MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2012

Lonepine Wetland Mitigation Project
Flathead Indian Reservation, Montana

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
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December 2012

MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

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MDT Project Number STPX 45(33)
Control Number 4729

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TABLE OF CONTENTS

TABLES

CHARTS

FIGURES

APPENDICES

Cover: Inundated wetland cell with *Schoenoplectus maritimus* growing around fringe.

1. INTRODUCTION

The Lonepine 2012 Wetland Mitigation Monitoring Report summarizes the results of the fifth year of monitoring at the Lonepine Wetland Mitigation Site. The Lonepine site was constructed to mitigate for wetland impacts incurred by the Montana Department of Transportation (MDT), Lonepine North and East highway reconstruction project. Any wetland credits developed beyond project needs were to be held in reserve and applied towards future MDT projects in the watershed. The project was constructed on MDT property between summer 2007 and summer 2008, concurrent with the adjacent Lower Dry Fork Reservoir dam reconstruction.

The project is located at 2,840 feet above mean sea level (amsl) on the west edge of the Flathead Indian Reservation, approximately 1.5 miles west of Lonepine and south of the Lower Dry Fork Reservoir dam. The project area is shown on the Lonepine US Geologic Survey (USGS) 7.5' topographic map in the northwest quarter of Section 3, Township 22 North, Range 24 West (Figure 1). Figures 2 and 3 (Appendix A) show the Monitoring Activity Locations and Mapped Site Features, respectively. Appendix B includes the MDT Montana Wetland Mitigation Site Monitoring Form, US Army Corps of Engineers (USACE) Wetland Determination Data Forms (Environmental Laboratory 1987), and the 2008 MDT Montana Wetland Assessment Forms (MWAM, Berglund and McEldowney 2008). Representative photographs of the project area are included in Appendix C and the Project Plan Sheet is included in Appendix D.

Project goals included the development of 23.85 acres of USACE approved wetland credit and 11.86 acres of CSKT approved wetland credit at the 80-acre site. The mitigation design focused on the creation of emergent wetlands and a minor component of aquatic bed and scrub-shrub wetlands. The target wetland functions included wildlife habitat, sediment/nutrient/toxicant removal, surface water storage, and production export/food chain support.

The project encompasses a series of five excavated wetland cells. The primary water source is the Lower Dry Fork Reservoir via the Camas C Canal and the secondary water source is precipitation. A general mitigation site layout is provided in Appendix D. Project objectives are listed below.

- Maximize emergent wetland development, associated wildlife habitat, nutrient//toxicant removal functions, surface water storage functions, and production export/food chain support on the site by constructing several large, interconnected cells that flood to a maximum depth of approximately one foot.
- Restore sinuosity and connectivity to ditched and straightened segments of Dry Fork Creek, including reactivation of a cutoff meander loop.

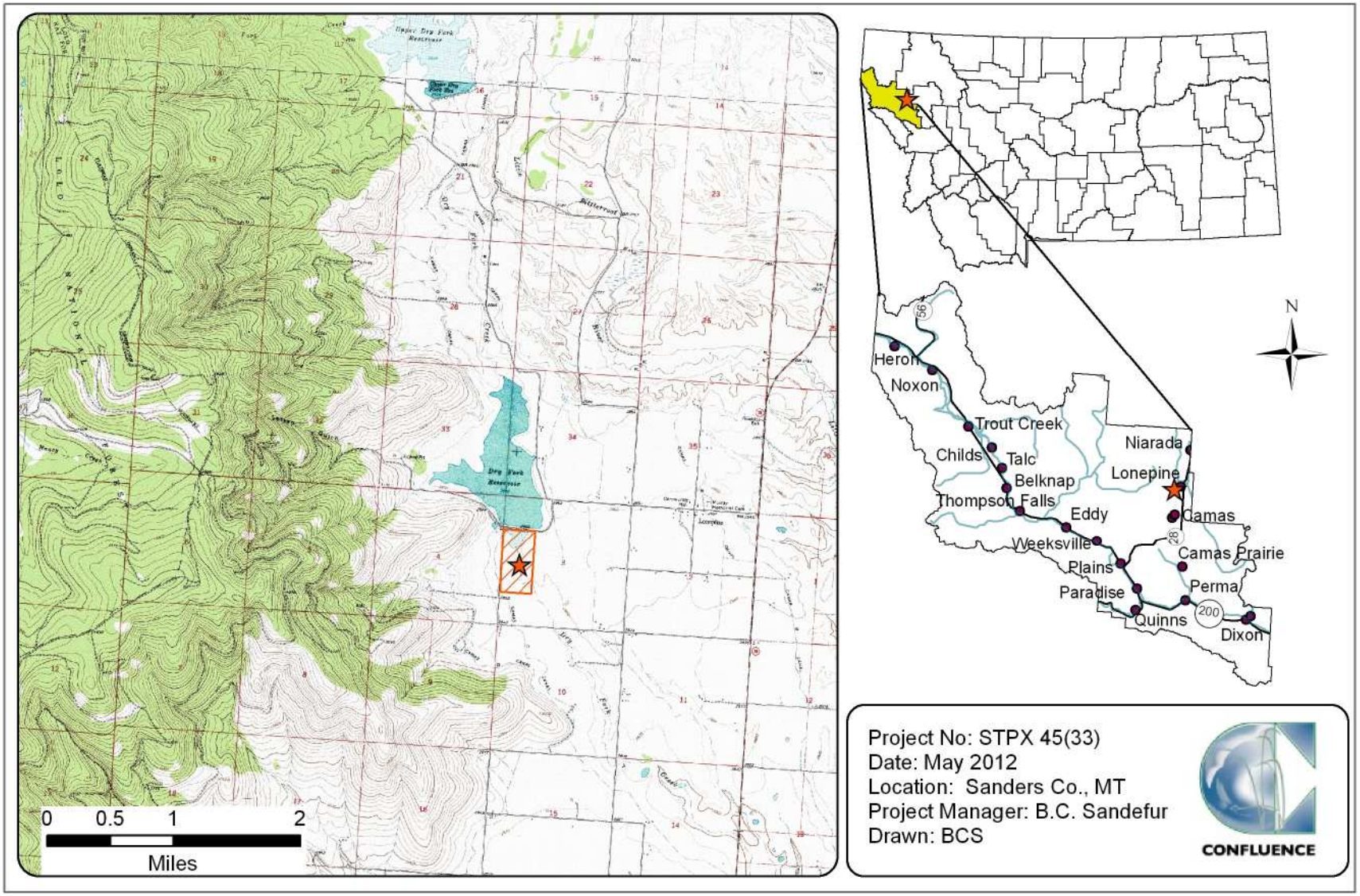

Figure 1. Project Location of the Lonepine Wetland Mitigation Site.

- Provide a riparian scrub-shrub component by revegetating the restored Dry Fork Creek channel margins and intercell watercourses with riparian shrub species.
- Enhance and protect uplands and existing wetlands along Dry Fork Creek by removing grazing from the site, planting upland shrubs, prohibiting development, and fencing.
- Minimize operational maintenance and promote a self-sustaining system by placing permanent spillways at all cell outlets to control water elevations.

The determination of mitigation credits for this project was coordinated between the USACE and the CSKT Shoreline Protection Office (Table 1). The following performance standards are reflective of the primary project goals and objectives and were developed in conjunction with and approved by the USACE:

1. **Wetland Hydrology and Open Water Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 USACE *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). Hydrologic success will also require that constructed channels be stable in wetlands that include channel reconstruction as described below.

2. **Hydric Soil Success** will be achieved where hydric soil conditions are present (per the most recent Natural Resource Conservation Service [NRCS] definitions for hydric soil) or appear to be forming, the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Soil sampling will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Manual. Since typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved. Soil receiving gypsum treatment will be sampled yearly during drawdown in order to monitor the effectiveness of the experimental treatment in reducing baseline slickspot conditions (pH of 10.6; 357 meq/L sodium; SAR of 500; and electrical conductivity of 23.1 mmhos/cm).

3. **Hydrophytic Vegetation Success** will be achieved in areas not receiving gypsum treatment where combined aerial cover of facultative or wetter species is greater than or equal to 80 percent and noxious weeds do not exceed 10 percent of total cover. Cattail basal coverage is not to exceed 50 percent in any cell except Cell 2.

   Wetlands will be delineated as per the technical guidelines in the 1987 Manual. The following concept of “dominance”, as defined in

the 1987 Manual, will be employed during future routine wetland determination in created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines).*"

4. **Stream Channel Restoration Success** will be evaluated in terms of revegetation success and bank stability success. Revegetation will be considered successful if noxious weeds do not exceed 10 percent cover, cuttings exhibit 50 percent survival after 3 years, and planted shrubs exhibit 75 percent survival after 5 years (or planted shrub densities are increased to accomplish the same projected net survival of individuals at a 50 percent survival rate over 5 years).

   Bank stability success will be evaluated by identifying a reference reach along an adjacent, undisturbed portion of the channel below the restoration. The percentage of eroding channel and bed elevation will be evaluated for both restoration and reference channels. For this purpose "eroding bank" will be defined as any bank greater than two feet in length that is more than 50 percent bare mineral soil and has no roots, surface vegetation, or other stabilizing structure (e.g. rock, woody debris) to inhibit erosion. Bank stability success will be achieved when, following restoration, less than 25 percent of banks are unstable or the percent stability of the restored channel is within 5 percent of the reference reach. Vertical stability success will be achieved when, following restoration, vertical movement of the new channel is not greater than 10 percent of vertical movement at the reference reach.

5. **Intercell Swale Success** will be evaluated in terms of revegetation success if wetlands do not develop. Revegetation will be considered successful if noxious weeds do not exceed 10 percent cover and planted shrubs exceed 75 percent survival after 5 years. If wetlands develop, success will be evaluated in terms of wetland hydrology, hydric soil, and hydrophytic vegetation success as described above.

6. **Secondary Restoration/Minor Rehabilitation Success** will be achieved when the site is fenced and grazing is removed from existing wetlands.

7. **Upland Buffer Success** will be achieved when the site is fenced and noxious weeds do not exceed 10 percent of cover within the buffer. Any area within the creditable buffer zone disturbed by

project construction must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.

Table 1. Final Confederated Salish and Kootenai Tribes (CSKT) and USACE credit ratios for the Lonepine Wetland Mitigation Project.

PROPOSED MITIGATION FEATURE	TYPE OF MITIGATION USING CSKT DEFINITIONS[1]	TYPE OF MITIGATION USING USACE DEFINITIONS[2]	MITIGATION SITE ESTABLISHED PRIOR TO IMPACTS	
			CSKT Credit Ratio Credit Acreage Credit Ratio	USACE Credit Acreage[2]
Approximately 21.35 acres (ac) of new emergent wetland / open water at five shallow wetland cells and one excavation area.	Creation	Creation	1:3.04 ratio 7.02 acres credit	1:1 ratio 21.35 acres credit (OW credit limited to 10% of total wetland area)
Approximately 0.30 ac at Dry Fork Creek stream channel and wetland/riparian fringe re-constructed through upland between the Camas C Canal and Wetland 1, and between Wetland 1 (ditched Dry Fork Creek segment) and Wetland 3 (historic meander channel).	Primary Restoration	Re-establishment	1:1.54 ratio 0.19 acre credit	1:1 ratio 0.30 acre credit
Approximately 0.04 ac of re-constructed Dry Fork Creek channel within Wetland 1 (ditched Dry Fork Creek segment).	Primary Restoration	Rehabilitation	1:1.54 ratio 0.03 acre credit	1:1.5 ratio 0.03 acre credit
Dry Fork Creek channel restoration plus restoration of hydrologic function at 0.26 ac Wetland 3 (historic meander channel).	Primary Restoration	Rehabilitation	1:1.54 ratio 0.17 acre credit	1:1.5 ratio 0.17 acre credit
Protection of and grazing removal at approximately 6.64 wetland acres that will remain on the project site following Lower Dry Fork Dam rehabilitation.	Secondary Restoration	Minor Rehabilitation	1:1.54 ratio 4.31 acres credit	1:5 ratio 1.33 acres credit
Approximately 0.43 ac of new riparian swales between wetland cells.	No Definition	No Definition	1:3.04 ratio 0.14 acre credit	1:4 ratio 0.11 acre credit
Approximately 4.45 ac of upland buffer between Wetland 1 and the farmed slope to the east of the project.	None (no planting proposed, thus, no CSKT credit)	Upland Buffer	None (no planting proposed, thus, no CSKT credit)	1:4 ratio on maximum 50-foot width (2.23 acres) 0.56 acre credit
TOTAL			**11.86 acres**	**23.85 acres**

[1] Wetland Mitigation Guidelines for the Flathead Reservation.

