# MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT

# BIG MUDDY CREEK MITIGATION SITE ROOSEVELT COUNTY, MONTANA

PROJECT CONSTRUCTED: 2011/2012

MONITORING REPORT #7: DECEMBER 2017



### Prepared for:



2701 Prospect Avenue Helena, Montana 59620

## Prepared by:



820 North Montana Ave, Suite A Helena, Montana 59601

# Montana Department of Transportation Wetland Mitigation Monitoring Report: Year 2017

# BIG MUDDY CREEK MITIGATION SITE ROOSEVELT COUNTY, MONTANA

MDT Project Number NH-1- (46) 633 Big Muddy Creek – West Control Number 4058-001

MDT Project Number NH-1- (46) 626 Brockton – East Control Number 4058

USACE: NWO-2009-01515-MTB

prepared for

Montana Department of Transportation 2701 Prospect Avenue Helena, Montana 59620

prepared by

RESPEC 820 North Montana Avenue, Suite A Helena, Montana 59601

December 2017

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### 1.0 INTRODUCTION

The north parcel of the Big Muddy Creek Wetland Mitigation Site was completed in spring 2011 and the south parcel was completed in 2012. This report presents the results of the seventh year of post-construction monitoring at the north parcel and the sixth year at the south parcel. Because the site has met all performance and acreage goals, 2017 is the final year of monitoring at this site. This Montana Department of Transportation (MDT) wetland mitigation project is located 4 miles west of Culbertson, on US Highway 2, in Section 21, Township 28 North, Range 55 East, Roosevelt County, Montana, as illustrated in Figure 1-1. The overall size of the site was modified in 2012 to provide compensatory mitigation for unavoidable impacts associated with the MDT Brockton – East project. The original mitigation area consisted of 10.62 acres located on the north side of US Highway 2. An additional 7.25 acres located south of US Highway 2 were added in 2012. The total mitigation area monitored since 2012 has been approximately 17.9 acres. The monitoring criteria and protocols contained in the wetland mitigation and monitoring plan submitted on April 12, 2010, remain as originally submitted and are discussed below.

Figures A-2 and A-3 in Appendix A show the 2017 monitoring activity locations and mapped site features, respectively. The MDT Mitigation Site Monitoring form [Berglund and McEldowney, 2008], US Army Corps of Engineers (USACE) Wetland Determination Data forms for the Great Plains (GP) Region [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] are included in Appendix B. Project site photographs are included in Appendix C, and the project plan sheets are provided in Appendix D.

The site is situated within Watershed #12 – the Lower Missouri River Basin. MDT completed an initial feasibility study in August 2009. MDT staff completed a baseline delineation and MWAM in June 2010.

Approximately 0.73 acre of wetlands was delineated within the project boundary as part of the baseline assessment completed in June 2010. The wetlands encompassed an inundated, emergent marsh that extended from the banks of an unnamed tributary to Big Muddy Creek, as well as a narrow emergent wet meadow that extended from the marsh into upland habitat.

The original mitigation goals were to create and preserve wetland habitat functions associated with riverine and emergent wetlands on the Big Muddy Creek tributary floodplain. The project objectives for the north parcel include the following:

- Maximize the development of emergent and aquatic bed wetlands, general wildlife habitat, short- and long-term surface-water storage, sediment/nutrient/toxicant removal, and production export/food chain support
- Create up to approximately 9.32 acres of wetland
- Preserve approximately 0.73 acre of wetland through permanent protection and weed management
- Preserve a protected, managed 0.43-acre upland buffer adjacent to site wetlands
- Minimize site operation and maintenance requirements.

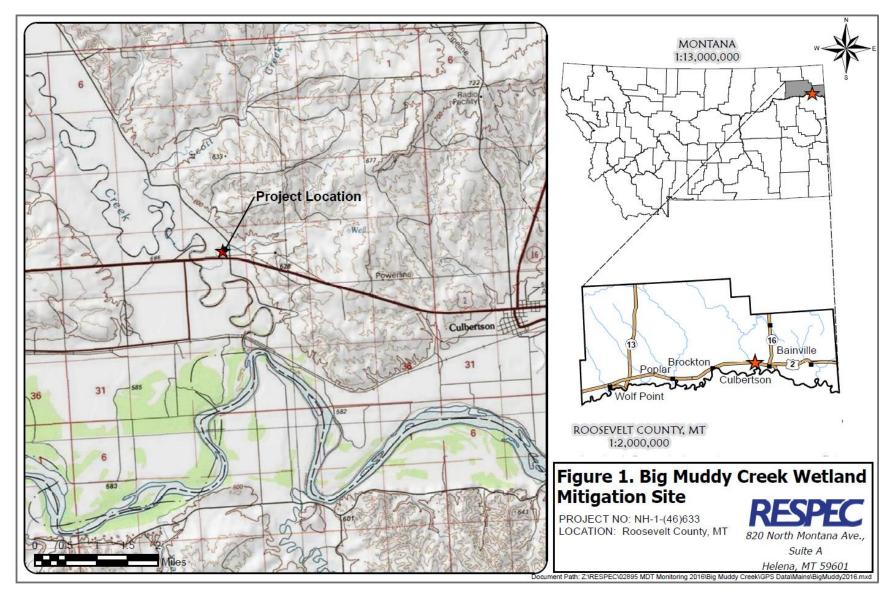


Figure 1-1. Project Location of the Big Muddy Creek Site.

The original mitigation plan proposed creating 6.53 acres of emergent/aquatic bed shallow marsh within three wetland cells. The cells were to be excavated to intersect groundwater and provide water depths that ranged from 0.5 to 2 feet. Additional hydrology was to be provided by direct precipitation and snowmelt. Up to 1.76 additional acres of emergent wetland were expected to form in the excavated areas between the three cells. The excavation was expected to facilitate saturation of the root zone via capillary action during the spring and early summer of most years. The potential passive development of approximately 1.03 acres of emergent wet meadow that is located at the north boundary and adjacent to the existing wet meadow was to be facilitated by increasing and augmenting hydrology to the south within the excavated cells.

The monitoring area was increased in 2012 to include an additional 7.25-acre parcel located to the south of US Highway 2. This revised mitigation area was incorporated into the original mitigation plan to include the unavoidable wetland impacts associated with the MDT Brockton – East project. This revision included constructing a 5.47-acre wetland depression within the south parcel in 2011 along the floodplain of an unnamed tributary to Big Muddy Creek in an area that was delineated as upland in April 2010. According to an MDT letter to Mr. Todd Tillinger of the USACE dated June 14, 2010 [Tillinger, 2010], this revision was a clerical and mathematical revision based on MDT's decision to let the MDT Brockton – East and Big Muddy Creek – West projects proceed at the same time and to construct them concurrently. A 1.83-acre preexisting wetland was located in the south parcel monitoring area and was included in the preservation credit category in 2012.

The performance standards for each mitigation feature are included in Section 3.9 of this report. The project credit ratios that were approved by the USACE and presented in the *Big Muddy Creek Wetland Mitigation Plan* [Atkins and Post, Buckley, Schuh, & Jernigan, 2011] are also shown in Section 3.9. The construction of the Big Muddy mitigation project was authorized under the authority of Section 404 of the Clean Water Act via permit NWO-2009-01515-MTB.

# 2.0 METHODS

The 2017 monitoring event was completed on July 12, 2017. Information for the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and are illustrated on Figure A-2 (Appendix A). Data-collection activities included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird- and wildlife-use documentation, photographic documentation, functional assessment, and a nonengineering examination of the infrastructure established within the mitigation project area.

#### 2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data form was assessed at four data points established within the project area. The hydrologic indicators were evaluated according to features observed in situ during the site visit. The data were recorded on the Wetland Determination Data forms (Appendix B). Hydrologic assessments allow mitigation goals that address inundation and saturation requirements to be evaluated.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season" [USACE, 2010]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is defined for purposes of this report as the number of days when a 50 percent probability exists that the minimum daily temperature is greater than or equal to 28.5 degrees Fahrenheit [USACE, 2010]. The growing season that was recorded for the predominant soil map units (Havrelon loam and Lohler silty clay) averages 113 days [US Department of Agriculture, 2011]. Areas that are defined as wetlands would require 14 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits that were excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded on the Wetland Determination Data forms (Appendix B). A pair of groundwater monitoring wells are located within the monitoring area, one each on the north and south parcels (Figure A-2, Appendix A). These wells have not been monitored regularly by MDT and were not monitored in 2017.

#### 2.2 VEGETATION

The boundaries of general dominant-species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2017 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (< 1 percent), 1 (1–5 percent), 2 (6–10 percent), 3 (11–20 percent), 4 (21–50 percent), and 5 (> 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure A-3, Appendix A).

Temporal changes in vegetation were evaluated through annual assessments of a static belt transect established in August 2011 and an additional transect established in 2012 (Figure A-2, Appendix A). Vegetation composition was assessed and recorded along two approximately 10-foot-wide belt transects (T-1 and T-2) that were 647 feet long and 366 feet long, respectively (Figure A-2, Appendix A). The transect endpoints were recorded with a resource-grade GPS unit.

Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges that were used for the vegetation community polygon data (Appendix B). Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (February 2017), prepared by the Montana Department of Agriculture [2015], was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photograph with noxious weed species color-coded (Figure A-3, Appendix A). Cover classes are represented by a T, L, M, or H, which represent less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively. Before the 2017 field season, monitoring crews attended a 1-day training hosted by MDT to ensure that field staff are adequately trained in judging total percent cover of noxious weeds both at the individual infestation level and

across entire sites. The total cover by noxious weeds overall across the site was estimated based on the noxious weed cover classes and project acreage.

#### **2.3 SOIL**

Soil information was obtained from the *Web Soil Survey for Roosevelt County, Montana* [US Department of Agriculture, 2011] and in situ soil descriptions. Soil cores were excavated by using a Montana sharpshooter shovel and evaluated according to procedures outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and the 2010 *Regional Supplement to the Corps of Engineers Manual: Great Plains Region* (2010 GP Regional Supplement) [USACE, 2010]. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data form for each profile (Appendix B).

#### 2.4 WETLAND DELINEATION

Waters of the US, including special aquatic sites and jurisdictional wetlands, were delineated throughout the project area according to criteria established in the 1987 Wetland Manual and the 2010 GP Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology that were described in the 2010 Regional Supplement to the Corps of Engineers Manual: Great Plains Region (2010 GP Regional Supplement) [USACE, 2010] must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2016 National Wetland Plant List (NWPL) [Lichvar et al., 2016]. A routine level-2 onsite determination method [Environmental Laboratory, 1987] was used to delineate jurisdictional areas within the project boundaries. The information was recorded onto Wetland Determination Data forms (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site (i.e., mudflat). The wetland boundary was surveyed and identified on the 2017 aerial photographs. Wetland areas were calculated using GIS methods.

#### 2.5 WILDLIFE

Observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring forms during each of the site visits. Indirect-use indicators, including tracks, scat, burrows, 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 wildlife species list of animals observed from 2011 through 2017 was compiled for this report.

#### 2.6 FUNCTIONAL ASSESSMENT

The MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate functions and values on the sites. This method provides an objective means of assigning an overall rating to wetlands and provides regulators with a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values [Berglund and McEldowney, 2008]. Field data for this assessment were collected during the site visit. MWAM forms were completed for four assessment areas (AAs), the created wetlands (north/south) and the existing wetlands (Appendix B).

#### 2.7 PHOTOGRAPHIC DOCUMENTATION

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

#### 2.8 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2017 monitoring season. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included wetland boundaries, fence boundaries, photo points, transect endpoints, noxious weed infestations, and wetland data points.

