MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2010

Lonepine Wetland Mitigation Project
Flathead Indian Reservation, Montana



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MORRISON MAIERLE, INC.
An Employee-Owned Company

December 2010

MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

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MDT Project Number STPX 45(33)
Control Number 4729

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CCI Project No: MDT.004

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1. INTRODUCTION

The Lonepine Mitigation 2010 Monitoring Report summarizes the results of the third year of monitoring at the Lonepine mitigation site. The Lonepine project was constructed to mitigate for wetland impacts incurred by the Montana Department of Transportation (MDT) Lonepine North and East highway reconstruction project. Excess wetland credits may be applied toward future MDT highway projects in the area. The project was constructed on MDT property between summer 2007 and summer 2008, in conjunction with the adjacent Lower Dry Fork Reservoir dam re-construction. Project goals were the development of 23.83 acres of US Army Corps of Engineers (USACE) approved wetland credit and 11.86 acres of Confederated Salish and Kootenai Tribes (CSKT) approved wetland credit at the 80-acre site.

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 NW quarter of the Section 3, Township 22 North, Range 24, West (Figure 1). Figures 2 and 3 in Appendix A show the Monitoring Activity Locations and Mapped Site Features of the site, respectively. Appendix B includes the MDT Wetland Site Mitigation Monitoring Form, USACE Wetland Determination Data Forms (Environmental Laboratory 1987), and the MDT Montana Wetland Assessment Forms. Representative photographs of the project area are included in Appendix C and the Project Plan Sheet is included in Appendix D.

The mitigation design focused on providing 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 wetland cells. The primary water source is the Lower Dry Fork Reservoir via the Camas C Canal and the secondary source is precipitation. A general mitigation site layout is provided in Appendix D. Project objectives are listed below (PBS&J 2009).

- 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.
- Provide a riparian scrub-shrub component by revegetating restored Dry Fork Creek channel margins and intercell watercourses with riparian shrub species.

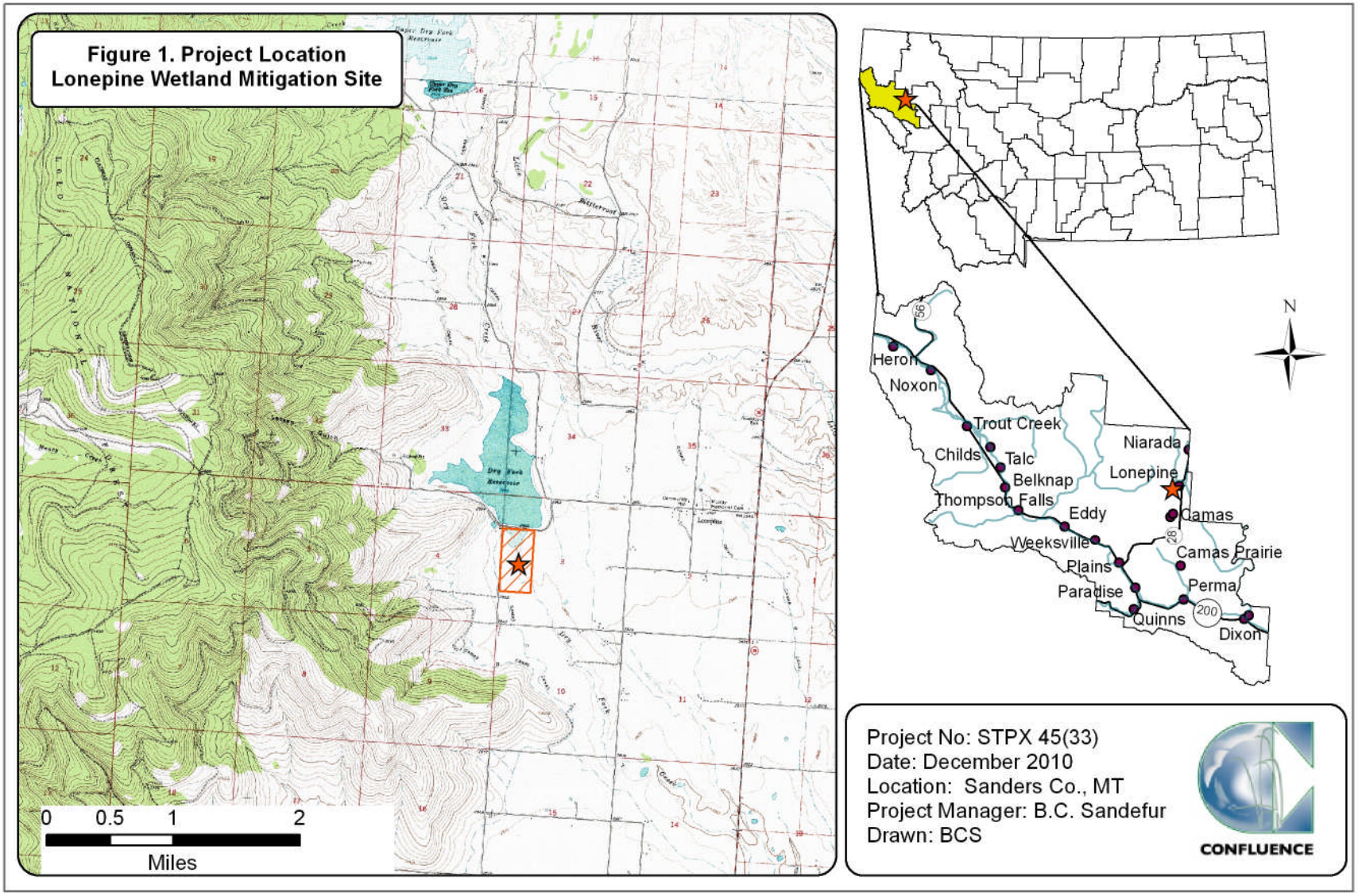


Figure 1. Project Location Lonepine Wetland Mitigation Site.

- 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 final approved performance standards (PBS&J 2009) are listed below. The USACE stated that all created wetlands within the project corridor will meet the three parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the 1987 USACE *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987).

1. **Wetland Hydrology and Open Water Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Manual. 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	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 amount equaling 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
I TOTAL			**11.86 acres**	**23.85 acres**

[1] Wetland Mitigation Guidelines for the Flathead Reservation (PBS&J 2009).

[2] Mitigation Ratios, Montana Regulatory Program (PBS&J 2009).

2. METHODS

The site was monitored on August 22, 2010. Information contained on the Mitigation Monitoring Form and Wetland Data Form was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity locations were mapped with a global positioning system (GPS) as illustrated on Figure 2 (Appendix A). Information collected included wetland delineation, vegetation community mapping, vegetation transect monitoring, soils data, hydrology data, bird and wildlife use documentation, photographs, functional assessments, planted woody species monitoring, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

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 more or 12.5 percent) 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).

Hydrological indicators as outlined on the Wetland Data Form were documented at 10 points established within the project area. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on electronic field data sheets (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation/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 Data Form (Appendix B). The boundary between wetlands and open water was mapped on the aerial photograph and an estimate of the average water depth at the boundary was recorded.

2.2. Vegetation

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

Temporal changes in vegetation were evaluated through annual assessments of static belt transects (Figure 2, Appendix A). Vegetation composition was assessed and recorded along 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 global positioning system (GPS) unit. Spatial changes in the dominant vegetation communities were documented along the stationed transect. The percent cover of each vegetation species within the transect was estimated using the same values and cover ranges listed in the above paragraph (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C).

The 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 "+", "▲", 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 Data Form for each profile (Appendix B).

Two soil samples were taken and analyzed for pH, electrical conductivity, calcium, magnesium, sodium and sodium absorption ration (SAR) in 2008 and 2010 for comparative purposes. Soil sampling locations were mapped 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 Wetland Manual. In order to delineate a representative area as wetland, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology, as described in the 1987 Manual, must be satisfied. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate wetland areas within the project boundaries. The information was recorded electronically on the Wetland Data Form (Appendix B).

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

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

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the wetland monitoring form during the site visit. Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of wildlife species observed onsite from 2008 to 2010 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 (Berglund and McEldowney 2008) was used in 2009 and 2010. 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 (Assessment Areas-AA) (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provides supplemental information documenting wetland condition, trends, current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transects. Photographs were taken at established photo points throughout the mitigation site during the site visit (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 (Global Positioning System) unit during the 2010 monitoring season. Points were collected using WAAS-enabled differential corrected satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, subsequently exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto an aerial photograph and then digitized. Site features and survey points that were mapped included fence boundaries, photograph points, transect endpoints, wetland boundaries, non-wetland plant community boundaries, and soil sample locations.

2.9. Maintenance Needs

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

3. RESULTS

3.1. Hydrology

There are 146 consecutive days in the growing season based on the available temperature data between 1918 and 1969 for the Lonepine meteorological station (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 weather station was closed in 1969.

Water for the project is supplied primarily by the Lower Dry Fork Reservoir via the Camas C Canal. Approximately 40 percent of the mitigation site was inundated during the 2010 investigation. The average surface water depth across the site was 1 foot and the depth ranged from 0 to 2 feet. Areas delineated as wetlands that were not inundated exhibited saturation within one foot of the ground surface based on test pit data (see below).

Two corresponding data points, one in upland and one in wetland, were established at five locations to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). The data point locations are shown on Figure 2 in Appendix A. The ten data points were named C1D (cell 1, dry) and C1W (cell 1, wet) through C5D and C5W. There were no wetland hydrology indicators present at the data points located in upland, specifically C1D to C5D. Data points C1W to C5W were sampled in areas that met all three wetland criteria. Primary wetland indicators at C1W to C5W were inundation, saturation in the upper 12 inches of the soil horizon, water marks, and drift lines. Surface water levels ranged from three to seven inches deep at each of the five data points within a wetland. Secondary indicators included the FAC-Neutral Test and water-stained leaves at data point C1W.

3.2. Vegetation

A list of 89 vegetation species identified from 2008 to 2010 is presented in Table 2 (Monitoring Form, Appendix B). Nine community types, six wetland and three upland, were identified at the mitigation site in 2010 (Figure 3, Appendix A). A review of the 2009 and 2010 photographs included in Appendix C show a notable increase in vegetation cover in the constructed cells site wide.