[2] Mitigation Ratios, Montana Regulatory Program.

2. METHODS

The site was monitored on July 30, 2012. Information collected during the field investigation was documented on the Mitigation Monitoring Form and Wetland Determination Data Forms (Appendix B). Monitoring activity locations were mapped with a global positioning system (GPS) as illustrated on Figure 2 (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; woody species survival assessment; and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (usually 14 days or 12.5 percent or more during the growing season)" (Environmental Laboratory 1987). The growing season is defined for purposes of this report as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit" (Environmental Laboratory 1987). There are 146 consecutive days in the growing season based on the available temperature data between 1918 and 1969 for the Lonepine 1 WNW meteorological station, Montana (245164) (WRCC 2010). The site would have to be inundated or saturated within 12 inches of the ground surface for 18 days to meet the wetland hydrology criteria.

The presence of hydrological indicators as outlined on the Wetland Determination Data Form was assessed at three data points established within the project area. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Determination Data Form (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation/saturation requirements.

No groundwater monitoring wells are present on the site. 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 Determination Data Form (Appendix B). The boundary between wetlands and uplands was mapped on the 2011 aerial photograph (Figure 3, Appendix A).

2.2. Vegetation

The boundaries of dominant-species based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2012 aerial photograph (Figure 3, Appendix A). The percent cover of dominant species within a community type was estimated and recorded using the following categories: 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 A).

Temporal changes in vegetation were evaluated through annual assessments of two vegetation belt transects approximately 10 feet wide and 150 feet (Transect 1) and 300 feet long (Transect 2) (Figure 2, Appendix A). The transect locations were recorded with a GPS unit. Spatial changes in the dominant vegetation communities were documented along the stationed transect. The percent cover of each vegetation species within the belt transect was estimated using the same values and cover ranges listed for the community polygons (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C).

The location of noxious weeds was noted in the field during the investigation and mapped on the aerial photo (Figure 3, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■" representing 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 *Sanders and parts of Lincoln and Flathead Counties* and *in situ* soil descriptions (NRCS 2010). Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Wetland Manual. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Determination Data Form for each profile (Appendix B).

Two soil samples were collected in 2012 from Cells 1 and 2, at the same general location as in previous years, and analyzed for pH, electrical conductivity (EC), calcium, magnesium, sodium, and sodium absorption ratio (SAR). The sample locations were mapped on Figure 2 (Appendix A) using a GPS.

2.4. Wetland Delineation

Waters of the US including jurisdictional wetlands and special aquatic sites 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 name and indicator status of plant species was derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). Previous years' reports used the 1988 National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The 2012 NWPL scientific plant names were used in this report. Many common names used in the 2012 NWPL appear incomplete or erroneous. When used in this report, 2012 NWPL common names that appear to

be incomplete or erroneous are provided with parenthetical clarification. For example, the common given name for the plant *Agrostis exarata* in the 2012 NWPL is "spiked bent". As this is likely an error, this species' common name would be reported here as "spiked bent (grass)". A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate wetland areas within the project boundaries. The information was recorded electronically on the Wetland Determination Data Form (Appendix B).

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

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was a special aquatic site, an atypical situation, or a problem area. The wetland boundary was identified on the 2012 aerial photography (Figure 3, Appendix A). Wetland areas were estimated using GIS methods.

2.5. Wildlife

Observations of site use by 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 onsite in the current year and previous years was compiled.

2.6. Functional Assessment

The 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999) was used to complete functional assessments of the site in 2003. The 2008 MWAM was used from 2009 to 2012. The assessment method provides an objective means of assigning wetlands an overall rating and 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 and McEldowney 2008). The 2008 revision refined ratings for some wetland functions, land management, and fish and wildlife habitat.

Field data for this assessment were collected during the site visit. A Wetland Assessment Form was completed for each wetland or group of wetlands, which are referred to as Assessment Areas (AA) (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland, upland, and vegetation transect conditions, site trends, and current land uses surrounding the site. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 2, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit during the 2012 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, imported into GIS, and presented in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included fence boundaries, photograph points, transect endpoints, and wetland data points.

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 that did not constitute an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

Climate data from the Polson Kerr Dam, Montana (246640), recorded an average annual precipitation rate of 15.07 inches from March 1951 to December 2011 (WRCC 2011). Annual precipitation rates recorded at the Polson Kerr Dam station in 2010 and 2011 were 22.79 inches and 15.81 inches, respectively. Monthly precipitation totals in inches from January to August reported as 10.62 (historic average), 14.68 (2010), 11.34 (2011), and 11.50 (2012). Precipitation rates between January and August are noted here for comparison of data available from the WRCC at the time this report was developed. These data indicate above average precipitation for this period between 2010 and 2012.

Water for the project is supplied primarily by the Lower Dry Fork Reservoir via the Camas C Canal. Approximately 20 percent of the mitigation site was inundated during the 2012 investigation. The average surface water depth across the site was 1 foot and the range was 0 to 3 feet. Areas delineated as wetlands that were not inundated exhibited saturation within one foot of the ground surface, surface soil cracks, water marks, drift lines, sediment deposits, drainage patterns, and/or water-stained leaves based on 2012 test pit data.

"Water-stained leaves" is a secondary indicator. All constructed streambanks were stable and no eroding streambanks were observed.

Three data points were established to refine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). The data point locations are shown on Figure 2 (Appendix A). Data point LP-1 was located in an area that met the wetland criteria. Wetland hydrology indicators present at LP-1 included inundation, saturation at 6 inches below the ground surface (bgs), drift lines, and sediment deposits. There were no wetland hydrology indicators observed at LP-2 and LP-3, which were subsequently mapped in uplands.

3.2. Vegetation

A list of 118 vegetation species identified from 2008 to 2012 is presented in Table 2 (Mitigation Monitoring Form, Appendix B). Eight community types, including six wetland and two upland, were identified at the mitigation site in 2012 (Figure 3, Appendix A). The acreages of the individual community types are listed on the Mitigation Monitoring Form (Appendix B). The dominant species for each community are listed below in descending order of abundance.

Upland Type 6 – *Bassia scoparia* (called *Kochia scoparia* on the 1988 list*)* comprised 13.69 acres across the large sandy areas on the perimeter of the wetland cells where the vegetation cover was lower, a decrease of 0.3 acres from 2011. The vegetation was dominated by Mexican-fireweed (*Bassia scoparia*), tall wheatgrass (*Thinopyrum ponticum*), clasping pepperwort (*Lepidium perfoliatum*), and Nuttall's alkaligrass (*Puccinellia nuttalliana*). Areas that appeared seasonally ponded within the community were vegetated with coastal saltgrass (*Distichlis spicata).*

Wetland Type 7 – *Phalaris arundinacea/Salix* spp. was identified on 1.41 acres in an isolated narrow strip of wetland adjacent to the riparian corridor. The herbaceous cover was dominated by reed canary grass (*Phalaris arundinacea*), black bent (grass) (*Agrostis gigantea*), tall wheatgrass, and Canadian thistle (*Cirsium arvense*). The wetland was planted with willow and other woody shrub species. The species observed included narrow-leaf willow (*Salix exigua*), golden currant (*Ribes aureum*), Pacific willow (*Salix lasiandra*), and yellow willow (*Salix lutea*).

Wetland Type 8 – *Typha latifolia/Schoenoplectus* spp. (called *Scirpus* spp. on 1988 list) was merged with 2010 Community 2 – *Schoenoplectus* spp*./Beckmannia syzigachne* in 2011. The community is located across 16.42 acres within the constructed wetland cells. Broad-leaf cattail (*Typha latifolia*), hard-stem club-rush (*Schoenoplectus acutus*), saltmarsh club-rush (*Schoenoplectus maritimus* – called *Scirpus maritimus* on 1988 list), red-tinge bulrush (*Scirpus microcarpus*), green and brown algae, and common duckweed (*Lemna minor*) were prevalent within this the community in 2012. There were 14 additional species identified within the wetland type.

Wetland Type 10 – Aquatic Macrophytes/Open water characterized several, inundated depressions throughout the site and totaled 2.51 acres in size. The areas were classified as aquatic bed habitats in 2011, generally defined as a wetland vegetation class dominated by plants "that grow principally on or below the surface of the water for most of the growing season in almost all years (Cowardin et al. 1979)." The Montana Natural Heritage Program (MTNHP) website further defines the Palustrine Aquatic Bed Class (PAB) as having aquatic plants at greater than 30 percent cover and water depths of greater than 0.5 m (and less than 2 meters) (MTNHP 2011). Dominant species included broad-leaf cattail, common duckweed, and hardstem club-rush. Brown and green algae (protist kingdom) were also observed on the water surface.

Wetland Type 12 – *Puccinellia nuttalliana* was identified on 0.45 acres in the designed outlet channel located near the south boundary. The cover was dominated by Nuttall's alkali grass and less than ten percent cover of Mexican-fireweed, tall wheatgrass, saltmarsh club-rush, and broad-leaf cattail.

Wetland Type 14 – *Typha latifolia/Phalaris arundinacea* was similar to Type 8 except that there was no hard-stem club-rush within the community. This community was identified on 9.42 acres in 2012, and increase of 0.38 acres identified in 2011. The dominant species were broad-leaf cattail, reed canary grass, field meadow-foxtail (*Alopecurus pratensis*), stalk-grain sedge (*Carex stipata*), Canadian thistle, and black hawthorn (*Crataegus douglasii*).

Wetland Type 15 – *Schoenoplectus maritimus/Typha latifolia* was identified across 3.80 acres within the footprint of the excavated basins. This community was generally identified as Type 4 – *Agropyron trachycaulum* (slender wheatgrass) in 2010 and transitioned to Type 15 in 2011 as these areas appeared to support an increase of wetland hydrology. The dominant vegetation transitioned to hydrophytic species with facultative wetland (FACW) and obligate (OBL) indicators in response to increased levels of inundation. Saltmarsh club-rush, broad-leaf cattail, field meadow foxtail, quackgrass (*Elymus repens*, called A*gropyron repens* on 1988 list), and Nuttall's alkali grass dominated the community.

Upland Type 16 – *Thinopyrum ponticum/Elymus repens* was renamed in 2011 based on the increase in tall wheatgrass and quackgrass and decrease in slender wheatgrass and creeping wildrye (*Elymus triticoides* – 2010 Community 5). This upland community was the largest vegetation community mapped within the Lonepine wetland mitigation site and occupied 32.80 acres around the perimeter and higher elevations within the interior of the site. Species with less than 10 percent cover each in the community included Mexican-fireweed, red goosefoot (*Chenopodium rubrum*), and clasping pepperwort. Canadian thistle was observed at less than five percent cover.

Three vegetation communities identified on the site in 2011 were no longer present in 2012. Community Type 11 – *Distichlis spicata*/*Kochia scoparia* was located in a small, isolated inundated wetland area located near the north boundary in 2011 and had transitioned from an upland in 2010. This community transition to community Type 7 - *Phalaris arundinacea/Salix* spp. in 2012. Community Type 13 – *Alopecurus pratensis*/*Phalaris arundinacea* was first identified in 2011 along the wetland margin of the Dry Fork Creek corridor and was replaced in 2012 by upland community Type 16 – *Thinopyrum ponticum/Elymus repens*, apparently due to lack of sufficient wetland hydrology necessary to sustain hydrophytic vegetation. Community Type 17 – *Alopecurus pratensis*/*Beckmannia syzigachne* was replaced by wetland Type 7 – *Phalaris arundinacea/Salix* spp. in 2012 due to a natural succession and success of volunteer willows on 0.38 acres adjacent to the reconstructed channel.

Table 2. Vegetation species identified at the Lonepine Wetland Mitigation Site from 2008 to 2012.

Scientific Names	Common Names	WMVC Indicator Status[1]
Achillea millefolium	Common Yarrow	FACU
Agropyron cristatum	Crested Wheatgrass	UPL
Agrostis gigantea	Black Bent	FAC
Algae, brown	Algae, Brown	NL
Algae, green	Algae, Green	NL
Alisma plantago-aquatica	European Water-Plantain	OBL
Alopecurus pratensis	Field Meadow-Foxtail	FAC
Amelanchier alnifolia	Saskatoon Service-Berry	FACU
Anthemis cotula	Stinking Chamomile	FACU
Artemisia cana	**Coaltown Sagebrush**	**FACU**
Artemisia frigida	Prairie Sagewort	UPL
Aster sp.	Aster	NL
Bassia hyssopifolia	Five-Horn Smotherweed	FACW
Bassia scoparia	Mexican-Fireweed	FAC
Beckmannia syzigachne	American Slough Grass	OBL
Bidens cernua	Nodding Burr-Marigold	OBL
Brassica sp.	Mustard	NL
Bromus inermis	Smooth Brome	FAC
Bromus tectorum	Cheatgrass	UPL
Camelina microcarpa	Little-Pod False Flax	FACU
Capsella bursa-pastoris	Shepherd's-Purse	FACU
Cardaria chalepensis	Lenspod Whitetop	UPL
Cardaria draba	Whitetop	UPL
Carex pellita	Woolly Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Carex vulpinoidea	Common Fox Sedge	OBL
Centaurea maculosa	Spotted Knapweed	UPL

[1]Draft NWPL (Lichvar and Kastasz 2009).
New species identified in 2012 are bolded.