#### 2.9 MAINTENANCE NEEDS

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

### 3.0 RESULTS

#### 3.1 HYDROLOGY

Climate data from the meteorological station at Culbertson Coop, Montana (242122), recorded an average annual precipitation rate of 13.6 inches from December 1900 to August 2017 [Western Regional Climate Center, 2017]. The annual precipitation recorded in the years 2010, 2011, 2012, 2013, 2014, 2015, and 2016 was 20.53, 17.43, 12.44, 19.82, 12.51, 13.18, and 17.75 inches, respectively. The historic precipitation average from January to August 31 was 10.63 inches. Precipitation in recent years for the same period was 16.77 (2010), 15.39 (2011), 8.98 (2012), 11.25 (2013), 10.73 (2014), 10.46 (2015), 11.28 inches (2016), and 5.13 (2017). These data suggest that the region received above-average precipitation in 2010 and 2011, below-average precipitation in 2012 and 2017, and near-average precipitation from 2013 through 2016. Precipitation at this location in 2017 through August (5.13 inches) was 5.5 inches below the long-term average of 10.63 inches.

Precipitation and infrequent flooding of the unnamed tributary of Big Muddy Creek drive hydrology at the Big Muddy site.

Less than 1 percent of the entire site was inundated during the 2016 and 2017 field surveys, which is a significant reduction from previous monitoring years (15 percent in 2015). The excavated cells in the north parcel had no standing water during the 2017 monitoring for the second time since monitoring began in 2010. Many areas defined as wetlands across both sides of the mitigation area were not inundated but exhibited periodic saturation within 12 inches (1.0 foot) of the ground. Other signs of hydrology included water marks, salt crust, geomorphic position, positive FAC-neutral test, inundation and saturation visible on aerial imagery, and surface soil cracks. Both the north and south parcels receive periodic overbank flow from the unnamed tributary during spring flows. Evidence of this happening in 2017 was lacking from both sites during monitoring. The constructed wetlands and adjacent stream are hydrologically connected via groundwater. Nearby, Big Muddy Creek appeared to be running at well-below-average levels during the July site visit, which is likely a result of wellbelow-average precipitation in the region between December and July in the watershed. In coordination with the Montana Governor's Drought and Water Supply Advisory Committee, the Montana State Library publishes monthly maps of moisture by county. The July 2017 map shows Roosevelt County to be Extremely Dry. Additionally, the governor of Montana issued Executive Order 5-2017 on June 23, 2017, declaring a drought emergency to exist in northeast Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Roosevelt County and 13 other counties in NE Montana [DNRC, 2017].

Four data points (DP-1W, DP-1U, DP-2U, and DP-2W) were sampled to determine the wetland and upland boundaries. DP-1W and DP-2W are located in areas that met the wetland criteria. DP-1W is located in the excavated basin south of the highway, and DP-2W is located in a concave, depressional salt flat in the north parcel. Evidence of positive wetland hydrology at DP-1W included a salt crust, surface soil cracks, geomorphic position, and a positive FAC-neutral test. Wetland hydrology indicators at DP-2W included saturation to near the ground surface, water marks, salt crust, surface soil cracks, saturation visible on aerial imagery, geomorphic position, and a positive FAC-neutral test. No primary or secondary indicators of wetland hydrology were observed at DP-1U or DP-2U, which are located upslope of DP-1W and DP-2W, respectively.

#### 3.2 VEGETATION

Monitoring year 2017 marked the seventh year of post-construction monitoring at the north parcel and the sixth year at the south parcel of the Big Muddy Creek site. A total of 75 plant species were observed site wide from 2011 through 2017, as provided in Table 3-1. Vegetation plant communities were mapped and named by plant composition and dominance. The nine communities that were identified in 2017 and complete lists of the associated species are included on the Wetland Mitigation Site Monitoring form (Appendix B) and the mapped communities shown on Figure A-3 (Appendix A).

Table 3-1. Vegetation Species Observed From 2011 Through 2017 at the Big Muddy Site (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status <sup>(a)</sup>
Achillea millefolium	Common Yarrow	FACU
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FACW
Apocynum cannabinum	Indian Hemp	FAC
Aquatic macrophytes	Aquatic macrophytes	NL
Artemisia cana	Coaltown Sagebrush	FACU
Artemisia frigida	Fringed Sage	NL
Artemisia tridentata	Big Sagebrush	NL
Aster sp.	Aster	NL
Astragalus sp.	Milkvetch	NL
Atriplex suckleyi	Suckley's Saltbush	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bouteloua dactyloides	Buffalo Grass	FACU
Bouteloua gracilis	Blue Gramma	NL
Bromus inermis	Smooth Brome	UPL
Carex aquatilis	Leafy Tussock Sedge	OBL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	NL
Distichlis spicata	Coastal Salt Grass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Equisetum arvense	Field Horsetail	FAC
Fraxinus pennsylvanica	Green Ash	FAC
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Iva axillaris	Deer-Root	FAC
Juncus balticus	Baltic Rush	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lactuca tatarica	Russian Blue Lettuce	UPL
Lemna minor	Common Duckweed	OBL
Lepidium densiflorum	Miner's Pepperwort	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Lupinus argenteus	Silvery Lupine	NL
Lycopus americanus	Cut-Leaf Water-Horehound	OBL

Table 3-1. Vegetation Species Observed From 2011 Through 2017 at the Big Muddy Site (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status <sup>(a)</sup>
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Nassella viridula	Green Needlegrass	NL
Opuntia polyacantha	Plains Pricklypear	NL
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa arida	Prairie Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FACU
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus deltoides	Eastern Cottonwood	FAC
Populus tremuloides	Quaking Aspen	FAC
Potentilla anserina	Silverweed	FACW
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus americanus	Chairmaker's Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Scutellaria galericulata	Hooded Skullcap	OBL
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	Freshwater Cord Grass	FACW
Suaeda calceoliformis	Paiuteweed	FACW
Symphoricarpos albus	Common Snowberry	UPL
Symphyotrichum laeve	Smooth Blue American-Aster	FACU
Taraxacum officinale	Common Dandelion	FACU
Teucrium canadense	American Germander	FACW
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-Beard	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Vicia americana	American Purple Vetch	FACU

<sup>(</sup>a) 2016 NWPL [Lichvar et al., 2016]. New species that were identified in 2017 are **bolded**.

Five vegetation communities were observed on the north parcel in 2017 and included four wetland types and one upland type. Wetland types that have (N) or (S) after the name indicates that the community type is specific to the north or south parcels, respectively.

- Wetland Type 3 Schoenoplectus spp.
- Wetland Type 4 Spartina pectinata/ Schoenoplectus spp.

- Wetland Type 9 Puccinellia nuttalliana/Iva axillaris
- Wetland Type 15 Bare Ground/Schoenoplectus meritimus
- Upland Type 16 Bromus inermis/Pascopyrum smithii.

Type 16 represented the drier areas that border the excavated depressions. All of the cells on the north parcel lacked standing water in 2017, so community Type 18 – Open Water/Schoenoplectus spp. was absent from the site. Aerial photos from June 26, 2017 show standing water and inundation in the western and eastern cells and the ground surface was cracked during the July field survey, indicating that surface water and inundation was present earlier in the growing season.

Three vegetation communities were observed on the south parcel in 2017: two wetland types and one upland type.

- Wetland Type 12 Puccinellia nuttalliana/Iva axillaris
- Wetland Type 17 Teucrium canadense/Chenopodium album
- Upland Type 14 Agropyron cristatum/Bromus inermis.

The excavated depression in the south parcel was dry during the July 2017 monitoring event but had surface soil cracks in some areas, indicating that inundation was likely present towards the ground surface earlier in the growing season. Extreme drought conditions prevented this site from retaining water into the summer and fall periods. Communities in the north and south parcels are discussed below.

Wetland community Type 3 – *Schoenoplectus* spp. replaced upland community Type 1 – *Elymus* spp. and upland Type 2 – *Chenopodium album* in 2013. The community was identified on 1.81 acres of the north parcel in 2017 and generally included the emergent vegetation found along the margins of the constructed cells. This community type expanded in 2017 because of 2 consecutive years of low water levels in the excavated cells. Dominant species included saltmarsh club-rush (*Schoenoplectus maritimus*), hard-stem club-rush (*Schoenoplectus acutus*), Chairmaker's club-rush (*Schoenoplectus americanus*), coastal saltgrass (*Distichlis spicata*), freshwater cordgrass (*Spartina pectinata*), and broad-leaf cat-tail (*Typha latifolia*). The cover class for bare ground was estimated at 6–10 percent. A natural recruitment area that consisted of Eastern cottonwood (*Populus deltoides*) and willow (*Salix* spp.) seedlings and saplings was identified along the eastern boundary of this community.

Wetland community Type 4 – *Spartina pectinata/Schoenoplectus* spp. characterized 0.78 acre of the preexisting wetland community, adjacent to the unnamed tributary to Big Muddy Creek that parallels the western and northern boundaries of the north parcel. The vegetation was dominated by freshwater cordgrass, saltmarsh club-rush, hard-stem club-rush, field sow-thistle (*Sonchus arvensis*), creeping meadow-foxtail (*Alopecurus arundinaceus*), fox-tail barley (*Hordeum jubatum*), and six other species observed at less than 5 percent cover. Inundated areas were observed in this community during the 2016 site visit, with water levels that ranged from 0 to 1.0 foot deep.

Wetland community Type 9 – *Puccinellia nutalliana/Iva axillaris* (N) was identified on 3.80 acres of wetland located within the excavated areas between the constructed cells on the northern side of US Highway 2. This community replaced wetland Type 5 – *Puccinellia nutalliana/Chenopodium album* 

in 2013 because of the shift in dominance from lamb's quarters (*Chenopodium album*) to deer-root (*Iva axillaris*). The vegetation cover was dominated by Nuttall's alkali grass (*Puccinellia nutalliana*), deer-root, western-wheat grass (*Pascopyrum smithii*), and coastal salt grass (*Distichlis spicata*), and 16 other species. This community increased in 2016 into the northernmost excavated cell on the north parcel, which is experiencing a gradual drying out.

Wetland community Type 12 – *Puccinellia nutalliana/Iva axillaris* (S) now represents 5.7 acres of the south parcel, which includes the excavated wetland depression and areas north and northeast of the constructed cell. Dominant species included Nuttall's alkali grass, deer-root, fox-tail barley, and seven other species.

Wetland community Type 15 – Bare Ground/Schoenoplectus meritimus was observed on 1.75 acres in 2017 and is located in the two southern cells of the north parcel. The community was not inundated during the July 2017 monitoring event, although several indicators of wetland hydrology provided evidence that the extent of inundation was greater earlier in the growing season. Bare ground represented more than 50 percent of the excavated depression. Dominant species included saltmarsh club-rush and Nuttall's alkali grass, with lesser cover from coastal saltgrass, fox-tail barley, and paiuteweed (Suaeda caleoliformis). Areas that were identified as Type 15 in 2017 had been identified as Type 18 – Open Water/Schoenoplectus spp. in previous years.

Wetland community Type 17 – *Teucrium canadense/Chenopodium album* was identified on 0.3 acre along the existing wetland fringe, west of the excavated depression on the south parcel. The vegetation was dominated by American germander (*Teucrium canadense*), lamb's quarters, freshwater cordgrass, Russian blue lettuce (*Lactuca tatarica*), common spike-rush (*Eleocharis palustris*), and 14 other species.

Upland community Type 14 – *Agropyron cristatum/Bromus inermis* characterized the 1.25-acre upland located south and east of the constructed cell on the south parcel. Dominant species included crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), deer-root, and 16 other species.

