salix exigua	willow,sandbar	OBL
Salix geyerana	willow, Geyer	FACW+
Salix lutea	willow,yellow	OBL
Scirpus microcarpus	**bulrush,small-fruit**	**OBL**
Solanum dulcamara	nightshade,climbing	FAC
Solidago canadensis	golden-rod,Canada	FACU
Sonchus arvensis	sowthistle,field	FACU+
Symphoricarpos albus	snowberry	FACU
Typha latifolia	cattail,broad-leaf	OBL
Verbascum thapsus	common mullein	NL
Vicia spp.		NL

[1]Region 9 Northwest (Reed 1988)
New species identified in 2011 are shown in **bold** type.
*Commonly accepted name not included on 1988 list.

Wetland Type 12 – *Alnus incana*/*Carex* spp. identified in the northwest corner was dominated by speckled alder, beaked sedge, inflated sedge, spring birch, and red-osier dogwood.

Vegetation transect results were detailed on the Bouchard Monitoring Form (Appendix B) and summarized in tabular and graphic formats on Tables 5 through 7 and Charts 1 through 6. Photographs of the Bouchard photo points and transect end points are shown on pages C-1 to C-6 in Appendix C.

The 2011 community types identified on the 526-foot Transect 1 were similar to those identified in 2010. Upland Type 1 and wetland Types 2, 3, and 4 were identified on the transect from 2008 to 2011. The length of the interval dominated by Type 3 – *Juncus/Eleocharis* increased in 2011. Hydrophytic vegetation communities dominated 80.6 percent of the transect intervals.

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

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

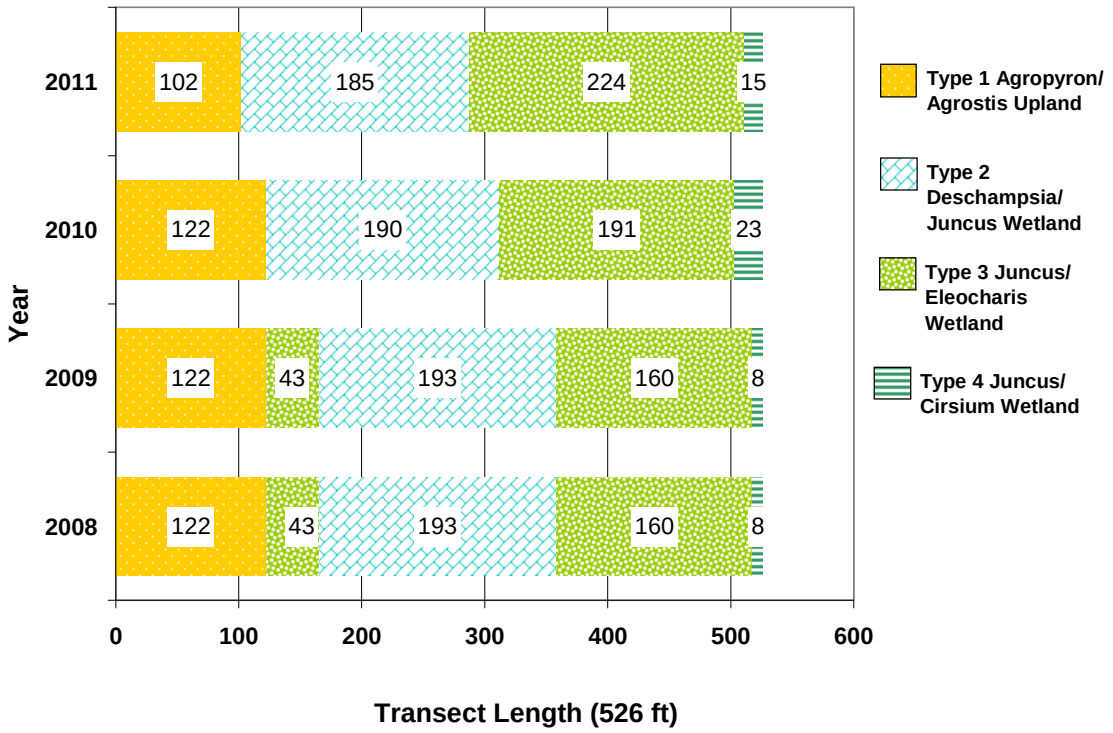

Chart 1. Bouchard Transect 1 maps showing vegetation types from transect start (0 feet) to finish (526 feet) from 2008 to 2011.

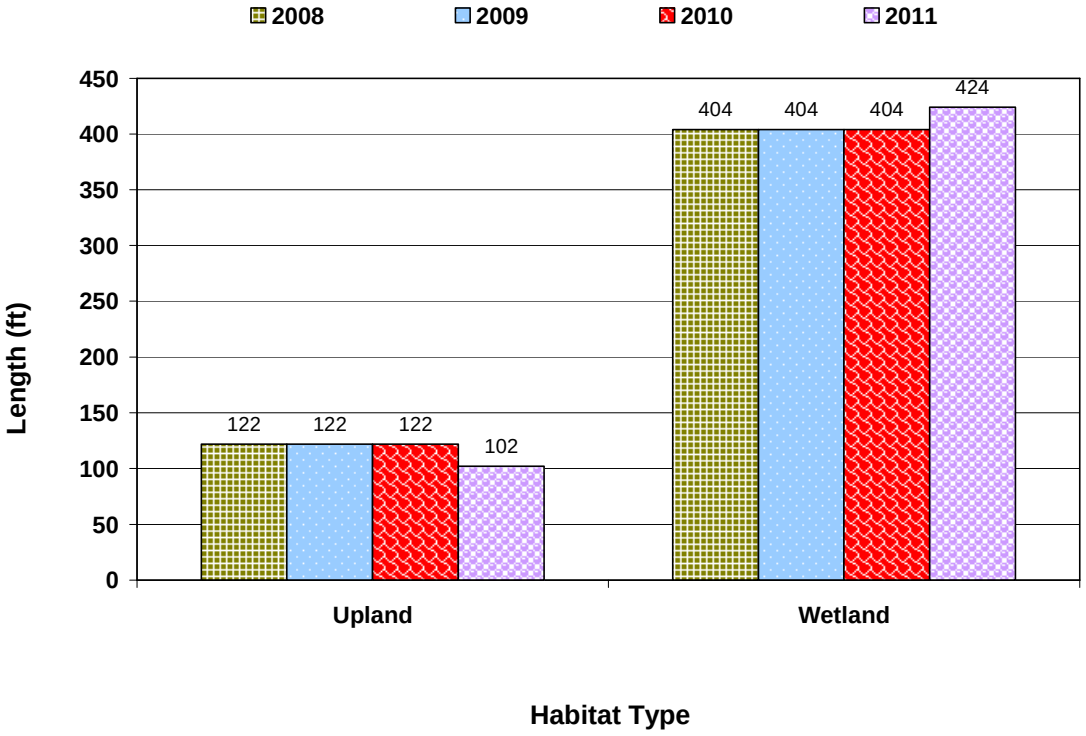

Chart 2. Length of Bouchard vegetation habitats within Transect 1 from 2008 to 2011.

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. Hydrophytic vegetation communities covered 100 percent of the transect intervals.

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

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

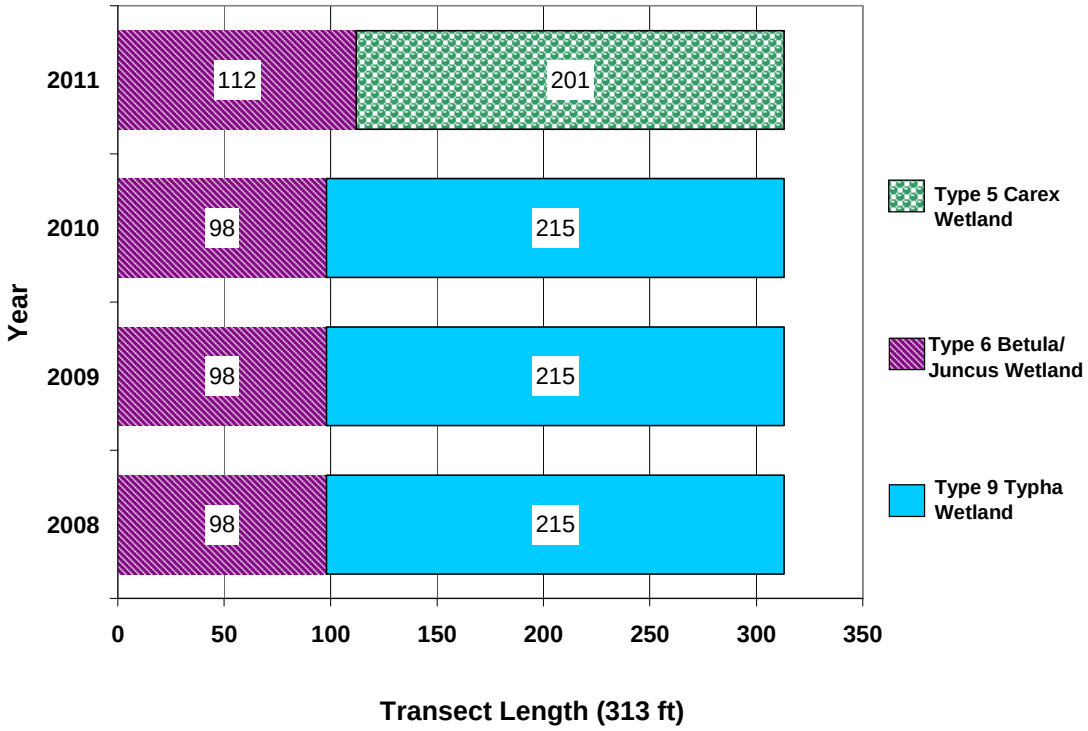

Chart 3. Bouchard Transect 2 maps showing vegetation types from transect start (0 feet) to finish (313 feet) from 2008 to 2011.

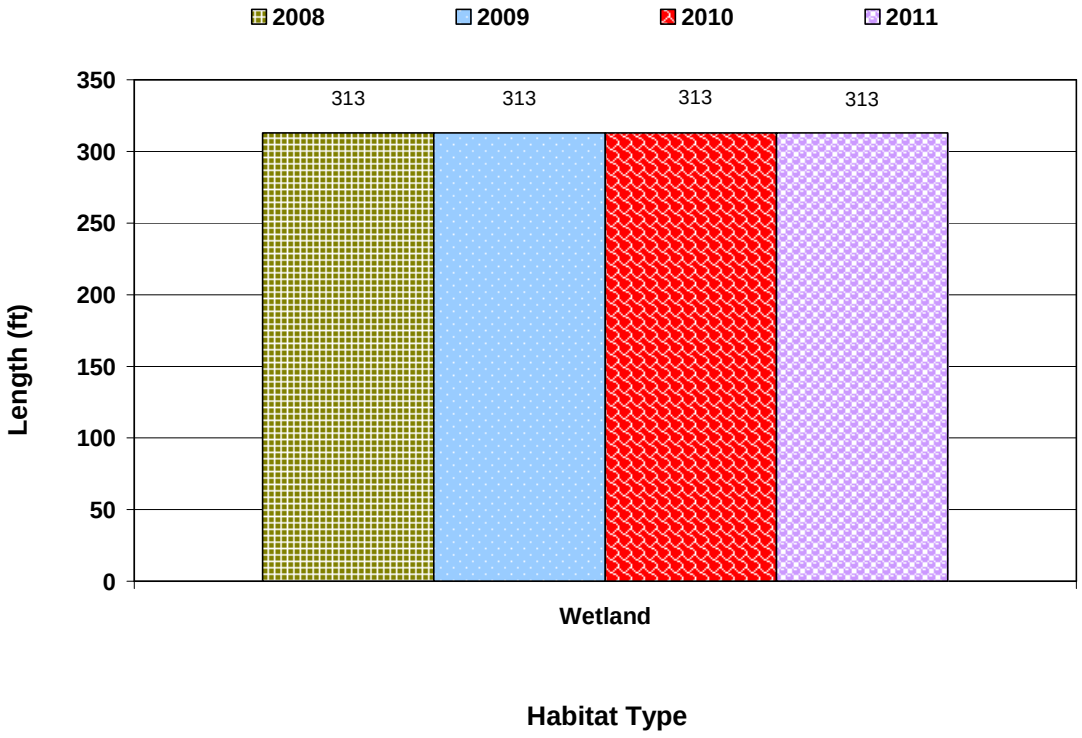

Chart 4. Length of vegetation habitats within Bouchard Transect 2 in 2008 to 2011.

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. A majority of the transect was dominated by upland Type 11 *Cirsium/Agropyron* in 2011. This represented a shift in dominant species from upland Type 1 *Agropyron/Agrostis* identified from 2008 to 2010 to Canada thistle and quackgrass in 2011. Upland vegetation communities dominated 89.5 percent of the transect intervals. There was a 3.5 percent increase in the cover of hydrophytic species from 2010 to 2011.

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

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

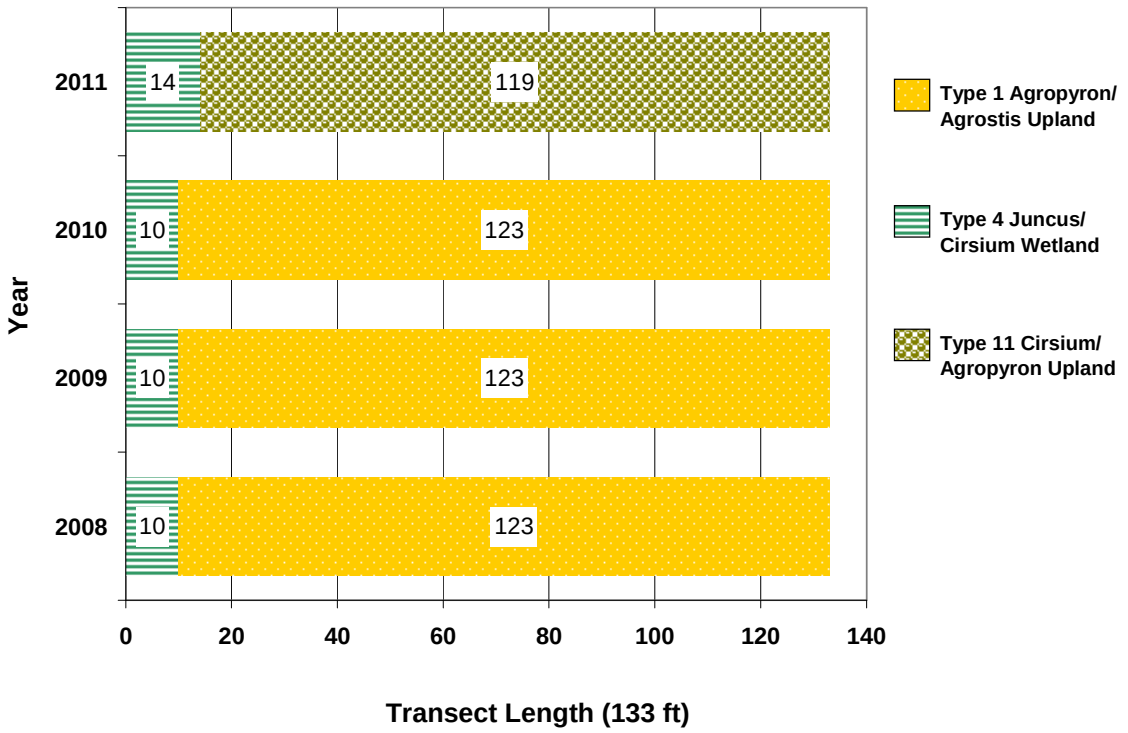

Chart 5. Bouchard Transect 3 maps showing vegetation types from transect start (0 feet) to finish (133 feet) from 2008 to 2011.

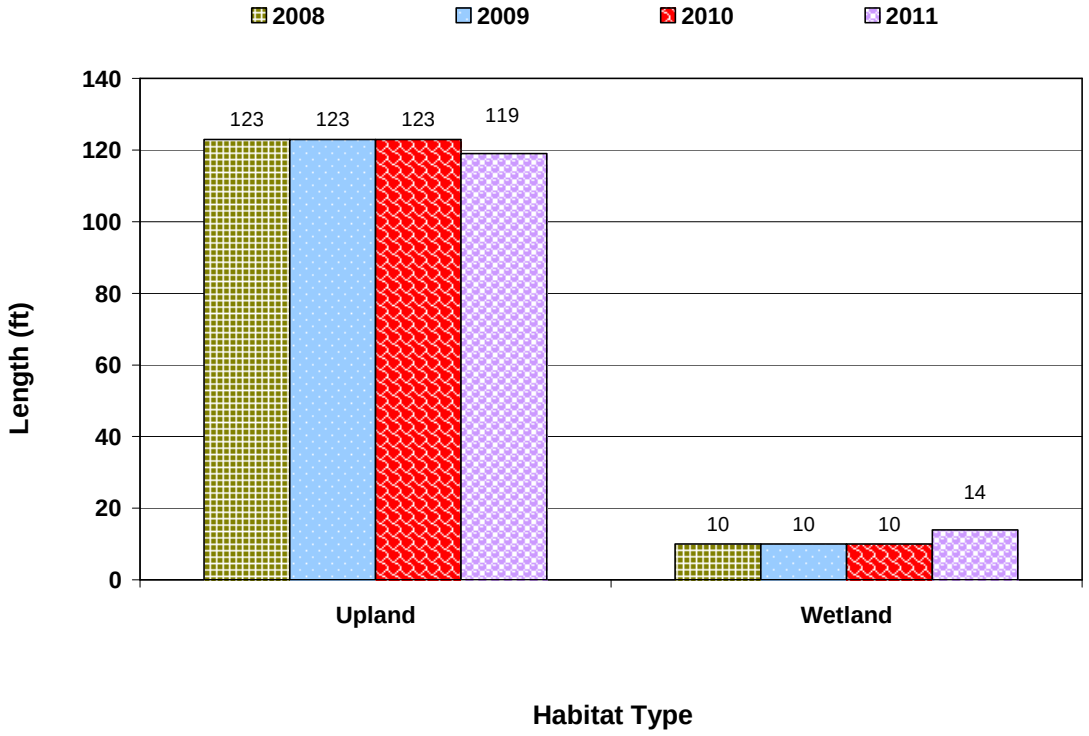

Chart 6. Length of vegetation habitats within Bouchard Transect 3 from 2008 to 2011.

Infestations of Priority 2B noxious weeds, including Canada thistle, spotted knapweed (*Centaurea maculosa*), St. Johnswort (*Hypericum* perforatum), houndstongue (*Cynoglossum officinale*), and oxeye daisy (*Chrysanthemum leucanthemum*) were mapped on Figure 5, (Appendix A). Canada thistle was identified across the site, particularly in community Types 1, 4, and 11. The size of the Canada 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. Spotted knapweed infestations ranged from 0.1 to 1.0 acre in size with a moderate cover class. Houndstongue, St. Johnswort, and oxeye daisy infestations inhabited less than 0.1 acre with a low (1 to 5 percent) cover. The MDT sprayed the weed colonies during the 2010 and 2011 growing seasons. These efforts have proven moderately effective at controlling houndstongue, St. Johnswort, and oxeye daisy while control of Canada thistle within this site has proven difficult.

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 2011 was based on visual estimates and counts for each live species. Fifteen speckled alder, fifty spring birch, five red osier dogwood, five currant (*Ribes* sp.), two Wood's rose, and fifty Bebb willow plants were identified in 2011. However, changes were made to the revegetation design during construction based on the availability of species. One hundred twenty-five plants were observed in 2011. 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 four 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 SP-1 thru SP-5 were located in areas that met the wetland criteria. Test pit SP-1 was a very dark gray (10YR 3/1) loam without redoximorphic features. The soil profile at data point SP-2 revealed a very dark gray (10 YR 3/1) loam with dark brown redox concentrations (7.5 YR 3/4) in the matrix. Test pits SP-3 and SP-4 contained black (10 YR 2/1) loam and silt loam soil, respectively, without redox features. Data point SP-5 revealed a black (10 YR 2/1) silt loam with dark gray depletions (10 YR 4/1) in the matrix. The five data points met the wetland criteria for hydric soil based on the presence of low chroma colors and (at some data points) redox concentrations in the matrix. 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 SP-1 to SP-5 were used to determine the wetland and upland boundaries (Bouchard Figures 4 and 5, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Bouchard Wetland Data Forms (Appendix B). The total acreage of aquatic habitat at Bouchard was 33.78 acres including 33.42 acres of emergent and scrub-shrub wetland and 0.36 acres of aquatic bed wetland. This represented an increase of 3.32 acres in aquatic habitat since 2010 and an increase of 14.75 acres since 2004.

Table 8. Aquatic habitats and acreages at the Bouchard Wetland Mitigation Site for 2004, 2009 to 2011.

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

3.1.5. Wildlife

A list of wildlife species observed directly or indirectly from 2007 to 2011 is presented in Table 9 (Monitoring Form, Appendix B). Eight bird species, three western meadowlarks (*Sturnella neglecta*), and a single American robin (*Turdus migratorius*), great blue heron (*Ardea herodias*), mallard (*Anas platyrhynchos*), sandhill crane (*Grus canadensis*), song sparrow (*Melospiza melodia*), Swainson's hawk (*Buteo swainsoni*), and Wilson's snipe (*Gallinago delicata*) were observed in 2011. One mammal and a herptile were also observed, two meadow voles (*Microtus pennsylvanicus*) and a plains gartersnake (*Thamnophis radix*). Deer (*Odocoileus* sp.) tracks were noted. There are no nesting structures currently installed at the site.