Table 2. (Continued). Vegetation species observed at the Lonepine Wetland Mitigation Site from 2008 to 2012.

Scientific Names	Common Names	WMVC Indicator Status[1]
Ceratophyllum demersum	Coon's-Tail	OBL
Chara sp.	Muskgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium rubrum	Red Goosefoot	FACW
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canadian Thistle	FAC
Cirsium vulgare	Bull Thistle	FACU
Crataegus douglasii	Black Hawthorn	FAC
Dasiphora fruticosa	Golden-Hardhack	FAC
Deschampsia cespitosa	Tufted Hairgrass	FACW
Descurainia sophia	Herb Sophia	UPL
Distichlis spicata	Coastal Salt Grass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium brachycarpum	Panicled Willow-Herb	UPL
Epilobium palustre	Marsh Willowherb	OBL
Ericameria nauseosa	Rubber Rabbitbrush	NL
Festuca pratensis	Meadow Fescue	FACU
Festuca sp.	Fescue	NL
Glyceria grandis	American Manna Grass	OBL
Glyceria maxima	Reed Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Glycyrrhiza lepidota	American Licorice	FAC
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Halogeton glomeratus	Saltlover	UPL
Hordeum brachyantherum	Meadow Barley	FACW
Hordeum jubatum	Fox-Tail Barley	FAC
Juncus arcticus	Arctic Rush	FACW
Lactuca serriola	Prickly Lettuce	FACU
Lemna minor	Common Duckweed	OBL
Lepidium densiflorum	Miner's Pepperwort	FACU
Lepidium perfoliatum	Clasping Pepperwort	FACU
Leucanthemum vulgare	**Ox-Eye Daisy**	**FACU**
Leymus cinereus	Great Basin Lyme Grass	FAC
Leymus triticoides	Beardless Lyme Grass	FAC
Malva neglecta	Common Mallow	UPL
Medicago lupulina	Black Medick	FACU
Medicagoa sp.	Alfalfa	NL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Monolepis nuttalliana	Nuttall's Poverty-Weed	FAC

[1]Draft NWPL (Lichvar and Kastasz 2009).
New species identified in 2012 are bolded.

Table 2. (Continued). Vegetation species observed at the Lonepine Wetland Mitigation Site from 2008 to 2012.

Scientific Names	Common Names	WMVC Indicator Status[1]
Pascopyrum smithii	Western-Wheat Grass	FACU
Persicaria amphibia	Water Smartweed	OBL
Persicaria lapathifolia	Dock-Leaf Smartweed	FACW
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa secunda	Curly Blue Grass	FACU
Polygonum sp.	Knotweed	NL
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus balsamifera	Balsam Poplar	FAC
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	Nuttall's Alkali Grass	FACW
Ranunculus aquatilis	**White Water-Crowfoot**	**OBL**
Ribes aureum	Golden Currant	FAC
Ribes sp.	Currant	NL
Rosa sp.	Rose	NL
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Rumex persicarioides	Golden Dock	UPL
Salix alba	White Willow	FACW
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix bebbiana	Gray Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Salix lasiandra	Pacific willow	FACW
Salix lutea	Yellow Willow	OBL
Sarcobatus vermiculatus	Greasewood	FACU
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solanum dulcamara	Climbing Nightshade	FAC
Solidago sp.	Goldenrod	NL
Sonchus arvensis	Field Sow-Thistle	FACU
Sparganium emersum	European Burr-Reed	OBL
Suaeda calceoliformis	Paiuteweed	FACW
Symphoricarpos albus	**Common Snowberry**	**FACU**
Symphoricarpos occidentalis	Western Snowberry	FAC
Symphoricarpos sp.	Snowberry	NL
Taraxacum officinale	Common Dandelion	FACU
Thinopyrum ponticum	Tall Wheatgrass	NL

[1]Draft NWPL (Lichvar and Kastasz 2009).
New species identified in 2012 are bolded.

Table 2. (Continued). Vegetation species observed at the Lonepine Wetland Mitigation Site from 2008 to 2012.

Scientific Names	Common Names	WMVC Indicator Status[1]
Thlaspi arvense	Field Penny-Cress	UPL
Tragopogon dubius	Yellow Salsify	UPL
Trifolium hybridum	Alsike Clover	FAC
Trifolium repens	White Clover	FAC
Tripleurospermum maritimum	False Mayweed	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL

Vegetation community data were collected on two 10-foot wide belt transects (Monitoring Forms, Appendix B) in 2012. The data from 2008 to 2012 for transect T-1 are summarized in Table 3 and Charts 1 and 2. The transect locations are shown on Figure 2 (Appendix A) and photographs of the transect endpoints are included on pages C-21 to C-22 in Appendix C.

Table 3. Transect 1 data summary for 2008 to 2012 at the Lonepine Wetland Mitigation Site.

Monitoring Year	2008	2009	2010	2011	2012
Transect Length (feet)	**150**	**150**	**150**	**150**	**150**
Vegetation Community Transitions along Transect	0	0	0	3	3
Vegetation Communities along Transect	1	1	1	2	2
Hydrophytic Vegetation Communities along Transect	0	1	1	2	2
Total Vegetative Species	2	5	14	16	10
Total Hydrophytic Species	2	5	12	13	6
Total Upland Species	0	0	2	3	4
Estimated % Total Vegetative Cover	1	75	90	90	90
% Transect Length Comprising Hydrophytic Vegetation Communities	0	100	100	100	100
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	100	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

The 150-foot transect T-1 intersected two vegetation communities in 2012, including wetland Type 8 – *Typha latifolia*/*Schoenoplectus* spp. and wetland Type 10 – Aquatic Macrophytes/Open water. There was little change in the community composition on the transect intervals between 2011 and 2012. Hydrophytic species comprised one hundred percent of transect T-1.

A summary of the data collected on transect T-2 is presented in Table 4 and Charts 3 and 4 (Monitoring Form, Appendix B). Photographs of the transect end points are shown on pages C-22 and C-23 in Appendix C. The transect was established 10 feet adjacent to the dike to document potential erosion along the dike face and vegetation establishment. The east side of the transect is in upland habitat and the west side is in wetland habitat. Plants observed on the west side of the transect were recorded. One vegetation community, wetland Type 8 – *Typha latifolia/Schoenoplectus* spp., was identified on T-2 from 2010 to 2012. Hydrophytic species dominated 100 percent of the transect intervals.

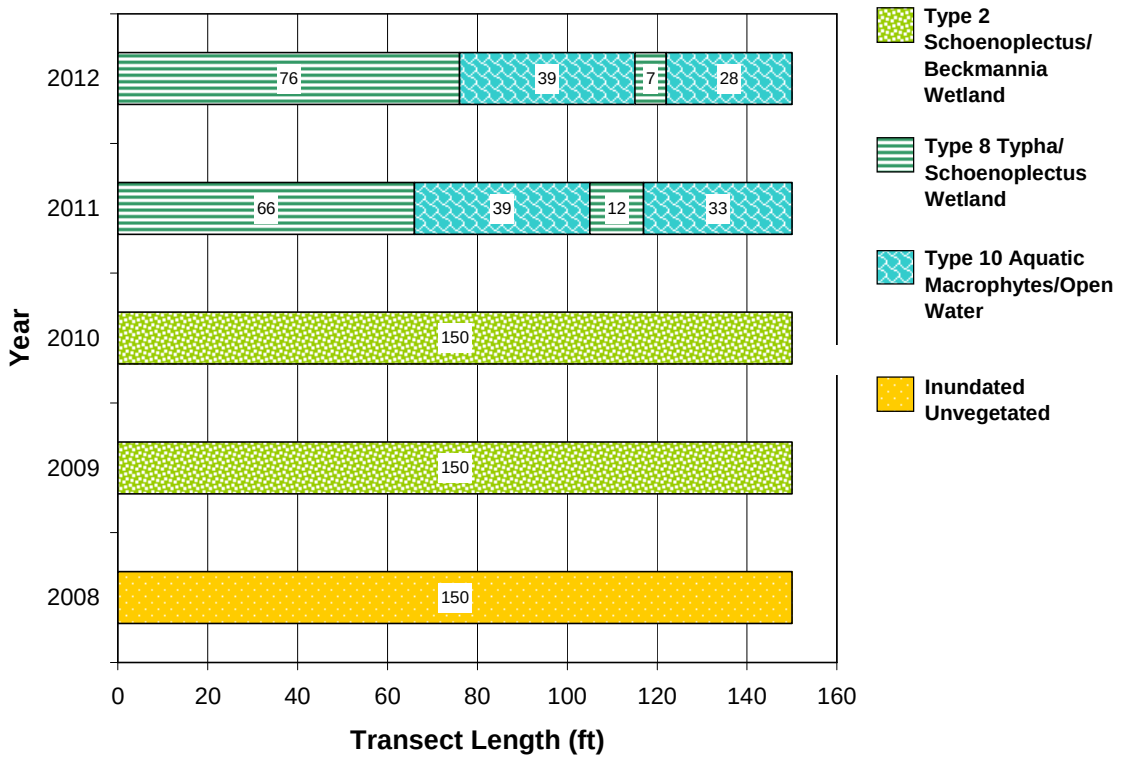

Chart 1. Transect T-1 intervals from 2008 to 2012 showing vegetation types from the start (0 feet) to finish (150 feet) of the transect.

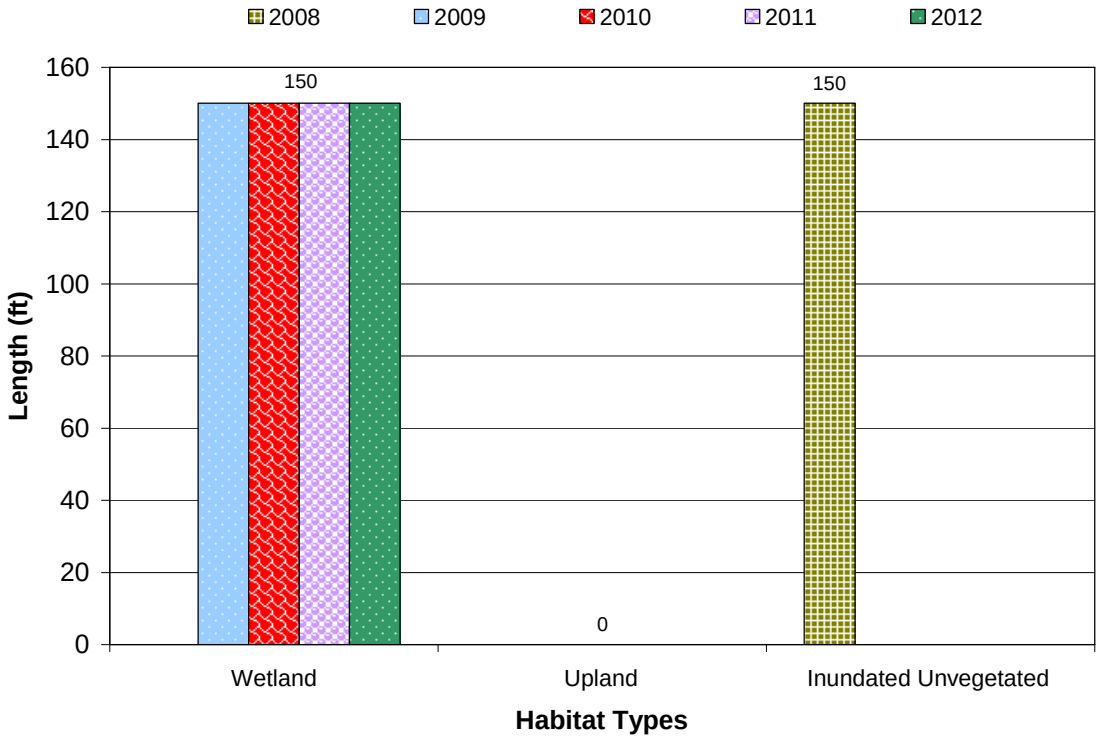

Chart 2. Length of habitat types within transect T-1 from 2008 to 2012 at the Lonepine Wetland Mitigation Site.

Table 4. Transect T-2 data summary from 2008 to 2012 at the Lonepine Wetland Mitigation Site.