Upland community Type 16 – *Bromus inermis/Pascopyrum smithii* was identified on 2.49 acres, which is an increase of 0.14 acre since 2014 and represents the drier areas that border the excavated depressions in the north parcel. This community replaced upland Type 8 – *Bromus inermis/Agropyron cristatum* because species composition and their associated cover classes had shifted during the 2015 survey. The vegetation was dominated by smooth brome, western wheatgrass, crested wheatgrass, deer-root, curly-cup gumweed (*Grindelia squarrosa*), and 21 other species.

Vegetation community transitions were measured along a 647-foot transect (T-1) for the northern half of the site and a 366-foot transect (T-2) for the southern half of the site (Figure A-2, Appendix A). T-1 intersected three vegetation communities, including wetland Types 3 – *Schoenoplectus* spp. and 9 – *Puccinellia nuttalliana/Iva axillaris*, and upland Type 16 – *Bromus inermis/Pascopyrum smithii*. The data recorded on T-1 are summarized in tabular and graphical formats in Table 3-2 and Charts 3-1 and 3-2, respectively. Because of low groundwater levels during the 2017 monitoring event, vegetation community changes occurred along T-1 with community Type 3 increasing from 4 percent in 2016 to

23 percent in 2017. Wetland Type 15 – Bare Ground/*Schoenoplectus* maritimus decreased from 19 percent in 2016 to 0 percent in 2017. The percent of upland community that was identified along the transect decreased from 30.1 percent in 2012 to 19.6 percent in 2017, which reflects the transition from upland to wetland vegetation cover.

Table 3-2. Data Summary for T-1 (North Parcel) From 2012 Through 2017 at the Big Muddy Site

Monitoring Year	2012	2013	2014	2015	2016	2017
Transect Length (feet)	647	647	647	647	647	647
Vegetation Community Transitions Along Transect	11	11	11	11	8	6
Vegetation Communities Along Transect	4	3	4	5	4	3
Hydrophytic Vegetation Communities Along Transect	2	2	2	4	3	2
Total Vegetative Species	24	20	25	29	21	18
Total Hydrophytic Species	11	9	10	12	10	10
Total Upland Species	13	11	15	17	11	8
Estimated % Total Vegetative Cover	50	70	70	70	70	85
Estimated % Unvegetated	50	30	30	30	30	15
% Transect Length Comprising Hydrophytic Vegetation Communities	32.1	49.8	51.6	83.0	80	80
% Transect Length Comprising Upland Vegetation Communities	30.1	18.1	18.1	17.0	20	20
% Transect Length Comprising Unvegetated Open Water	37.7	32.1	20.1	0	0	0
% Transect Length Comprising Mudflat	0.0	0.0	10.2	0	0	0

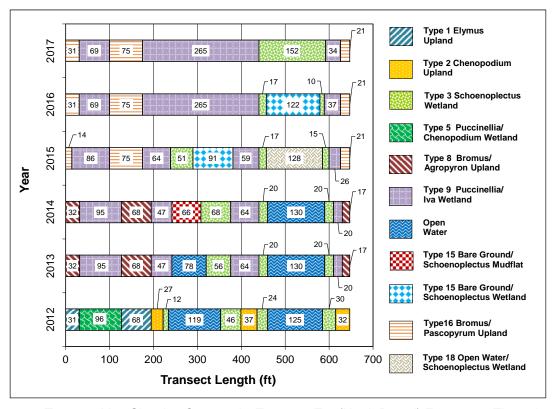
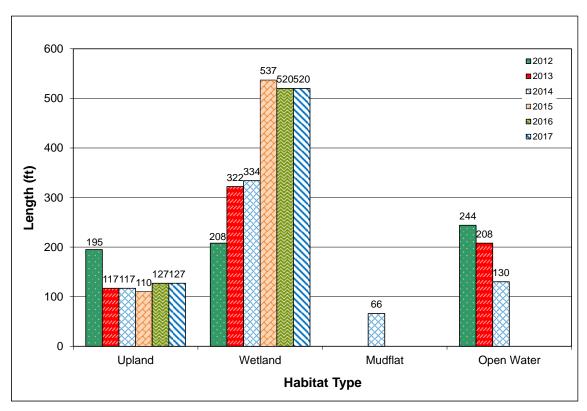


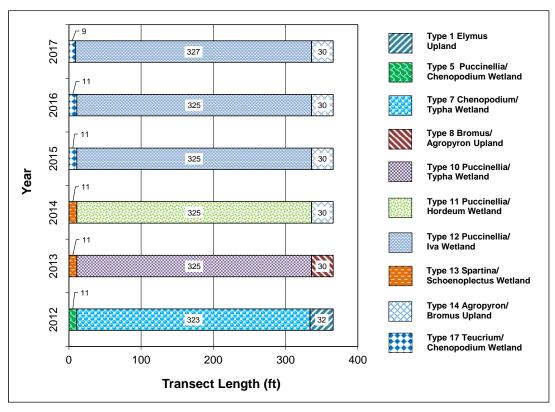
Chart 3-1. Transect Map Showing Community Types on T-1 (North Parcel) From 2012 Through 2017.



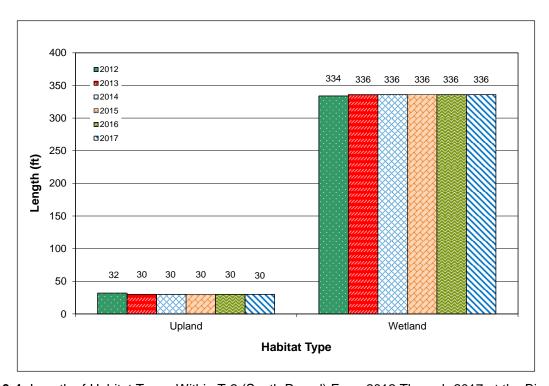
**Chart 3-2.** Length of Habitat Types Within T-1 (North Parcel) From 2012 Through 2017 at the Big Muddy Site.

Table 3-3. Data Summary for T-2 (South Parcel) From 2012 Through 2017 at the Big Muddy Site

Monitoring Year	2012	2013	2014	2015	2016	2017
Transect Length (feet)	366	366	366	366	366	366
Vegetation Community Transitions Along Transect	2	2	2	2	2	2
Vegetation Communities Along Transect	3	3	3	3	3	3
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	21	18	17	15	16	16
Total Hydrophytic Species	11	10	7	4	4	4
Total Upland Species	10	8	10	11	12	12
Estimated % Total Vegetative Cover	90	95	95	95	95	95
Estimated % Unvegetated	10	5	5	5	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	91.3	91.8	91.8	91.8	91.8	91.8
% Transect Length Comprising Upland Vegetation Communities	8.7	8.2	8.2	8.2	8.2	8.2
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0	0	0	0
% Transect Length Comprising Mudflat	0.0	0.0	0	0	0	0



**Chart 3-3.** Transect Map Showing Community Types on T-2 (South Parcel) From 2012 Through 2017 From Start to Finish at the Big Muddy Site.



**Chart 3-4.** Length of Habitat Types Within T-2 (South Parcel) From 2012 Through 2017 at the Big Muddy Site.

Two infestations of Canada thistle (*Cirsium arvense*), which is a Priority 2B noxious weed, were observed at the northeast edge of the unnamed tributary on the north parcel. The infestations included trace and moderate cover classes. The Canada thistle and field bindweed infestations previously noted on the south parcel were not identified during the 2017 field survey. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds at each site. No woody species were installed at either location within this site. A natural recruitment area that consists of Eastern cottonwood (*Populus deltoides*) and willow (*Salix* spp.) seedlings and saplings was identified within wetland Type 3 in the north parcel from 2013 through 2017. In 2017, the seedlings appeared to be healthy and showed little signs of herbivory, although growth has been slow.

#### **3.3 SOIL**

The project site was mapped in the *Web Soil Survey for Roosevelt County, Montana* [US Department of Agriculture, 2011]. Three soil series were mapped within the monitoring area and include the Havrelon loam, Lallie silty clay, and Lohler silty clay. The Havrelon loam was mapped primarily in the preexisting wetland areas in the north parcel. This series is a moderately well-drained loam that is taxonomically classified as a frigid Typic Ustifluvents. The Havrelon series is found on floodplains of major streams and tributaries. The Lohler silty clay is a slowly permeable soil that is taxonomically classified as a frigid Vertic Ustifluvents and mapped across the majority of both monitoring parcels. This soil is mainly found on floodplains. The Lallie series consist of very deep, poorly drained, slowly permeable soils formed in lake basins and old oxbows. This series was mapped along the west boundary of the site that surrounds the unnamed tributary of Big Muddy Creek. The three soil map units are included on the *Montana Hydric Soils List* [US Department of Agriculture, 2014].

Soil test pits were excavated at four locations, all of which were within what was originally mapped as the Lohler silty clay soil series (DP-1W, DP-1U, DP-2U, and DP-2W; Figure A-2, Appendix A). The presence of the Lohler silty clay soil series was confirmed through observations at all four data points during the 2017 monitoring event. DP-1W and DP-2W are located in areas that met the wetland criteria. The upper horizon of the soil profile at DP-1W revealed 8 inches of dark (10YR 3/1) silty clay with 5 percent yellowish-red (5 YR 4/6) redox concentrations in the matrix. The lower horizon consisted of an olive brown (2.5Y 4/3) silty clay with 30 percent very dark gray (Gley 1 3/N) gleyed concentrations in the matrix. This soil met the criteria for redox dark surface and classification as a hydric soil. The soil profile at DP-2W revealed a dark grayish-brown (10YR 4/2) silty clay with 5 percent brown (7.5 YR 4/6) redox concentrations in the matrix. During previous surveys, this soil did not meet the criteria for any hydric soil indicators, likely because of its location in a recently constructed wetland where soils may have been too young to have formed hydric indicators [USACE, 2010]; however, in 2017 the percentage of redox concentrations had increased to 5 percent. This soil meets the National Technical Committee for Hydric Soils (NTCHS). The soil profile at DP-1U, which is located in the adjacent upland approximately 20 feet upslope of DP-1W, was a dark (10YR 3/1) silty clay loam. No hydric soil indicators were observed in this soil profile. The soil profile at DP-2U, which is located in the adjacent upland approximately 30 feet upslope of DP-2U, was a dark grayish-brown (10YR 4/2) silty clay. No hydric soil indicators were observed in this soil profile.

#### 3.4 WETLAND DELINEATION

Two data points (DP-2U and DP-2W) located within the north parcel and two data points (DP-1W and DP-1U) in the south parcel were evaluated to confirm the wetland boundary determinations (Figure A-2, Appendix A; Wetland Determination Data forms, Appendix B). The 2017 wetland delineation identified a combined total of 14.12 acres of wetland/aquatic habitat at the north and south parcels, which is the same as 2016, and a decrease of 0.13 acre since 2014; this data is presented in Table 3-4. A total of 8.12 acres of wetland habitat was identified in the north parcel in 2017. The 6.0-acre extent of overall wetland and aquatic habitat in the south parcel remained constant from 2013 through 2017.

Table 3-4. Total Wetland Acres Delineated From 2011 Through 2017 at the Big Muddy Site

Wetland and Aquatic Habitat	2012 (acres)	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)
Created Wetland – North Parcel	1.14	3.65	4.61	7.39	7.39	7.39
Preexisting Wetland – North Parcel	0.73	0.73	0.73	0.73	0.73	0.73
Open Water – North Parcel	5.05	3.87	2.91	0.00	0.00	0.00
Subtotal for North Parcel	6.92	8.25	8.25	8.12	8.12	8.12
Created Wetland – South Parcel	4.11	4.17	4.17	4.17	4.17	4.17
Preexisting Wetland – South Parcel	1.83	1.83	1.83	1.83	1.83	1.83
Open Water – South Parcel	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal for South Parcel	5.94	6.00	6.00	6.00	6.00	6.00
Total	12.87	14.25	14.25	14.12	14.12	14.12

#### 3.5 WILDLIFE

A comprehensive list of birds and other wildlife species that were observed directly or indirectly from 2011 through 2017 is presented in Table 3-5 and the site Wetland Mitigation Site Monitoring form (Appendix B). Twelve bird species as well as rabbit scat, deer tracks, and two plains garter snakes (*Thamnophis radix*) were observed in 2017. Wildlife observations in 2017 are bolded in Table 3-5.