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

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog*	*Rana luteiventris*
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*

Species identified in 2011 are listed in **bold** type.
*Species identified in 2011 by MDT.

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

COMMON NAME	SCIENTIFIC NAME
BIRD	
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*
MAMMAL	
Coyote	*Canis latrans*
Deer sp.*	*Odocoileus* sp.
Meadow Vole	***Microtus pennsylvanicus***
Muskrat	*Ondatra zibethicus*
Raccoon*	*Procyon lotor*
Red Fox*	Vulpes vulpes
REPTILE	
Plains Gartersnake	***Thamnophis radix***
Western Painted Turtle*	*Chrysemys picta*

Species identified in 2011 are listed in **bold** type.
*Species identified in 2011 by MDT.

3.1.6. Functional Assessment

Results of the 2004 (baseline), 2009, 2010, and 2011 functional assessments are summarized in Table 10. The 2011 Bouchard Wetland Assessment Form is included in Appendix B. The Bouchard Property was evaluated as one assessment area (AA-1) that encompassed 33.78 acres in 2011. The AA was rated as a Category II wetland in 2011 with 82.22 percent of the total possible points. The 2011 increase in the extent of aquatic habitat resulted in a corresponding increase in functional units. In addition, a nearby great blue heron rookery was identified and increased MTNHP species habitat rating. The site has shown a net acreage gain of 14.8 acres since 2004 and a functional unit gain of 162.43. Functional ratings were high for general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, production export/food chain support, groundwater discharge/recharge, and recreation/education potential.

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

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

3.1.7. Photo Documentation

Photographs from photo points PP1 to PP11 (Figure 2, Appendix A) and of the transect endpoints are shown on pages C-1 to C-9 of Appendix C.

3.1.8. Maintenance Needs

Infestations of Priority 2B noxious weeds, including Canada thistle, spotted knapweed, St. Johnswort, houndstongue, and oxeye daisy were mapped on Figure 5, (Appendix A). Canada thistle was identified across the site, particularly in community Types 1, 4, and 11. The size of the Canada 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. Spotted knapweed infestations ranged from 0.1 to 1.0 acre in size with a moderate cover class. Houndstongue, St. Johnswort, and oxeye daisy infestations inhabited less than 0.1 acre with low (1 to 5 percent) cover. The MDT sprayed approximately four acres of weeds, targeting Canada thistle, during the 2011 growing season.

3.1.9. Current Credit Summary

Approximately 33.78 aquatic habitat acres consisting of 33.42 acres of emergent and scrub/shrub wetlands and 0.36 acre of aquatic bed wetland were delineated in 2011. The pre-project wetland delineation documented 19.03 acres of wetland and open water. The net increase in aquatic habitat acres to date is 14.8 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 1.64 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 = (7.4 – 4.6) / 4.6; Enhancement factor = 0.61
Enhancement Ratio = 1/ 0.61; Enhancement Ratio = 1.64

Using this ratio, the site earned 26.35 USACE credit acres and 15.75 CSKT credit acres in 2011. An increase of wetland acreage above the projected estimate and a trend of increasing functional units have 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, although it is less than 10 percent site wide.

Table 11. Credit summary for 2010 and 2011 at the Bouchard Property Wetland Mitigation Site.

Targeted Mitigation Type	2010 Wetlands (Acre)	2011 Wetlands (Acre)	2011 Credit Ratio		2010 Credit (acre)		2011 Credit (acre)		Projected Credit (acre)	
			USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	6.72	10.04	1:1	3.36:1	6.72	2.00	10.04	2.99	5.16	1.54
Re-establishment / primary restoration	4.71	4.71	1:1	1.86:1	4.71	2.53	4.71	2.53	2.94	1.58
Rehabilitation / secondary restoration	19.03	19.03	1.64:1	1.86:1	6.65	10.23	11.60	10.23	4.05	10.23
Total	**30.46**	**33.78**			**18.08**	**14.76**	**26.35**	**15.75**	**12.15**	**13.35**

3.2. Mud Creek

3.2.1. Hydrology

The average total annual precipitation recorded at the Saint Ignatius weather station, Montana (247286) from February 1896 to December 2010 was 15.83 inches (WRCC 2011). Total precipitation from January to August 2011 recorded at the Bureau of Reclamation AgriMet station at Saint Ignatius (SIGM) was 18.32 inches (USBR 2011). The cumulative precipitation thru August 2011 was 2.49 inches above the mean annual precipitation for the period of record.

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 continues to expand in response to the post-construction increase in groundwater and the removal of grazing. Max surface water depths in the Mud Creek channel in 2011 was recorded at 4.0 feet. Within the wetland areas, surface water depths ranged from 0.0 to 1.5 feet with an average depth of approximately 0.4 feet. Seventy-five percent of the mitigation area was inundated with water. The depth of water at the emergent vegetation and 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.

Two data points, MC-1 and MC-2, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data point MC-1 was located within an area that met the three wetland criteria. The data point was saturated at 8 inches below the ground surface (bgs). The apparent water table was 9 inches bgs. There was also evidence of drift lines, sediment deposits, drainage patterns, and water stained leaves. Data point MC-2 showed no evidence of wetland hydrology.

3.2.2. Vegetation

A comprehensive list of 94 species identified onsite from 2009 to 2011 is presented in Table 12. There were 17 new species identified during the 2011 site visit. Nine community types were identified in 2011, one upland and eight wetland community types (Mud Creek Figure 7, Appendix A). The community types were Type 1 – *Juncus balticus/Agrostis alba* Wetland, Type 4 – *Juncus* spp*./Carex* spp*.* Wetland, Type 5 – *Carex* spp*.* Wetland, Type 6 – *Crataegus douglasii/Phalaris arundinacea* Wetland, Type 8 – Open water (water of the US), Type 9 – *Cirsium arvense/Juncus balticus* Wetland, Type 10 – *Phalaris arundinacea* Wetland, Type 11 – *Scirpus microcarpus/Phalaris*

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Achillea millefolium	yarrow,common	FACU
Agropyron repens	quackgrass	FACU
Agropyron smithii	wheatgrass,western	FACU
Agropyron spp.	wheatgrass	NL
Agropyron trachycaulum	wheatgrass,slender	FAC
Agrostis alba	redtop	FACW
Algae, green	**algae, green**	**NL**
Alnus incana	alder,speckled	FACW
Aquatic Macrophytes		NL
Artemisia cana	**sagebrush,silver**	**FAC**
Bidens cernua	beggar-ticks,nodding	FACW+
Brassica kaber	**wild mustard**	**NL**
Bromus inermis	smooth brome	NL
Bromus japonicus	brome,Japanese	FACU
Bromus tectorum	cheatgrass	NL
Carex bebbii	sedge,Bebb's	OBL
Carex nebrascensis	sedge,Nebraska	OBL
Carex praegracilis	sedge,clustered field	FACW
Carex sp.		NL
Carex stipata	awlfruit sedge	NL
*Carex utriculata**	beaked sedge	OBL
Centaurea maculosa	**spotted knapweed**	**NL**
Chrysanthemum leucanthemum	oxeye daisy	NL
Cirsium vulgare	thistle,bull	FACU
Cornus stolonifera	dogwood,red-osier	FACW
Crataegus douglasii	hawthorn,Douglas'	FAC
Cynoglossum officinale	gypsy-flower	NL
Dactylis glomerata	grass,orchard	FACU
Deschampsia cespitosa	hairgrass,tufted	FACW
Descurainia sophia	common tansy mustard	NL
Dianthus sp.		NL
Dipsacus sylvestris	teasel	NI
Eleocharis palustris	spikerush,creeping	OBL
Elodea sp.		NI
Epilobium ciliatum	willow-herb,hairy	FACW-
Equisetum arvense	**horsetail,field**	**FAC**
Festuca arundinacea	fescue,Kentucky	FACU-
Festuca sp.		NL
Geum macrophyllum	avens,large-leaf	FACW+
Glyceria grandis	American mannagrass	NL
Glyceria striata	grass,fowl manna	OBL
Hordeum jubatum	**barley,fox-tail**	**FAC+**

[1]Region 9 Northwest (Reed 1988).
New species identified in 2011 are shown in **bold** type.
*Commonly accepted name not included in 1988 list.

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Impatiens ecalcarata	touch-me-not,spurless	FACW
Iris pseudacorus	iris,yellow	OBL
Juncus articulatus	rush,jointed	OBL
Juncus balticus	rush,Baltic	OBL
Juncus effusus	**rush,soft**	**FACW+**
Juncus ensifolius	rush,three-stamen	FACW
Juncus nodosus	**rush,knotted**	**OBL**
Juncus sp.		NL
Juncus tenuis	**rush,slender**	**FAC**
Lactuca serriola	lettuce,prickly	FAC-
Lemna minor	duckweed,lesser	OBL
Lepidium campestre	field pepperweed	NL
Lepidium perfoliatum	pepper-grass,clasping	FACU+
Lychnis alba	bladder campion	NL
Lysichiton americanum	skunk-cabbage,yellow	OBL
Malva neglecta	common mallow	NL
Medicago sativa	alfalfa	NL
Melilotus alba	**sweetclover,white**	**FACU**
Melilotus officinalis	sweetclover,yellow	FACU
Mentha arvensis	mint,field	FAC
Mimulus guttatus	monkey-flower,common large	OBL
Nasturtium officinale	water-cress,true	OBL
Nepeta cataria	catnip	FAC
Oenanthe sp.		NL
Phalaris arundinacea	grass,reed canary	FACW
Phleum pratense	timothy	FACU
Plantago major	**plantain,common**	**FAC+**
Poa pratensis	bluegrass,Kentucky	FACU+
Poa sp.		NL
Polygonum amphibium	**smartweed,water**	**OBL**
Polygonum bistortoides	bistort,American	FACW+
Polygonum sp.		NL
Populus tremula	aspen,quaking	FAC+
*Populus trichocarpa**	black cottonwood	FAC
Potentilla recta	sulfur cinqufoil	NL
Ranunculus aquatilis	butter-cup,white water	OBL
Rosa woodsii	rose,Woods	FACU
Rumex crispus	dock,curly	FACW
Salix bebbiana	willow,Bebb	FACW

[1]Region 9 Northwest (Reed 1988).
New species identified in 2011 are shown in **bold** type.
*Commonly accepted name not included in 1988 list.

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Salix drummondiana	willow,Drummond	FACW
Salix exigua	**willow,sandbar**	**OBL**
Scirpus acutus	**bulrush,hard-stem**	**OBL**
Scirpus microcarpus	bulrush,small-fruit	OBL
Sisymbrium altissimum	mustard,tall tumble	FACU-
Solanum dulcamara	nightshade,climbing	FAC
Solidago canadensis	**golden-rod,Canada**	**FACU**
Sonchus arvensis	sowthistle,field	FACU+
Tragopogon dubius	yellow salsify	NL
Trifolium pratense	clover,red	FACU
Trifolium repens	clover,white	FACU+
Trifolium sp.		NL
Typha latifolia	cattail,broad-leaf	OBL
Urtica dioica	**nettle,stinging**	**FAC+**
Verbascum thapsus	common mullein	NL
Veronica americana	speedwell,American	OBL

[1]Region 9 Northwest (Reed 1988).
New species identified in 2011 are shown in **bold** type.

arundinacea Wetland, and Type 12 - *Phalaris arundinacea/Bromus inermis* Upland. The species composition is detailed by type below and on the Monitoring Form (Appendix B).

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

Wetland Type 4 – *Juncus* spp./*Carex* spp. was found at the north boundary. Baltic rush, three-stamen rush (*Juncus ensifolius*), knotted rush (*Juncus nodosus*), Nebraska sedge (*Carex nebrascensis*), beaked sedge, Bebb's sedge (*Carex bebbii*), clustered field sedge (*Carex praegracillis*), and awlfruit sedge (*Carex stipata*) dominated the cover.

Wetland Type 5 – *Carex* spp. characterized the wetland areas along the reconstructed banks of Mud Creek. Woody species were planted along the stream corridor. The community was dominated by beaked sedge, awlfruit sedge, small-fruit bulrush (*Scirpus microcarpus*), broad-leaf cattail (*Typha latifolia*), and reed canary grass dominated the community. *Salix* spp. occur at a trace percent cover.

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 species included Douglas hawthorne, reed canary grass, climbing nightshade (*Solanum dulcamara*), and Canada thistle.

Community Type 8 – Open Water characterized the 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 true water cress (*Nasturtium officinale*), American speedwell (*Veronica americana*), and water weed (*Elodea* sp.).

Wetland Type 9 – *Cirsium arvense/Juncus balticus* was found in the central section of the mitigation area. Canada thistle, Baltic rush, hairy willow-herb (*Epilobium ciliatum*), and redtop dominated the cover in this community.

Wetland Type 10 – *Phalaris arundinacea* encompassed 1.12 acres, the largest community within the mitigation area. Reed canary grass, Baltic rush, and field sowthistle (*Sonchus arvensis*) dominated the herbaceous cover and Douglas hawthorn and Drummond willow (*Salix drummondiana*) formed the scrub shrub layer.

Wetland Type 11 – *Scirpus microcarpus/Phalaris arundinacea* was identified in the north half of the project area. The predominant herbaceous species were small-fruit bulrush, reed canary grass, clustered field sedge, and awlfruit sedge

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

Vegetation transect results were detailed on the Mud Creek Monitoring Form (Appendix B) and summarized in Table 13 and Charts 7 and 8. Photographs of the transect end points are shown in Appendix C. The community dominance shifted between 2010 and 2011. The development of Community Type 10 *Phalaris* and Type 11 *Scripus/Phalaris* in 2011 reflected 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 Canada thistle, developed within Type 10 in 2011. The transect was dominated by wetland community Types 9 and 10, with fewer species represented by communities 4, 5, 8, and 11. Ninety-four percent of the transect intervals were dominated by hydrophytic species and six percent of the transect intersected open water associated with the Mud Creek channel.

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

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

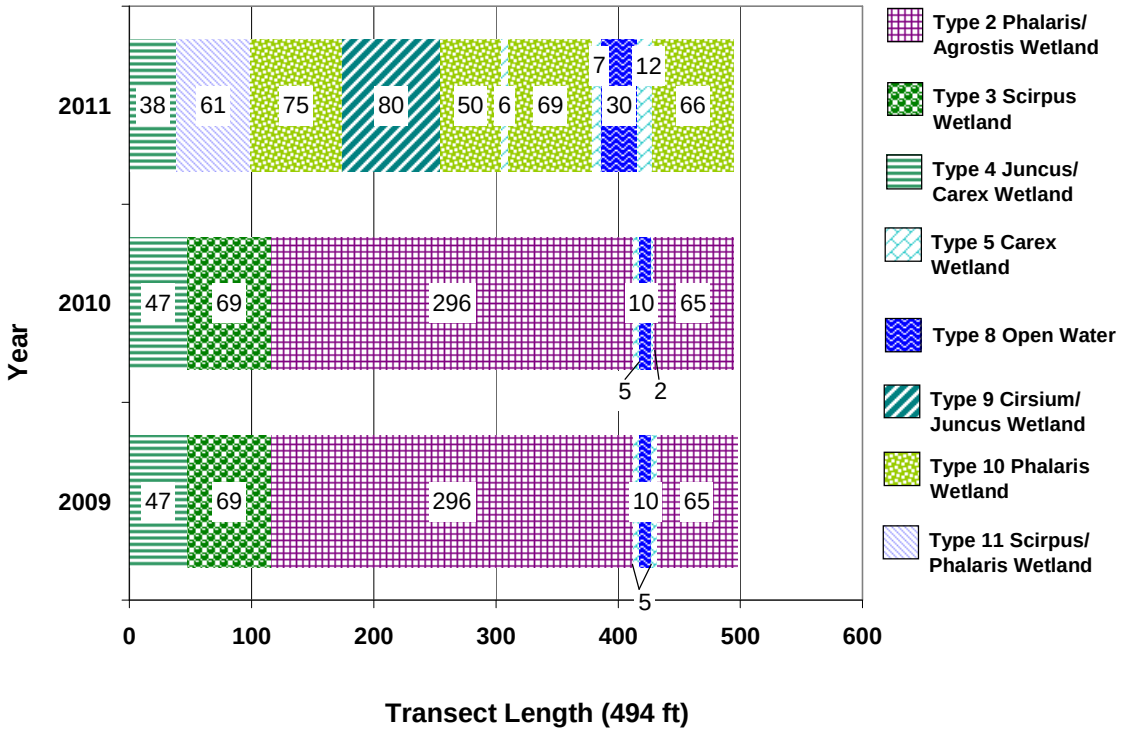

Chart 7. Mud Creek Transect 1 maps showing vegetation types from transect start (0 feet) to finish (494 feet) from 2009 to 2011.

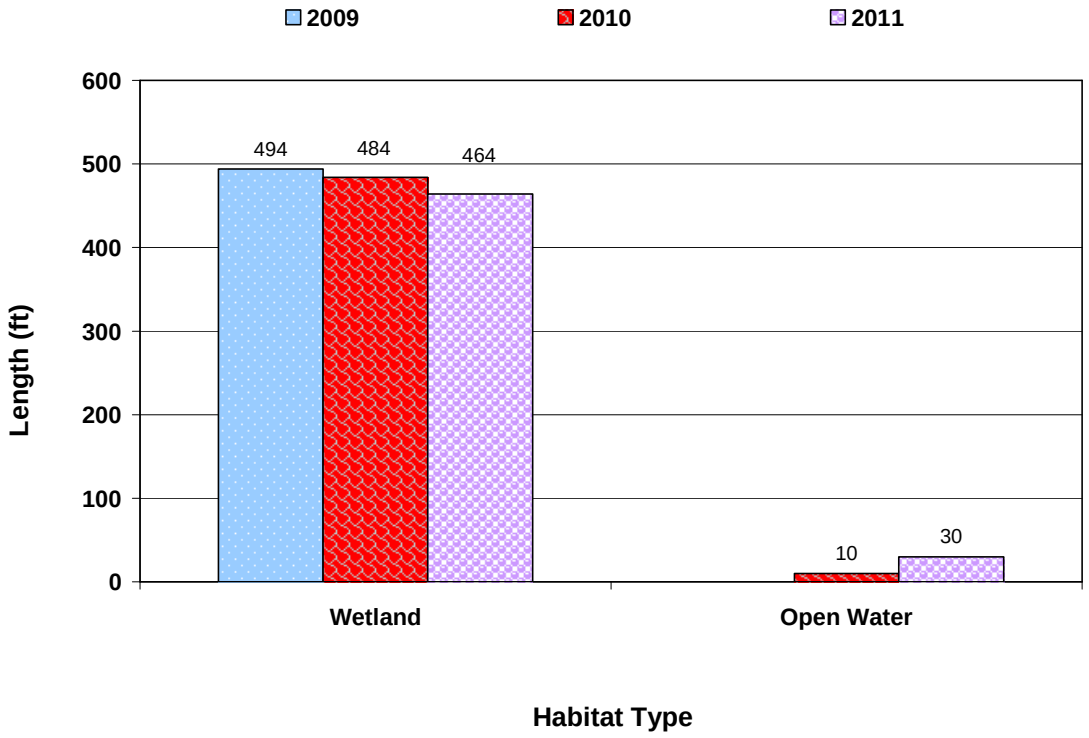

Chart 8. Mud Creek length of vegetation communities within Transect 1 from 2009 to 2011.

The locations of Priority 2A, yellowflag iris (*Iris pseudacorus*), and 2B noxious weed infestations Canada thistle, oxeye daisy, and spotted knapweed are shown on Figure 7 (Appendix A). Yellowflag iris infestations were identified as covering less than 0.1 acre with trace percent cover. The size of Canada thistle infestations ranged from less than 0.1 acre to 1.0 acre in size with a trace to high percent cover. Greater than 50 percent of the vegetation cover in Type 9 was identified as Canada thistle. Two small oxeye daisy infestations were noted near the 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 a moderate cover class. The site did not appear to respond favorably to 2010 spraying efforts. The site was again sprayed by MDT during the growing season in 2011.

Wetland and riparian vegetation was planted in 2008. The vegetated soil lifts and wetland sod mats used for the creek restoration were well established 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 perpendicular to the south project area boundary. Transects were assessed from south to north. Woody species survival including the number of live plants

was recorded on the Monitoring Form (Appendix B). Species survival in 2011 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. Thin-leaf alder (12) and Bebb willow (8) species exhibited the highest survival rates. Four (4) Douglas hawthorn and four (4) Wood's rose were also observed. The plantings looked healthy with vigorous growth for the season and few discolored leaves. No volunteer woody species were noted.

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. The soil in test pit MC-1 generally confirmed the mapped unit.

Two test pits were examined to determine hydric soil parameters. Test pit MC-1 was located in an area that met the three wetland criteria. The soil profile revealed a dark gray, silty clay loam with brown (7.5YR 4/4) redox concentrations in the matrix. There were also redox depletions in 10 percent of the matrix in test pit MC-1. The low chroma and redox concentrations were indicators of wetland hydrology. The soil in upland test pit MC-2 was a very dark brown (10YR 2/2) silt loam soil without redox concentrations within the upper 12 inches of the profile.