Monitoring Year	2008	2009	2010	2011	2012
Transect Length (feet)	300	300	300	300	300
Vegetation Community Transitions along Transect	2	2	0	0	0
Vegetation Communities along Transect	3	3	1	1	1
Hydrophytic Vegetation Communities along Transect	0	2	1	1	1
Total Vegetative Species	3	11	11	11	10
Total Hydrophytic Species	2	7	11	10	10
Total Upland Species	1	4	0	1	0
Estimated % Total Vegetative Cover	9	75	85	90	90
% Transect Length Comprising Hydrophytic Vegetation Communities	0	93	100	100	100
% Transect Length Comprising Upland Vegetation Communities	34	7	0	0	0
% Transect Length Comprising Unvegetated Open Water	66	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

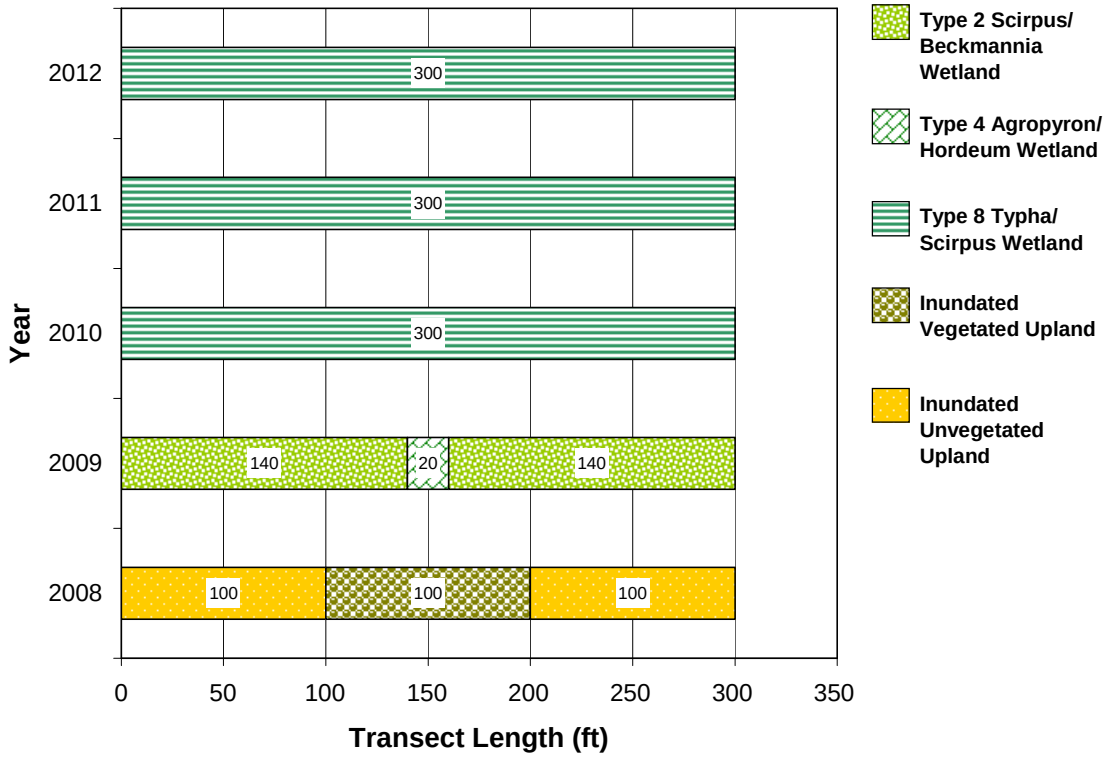

Chart 3. Transect T-2 intervals from 2008 to 2012 showing vegetation types from the start (0 feet) to finish (300 feet) of the transect.

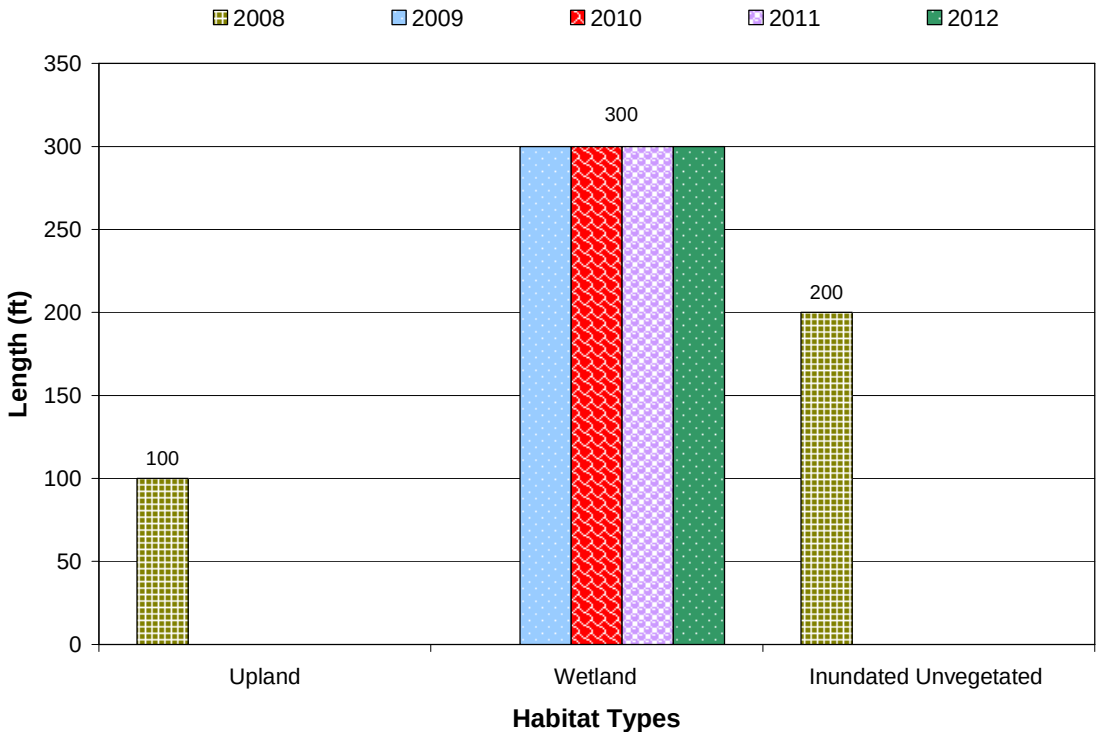

Chart 4. Length of habitat types within transect T-2 from 2008 to 2012 at the Lonepine Wetland Mitigation Site.

The locations of 26 infestations of Canadian thistle, a Priority 2B noxious weed, are shown on Figure 3 (Appendix A). Canadian thistle was identified primarily within the upland perimeter of the west half of the site, near the east boundary, and within the north half of the riparian corridor. The size ranged from less than 0.1 acre to between 0.1 and 1.0 acre. The cover class ranged from trace (less than 1 percent) to moderate (5 to 25 percent). Two acres of Canadian thistle and spotted knapweed (*Centaurea maculosa*) were sprayed by MDT in 2011.

The original revegetation design specified planting 580 woody shrubs and 500 willow cuttings. Approximately 270 dead willow cuttings were replaced along Dry Fork Creek in November 2008. Approximately 260 live woody plants, including 250 sandbar cuttings, were observed along the reconstructed banks of Dry Fork Creek in 2012, primarily within wetland community Type 7. Numerous new narrow-leaf willow shoots are propagating from the planted cuttings. The overall survival rate of the woody plants based on the 2012 observations is approximately 45 percent. Approximately 50 percent of the narrow-leaf willow cuttings have survived. Many woody plants may not have been counted as a result of obscuration.

3.3. Soil

A majority of the project site is mapped in the Sanders County Soil Survey (USDA 2011) as the Dry Fork-Selow silt loam and the White Earth silt loam, both found on 0 to 4 percent slopes. The Dry Fork-Selow soils formed on lake plains and terraces from lacustrine deposits. The White Earth soils are predominantly

alluvium, found on alluvial fans and stream terraces. These soil map units are not included on the Montana Hydric Soil List. The existing soil structure was disturbed during 2008 construction.

The test pits excavated in 2012 were located within the Bolack silt loam map unit or the Marklepass series. The Bolack silt loam is a poorly drained soil, taxonomically classified as a frigid Typic Endoaquolls. The soil map unit is hydric. The Marklepass series is a non-hydric, well drained, silty clay loam, classified as a frigid Typic Natrixeralfs.

Three test pits were excavated at the Lonepine wetland mitigation site in 2012. Data point LP-1 was located in an area that met the wetland criteria and data points LP-2 and LP-3 were located in areas defined as upland. The soil at LP-1 from 10 to 14 inches bgs was a gray (10 YR 5/1) clay loam without redoximorphic features. The low chroma was an indication of a hydric soil. The soil profile at LP-2 revealed a pink (7.5 YR 7/3) silt loam without redoximorphic features. The test pit was mapped within the Bolack silt loam, which is listed on the local hydric soil list. The soil at LP-3 was a very pale brown, fine loamy sand, without redox features. The area was mapped within the Marklepass series, which is non-hydric.

Two soil samples (SS-1-Cell 1 and SS-2-Cell 2) were collected and analyzed for pH, electrical conductivity (EC), calcium, magnesium, sodium, and sodium adsorption ratio (SAR) in 2008 and 2010 to 2012. The soil sample collection points are shown on Figure 2 (Appendix A). The samples were taken from the same area as in 2010 and 2011, where the soil had been treated with lime. Results from the 2009 sampling were erroneous and, therefore, were not included in the 2009 report or Table 5. These values were compared to baseline slickspot conditions (2003 Baseline – Cell 2) to monitor the effectiveness of the experimental gypsum treatment.

Table 5. Soil sample results measuring pH, EC, Ca, Mg, Na, and SAR in 2008 and 2010 to 2012 at the Lonepine Wetland Mitigation Site.

Year and Soil Sample	pH (s.u.)	Electrical Conductivity (mmhos/cm)	Calcium (meq/L)	Magnesium (meq/L)	Sodium (meq/L)	SAR (unitless)
2008 SS-1	7.6	4.87	25.5	14.4	28.3	6.34
2010 SS-1	7.5	4.3	18.8	6.8	22.4	6.3
2011 SS-1	8.9	<0.005	1.2	0.96	34	32.5
2012 SS-1	10.3	107	0.82	<0.20	1350	1940
2003 Baseline-Cell 2	10.6	23.1	0.8	0.22	357	500
2008 SS-2	7.7	5.24	26.9	10.5	36.5	8.43
2010 SS-2	8	0.87	1.9	1.1	4.6	3.8
2011 SS-2	9.9	0.039	1.7	0.41	487	400
2012 SS-2	10.2	13	12.6	3.3	165	58.4

The electrical conductivity (EC) level measured in sample SS-1 in 2012 was 4.6 times the 2003 baseline conditions (Table 5). The sodium concentration was 3.8 times the baseline conditions and the SAR was 3.9 times the baseline conditions in 2012, suggesting that the initial benefit of the slickspot gypsum treatment may have limited long-term benefit to soil and plant growing conditions. Calcium and magnesium concentrations measured in 2012 were very near the baseline conditions, which represented a decrease from 2011. The pH in SS-1 was more alkaline in 2012 and increased from 8.9 in 2011 to 10.3 in 2012; very near the baseline condition for pH of 10.6.

The EC, sodium, and SAR levels measured in sample SS-2 in 2012 were lower than the 2003 baseline conditions. The calcium concentration rose from 1.7 meq/l (milliequivalents/liter) in 2011 to 12.6 meg/L in 2012, well above the baseline calcium concentration of 0.8 meq/L. Magnesium concentrations increased from 0.41 meq/L in 2011 to 3.3 meq/L in 2012. This represented a considerable increase over the baseline magnesium concentration of 0.22 meq/L. The ph measured in sample SS-2 was 10.2 in 2012, which has shown a steady increase since the initial treatment. The “slick spot” areas represent a small portion of the uplands within the mitigation site. The elevated alkalinity levels in these isolated areas have not affected wetland development throughout the majority of the site.

3.4. Wetland Delineation

The total area of wetland habitat delineated in 2012 encompassed 34.0 acres, a decrease of 0.6 acres since 2011 (Table 6). The decrease in wetland acreage occurred near the center of the site where 2011 wetland community Type 13 – *Alopecurus pratensis/Phalaris arundinacea* transitioned to upland community Type 16 – *Thinopyrum ponticum/Elymus repens* in 2012. The transition was verified by data points LP-1 to LP-3. The acreage includes 7.13 acres of pre-existing wetland. The open water acreage defined in 2010 (2.33 acres) was reclassified as aquatic bed habitat in 2011.

Table 6. Wetland acreage identified from 2009 to 2012 at the Lonepine Wetland Mitigation Site.