#### 3.6 FUNCTIONAL ASSESSMENT

The 2008 MWAM was used in the *Big Muddy Creek Wetland Mitigation Plan* [Atkins and Post, Buckley, Schuh, & Jernigan, 2011] to evaluate 8 acres of the existing riverine wetland associated with the tributary to Big Muddy Creek and 2 acres of the remnant wet meadow located north and south of the site. Both AAs extended outside the current project boundaries. The 2008 MWAM has also been used to evaluate the functional values of the mitigation wetlands from 2011 through 2017. These values are provided in Table 3-6. Four AAs were assessed in 2017 that included the created wetlands within the north parcel, preserved wetlands within the north parcel, created wetlands within the south parcel, and preserved wetlands within the south parcel. The created and preserved wetland AAs within the Big Muddy site were not separated by parcel (north/south) in 2012. The MWAM forms for the Big Muddy area that were completed in 2017 are located in Appendix B.

Table 3-5. Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2017 (Page 1 of 2)

Common Name	Scientific Name
Aı	mphibian
Boreal Chorus Frog	Pseudacris maculata
Northern Leopard Frog	Rana pipiens
Woodhouse's Toad	Bufo woodhousii
٨	Mammal
White-tailed Deer	Odocoileus virginianus
Deer sp.	Odocoileus sp.
Muskrat	Ondatra zibethicus
Rabbit sp.	unknown species
Raccoon	Procyon lotor
Red Fox	Vulpes vulpes
	Reptile
Plains Garter Snake	Thamnophis radix
Prairie Rattlesnake	Crotalus viridis
Unknown Snake	
	Bird
American Avocet	Recurvirostra americana
American Coot	Fulica americana
American Goldfinch	Spinus tristus
American Pigeon	Anas americana
Bank Swallow	Riparia riparia
Barn Swallow	Hirundo rustica
Blue-winged Teal	Anas discors
Brewer's Blackbird	Euphagus cyanocephalus
Cinnamon Teal	Anas cyanoptera
Cliff Swallow	Petrochelidon pyrrhonota
Common Yellowthroat	Geothlypis trichas
Eastern Kingbird	Tyrannus tyrannus
Franklin's Gull	Leucophaeus pipixcan
Gadwall	Anas strepera
Killdeer	Charadrius vociferus
Loggerhead Shrike	Lanius Iudovicianus
Mallard	Anas platyrhynchos
Mourning Dove	Zenaida macroura
Northern Pintail	Anas acuta
Northern Shoveler	Anas clypeata
Red-tailed hawk	Buteo jamaicensis
Red-winged Blackbird	Agelaius phoeniceus
Ring-necked Pheasant	Phasianus colchicus
Sparrow	unknown species
Spotted Sandpiper	Actitis macularius

Table 3-5. Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2017 (Page 2 of 2)

Common Name	Scientific Name						
Bird							
Swainson's Hawk	Buteo swainsoni						
Tree Swallow	Tachycineta bicolor						
Upland Sandpiper	Bartramia longicauda						
Western Meadowlark	Sturnella neglecta						
Western Sandpiper	Calidris mauri						
Wilson's Phalarope	Phalaropus tricolor						
Wilson's Snipe	Gallinago delicata						
Yellow-headed Blackbird	Xanthocephalus xanthocephalus						

Species that were identified in 2017 are bolded.

The north parcel Creation AA encompassed 7.39 acres and included the constructed wetland cells and excavated areas between the cells, which were characterized by wetland community Types 3 – *Schoenoplectus* spp., 9 – *Puccinellia nuttalliana/Iva axillaris*, 15 – Bare Ground/*Schoenoplectus* spp., and 18 – Open Water/*Schoenoplectus* spp. This AA was rated as a Category II wetland with 72 percent of the total possible points. Overall, the AA rates high for several wetland functions including production export/food chain support, short- and long-term surface-water storage, sediment/shoreline stabilization, and recreation/education potential. This AA achieved 53.21 total functional units in 2017.

The north parcel Preservation AA included 0.73 acre located within the floodway fringe of the existing tributary to Big Muddy Creek (wetland community Type 4 – *Spartina pectinate/Schoenoplectus* spp.). This AA was rated as a Category III wetland with 56 percent of the total possible points and 4.09 functional units in 2017. The AA received high ratings in 2017 for sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and recreation/education potential. The north parcel Creation and Preservation AAs scored 53.21 and 4.09 functional units, respectively. Combined, the north parcel Creation and Preservation AAs scored 57.30 functional units in 2017.

The south parcel Creation AA encompassed 4.17 acres within the footprint of the excavated wetland cell and was dominated by wetland community Type 12 – *Puccinellia nuttalliana/Iva axillaris*. The AA was rated as a Category III wetland with 61 percent of the total possible points and 25.44 functional units in 2017, the same as 2016. The AA received high ratings for short- and long-term surface-water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and recreation/education potential.

The south parcel Preservation AA identified in 2017 included 1.83 acres of existing wetland and 10.61 functional units. The AA was rated as a Category III wetland with 58 percent of the total possible points from 2013 through 2017. The seasonal/intermittent nature of the wetland hydrology within this AA was the primary factor that limited overall functional ratings. The AA received high ratings for sediment/shoreline stabilization, sediment/nutrient/toxicant removal, and recreation/education potential. The south parcel Creation and Preservation AAs scored 25.44 and 10.61 functional units, respectively. Combined, the south parcel Creation and Preservation AAs attained 36.05 functional units in 2017.

Table 3-6. Functions and Values of the Big Muddy Site From 2011 Through 2012 and 2014 Through 2017 (Page 1 of 2)

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2011 (Creation) AA-1	2011 (Preservation) AA-2	2012 <sup>(a)</sup> (Creation) AA-1	2012 <sup>(a)</sup> (Preservation) AA-2	2014 Creation North Parcel	2014 Preservation North Parcel	2014 Creation South Parcel	2014 Preservation South Parcel	2015 Creation North Parcel	2015 Preservation North Parcel
Listed/Proposed Threatened and Endangered (T&E) Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
Montana Natural Heritage Program (MTNHP) Species Habitat	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
General Wildlife Habitat	Mod (0.5)	High (0.9)	Mod (0.7)	High (0.9)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)
Short- and Long-Term Surface-Water Storage	High (1.0)	Mod (0.4)	High (1.0)	High (0.8)	High (1.0)	Low (0.3)	High (0.9)	Low (0.3)	High (1.0)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (0.9)	High (1.0)	High (0.9)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.3)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (0.9)	High (1.0)	High (1.0)	High (0.9)
Production Export/Food Chain Support	Mod (0.5)	High (0.9)	Mod (0.6)	High (1.0)	Mod (0.7)	Mod (0.4)	Mod (0.4)	Mod (0.7)	High (0.8)	Mod (0.4)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (1.0)	Mod (0.7)
Uniqueness	Low (0.2)	Mod (0.4)	Low (0.2)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)	High (0.15)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	5.35/10	6.55/10	6.65/10	7.05/10	7.1/10	5.6/10	6.1/10	5.8/10	7.2/10	5.6/10
% of Possible Score Achieved	53.5%	65.5%	66.5%	70.5%	71.0%	56.0%	61.0%	58.0%	72.0%	56.0%
Overall Category	III	II	II	II	II	III	III	III	II	III
Total Acreage of Assessed Wetlands within Site Boundaries	6.19	0.73	10.31	2.56	7.52	0.73	4.17	1.83	7.39	0.73
Functional Units (acreage x actual points)	33.12	4.78	68.56	18.05	53.39	4.09	25.44	10.61	53.21	4.09

Table 3-6. Functions and Values of the Big Muddy Site From 2011 Through 2012 and 2014 Through 2017 (Page 2 of 2)

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2015 Creation South Parcel	2015 Preservation South Parcel	2016 Creation North Parcel	2016 Preservation North Parcel	2016 Creation South Parcel	2016 Preservation South Parcel	2017 Creation North Parcel	2017 Preservation North Parcel	2017 Creation South Parcel	2017 Preservation South Parcel
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)								
MTNHP Species Habitat	Mod (0.5)	Mod (0.5)								
General Wildlife Habitat	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A								
Flood Attenuation	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)
Short- and Long-Term Surface-Water Storage	High (0.9)	Low (0.3)	High (1.0)	Low (0.3)	High (0.9)	Low (0.3)	High (1.0)	Low (0.3)	High (0.9)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (0.9)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (1.0)	High (1.0)	High (1.0)	High (0.9)
Sediment/Shoreline Stabilization	High (0.9)	High (1.0)	High (0.9)	High (0.9)	High (0.9)	High (1.0)	High (1.0)	High (0.9)	High (0.9)	High (1.0)
Production Export/Food Chain Support	Mod (0.4)	Mod (0.7)	High (0.8)	Mod (0.4)	Mod (0.4)	Mod (0.7)	Mod (0.8)	Mod (0.4)	Mod (0.4)	Mod (0.7)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Mod (0.4)								
Recreation/Education Potential (bonus points)	High (0.2)	High (0.2)								
Actual Points/Possible Points	6.1/10	5.8/10	7.2/10	5.6/10	6.1/10	5.8/10	7.2/10	5.6/10	6.1/10	5.8/10
% of Possible Score Achieved	61.0%	58.0%	72.0%	56.0%	61.0%	58.0%	72.0%	56.0%	61.0%	58.0%
Overall Category	III	III	II	III	III	III	II	III	III	III
Total Acreage of Assessed Wetlands within Site Boundaries	4.17	1.83	7.39	0.73	4.17	1.83	7.39	0.73	4.17	1.83
Functional Units (acreage x actual points)	25.44	10.61	53.21	4.09	25.44	10.61	53.21	4.10	25.44	10.62

<sup>(</sup>a) 2012 AAs included wetland areas on both sides (north/south) of US Highway 2.

#### 3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken at photo points 1 through 7 (PP1 through PP7), transect endpoints, and wetland determination data points are shown in Appendix C.

#### 3.8 MAINTENANCE NEEDS

No diversion structures or nesting structures are currently installed at the site. Two infestations of Canada thistle, which is a Priority 2B noxious weed, were observed at the edge of the unnamed tributary in the northeast quadrant of the north site (Figure A-3, Appendix A). Weed coverage at both portions of the mitigation site is less than 1 percent. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds that were identified at each location and treatment to contain and control identified populations.

#### 3.9 CURRENT CREDIT SUMMARY

Table 3-7 summarizes the originally proposed mitigation acreages, credit ratios, and scaled performance standards from the *Big Muddy Creek Wetland Mitigation Plan* [Atkins and Post, Buckley, Schuh, & Jernigan, 2011]. This table was modified in 2012 to include the additional acreages monitored within the south parcel. Table 3-8 presents a summary of the site's progress in relation to the established performance standards. Table 3-9 provides a breakdown of the credit acreages (based on the 2017 delineation) listed for each category scaled according to the credit criteria listed in Table 3-7. Each mitigation category has been divided into the respective parcels (north or south). The total credit acres accrued at the Big Muddy site in 2017 was 12.95 acres.