3.2.4. Wetland Delineation

Two data points (Figure 6, Appendix A) were used to determine the upland and wetland boundaries of delineated wetlands. The Mud Creek Wetland Data Forms are included in Appendix B and the wetland boundaries are shown on Figure 7 (Appendix A). The total aquatic habitat developed to date within the 2.6-acre project area was 2.16 acres, which included 0.08 acres of open water or water of the US associated with Mud Creek (Table 14). There was no change in the total wetland acreage from 2010 to 2011.

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

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

3.2.5. Wildlife

A list of wildlife species observed directly and indirectly from 2009 to 2011 at the Mud Creek Site is shown in Table 15 (Monitoring Form, Appendix B). A Brewer's blackbird (*Euphagus cyanocephalus*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), and a meadow vole (*Microtus pennsylvanicus*) were observed at the site during 2011 monitoring. Tracks of an unidentified deer were also noted.

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

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*

Species identified in 2011 are listed in **bold** type.

Table 15 (cont.). Wildlife species observed at the Mud Creek Wetland Mitigation Site from 2009 to 2011.

COMMON NAME	SCIENTIFIC NAME
MAMMAL	
Deer Sp.	**Odocoileus sp.**
Feral cat	
Meadow Vole	***Microtus pennsylvanicus***
Raccoon	*Procyon lotor*
Red Fox	*Vulpes vulpes*
Striped Skunk	***Mephitis mephitis***
White-tailed Deer	***Odocoileus virginianus***

Species identified in 2011 are listed in **bold** type.

3.2.6. Functional Assessment

Results of the 2004 (baseline), 2009, 2010, and 2011 functional assessments (Berglund 1999) are summarized in Table 16. The 2011 Mud Creek Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 2.6-acre project area was 2.16 acres, which included 0.08 acres of open water with aquatic macrophytes associated with the Mud Creek channel. There was no change in wetland acreage from 2010 to 2011.

The Mud Creek property was evaluated as one assessment area (AA-1) that encompassed 2.16 acres in 2011. The AA was rated as a Category III wetland in 2011 with 65 percent of the total possible points. The points and ratings were consistent from 2009 to 2011. 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 2011 functional assessment yielded 16.85 functional units.

Table 16. Summary of 2004 Baseline and 2009 through 2011 wetland function/value ratings and functional points at the Mud Creek Wetland Mitigation Project.

Function and Value Parameters from the MDT Montana Wetland Assessment Method (1999)	2004 (Baseline) (AA-1)	2009 (AA-1)	2010 (AA-1)	2011 (AA-1)
Listed/Proposed T&E Species Habitat	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)
General Wildlife Habitat	Mod (0.5)	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)
Flood Attenuation	Low (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)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	Mod (0.7)	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)
Groundwater Discharge/Recharge	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)
Recreation/Education Potential	Low (0.1)	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**
% of Possible Score Achieved	**50%**	**65%**	**65%**	**65%**
Overall Category	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	NA	**2.02**	**2.16**	**2.16**
Total Functional Units (acreage x actual points)	NA	**15.76**	**16.85**	**16.85**

3.2.7. Photo Documentation

Photographs of photo points PP1 to PP13 (Figure 2, Appendix A) and of the transect endpoints are shown on pages C-10 to C-19 in Appendix C.

3.2.8. Maintenance Needs

The locations of Priority 2A, yellowflag iris, and 2B noxious weed infestations Canada thistle, oxeye daisy, and spotted knapweed are shown on Figure 7 (Appendix A). Yellowflag iris infestations were identified at less than 0.1 acre in extent and a trace cover class. The size of Canada thistle infestations ranged from less than 0.1 acre to 1.0 acre in size and at trace to high percent cover. Greater than 50 percent of the vegetation cover in Type 9 was identified as Canada thistle. Two small oxeye daisy infestations were noted near the 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 a moderate cover class. The site did not appear to respond favorably to 2010 spraying efforts. The site was again sprayed by MDT during the growing season in 2011.

3.2.9. Current Credit Summary

The wetland delineation identified 2.16 acres of emergent and aquatic bed wetlands in 2011. The functional assessment yielded 16.85 functional units in 2010 and 2011. The 2011 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 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 1.78 USACE credit acres, based on the 3.57:1 enhancement ratio, and 0.77 CSKT credit acres to date.

The 2011 estimated credits are well less than the projected credits partly as a result of an apparent discrepancy in the original project acreage calculation in the mitigation plan. The mitigation plan proposed a total of 6.81 acres of mitigation. The total area of the post-construction site is 2.6 acres including 0.44 acres of uplands.

Table 17. Credits from 2010 to 2011 at the Mud Creek Wetland Mitigation Site.

Targeted Mitigation Type	2010 Wetland (acres)	2011 Wetland (acres)	Credit Ratio		2010 Credit (acre)		2011 Credit (acre)		Projected Totals (acre)	
			USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	1.63	1.63	1:1	3.36:1	1.63	0.49	1.63	0.49	6.18	3.22
Rehabilitation/ secondary restoration	0.53	0.53	3.57:1	1.86:1	0.15	0.28	0.15	0.28	0.63	0.33
TOTAL	**2.16**	**2.16**			**1.78**	**0.77**	**1.78**	**0.77**	**6.81**	**3.55**

The areas delineated as wetlands (2.16 acres out of 2.60 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 2011 although it is less than 10 percent site wide.

3.3. Peterson Property

3.3.1. Hydrology

The average total annual precipitation recorded at the Saint Ignatius weather station, Montana (247286) from February 1896 to December 2010 was 15.83 inches (WRCC 2011). Total precipitation from January to August 2011 recorded at the Bureau of Reclamation AgriMet station at Saint Ignatius (SIGM) was 18.32 inches (USBR 2011). The cumulative precipitation thru August 2011 was 2.49 inches above the mean annual precipitation.

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 riparian wetland corridor aligned east to west that follows topographic slope towards Post Creek.. The project is exposed to seasonal flooding during spring runoff, groundwater, and sustained flows during summer from irrigation return. Twelve log crib structures were installed to impound water behind the structures. The site exhibited inundation of varying depths behind these impoundments during monitoring. Each crib structure was designed to allow surface flow to spill through a designated overflow.

Approximately 10 percent of the project area was inundated in 2011. Surface water depths ranged from 1.0 to 4.0 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, SP-1 to SP-4 were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points SP-2, SP-3, and SP-4 were located within areas that met the wetland criteria. Data points SP-2 and SP-4 did not exhibit any primary indicators of wetland hydrology. The sample plots were considered problematic for hydrology as a result of the seasonal, groundwater-driven hydrology and dry season timing of the site visit. The data points were defined as wetlands based on the factors listed above and the presence of hydrophytic vegetation and hydric soil. Data point SP-3 displayed two secondary indicators, the FAC-Neutral test and water stained leaves. Data point SP-1 did not show evidence of wetland hydrology.

3.3.2. Vegetation

A comprehensive list of 69 species was compiled from 2008 to 2011 is presented in Table 18. There were ten new species identified on site during the 2011 monitoring visit. Six community types, four wetland and two upland, were identified and mapped at the mitigation site in 2011 (Peterson Figure 9, Appendix A). The community types were Type 2 - *Phalaris arundinacea* Wetland, Type 4 - *Carex nebrascensis/Poa palustris* Wetland, Type 5 – *Epilobium ciliatum* Wetland, Type – 6 *Sisymbrium altisimum* Upland, Type 7 - *Agropyron repens*/*Poa pratensis* Upland, and Type – 8 *Typha latifolia/Phalaris arundinacea* Wetland.

The species composition is detailed by type on the Peterson Monitoring Form (Appendix B) and below.

Wetland Type 2 – *Phalaris arundinacea* was identified at the east and west ends 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 14 additional species.

Wetland Type 4 – *Carex nebrascensis/Poa palustris* was located in transition areas at the edge of the riparian corridor. Nebraska sedge, fowl bluegrass (*Poa palustris*), reed canarygrass dominated the vegetation cover. Teasel (*Dipsacus sylvestris*) and English plantain (*Plantago lanceolata*) each inhabited six to ten percent of the community.

Wetland Type 5 – *Epilobium ciliatum* was located in the northwest corner of the mitigation site. Dominant vegetation consisted of hairy willow-herb with minor cover contributed by teasel, Nebraska sedge, reed canary grass, Canada thistle, and field mint (*Mentha arvensis*).

Upland Type 6 – *Sisymbrium altissimum* was identified in the northeast corner of the site near the mitigation boundary. The species were dominated by a monoculture of tall tumble mustard (*Sisymbrium altissimum*). Associate species in the community were difficult to identify as a result of chemical spraying to control infestation of whitetop and knapweed completed prior to the site visit.

Upland Type 7 – *Agropyron repens/ Poa pratensis* encompassed 19.48 acres of the site, dominating a majority of the area north and south of the creek corridor. Dominant vegetation consisted of quackgrass, Kentucky bluegrass, smooth brome, hoary cress (*Cardaria draba*), teasel, and pursh seedweed (*Suaeda calceoliformis*).

Wetland Type 8 – *Typha latifolia/Phalaris arundinacea* was located along the unnamed perennial tributary that flows through the mitigation site. In 2011, broad-leaf cattail dominated this community historically dominated by reed canary grass. Reed canary grass, speckled alder, beaked sedge, and hairy willow-herb each contributed between six and twenty percent to the vegetation cover of this riparian community.

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Agropyron cristatum	crested wheatgrass	NL
Agropyron repens	quackgrass	FACU
Alnus incana	alder,speckled	FACW
Asparagus officinalis	**asparagus-fern,garden**	**FACU**
Bromus inermis	**smooth brome**	**NL**
Bromus tectorum	cheatgrass	NL
Cardaria draba	**hoary cress**	**NL**
Carex nebrascensis	sedge,Nebraska	OBL
Carex stipata	awlfruit sedge	NL
*Carex utriculata**	beaked sedge	OBL
Carex vesicaria	**sedge,inflated**	**OBL**
Chrysanthemum leucanthemum	oxeye daisy	NL
Cirsium arvense	thistle,Canada	FACU+
Cirsium vulgare	thistle,bull	FACU
Cornus stolonifera	dogwood,red-osier	FACW
Cynoglossum officinale	gypsy-flower	NL
Dactylis glomerata	grass,orchard	FACU
Descurainia sophia	common tansy mustard	NL
Dianthus sp.		NL
Dipsacus sylvestris	teasel	NI
Eleocharis palustris	spikerush,creeping	OBL
Elodea sp.	elodea	NL
Epilobium ciliatum	willow-herb,hairy	FACW-
Festuca arundinacea	fescue,Kentucky	FACU-
Festuca sp.		NL
Geum macrophyllum	avens,large-leaf	FACW+
Glyceria grandis	American mannagrass	NL
Impatiens ecalcarata	touch-me-not,spurless	FACW
Iris pseudacorus	iris,yellow	OBL
Juncus balticus	rush, Baltic	OBL
Juncus ensifolius	rush,three-stamen	FACW

[1]Region 9 Northwest (Reed 1988).
New species identified in 2011 are shown in **bold** type.
*Commonly accepted name for species not included on 1988 list.

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

Scientific Name	Common Name	Region 9 Wetland Indicator[1]
Juncus sp.		NL
Juncus tenuis	**rush,slender**	**FAC**
Kochia scoparia	**summer-cypress,Mexican**	**FAC**
Lactuca serriola	lettuce,prickly	FAC-
Lemna minor	duckweed,lesser	OBL
Lepidium campestre	field pepperweed	NL
Lepidium perfoliatum	pepper-grass,clasping	FACU+
Lychnis alba	bladder campion	NL
Malva neglecta	common mallow	NL
Medicago sativa	alfalfa	NL
Melilotus officinalis	sweetclover,yellow	FACU
Mentha arvensis	**mint,field**	**FAC**
Nasturtium officinale	water-cress,true	OBL
Nepeta cataria	catnip	FAC
Oenanthe sp.		NL
Phalaris arundinacea	grass,reed canary	FACW
Plantago lanceolata	plantain, English	FACU+
Poa palustris	bluegrass,fowl	FAC
Poa pratensis	bluegrass,Kentucky	FACU+
Poa sp.		NL
Polygonum amphibium	smartweed,water	OBL
Polygonum bistortoides	bistort,American	FACW+
Polygonum sp.		NL
Potentilla recta	sulfur cinqufoil	NL
Rosa woodsii	rose,Woods	FACU
Rumex crispus	dock,curly	FACW
Salix bebbiana	willow,Bebb	FACW
Salix drummondiana	willow,Drummond	FACW
Scirpus acutus	**bulrush,hard-stem**	**OBL**
Scirpus microcarpus	bulrush,small-fruit	OBL
Sisymbrium altissimum	mustard,tall tumble	FACU-
Solanum dulcamara	nightshade,climbing	FAC
Sonchus arvensis	sowthistle,field	FACU+
Suaeda calceoliformis	**pursh seepweed**	**NL**
Thlaspi arvense	penny-cress,field	NI
Tragopogon dubius	yellow salsify	NL
Trifolium pratense	clover,red	FACU
Trifolium sp.		NL
Typha latifolia	cattail,broad-leaf	OBL
Verbascum blattaria	**mullein,moth**	**UPL**

[1]Region 9 Northwest (Reed 1988).
New species identified in 2011 are shown in **bold** type.

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 Type 8 wetland dominated Transect 1 in 2011 (Chart 9). The community structure was slightly different from communities Type 1 upland and Type 3 wetland seen in 2009 and 2010. The percent cover of quackgrass increased in Type 7 and the cover of broad-leaf cattail increased in Type 8 in 2011 Approximately 55.6 percent of the transect was dominated by hydrophytic species in 2011, an increase of 10.5 percent from 2010.

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

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

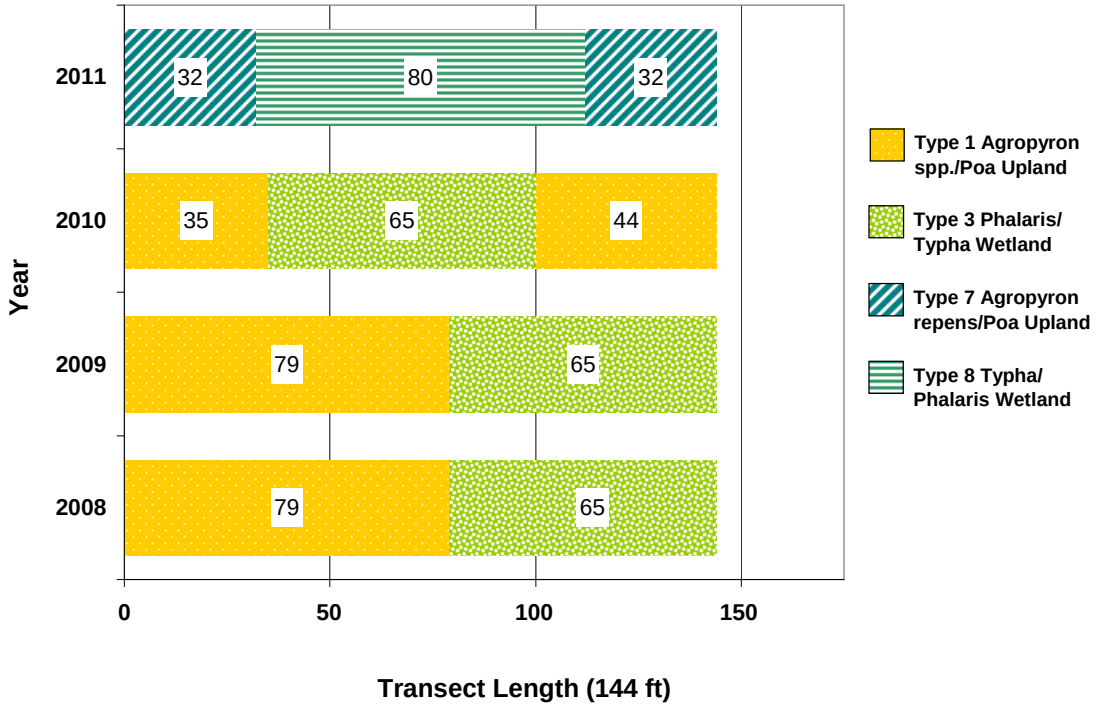

Chart 9. CSKT Peterson Transect 1 maps showing vegetation types from transect start (0 feet) to finish (144 feet) for 2008 to 2011.

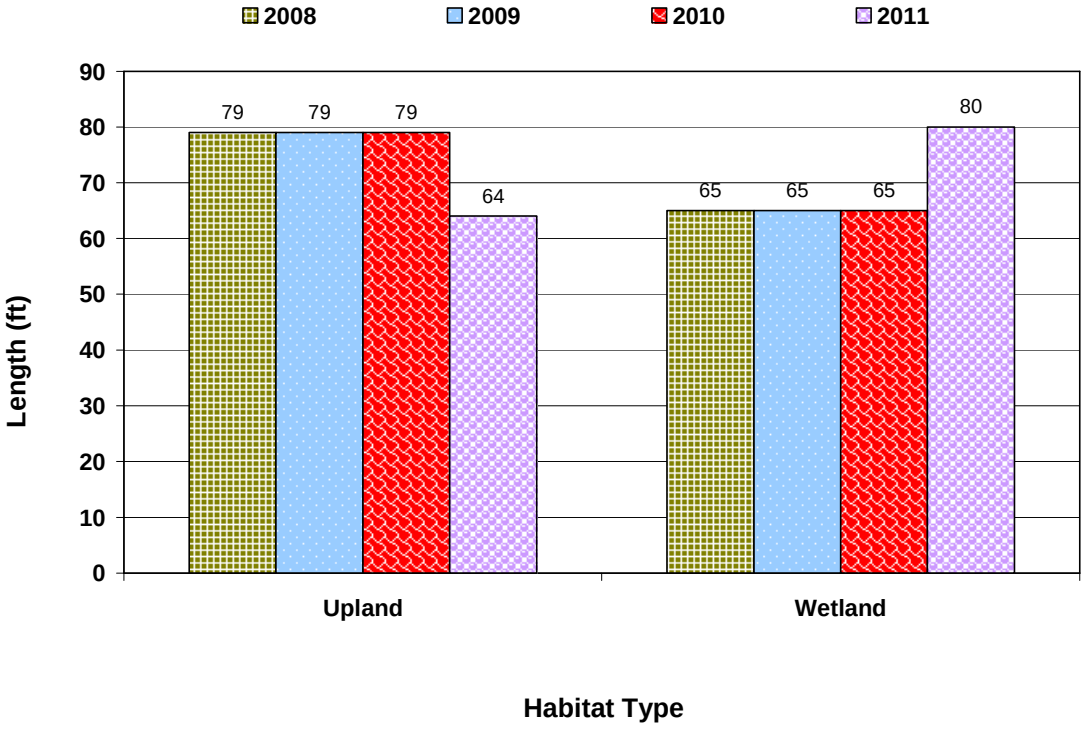

Chart 10. CSKT Peterson - Length of vegetation habitats within Transect 1 for 2008 to 2011.

Wetland communities Types 4 and 8 and upland community Type 7 dominated Transect 2 in 2011 (Chart 11). The community types were similar to those observed from 2008 to 2010 except for a decrease in the extent of wetland Type 4 *Carex/Poa* and a corresponding increase in upland Type 7 *Agropyron/Poa*. Approximately 70.8 percent of the transect was inhabited by hydrophytic species, a 19.7 percent decrease from 2010 (Table 20, Chart 12).

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

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

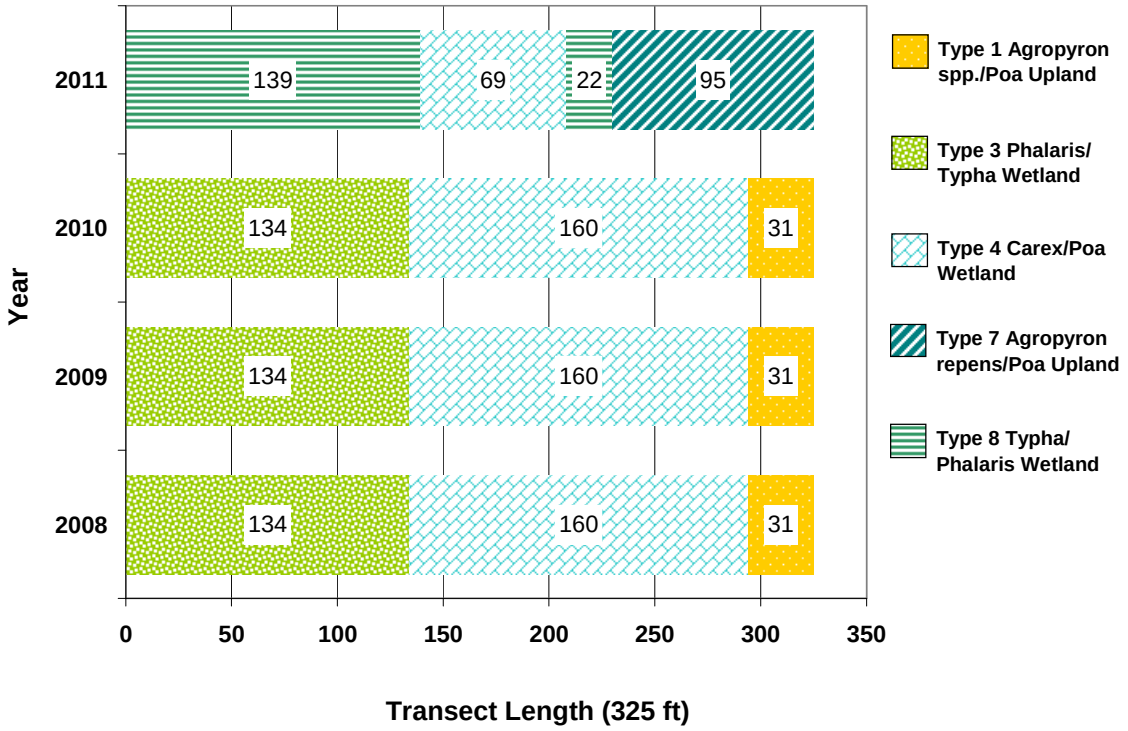

Chart 11. CSKT Peterson Transect 2 map showing vegetation types from transect start (0 feet) to finish (325 feet) from 2008 to 2011.