The community types were Type 2 – *Scirpus* spp./*Beckmannia syzigachne* Wetland, Type 4 – *Agropyron trachycaulum* Wetland, Type 5 – *Agropyron trachycaulum/Elymus triticoides* Upland, Type 6 – *Kochia scoparia* Upland, Type 7: *Phalaris arundinacea/Salix* spp Wetland, Type 8 – *Typha latifolia/Scirpus* spp., Wetland, Type 9 – *Beckmannia syzigachne /Glyceria striata* Wetland, Type 11 – *Distichlis spicata*/*Kochia scoparia* Upland and Type 12 – *Puccinellia nuttalliana* Wetland. Open water areas were identified by the number 10 on Figure 3 (Appendix A). The species composition for each community is presented below in descending order of abundance.

Wetland community Type 2 – *Scirpus* spp./*Beckmannia syzigachne* was identified in several isolated wetlands across the site. Saltmarsh bulrush (*Scirpus maritimus*), hard-stem bulrush (*Scirpus acutus*), American sloughgrass (*Beckmannia syzigachne*), muskgrass (*Chara* spp.), green algae and broad-leaf cattail (*Typha latifolia*) dominated the vegetation cover.

Wetland Type 4 – *Agropyron trachycaulum* formed on the edges of several constructed cells. Slender wheatgrass (*Agropyron trachycaulum*), American sloughgrass, and brown algae dominated the vegetation species. Approximately 20 additional grasses and forbs were present at less than five percent cover.

Upland community Type 5 – *Agropyron trachycaulum/Elymus triticoides* was identified in the northwest corner of the site. Slender wheatgrass, creeping wildrye (*Elymus triticoides*), smooth brome (*Bromus inermis*), clasping peppergrass (*Lepidium perfoliatum*), and kochia (*Kochia scoparia*) dominated the vegetation cover. Numerous other grasses and forbs were identified within the community at less than five percent cover.

Upland Type 6 – *Kochia scoparia* covered the large sandy areas on the perimeter of the wetland cells that exhibited low vegetation cover. The vegetation was dominated by kochia, coast-blite goose foot (*Chenopodium rubrum*), and clasping peppergrass.

Wetland Type 7 – *Phalaris arundinacea/Salix* spp. was identified in a single narrow strip of wetland located adjacent to the riparian corridor. The vegetation cover was dominated by broad-leaf cattail, hard-stem bulrush, meadow foxtail (*Alopecurus pratensis*), and lesser duckweed (*Lemna minor*). The wetland was planted with willow and other woody shrub species.

Type 8 – *Typha latifolia/Scirpus* spp. Wetland was located within the riparian corridor and the constructed wetland cells. Broad-leaf cattail, hard-stem bulrush, saltmarsh bulrush, and meadow foxtail dominated the community.

Community Type 9 – *Beckmannia syzigachne /Glyceria striata* was identified in a small, isolated area located next to the riparian corridor in the north half of the site. The species were dominated by American sloughgrass, meadow foxtail, and fowl mannagrass. Canada thistle was present in the community at less than one percent cover.

Type 11 – *Distichlis spicata*/*Kochia scoparia* was located in a small, isolated upland area near the north boundary. Inland salt grass, kochia, and saltlover (*Halogeton glomeratus*) dominated the vegetation cover.

Wetland Type 12 – *Puccinellia nuttalliana* was identified in an excavated ditch located near the south boundary. Nuttall's alkali grass, muskgrass, and open water dominated the cover.

Open water (10) was located in the large constructed cell in the northwest quarter of the project site. Muskgrass, American sloughgrass, fowl mannagrass, lesser duckweed, hard-stem bulrush, and broad-leaf cattail were observed at less than five percent cover.

Vegetation community data were collected from two 10-foot wide belt transects (Monitoring Forms, Appendix B). The transect data for Transect 1 is summarized in Table 3 and Charts 1 through 4. The transect locations are shown on Figure 2 (Appendix A) and photographs of the transect endpoints are included on pages C-8 and C-9 of Appendix C.

The only community identified on the 150-foot Transect 1 in 2010 was wetland Type 2 – *Scirpus* spp./*Beckmannia syzicachne,* the same community identified in 2009. A photograph of the start of the transect in 2009 and 2010 is shown on page C-7 of Appendix C. Twelve hydrophytic species were observed within the community in 2010, an increase of nine species since 2009. The transect was dominated by aquatic macrophytes, open water, hard-stem bulrush, green algae, lesser duckweed, and American sloughgrass. The estimated cover on the transect increased from 75 to 90 percent. Hydrophytic species encompassed one hundred percent of the transect intervals.

A summary of the data collected on Transect 2 is presented in Table 4. The vegetation data is included on the Monitoring Form (Appendix B). Photographs of the transect end points are shown on page C-8 of Appendix C. One vegetation community, Type 8 – *Typha latifolia/Scirpus* spp., was identified on Transect 2 in 2010. The vegetation cover transitioned from Type 2, dominated by *Scirpus* and *Beckmannia*, in 2009 to Type 8 in 2010. The estimated total cover increased from 75 to 85 percent. Hydrophytic species dominate 100 percent of the transect intervals.

Table 2. Vegetation species identified at Lonepine Wetland Mitigation Site from 2008 to 2010.

Achillea millefolium	yarrow,common	FACU
Agropyron cristatum	crested wheatgrass	NL
Agropyron dasystachyum	wheatgrass,thick-spike	FACU-
Agropyron repens	quackgrass	FACU
Agropyron smithii	wheatgrass,Western	FACU
Agropyron trachycaulum	wheatgrass,slender	FAC
Agrostis alba	redtop	FACW
Algae, brown	**algae, brown**	NL
Algae, green	**algae, green**	NL
Alisma plantago-aquatica	water-plantain,broad-leaf	OBL
Alopecurus pratensis	foxtail,meadow	FACW
Amelanchier alnifolia	service-berry,Saskatoon	FACU
Anthemis cotula	mayweed	FACU
Aquatic Macrophytes		NL
Artemisia frigida	prairie sagewort	NL
Aster spp.		NL
Bassia hyssopifolia	smother-weed,five-horn	FACW
Beckmannia syzigachne	sloughgrass,American	OBL
Bidens cernua	**beggar-ticks,nodding**	FACW+
Brassica spp.		NL
Bromus inermis	smooth brome	NL
Bromus tectorum	cheatgrass	NL
Capsella bursa-pastoris	purse,common shepherd's	FAC-
Cardaria chalepensis	lenspod whitetop	NL
Carex lanuginosa	sedge,wooly	OBL
Carex praegracilis	sedge,clustered field	FACW
Carex stipata	**awlfruit sedge**	NL
Carex rostrata (utriculata)*	beaked sedge	OBL
Carex vulpinoidea	sedge,fox	OBL
Centaurea maculosa	spotted knapweed	NL
Chara spp.		NL
Chenopodium album	goosefoot,white	FAC
Chenopodium rubrum	**goosefoot,coast-blite**	FACW+
Chrysothamnus nauseousus	rubber rabbitbrush	NL
Cichorium intybus	chicory	NL
Cirsium arvense	thistle,creeping	FACU+
Cirsium vulgare	thistle,bull	FACU
Crataegus douglasii	hawthorn,Douglas'	FAC
Deschampsia cespitosa	hairgrass,tufted	FACW
Descurainia sophia	common tansymustard	NL
Distichlis spicata	saltgrass,seashore	FAC+
Eleocharis palustris	spikerush,creeping	OBL
Elymus cinereus	**wild-rye,basin**	NI

[1]Region 9 Northwest (Reed 1988).
Species identified in 2010 are listed in **bold** type.
*Commonly accepted name not included on 1988 list.

Table 2 (Continued). Vegetation species observed at Lonepine Wetland Mitigation Site from 2008 to 2010.

Elymus triticoides	**wild-rye,creeping**	FAC
Elymus varnensis	tall wheatgrass	NL
Epilobium palustre	**willow-herb,marsh**	OBL
Festuca spp.		NL
Glyceria grandis	**American mannagrass**	NL
Glyceria maxima	meadowgrass,reed	OBL
Glyceria striata	**grass,fowl manna**	OBL
Glycyrrhiza lepidota	licorice,American	FAC+
Grindelia squarrosa	gumweed,curly-cup	FACU
Halogeton glomeratus	saltlover	NL
Hordeum brachyantherum	barley,meadow	FACW
Hordeum jubatum	barley,fox-tail	FAC+
Juncus balticus	rush,Baltic	OBL
Kochia scoparia	summer-cypress,Mexican	FAC
Lactuca serriola	lettuce,prickly	FAC-
Lemna minor	**duckweed,lesser**	OBL
Lepidium densiflorum	pepper-grass,dense-flower	FAC-
Lepidium perfoliatum	pepper-grass,clasping	FACU+
Malva neglecta	common mallow	NL
Matricaria perforata	mayweed,scentless	NI
Medicago lupulina	**medic,black**	FAC
Medicagoa spp.		NL
Melilotus alba	sweetclover,white	FACU
Melilotus officinalis	sweetclover,yellow	FACU
Monolepis nuttalliana	**poverty-weed,Nuttall's**	FAC-
Phalaris arundinacea	grass,reed canary	FACW
Phleum pratense	timothy	FACU
Poa juncifolia	**bluegrass,alkali**	FACU+
Poa palustris	**bluegrass,fowl**	FAC
Poa pratensis	bluegrass,Kentucky	FACU+
Polygonum amphibium	smartweed,water	OBL
Polygonum lapathifolium	willow-weed	FACW+
Polygonum spp.		NL
Polypogon monspeliensis	**grass,annual rabbit-foot**	FACW+
Populus deltoides	cotton-wood,Eastern	FAC
Populus balsamifera (trichocarpa)*	black cottonwood	FAC
Potentilla fruticosa	cinquefoil,shrubby	FAC-
Puccinellia nuttalliana	**grass,Nuttall's alkali**	OBL
Ribes aureum	**currant,golden**	FAC+
Ribes spp.		NL
Rosa spp.		NL
Rosa woodsii	**rose,Woods**	FACU
Rumex crispus	dock,curly	FACW

[1]Region 9 Northwest (Reed 1988).
Species identified in 2010 are listed in **bold** type.
*Commonly accepted name not included on 1988 list.