Wetland Habitat Type	2009 (ac)	2010 (ac)	2011 (ac)	2012 (ac)
Pre-existing Wetlands	7.1	7.13	7.13	7.13
Transitional/Inundated Communities	21.74	--	--	--
Open Water*	--	2.33	--	--
Created Wetlands	14.64	22.61	27.47	26.87
Total Wetland Habitat	**28.84**	**32.07**	**34.60**	**34.00**

*Open water category incorporated into aquatic bed wetland category in 2009.

3.5. Wildlife

The Lonepine wetland complex provides emergent marsh, aquatic bed, wet meadow, and upland habitat for several bird guilds and wildlife species. The MDT wetland staff observed 15 bird species in spring, 2009 and three mammal and four bird species in August, 2009. The wildlife value of this site has continued to increase as the aquatic bed and shrub habitat have developed. Animal species observed directly and indirectly in 2012 included Columbia spotted frogs (*Rana luteiventris*), white tailed deer (*Odocoileus virginianus*), juvenile fish, and a muskrat (*Ondatra zibethicus*) burrow. Fifteen bird species were observed in 2012 and included waterfowl, shorebirds, and other species commonly associated with wetland habitat (Table 7). No nesting structures were installed at this site.

Table 7. Wildlife species observed at the Lonepine Wetland Mitigation Site from 2008 to 2012.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Columbia Spotted Frog	***Rana luteiventris***
Frog spp	
BIRDS	
American Coot	***Fulica americana***
American Robin	***Turdus migratorius***
American White Pelican	*Pelecanus erythrorhynchos*
American Wigeon	*Anas americana*
Bald Eagle	*Haliaeetus leucocephalus*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Black-billed Magpie	*Pica hudsonia*
Blue-winged Teal	*Anas discors*
Brown-headed Cowbird	***Molothrus ater***
Canada Goose	*Branta canadensis*
Cinnamon Teal	*Anas cyanoptera*
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Nighthawk	*Chordeiles minor*
Common Tern	*Sterna hirundo*
Eared Grebe	***Podiceps nigricollis***
Eastern Kingbird	***Tyrannus tyrannus***
Great Blue Heron	*Ardea herodias*
Greater Yellowlegs	*Tringa melanoleuca*

Species observed in 2012 are bolded.

Table 7 (continued). Wildlife species observed at the Lonepine Wetland Mitigation Site from 2008 to 2012.

COMMON NAME	SCIENTIFIC NAME
BIRDS	
Green-winged Teal	*Anas crecca*
Killdeer	*Charadrius vociferus*
Long-billed Curlew	*Numenius americanus*
Mallard	*Anas platyrhynchos*
Northern Harrier	***Circus cyaneus***
Northern Shoveler	*Anas clypeata*
Osprey	***Pandion haliaetus***
Red-tailed Hawk	***Buteo jamaicensis***
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-necked Pheasant	*Phasianus colchicus*
Short-eared Owl	*Asio flammeus*
Song Sparrow	***Melospiza melodia***
Spotted Sandpiper	***Actitis macularius***
Western Meadowlark	***Sturnella neglecta***
Wilson's Snipe	***Gallinago delicata***
Yellow-headed Blackbird	***Xanthocephalus xanthocephalus***
FISH	
Fish sp.	
Juvenile fish	
MAMMALS	
Coyote	*Canis latrans*
Deer Spp.	
Meadow Vole	*Microtus pennsylvanicus*
Muskrat	***Ondatra zibethicus***
Red Fox	*Vulpes vulpes*
White-tailed Deer	***Odocoileus virginianus***

Species observed in 2012 are bolded.

3.6. Functional Assessment

The 2003 baseline assessment was completed using the 1999 MWAM while the post-construction conditions were assessed using the 2008 MWAM. Only general comparisons in wetland functional development can be made between the baseline and post-construction functional assessments. The site was separated into two AAs; Cells 1 to 5 and the Dry Fork Creek riparian area. The respective areas of the AAs in 2012 were 23.73 acres and 10.27 acres. Table 8 summarizes the results of the 2003 (Baseline) and 2010 to 2012 functional assessments. The 2012 assessment forms are included in Appendix B.

The areal extent of the Dry Fork Creek AA decreased by 0.6 acres from 2011 to 2012 as a result of a transition from wetland community 13 to upland community 16. The Dry Fork Creek riparian area has been rated as a Category II wetland since 2010. The score rose from 72 percent in 2011 to 75 percent in 2012 reflecting the increase in the percent cover of the streambank vegetation. The

Dry Creek riparian corridor provided documented secondary habitat for great blue heron, long-billed curlew and western toad, and documented incidental habitat for the American white pelican and bobolink. The functional units decreased slightly from 85.87 to 84.21 and reflected the change in wetland acreage (Table 8).

The constructed wetland cells (Cells 1 to 5) received 69.0 percent of the total points possible in 2011 and 2012. The score was reported in 2011 as 73.0 percent due to an error in rating calculations and has been corrected in Table 8 of the 2012 report. Ratings for the constructed cells in 2011 and 2012 were High for general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, groundwater discharge/recharge, and recreation/education potential (bonus points).

The net gain in wetland acreage across the site since 2003 has been 26.81 acres. The total functional units achieved at the site in 2012 were 247.95, a net functional unit gain for both assessment areas of 213.01 compared to 2003 baseline conditions.

3.7. Photo Documentation

Representative photographs of the project site taken of photo points PP1 through PP15 from 2009 to 2012 are shown on pages C-1 through C-27 of Appendix C. The transect end points are shown on pages C-21 to C-23 of Appendix C. The data points are shown on page C-28. The photos illustrate the development of vegetation cover and wetland area over time.

3.8. Maintenance Needs

There were no maintenance recommendations identified for the ditches, inlet, or outlet structures within the mitigation site. The locations of infestations of Canadian thistle, a Priority 2B noxious weed, are shown on Figure 3 (Appendix A). Canadian thistle was identified primarily in the upland perimeter of the west half of the site, near the east boundary, and within the riparian corridor. The size ranged from less than 0.1 acre to between 0.1 and 1.0 acre. The cover class ranged from trace (less than 1 percent) to moderate (5 to 25 percent). Two acres of Canadian thistle and spotted knapweed (*Centaurea maculosa*) were sprayed by MDT in 2011.

Table 8. Summary of the 2003 Baseline and 2009 to 2012 wetland function/value ratings and functional points at the Lonepine Wetland Mitigation Site.

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2003[1] Baseline Dry Fork Creek	2003[1] Baseline Isolated Wetlands	2010[2] Dry Fork Creek	2010[2] Cells 1-5	2011[2] Dry Fork Creek	2011[2] Cells 1-5	2012[2] Dry Fork Creek	2012[2] Cells 1-5
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Low (0.3)	Low (0.1)	High (0.9)	High (0.9)	Exc. (1.0)	High (0.9)	Exc. (1.0)	High. (.9)
General Fish/Aquatic Habitat	Mod (0.4)	NA	Mod (0.5)	NA	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)
Flood Attenuation	Mod (0.5)	NA	Mod (0.6)	NA	Mod (0.6)	NA	Mod (0.6)	NA
Short and Long Term Surface Water Storage	Mod (0.6)	Low (0.3)	High (0.8)	High (1.0)	High (1.0)	High (0.9)	High (1.0)	High (0.9)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	NA	High (1.0)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	NA	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (0.9)	High (1.0)	High (0.9)
Production Export/ Food Chain Support	High (0.8)	Low (0.1)	High (1.0)	High (1.0)	Exc. (1.0)	Mod. (0.7)	Exc. (1.0)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential (bonus points)	Low (0.1)	Low (0.1)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points / Possible Points	**5.0 / 12**	**1.9 / 8**	**7.7 / 11**	**6.5 / 9**	**7.9 / 11**	**6.9 / 10**	**8.2/11**	**6.9/10**
% of Possible Score Achieved	**47%**	**24%**	**70%**	**72%**	**72%**	**69%**	**75%**	**69%**
Overall Category	**III**	**IV**	**II**	**II**	**II**	**II**	**II**	**II**
Acreage of Assessed Aquatic Habitats within Easement (ac)	**6.87**	**0.31**	**8.47**	**23.60**	**10.87**	**23.73**	**10.27**	**23.73**
Functional Units (acreage x actual points) **(f^1-)**	**34.35**	**0.59**	**65.22**	**153.40**	**85.87**	**163.74**	**84.21**	**163.74**
Net Acreage Gain (ac)	NA		**24.89**		**27.41**		**26.81**	
Net Functional Unit Gain (fu)	NA		**183.68**		**214.67**		**213.01**	

[1]Berglund 1999
[2]Berglund and McEldowney 2008

3.9. Current Credit Summary

Project goals outlined in Section 1 included the development of 23.85 acres of USACE approved wetland credit and 11.86 acres of CSKT approved wetland credit at the 80-acre Lonepine site. The total area of wetland habitat delineated in 2012 encompassed 34.0 acres. The acreage included the constructed wetland cells 1 to 5, the Dry Fork Creek channel, and pre-existing wetland. The wetland acreage between the constructed cells and adjacent to the creek channel decreased by 0.6 acres from 2011 to 2012.

Table 9 summarizes the estimated credit acreages from 2010 to 2012. The CSKT and USACE will authorize the final mitigation credits developed at the site. 2012 credits based on CSKT ratios totaled 14.06 credit acres, a slight decrease of 0.2 credit acres since 2011. 2012 credits based on USACE ratios totaled 28.51 acres, a decrease of 0.6 credit acres from 2011. Full credit was applied to the constructed Dry Fork channel based on the percent survival (210 live cuttings observed) and continued propagation of narrow-leaf willow cuttings. The USACE credit for the riparian intercell swales was 0.0 acres due to the lack of shrub planting success (less than 12 percent) in this area. All performance standards adopted for this mitigation project have been met with the exception of the standard addressing the planted shrub densities. Woody species survival for the containerized materials and cuttings was less than the 75 percent target. The cover of Canadian thistle in the upland areas located in the west half of the site increased from 2010 to 2011. The thistle and spotted knapweed were sprayed by MDT in 2011. No spotted knapweed was observed in 2012. The site wide noxious weed cover was less than 10 percent, meeting the success criteria.

Table 9. The 2010 to 2012 CSKT and USACE estimated credit acreages at the Lonepine Wetland Mitigation Site.

PROPOSED FEATURE	CSKT CREDIT RATIOS	CSKT CREDIT TARGET (ACRES)	USACE CREDIT RATIOS	USACE CREDIT TARGET	2010 DELINEATED ACRES	2010 ESTIMATED CSKT CREDIT ACRES	USACE 2010 ESTIMATED CREDIT ACRES	2011 DELINEATED WETLAND ACRES	2011 CSKT CREDIT ACRES	USACE 2011 CREDIT ACRES	2012 DELINEATED WETLAND ACRES	2012 CSKT CREDIT ACRES	USACE 2012 CREDIT ACRES	2012 PERFORMANCE STANDARD COMMENTS
Wetland cells, wetland excavation, and designed intercell swales that have developed into wetlands	1:3.04	7.02	1:1 (OW limited to 10% of wetlands)	21.35	22.86	7.68	22.86	25.38	8.35	25.38	24.79	8.15	24.79	**Wetland Hydrology**: Satisfied; **Hydric Soil**: Satisfied; **Noxious Weed Cover**: Satisfied; **Hydrophytic Veg Cover in Gypsum-Treated Areas**: Satisfied; **Hydrophytic Veg Cover in Untreated Areas**: Meeting target
New Dry Fork channel and wetland fringe along dam face	1:1.54	0.19	1:1	0.3	1.54	0.84	1.38*	1.54	1.00	1.54	1.54	1.00	1.54	**Bank Stability**: Satisfied; **Noxious Weed Cover**: Satisfied; **Cutting Survival**: On target; **Shrub Survival**: Below target
New Dry Fork Creek channel in pre-existing Wetland 1	1:1.54	0.03	1:1.5	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.03	**Bank Stability**: Satisfied
Dry Fork Creek meander re-activation	1:1.54	0.17	1:1.5	0.17	0.26	0.17	0.17	0.26	0.17	0.17	0.26	0.17	0.17	**Bank Stability**: Satisfied; **Noxious Weed Cover**: Satisfied; **Cutting Survival**: On target
Protection / grazing removal at pre-existing wetlands	1:1.54	4.31	1:5	1.33	7.13	4.63	1.43	7.13	4.63	1.43	7.13	4.63	1.43	**Fencing and Grazing Exclusion**: Satisfied
Riparian intercell swales	1:3.04	0.14	1:4	0.11	0.24	0.08	0.00**	0.24	0.08	0.00**	0.24	0.08	0.00**	**Noxious Weed Cover**: Satisfied; **Shrub Survival**: Below target
Upland buffer	None (no planting proposed)	0.00	1:4 (max. 50-ft width)	0.56	2.23	0.00	0.56	2.23	0.00	0.56	2.23	0.00	0.56	**Fencing**: Satisfied; **Noxious Weed Cover**: Marginal; **Vegetation Cover**: Satisfied
TOTAL		**11.86**		**23.85**	**32.07**	**13.43**	**26.90**	**34.59**	**14.26**	**29.11**	**34.00**	**14.06**	**28.51**	

*Estimated credit acreage of the new Dry Fork channel reduced by 0.16 acres in 2010 based on low woody species survival.
**The acreage associated with the riparian intercell swales not included in credit acre estimate based on less than 12 % shrub survival.