Table 3-7. Wetland Crediting and Performance Standard Summary for the Original Big Muddy Creek Site (Page 1 of 2)

	Compensatory Mitigation Type	USACE Mitigation Credit Ratio <sup>(a)</sup>	Proposed Acres	Preliminary Credit Estimate (acres)	Performance Standard 1	Performance Standard 2	Performance Standard 3	Scaled % Credit Criteria <sup>(b)</sup>
	Creation: Establishment <sup>(c)</sup> (area between cells [1.76 acres] and passive creation in northern tip of site [1.03 acres])	1:1	1.03–2.79	1.03–2.79	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	Achieve 70% Absolute Cover of FAC or Wetter Plants	Noxious Weed Absolute Cover < 5%	Features constructed/implemented and: All standards met = 100% Standard 1 met and demonstrable progress on 2–3 = 70% Standard 1 not met but demonstrable progress on 1–3 = 50% Standard 1 met but lack of progress/ corrective action on 2–3 = 30% Standard 1 not met and no demonstrable progress/corrective Action = 0%
North Parcel	Creation: Establishment (emergent marsh and open water in north parcel)	1:1	6.53	6.53	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Features constructed/implemented and: All standards met = 100% Standard 1 met and demonstrable progress on 2–3 = 70% Standard 1 not met but demonstrable progress on 1–3 = 50% Standard 1 met but lack of progress/ corrective action on 2–3 = 30% Standard 1 not met and no demonstrable progress/corrective Action = 0%
	Preservation (north parcel)	4:1	0.73	0.18	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	All standards met = 100% Standard 1 met and demonstrable progress on 3 = 75% Standard 1 not met but demonstrable progress on 1 and 3 = 50% Standard 1 met but lack of progress on 3 = 30% Standard 1 not met = 0%
	Upland Buffer (north parcel)	5:1	0.43	0.09	N/A	N/A	Noxious Weed Absolute Cover < 5%	Standard 3 met = 100% Standard 3 not met but with demonstrable progress = 30% Standard 3 not met with no demonstrable progress = 0%

Table 3-7. Wetland Crediting and Performance Standard Summary for the Original Big Muddy Creek Site (Page 2 of 2)

	Compensatory Mitigation Type	USACE Mitigation Credit Ratio <sup>(a)</sup>	Proposed Acres	Preliminary Credit Estimate (acres)	Performance Standard 1	Performance Standard 2	Performance Standard 3	Scaled % Credit Criteria <sup>(b)</sup>	
leo	Creation: Establishment (emergent marsh and open water in south parcel) <sup>(d)</sup>	1:1	5.47	5.47	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Features constructed/implemented and: All standards met = 100% Standard 1 met and demonstrable progress on 2–3 = 70% Standard 1 not met but demonstrable progress on 1–3 = 50% Standard 1 met but lack of progress/corrective action on 2–3 = 30% Standard 1 not met and no demonstrable progress/corrective Action = 0%	
South Parcel	Preservation (south parcel) <sup>(d)</sup>	4:1	1.83	0.46	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	All standards met = 100% Standard 1 met and demonstrable progress on 3 = 75% Standard 1 not met but demonstrable progress on 1 and 3 = 50% Standard 1 met but lack of progress on 3 = 30% Standard 1 not met = 0%	
	Upland Buffer (south parcel)	5:1	NA	NA	N/A	N/A	Noxious Weed Absolute Cover < 5%	Standard 3 met = 100% Standard 3 not met but with demonstrable progress = 30% Standard 3 not met with no demonstrable progress = 0%	
	Total			13.76-15.52 acres					

<sup>(</sup>a) USACE, 2005.

<sup>(</sup>b) Percentages to be applied to credit estimate acres in Column 5.

<sup>(</sup>c) Incidentally created wetlands will be credited according to parameters listed under "Creation: Establishment."

<sup>(</sup>d) Areas added in 2012 have been included in preliminary wetland crediting and performance standard summary approved by the USACE for the Big Muddy wetland mitigation project.

Table 3-8. Summary of Performance Standards for Big Muddy Credit Areas

	Compensatory Mitigation Type	Performance Standard 1	Performance Standard 2	Performance Standard 3	Discussion
	Creation: Establishment <sup>(a)</sup> (area between cells [1.76 acres] and passive creation in northern tip of site [1.03 acres])	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	Achieve 70% Absolute Cover of FAC or Wetter Plants	Noxious Weed Absolute Cover < 5%	Performance Standards 1, 2 and 3 met. Full credit allocated.
North Parcel	Creation: Establishment (emergent marsh and open water in north parcel)	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Performance Standards 1, 2 and 3 met. Full credit allocated.
Z	Preservation (north parcel)	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	Performance Standards 1 and 3 met. Full credit allocated.
	Upland Buffer (north parcel)	N/A	N/A	Noxious Weed Absolute Cover < 5%	Performance Standard 3 met. Full credit allocated.
leo.	*Creation: Establishment <sup>(b)</sup> (emergent marsh and open water in south parcel)	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Performance Standards 1, 2 and 3 met. Full credit allocated.
South Parcel	*Preservation (south parcel)	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	Performance Standards 1 and 3 met. Full credit allocated.
	Upland Buffer (south parcel)	N/A	N/A	Noxious Weed Absolute Cover < 5%	Performance Standard 3 met. Full credit allocated.

 <sup>(</sup>a) Incidentally created wetlands will be credited according to parameters listed under "Creation: Establishment."
 (b) Areas added in 2012 have been included in preliminary wetland crediting and performance standard summary approved by the USACE for the Big Muddy wetland mitigation project.

Table 3-9. Summary of Wetland Credits From 2011 Through 2017 at the Big Muddy Site (Page 1 of 2)

	Compensatory Mitigation Type	USACE Mitigation Credit Ratio	2011 Delineated Acres	Scaled % Credit Standards	2011 Credit Acres	2012 Delineated Acres	Scaled % Credit Standards	2012 Credit Acres	2013 Delineated Acres	Scaled % Credit Standards	2013 Credit Acres	2014 Delineated Acres
	Wetland Creation: Establishment (area between constructed cells in north parcel)	1:1	0.44	70%	0.31	0.00	0%	0.00	1.76	70%	1.23	1.76
th Parcel	Wetland Creation: Establishment (wetland cells in north parcel)	1:1	5.75	70%	4.03	5.76	70%	4.03	5.76	70%	4.03	5.76
North	Wetland Preservation (north parcel)	4:1	0.73	100%	0.18	0.73	100%	0.18	0.73	100%	0.18	0.73
	Upland Buffer (north parcel)	5:1	3.70	100%	0.74	3.69	100%	0.74	2.37	100%	0.47	2.37
	North Subtotal		10.62	_	5.26	10.18		4.95	10.62		5.92	10.62
cel	Wetland Creation: Establishment (wetland cell in south parcel)	1:1	-			4.55	70%	3.19	4.17	70%	2.92	4.17
South Parcel	Wetland Preservation (south parcel)	4:1	_			1.83	100%	0.46	1.83	100%	0.46	1.83
Sou	Upland Buffer (south parcel)	5:1	_			1.31	100%	0.26	1.25	100%	0.25	1.25
	South Subtotal					7.69		3.90	7.25		3.63	7.25
	Total		10.62		5.26	17.87		8.86	17.87		9.55	17.87

Table 3-9. Summary of Wetland Credits From 2011 Through 2017 at the Big Muddy Site (Page 2 of 2)

	Compensatory Mitigation Type	Scaled % Credit Standards	2014 Credit Acres	2015 Delineated Acres	Scaled % Credit Standards	2015 Credit Acres	2016 Delineated Acres	Scaled % Credit Standards	2016 Credit Acres	2017 Delineated Acres	Scaled % Credit Standards	2017 Credit Acres
	Wetland Creation: Establishment (area between constructed cells in north parcel)	100%	1.76	1.63	100%	1.63	1.63	100%	1.63	1.63	100%	1.63
th Parcel	Wetland Creation: Establishment (wetland cells in north parcel)	70%	4.03	5.76	100%	5.76	5.76	100%	5.76	5.76	100%	5.76
North	Wetland Preservation (north parcel)	100%	0.18	0.73	100%	0.18	0.73	100%	0.18	0.73	100%	0.18
	Upland Buffer (north parcel)	100%	0.47	2.50	100%	0.50	2.50	100%	0.50	2.50	100%	0.50
	North Subtotal		6.45	10.62		8.07	10.62		8.07	10.62		8.07
Parcel	Wetland Creation: Establishment (wetland cell in south parcel)	100%	4.17	4.17	100%	4.17	4.17	100%	4.17	4.17	100%	4.17
South Par	Wetland Preservation (south parcel)	100%	0.46	1.83	100%	0.46	1.83	100%	0.46	1.83	100%	0.46
Sot	Upland Buffer (south parcel)	100%	0.25	1.25	100%	0.25	1.25	100%	0.25	1.25	100%	0.25
	South Subtotal		4.88	7.25		4.88	7.25		4.88	7.25		4.88
	Total		11.33	17.87		12.95	17.87		12.95	17.87		12.95