Table 2 (Continued). Vegetation species observed at Lonepine Wetland Mitigation Site from 2008 to 2010.

Salix alba	willow,white	FACW
Salix amygdaloides	willow,peach-leaf	FACW
Salix bebbiana	willow,bebb	FACW
Salix exigua	willow,sandbar	OBL
Salix lutea	willow,yellow	OBL
Sarcobatus vermiculatus	greasewood,black	FACU+
Scirpus acutus	bulrush,hard-stem	OBL
Scirpus americanus	bulrush,Olney's	OBL
Scirpus maritimus	bulrush,saltmarsh	OBL
Scirpus microcarpus	bulrush,small-fruit	OBL
Sisymbrium altissimum	mustard,tall tumble	FACU-
Solanum dulcamara	**nightshade,climbing**	FAC
Solidago spp.		NL
Sonchus arvensis	**sowthistle,field**	FACU+
Sparganium emersum	burreed,narrow-leaf	OBL
Suaeda depressa	**seepweed,pursh**	FACW-
Symphoricarpos occidentalis	**snowberry,Western**	NL
Symphoricarpos spp.		NL
Taraxacum officinale	**dandelion,common**	FACU
Thlaspi arvense	penny-cress,field	NI
Tragopogon dubius	yellow salsify	NL
Trifolium repens	clover,white	FACU+
Typha latifolia	cattail,broad-leaf	OBL

[1]Region 9 Northwest (Reed 1988).
Species identified in 2010 are listed in **bold** type.

Table 3. Transect 1 data summary for 2008 to 2010.

Vegetation Community Transitions along Transect	0	0	0
Vegetation Communities along Transect	1	1	1
Hydrophytic Vegetation Communities along Transect	0	1	1
Total Vegetative Species	2	5	14
Total Hydrophytic Species	2	5	12
Total Upland Species	0	0	2
Estimated % Total Vegetative Cover	1	75	90
% Transect Length Comprising Hydrophytic Vegetation	0	100	100
% Transect Length Comprising Upland Vegetation	0	0	0
% Transect Length Comprising Unvegetated Open Water	100	0	0
% Transect Length Comprising Bare Substrate	0	0	0

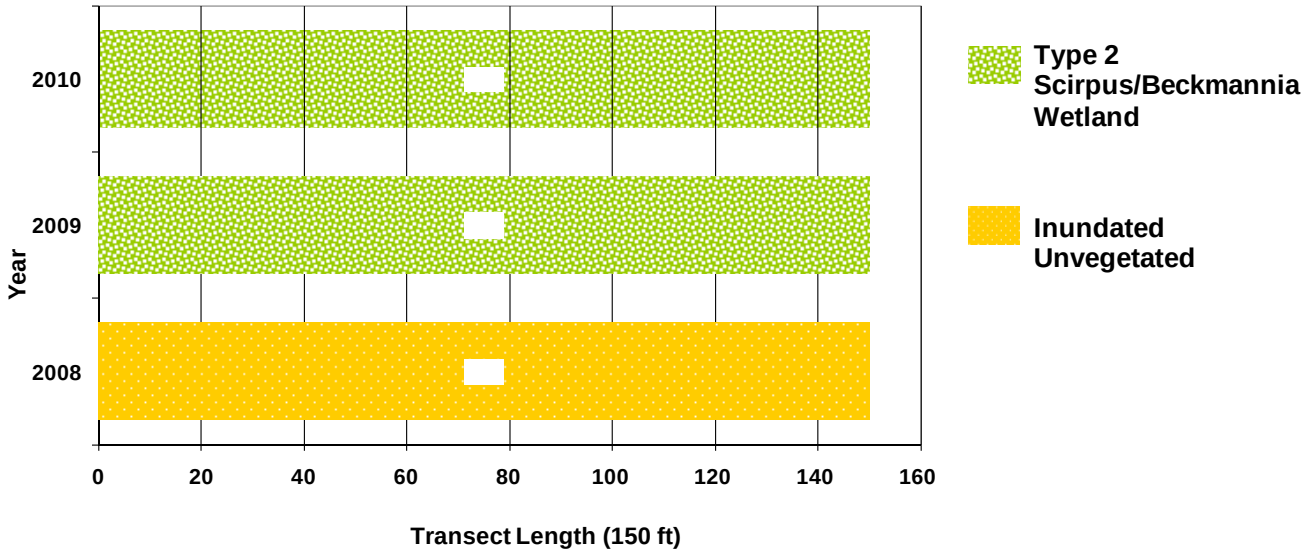


Chart 1. Transect 1 maps showing vegetation types in 2008 to 2010 from the start to end of the transect.

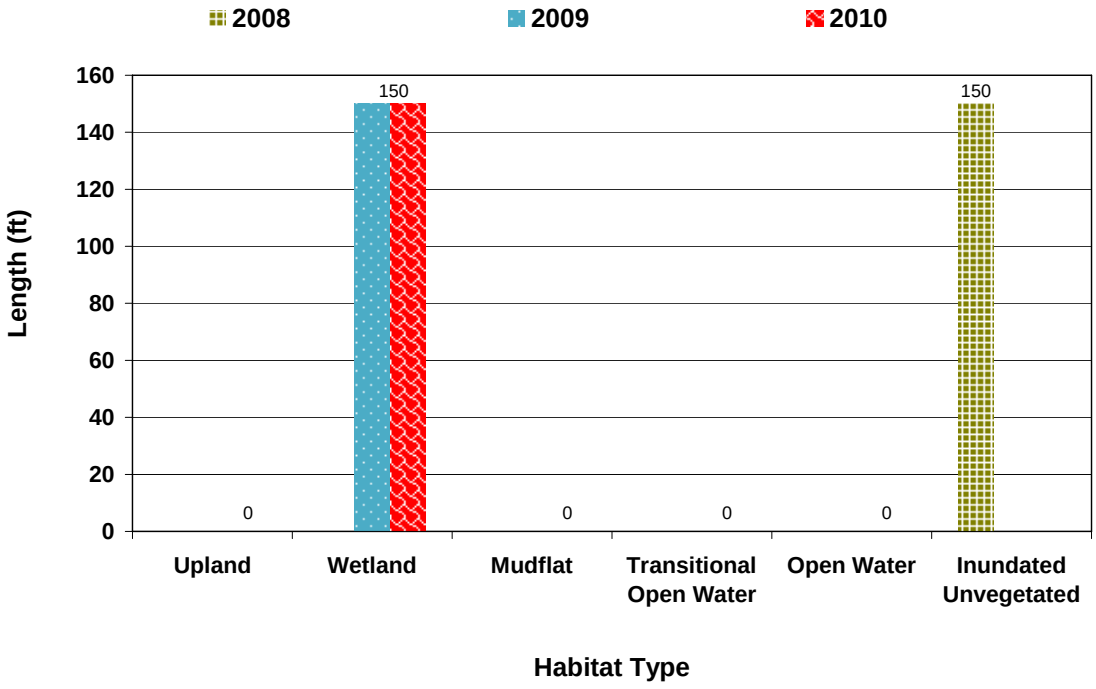


Chart 2. Length of vegetation communities within Transect 1 from 2008 to 2010.

Table 4. Transect 2 data summary for 2008 to 2010.

Vegetation Community Transitions along Transect	2	2	0
Vegetation Communities along Transect	3	3	1
Hydrophytic Vegetation Communities along Transect	0	2	1
Total Vegetative Species	3	11	11
Total Hydrophytic Species	2	7	11
Total Upland Species	1	4	0
Estimated % Total Vegetative Cover	9	75	85
% Transect Length Comprising Hydrophytic Vegetation	0	93	100
% Transect Length Comprising Upland Vegetation Communities	34	7	0
% Transect Length Comprising Unvegetated Open Water	66	0	0
% Transect Length Comprising Bare Substrate	0	0	0

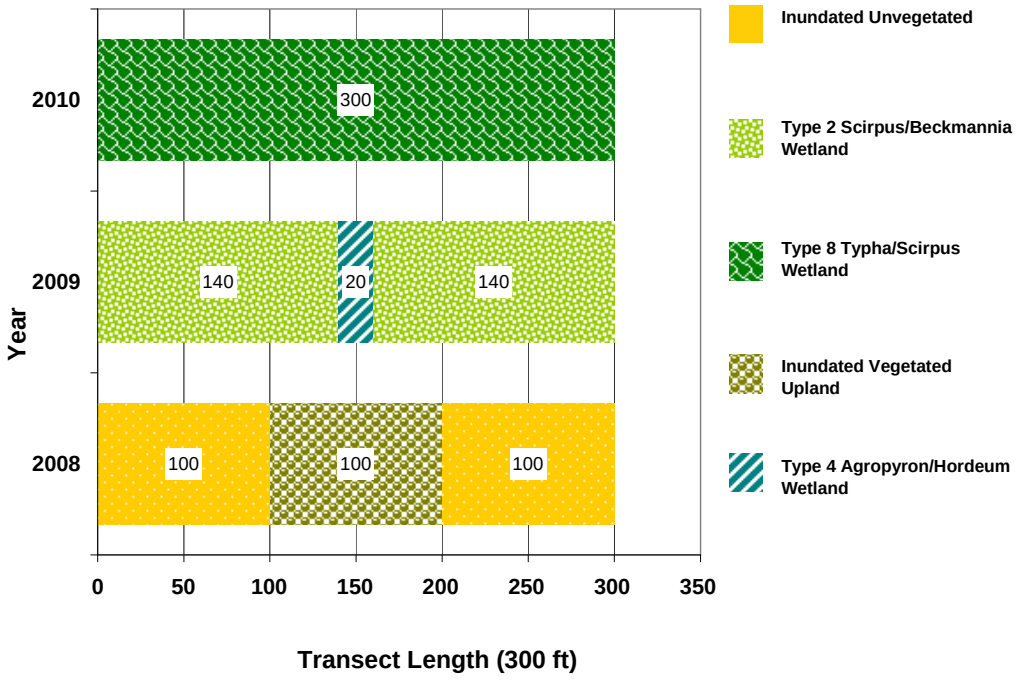


Chart 3. Transect 2 maps showing vegetation types from the start to end of transect in 2008 to 2010.