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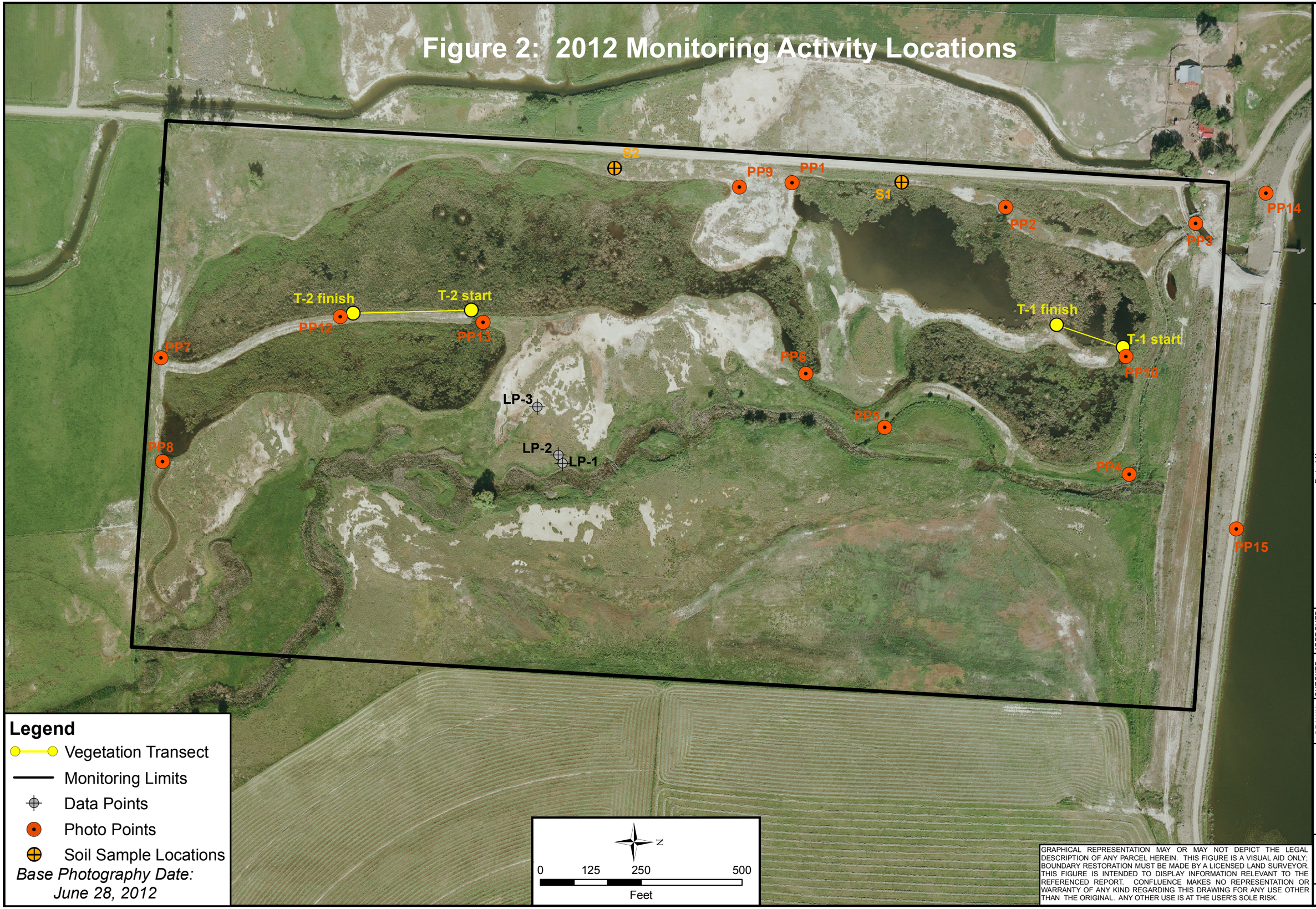
Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
Lonepine Wetland Mitigation Project
Flathead Indian Reservation, Montana

Figure 2: 2012 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Data Points
- Photo Points
- Soil Sample Locations

Base Photography Date: June 28, 2012

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: Sanders Co., MT

PROJECT NO: STPX 45(33)

FILE: LonePine/Monitor2012.mxd

Project Name
Lone Pine Wetland Mitigation Site

Drawing Title
2012 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted

Drawn: September 14, 2012

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 2

REV -

Figure 3: 2012 Mapped Site Features

N

0 125 250 500
Feet

Acreages

Project Area	79.49 acres
Total Wetlands	34.00 acres
Pre-existing Wetlands	7.13 acres
Created Wetlands	26.87 acres
Uplands	45.49 acres

Vegetation Community Types

- 6 Bassia scoparia
- 7 Phalaris arundinacea/Salix spp.
- 8 Typha latifolia/Schoenoplectus spp.
- 10 Aquatic Macrophytes/Open Water
- 12 Puccinellia nuttalliana
- 14 Typha latifolia/Phalaris arundinacea
- 15 Schoenoplectus maritimus/Typha latifolia
- 16 Thinopyrum ponticum/Elymus repens

Noxious Weeds
Cirsium arvense
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)

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: June 28, 2012

LOCATION: Sanders Co., MT
PROJECT NO: STPX 45(33)
FILE: LonePine/Veg2012.mxd

Project Name: Lone Pine Wetland Mitigation Site
Drawing Title: 2012 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED JU
SCALE: Noted
Drawn: September 14, 2012
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2012 MDT Wetland Mitigation Site Monitoring Form
2012 USACE Wetland Determination Data Form
2012 MDT Montana Wetland Assessment Form

MDT Wetland Mitigation Monitoring
Lonepine Wetland Mitigation Project
Flathead Indian Reservation, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Lonepine Assessment Date/Time 7/30/2012 10:46:25 AM

Person(s) conducting the assessment: B Sandefur, E Sandefur

Weather: Sunny & hot Location: Lonepine, MT

MDT District: Missoula Milepost:

Legal Description: T 22N R 24W Section(s) 3

Initial Evaluation Date: 7/25/2008 Monitoring Year: 5 #Visits in Year: 1

Size of Evaluation Area: 80 (acres)

Land use surrounding wetland:

Agriculture, Dry Fork Reservoir

HYDROLOGY

Surface Water Source: Lower Dry Fork Reservoir via Camas C canal

Inundation: ☑ Average Depth: 1 **(ft)** Range of Depths: 0-3 **(ft)**

Percent of assessment area under inundation: 20 %

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**:**

Soil cracks present in areas wet during the spring, water marks, water-stained leaves, drift lines, sediment deposits, and drainage patterns.

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 Lonepine

(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 # 6 **Community Type:** Bassia scoparia / **Acres:** 13.69

Species	Cover class	Species	Cover class
Bassia scoparia	4	Bromus tectorum	0
Chenopodium rubrum	0	Cirsium arvense	0
Distichlis spicata	0	Elymus cinereus	0
Elymus repens	1	Halogeton glomeratus	1
Hordeum jubatum	1	Lepidium perfoliatum	2
Melilotus officinalis	0	Puccinellia nuttalliana	2
Rumex crispus	0	Sisymbrium altissimum	0
Sonchus arvensis	0	Suaeda calceoliformis	1
Thinopyrum ponticum	2		

Comments:

Community # 7 **Community Type:** Phalaris arundinacea / Salix spp. **Acres:** 1.41

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Beckmannia syzigachne	0
Cirsium arvense	1	Epilobium palustre	0
Glyceria grandis	0	Juncus arcticus	0
Phalaris arundinacea	4	Puccinellia nuttalliana	0
Ribes aureum	0	Rumex crispus	0
Salix exigua	2	Salix lasiandra	0
Salix lutea	0	Schoenoplectus acutus	0
Schoenoplectus maritimus	0	Thinopyrum ponticum	1
Typha latifolia	0		

Comments:

Community # 8 **Community Type:** Typha latifolia / Schoenoplectus spp. **Acres:** 16.42

Species	Cover class	Species	Cover class
Algae, brown	0	Algae, green	0
Alisma plantago-aquatica	0	Alopecurus pratensis	0
Aquatic macrophytes	1	Beckmannia syzigachne	1
Carex pellita	0	Carex utriculata	0
Chara sp.	1	Cirsium arvense	0
Eleocharis palustris	1	Elymus repens	0
Epilobium palustre	0	Juncus arcticus	0
Lemna minor	2	Persicaria amphibia	0
Phalaris arundinacea	0	Puccinellia nuttalliana	1
Rumex crispus	0	Schoenoplectus acutus	4
Schoenoplectus maritimus	2	Scirpus microcarpus	0
Typha latifolia	4		

Comments:

Community # 10 **Community Type:** Aquatic macrophytes / Open Water **Acres:** 2.51

Species	Cover class	Species	Cover class
Algae, brown	2	Algae, green	2
Alisma plantago-aquatica	0	Alopecurus pratensis	0
Aquatic macrophytes	3	Beckmannia syzigachne	0
Chara sp.	0	Eleocharis palustris	0
Lemna minor	1	Open Water	5
Ranunculus aquatilis	0	Salix lutea	0
Schoenoplectus acutus	1	Schoenoplectus maritimus	0
Sparganium emersum	0	Thinopyrum ponticum	0
Typha latifolia	1		

Comments:

Community # 12 **Community Type:** Puccinellia nuttalliana / **Acres:** 0.45

Species	Cover class	Species	Cover class
Algae, brown	1	Alisma plantago-aquatica	0
Bassia scoparia	2	Beckmannia syzigachne	0
Epilobium palustre	0	Hordeum jubatum	0
Puccinellia nuttalliana	4	Rosa woodsii	0
Rumex crispus	0	Schoenoplectus maritimus	1
Suaeda calceoliformis	0	Thinopyrum ponticum	1
Typha latifolia	1		

Comments:

Community # 14 **Community Type:** Typha latifolia / Phalaris arundinacea **Acres:** 9.42

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Beckmannia syzigachne	0
Carex stipata	1	Carex utriculata	0
Cirsium arvense	1	Crataegus douglasii	1
Epilobium palustre	0	Glyceria grandis	0
Lemna minor	0	Phalaris arundinacea	2
Poa palustris	0	Salix alba	0
Salix amygdaloides	0	Scirpus microcarpus	0
Sparganium emersum	0	Symphoricarpos albus	0
Typha latifolia	1		

Comments:

Community # 15 **Community Type:** Schoenoplectus maritimus / Typha latifolia **Acres:** 3.8

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	1
Alopecurus pratensis	2	Chenopodium album	0
Cirsium arvense	0	Cirsium vulgare	0
Distichlis spicata	1	Eleocharis palustris	1
Elymus repens	2	Hordeum jubatum	1
Juncus arcticus	1	Lemna minor	1
Leucanthemum vulgare	0	Puccinellia nuttalliana	2
Rumex crispus	0	Schoenoplectus acutus	1
Schoenoplectus maritimus	4	Sonchus arvensis	0
Suaeda calceoliformis	0	Thinopyrum ponticum	0
Typha latifolia	3		

Comments:

Community # 16 **Community Type:** Thinopyrum ponticum / Elymus repens **Acres:** 31.8

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Artemisia cana	0
Bassia scoparia	3	Bromus inermis	1
Bromus tectorum	1	Chenopodium rubrum	2
Cirsium arvense	1	Cirsium vulgare	0
Distichlis spicata	0	Elymus cinereus	0
Elymus repens	3	Festuca pratensis	0
Glycyrrhiza lepidota	0	Grindelia squarrosa	0
Halogeton glomeratus	0	Hordeum jubatum	1
Juncus arcticus	0	Lactuca serriola	1
Lepidium perfoliatum	2	Medicago lupulina	0
Melilotus officinalis	0	Poa pratensis	1
Populus deltoides	0	Puccinellia nuttalliana	1
Rumex crispus	0	Salix amygdaloides	0
Sisymbrium altissimum	0	Sonchus arvensis	0
Suaeda calceoliformis	0	Symphoricarpos albus	0
Thinopyrum ponticum	4	Thlaspi arvense	0

Comments:

Total Vegetation Community Acreage **79.5**

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

VEGETATION TRANSECTS

Site: Lonepine Date: 7/30/2012 10:46:25 AM

Transect Number: 1 **Compass Direction from Start:** 196

Interval Data:

Ending Station 76 **Community Type:** Typha latifolia / Schoenoplectus spp.