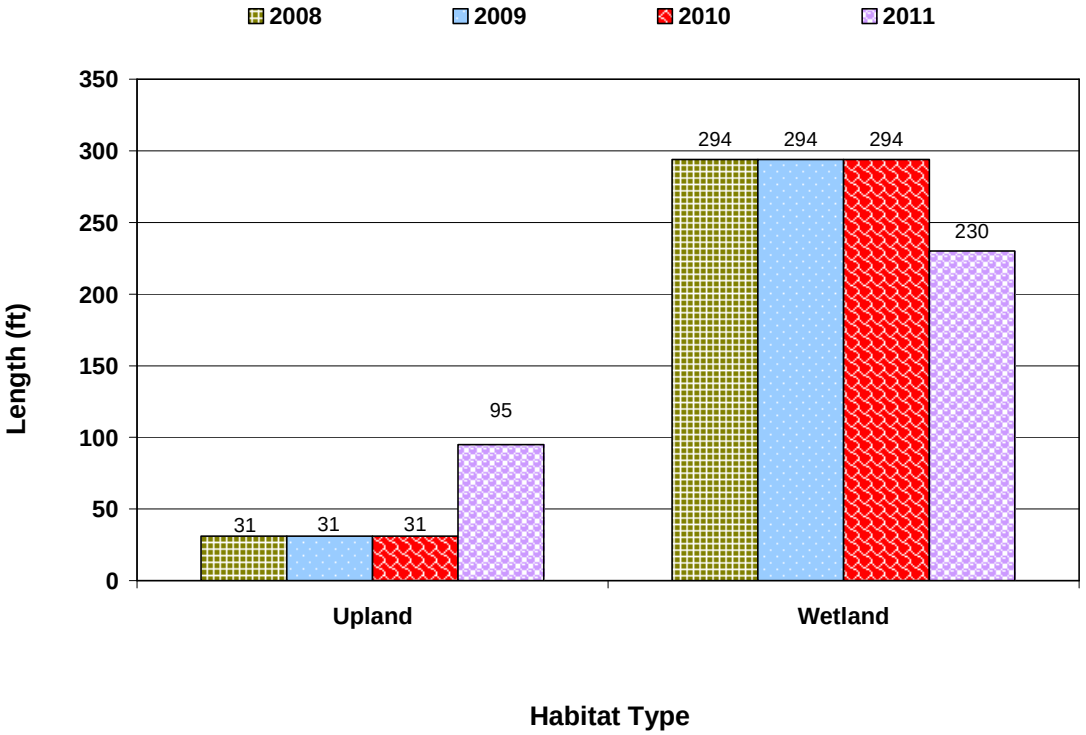

Chart 12. CSKT Peterson Length of vegetation habitats within Transect 2 for 2008 to 2011.

The location of Priority 2B noxious weed infestations of Canada thistle, whitetop (*Cardaria draba*), sulfur cinquefoil (*Potentilla recta*), oxeye daisy, and Priority 2A yellowflag iris observed during 2011 field monitoring were mapped on Peterson Figure 9 in Appendix A. The size of the Canada thistle infestations ranged from less than 0.1 acre to 1.0 acre in 2011. The percent cover ranged from trace to high. Whitetop was found across the site at less than 0.1 acre to 1.0 acre and at low to moderate cover. Sulfur cinquefoil was identified at less than 0.1 acre to 1.0 acre, at a range of low to moderate cover. Oxeye daisy and yellowflag iris were found at trace percent cover on the site at less than 0.1 acre in size. Extensive weed control was conducted on this site prior to the 2010 monitoring event to control these species. The creek edges and southwest corner of the site were resprayed by MDT in 2011.

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 several 6.6-foot (2.0 meter) wide belt transects that encompassed approximately 7,500 square feet. Transects were established along the edges of the wetland swale encompassing creation and enhancement mitigation areas. Woody species plantings occurred mostly on the berms associated with log crib structures constructed within the site. One transect was placed along a log crib structure. The 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. Approximately 15 live speckled alder, 20 live Wood's rose, and 3 red-osier dogwood were observed in 2011. Species survival in 2011 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. Changes were made to the revegetation design during construction based on the availability of plant materials. Overall survival was considered moderate based on the visual assessment.

3.3.3. Soil

The project site was mapped in the Lake County Soil Survey (NRCS 2010) as Colake loam, 0 to 1 percent slopes. The Colake series are poorly drained soils, occurring in swales and depressions on plains and stream terraces. The series is included on the Montana Hydric Soil List. The map units were generally confirmed by test pit soils at wetland data points.

Data points SP-1 thru SP-4 met the hydric soil criteria. Test pit SP-1 displayed a dark grayish brown (10YR 4/2) silt loam with dark yellowish brown (10 YR 4/6)

redox concentrations in the matrix. The soil profile at SP-2 revealed a very dark gray (10YR 3/1) silt loam with dark brown (7.5YR 3/4) redox concentrations in the matrix. The profile at test pit SP-3 exhibited a black (10 YR 2/1) clay loam with yellowish red (5YR 4/6) redox concentrations in the matrix. Data point SP-4 revealed a very dark brown (10YR 2/2) silt loam soil with dark brown redox concentrations in the matrix. The low chromas and presence of redox features were indicative of wetland hydrology.

3.3.4. Wetland Delineation

Four data points were collected in 2011 to determine the wetland and upland boundaries at the site (Wetland Data Forms, Appendix B). The wetland boundaries were delineated and mapped on Figure 9 in Appendix A. The delineation identified 4.25 acres of wetland in 2011, an increase of 0.07 acre since 2010 (Table 21).

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

Aquatic Habitat	2009	2010	2011
Wetland Area (acres)	3.71	4.18	4.25
Total Aquatic Habitat (acres)	**3.71**	**4.18**	**4.25**

3.3.5. Wildlife

A list of wildlife species observed directly and indirectly at the site from 2008 to 2011 is presented in Table 22. Two red-wing blackbirds, twenty Canada geese, and two sparrows were observed in 2011. The bird species observed in 2011 are listed in bold type. Signs observed and bird activity codes were recorded on the Monitoring Form in Appendix B. No signs of mammals were observed in 2011.

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

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog*	*Rana luteiventris*
REPTILE	
Terrestrial Gartersnake	*Thamnophis elegans*
INVERTEBRATE	
Unknown crayfish	*Crayfish sp.*

Species identified in 2011 are listed in **bold** type.

* Species identified in 2011 by MDT.

Table 22 (cont.). Wildlife species observed at the Peterson Wetland Mitigation Site from 2008 to 2011.

COMMON NAME	SCIENTIFIC NAME
BIRD	
American Kestrel	*Falco sparverius*
American Robin	*Turdus migratorius*
Barn Swallow	*Hirundo rustica*
Canada Goose	***Branta canadensis***
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*

Species identified in 2011 are listed in **bold** type.

* Species identified in 2011 by MDT.

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3.3.6. Functional Assessment

Results of the 2004 (baseline), 2009, 2010, and 2011 functional assessments were summarized in Table 23. The 2011 Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 25-acre project area is 4.25 acres, an increase of 0.07 acres from 2010 to 2011.

The Peterson Property was evaluated as one assessment area (AA-1) that encompassed 4.25 acres in 2011. The AA was rated as a Category II wetland in 2011 with 69 percent of the total possible points, an increase of two percentage points since 2010. The increase was the result of higher ratings based on the overall change from moderate to low disturbance within the AA. The net functional unit gain was 25.62, an increase of 1.37 units since 2010. 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 and 2009 through 2011 wetland function/value ratings and functional points at the Peterson Wetland Mitigation Project.

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

3.3.7. Photo Documentation

Photographs of photo points PP1 to PP6 (Figure 9, Appendix A) and of the transect endpoints are shown on pages C-20 to C-24 of Appendix C.

3.3.8. Maintenance Needs

The location of Priority 2B noxious weed infestations of Canada thistle, whitetop (*Cardaria draba*), sulfur cinquefoil (*Potentilla recta*), oxeye daisy, and Priority 2A yellowflag iris observed during 2011 field monitoring were mapped on Peterson Figure 9 in Appendix A. The size of the Canada thistle infestations ranged from less than 0.1 acre to 1.0 acre in 2011. The percent cover ranged from trace to high. Whitetop was found across the site at less than 0.1 acre to 1.0 acre and at low to moderate cover. Sulfur cinquefoil was identified at less than 0.1 acre to 1.0 acre, at a range of low to moderate cover. Oxeye daisy and yellowflag iris were found at trace percent cover on the site at less than 0.1 acre in size. Extensive weed control was conducted on this site prior to the 2010 monitoring event to control these species. Based on the results of the field survey, it did not

appear weed control efforts in 2010 had a marked effect on the population of noxious weeds within the site. The creek edges and southwest corner of the site were resprayed by MDT in 2011 following the 2011 site visit.

The log crib structures were operational and did not appear compromised or undermined. 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 2011 totaled 4.25 acres, an increase of 0.07 acres since 2010. The net acreage gain from 2004 to 2011 was 2.99 acres and the functional unit gain was 25.62. Table 24 summarizes the 2011 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 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 3.54 USACE credit acres and 1.56 CSKT credit acres to date. The 2011 credit estimates have exceeded the USACE and CSKT projected acreages for the mitigation site.

Table 24. Estimated credit summary for 2010 and 2011 at the CSKT Peterson Property Wetland Mitigation Site.

Targeted Mitigation Type	2010 Wetland (acre)	2011 Wetland (acre)	Credit Ratio		2010 Credit (acre) Credit		2011 Credit (acre) Credit		Projected Totals (acres)	
			USACE	CSKT	USACE	CSKT	USACE	CSKT	USACE	CSKT
Creation	2.93	3.00	1:1	3.36:1	2.93	0.87	3.00	0.89	2.14	0.64
Rehabilitation/ secondary restoration	1.25	1.25	2.52:1 (2010) 2.33:1 (2011)	1.86:1	0.49	0.67	0.54	0.67	0.25	0.67
Total	**4.18**	**4.25**	**--**	**--**	**3.42**	**1.54**	**3.54**	**1.56**	**2.39**	**1.31**

4. REFERENCES

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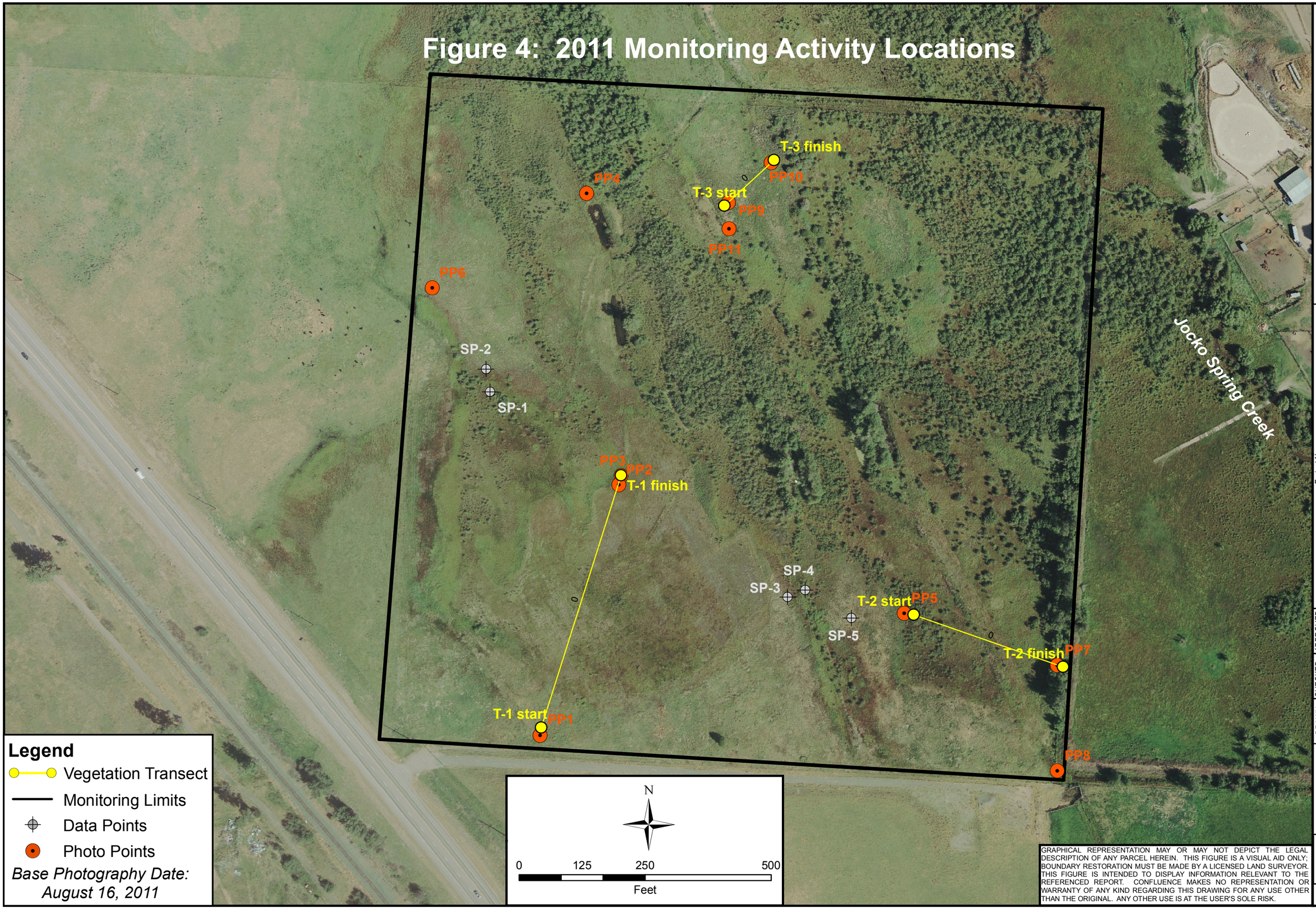
Appendix A

Figures 4 through 9

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

Figure 4: 2011 Monitoring Activity Locations



Legend

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

Base Photography Date: August 16, 2011

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/Monitor2011.mxd

Project Name
Bouchard Wetland Mitigation Site

Drawing Title
2011 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted

Drawn: September 19, 2011

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 4

REV -

Figure 5: 2011 Mapped Site Features

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: August 16, 2011

Noxious Weeds
- Hypericum perforatum
- Cirsium arvense
- Cynoglossum officinale
- Centaurea maculosa
- Chrysanthemum leucanthemum

Infestation SIze
- X = <0.1 acre
- ▲ = 0.1 to 1 acre
- ■ = 1 to 5 acre

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

Acreages

Project Area	41.13 acres
Wetlands	33.78 acres
Uplands	7.35 acres

Vegetation Community Types

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

Jocko Spring Creek

N

0 125 250 500
Feet

LOCATION: Lake Co., MT
PROJECT NO: NH 5-2(120)20
FILE: Bouchard/Veg2011.mxd

Project Name: Bouchard Wetland Mitigation Site
Drawing Title: 2011 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED JJ
SCALE: Noted
Drawn: September 26, 2011
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 5

REV -

Figure 6: 2011 Monitoring Activity Locations

N

0 50 100 200

Feet

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

Legend

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

Base Photography Date: August 16, 2011

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

LOCATION: Lake Co., MT

PROJECT NO: NH 5-2(122)31

FILE: MudCreek/Monitor2010.mxd

Project Name
Mud Creek Wetland Mitigation Site

Drawing Title
2011 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted

Drawn: September 19, 2011

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 6

REV -

Figure 7: 2011 Mapped Site Features

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities
Mud Creek

Base Photography Date: August 16, 2011

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 (5-25% cover)
- H= High (25-100% cover)

Vegetation Community Types

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

Acreages

Project Area	2.60 acres
Gross Wetlands	2.16 acres
Mud Creek (8)	0.08 acres
Net Wetlands	2.08 acres
Uplands	0.44 acres

N

0 50 100 200
Feet

LOCATION: Lake Co., MT
PROJECT NO: NH 5-2(122)31
FILE: MudCreek/Veg2011.mxd

Project Name: Mud Creek Wetland Mitigation Site
Drawing Title: 2011 Mapped Site Features

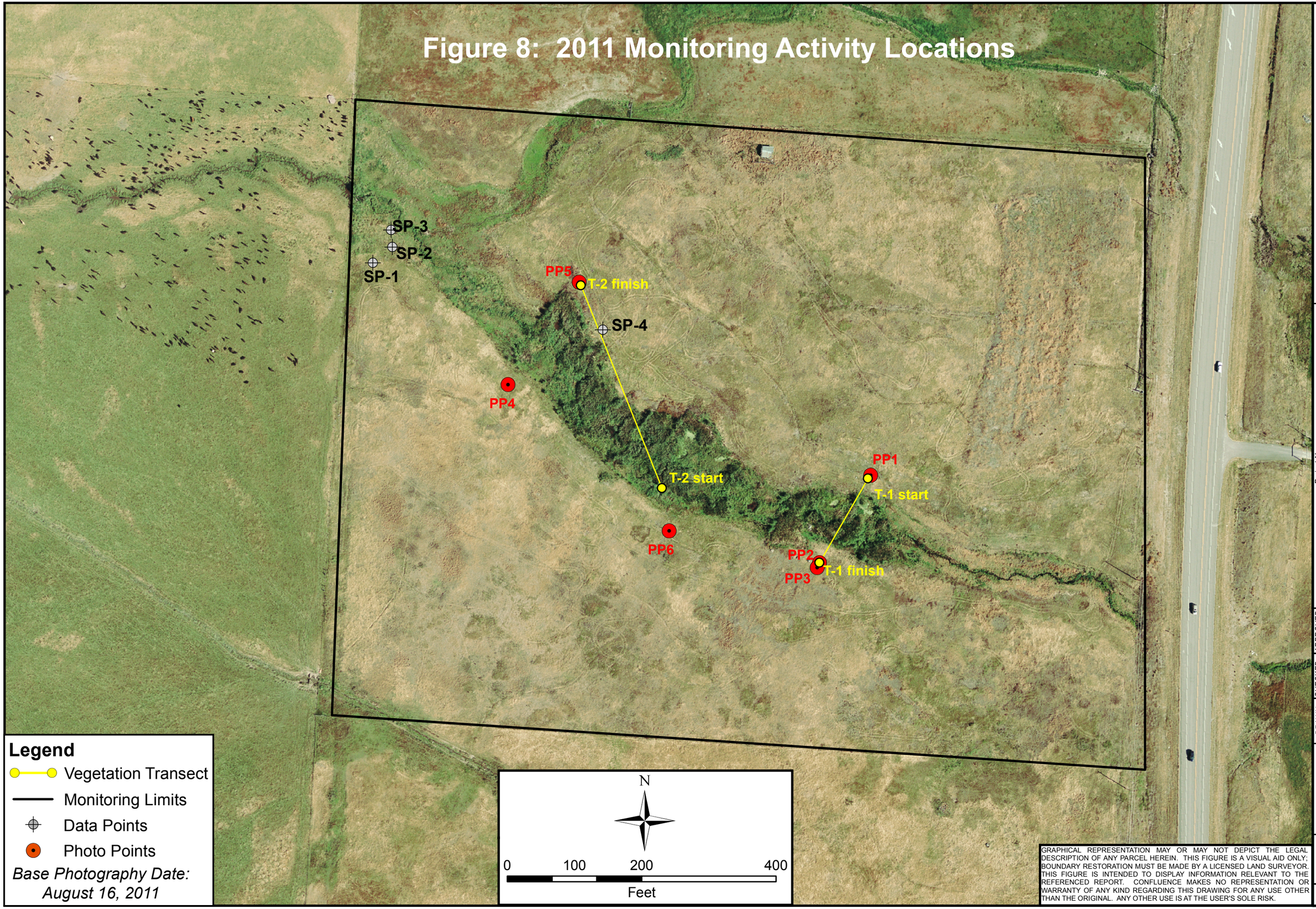
DRAWN BCS | CHECKED BV | APPROVED JJ
SCALE: Noted
Drawn: September 20, 2011
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 7

REV -

Figure 8: 2011 Monitoring Activity Locations



Legend

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

Base Photography Date: August 16, 2011

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/Monitor2011.mxd

Project Name
US-93 Peterson Mitigation Site

Drawing Title
2011 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted

Drawn: September 16, 2011

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 8

REV -

Figure 9: 2011 Mapped Site Features

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: August 16, 2011

Noxious Weeds
- Cirsium arvense
- Cardaria draba
- 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 (5-25% cover)
- H = High (25-100% cover)

Vegetation Community Types

- 2 Phalaris arundinacea
- 4 Carex nebrascensis/Poa palustris
- 5 Epilobium ciliatum
- 6 Sisymbrium altisimum
- 7 Agropyron repens/Poa pratensis
- 8 Typha latifolia/Phalaris arundinacea

N

0 100 200 400

Feet

Acreages

Project Area	25.01 acres
Wetland Area	4.25 acres
Uplands	20.76 acres

LOCATION: Lake Co., MT
PROJECT NO: NH 5-2(122)31
FILE: US93Peterson/Veg2011.mxd

Project Name: US-93 Peterson Mitigation Site
Drawing Title: 2011 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted
Drawn: September 19, 2011
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 9

REV -

Appendix B

2011 MDT Wetland Mitigation Site Monitoring Form
2011 USACE Routine Wetland Determination Data Form
2011 MDT Montana Wetland Assessment Form

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

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: US93 - Bouchard Assessment Date/Time 8/4/2011 8:43:58 AM

Person(s) conducting the assessment: S. Fraizer / B. Schultz

Weather: Sunny and hot Location: Arlee

MDT District: Missoula Milepost: 20.5

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

Initial Evaluation Date: 7/29/2008 Monitoring Year: 4 #Visits in Year: 1

Size of Evaluation Area: 41 (acres)

Land use surrounding wetland:

Roadway (US93); Agriculture/Rangeland; Rural Residential Housing

HYDROLOGY

Surface Water Source: Shallow Groundwater, Jocko Spring Creek

Inundation: ☑ Average Depth: 0.2 **(ft)** Range of Depths: 0-4 **(ft)**

Percent of assessment area under inundation: 65 %

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.