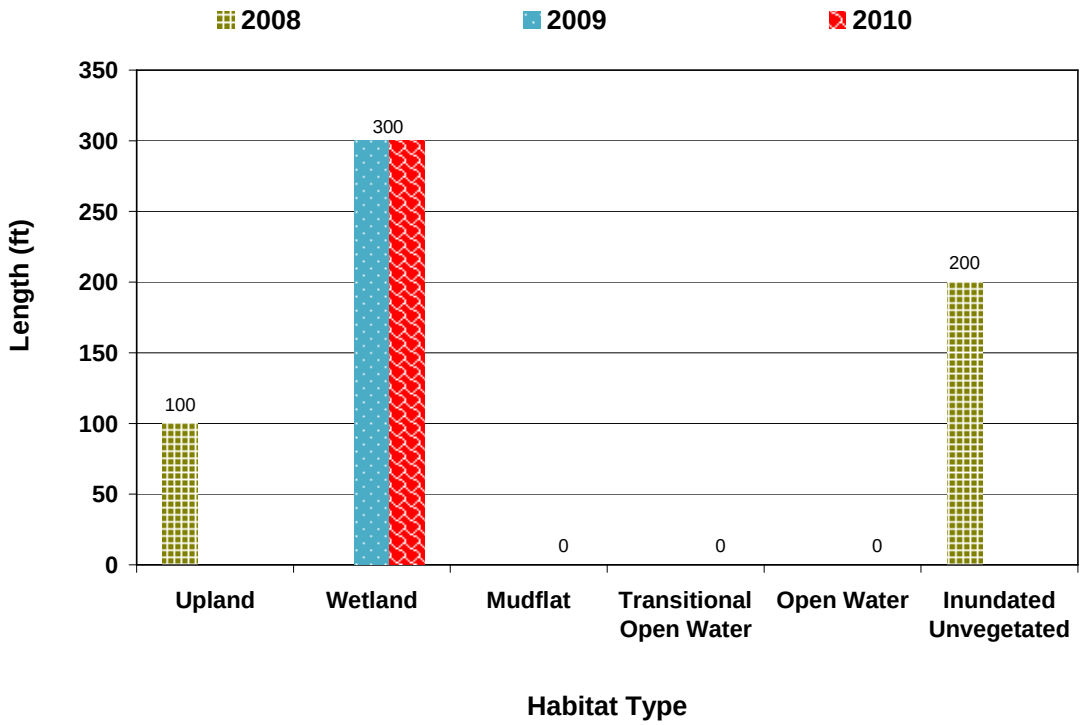


Chart 4. Length of vegetation communities within Transect 2 from 2008 to 2010.

Infestations of Canada thistle, a Priority 2B noxious weed, were noted on Figure 3 (Appendix A). The infestations were identified primarily in the upland perimeter in the southwest portion of the site and 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 low (less than 1 percent) to moderate (5 to 25 percent).

The original revegetation design specified 580 woody plantings (shrubs) and 500 willow sprigs (cuttings). The 285 woody plants identified during 2009 were primarily willows located along the Dry Fork Creek corridor (PBS&J 2009). The root systems of several containerized shrubs were exposed during watering, killing a majority of the containerized species. Approximately 270 dead willow cuttings were replaced along Dry Fork Creek in November 2008. Live woody plantings were observed only along the reconstructed banks of Dry Fork Creek in 2009 and in 2010.

3.3. Soil

The existing soil structure was disturbed during 2008 construction. 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. The soil sample collection points are shown on Figure 2 (Appendix A). Results from the 2009 sampling were erroneous, and therefore, were not included in the previous report.

Table 5. Soil sample results measuring pH, EC, Ca, Mg, Na, and SAR.

2003 Baseline-Cell 2	10.6	23.1	0.8	0.22	357	500
2008 SS-1	7.6	4.87	25.5	14.4	28.3	6.34
2008 SS-2	7.7	5.24	26.9	10.5	36.5	8.43
2010 SS-1	7.5	4.3	18.8	6.8	22.4	6.3
2010 SS-2	8	0.87	1.9	1.1	4.6	3.8

The EC levels have decreased measurably at both sample locations since the baseline samples were analyzed in 2003. The EC SS-2 decreased from 5.24 mmhos/cm in 2008 to 0.87 mmhos/cm in 2010, which reflected measured decreases in the levels of calcium, magnesium and sodium from 2008 to 2010. The SAR measured at SS-2 decreased from 8.43 in 2008 to 3.8 in 2010. The decreases in EC, salt ions, and SAR from 2008 to 2010 were less notable at SS-1 than at SS-2. The performance standards for hydric soil specified the following maximum limits for the treated slickspot areas: pH of 10.6, 357 meq/L of sodium, SAR of 500, and EC of 23.1 mmhos/cm. The 2010 soil sample results at both locations were several times lower than the specified limits.

Ten test pits were excavated at the Lonepine monitoring site location. Data points C1D to 5D were located in upland areas and C1W to 5W were located in wetland areas. Test pits C1D, C2D, and C5D revealed dark grayish brown (10YR 4/2), silty clay loam soils with no redox features. Test pit C3D revealed a grayish brown (2.5Y 5/2), silty clay soil with no redox features. Test pit C4D revealed a very dark gray brown (10YR 3/2) silty clay soil with no redox features. Test pits C1W and C2W both revealed a very dark gray (10YR 3/1), silty clay loam soil. Test pit C1W exhibited gleyed soil horizons and low chroma soils. Test pit C3W revealed a gray (5Y 5/1) silty clay soil with gleyed and low chroma soils. Test pits C4W and C5W both revealed dark gray (10YR 4/1) silty clay soil. The area surrounding the data points located in wetlands was nearly 100 percent inundated.

3.4. Wetland Delineation

Ten data points were used to determine the wetland and upland boundaries shown on Figure 3 (Appendix A). The Wetland Data Forms are included in Appendix B. The total area of aquatic habitat delineated in 2010 encompassed 32.07 acres that included 7.13 acres of pre-existing wetland, 22.61 acres of created emergent wetland, and 2.33 acres of open water. There was an overall increase of 3.2 acres in wetland habitat from 2009 to 2010.

Table 6. Aquatic habitat acreage identified in 2009 and 2010.

Total Aquatic Habitat	21.74*	32.07
Open Water		2.33
Pre-existing Wetlands	7.1	7.13
Net Wetlands		22.61

*Open water category not differentiated in 2009.

3.5. Wildlife

The Lonepine wetland complex provides habitat for several wildlife species. The MDT wetland staff observed 15 bird species in spring 2009 and three mammal and four bird species in August 2009 (PBS&J 2009). Animal species observed directly and indirectly in 2010 included frog spp., deer spp. and coyote (*Canis latrans*). Although birds, including waterfowl and shorebirds, were observed during the 2010 monitoring event, no species were recorded on the data form.

Table 7. Wildlife species observed at the Lonepine Wetland Mitigation Site from 2008 to 2010.

AMPHIBIAN	
Frog spp.	
BIRD	
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*
Common Nighthawk	*Chordeiles minor*
Great Blue Heron	*Ardea herodias*
Greater Yellowlegs	*Tringa melanoleuca*
Green-winged Teal	*Anas crecca*
Killdeer	*Charadrius vociferus*
Long-billed Curlew	*Numenius americanus*
Mallard	*Anas platyrhynchos*
Northern Shoveler	*Anas clypeata*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-necked Pheasant	*Phasianus colchicus*
Spotted Sandpiper	*Actitis macularius*
MAMMAL	
Coyote	***Canis latrans***
Deer spp.	
Meadow Vole	*Microtus pennsylvanicus*

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

3.6. Functional Assessment

The baseline assessment completed in 2003 was assessed using the 1999 MWAM. Functional assessments completed for 2008 to 2010 used the 2008 MWAM. The site was separated into two AAs, the five constructed cells and the Dry Fork Creek riparian area. The respective acreages were 23.6 acres and 8.47 acres. Table 8 summarizes the results of the 2003 (Baseline) and 2009 and 2010 functional assessments. The 2010 assessment forms are included in Appendix B.

The overall wetland category improved for both AAs from Category III wetlands in 2009 to Category II wetlands in 2010. The percent of possible points for the Dry Creek riparian area increased from 56 percent in 2009 to 70 percent in 2010 with point increases in general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, groundwater discharge/recharge, and recreation/education potential. The Dry Creek riparian corridor provided documented secondary habitat for the great blue heron and the bald eagle, and incidental habitat for the long-billed curlew and American white pelican.

The constructed wetland cells received 72 percent of the total points possible in 2010, an increase of 15 percentage points from 2009. Ratings were high for general wildlife habitat, short and long term surface water storage, production export/food chain, groundwater discharge/recharge, and recreation/education potential bonus points.

The net acreage gain across the site since 2003 was 24.89 acres. The total functional units achieved at the site in 2010 were 218.62, with a net functional unit gain for both assessment areas of 183.68 compared to the 2003 baseline conditions.

3.7. Photo Documentation

Representative photographs of the project site taken from photo points PP1 through PP12 are shown on pages C-1 through C-9 of Appendix C. The transect end points are shown on pages C-8 and C-9 of Appendix C.

3.8. Maintenance Needs

Infestations of Canada thistle, a Priority 2B noxious weed, were noted on Figure 3 (Appendix A). The infestations were associated primarily with the upland perimeter in the southwest portion of the site and the riparian corridor. The MDT completed weed spraying in spring 2010. Spraying should continue in subsequent years to control noxious weed populations. Although live woody species were observed along the Dry Fork Creek corridor, additional cuttings should be planted to further promote the enhancement of woody shrub cover within the riparian wetland.