Species	Cover class	Species	Cover class
Algae, brown	3	Algae, green	1
Alisma plantago-aquatica	0	Alopecurus pratensis	1
Aquatic macrophytes	2	Lemna minor	3
Open Water	1	Schoenoplectus acutus	5
Schoenoplectus maritimus	1	Typha latifolia	2

Ending Station 115 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, brown	4	Aquatic macrophytes	1
Lemna minor	1	Open Water	5
Schoenoplectus acutus	2		

Ending Station 122 **Community Type:** Typha latifolia / Schoenoplectus spp.

Species	Cover class	Species	Cover class
Algae, green	5	Lemna minor	2
Open Water	5	Schoenoplectus acutus	2
Typha latifolia	1		

Ending Station 150 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, green	5	Lemna minor	2
Open Water	5	Schoenoplectus acutus	2
Typha latifolia	1		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 180

Interval Data:

Ending Station 300 **Community Type:** Typha latifolia / Schoenoplectus spp.

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Beckmannia syzigachne	2
Carex pellita	0	Eleocharis palustris	0
Hordeum jubatum	0	Lemna minor	0
Puccinellia nuttalliana	0	Rumex crispus	0
Schoenoplectus maritimus	2	Typha latifolia	5

Transect Notes:

300ft transect established adjacent to dike area to document erosion on dike face and prevent 'quick sand issues' during monitoring. East side of line is in upland habitat and west side of line is in wetland habitat. Entered plants on wetland side of transect.

PLANTED WOODY VEGETATION SURVIVAL

Lonepine

Planting Type	#Planted	#Alive	Notes
Ribes aureum	70	2	Observed in vegetation community 7
Salix exigua	500	250	Likely natural recruitment included in count
Salix lasiandra	60	5	Observed in vegetation community 7
Salix lutea		3	Observed in vegetation community 7

Comments

Natural willow recruitment appears to be occuring along channel in vegetation community 7.

Lonepine

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 Coot	25	F	AB, OW, WM
American Robin	1	L	MA, UP, WM
Brown-headed Cowbird	21	F, L	AB, MA, UP, WM
Cliff Swallow	30	F, FO, L	OW, UP, WM
Eared Grebe	3	BP, N	AB, MA, OW
Eastern Kingbird	2	L	MA, UP, WM
Northern Harrier	1	FO	OW
Osprey	1	FO	OW
Red-tailed Hawk	1	FO	UP, WM
Red-winged Blackbird	10	F, L, N	MA
Song Sparrow	1	F, L	OW, UP, WM
Spotted Sandpiper	2	F, L	AB, US
Western Meadowlark	3	L	AB, UP, WM
Wilson's Snipe	19	F, L, N	AB, OW, WM, US
Yellow-headed Blackbird	25	F, L	MA, OW, UP, WM

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	3	No	No	No	
Fish sp.	50	No	No	No	Juveniles
Muskrat		No	No	Yes	
White-tailed Deer	2	No	No	No	

Wildlife Comments:

Lonepine

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
9458-61	47.699654	-114.668716	180	PP-14
9462-67	47.699448	-114.665596	180	PP-15
9468-72	47.699085	-114.668686	180	PP-3
9473	47.698711	-114.667351	180	PP-10, Start veg tran 1
9474-79	47.69886	-114.665985	270	PP-4
9480-84	47.697781	-114.668785	90	PP-2
9485-88	47.696373	-114.668701	90	PP-1
9489-93	47.696373	-114.668701	0	PP-1
9494	47.696033	-114.668671	180	PP-9
9495-99	47.692169	-114.666573	315	PP-7
9502-05	47.692207	-114.665672	315	PP-8
9506-09	47.692207	-114.665672	90	PP-8
9513	47.693321	-114.667282	0	PP-12, T-2 start
9514	47.694202	-114.667198	180	PP-13, T-2 end
9515-9519	47.696491	-114.666801	270	PP-6
9521	47.697147	-114.666473	0	PP-5
9522	47.69817	-114.667595	0	T-1, end
9524	47.694945	-114.66587833		LP-1
9525	47.69344	-114.65933		LP-2
9526	47.69481	-114.666128333		LP-3

Comments:

Lonepine

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: Lonepine | City/County: Sanders | Sampling Date: 7/30/2012

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

Investigator(s): B Sandefur | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.694945 | Long: -114.665878333333 | Datum: WGS84

Soil Map Unit Name: Bolack silt 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:
Point on edge of sharp topo break along veg com 14.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Typha latifolia	90	☑	OBL
2. Carex stipata	5	☐	OBL
3. Lemna minor	5	☐	OBL
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: 1 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: LP-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
0-10	10YR 4/1	95	10YR 4/4	5	C	M	Silty Clay Loam	
10-14	10YR 5/1	100					Clay Loam	

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: frigid Typic Endoaquolls

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

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): 6

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: Lonepine | City/County: Sanders | Sampling Date: 7/30/2012

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

Investigator(s): B Sandefur | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69344 | Long: -114.65933333 | Datum: WGS84

Soil Map Unit Name: Bolack silt 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:
Point in old veg com 13, previously identified as wet. Upland status in 2012. Distinct topo break into adjacent wetlands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Elymus varnensis	60	☑	NL
2. Lactuca serriola	10	☐	FACU
3. Lepidium perfoliatum	10	☐	FACU
4. Bromus inermis	20	☐	FAC
5. Cirsium arvense	5	☐	FAC
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: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

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

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:
Data point taken within distinct upland veg community.

SOIL

Sampling Point: LP-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
0-7	10YR 7/1	100					Silt Loam	
7-14	7.5YR 7/3	100					Silt Loam	

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: frigid Typic Endoaquolls

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

No redox features w/in very light colored soil.

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 present at point, data point on upland rise from LP-1 and above influence of groundwater table.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 7/30/2012

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

Investigator(s): B Sandefur | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69481 | Long: -114.666128333333 | Datum: WGS84

Soil Map Unit Name: Marklepass-Slickspots complex

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:
Point in veg com 6. Distinct upland veg community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Bromus tectorum	60	☑	UPL
2. Elymus varnensis	20	☑	NL
3. Sisymbrium altissimum	10	☐	FACU
4. Lepidium perfoliatum	10	☐	FACU
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: 0 (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: LP-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 7/3	100					ry Fine Loamy Sa	

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: frigid Typic Natrixeralfs

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Soil very friable, no hydric features.

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.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Lonepine wetland mitigation **2. MDT project#** STPX (45)33 **Control#** 4729

3. Evaluation Date 7/30/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Cells 1-5

6. Wetland Location(s): T 22N **R** 24W **Sec1** 3 **T** **R** **Sec2**

Approx Stationing or Mileposts East of Lonepine, below Lower Dry Fork Reservoir

Watershed 17010212 **Watershed/County** Lower Clark Fork Watershed/Sanders County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 23.73

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) 23.73

How assessed: Measured e.g. by GPS

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland		Seasonal/Intermittant	20
Depressional	Aquatic Bed		Seasonal/Intermittant	80

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

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	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

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

Adjacent lands subject to livestock grazing and cultivation. A few roads and buildings surround AA.

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

Cirsium arvense, Centaurea maculosa

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes five cells that have moderate to shallow surface water inundation dominated by emergent vegetation with some aquatic vegetation.

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

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
>=3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Wetland vegetation includes emergent and aquatic bed classes.

SECTION PERTAINING to FUNCTIONS 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 (check one based on definitions contained in instructions):

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

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [check] 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	.3L	.1L	0L

Sources for documented use No field observations, USFWS database

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 (check one based on definitions contained in instructions):

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

Secondary habitat (list Species) ◉ D ◯ S great blue heron, long-billed curlew, western toad

Incidental habitat (list species) ◉ D ◯ S American white pelican, Bobolink

No usable habitat ☐ S

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use Field observations and MNHP list.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Substantial

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

- [x] 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, check 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 [check] 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 Wildlife in this area continues to increase with evidence of deer, waterfowl, hawks and great blue heron. Periodic use by American white pelican and long-billed curlew, species of concern.

14D. General Fish 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 used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☐ **NA** here and proceed to 14E.) Warm Water

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◉ **N** ○ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** .3L

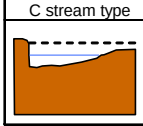
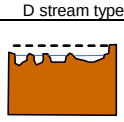
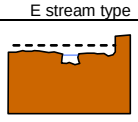
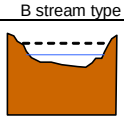
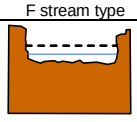
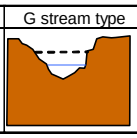
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .3L

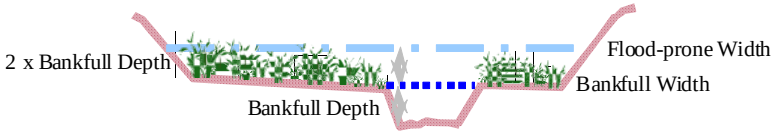
iii. Final Score and Rating: .3 L **Comments:** Schools of juvenile fish observed within the cells during 2011 and 2012 site visits. Fish use restricted.

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, click ☑ **NA** here and proceed to 14F.)

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

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no 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

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodrpone width / **Bankfull width** = **Entrenchment ratio**

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 (check)? **Y** ○ **N** ◉

Comments:

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

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] 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: The constructed cells provide up to 40 AF of water storage capacity (20 acres x 2 feet deep).

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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] 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: Continued increase in vegetation documented in cells.

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 [check] 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: Open water subject to wave action, well vegetated with cattails, bulrush, and other deep-rooted vegetation.

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); 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, S/I, and T/E are as previously defined, and A = "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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8	.5M	.6M	.3	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ○ **N** ◉ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .7M

Comments: The biological activity level was mod, the AA contains a surface outlet, and the water regime is S/I.

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: Occurs at the toe of the dam

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 [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information		NA		

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] 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: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

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

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

Known bird watching, hunting

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Cells 1-5

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	14.238	☐
C. General Wildlife Habitat	H	.9	1	21.357	☑
D. General Fish Habitat	L	.3	1	7.119	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	H	.9	1	21.357	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	23.73	☑
H. Sediment/Shoreline Stabilization	H	.9	1	21.357	☐
I. Production Export/Food Chain Support	M	.7	1	16.611	☑
J. Groundwater Discharge/Recharge	H	1	1	23.73	☑
K. Uniqueness	M	.4	1	9.492	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	4.746	☐
Totals:		6.9	10	163.737	
Percent of Possible Score			**69** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise 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**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☑ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☑ Percent of possible score > 65% (round to nearest whole #).

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; otherwise go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Lonepine wetland mitigation **2. MDT project#** STPX (45)33 **Control#** 4729

3. Evaluation Date 7/30/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Dry Fork Creek

6. Wetland Location(s): T 22N **R** 24W **Sec1** 3 **T** **R** **Sec2**

Approx Stationing or Mileposts East of Lonepine, below Lower Dry Fork Reservoir

Watershed 17010212 **Watershed/County** Lower Clark Fork Watershed/Sanders County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 10.27

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 10.27

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Riverine	Unconsolidated Bottom		Permanent/Perennial	25
Riverine	Emergent Wetland		Permanent/Perennial	70
Riverine	Scrub-Shrub Wetland		Permanent/Perennial	5

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

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	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

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

Adjacent lands subject to livestock grazing and cultivation

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

Cirsium arvense

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes pre-existing wetlands associated with Dry Fork Creek including a re-activated meander loop and adjacent excavated wetlands and the new creek section along the dam fence.

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

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
>=3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Scrub shrub area is filling in with many of the willows surviving and growing in size, particularly Salix exigua. Emergent also present.

SECTION PERTAINING to FUNCTIONS 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 (check one based on definitions contained in instructions):

Primary or critical habitat (list species) ○ D ○ S

Secondary habitat (list Species) ○ D ○ S

Incidental habitat (list species) ○ D ○ S

No usable habitat ☑ S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [check] 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	.3L	.1L	0L

Sources for documented use No field observations, USFWS database

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 (check one based on definitions contained in instructions):

Primary or critical habitat (list species) ○ D ○ S

Secondary habitat (list Species) ◉ D ○ S great blue heron, long-billed curlew, western toad

Incidental habitat (list species) ◉ D ○ S American white pelican, Bobolink

No usable habitat ☐ S

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Substantial

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

- [x] 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, check 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 [check] 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 AA adjacent to created wetland cells and provides wildlife corridor. Abundant waterfowl, hawks and great blue herons. Periodic use by American white pelican and long-billed curlew, species of concern.