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 US93 - Bouchard

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

* Indicates accepted spp name not on '88 list.

Community # 1 **Community Type:** Agropyron spp. / Agrostis alba **Acres:** 6.28

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agropyron repens	3
Agropyron trachycaulum	2	Agrostis alba	4
Alyssum alyssoides	1	Artemisia ludoviciana	0
Brassica kaber	0	Bromus carinatus	1
Bromus inermis	3	Bromus tectorum	0
Calamagrostis canadensis	1	Carduus nutans	0
Centaurea maculosa	0	Cirsium arvense	1
Cynoglossum officinale	0	Dipsacus sylvestris	0
Geum macrophyllum	1	Hypericum perforatum	0
Kochia scoparia	0	Lepidium campestre	0
Phleum pratense	0	Plantago major	0
Poa pratensis	2	Verbascum thapsus	1

Comments:

Community # 2 **Community Type:** Deschampsia cespitosa / Juncus spp. **Acres:** 1.82

Species	Cover class	Species	Cover class
Achillea millefolium	1	Alnus incana	0
Alopecurus pratensis	1	Betula occidentalis	0
Calamagrostis canadensis	1	Carex lanuginosa	1
Carex praegracilis	0	Carex utriculata*	2
Cirsium arvense	0	Cornus stolonifera	0
Deschampsia cespitosa	5	Eleocharis palustris	1
Epilobium ciliatum	0	Equisetum arvense	2
Hypericum perforatum	0	Juncus balticus	1
Juncus ensifolius	2	Juncus tenuis	1
Lactuca serriola	1		

Comments:

Community # 3 **Community Type:** Juncus spp. / Eleocharis palustris **Acres:** 2.44

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

Comments:

Community # 4 **Community Type:** Juncus balticus / Cirsium arvense **Acres:** 4.09

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron repens	2
Alyssum alyssoides	1	Chrysanthemum leucanthe	0
Cirsium arvense	4	Cynoglossum officinale	1
Geum macrophyllum	1	Hypericum perforatum	0
Juncus balticus	4	Lactuca serriola	1
Plantago major	1	Poa pratensis	3
Potentilla fruticosa	0	Rosa woodsii	0
Rubus idaeus	0	Solanum dulcamara	1
Solidago canadensis	1	Sonchus arvensis	1

Comments:

Community # 5 Community Type: Carex spp. / **Acres:** 8.72

Species	Cover class	Species	Cover class
Algae, green	0	Alnus incana	1
Angelica arguta	1	Betula occidentalis	2
Carex lanuginosa	1	Carex nebrascensis	1
Carex praegracilis	1	Carex retrorsa	1
Carex utriculata*	5	Carex vesicaria	1
Cirsium arvense	0	Cornus stolonifera	0
Deschampsia cespitosa	0	Epilobium ciliatum	1
Geum macrophyllum	1	Hypericum perforatum	0
Juncus balticus	2	Juncus tenuis	2
Lactuca serriola	0	Mentha arvensis	1
Potentilla fruticosa	1	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 balticus **Acres:** 14

Species	Cover class	Species	Cover class
Agrostis alba	1	Alnus incana	1
Aster sp.	0	Betula occidentalis	5
Carex nebrascensis	0	Carex retrorsa	1
Carex utriculata*	3	Carex vesicaria	2
Cirsium arvense	0	Cornus stolonifera	1
Epilobium ciliatum	1	Geum macrophyllum	0
Hypericum perforatum	0	Juncus balticus	4
Juncus tenuis	2	Mentha arvensis	1
Mimulus guttatus	0	Potentilla fruticosa	2
Salix bebbiana	2	Solanum dulcamara	0
Solidago canadensis	1		

Comments:

Community # 8 Community Type: Populus spp. / **Acres:** 1.51

Species	Cover class	Species	Cover class
Carex nebrascensis	1	Carex utriculata*	2
Populus tremula	3	Populus trichocarpa*	5

Comments:

Community # 10 Community Type: Aquatic Macrophytes / **Acres:** 0.35

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 / Agropyron repens **Acres:** 1.07

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron repens	4
Agrostis alba	2	Carduus nutans	0
Carex utriculata*	0	Chrysanthemum leucanthe	0
Cirsium arvense	5	Cynoglossum officinale	0
Juncus balticus	1	Mentha arvensis	0
Poa pratensis	1	Rumex crispus	0
Salix bebbiana	0	Solidago canadensis	1
Verbascum thapsus	0	Verbascum thapsus	0

Comments:

Community # 12 Community Type: Alnus incana / Carex spp. **Acres:** 0.85

Species	Cover class	Species	Cover class
Alnus incana	5	Betula occidentalis	2
Carex lanuginosa	1	Carex utriculata*	5
Carex vesicaria	2	Cornus stolonifera	1
Glyceria striata	0	Typha latifolia	1

Comments:

Total Vegetation Community Acreage **41.13**

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

VEGETATION TRANSECTS

Site: US93 - Bouchard Date: 8/4/2011 8:43:58 AM

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

Interval Data:

Ending Station 102 **Community Type:** Agropyron spp. / Agrostis alba

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agropyron repens	3
Agropyron trachycaulum	2	Agrostis alba	2
Bromus inermis	4	Calamagrostis canadensis	4
Cirsium arvense	0		

Ending Station 287 **Community Type:** Deschampsia cespitosa / Juncus spp.

Species	Cover class	Species	Cover class
Achillea millefolium	1	Alnus incana	0
Alopecurus pratensis	1	Betula occidentalis	0
Calamagrostis canadensis	1	Carex lanuginosa	0
Carex praegracilis	0	Carex utriculata*	2
Cirsium arvense	0	Cornus stolonifera	0
Deschampsia cespitosa	5	Eleocharis palustris	1
Epilobium ciliatum	0	Equisetum arvense	2
Hypericum perforatum	1	Juncus balticus	1
Juncus ensifolius	2	Juncus tenuis	3
Lactuca serriola	1		

Ending Station 511 **Community Type:** Juncus spp. / Eleocharis palustris

Species	Cover class	Species	Cover class
Alnus incana	0	Betula occidentalis	0
Carex lanuginosa	1	Carex stipata	0
Carex utriculata*	1	Cornus stolonifera	0
Eleocharis palustris	3	Epilobium ciliatum	0
Equisetum arvense	2	Glyceria striata	0
Juncus balticus	3	Juncus ensifolius	2
Juncus tenuis	4	Salix bebbiana	0
Scirpus microcarpus	0	Typha latifolia	0

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

Species	Cover class	Species	Cover class
Cirsium arvense	5	Juncus balticus	3
Plantago major	0	Solanum dulcamara	3
Sonchus arvensis	2		

Transect Notes:

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

Interval Data:

Ending Station 112 **Community Type:** Betula occidentalis / Juncus balticus

Species	Cover class	Species	Cover class
Carex nebrascensis	0	Carex utriculata*	2
Epilobium ciliatum	1	Geum macrophyllum	0
Hypericum perforatum	0	Juncus balticus	4
Mentha arvensis	1	Salix bebbiana	4
Solanum dulcamara	0		

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

Species	Cover class	Species	Cover class
Alnus incana	0	Angelica arguta	1
Carex lanuginosa	1	Carex nebrascensis	0
Carex praegracilis	0	Carex retrorsa	0
Carex utriculata*	5	Carex vesicaria	2
Cirsium arvense	0	Cornus stolonifera	0
Epilobium ciliatum	1	Hypericum perforatum	0
Juncus balticus	2	Juncus tenuis	2
Lactuca serriola	0	Mentha arvensis	1
Ribes sp.	0	Rubus idaeus	2
Salix bebbiana	1	Typha latifolia	1

Transect Notes:

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

Interval Data:

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

Species	Cover class	Species	Cover class
Agropyron repens	2	Cirsium arvense	5
Juncus balticus	3		

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

Species	Cover class	Species	Cover class
Agropyron repens	4	Carduus nutans	0
Chrysanthemum leucanthe	1	Cirsium arvense	5
Cynoglossum officinale	0	Juncus balticus	0
Mentha arvensis	0	Rumex crispus	0
Verbascum thapsus	0		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

US93 - Bouchard

Planting Type	#Planted	#Alive	Notes
ALNINC		15	good growth and vigor
BETOCC	817	50	excellent growth and vigor
CORSTO	408	5	moderate growth and vigor
CRADOU		0	
RIBHUD	245	5	excellent growth and vigor
ROSWOO		2	good growth and vigor
SALBEB		50	excellent growth and vigor
SALSPP	408	0	
SYMALB		0	

Comments

US93 - 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
Great Blue Heron	1	N	MA
Mallard	1	L	MA
Sandhill Crane	1	N	MA
Song Sparrow	1	N	SS
Swainson's Hawk	1	F	WM
Western Meadowlark	3	L	UP
Wilson's Snipe	1	F, L	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	No	No	
Meadow Vole	2	No	No	No	
Plains Gartersnake	1	No	No	No	

Wildlife Comments:

US93 - 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
100	47.203144	-114.104858	40	PP10 T-3 end looking E
101	47.200741	-114.103539	180	PP5 looking S
102	47.20079	-114.103523	270	PP5 looking W
103	47.200829	-114.103607	135	PP5 start T-2
104-107	47.200867	-114.103622	0	PP5 Pano
110-115	47.199989	-114.102219		PP8 pano NW
111	47.199932	-114.102272	0	PP8 SE corner
116	47.200485	-114.102295	270	PP7 T-2 end looking W
67	47.202999	-114.10508	0	PP1 T-1start
68	47.201355	-114.105865	0	PP2 T1 end looking N
69-75	47.2015	-114.105919	180	PP3 pano shot T-1 end
76	47.20158	-114.105675	270	PP3 T-1end looking W
77	47.20158	-114.105675	0	PP3 T-1 end looking N
78-85	47.20158	-114.105675	180	PP3 pano S
80			180	PP3
86-88	47.201942	-114.106918		cirsium arvense infestation veg comm 1
89	47.202408	-114.107529	180	PP6 W boundary looking S
90	47.202457	-114.107483	90	PP6 W boundary looking E
91	47.20237	-114.107445	0	PP6 W boundary looking N
92	47.203018	-114.106316	180	PP4 NE project area
94	47.202839	-114.10508	320	PP9 pond fringe facing NW
95	47.202839	-114.10508	135	PP9 pond fringe
96	47.202759	-114.105133	230	PP9 weedy fringe
97	47.202759	-114.105133	45	PP9 looking at T-3
98	47.202759	-114.105133	320	PP11 looking at pond not start T-3

99	start T-3

Comments:

US93 - 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

Functional Assessments

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

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired?

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: US93 - Bouchard | City/County: Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 26 T 17N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

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:

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. Betula occidentalis	15	☑	FACW
2. Cornus stolonifera	5	☑	FACW
3.	0	☐	
4.	0	☐	
5.	0	☐	
	20 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Agrostis alba	25	☑	FACW
2. Cirsium arvense	25	☑	FACU+
3. Poa pratensis	30	☑	FACU+
4. Agropyron repens	15	☐	FACU
5. Juncus balticus	5	☐	OBL
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = 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: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Loam	
4-15	10YR 3/1	100					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: Typic Endoaquoll

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:

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

Project/Site: US93 - Bouchard | City/County: Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 26 T 17N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

Soil Map Unit Name: Colake silt loam, drained, 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:

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: 5 ft)			
1. Juncus balticus	80	☑	OBL
2. Agrostis alba	5	☐	FACW
3. Carex utriculata*	20	☐	OBL
4. Epilobium ciliatum	3	☐	FACW-
5. Geum macrophyllum	3	☐	FACW+
6.	0	☐	
7.	0	☐	
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 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 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 3/1	100					Loam	mucky
11-16	10YR 3/1	95	7.5YR 3/4	5	C	M	Loam	mucky

[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: 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):	2
Water Table Present?	Yes ☑ No ☐	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ☑ No ☐	Depth (inches):	0

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

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

Project/Site: US93 - Bouchard | City/County: Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 26 T 17N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

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

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: 5 ft.)			
1. Juncus balticus	35	☑	OBL
2. Cirsium arvense	50	☑	FACU+
3. Agropyron repens	15	☐	FACU
4. Poa pratensis	5	☐	FACU+
5. Achillea millefolium	2	☐	FACU
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	107 = 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: SP-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Loam	
4-16	10YR 2/1	100					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: Typic Endoaquolls

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: no hydro indicators

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

Project/Site: US93 - Bouchard | City/County: Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 26 T 17N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

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:

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: 5 ft.)			
1. Salix bebbiana	15	☑	FACW
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	15 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Juncus balticus	80	☑	OBL
2. Mimulus guttatus	2	☐	OBL
3. Carex retrorsa	15	☐	FAC
4. Cirsium arvense	5	☐	FACU+
5. Geum macrophyllum	5	☐	FACW+
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	107 = 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 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Silt Loam	mucky
6-11	10YR 2/1	100					Silt Loam	mucky
11-17	10YR 3/1	97	7.5YR 3/4	3	C	M	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: Typic Endoaquoll

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): 5

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 4

Wetland Hydrology Present? Yes ☑ **No** ☐

Remarks:

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

Project/Site: US93 - Bouchard | City/County: Lake Co. | Sampling Date: 8/4/2011

Applicant/Owner: MDT | State: MT | Sampling Point: SP-5

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 26 T 17N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

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

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: 5)			
1. Juncus balticus	80	☑	OBL
2. Carex utriculata*	5	☐	OBL
3. Poa pratensis	10	☐	FACU+
4. Cirsium arvense	15	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	110 = 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 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Silt Loam	
4-11	10YR 2/1	95	10YR 4/1	5	D	M	Silt Loam	
11-17	10YR 2/1	100					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: Typic Endoaquoll

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): 14
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 12

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

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

1. Project name US93 - Bouchard **2. MDT project#** NH 5-2(120)20 **Control#**

3. Evaluation Date 8/4/2011 **4. Evaluators** S. Frazier / B. Schultz **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 33.78

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) 33.78

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 Jocko Spring Creek. Site construction completed in 2006 and AA managed in a natural state. Weed cover has been increasing annually. AA bordered by the US93 corridor to west, and by pasture, agricultural buildings and farmyards to the north, south, and east.

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

Priority 2B,Cirsium arvense, Cynoglossum officinale, Centaurea maculosa, Chrysanthemum leucanthemum, Hypericum perforatum.

iii. Brief descriptive summary of surrounding land use/habitat

The AA is bordered by the US93 corridor to the west, and by pasture, agricultural buildings and farmyards to the north, south, and east.The AA was previously classified as a slope (HGM) wetland complex in 2009 and 2010 and reclassified as Riverine and Depressional wetlands based on topopgraphy, documented surface water connections to Jocko Spring Creek, and inferred groundwater connections to Jocko Spring Creek.

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 T&E list for Flathead County - August 2011

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 (S3)
Incidental habitat (list species)	**D S**	Bald Eagle (S3); 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 MTNHP Species of Concern List for Flathead County. Great blue heron rookery on Jocko River nearby, site probably used for foraging/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 site by birds and voles during site visit. Deer tracks were noted.

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:

Less than 5 pecent of AA subject to flooding from Jocko spring Creek.

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:

Max inundation = average of 6 inches of water over approx 33 acre of wetland = 16.5 acre-feet

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:

Majority of AA contains no or restricted outlet. Cover is >70%

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: E half of AA is adjacent to Jocko Spring Creek. Car and Jun spp. inhabit streambanks.

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	.7	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments: Jocko Spring Creek provides surface outlet for a portion of AA. Longest duration of water in AA is P/P.

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: The shallow water table is evidenced by site saturation and inundation levels.

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	10.134
B. MT Natural Heritage Program Species Habitat	M	.6	1	20.268
C. General Wildlife Habitat	H	.9	1	30.402
D. General Fish Habitat	NA	0	0	0
E. Flood Attenuation	NA	0	0	0
F. Short and Long Term Surface Water Storage	H	1	1	33.78
G. Sediment/Nutrient/Toxicant Removal	H	1	1	33.78
H. Sediment/Shoreline Stabilization	NA	0	0	0
I. Production Export/Food Chain Support	H	1	1	33.78
J. Groundwater Discharge/Recharge	H	1	1	33.78
K. Uniqueness	M	.6	1	20.268
L. Recreation/Education Potential	H	1	1	33.78
Totals:		7.4	9	249.972
Percent of Possible Score		**82.22** %		

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Total actual functional points > 80% (round to nearest whole #) of total possible functional points

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)
- ☐ Score of 1 functional point for Species Rated S1,S2, or S3 by the MT Natural Heritage Program; **or**
- ☑ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☑ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export/Food Chain Support; **and**
- ☐ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

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

I **II** **III** **IV**

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: US93 - Mud Creek Assessment Date/Time 8/3/2011 9:24:11 AM

Person(s) conducting the assessment: S. Frazier / B. Schultz

Weather: partly cloudy 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:

Rangeland and roadways (US 93 and Old US 93)

HYDROLOGY

Surface Water Source: Mud Creek; groundwater seep to west of site

Inundation: ☑ Average Depth: 0.4 **(ft)** Range of Depths: 0-4 **(ft)**

Percent of assessment area under inundation: 75 %

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**:**

High water table, water-stained leaves, sediment deposits, drainage patterns, and drift lines.

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 US93 - Mud Creek

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

* Indicates accepted spp name not on '88 list.

Community # 1 **Community Type:** Juncus balticus / Agrostis alba **Acres:** 0.07

Species	Cover class	Species	Cover class
Agrostis alba	3	Alnus incana	1
Carex bebbii	0	Carex utriculata*	0
Cirsium arvense	1	Cirsium vulgare	0
Cynoglossum officinale	0	Epilobium ciliatum	0
Geum macrophyllum	1	Juncus balticus	5
Lactuca serriola	1	Phalaris arundinacea	2
Poa pratensis	0	Solanum dulcamara	0

Comments:

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

Species	Cover class	Species	Cover class
Agrostis alba	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 balticus	4
Juncus effusus	1	Juncus ensifolius	2
Juncus nodosus	2	Lactuca serriola	0
Phalaris arundinacea	2	Phleum pratense	0
Poa pratensis	0	Typha latifolia	0

Comments:

Community # 5 **Community Type:** Carex spp. / **Acres:** 0.18

Species	Cover class	Species	Cover class
Agrostis alba	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 articulatus	2	Juncus balticus	0
Juncus ensifolius	1	Juncus tenuis	0
Lactuca serriola	0	Mentha arvensis	0
Mimulus guttatus	0	Nasturtium officinale	1
Phalaris arundinacea	2	Polygonum amphibium	0
Salix bebbiana	0	Salix drummondiana	0
Salix exigua	0	Scirpus acutus	0
Scirpus microcarpus	3	Typha latifolia	2

Comments:

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

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

Comments:

Community # 8 **Community Type:** Open Water / Aquatic Macrophytes **Acres:** 0.08

Species	Cover class	Species	Cover class
Algae, green	1	Elodea sp.	2
Nasturtium officinale	2	Open water	5
Veronica americana	2		

Comments:

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

Species	Cover class	Species	Cover class
Agrostis alba	2	Carex nebrascensis	1
Carex stipata	1	Cirsium arvense	5
Crataegus douglasii	1	Epilobium ciliatum	3
Geum macrophyllum	1	Juncus balticus	4
Phalaris arundinacea	1	Poa pratensis	1
Sisymbrium altissimum	1	Verbascum thapsus	0

Comments:

Community # 10 Community Type: Phalaris arundinacea / **Acres:** 1.12

Species	Cover class	Species	Cover class
Agrostis alba	0	Alnus incana	0
Carex stipata	0	Carex utriculata*	0
Chrysanthemum leucanthe	0	Cirsium arvense	0
Cirsium vulgare	0	Crataegus douglasii	1
Epilobium ciliatum	0	Geum macrophyllum	0
Glyceria grandis	0	Iris pseudacorus	0
Juncus balticus	2	Lactuca serriola	0
Lysichiton americanum	0	Phalaris arundinacea	5
Plantago major	1	Salix drummondiana	1
Scirpus microcarpus	0	Sisymbrium altissimum	0
Sonchus arvensis	1	Verbascum thapsus	0

Comments:

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

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

Comments:

Phalaris arundinacea is encroaching and becoming a more dominant component of this community as compared to 2010.