Table 8. Summary of the 2003 Baseline and 2009 to 2010 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	2009[2] Dry Fork Creek	2009[2] Cells 1-5	2010[2] Dry Fork Creek	2010[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)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Low (0.3)	Low (0.1)	Mod (0.7)	Mod (0.7)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	Mod (0.4)	NA	Mod (0.4)	NA	Mod (0.5)	NA
Flood Attenuation	Mod (0.5)	NA	Mod (0.6)	NA	Mod (0.6)	NA
Short and Long Term Surface Water Storage	Mod (0.6)	Low (0.3)	Mod (0.6)	High (0.9)	High (0.8)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	NA	Mod (0.7)	Mod 0.7	High (1.0)	Mod (0.7)
Sediment/Shoreline Stabilization	Mod (0.6)	NA	Mod (0.6)	Mod (0.6)	Mod (0.7)	Mod (0.7)
Production Export/ Food Chain Support	High (0.8)	Low (0.1)	High (0.8)	Mod (0.7)	High (1.0)	High (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.4)	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)
Recreation/Education Potential (bonus points)	Low (0.1)	Low (0.1)	Mod (0.1)	High (0.15)	High (0.2)	High (0.2)
Actual Points / Possible Points	**5.0 / 12**	**1.9 / 8**	**6.2 / 11**	**5.15 / 9**	**7.7 / 11**	**6.5 / 9**
% of Possible Score Achieved	**47%**	**24%**	**56%**	**57%**	**70%**	**72%**
Overall Category	**III**	**IV**	**III**	**III**	**II**	**II**
Acreage of Assessed Aquatic Habitats within Easement (ac)	**6.87**	**0.31**	**7.64**	**21.23**	**8.47**	**23.60**
Functional Units (acreage x actual points) **(f[1]-)**	**34.35**	**0.59**	**47.37**	**109.33**	**65.22**	**153.40**
Net Acreage Gain (ac)	NA		**21.69**		**24.89**	
Net Functional Unit Gain (fu)	NA		**121.76**		**183.68**	

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

3.9. Current Credit Summary

The total area of aquatic habitat delineated in 2010 encompassed 32.07 acres that included 7.13 acres of pre-existing wetland, 22.61 acres of created emergent wetland and 2.33 acres of open water. The total acreage of aquatic habitat increased 3.2 acres in 2010 as a result of wetland development along the margins of the created wetlands.

Table 9 summarizes the credit acreage estimates for 2009 and 2010. The CSKT and USACE will authorize the final mitigation credits earned at the site. The credit estimate calculated in 2010 totaled 12.98 credit acres based on the CSKT credit ratios, an increase of 0.87 acres since 2009. The USACE 2010 credit estimate was 26.42 credit acres, an increase of 2.59 acres since 2009. The USACE credit for the new Dry Fork channel was reduced by 0.16 acres to account for the lack of survival of the planted woody species. The USACE credit for the riparian intercell swales was also reduced by 0.06 acres to address the lack of planting success for the woody species. The mitigation areas were compared to the performance standards. A majority of the performance standards have been met except for the standard addressing the planted shrub densities. Survival of woody species was significantly less than the 75 percent target. The 2010 net wetland acreage gain (since 2003) was 24.89 acres and the net functional unit gain was 184.86.

Table 9. The 2009 and 2010 Tribal (CSKT) and USACE estimated credit acreages at the Lonepine Wetland Mitigation Site.

PROPOSED FEATURE	2009 DELINEATED ACRES	CSKT CREDIT RATIOS	2009 ESTIMATED CSKT CREDIT ACRES	CSKT CREDIT TARGET (ACRES)	USACE CREDIT RATIOS	USACE 2009 ESTIMATED CREDIT ACRES	USACE CREDIT TARGET	2010 DELINEATED ACRES	2010 ESTIMATED CSKT CREDIT ACRES	USACE 2010 ESTIMATED CREDIT ACRES
Wetland cells, wetland excavation, and designed intercell swales that have developed into wetlands	21.58	1:3.04	7.10	7.02	1:1 (OW limited to 10% of wetlands)	21.58	21.35	23.34	7.68	23.34
New Dry Fork channel and wetland fringe along dam face	0.16	1:1.54	0.10	0.19	1:1	0.16 (not included in total)	0.3	1.54	0.84	1.38*
New Dry Fork Creek channel in pre-existing Wetland 1	0.04	1:1.54	0.03	0.03	1:1.5	0.03	0.03	0.04	0.03	0.03
Dry Fork Creek meander re-activation	0.26	1:1.54	0.17	0.17	1:1.5	0.17	0.17	0.26	0.17	0.17
Protection / grazing removal at pre-existing wetlands	7.13	1:1.54	4.63	4.31	1:5	1.43	1.33	7.13	4.63	1.43
Riparian intercell swales	0.24	1:3.04	0.08	0.14	1:4	0.06 (not included in total)	0.11	0.24	0.08	0.00**
Upland buffer	4.45	None (no planting proposed)	0.00	0.00	1:4 (max. 50-ft width)	0.56	0.56	2.23	0.00	0.56
TOTAL	**33.86**		**12.11**	**11.86**		**23.83**	**23.85**	**34.78**	**13.43**	**26.90**

4. REFERENCES

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Appendix A

Figures 2 and 3

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

Figure 2: 2010 Monitoring Activity Locations

Cell4WDdry
Cell4WDwet
S2
PP9
PP1
S1
Cell2WDdry
Cell2WDwet
PP2
Cell1WDdry
Cell1WDwet
PP3
PP14
T-2 end
T-2 start
PP12
PP13
PP7
Cell5WDwet
Cell5WDdry
PP8
PP6
T-1 end
T-1 start
PP10
Cell3WDwet
Cell3WDdry
PP5
PP4
PP15

Legend

- Vegetation Transect
- Monitoring Limits
- DataPoints
- PhotoPoints
- Soil Sample Locations

Base Photography Date: July 15, 2010

N

0 125 250 500

Feet

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

LOCATION: Sanders Co., MT

PROJECT NO: STPX 45(33)

FILE: LonePine/Monitor2010.mxd

Project Name
Lone Pine Wetland Mitigation Site

Drawing Title
2010 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JL

SCALE: Noted

Drawn: November 3, 2010

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 2

REV -

Figure 3: 2010 Mapped Site Features

Acreages

Project Area	79.49 acres
Gross Wetlands	32.07 acres
Open Water (10)	2.33 acres
Pre-existing Wetlands	7.13 acres
Vegetated Wetlands	24.94 acres
Uplands	47.42 acres

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)

Vegetation Community Types

2 Scirpus spp./Beckmannia syzigachne
4 Agropyron trachycaulum
5 Agropyron trachycaulum/Elymus triticoides
6 Kochia scoparia
7 Phalaris arundinacea/Salix spp.
8 Typha latifolia/Scirpus spp.
9 Beckmannia syzigachne/Glyceria striata
11 Distichlis spicata/Kochia scoparia
12 Puccinellia nuttalliana

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities
Open Water (10)

Base Photography Date: July 15, 2010

N

0 125 250 500
Feet

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

LOCATION: Sanders Co., MT
PROJECT NO: STPX 45(33)
FILE: LonePine/Veg2010.mxd

Project Name: Lone Pine Wetland Mitigation Site
Drawing Title: 2010 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED JL
SCALE: Noted
Drawn: November 3, 2010
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2010 MDT Wetland Mitigation Site Monitoring Form
2010 USACE Wetland Determination Data Form
2010 MDT 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 8/22/2010

Person(s) conducting the assessment: J. Asebrook, J. Hintz

Weather: overcast, light rain, warm Location: LonePine

MDT District: Missoula Milepost: 0

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

Initial Evaluation Date: 7/25/2008 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 80 (acres)

Land use surrounding wetland:

agriculture, reservoir

HYDROLOGY

Surface Water Source: Lower Dry Fork Reservoir via the Camas C Canal

Inundation: ☑ Average Depth: 1 **(ft)** Range of Depths: 0-2 **(ft)**

Percent of assessment area under inundation: 40 %

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

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

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

Groundwater Monitoring Wells

Record depth of water surface below ground

Additional Activities Checklist:

☐ Map emergent vegetation-open water boundary on aerial photograph.

☐ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)

☐ Use GPS to survey groundwater monitoring well locations, if present.

Hydrology Notes:

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 # 2 **Community Type:** Scirpus spp. / Beckmannia syzigachne

Species	Cover class	Species	Cover class
Agropyron trachycaulum	0	Algae, green	3
Alisma plantago-aquatica	0	Alopecurus pratensis	0
Beckmannia syzigachne	4	Brassica spp.	0
Chara spp.	3	Cirsium arvense	0
Eleocharis palustris	1	Elymus triticoides	0
Epilobium palustre	0	Glyceria striata	1
Hordeum jubatum	0	Lactuca serriola	0
Lemna minor	1	Phalaris arundinacea	0
Poa juncifolia	0	Puccinellia nuttalliana	0
Rumex crispus	0	Scirpus acutus	4
Scirpus maritimus	4	Typha latifolia	2

Comments:

This wetland community is also similar to Type 8 (now merged version of Types 3 and 8 from 2009). May merge Type 2 with Type 8 in future.

Community # 4 **Community Type:** Agropyron trachycaulum /

Species	Cover class	Species	Cover class
Agropyron trachycaulum	5	Algae, brown	2
Alopecurus pratensis	1	Beckmannia syzigachne	3
Chara spp.	0	Chenopodium rubrum	0
Cirsium arvense	0	Eleocharis palustris	0
Elymus triticoides	1	Glycyrrhiza lepidota	0
Hordeum jubatum	0	Kochia scoparia	0
Lactuca serriola	0	Lemna minor	0
Lepidium perfoliatum	0	Monolepis nuttalliana	1
Poa juncifolia	0	Polygonum amphibium	0
Rumex crispus	0	Scirpus acutus	0
Scirpus maritimus	1	Sparganium emersum	0
Trifolium repens	0	Typha latifolia	1

Comments:

Community 4 = combination of 2009 communities 1 and 4. Community 1 appears to have become wetter over time and now resembles community 4.