### 4.0 REFERENCES

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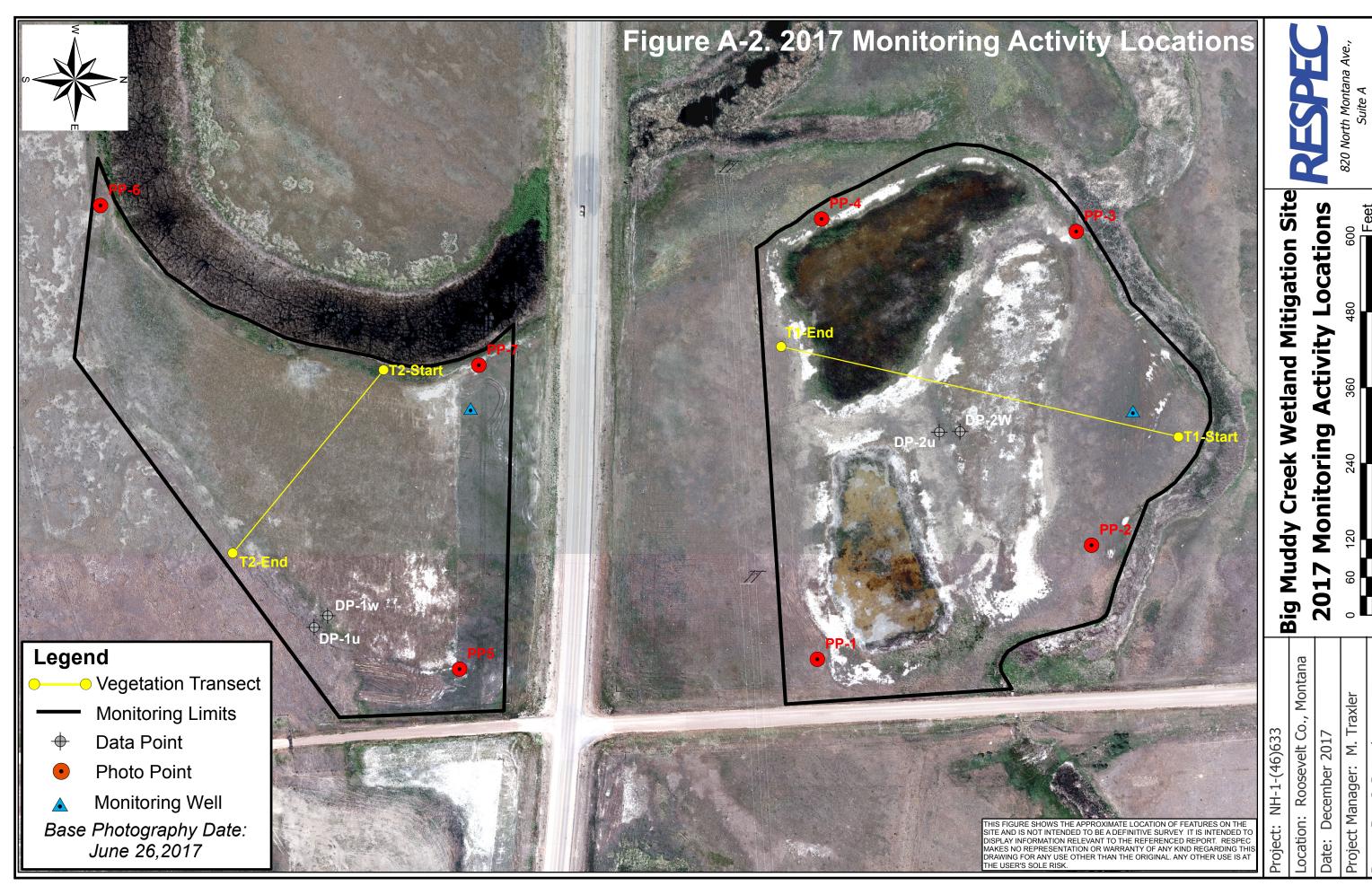
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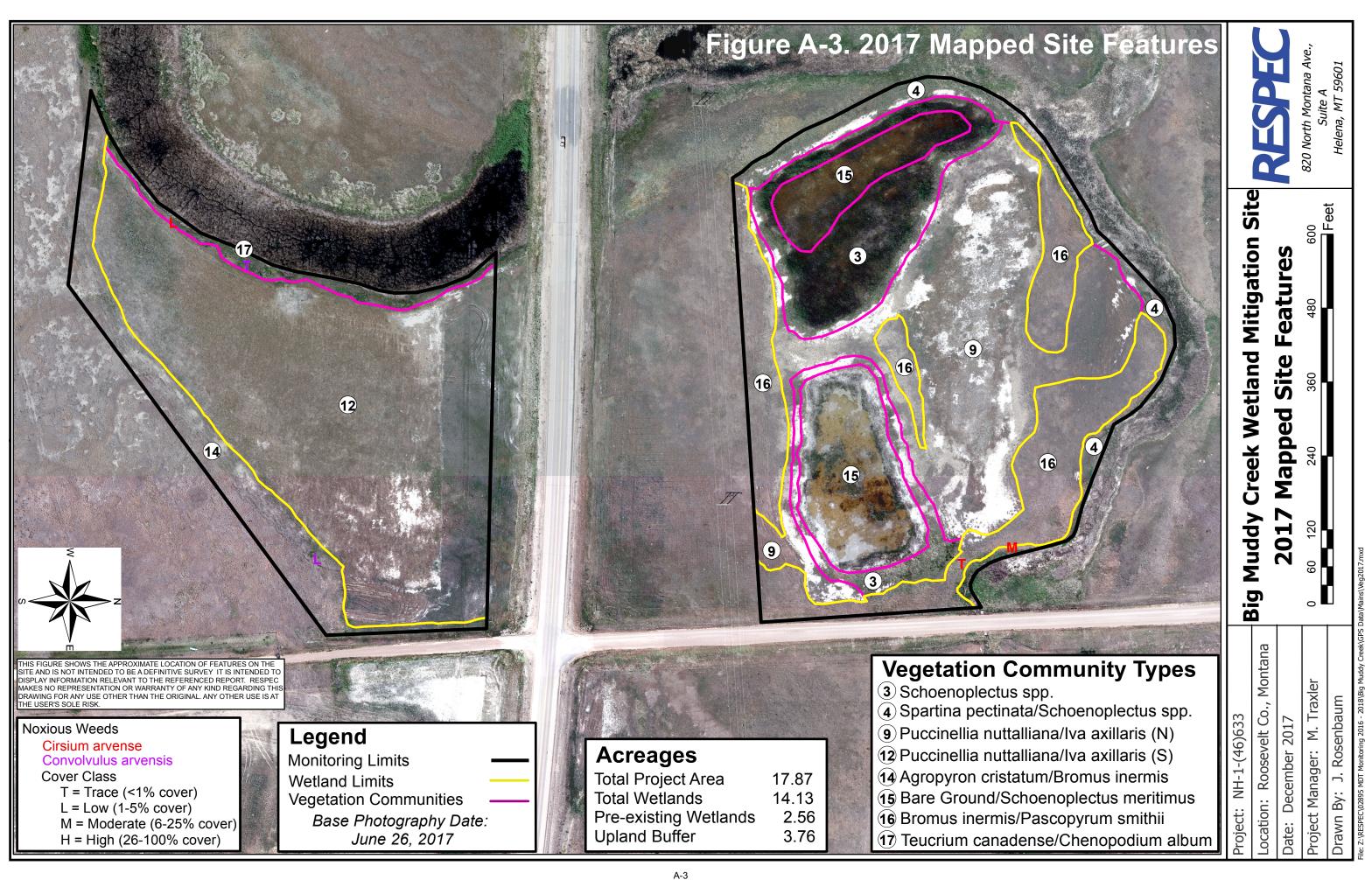
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# APPENDIX A PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring Big Muddy Creek Mitigation Site Roosevelt County, Montana





# APPENDIX B MONITORING FORMS

MDT Wetland Mitigation Monitoring Big Muddy Creek Mitigation Site Roosevelt County, Montana

### RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Big Assessment Date: Location: 4 miles Milepost: 2 Legal Description: Weather Condition Initial Evaluation Size of evaluation Hwy 2	July 12, 20 west of Cul -639.75 on T 28N as: mostly of Date: Augu	Libertson	Person ection 21 es Monit	Time of I	Strict: Glend Day: 9:30 A Visits in Ye	<u>M</u> ar: <u>1</u>				
		Н	YDROLO	GY						
Inundation: Absent Percent of assessment area Other evidence of Surface soil crack FAC-neutral test.	Surface Water Source: <a href="Unnamed tributary to Big Muddy Creek">Unnamed tributary to Big Muddy Creek</a> , precipitation, groundwater Inundation: <a href="Absent">Absent</a> Average Depth: <a href="Offeet">Offeet</a> Range of Depths: <a href="Offeet">O</a> Percent of assessment area under inundation: <a href="Offeet">Offeet</a> Depth at emergent vegetation-open water boundary: <a href="NA feet">NA feet</a> If assessment area is not inundated then are the soils saturated within 12 inches of surface: <a href="Yes">Yes</a> Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):  Surface soil cracks, salt crust, geomorphic position, inundation and saturation visible on aerial, FAC-neutral test, water marks.  Groundwater Monitoring Wells: <a href="Present">Present</a>									
Well Number	Depth	Well Number	Depth	Well Number	Depth					
Well 1	P		P		P					
Well 2										
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.  COMMENTS / PROBLEMS:  Area receives periodic overbank flow from the unnamed tributary during spring flows and large storm events. Groundwater connection between stream and constructed wetlands on both north and south side of Hwy 2. Constructed depressions with periodic to permanent inundation. 2017 was										
the second consec										

extreme drought in area. Well 1 located in northern tract, Well 2 located in southern tract. Unable

to open either well to measure water depth, as the wells appeared to be locked.

# **VEGETATION COMMUNITIES**

Community Number: 3 Community Title (main spp): Schoenoplectus spp./

Dominant Species	% Cover	<b>Dominant Species</b>	% Cover
Schoenoplectus maritimus	3 = 11-20%	Hordeum jubatum	1 = 1-5%
Distichlis spicata	2 = 6-10%	Juncus balticus	1 = 1-5%
Spartina pectinata	2 = 6-10%	Puccinellia nuttalliana	1 = 1-5%
Typha latifolia	2 = 6-10%	Eleocharis palustris	1 = 1-5%
Bare Ground	2 = 6-10%	Schoenoplectus acutus	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Schoenoplectus americanus	1 = 1-5%

Comments / Problems: \_\_\_\_

Community Number: 4 Community Title (main spp): Spartina pectinata / Schoenoplectus spp.

Dominant Species	% Cover	Dominant Species	% Cover
Schoenoplectus maritimus	4 = 21-50%	Elymus trachycaulus	1 = 1-5%
Spartina pectinata	4 = 21-50%	Schoenoplectus acutus	1 = 1-5%
Sonchus arvensis	3 = 11-20%	Typha latifolia	1 = 1-5%
Alopecurus arundinaceus	2 = 6-10%		
Hordeum jubatum	2 = 6-10%		
Puccinellia nuttalliana	1 = 1-5%		

Comments / Problems: \_\_\_\_\_

Community Number: 9 Community Title (main spp): Puccinellia nuttalliana / Iva axillaris

<b>Dominant Species</b>	% Cover	Dominant Species %	
Puccinellia nuttalliana	5 = > 50%	Agropyron cristatum	1 = 1-5%
Distichlis spicata	4 = 21-50%	Bassia scoparia	1 = 1-5%
Iva axillaris	4 = 21-50%	Chenopodium album	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Schoenoplectus maritimus	1 = 1-5%
Grindelia squarrosa	2 = 6-10%	Spartina pectinata	1 = 1-5%
Bare Ground	2 = 6-10%	Bromus inermis	1 = 1-5%

Comments / Problems: Community located in northern tract.

Community Number: 12 Community Title (main spp): Puccinellia nuttalliana / Iva axillaris

Dominant Species	% Cover	Dominant Species	% Cover
Puccinellia nuttalliana	5 = > 50%	Bassia scoparia	1 = 1-5%
Hordeum jubatum	4 = 21-50%	Distichlis spicata	1 = 1-5%
Iva axillaris	4 = 21-50%	Spartina pectinata	1 = 1-5%
Chenopodium album	2 = 6-10%		
Bare Ground	1 = 1-5%		
Suaeda calceoliformis	1 = 1-5%		

Comments / Problems: Community located in southern tract.

# **VEGETATION COMMUNITIES (continued)**

Community Number: <u>14</u> Community Title (main spp): <u>Agropyron cristatum / Bromus inermis</u>

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	5 = > 50%		
Agropyron cristatum	4 = 21-50%		
Iva axillaris	2 = 6-10%		
Hordeum jubatum	1 = 1-5%		
Grindelia squarrosa	1 = 1-5%		
Poa pratensis	1 = 1-5%		

Comments / Problems:

Community Number: 15 Community Title (main spp): Bare Ground / Schoenoplectus maritimus

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	5 = > 50%		
Schoenoplectus maritimus	3 = 11-20%		
Puccinellia nuttalliana	2 = 6-10%		
Hordeum jubatum	1 = 1-5%		
Distichlis spicata	1 = 1-5%		
Suaeda calceoliformis	+=<1%		

Comments / Problems: \_\_\_\_\_

Community Number: 16 Community Title (main spp): Bromus inermis / Pascopyrum smithii

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	4 = 21-50%	Spartina pectinata	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Chenopodium sp.	1 = 1-5%
Grindelia squarrosa	2 = 6-10%	Distichlis spicata	1 = 1-5%
Iva axillaris	2 = 6-10% Elymus trachycaulus		1 = 1-5%
Agropyron cristatum	2 = 6-10%	Hordeum jubatum	1 = 1-5%
Poa pratensis	1 = 1-5%	Puccinellia nuttalliana	1 = 1-5%

Comments / Problems:

Community Number: 17 Community Title (main spp): Teucrium canadense / Chenopodium album

Dominant Species	% Cover	_	% Cover
Teucrium canadense	4 = 21-50%	Distichlis spicata	1 = 1-5%
Chenopodium album	3 = 11-20%	Iva axillaris	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Lepidium densiflorum	1 = 1-5%
Lactuca tatarica	2 = 6-10%	Symphoricarpos albus	1 = 1-5%
Spartina pectinata	2 = 6-10%	Convolvulus arvensis	1 = 1-5%
Apocynum cannabinum	1 = 1-5%	Puccinellia nuttalliana	1 = 1-5%

Comments / Problems:

# **VEGETATION COMMUNITIES (continued)**

Community Number: 18 Community Title (main spp): Open Water / Schoenople	ctus spp.
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Dominant Species	% Cover	Dominant Species	% Cover
Schoenoplectus maritimus	5 = > 50%		
Open Water	1 = 1-5%		
Aquatic macrophytes	3 = 11-20%		
Algae, green	2 = 6-10%		
Schoenoplectus acutus	1 = 1-5%		
Spartina pectinata	+ = < 1%		

Comments / Problems: This vegetation type was very limited in 2016 and 2017 due to lack of surface water.