Community # 12 **Community Type:** Phalaris arundinacea / Bromus inermis **Acres:** 0.44

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

Comments:

Total Vegetation Community Acreage **2.6**

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

VEGETATION TRANSECTS

Site: US93 - Mud Creek **Date:** 8/3/2011 9:24:11 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 alba	2	Carex bebbii	1
Carex praegracilis	1	Carex utriculata*	2
Epilobium ciliatum	0	Juncus balticus	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	0
Phalaris arundinacea	3	Scirpus microcarpus	5

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

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

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

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

Ending Station 416 **Community Type:** Open Water / Aquatic Macrophytes

Species	Cover class	Species	Cover class
Elodea spp.	2	Nasturtium officinale	2
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 alba	2	Alnus incana	0
Chrysanthemum leucanthe	0	Cirsium arvense	0
Juncus balticus	2	Lactuca serriola	0
Phalaris arundinacea	5	Salix drummondiana	0

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

US93 - Mud Creek

Planting Type	#Planted	#Alive	Notes
ALNINC	85	12	Good growth and vigor
CORSTO	32	0	
CRADOU	10	4	Good growth and vigor
POPTRE	0	0	
POPTRI	83	0	
ROSWOO	31	4	Good growth and vigor
SALAMY	0	0	
SALBEB	56	8	Good growth and vigor
SALEXI	0	0	
SALLUT	54	0	

Comments

The "Number planted" figures listed above were taken from the Wetland Mitigation Planting Details and Schedule. Actual planting numbers and species may vary from those presented in the planting plan. Overall, plant survival was moderate while vigor for the survivors appear good.

US93 - 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
Brewer's Blackbird	1	L	SS
Canada Goose	12	FO	WM
Mallard	1	L	WM
Red-winged Blackbird	2	L	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
Meadow Vole	1	No	No	No	
Striped Skunk		Yes	No	No	
White-tailed Deer		Yes	No	No	

Wildlife Comments:

US93 - 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	47.581062	-114.114655	0	PP1 looking N
10	47.581707	-114.114311	315	PP8 looking NW down transect
11	47.581707	-114.114311	135	PP8 looking SE down transect
12	47.581413	-114.114212	315	PP9 looking NW to start transect
13	47.581413	-114.114212	135	PP9 looking SE to end transect
15	47.580963	-114.114021	135	PP7 looking SE along transect
16	47.58046	-114.114288	180	PP6 looking S under overpass
17	47.58046	-114.114288	45	PP6 looking NE upstream mud creek
18	47.580647	-114.113884	315	end transect looking NW
2	47.581024	-114.114456	90	livestock water gap
23-26	47.580647	-114.113884		PP4 pano
2462	47.580807	-114.114227		cover shot
27, 28-31	47.58144	-114.113922		PP10
3	47.58152	-114.114182		canada thistle population
32,33-37	47.581387	-114.112511	270	PP12 west downstream, pano
38-42	47.581413	-114.112511		PP13 pano - land use east of site
43-46	47.581497	-114.113052		PP11 pano
47, 48-52	47.582108	-114.113869		PP3 , PP3 pano
5	47.58194	-114.114594	90	PP2 looking E
6	47.581974	-114.114578	180	PP2 looking S
61-65	47.5807	-114.114502		PP5 pano
7	47.581974	-114.114578	135	PP2 looking SE
8	47.581959	-114.114471	0	T-1 start N end

Comments:

US93 - 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

Functional Assessments

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

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired?

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: US93 - Mud Creek | City/County: Pablo/Lake County | Sampling Date: 8/3/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 13 T 21N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

Soil Map Unit Name: Borohemists, 0 to 1% 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:

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: 5 ft)			
1. Phalaris arundinacea	15	☑	FACW
2. Carex utriculata*	30	☑	OBL
3. Scirpus microcarpus	30	☑	OBL
4. Typha latifolia	5	☐	OBL
5. Glyceria grandis	15	☑	NO
6. Carex nebrascensis	10	☐	OBL
7. Agrostis alba	10	☐	FACW
8. Juncus ensifolius	5	☐	FACW
9. Juncus tenuis	3	☐	FAC
10. Juncus articulatus	3	☐	OBL
11.	0	☐	
	126 = 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: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Glyceria grandis was left of the 1988 plant list. As all glyceria sp. On this list are either OBL/FACW. G. grandis was considered hydrophytic for this plot.

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	5Y 3/1	80	7.5YR 4/3	10	C	M	Silt Loam	Alos, 10% redox depletions
6-12	5Y 4/1	90	7.5YR 4/4	10	C	M	Silty 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: Borohemists

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): 9
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 8

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

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

Project/Site: US93 - Mud Creek | City/County: Pablo/Lake County | Sampling Date: 8/3/2011

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

Investigator(s): S. Frazier / B. Shultz | Section, Township, Range: S 13 T 21N R 20W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum:

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:

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: 5)			
1. Phalaris arundinacea	60	☑	FACW
2. Cirsium arvense	20	☐	FACU+
3. Brassica kaber	20	☐	NO
4. Epilobium ciliatum	5	☐	FACW-
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	105 = 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 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					Silt Loam	
14-18	10YR 3/1	98	7.5YR 4/4	2	C	M	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: Brohemists

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No redox w/in upper 12 inches with low (2) chroma.

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:

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

1. Project name US93-Mud Creek **2. MDT project#** NH-PLH 5-2(142)51 **Control#**

3. Evaluation Date 8/3/2011 **4. Evaluators** S. Frazier / B. Schultz **5. Wetland/Site# (s)** AA-1

6. Wetland Location(s): T 21N **R** 20W **Sec1** 13 **T** **R** **Sec2**

Approx Stationing or Mileposts 51

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

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 2.16

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) 2.16

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	Riverine	lower perennial	Aquatic Bed		Permanently flooded	5
Riverine	Palustrine	none	Emergent Wetland		Permanently flooded	10
Riverine	Riverine	lower perennial	Unconsolidated Bottom		Permanently flooded	5
Riverine	Palustrine	none	Scrub-Shrub Wetland		seasonally flooded	5
Riverine	Palustrine	none	Emergent Wetland		seasonally flooded	75

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 realigned/regraded section of Mud Creek and adjacent enhanced wetlands. AA was constructed in 2007 and is managed in a natural state. Approximately 80% of the wetlands within the AA were classified as Riverine wetlands in 2011 based on topography and inferred surface and subsurface hydrologic connections to Mud Creek.

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

Cirsium arvense; Cirsium vulgare; Chrysanthemum leucanthemum; Iris psuedocorus

iii. Brief descriptive summary of surrounding land use/habitat

The AA is bordered by roadway (US93 and Old US 93) to the south and east, and by grazed pastures to the north and west.

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: AA encompasses emergent, aquatic bed, and scrub/shrub vegetation classes.

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
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 County List - August 2011

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); 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 MTNHP County List

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 Several geese, black birds, mallards, and vole and signs of deer and skunk were observed in 2011.

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 Suspected introduced gamefish (Tier 4): Brook trout, northern pike, yellow perch with incidental native fish (Source: MFIS

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: Bridge and ag structures downstream.

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, check ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
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: Max acre-feet of ponding: average of approx 8 inches of water over 2.16 acre of wetland = 1.44 acre-feet

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:

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 along Mud Creek w/stability ratings > or = to 6: Juncus spp., Carex spp., Reed canarygrass

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	.7	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments: AA exhibits high structural diversity, surface outlet, and P/P regime.

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: seeps located immdiately west of AA contribute water to the AA

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: Site owned by MDT.

General Site Notes

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

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

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Total actual functional points > 80% (round to nearest whole #) of total possible functional points

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)
- ☐ Score of 1 functional point for Species Rated S1,S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export/Food Chain Support; **and**
- ☐ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

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

I **II** **III** **IV**

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: US93 - Peterson Assessment Date/Time 8/5/2011 8:36:09 AM

Person(s) conducting the assessment: S. Frazier / B. Schultz

Weather: Overcast; approx. 75 degrees 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: 4 #Visits in Year: 1

Size of Evaluation Area: 25 (acres)

Land use surrounding wetland:

Rangeland to the north, south, and west; US93 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: 1-4 **(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: Yes

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

Water-stained leaves, FAC-neutral test.

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:

The assessment area consists of an unnamed, perennial tributary of Post Creek, and a small wetland swale that joins with the unnamed tributary near the northwestern corner of the mitigation site. The source of water for the wetland swale appears to be irrigation water that is diverted from a small ditch located just north of the mitigation site. There are no monitoring wells at this site.

VEGETATION COMMUNITIES

Site US93 - Peterson

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

* Indicates accepted spp name not on '88 list.

Community # 2 **Community Type:** Phalaris arundinacea / **Acres:** 0.48

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	3	Iris pseudacorus	0
Juncus balticus	1	Mentha arvensis	0
Nasturtium officinale	0	Phalaris arundinacea	5
Rosa woodsii	0	Scirpus acutus	1
Sisymbrium altissimum	0	Solanum dulcamara	1

Comments:

Community # 4 **Community Type:** Carex nebrascensis / Poa palustris **Acres:** 1.5

Species	Cover class	Species	Cover class
Carex nebrascensis	4	Chrysanthemum leucanthe	0
Cirsium arvense	1	Cirsium vulgare	1
Dipsacus sylvestris	2	Lactuca serriola	1
Phalaris arundinacea	3	Plantago lanceolata	2
Poa palustris	3	Potentilla recta	0
Rosa woodsii	1	Suaeda calceoliformis	1

Comments:

Community # 5 **Community Type:** Epilobium ciliatum / **Acres:** 0.52

Species	Cover class	Species	Cover class
Carex nebrascensis	1	Cirsium arvense	1
Dipsacus sylvestris	2	Epilobium ciliatum	5
Geum macrophyllum	0	Mentha arvensis	1
Phalaris arundinacea	1		

Comments:

Community # 6 **Community Type:** Sisymbrium altissimum / **Acres:** 1.29

Species	Cover class	Species	Cover class
Agropyron repens	1	Asparagus officinalis	0
Cirsium vulgare	0	Lepidium perfoliatum	0
Sisymbrium altissimum	5		

Comments:

Community had been recently treated with herbicide; very difficult to identify associate species

Community # 7 **Community Type:** Agropyron repens / Poa pratensis **Acres:** 19.48

Species	Cover class	Species	Cover class
Agropyron repens	5	Alnus incana	0
Bromus inermis	2	Bromus tectorum	1
Cardaria draba	2	Carex nebrascensis	0
Carex vesicaria	0	Chrysanthemum leucanthe	0
Cirsium arvense	1	Cirsium vulgare	0
Dactylis glomerata	0	Dipsacus sylvestris	2
Geum macrophyllum	0	Kochia scoparia	0
Lactuca serriola	0	Lepidium perfoliatum	1
Phalaris arundinacea	0	Plantago lanceolata	1
Poa palustris	0	Poa pratensis	3
Potentilla recta	1	Rosa woodsii	1
Rumex crispus	0	Sisymbrium altissimum	1
Sonchus arvensis	1	Suaeda calceoliformis	2
Thlaspi arvense	0	Verbascum blattaria	0

Comments:

Community # 8 **Community Type:** Typha latifolia / Phalaris arundinacea **Acres:** 1.75

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 balticus	0	Juncus ensifolius	1
Juncus tenuis	0	Mentha arvensis	0
Phalaris arundinacea	3	Plantago lanceolata	0
Poa pratensis	1	Polygonum amphibium	0
Rosa woodsii	1	Rumex crispus	0
Sonchus arvensis	1	Suaeda calceoliformis	0
Typha latifolia	5		

Comments:

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: US93 - Peterson Date: 8/5/2011 8:36:09 AM

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

Interval Data:

Ending Station 32 **Community Type:** Agropyron repens / Poa pratensis

Species	Cover class	Species	Cover class
Cirsium arvense	2	Dipsacus sylvestris	2
Phalaris arundinacea	2	Poa pratensis	3
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	0	Iris pseudacorus	0
Juncus balticus	1	Mentha arvensis	0
Phalaris arundinacea	2	Polygonum amphibium	0
Rosa woodsii	1	Typha latifolia	4

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

Species	Cover class	Species	Cover class
Agropyron repens	3	Alnus incana	0
Cirsium arvense	0	Dipsacus sylvestris	0
Phalaris arundinacea	1	Poa pratensis	5
Potentilla recta	0		

Transect Notes:

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

Interval Data:

Ending Station 139 **Community Type:** Typha latifolia / Phalaris arundinacea

Species	Cover class	Species	Cover class
Alnus incana	1	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 208 **Community Type:** Carex nebrascensis / Poa palustris

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

Ending Station 230 **Community Type:** Typha latifolia / Phalaris arundinacea

Species	Cover class	Species	Cover class
Alnus incana	1	Carex nebrascensis	4
Cirsium arvense	1	Epilobium ciliatum	3
Geum macrophyllum	1	Juncus tenuis	0
Rumex crispus	1	Typha latifolia	5

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

Species	Cover class	Species	Cover class
Agropyron repens	0	Cirsium arvense	2
Poa palustris	5	Rosa woodsii	0
Thlaspi arvense	0		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

US93 - Peterson

Planting Type	#Planted	#Alive	Notes
ALNINC	1163	15	Good growth and vigor
CORSTO	226	3	Good growth and vigor
CRADOU	75	0	
PRUAME	226	0	
RHAALN	207	0	
ROSWOOD	450	20	Good growth and vigor
SALBEB	394	0	
SALEXI	0	0	
SALLUT	375	0	
SAMCER	19	0	
SYMALB	56	0	

Comments

US93 - 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	20	FO	UP, WM
Red-winged Blackbird	2	L	MA
Sparrow Sp.	2	FO	MA, UP

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

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

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

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Columbia Spotted Frog		No	No	No	

Wildlife Comments:

US93 - 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
118	47.36158	-114.098915		PP1 T-1 start
119-125	47.36158	-114.098915		PP1 T-1 pano
128	47.361153	-114.099258		PP2 end T-1 looking N
130	47.361153	-114.099258		PP2 T-1 looking E
131	47.361279	-114.099228		PP3 end T-1
132	47.361153	-114.099258		PP2 end T-1 looking N
133-138	47.361153	-114.099258		PP2 end pano
139-143	47.361134	-114.100174		PP6 T-2
144	47.361382	-114.100113		PP6 start T-2
145-150	47.361813	-114.101067		riparian corridor pano
151	47.361813	-114.101067		PP4 looking across T-2
152	47.362286	-114.100655		PP5 end T-2 wetland boundary

Comments:

US93 - 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

Functional Assessments

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

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired?

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? No

If yes, describe the problems below.

No mtn. required on structures.

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

Project/Site: US93 - Peterson | City/County: St. Ignatius/Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 35 T 19N R 20W

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

Subregion (LRR): LRR E | Lat: 47.362385 | Long: -114.1018033 | Datum:

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:

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: 5 ft)			
1. Poa pratensis	85	☑	FACU+
2. Agropyron repens	15	☐	FACU
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = 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: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					Loam	
3-11	10YR 4/2	98	10YR 4/6	2	C	M	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: 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:

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

Project/Site: US93 - Peterson | City/County: St. Ignatius/Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 35 T 19N R 20W

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

Subregion (LRR): LRR E | Lat: 47.36231333 | Long: -114.1019183 | Datum:

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:
Area sampled by this data point has problematic hydrology (seasonal, groundwater-driven hydrology). The area was sampled late in the growing season. Determined to exhibit wetland hydrology based on geomorphic position (floodplain/terrace), topography, and the presence of hydric soils and hydrophytic vegetation.

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: 5 ft)			
1. Rosa woodsii	5	☑	FACU
2. Salix bebbiana	5	☑	FACW
3.	0	☐	
4.	0	☐	
5.	0	☐	
	10 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Carex nebrascensis	35	☑	OBL
2. Dipsacus sylvestris	5	☐	NI
3. Phalaris arundinacea	20	☑	FACW
4. Poa palustris	30	☑	FAC
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	90 = 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: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Loam	
4-10	10YR 3/1	95	7.5YR 3/4	5	C	M	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: 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: Area sampled by this data point has problematic hydrology (seasonal, groundwater-driven hydrology). Area sampled determined to be a wetland based on geomorphic position (floodplain/terrace), topography, and the presence of hydric soils and hydrophytic vegetation.

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

Project/Site: US93 - Peterson | City/County: St. Ignatius/Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 35 T 19N R 20W

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

Subregion (LRR): LRR E | Lat: 47.36244833 | Long: -114.1018183 | Datum:

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:

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: 5 ft)			
1. Phalaris arundinacea	95	☑	FACW
2. Impatiens ecalcarata	5	☐	FACW
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = 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 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					Clay Loam	
5-16	10YR 2/1	94	5YR 4/6	4	C	M	Clay Loam	Matrix exhibits depletions 2% 10yr 4\1.

[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: 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:

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

Project/Site: US93 - Peterson | City/County: St. Ignatius / Lake Co. | Sampling Date: 8/4/2011

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

Investigator(s): S. Frazier / B. Schultz | Section, Township, Range: S 35 T 19N R 20W

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

Subregion (LRR): LRR E | Lat: 47.36209167 | Long: -114.1005133 | Datum:

Soil Map Unit Name: Colake loam

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:
Area sampled by this data point has problematic hydrology (seasonal, groundwater-driven hydrology). Area sampled late in the growing season. Determined to be a wetland based on geomorphic position (floodplain/terrace) and the presence of hydric soils and hydrophytic vegetation.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
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: 5 ft.)			
1. Poa palustris	80	☑	FAC
2. Plantago lanceolata	15	☐	FACU+
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 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					Silt Loam	
3-16	10YR 2/2	93	7.5YR 3/3	7	C	M		

[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: 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: Data point on terrace near creek. Area sampled by this data point has problematic hydrology (seasonal, groundwater-driven hydrology) based on late season site visit. Area sampled determined to be a wetland based on geomorphic position (floodplain/terrace), topography, and the presence of hydric soils and hydrophytic vegetation.

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

1. Project name US93 - Peterson **2. MDT project#** NH 5-2(122)31 **Control#**

3. Evaluation Date 8/5/2011 **4. Evaluators** S. Frazier / B. Schultz **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 Watershed/Lake County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 4.25

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 4.25

How assessed: Measured e.g. by GPS

Purpose of Evaluation

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

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 reclassified as Riverine (HGM) based on topography and inferred hydrologic connections to the stream.

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

Cirsium arvense; Cirsium vulgare; cardaria draba; potentilla recta; Chrysanthemum luecanthemum; Iris psuedocorus

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: Two vegetated classes present: emergent wetland 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)
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 - August 2011 / MTNHP County List and 2010 MWAM

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); Bald Eagle (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 MTNHP County List; 2010 MWAM

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA Low

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 Disturbance rated as low. Longest duration of ponding in the AA was "P/P". Twenty geese, blackbirds, and sparrows were observed in 2011.

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 Unnamed stream in AA not considered suitable habitat for fish.

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: AA has unrestricted outlet and total area of 4.25 acres.

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: Approx. 3.40 ac. of AA is permanently inundated with an est. average of 0.5 ft surface water, equaling 1.7 acre-feet of storage.

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 unrestricted outlet and abundant evidence of flooding

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: Dominant streambank species are reed canarygrass (stability rating = 9) and cattail (stability ranking = 9)

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	.7	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments: Vegetated component = ~3.83 acre; AA contains surface outlet. Stream in AA is perennial so longest duration of surface water assessed as "P/P".

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: Wetlands/waters in AA were constructed in 2006 and are managed in a natural state, so disturbance classified as low.