Community # 5 Community Type: Agropyron trachycaulum / Elymus triticoides

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron trachycaulum	4
Alopecurus pratensis	0	Anthemis cotula	1
Bromus inermis	2	Chenopodium rubrum	1
Cichorium intybus	0	Cirsium arvense	1
Crataegus douglasii	1	Distichlis spicata	0
Elymus triticoides	4	Glycyrrhiza lepidota	0
Grindelia squarrosa	0	Halogeton glomeratus	0
Hordeum jubatum	1	Kochia scoparia	2
Lepidium perfoliatum	2	Medicago lupulina	0
Melilotus alba	0	Melilotus officinalis	0
Monolepis nuttalliana	1	Phalaris arundinacea	0
Poa pratensis	0	Polygonum lapathifolium	0
Populus deltoides	0	Puccinellia nuttalliana	1
Rosa woodsii	0	Rumex crispus	0
Sisymbrium altissimum	0	Sonchus arvensis	1
Suaeda depressa	0	Symphoricarpos occidentali	1
Taraxacum officinale	0	Tragopogon dubius	0

Comments:

This upland community is very weedy but has higher vegetation cover than Type 5 with more weedy grasses. DISSPI and SUE in wetter openings.

Community # 6 Community Type: Kochia scoparia /

Species	Cover class	Species	Cover class
Agropyron repens	1	Agropyron trachycaulum	1
Chenopodium rubrum	2	Cirsium arvense	0
Cirsium vulgare	0	Distichlis spicata	0
Elymus cinereus	0	Elymus triticoides	1
Grindelia squarrosa	0	Halogeton glomeratus	1
Hordeum jubatum	0	Kochia scoparia	5
Lepidium perfoliatum	2	Melilotus alba	0
Puccinellia nuttalliana	0	Rumex crispus	0
Sonchus arvensis	1	Suaeda depressa	0

Comments:

This upland area has open, sandy areas that often have low vegetation cover. A few areas have standing water where DISSPI is present.

Community # 7 Community Type: Phalaris arundinacea / Salix spp.

Species	Cover class	Species	Cover class
Agrostis alba	1	Alopecurus pratensis	3
Aster spp.	0	Beckmannia syzigachne	1
Bromus inermis	0	Chara spp.	4
Cirsium arvense	1	Elymus triticoides	2
Epilobium palustre	0	Glyceria grandis	0
Glyceria striata	1	Hordeum jubatum	0
Phalaris arundinacea	4	Puccinellia nuttalliana	1
Ribes aureum	0	Salix exigua	2
Salix lutea	0	Solanum dulcamara	0
Sonchus arvensis	1	Suaeda depressa	0
Typha latifolia	0		

Comments:

Thin wetland strip that has been planted with willow and other shrub species.

Community # 8 Community Type: Typha latifolia / Scirpus spp.

Species	Cover class	Species	Cover class
Agropyron trachycaulum	1	Alisma plantago-aquatica	0
Alopecurus pratensis	2	Beckmannia syzigachne	1
Bidens cernua	0	Carex lanuginosa	0
Carex stipata	0	Chara spp.	1
Cirsium arvense	1	Distichlis spicata	0
Eleocharis palustris	1	Elymus triticoides	0
Glyceria grandis	1	Hordeum jubatum	1
Juncus balticus	0	Kochia scoparia	0
Lemna minor	2	Lepidium perfoliatum	0
Phalaris arundinacea	1	Poa palustris	0
Polygonum amphibium	0	Polygonum lapathifolium	0
Polygonum spp.	0	Polypogon monspeliensis	0
Puccinellia nuttalliana	0	Rumex crispus	0
Scirpus acutus	3	Scirpus maritimus	1
Sparganium emersum	1	Trifolium repens	0
Typha latifolia	5		

Comments:

This wetland community is now a merged type that combined Type 3 and Type 8 of 2009. The existing Type 2 is becoming very similar to this.

Community # 9 Community Type: Beckmannia syzigachne / Glyceria striata

Species	Cover class	Species	Cover class
Agropyron trachycaulum	0	Alopecurus pratensis	3
Beckmannia syzigachne	4	Bromus inermis	0
Cirsium arvense	0	Deschampsia cespitosa	0
Elymus triticoides	1	Glyceria striata	3
Hordeum jubatum	0	Phalaris arundinacea	1
Phleum pratense	0	Poa juncifolia	1
Poa pratensis	0	Puccinellia nuttalliana	1
Scirpus maritimus	1	Sonchus arvensis	0

Comments:

This is a small wetland type community just south of the planted creek area.

Community # 10 Community Type: open water /

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Beckmannia syzigachne	1
Chara spp.	2	Elymus triticoides	0
Glyceria striata	1	Hordeum jubatum	0
Lemna minor	1	Open Water	5
Scirpus acutus	1	Scirpus maritimus	0
Typha latifolia	1		

Comments:

This community represents the open water type.

Community # 11 Community Type: Distichlis spicata / Kochia scoparia

Species	Cover class	Species	Cover class
Distichlis spicata	4	Halogeton glomeratus	3
Kochia scoparia	4	Puccinellia nuttalliana	1

Comments:

Very small wet area (lumped with Type 6 in 2009) at north end of property that is clearly dominated by DISSPI and KOCSCO.

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

Species	Cover class	Species	Cover class
Agropyron trachycaulum	1	Algae, green	1
Beckmannia syzigachne	0	Chara spp.	2
Elymus triticoides	0	Hordeum jubatum	0
Lemna minor	0	Open Water	2
Puccinellia nuttalliana	4	Scirpus acutus	0
Scirpus maritimus	0	Sparganium emersum	0
Typha latifolia	1		

Comments:

Also small wetland type that occupies man-made undulating outlet channel at the bottome of all the wetland cells

VEGETATION TRANSECTS

Site: Lonepine Date: 8/22/2010

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

Interval Data:

Ending Station 150 **Community Type:** Scirpus spp. / Beckmannia syzigachne

Species	Cover class	Species	Cover class
Algae, green	3	Alisma plantago-aquatica	0
Alopecurus pratensis	1	Aquatic Macrophytes	5
Beckmannia syzigachne	1	Eleocharis palustris	1
Glyceria striata	1	Hordeum jubatum	0
Lemna minor	3	Open Water	5
Phalaris arundinacea	0	Puccinellia nuttalliana	0
Scirpus acutus	4	Scirpus maritimus	1
Typha latifolia	2		

Transect Notes:

150 foot transect.
Beginning and end of transect is close to Type 6.

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

Interval Data:

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

Species	Cover class	Species	Cover class
Alisma plantago-aquatica	0	Alopecurus pratensis	2
Beckmannia syzigachne	4	Eleocharis palustris	0
Hordeum jubatum	0	Phalaris arundinacea	0
Puccinellia nuttalliana	0	Rumex crispus	0
Scirpus acutus	1	Scirpus maritimus	3
Typha latifolia	5		

Transect Notes:

300 foot transect. No stake at start - not sure it was lined up exactly. Stake at end had fallen in the water. Put back in as best we could. Transect was initially established to run adjacent to dike area to monitor eroding 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 each side of transect.

PLANTED WOODY VEGETATION SURVIVAL

Lonepine

Planting Type	#Planted	#Alive	Notes
Amelanchier alnifolia	60	0	Number planted unknown. Heat stress
Artemisia cana	65	0	Number planted unknown. Possibly substituted Potentill fruiticosa. Heat stress
Chrysothamnus nauseousus	65	0	Number planted unknown. Heat stress
Crataegus douglasii	60	0	Number planted unknown. Heat stress
Crataegus douglasii	45	0	Number planted unknown. Heat stress
Populus trichocarpa	50	0	Number planted unknown. Heat stress
Ribes aureum	70	2	Living stems in vegetation community 7
Roas woodsii	45	0	Number planted unknown. Heat stress
Salix amygdaloides	60	0	Number planted unknown. Heat stress
Salix lasiandra	60	0	Number planted unknown. Heat stress
Salix spp. cuttings	500	200	Primarily Salix exigua observed along veg com 7

Comments

Live woody vegetation observed along Dry Fork Creek meander in 2010.

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

Bird Comments

Although waterfowl, shorebirds, and other avian species were observed during the 2010 monitoring, no specific species were noted.

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
Coyote		No	Yes	No	
Deer spp.	2	Yes	Yes	No	
Frog spp	1	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
1, 2	47.69633478	-114.66879381	90	PP1: view looking east; has stake
0,11,12,13,14,1	47.6990636	-114.66864109	180	PP3: view looking south
16,17,18,19	47.69960817	-114.6686369	180	PP14: view looking south
20,21,22,23,24	47.69881801	-114.66612266	270	PP4: view looking west
25	47.69865096	-114.66735438	180	PP10: looking south along start of Tr1
26			0	PP5: view looking north along Dry Fork Creek
27, 28, 29, 30, 3	47.69649471	-114.66687025	270	PP6: view looking west
3, 4, 5, 6	47.69633478	-114.66879381	0	PP1: view looking north
32, 33	47.69423705	-114.66730996	0	PP12: looking north along start of Tr2
34	47.69423705	-114.66730996	180	new photo: looking south along start of Tr2
35	47.69339458	-114.66722346	180	PP13: looking south along end of Tr2
38, 39, 40	47.6921782	-114.66561757	315	PP8: view looking northwest
41,42,43,44,45	47.6921326	-114.66663999	315	PP7: view looking northwest
46, 47, 48	47.6921782	-114.66561757	90	PP8: view looking east
49,50,51,52,53	47.69947473	-114.66554021	180	PP15: view looking south
7	47.6959555	-114.66876791	180	PP9: view looking south
8,9	47.69779617	-114.66873136	90	PP2: view looking east; has a series of stakes

Comments:

ADDITIONAL ITEMS CHECKLIST

Hydrology

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

Photos

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

Vegetation

☐ Map vegetation community boundaries

☐ Complete Vegetation Transects

Soils

☐ Assess soils

Wetland Delineations

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

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired? No

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

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

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

If no, describe the problems below.

Control structure in NW corner of site and outlet structures for each cell appear in good condition in 2010.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell1WDdry

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69854803 | Long: -114.66883144 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

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:
This plot is an upland companion plot to Cell 1WD wet. Despite having facultative vegetation that passes the domiance test, there is no wetland hydrology or hydric soil. It is not within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Kochia scoparia	40	☑	FAC
2. Elymus triticoides	35	☑	FAC
3. Lepidium perfoliatum	10	☐	FACU
4. Chenopodium rubrum	5	☐	FACW
5. Sueda calceoliformis	1	☐	FACW
6.		☐	
7.		☐	
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation passes Dominance Test. Facultative vegetation makes this vegetation hydrophytic.