14D. General Fish 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 used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☐ **NA** here and proceed to 14E.) Warm Water

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** (●) **N** ( ) *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** .4M

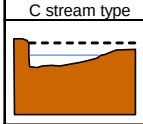
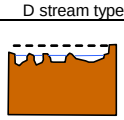
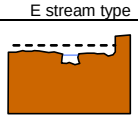
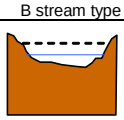
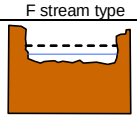
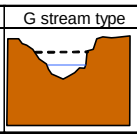
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ( ) **Y** (●) **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .4M

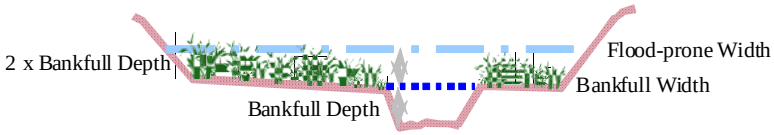
iii. Final Score and Rating: .4 M **Comments:** Small fish observed within the creek in 2011 and 2012.

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, click ☐ **NA** here and proceed to 14F.)

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

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no 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

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodrpone width 5 **/** **Bankfull width** 2 **=** **Entrenchment ratio** 2.5

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 (check)? **Y** ( ) **N** (●)

Comments: Creek is sourced by Lower Dry Fork Reservoir and subject to dam releases.

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, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] 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: The minimum water storage capacity is 20 AF (10 A x 2 ft).

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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] 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 contains restricted outlet. There is evidence of ponding.

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

i. Rating (working from top to bottom, use the matrix below to arrive at [check] 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: Vegetation cover along channel streambanks continues to increase and includes Phalaris, Salix, Carex, and Scirpus.

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); 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, S/I, and T/E are as previously defined, and A = "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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8	.5M	.6M	.3	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** 1 E

Comments: AA has greater than 5 acres of vegetation cover, high bio activity rating, contains a surface outlet, and a 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: occurs below major dam

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 [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information		NA		

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] 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: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

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

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

hunting, birdwatching

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Dry Fork Creek

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	6.162	☐
C. General Wildlife Habitat	E	1	1	10.27	☐
D. General Fish Habitat	M	.4	1	4.108	☐
E. Flood Attenuation	M	.6	1	6.162	☐
F. Short and Long Term Surface Water Storage	H	1	1	10.27	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	10.27	☐
H. Sediment/Shoreline Stabilization	H	1	1	10.27	☑
I. Production Export/Food Chain Support	E	1	1	10.27	☑
J. Groundwater Discharge/Recharge	H	1	1	10.27	☑
K. Uniqueness	M	.4	1	4.108	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	2.054	☐
Totals:		8.2	11	84.214	
Percent of Possible Score			**74.55** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise 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**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☑ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☑ Percent of possible score > 65% (round to nearest whole #).

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; otherwise go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Lonepine Wetland Mitigation Project
Flathead Indian Reservation, Montana

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees

Location: South edge of Cell 2
Taken in 2009

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees

Location: South edge of Cell 2
Taken in 2010

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees

Location: South edge of Cell 2
Taken in 2011

Photo Point 1 – *Photo 1*
Bearing: 90 Degrees

Location: South edge of Cell 2
Taken in 2012

Photo Point 1 – *Photo 2*
Bearing: 0 Degrees

Location: South edge of Cell 2
Taken in 2009

Photo Point 1 – *Photo 2*
Bearing: 0 Degrees

Location: South edge of Cell 2
Taken in 2010

Photo Point 1 – *Photo 2*
Bearing: 0 Degrees

Location: South edge of Cell 2
Taken in 2011

Photo Point 1 – *Photo 2*
Bearing: 0 Degrees

Location: South edge of Cell 2
Taken in 2012

Photo Point 2 – *Photo 1*
Bearing: 90 Degrees

Location: Between Cell 1 and cell 2
Taken in 2009

Photo Point 2 – *Photo 1*
Bearing: 90 Degrees

Location: Between Cell 1 and cell 2
Taken in 2010

Photo Point 2 – *Photo 1*
Bearing: 90 Degrees

Location: Between Cell 1 and cell 2
Taken in 2011

Photo Point 2 – *Photo 1*
Bearing: 90 Degrees

Location: Between Cell 1 and cell 2
Taken in 2012

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

Location: Northwest corner of project area
Taken in 2009

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

Location: Northwest corner of project area
Taken in 2010

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

Location: Northwest corner of project area
Taken in 2011

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

Location: Northwest corner of project area
Taken in 2012

Photo Point 4 – *Photo 1*
Bearing: 270 Degrees

Location: Along Dry Fork Creek
Taken in 2009

Photo Point 4 – *Photo 1*
Bearing: 270 Degrees

Location: Along Dry Fork Creek
Taken in 2010

Photo Point 4 – *Photo 1*
Bearing: 270 Degrees

Location: Along Dry Fork Creek
Taken in 2011

Photo Point 4 – *Photo 1*
Bearing: 270 Degrees

Location: Along Dry Fork Creek
Taken in 2012

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

Location: Along Dry Fork Creek
Taken in 2009

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

Location: Along Dry Fork Creek
Taken in 2010

Photo Point 5 – *Photo 1*
Bearing: 62 Degrees

Location: Along Dry Fork Creek
Taken in 2011

Photo Point 5 – *Photo 1*
Bearing: 62 Degrees

Location: Along Dry Fork Creek
Taken in 2012

Photo Point 6 – *Photo 1*
Bearing: 270 Degrees

Location: North shore of Cell 4
Taken in 2009

Photo Point 6 – *Photo 1*
Bearing: 270 Degrees

Location: North shore of Cell 4
Taken in 2010

Photo Point 6 – *Photo 1*
Bearing: 270 Degrees

Location: North shore of Cell 4
Taken in 2011

Photo Point 6 – *Photo 1*
Bearing: 270 Degrees

Location: North shore of Cell 4
Taken in 2012

Photo Point 7 – *Photo 1*
Bearing: 315 Degrees

Location: South shore of Cell 4
Taken in 2009

Photo Point 7 – *Photo 1*
Bearing: 315 Degrees

Location: South shore of Cell 4
Taken in 2010

Photo Point 7 – *Photo 1*
Bearing: 315 Degrees

Location: South shore of Cell 4
Taken in 2011

Photo Point 7 – *Photo 1*
Bearing: 315 Degrees

Location: South shore of Cell 4
Taken in 2012

Photo Point 8 – *Photo 1*
Bearing: 315 Degrees

Location: Open water in Cell 5
Taken in 2009

Photo Point 8 – *Photo 1*
Bearing: 315 Degrees

Location: Open water in Cell 5
Taken in 2010

Photo Point 8 – *Photo 1*
Bearing: 315 Degrees

Location: Open water in Cell 5
Taken in 2011

Photo Point 8 – *Photo 1*
Bearing: 315 Degrees

Location: Open water in Cell 5
Taken in 2012

Photo Point 8 – *Photo 2*
Bearing: 90 Degrees

Location: South boundary of project area
Taken in 2009

Photo Point 8 – *Photo 2*
Bearing: 90 Degrees

Location: South boundary of project area
Taken in 2010

Photo Point 8 – *Photo 2*
Bearing: 90 Degrees

Location: South boundary of project area
Taken in 2011

Photo Point 8 – *Photo 2*
Bearing: 90 Degrees

Location: South boundary of project area
Taken in 2012

Intentionally Blank

Photo Point 9 – *Photo 1*
Bearing: 180 Degrees
Location: Western edge of Cell 4
Taken in 2010

Photo Point 9 – *Photo 1*
Bearing: 180 Degrees
Location: Western edge of Cell 4
Taken in 2011

Photo Point 9 – *Photo 1*
Bearing: 180 Degrees
Location: Western edge of Cell 4
Taken in 2012

Photo Point 10 – *Photo 1* **Location:** Start Veg Tran 1
Bearing: 180 Degrees **Taken in 2009**

Photo Point 10 – *Photo 1* **Location:** Start Veg Tran 1
Bearing: 180 Degrees **Taken in 2010**

Photo Point 10 – *Photo 1* **Location:** Start Veg Tran 1
Bearing: 180 Degrees **Taken in 2011**

Photo Point 10 – *Photo 1* **Location:** Start Veg Tran 1
Bearing: 180 Degrees **Taken in 2012**

Photo Point 12 – *Photo 1* **Location:** Start Veg Tran 2
Bearing: 0 Degrees **Taken in 2009**

Photo Point 12 – *Photo 1* **Location:** Start Veg Tran 2
Bearing: 0 Degrees **Taken in 2010**

Photo Point 12 – *Photo 1* **Location:** Start Veg Tran 2
Bearing: 0 Degrees **Taken in 2011**

Photo Point 12 – *Photo 1* **Location:** Start Veg Tran 2
Bearing: 0 Degrees **Taken in 2012**

Photo Point 13 – *Photo 1* **Location:** Finish Veg Tran 2
Bearing: 180 Degrees **Taken in 2009**

Photo Point 13 – *Photo 1* **Location:** Finish Veg Tran 2
Bearing: 180 Degrees **Taken in 2010**

Photo Point 13 – *Photo 1* **Location:** Finish Veg Tran 2
Bearing: 180 Degrees **Taken in 2011**

Photo Point 13 – *Photo 1* **Location:** Finish Veg Tran 2
Bearing: 180 Degrees **Taken in 2012**

Photo Point 14 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from northwest corner
Taken in 2009

Photo Point 14 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from northwest corner
Taken in 2010

Photo Point 14 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from northwest corner
Taken in 2011

Photo Point 14 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from northwest corner
Taken in 2012

Photo Point 15 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from dam surface
Taken in 2009

Photo Point 15 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from dam surface
Taken in 2010

Photo Point 15 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from dam surface
Taken in 2011

Photo Point 15 – *Photo 1*
Bearing: 180 Degrees

Location: View of project area from dam surface
Taken in 2012

Data Point – *LP-1* **Location:**
Bearing: **Taken in 2012**

Data Point – *LP-2* **Location:**
Bearing: **Taken in 2012**

Data Point – *LP-3* **Location:**
Bearing: **Taken in 2012**

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Lonepine Wetland Mitigation Project
Flathead Indian Reservation, Montana

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPX 45(33)	8

LONEPINE WETLAND MITIGATION

PROPOSED DAM OUTLET WORKS & CANAL MODIFICATIONS

POT 10+00.00

POT 18+06.36

NEW FENCE AROUND WELL

CONTROL LINE

NEW GATE

N 0° 28' 16" W

NEW GATE

IRRIGATION TURNOUT STRUCTURES INVERT ELEV. 864.40 [2 835.96ft] (CELL 1) 863.83 [2 834.09ft] (CHANNEL 3)

INLET 1

WETLAND 5

WETLAND 4

44+85.41 END CHANNEL 3

REMOVE FENCE

NEW FENCE

Proposed Wetland Cell 1

Proposed Wetland Cell 2

Proposed Wetland Cell 4

OUTLET 2a

OUTLET 1

WETLAND 2

OUTLET 2b

OUTLET 4

REMOVE FENCE

INLET 4

TEMPORARY FENCE

OUTLET 3

D

31+04.44 END CHANNEL 2

Proposed Wetland Cell 5

DO NOT DISTURB

TEMPORARY FENCE

30+08.47 BEG. CHANNEL 2

CHANNEL 2

WETLAND 3

Proposed Wetland Cell 3

WETLAND 1

CREEK

40+12.00 BEG. CHANNEL 3

OUTLET 5

DO NOT DISTURB

DRY FORK

Proposed Wetland Excavation A

CHANNEL PLUG

CHANNEL 3

21+51.02 END CHANNEL 1

TEMPORARY FENCE

REMOVE FENCE

DAM SAFETY PROJECT LIMIT OF CONSTRUCTION

27 m

15 m

DAM SAFETY PROJECT BUFFER ZONE

CHANNEL 1

WETLAND 1

20+00.00 BEG. CHANNEL 1

NEW FENCE

OFFSITE WETLAND 1

LEGEND

- EXISTING WETLANDS
- PERMITTED WETLAND IMPACTS
- PROPOSED WETLAND CELLS
- PROPOSED UPLAND BUFFER
- PROPOSED CHANNEL CENTERLINE
- PROPOSED BERM
- NEW FENCE

SCALE 1:1200

0 60M 120M

SITE PLAN

D-1

MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

WGM GROUP, INC.

LAND & WATER CONSULTING

A Division Of: PBSJ

w:\projects\020606\design rd\4129rdwld202.dgn	7/28/2006	2:21:28 PM	3	WGM Group Inc.
			2	