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	1.275
B. MT Natural Heritage Program Species Habitat	L	.1	1	0.425
C. General Wildlife Habitat	H	.9	1	3.825
D. General Fish Habitat	NA	0	0	0
E. Flood Attenuation	M	.4	1	1.7
F. Short and Long Term Surface Water Storage	H	.8	1	3.4
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	3.825
H. Sediment/Shoreline Stabilization	H	1	1	4.25
I. Production Export/Food Chain Support	H	.8	1	3.4
J. Groundwater Discharge/Recharge	H	1	1	4.25
K. Uniqueness	M	.4	1	1.7
L. Recreation/Education Potential	H	1	1	4.25
Totals:		7.6	11	32.3
Percent of Possible Score		**69.09** %		

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

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 2010**

Photo Point 2 – *Photo 1* **Location:** Veg Tran 1, end
Bearing: 0 Degrees **Taken in 2010**

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 3 – *Photo 1*
Bearing: 270 Degrees

Location: Veg Tran 1, end
Taken in 2009

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

Location: Veg Tran 1, end
Taken in 2010

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

Location: Veg Tran 1, end
Taken in 2010

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

Location: Veg Tran 1, end
Taken in 2011

Photo Point 3 – *Photo 1*
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 2009

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

Location: Veg Tran 1, end
Taken in 2011

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 4 – *Photo 1* **Location:** NE project area
Bearing: 180 Degrees **Taken in 2009**

Photo Point 4 – *Photo 1* **Location:** NE project area
Bearing: 180 Degrees **Taken in 2010**

Photo Point 4 – *Photo 1* **Location:** NE project area
Bearing: 180 Degrees **Taken in 2011**

Photo Point 5 – *Photo 1* **Location:** Veg Tran 2, start
Bearing: 270 Degrees **Taken in 2010**

Photo Point 5 – *Photo 1* **Location:** Veg Tran 2, start
Bearing: 270 Degrees **Taken in 2011**

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: 90 Degrees **Taken in 2009**

Photo Point 5 – *Photo 2* **Location:** Veg Tran 2, start
Bearing: 135 Degrees **Taken in 2010**

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 2011**

Photo Point 6 – *Photo 1* **Location:** West boundary
Bearing: 90 Degrees **Taken in 2011**

Photo Point 7 – *Photo 1* **Location:** Veg Tran 2, end
Bearing: 270 Degrees **Taken in 2009**

Photo Point 7 – *Photo 1* **Location:** Veg Tran 2, end
Bearing: 270 Degrees **Taken in 2010**

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 2009**

Photo Point 8 – *Photo 1* **Location:** SE corner of project area
Bearing: 0 Degrees **Taken in 2011**

Photo Point 8 – *Photo 1* **Location:** SE corner of project area
Bearing: 0 Degrees **Taken in 2011**

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 2010**

Photo Point 9 – *Photo 2* **Location:** Fringe of pond
Bearing: 320 Degrees **Taken in 2010**

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 3* **Location:** View toward T-3
Bearing: 45 Degrees **Taken in 2009**

Photo Point 9 – *Photo 4* **Location:** Weedy pond fringe
Bearing: 230 Degrees **Taken in 2009**

Photo Point 9 – *Photo 3* **Location:** View toward T-3
Bearing: 45 Degrees **Taken in 2010**

Photo Point 9 – *Photo 4* **Location:** Weedy pond fringe
Bearing: 230 Degrees **Taken in 2010**

Photo Point 9 – *Photo 3* **Location:** View toward T-3
Bearing: 45 Degrees **Taken in 2011**

Photo Point 9 – *Photo 4* **Location:** Weedy pond fringe
Bearing: 230 Degrees **Taken in 2011**

Photo Point 10 – *Photo 1* **Location:** Veg Tran 3, end
Bearing: 230 Degrees **Taken in 2010**

Photo Point 10 – *Photo 1* **Location:** Veg Tran 3, end
Bearing: 40 Degrees **Taken in 2011**

Photo Point 11 – *Photo 1* **Location:** Veg Tran 3, start
Bearing: 320 Degrees **Taken in 2009**

Photo Point 11 – *Photo 1* **Location:** Veg Tran 3, start
Bearing: 320 Degrees **Taken in 2010**

Photo Point 11 – *Photo 1* **Location:** Veg Tran 3, start
Bearing: 320 Degrees **Taken in 2011**

Photo Point 1 – *Photo 1* **Location:** Livestock water gap
Bearing: 90 Degrees **Taken in 2009**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 45 Degrees **Taken in 2009**

Photo Point 1 – *Photo 1* **Location:** Livestock water gap
Bearing: 90 Degrees **Taken in 2010**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 0 Degrees **Taken in 2010**

Photo Point 1 – *Photo 1* **Location:** Livestock water gap
Bearing: 90 Degrees **Taken in 2011**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 0 Degrees **Taken in 2011**

Photo Point 2 – *Photo 1* **Location:** Northern project boundary
Bearing: 60 Degrees **Taken in 2009**

Photo Point 2 – *Photo 2* **Location:** Western project boundary
Bearing: 130 Degrees **Taken in 2009**

Photo Point 2 – *Photo 1* **Location:** Northern project boundary
Bearing: 60 Degrees **Taken in 2010**

Photo Point 2 – *Photo 2* **Location:** Western project boundary
Bearing: 130 Degrees **Taken in 2010**

Photo Point 2 – *Photo 1* **Location:** Northern project boundary
Bearing: 60 Degrees **Taken in 2011**

Photo Point 2 – *Photo 2* **Location:** Western project boundary
Bearing: 130 Degrees **Taken in 2011**

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 2010

Photo Point 4 – *Photo 1*
Bearing: 340 Degrees
Location: NE corner of project area
Taken in 2010

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 5 – *Photo 1*
Bearing: 0 Degrees

Location: South project area
Taken in 2009

Photo Point 5 – *Photo 1*
Bearing: 0 Degrees

Location: South project area
Taken in 2010

Photo Point 5 – *Photo 1*
Bearing: 0 Degrees

Location: South project area
Taken in 2011

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 2010**

Photo Point 6 – *Photo 2* **Location:** Mud Creek
Bearing: 45 Degrees **Taken in 2010**

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 7 – *Photo 1* **Location:** Along T-1
Bearing: 135 Degrees **Taken in 2009**

Photo Point 8 – *Photo 1* **Location:** Along T-1
Bearing: 340 Degrees **Taken in 2009**

Photo Point 7 – *Photo 1* **Location:** Along T-1
Bearing: 135 Degrees **Taken in 2010**

Photo Point 8 – *Photo 1* **Location:** Along T-1
Bearing: 340 Degrees **Taken in 2010**

Photo Point 7 – *Photo 1* **Location:** Along T-1
Bearing: 135 Degrees **Taken in 2011**

Photo Point 8 – *Photo 1* **Location:** Along T-1
Bearing: 340 Degrees **Taken in 2011**

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 2010

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 2011

Photo Point 10 – *Photo 1*
Bearing: 90 Degrees
Location: Mud Creek
Taken in 2011

Photo Point 11 – *Photo 1* **Location:** US Hwy 93 Bridge
Bearing: 90 Degrees **Taken in 2009**

Photo Point 12 – *Photo 1* **Location:** US Hwy 93 over Mud Creek
Bearing: 230 Degrees **Taken in 2009**

Photo Point 11 – *Photo 1* **Location:** US Hwy 93 Bridge
Bearing: 90 Degrees **Taken in 2010**

Photo Point 12 – *Photo 1* **Location:** US 93 over Mud Creek
Bearing: 230 Degrees **Taken in 2010**

Photo Point 11 – *Photo 1* **Location:** US Hwy 93 Bridge
Bearing: 90 Degrees **Taken in 2011**

Photo Point 12 – *Photo 1* **Location:** US 93 over Mud Creek
Bearing: 230 Degrees **Taken in 2011**

Photo Point 13 – *Photo 1*
Bearing: 90 Degrees
Location: Landuse east of project area
Taken in 2009

Photo Point 13 – *Photo 1*
Bearing: 90 Degrees
Location: Landuse east of project area
Taken in 2010

Photo Point 13 – *Photo 1*
Bearing: 90 Degrees
Location: Landuse east of project area
Taken in 2011

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 2010**

Photo Point 1 – *Photo 2* **Location:** PP1
Bearing: 135 Degrees **Taken in 2010**

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 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 2 – *Photo 3* **Location:** PP2
Bearing: 110 Degrees **Taken in 2010**

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 2009**

Photo Point 3 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2010**

Photo Point 3 – *Photo 1* **Location:** T-1 finish
Bearing: 45 Degrees **Taken in 2011**

Photo Point 4 – *Photo 1* **Location:** Looking across T-2
Bearing: 30 Degrees **Taken in 2009**

Photo Point 5 – *Photo 1* **Location:** Wetland boundary
Bearing: 135 Degrees **Taken in 2009**

Photo Point 4 – *Photo 1* **Location:** Looking across T-2
Bearing: 30 Degrees **Taken in 2010**

Photo Point 5 – *Photo 1* **Location:** Wetland boundary
Bearing: 135 Degrees **Taken in 2010**

Photo Point 4 – *Photo 1* **Location:** Looking across T-2
Bearing: 30 Degrees **Taken in 2011**

Photo Point 5 – *Photo 1* **Location:** Wetland boundary
Bearing: 135 Degrees **Taken in 2011**

Photo Point 6 – *Photo 1* **Location:** T-2 start
Bearing: 315 Degrees **Taken in 2009**

Photo Point 6 – *Photo 1* **Location:** T-2 start
Bearing: 315 Degrees **Taken in 2010**

Photo Point 6 – *Photo 1* **Location:** T-2 start
Bearing: 315 Degrees **Taken in 2011**

Appendix D

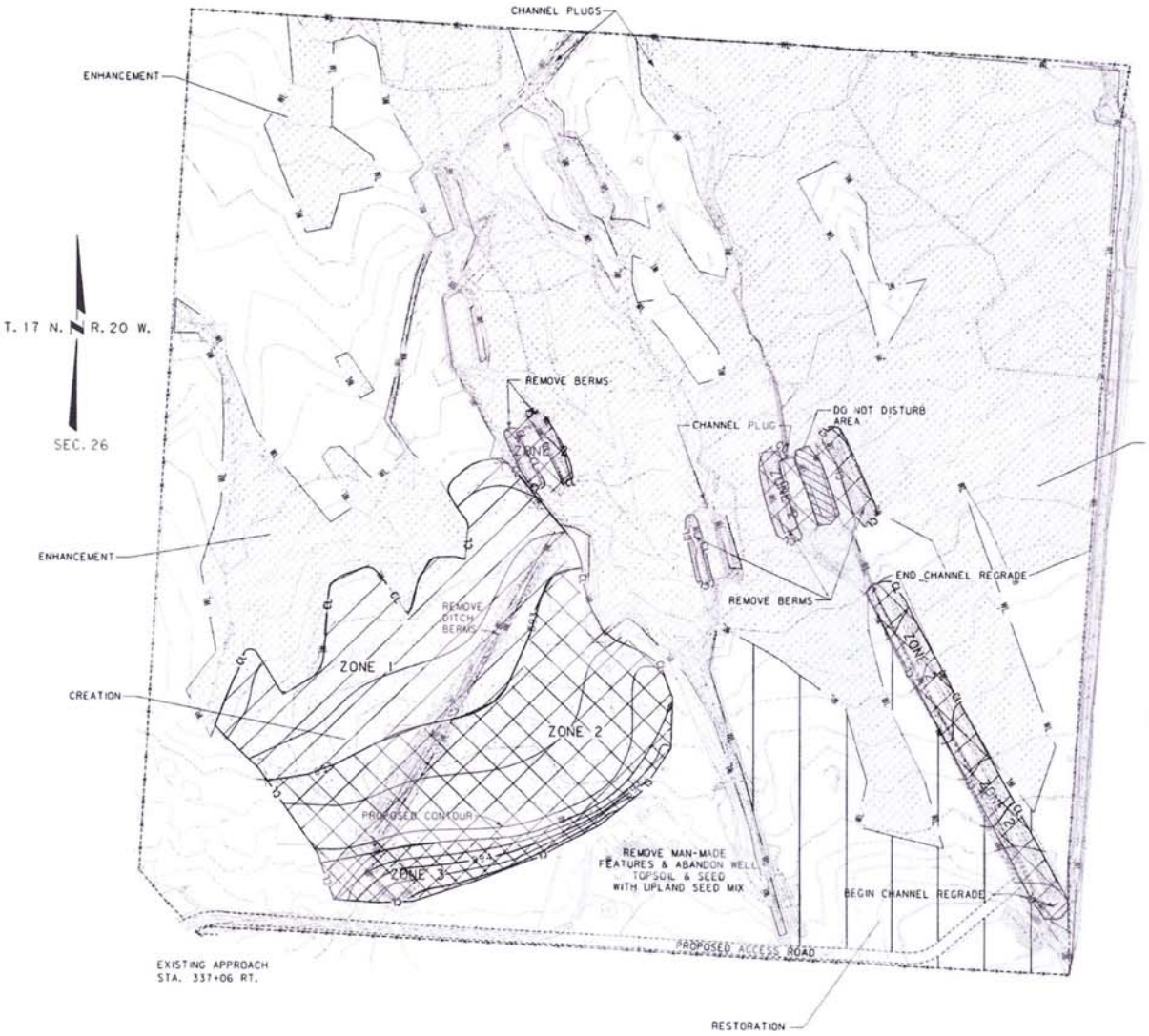
Original Site Plans

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

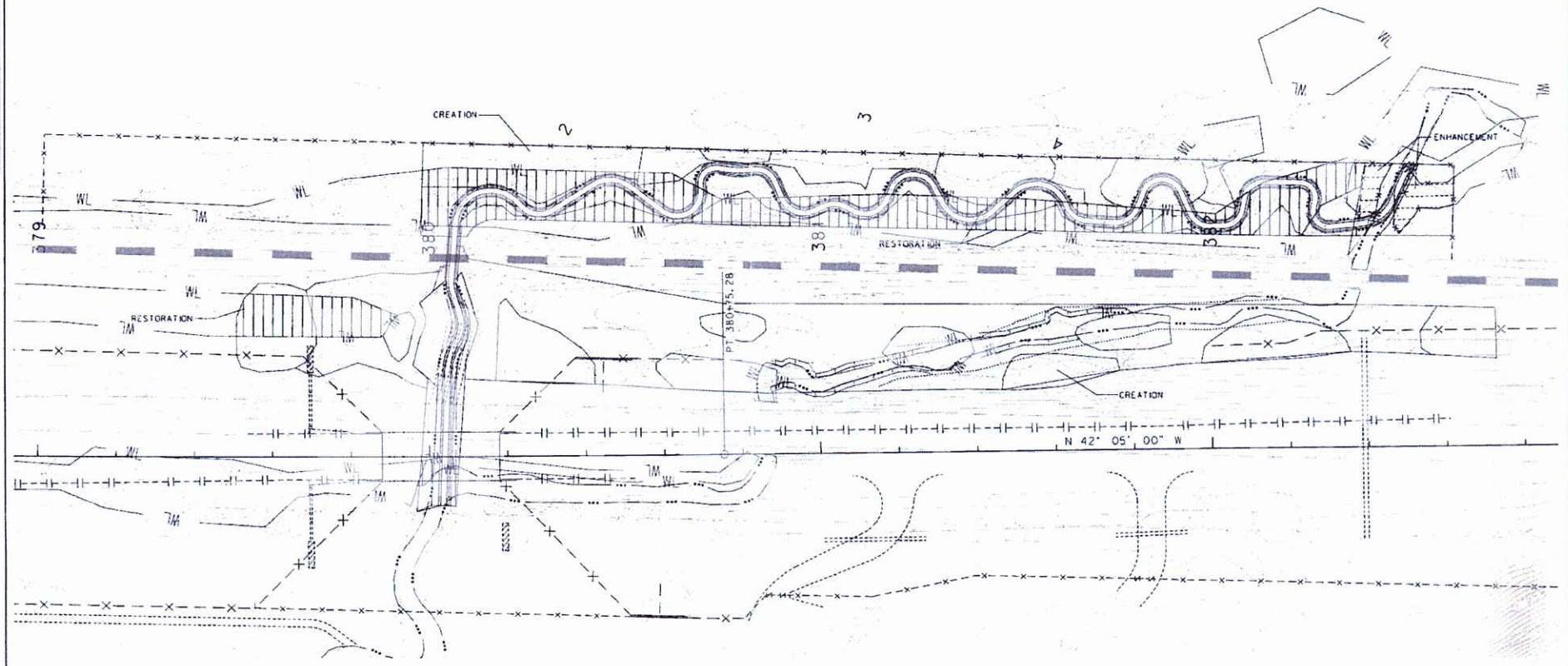
MONTANA CADD

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

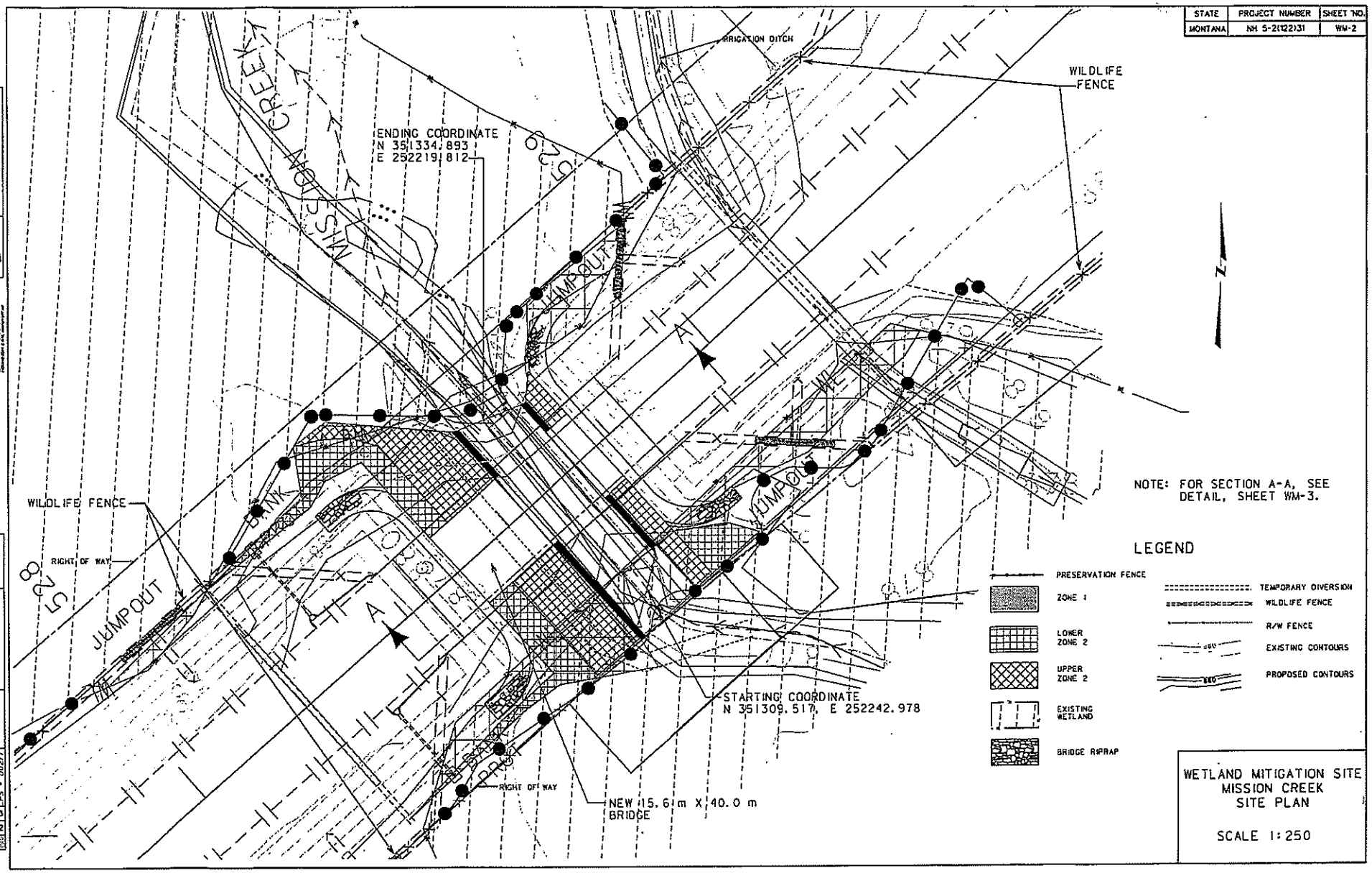
COE PERMITTING

SCALE = 1:500

MONTANA DEPARTMENT OF TRANSPORTATION

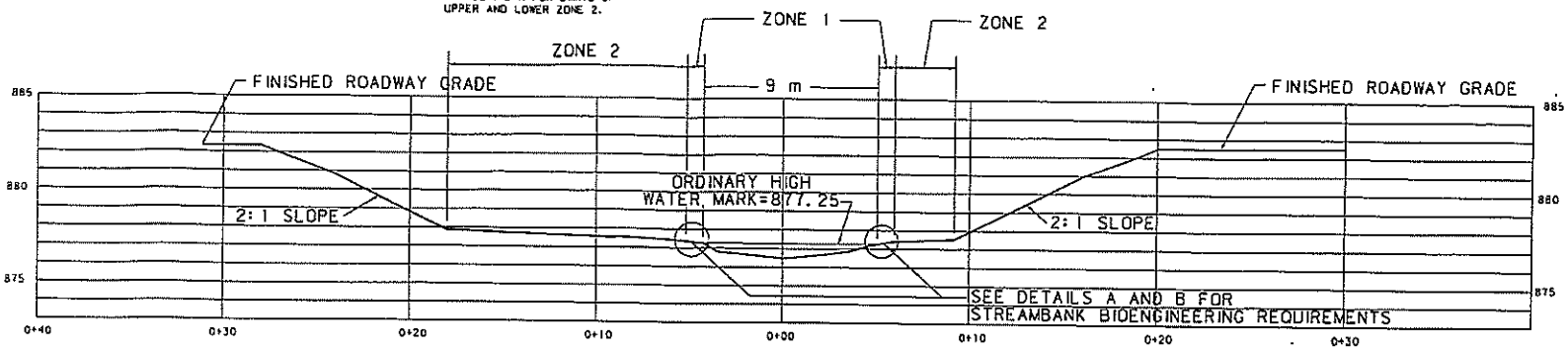
MONTANA CADD

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

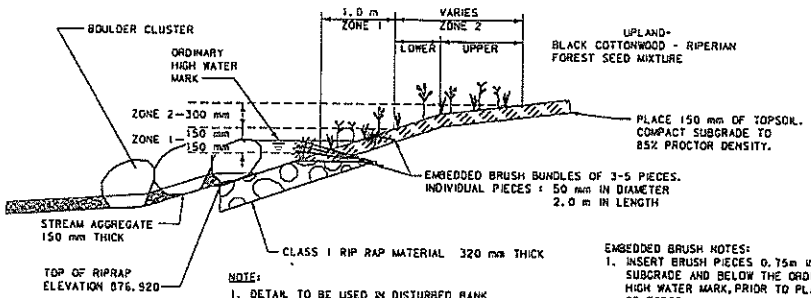
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-4

NOTE:
SEE DETAIL A FOR LIMITS OF UPPER AND LOWER ZONE 2.