SOIL

Sampling Point: Cell1WDdr

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
0-2	10YR 5/2	100					Silty Clay Loam	
2-18	10YR 4/2	100					Silty Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No hydric soil criteria present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: No wetland hydrology criteria present.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell1WDwet

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69854803 | Long: -114.66883144 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Scirpus maritimus	25	☑	OBL
2. Typha latifolia	20	☐	OBL
3. Agropyron trachycaulum	30	☑	FAC
4. Scirpus acutus	5	☐	OBL
5. Glyceria striata	5	☐	OBL
6. Beckmannia syzigachne	5	☐	OBL
7. Puccinellia nuttalliana	5	☐	FACW
8. Hordeum jubatum	1	☐	FAC
9. Alopecurus pratensis	1	☐	FACW
10. Distichlis spicata	1	☐	FAC
11. green algae	20	☐	
	98 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Area is dominated by hydrophytic vegetation - passes Dom Test. Also present: Chara spp. (5%) and Elymus triticoides (1%).

SOIL

Sampling Point: Cell1WDwe

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
0-1	GLEY1 3N	100					Silty Clay	
1-18	10YR 3/1	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

All soil types are mapped by the NRCS as "partially hydric". Inundated nearly 100% in Cell 1; therefore, soils meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not developed. Marklepass: fine, mixed, superactive, frigid Typic Natrixeralfs. Dry Fork: coarse-silty, mixed, active, frigid Calcic Haploxerepts. Whitearth: fine, silty, mixed, superactive frigid Typic Natrixeralfs.

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): 7

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Cell 1 is 100% inundated. Water ranges from 0-15 inches.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell2WDdry

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

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:
This plot is an upland companion plot to Cell 2WD wet. It is not within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Kochia scoparia	70	☑	FAC
2. Lepidium perfoliatum	5	☐	FACU
3. Elymus triticoides	5	☐	FAC
4. Halogeton glomeratus	10	☐	NI
5.		☐	
6.		☐	
7.		☐	
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation is hydrophytic - does pass the Dom Test

SOIL

Sampling Point: Cell2WDdr

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

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

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No hydric soil criteria present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: No wetland hydrology criteria present.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell2WDwet

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: | Long: | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Typha latifolia	40	☑	OBL
2. Scirpus acutus	20	☑	OBL
3. Scirpus maritimus	20	☑	OBL
4. Beckmannia syzigachne	5	☐	OBL
5. Alopecurus pratensis	2	☐	FACW
6. Hordeum jubatum	1	☐	FAC
7. Polypogon monspeliensis	1	☐	FACW
8. Elymus triticoides	1	☐	FAC
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Area is dominated by hydrophytic vegetation - passes Dom Test.

SOIL

Sampling Point: Cell2WDwe

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
0-20	10YR 3/1	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

All soil types are mapped by the NRCS as "partially hydric". Inundated nearly 100% in Cell 2; therefore, soils meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not developed. Marklepass: fine, mixed, superactive, frigid Typic Natrixeralfs. Dry Fork: coarse-silty, mixed, active, frigid Calcic Haploxerepts. Whitearth: fine, silty, mixed, superactive frigid Typic Natrixeralfs.

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): 3

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Cell 2 is nearly 100% inundated. Water ranges from 0-24 inches.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell3WDdry

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.6975246 | Long: -114.66689464 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

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:
This plot is an upland companion plot to Cell 3WD wet. The vegetation is hydrophytic but there is no evidence of wetland hydrology or hydric soil. It is not within a wetland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Chenopodium rubrum	40	☑	FACW
2. Elymus triticoides	15	☑	FAC
3. Kochia scoparia	15	☑	FAC
4. Agropyron trachycaulum	5	☐	FAC
5. Grindelia squarrosa	2	☐	FACU
6. Puccinellia nuttalliana	1	☐	FACW
7. Melilotus alba	1	☐	FACU
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Vegetation is hydrophytic due to FAC and FACW dominant species. Passes Dom Test.

SOIL

Sampling Point: Cell3WDdr

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 5/2	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No hydric soil criteria present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: No wetland hydrology criteria are present.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell3WDwet

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.6975246 | Long: -114.66689464 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Scirpus acutus	50	☑	OBL
2. Beckmannia syzigachne	10	☐	OBL
3. Eleocharis palustris	5	☐	OBL
4. Typha latifolia	1	☐	OBL
5. Alopecurus pratensis	1	☐	FACW
6. Puccinellia nuttalliana	2	☐	FACW
7.		☐	
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Area is dominated by hydrophytic vegetation - passes Dom Test.

SOIL

Sampling Point: Cell3WDwe

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
0-2	GLEY1 10Y	100					Silty Clay	
2-16	5Y 5/1	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

All soil types are mapped by the NRCS as "partially hydric". Inundated nearly 100% in Cell 3; therefore, soils meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not developed. Marklepass: fine, mixed, superactive, frigid Typic Natrixeralfs. Dry Fork: coarse-silty, mixed, active, frigid Calcic Haploxerepts. Whitearth: fine, silty, mixed, superactive frigid Typic Natrixeralfs.

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): 7

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Cell 3 is nearly 100% inundated. Water ranges from 0 to 24 inches.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell4WDdry

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69444349 | Long: -114.66875425 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

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:
This plot is an upland companion plot to Cell 4WD wet. Although facultative vegetation is hydrophytic, there is no sign of wetland hydrology or hydric soil. It is not within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Agropyron repens	60	☑	FAC
2. Poa pratensis	30	☑	FAC
3. Agropyron trachycaulum	10	☐	FAC
4. Glycyrrhiza lepidota	2	☐	FAC+
5. Elymus triticoides	1	☐	FAC
6. Sonchus arvensis	1	☐	FACU
7. Cirsium arvense	1	☐	FACU
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Facultative vegetation allows vegetation to pass the Dom Test.

SOIL

Sampling Point: Cell4WDdr

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No hydric soil criteria present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: No wetland hydrology indicators present.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell4WDwet

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69444349 | Long: -114.66875425 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Agropyron trachycaulum	80	☑	FAC
2. Typha latifolia	10	☐	OBL
3. Alopecurus pratensis	1	☐	FACW
4. Eleocharis palustris	1	☐	OBL
5. Scirpus maritimus	1	☐	OBL
6. Beckmannia syzigachne	1	☐	OBL
7. Scirpus acutus	1	☐	OBL
8. Cirsium arvense	1	☐	FACU
9. Monolepis nuttalliana	1	☐	FAC
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Area is dominated by hydrophytic vegetation - passes Dom Test and Prev Index.

SOIL

Sampling Point: Cell4WDwe

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

All soil types are mapped by the NRCS as "partially hydric". Inundated nearly 100% in Cell 4; therefore, soils meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not developed. Marklepass: fine, mixed, superactive, frigid Typic Natrixeralfs. Dry Fork: coarse-silty, mixed, active, frigid Calcic Haploxerepts. Whitearth: fine, silty, mixed, superactive frigid Typic Natrixeralfs.

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): 4

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Cell 4 is 100% inundated. Water ranges from 0-24 inches.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell5WDdry

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69433696 | Long: -114.66875425 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

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:
This plot is an upland companion plot to Cell 5WD wet and is not within a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Kochia scoparia	30	☑	FAC
2. Melilotus officinalis	30	☑	FACU
3. Agropyron trachycaulum	10	☐	FAC
4. Elymus triticoides	5	☐	FAC
5. Chenopodium rubrum	5	☐	FACW
6. Bromus inermis	1	☐	NI
7. Lactuca serriola	1	☐	FACU
8.		☐	
9.		☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:
Vegetation does not passes Dom Test.

SOIL

Sampling Point: Cell5WDdr

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

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

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No hydric soil criteria present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

Remarks: No wetland hydrology criteria present.

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

Project/Site: Lonepine | City/County: Sanders | Sampling Date: 8/22/2010

Applicant/Owner: MDT | State: MT | Sampling Point: Cell5WDwet

Investigator(s): J. Asebrook, J. Hintz | Section, Township, Range: S 3 T 22N R 24W

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

Subregion (LRR): LRR E | Lat: 47.69433696 | Long: -114.66719521 | Datum: NAD83

Soil Map Unit Name: Marklepass, Dry Fork, Whitearth

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
	= Total Cover		
Herb Stratum (Plot size:)			
1. Agropyron trachycaulum	70	☑	FAC
2. Typha latifolia	5	☐	OBL
3. Beckmannia syzigachne	5	☐	OBL
4. Eleocharis palustris	2	☐	OBL
5. Scirpus acutus	2	☐	OBL
6. Alopecurus pratensis	2	☐	FACW
7. Scirpus maritimus	1	☐	OBL
8. Rumex crispus	1	☐	FAC
9. brown algae	10	☐	
10.		☐	
11.		☐	
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.		☐	
2.		☐	
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Area is dominated by hydrophytic vegetation - passes Dom Test.

SOIL

Sampling Point: Cell5WDwe

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
0-1	10YR 2/1	100					Silty Clay	
1-16	10YR 4/1	100					Silty Clay	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquatic 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:

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

All soil types are mapped by the NRCS as "partially hydric". Inundated nearly 100% in Cell 5; therefore, soils meet the NRCS hydric soil criteria #3, "Soils that are frequently ponded for long duration or very long duration during the growing season." Other hydric soil indicators have not developed. Marklepass: fine, mixed, superactive, frigid Typic Natrixeralfs. Dry Fork: coarse-silty, mixed, active, frigid Calcic Haploxerepts. Whitearth: fine, silty, mixed, superactive frigid Typic Natrixeralfs.