SECTION A-A
TYPICAL SECTION

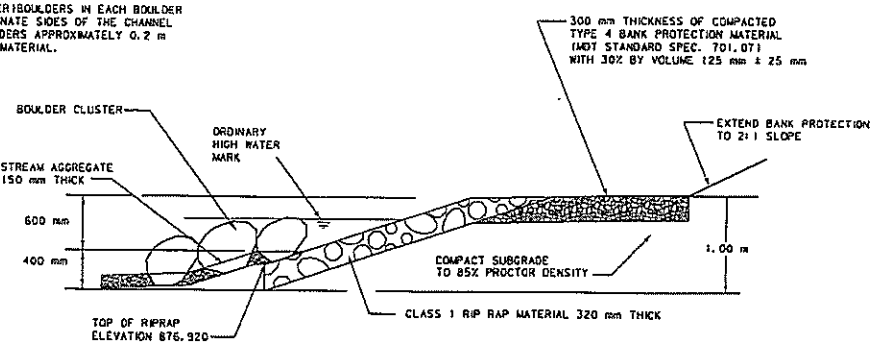
BOULDER CLUSTER NOTE:
1. PLACE NINE (0.5-0.75 m DIAMETER) BOULDERS IN EACH BOULDER GROUP. PLACE GROUPS ON ALTERNATE SIDES OF THE CHANNEL AT 6 m INTERVALS. EMBED BOULDERS APPROXIMATELY 0.2 m INTO THE RIPRAP OR STREAMBED MATERIAL.



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

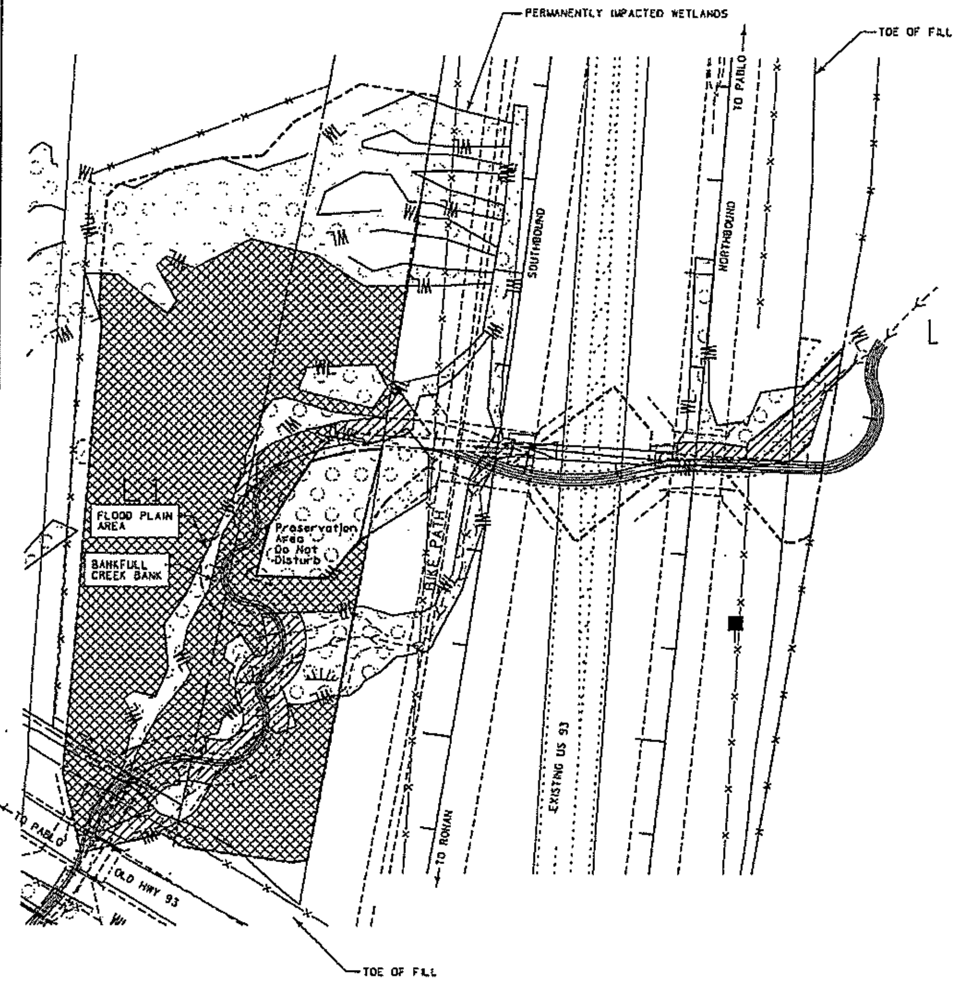
WETLAND MITIGATION SITE
MISSION CREEK
CHANNEL DETAILS

SCALE N. T. S.

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(123)48	12

CSF = 0.99930000

DETAIL
MUD CREEK
WETLAND IMPACTS AND MITIGATION AREAS



Types of Compensatory Mitigation	Definition1	Corps Ratio2
Preservation	Protection. In perpetuity.	NA
Creation	Establishment of a wetland or other aquatic resource where one did not formerly exist	1:1
Re-establishment (Corps)	Restoration of wetland characteristics to existing non-wetland areas that were historically wetlands	1:1
Rehabilitaion	Restoration of wetland functions of existing wetland areas that exist in a substantially degraded state.	Based on exspected functional shift. A minimum 1.5:1 ratio applies
Enhancement (Corps)	Altering the physical characteristics (or land management - CSKT) of a jurisdictional wetland such that it permanently modifies and improves on or more specific functions.	Based on expected functional shift. a minimum 3:1 ratio applies
Re-establishment (Corps)	Restoration of wetland functions characteristics to existing non-wetland areas that were historically wetlands	

1. Source for Corps: Letter from Todd Tillinger (Corps) to Tom Parker (Herrera) dated December 18, 2002.
2. Ratios based on Memorandum from Herrera EnvironmentalConsultants 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 EnvironmentalConsultants dated December 18, 2002.

LEGEND

EXISTING WETLANDS

WETLAND MITIGATION BOUNDARY

PERMANENTLY IMPACTED WETLAND = 8647.79 m²

TEMPORARILY IMPACTED WETLAND

CREATED WETLAND = 25 017 m²

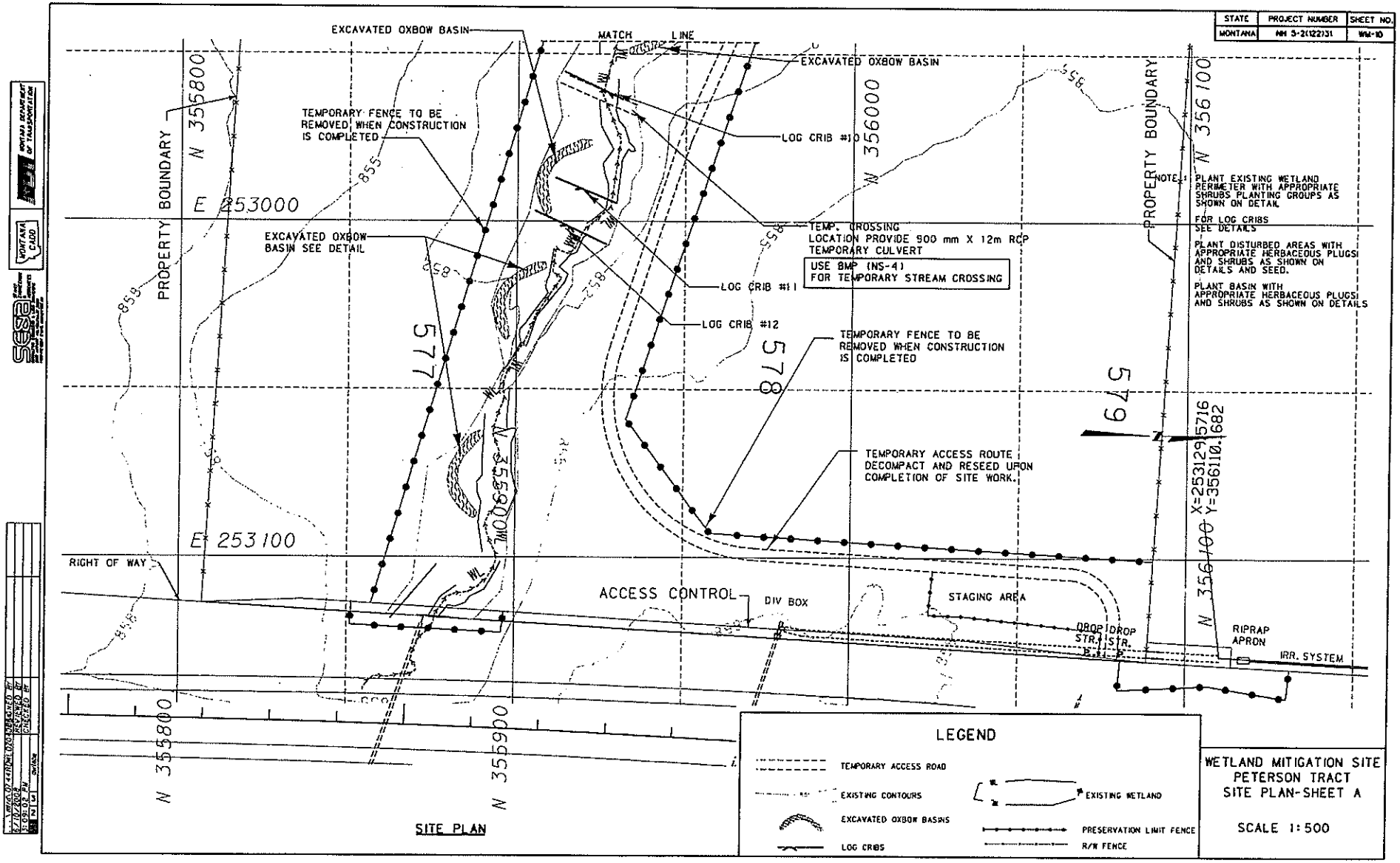
TotalMitigation Area
Totalarea = 36072 m²
Existing Wetland area = 11055 m² (Enhancement)
Existing Upland area = 25017 m² (New Wetland)
Wetland area permanently impacted 8647.79 m²

CarterBurgess
h744\rd\h744rdeld04.dgn

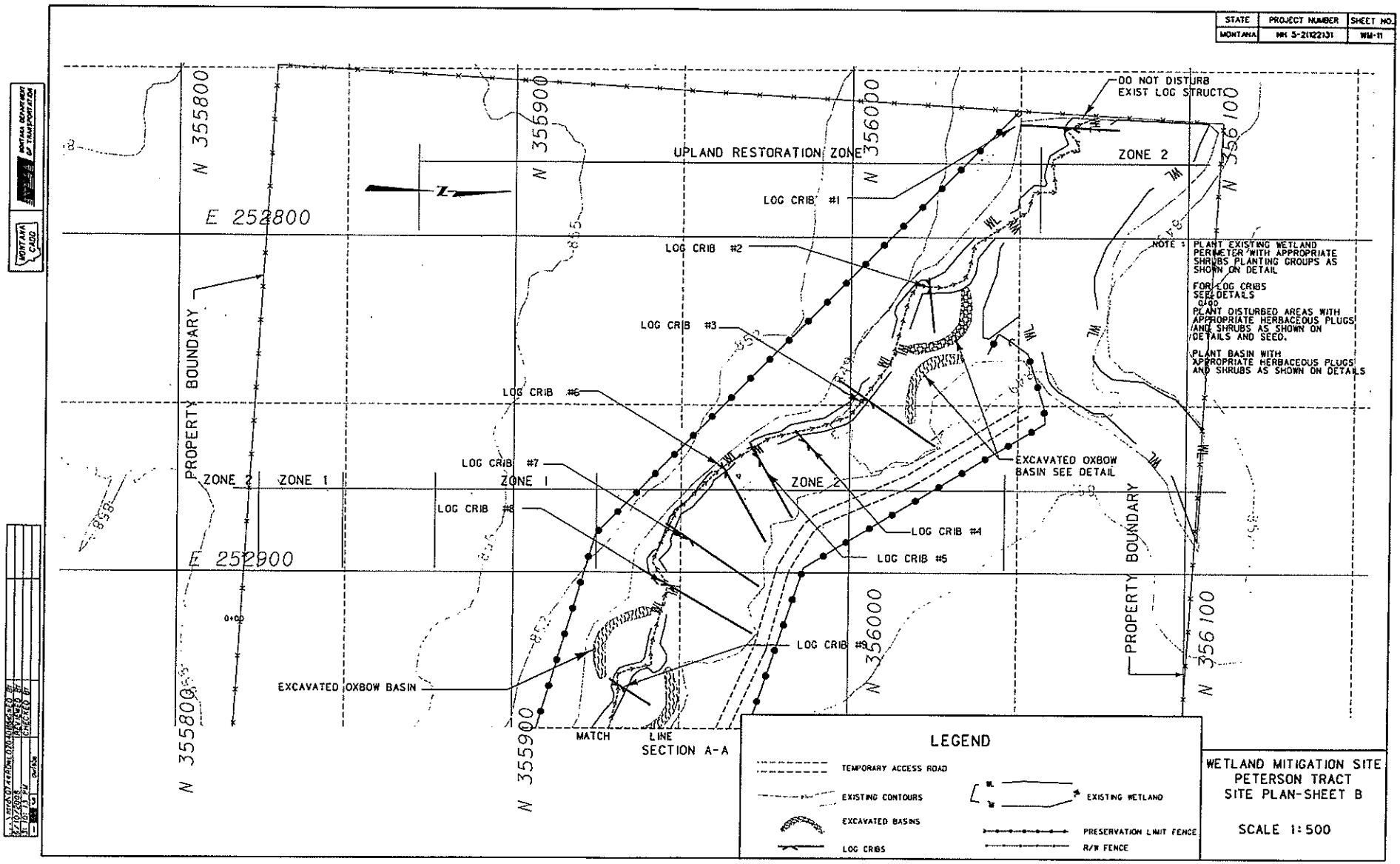
MONTANA CADD

MONTANA DEPARTMENT OF TRANSPORTATION

DESIGNED BY
REVIEWED BY
CHECKED BY

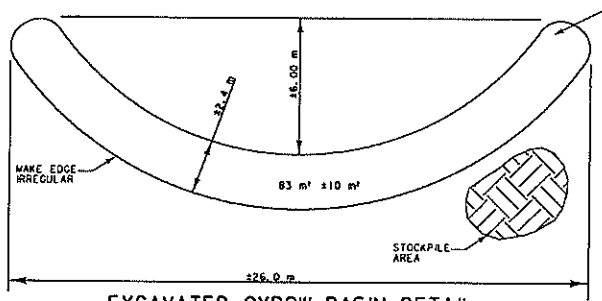


STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-10


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:

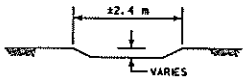
EXCAVATE APPROXIMATELY 12-18 m³ PER SITE AS DIRECTED BY PROJECT MANAGER. INCLUDE 100 mm OF TOPSOIL BELOW FINISHED GRADE

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

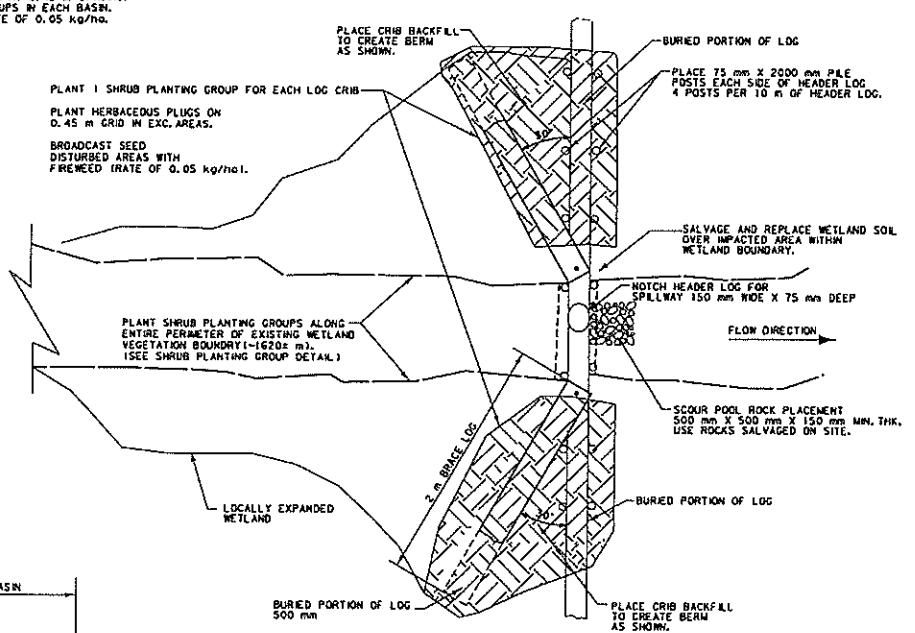
TYPICAL SECTION



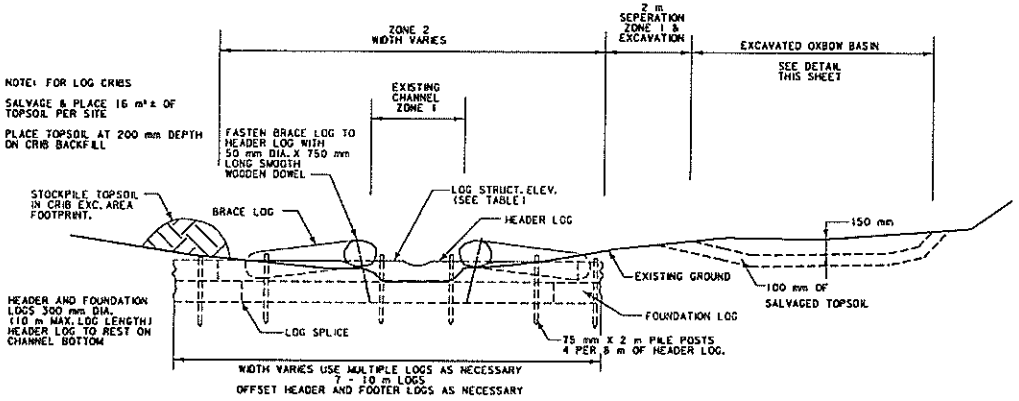
NOTE:

SEE SHEET WM-6 FOR PLANTING GROUP AND PLANTING DETAILS.

SEE SHEET WM-4 FOR LOG CRIB AND OXBOW SUMMARY.

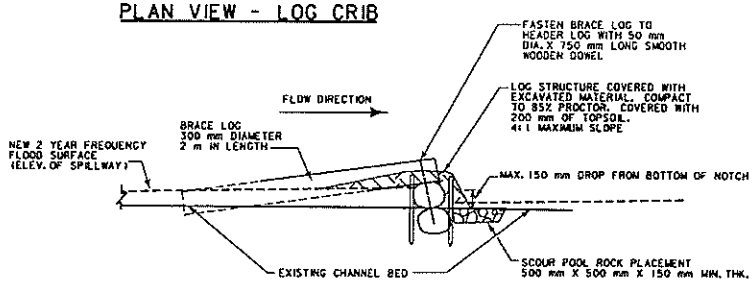


PLAN VIEW - LOG CRIB



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.

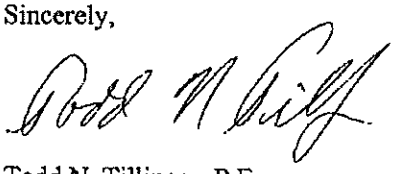
7.2.1 **Restoration (re-establishment)** of wetland characteristics to existing non-wetland areas that were historically wetlands will also result in a mitigation ratio of 1:1, with one acre of satisfactory wetland restoration of this type compensating for one acre of unavoidable wetland impact.

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.