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): 0

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

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 8/22/2010 **4. Evaluators** J. Asebrook, J. Hintz **5. Wetland/Site# (s)** Lonepine Mitigation - 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 3 - Lower Clark Fork **County** Sanders

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 23.6

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) 23.6

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	Unconsolidated Bottom		Permanent/Perennial	10
Depressional	Emergent Wetland		Permanent/Perennial	70
Depressional	Aquatic Bed		Permanent/Perennial	20

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:

moderate Cirsium arvense, some Centaurea maculosa; many non-native grasses plus KOCSCO

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 component includes emergent and aquatic bed

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 observation, MNHP

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

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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

Secondary habitat (list Species) ◉ D ○ S Bald eagle, Great blue heron

Incidental habitat (list species) ◉ D ○ S Long-billed curlew, American white pelican

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 observation, MNHP

14C. General Wildlife Habitat Rating:

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

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

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

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

- ☑ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, 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 of this area is increasing with evidence of deer, waterfowl, hawks, and great blue heron. Periodic use by bald eagle, American White Pelican, and long-billed curlew, all 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.)

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** _____

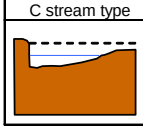
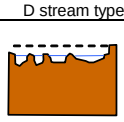
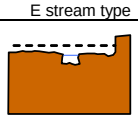
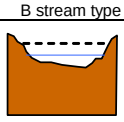
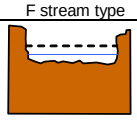
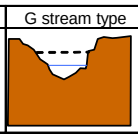
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in **i** or **iia** above:*
Modifed Rating _____

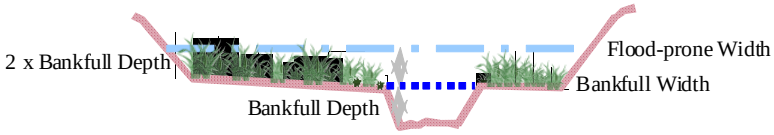
iii. Final Score and Rating: _____ **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, 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)				Moderately entrenched – B stream type					
% of flooded wetland classified as forested and/or scrub/shrub				75%	25-75%	<25%			
AA contains **no outlet or restricted outlet**									
AA contains **unrestricted outlet**									

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:

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				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

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

i. Rating (working from top to bottom, use the matrix below to arrive at [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: Subject to wave action.

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	.9H	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.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:

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 a 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 birdwatching, hunting

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Lonepine Mitigation - 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	14.16	☑
C. General Wildlife Habitat	H	.9	1	21.24	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	H	1	1	23.6	☑
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	16.52	☐
H. Sediment/Shoreline Stabilization	M	.7	1	16.52	☐
I. Production Export/Food Chain Support	E	1	1	23.6	☐
J. Groundwater Discharge/Recharge	H	1	1	23.6	☑
K. Uniqueness	M	.4	1	9.44	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	4.72	☐
Totals:		6.5	9	153.4	
Percent of Possible Score			**72.22** %		

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 above)

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 8/22/2010 **4. Evaluators** J. Asebrook, J. Hintz **5. Wetland/Site# (s)** Lonepine Mitigation 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 3 - Lower Clark Fork **County** Sanders

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 8.47

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) 8.47

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
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:

moderate Cirsium arvense; many non-native grasses

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 face.

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

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 observations, MNHP

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

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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

Secondary habitat (list Species) ◉ D ○ S Bald eagle, Great blue heron

Incidental habitat (list species) ◉ D ○ S Long-billed curlew, American White Pelican

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 observations, MNHP

14C. General Wildlife Habitat Rating:

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

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

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

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

- ☑ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, 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 of this area is increasing with evidence of deer, waterfowl, hawks, and great blue heron. Periodic use by bald eagle, American White Pelican, and long-billed curlew, all 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** .5M

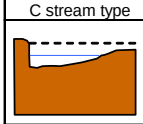
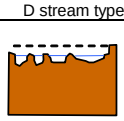
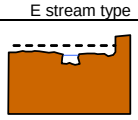
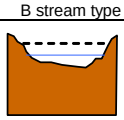
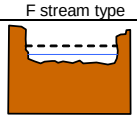
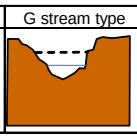
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in **i** or **iia** above:*
Modifed Rating

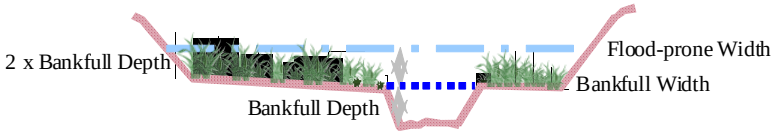
iii. Final Score and Rating: _____ **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, 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)				Moderately entrenched – B stream type					
% of flooded wetland classified as forested and/or scrub/shrub				75%	25-75%	<25%			
AA contains **no outlet or restricted outlet**									
AA contains **unrestricted outlet**									

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 LDF Reservoir

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:

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				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

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

i. Rating (working from top to bottom, use the matrix below to arrive at [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:

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	.9H	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.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:

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: Occurs at the base of dam and receives seepage

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): Lonepine Mitigation 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	5.082	☑
C. General Wildlife Habitat	H	.9	1	7.623	☑
D. General Fish Habitat	M	.5	1	4.235	☐
E. Flood Attenuation	M	.6	1	5.082	☐
F. Short and Long Term Surface Water Storage	H	.8	1	6.776	☐
G. Sediment/Nutrient/Toxicant Removal	H	1	1	8.47	☑
H. Sediment/Shoreline Stabilization	M	.7	1	5.929	☐
I. Production Export/Food Chain Support	E	1	1	8.47	☐
J. Groundwater Discharge/Recharge	1 H	1	1	8.47	☑
K. Uniqueness	M	.4	1	3.388	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	1.694	☐
Totals:		7.7	11	65.219	
Percent of Possible Score			**70** %		

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 above)

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 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 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 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 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 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 6 – *Photo 1*
Bearing: 270 Degrees

Location: Northern shore of Cell 4
Taken in 2009



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

Location: Northern shore of Cell 4
Taken in 2010



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

Location: Southern shore of Cell 4
Taken in 2009



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

Location: Southern shore of Cell 4
Taken in 2010



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 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 9 – *Photo 1*
Bearing: 180 Degrees

Location: Western edge of Cell 4
Taken in 2010



Photo Point 10 – *Photo 1*
Bearing: 180 Degrees

Location: Start Veg Tran 1
Taken in 2009



Photo Point 10 – *Photo 1*
Bearing: 180 Degrees

Location: Start Veg Tran 1
Taken in 2010



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



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



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



Photo Point 10 – *Photo 1*
Bearing: 180 Degrees
Location: End Veg Tran 2
Taken in 2010



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 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

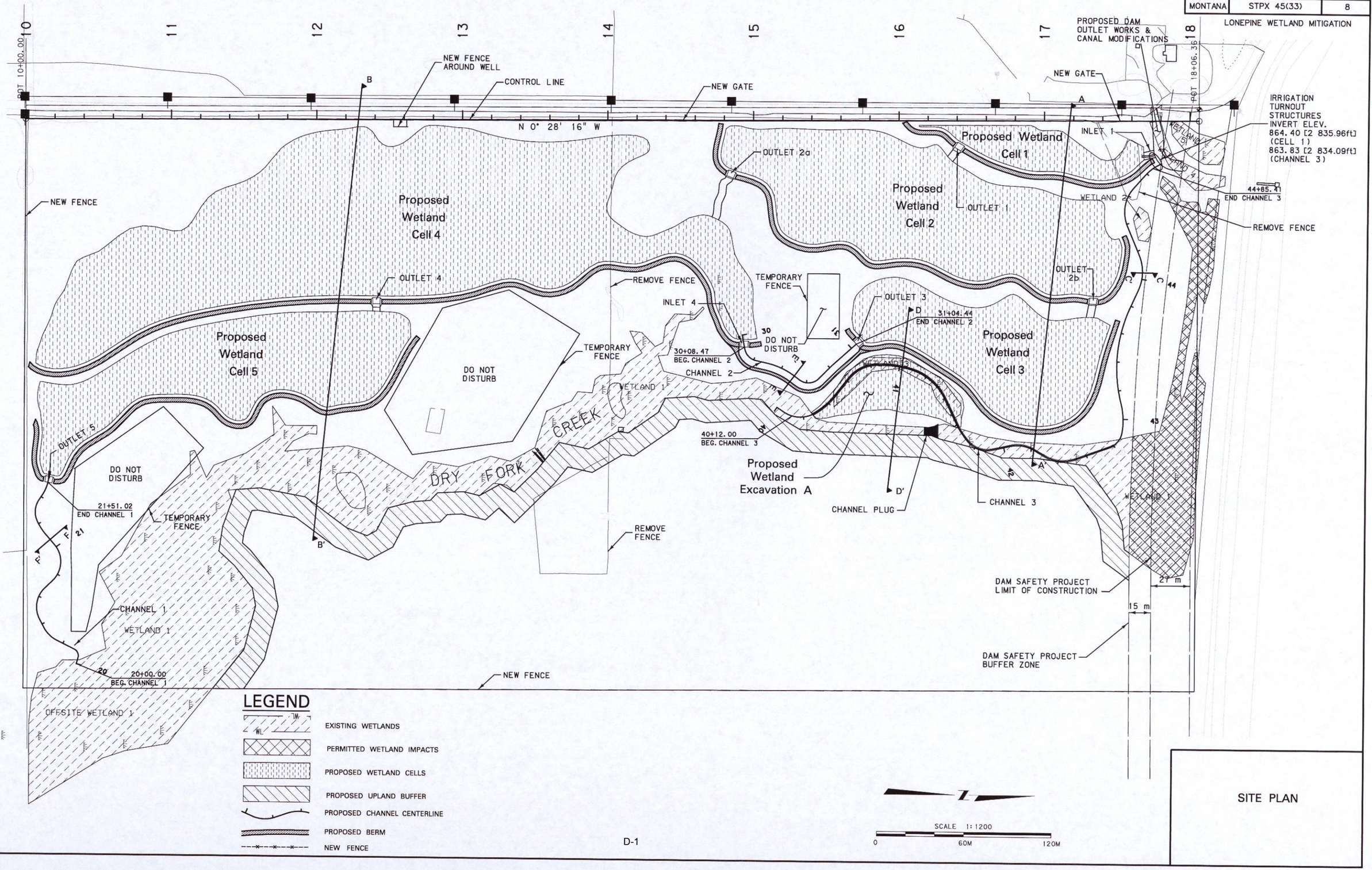
Appendix D

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



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: PBS

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