% Cover	<b>Dominant Species</b>	% Cover
j l <b>≣</b> l	<del>-</del>	
+		
unity Title (main spp):	•	
% Cover		% Cover
	•	
-		
% Cover	<b>Dominant Species</b>	% Cover
-		
	% Cover	unity Title (main spp):

# PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: No woody species were installed on this site. The wetlands were revegetated with seed and salvaged material. Numerous volunteer seedlings and saplings (less than 1-inch diameter) were observed within the eastern portion of the site in 2017, including cottonwoods, aspen, and willows.

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# MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Big Muddy** Date: **July 12, 2017** Examiner: **M. Traxler** 

Transect Number: 1 Approximate Transect Length: 647 feet Compass Direction from Start: 220 Note: North Side

Transect Interval Length: 31 feet (station 0-31)	
Vegetation Community Type: Bromus inermis / Pascopyrum smithii	
Plant Species	Cover
Distichlis spicata	4 = 21-50%
Pascopyrum smithii	3 = 11-20%
Agropyron cristatum	3 = 11-20%
Artemisia cana	2 = 6-10%
Bromus inermis	2 = 6-10%
Chenopodium sp.	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: <b>69 feet (station 31-100)</b> Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris		
Plant Speci	es	Cover
Distichlis spicata		5 = > 50%
Puccinellia nuttalliana		5 = > 50%
Iva axillaris		3 = 11-20%
Suaeda calceoliformis		2 = 6-10%
Chenopodium sp.		1 = 1-5%
Hordeum jubatum		1 = 1-5%
	Total Vegetative Cover:	90%

Transect Interval Length: <b>75 feet (station 100-175)</b>	
Vegetation Community Type: Bromus inermis / Pascopyrum smithii	
Plant Species	Cover
Bromus inermis	4 = 21-50%
Distichlis spicata	4 = 21-50%
Iva axillaris	3 = 11-20%
Pascopyrum smithii	3 = 11-20%
Agropyron cristatum	2 = 6-10%
Puccinellia nuttalliana	1 = 1-5%
Chenopodium sp.	1 = 1-5%
Grindelia squarrosa	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: 265 feet (station 175-440)	
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris	
Plant Species	Cover
Puccinellia nuttalliana	4 = 21-50%
Bare Ground	3 = 11-20%
Hordeum jubatum	2 = 6-10%
Distichlis spicata	1 = 1-5%
Grindelia squarrosa	1 = 1-5%
Chenopodium sp.	1 = 1-5%
Pascopyrum smithii	1 = 1-5%
Bassia scoparia	1 = 1-5%
Total Vegetative Cover:	75%

# MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Big Muddy** Date: **July 12, 2017** Examiner: **M. Traxler** 

Transect Number: <u>1</u> Approximate Transect Length: <u>647 feet</u> Compass Direction from Start: <u>220°</u> Note: <u>North Side</u>

Transect Interval Length: 152 feet (station 440-592)	
Vegetation Community Type: Schoenoplectus spp. /	
Plant Species	Cover
Schoenoplectus acutus	4 = 21-50%
Schoenoplectus maritimus	4 = 21-50%
Spartina pectinata	2 = 6-10%
Bare Ground	2 = 6-10%
Alopecurus arundinaceus	1 = 1-5%
Eleocharis palustris	1 = 1-5%
Puccinellia nuttalliana	1 = 1-5%
Sonchus arvensis	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	75%

Transect Interval Length: 34 feet (station 592-626)	
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris	
Plant Species	Cover
Bare Ground	4 = 21-50%
Distichlis spicata	3 = 11-20%
Puccinellia nuttalliana	2 = 6-10%
Grindelia squarrosa	+ = < 1%
Hordeum jubatum	+ = < 1%
Total Vegetative Cover:	75%

Transect Interval Length: 21 feet (station 626-647)	
Vegetation Community Type: Bromus inermis / Pascopyrum smithii	
Plant Species	Cover
Bromus inermis	4 = 21-50%
Grindelia squarrosa	1 = 1-5%
Iva axillaris	1 = 1-5%
Agropyron cristatum	1 = 1-5%
Pascopyrum smithii	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	Cover
Tracel Version Communication	0/
Total Vegetative Cover:	%

B-8

Transect Number: 2 Approximate Transect Length: 366 feet Compass Direction from Start: 130 Note: South Side

Transect Interval Length: 9 feet (station 0-9)	
Vegetation Community Type: Teucrium canadense / Chenopodium	
album	
Plant Species	Cover
Symphoricarpos albus	3 = 11-20%
Iva axillaris	2 = 6-10%
Spartina pectinata	2 = 6-10%
Chenopodium album	1 = 1-5%
Teucrium canadense	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: 327 feet (station 9-336)	
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris	
Plant Species	Cover
Puccinellia nuttalliana	5 = > 50%
Hordeum jubatum	3 = 11-20%
Chenopodium album	2 = 6-10%
Bare Ground	1 = 1-5%
Iva axillaris	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: 30 feet (station 336-366)	
Vegetation Community Type: Agropyron cristatum / Bromus inermis	
Plant Species	Cover
Bromus inermis	5 = > 50%
Agropyron cristatum	2 = 6-10%
Iva axillaris	1 = 1-5%
Vicia americana	+ = < 1%
Grindelia squarrosa	+ = < 1%
Symphoricarpos albus	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	Cover
-	
Total Vegetative Cover:	%

B-5

3 = 11-10%

+ = Obligate

P = Planted

1 = 1-5%

4 = 21-50%

- = Facultative/Wet

V = Volunteer

2 = 6-10%

5 = > 50%

0 = Facultative

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): %

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments:

### **PHOTOGRAPHS**

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph (	Checklist:
--------------	------------

	$\times$	One	photog	raph	for	each	of t	he four	cai	dinal	directions	suri	ound	ing	th	e wetla	nd.	
r														•				

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.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1, Photo 1: 48.165836 / -104.617004	N
PP-1		Photo Point 1, Photo 2: 48.165836 / -104.617004	NW
PP-1		Photo Point 1, Photo 3: 48.165836 / -104.617004	SW
PP-2		Photo Point 2, Photo 1: 48.167038 / -104.617645	N
PP-2		Photo Point 2, Photo 2: 48.167038 / -104.617645	Е
PP-2		Photo Point 2, Photo 3: 48.167038 / -104.617645	S
PP-2		Photo Point 2, Photo 4: 48.167038 / -104.617645	W
PP-3		Photo Point 3, Photo 1: 48.16716 / -104.619606	Е
PP-3		Photo Point 3, Photo 2: 48.16716 / -104.619606	S
PP-3		Photo Point 3, Photo 3: 48.16716 / -104.619606	W
PP-3		Photo Point 3, Photo 4: 48.16716 / -104.619606	N
PP-4		Photo Point 4, Photo 1: 48.166012 / -104.619835	N
PP-4		Photo Point 4, Photo 2: 48.166012 / -104.619835	NE
PP-4		Photo Point 4, Photo 3: 48.166012 / -104.619835	NW
PP-5		Photo Point 5 (Pano): 48.164421 / -104.616943	221
PP-6		Photo Point 6 (Pano): 48.162872 / -104.620232	0
PP-7		Photo Point 7 (Pano): 48.164448 / -104.618835	180
T-1 start		Transect 1 start: 48.167465 / -104.618301	220
T-1 end		Transect 1 end: 48.165768 / -104.619057	30
T-2 start		Transect 2 start: 48.164039 / -104.619043	130
T-2 end		Transect 2 end: 48.163334 / -104.618011	310
DP-1U		Upland soil pit #1: 48.163729 / -104.617384	
DP-1W		Wetland soil pit #1: 48.163785 / -104.61745	
DP-2U		Upland soil pit #2: 48.166432 / -104.618452	
DP-2W		Wetland soil pit #2: 48.166514 / -104.618436	

Comments /	<b>Problems:</b>	

# **GPS SURVEYING**

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:  Upland/wetland boundary.
4-6 landmarks that are recognizable on the aerial photograph.
Start and End points of vegetation transect(s).
<ul><li>✓ Photograph reference points.</li><li>✓ Groundwater monitoring well locations.</li></ul>
Bird nest boxes.
Comments / Problems:
WETLAND DELINEATION (attach COE delineation forms)
(attach COE defineation forms)
At each site conduct these checklist items:
<ul> <li>✓ Delineate wetlands according to the 1987 Army COE manual and regional supplement.</li> <li>✓ Delineate wetland – upland boundary onto aerial photograph.</li> </ul>
Comments / Problems:
FUNCTIONAL ASSESSMENT  Complete and attach full MDT Montana Wetland Assessment Method field forms.
Comments / Problems:
MAINTENANCE
Were man-made nesting structure installed at this site? No
If yes, do they need to be repaired? <u>NA</u> 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? <b>No</b>
If yes, are the structures working properly and in good working order? <u>NA</u> If no, describe the problems below.
Comments / Problems:

W	VTT	DI	JF	F
	, ,,	1171	/II.	1

Were man-made nesting stru	uctures installed? <b>No</b>
If yes, type of structure:	
Are the nesting structures be	eing used? NA
Do the nesting structures ne	ed repairs?

# **Mammals and Herptiles**

Birds

Mammal and Hamtile Species	Number		Indir	ect Indicatio	on of Use
Mammal and Herptile Species	Observed	Tracks	Scat	Burrows	Other
Garter snake	2				
Deer sp.					
Rabbit sp.			$\boxtimes$		

# **Additional Activities Checklist:**

<u>NA</u> Macroinvertebrate Sampling (if required)

Comments / Problems: <u>Site contained no standing water during 2017 site visit which might be limiting wildlife use - especially waterfowl species and mammals that would routinely come to the site to drink.</u>

# **BIRD SURVEY - FIELD DATA SHEET**

Site: Big Muddy	Date: <u>7/12/17</u>
Survey Time:	to

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Western Meadowlark	4	LFFO	UP				
Mourning Dove	2	NFFO	UP				
Ring-necked Pheasant	1	L	MA				
Upland Sandpiper	2	L	UP				
Brewer's Blackbird	1	FO	UP				
Common Yellowthroat	1	L	MA				
Red-tailed Hawk	1	FO	UP				
Red-winged Blackbird	2	L FO	MA MF				
Spotted Sandpiper	1	FO	UP				
Killdeer	4	LFFO	MF UP				
Tree Swallow	20	FO	MA				
Wilson's Phalarope	1	FO	MA				

BEHAVIOR CODES

**BP** = One of a breeding pair **BD** = Breeding display

 $\mathbf{F} =$ Foraging  $\mathbf{FO} =$ Flyover

**FO** = Flyover **L** = Loafing

N = Nesting

HABITAT CODES

**OW** = Open Water

AB = Aquatic bed
FO = Forested
I = Island
WM = Wet meadow
WA = Marsh
US = Unconsolidated shore

MA = Marsh US = Unc MF = Mud Flat

Weather: \_\_\_\_\_

Notes: Ducks could be heard on adjacent property but not seen due to height of vegetation.

# WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy			City/County:	Roosevelt	Sampling Date: 12-Jul-17
pplicant/Owner: MDT				State:	: MT Sampling Point: DP-1U
nvestigator(s): M. Traxler			Section, To	wnship, Ra	ange: <b>S</b> 21
andform (hillslope, terrace, etc.): Shoul	der slope		Local relief	(concave, o	convex, none): flat Slope: 10.0%5.
bregion (LRR): LRR F	<u> </u>	Lat.: 48	163729		Long.: -104.617384 Datum: WGS84
il Map Unit Name: Lohler silty clay			.103723		NWI classification: Not Mapped
			. Vo	s • No	
climatic/hydrologic conditions on the s		•			(2.1.1.)
	r Hydrology	significantly	disturbed?	Are "N	lormal Circumstances" present? Yes  No
	r Hydrology 🔃	naturally pro		•	eded, explain any answers in Remarks.)
-		showing sa	mpling p	oint loc	ations, transects, important features, et
	s O No O			Sampled A	
	s O No 💿		withi	n a Wetland	<sub>d?</sub> Yes ○ No •
Vetland Hydrology Present? Yes  Remarks:					
Data point in upland, vegetation commu		 plants	Dominant	FWS Re	gion: -?-
(5)	,		—Species? Rel.Strat.	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 Foot Radiu		% Cover	Cover	Status	Number of Dominant Species
1					That are OBL, FACW, or FAC: 0 (A)
2		•	<u> </u>		Total Number of Dominant
4.					Species Across All Strata: 2 (B)
			C		Percent of dominant Species
Sapling/Shrub Stratum_ (Plot size: 15 Fo	oot Radius )	0	= Total Co	over	That Are OBL, FACW, or FAC: 0.0% (A/B)
1		0			Prevalence Index worksheet:
2.					Total % Cover of: Multiply by:
3					OBL species $0 \times 1 = 0$
4.		0			FACW species $0 \times 2 = 0$
5					FAC species $5 \times 3 = 15$
		0	= Total Co	over	FACU species $25 \times 4 = 100$
Herb Stratum (Plot size: 5 Foot Radius					UPL species $\frac{42}{2}$ x 5 = $\frac{210}{2}$
1. Agropyron cristatum			13.9%	UPL	Column Totals: (A)325 (B)
2. Bromus inermis			41.7%	UPL	
Iva axillaris     Lactuca tatarica			6.9%	FAC UPL	Prevalence Index = B/A = 4.514
5. Pascopyrum smithii			<u>1.4%</u> 34.7%	FACU	Hydrophytic Vegetation Indicators:
6			1.4%	UPL	1 - Rapid Test for Hydrophytic Vegetation
7.			0.0%		2 - Dominance Test is > 50%
8.			0.0%		3 - Prevalence Index is ≤3.0 <sup>1</sup>
9.		0			4 - Morphological Adaptations (Provide supporting
10.			0.0%		data in Remarks or on a separate sheet)
		72	= Total Co	over	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	ot Radius )				$^{\rm 1}$ Indicators of hydric soil and wetland hydrology must be present.
Woody Vine Stratum (Plot size: 30 For		Λ			
1		_			
					Hydrophytic
1		_	= Total Co	over	Hydrophytic Vegetation Present?  Yes No   No

US Army Corps of Engineers

Soil Sampling Point: DP-1U

Profile Description: (Descr Depth <u>Ma</u>	atrix		ox Feature					
(inches) Color (mo	oist) %	Color (moist)	%	Tvpe <sup>1</sup> L	.oc²	Texture		Remarks
0-16 10YR	3/1 100					Silty Clay Loam		
Type: C=Concentration. D=I	Depletion. RM=Red	luced Matrix, CS=Covere	ed or Coated	Sand Grains	<sup>2</sup> Loca	tion: PL=Pore Lining. M	Matrix	
lydric Soil Indicators: (A	pplicable to all LI	RRs, unless otherwis	e noted.)			Indicators for Pro	olematic H	ydric Soils³:
Histosol (A1)		Sandy Gleyed	Matrix S4			1 cm Muck (A9	(LRR I, J)	
Histic Epipedon (A2)		Sandy Redox (	S5)			Coastal Prairie		(LRR F, G, H)
Black Histic (A3)		Stripped Matrix	(S6)			Dark Surface (S		
Hydrogen Sulfide (A4)		Loamy Mucky				High Plains Dep	ressions (F	16)
Stratified Layers (A5) (LRF	•	Loamy Gleyed	` ,			(LRR H out	ide of MLR	A 72 and 73)
1 cm Muck (A9) (LRR F,G,	-	Depleted Matri	. ,			Reduced Vertic	(F18)	
Depleted Below Dark Surf	ace (A11)	Redox Dark Su	, ,			Red Parent Mat	erial (TF2)	
Thick Dark Surface (A12)		Depleted Dark		1		Very Shallow D	ırk Surface	(TF12)
Sandy Muck Mineral (S1)	. (00) (100 0 11)	Redox depress	, ,			Other (Explain	n Remarks)	
2.5 cm Mucky Peat or Pea	. , . , ,	High Plains De		,		<sup>3</sup> Indicators of hydror		
5 cm Mucky Peat or Peat	(S3) (LRR F)	(MLRA /2	and 73 of L	KK H)		hydrology must be p	esent, unle	ss disturbed or problema
estrictive Layer (if presen	nt):							
Type:							,	$\sim$
Type: Depth (inches):						Hydric Soil Present	Yes (	○ No ●
Depth (inches):						Hydric Soil Present	Yes (	○ No •
Depth (inches):Remarks:	served during fiel	ld survey. Soil not mo	nist to 16"			Hydric Soil Present	Yes (	○ No •
Depth (inches):	served during fiel	ld survey. Soil not mo	oist to 16".			Hydric Soil Present	Yes <sup>(</sup>	○ No •
Depth (inches):Remarks:	served during fiel	ld survey. Soil not mo	oist to 16".			Hydric Soil Present	Yes <sup>(</sup>	○ No •
Depth (inches): Remarks: o hydric soil indicators obs	served during fiel	ld survey. Soil not mo	oist to 16".			Hydric Soil Present	Yes <sup>(</sup>	○ No •
Depth (inches):		ld survey. Soil not mo	oist to 16".					
Depth (inches):	tors:					Secondary Ind	cators (mi	nimum of two require
Depth (inches):	tors:	ed; check all that app	oly)			Secondary Ind	cators (mi	nimum of two require
Depth (inches):	tors:	ed; check all that app	oly) 11)			Secondary Ind Surface S Sparsely	cators (mi iil Cracks (B egetated Co	nimum of two require 6) oncave Surface (B8)
Depth (inches):	tors:	ed; check all that app Salt Crust (B	oly) 11) rtebrates (B1	•		Secondary Ind Surface S Sparsely	cators (mi	nimum of two require 6) oncave Surface (B8)
Depth (inches): Demarks: Demar	tors:	ed; check all that app	oly) 11) rtebrates (B1	•		Secondary Ind Surface S Sparsely Drainage	cators (mi iil Cracks (B egetated Co Patterns (B1	nimum of two require 6) oncave Surface (B8)
Depth (inches):  Demarks: Dema	tors:	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su	oly) 11) rtebrates (B1 Ilfide Odor (C Water Table	C1) (C2)		Secondary Ind Surface S Sparsely Drainage Oxidized	cators (mi iil Cracks (B egetated Co Patterns (B1	nimum of two require 6) oncave Surface (B8) .0)
Depth (inches):  Remarks: Depth (inches): Dept	tors:	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su	oly) 11) rtebrates (B1 Ilfide Odor (C Water Table	(1)	s (C3)	Secondary Ind Surface S Sparsely Drainage Oxidized (whe	cators (mi iil Cracks (B egetated Co Patterns (B1 thizosphere	nimum of two require 66) oncave Surface (B8) 1.0) s on Living Roots (C3)
Depth (inches):  Remarks: O hydric soil indicators observed by the soil indicators observed by	tors:	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season V Oxidized Rhi	oly) 11) rtebrates (B1 Ilfide Odor (C Water Table	C1) (C2)	s (C3)	Secondary Ind Surface S Sparsely \ Drainage Oxidized (whe	cators (mi iil Cracks (B egetated Co Patterns (B1 thizosphere re tilled) urrows (C8)	nimum of two require 66) oncave Surface (B8) 1.0) s on Living Roots (C3)
Depth (inches):  Remarks: Depth (inches): Dept	tors:	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season V Oxidized Rhi	oly) 11) rtebrates (B1 lifide Odor (C Water Table ( zospheres or not tilled)	(C2) Living Roots	s (C3)	Secondary Ind Surface S Sparsely \ Drainage Oxidized (whe	cators (mi iil Cracks (B egetated Co Patterns (B1 thizosphere re tilled) urrows (C8)	nimum of two require  16)  Doncave Surface (B8)  1.0)  Is on Living Roots (C3)  Aerial Imagery (C9)
Depth (inches):  Remarks: O hydric soil indicators observed by the lightest of	tors:	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season \ Oxidized Rhi	oly)  11)  rtebrates (B1  llfide Odor (C  Water Table of tilled)  Reduced Iror	(C2) Living Roots	s (C3)	Secondary Ind Surface S Sparsely \ Drainage Oxidized (who Crayfish E Saturation Geomorpi	cators (mi bil Cracks (B regetated Co Patterns (B1 thizosphere re tilled) urrows (C8) Visible on a	nimum of two require  6)  concave Surface (B8)  0)  s on Living Roots (C3)  Aerial Imagery (C9)  (D2)
Depth (inches):  Remarks: Depth (inches):  Wetland Section of the	t <b>ors:</b> um of one require	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season V Oxidized Rhi (where	oly) 11) rtebrates (B1 lifide Odor (C Water Table of tilled) Reduced Iror urface (C7)	C1) (C2) In Living Roots	s (C3)	Secondary Ind Surface S Sparsely Drainage Oxidized (whe Crayfish E Saturation Geomorph FAC-neut	cators (mi iil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5)	nimum of two require  6)  concave Surface (B8)  0)  s on Living Roots (C3)  Aerial Imagery (C9)  (D2)
Depth (inches):  Remarks: Depth (inches): Remarks: Depth (inches)	tors: um of one require dial Imagery (B7)	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Oxidized Rhi (where	oly) 11) rtebrates (B1 lifide Odor (C Water Table of tilled) Reduced Iror urface (C7)	C1) (C2) In Living Roots	s (C3)	Secondary Ind Surface S Sparsely Drainage Oxidized (whe Crayfish E Saturation Geomorph FAC-neut	cators (mi iil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5)	nimum of two require (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2)
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Depth (inches):  Remarks:  Io hydric soil indicators observed by the land Hydrology  Wetland Hydrology Indicate  Primary Indicators (minimum Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aer  Water-Stained Leaves (B5)  Field Observations:  Surface Water Present?  Water Table Present?  Saturation Present?	tors:  um of one require  tial Imagery (B7)  Po  Yes No  Yes No	ed; check all that app  Salt Crust (B Aquatic Inve Hydrogen St Dry Season V Oxidized Rhi (where to the companies of the compa	oly)  11)  rtebrates (B1  lifide Odor (C  Water Table of tilled)  Reduced Iror  urface (C7)  in in Remark  mes):  mes):	C1) (C2) In Living Roots		Secondary Ind Surface S Sparsely Drainage Oxidized (whe Crayfish E Saturation Geomorph FAC-neut	cators (mi oil Cracks (B degetated Co Patterns (B1 thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5) re Hummoc	nimum of two require (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2) ) ks (D7) (LRR F)
Depth (inches):  Remarks:  Io hydric soil indicators observed by the land Hydrology  Wetland Hydrology Indicate  Primary Indicators (minimum of the land water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aer  Water-Stained Leaves (B5)  Field Observations:  Surface Water Present?  Water Table Present?  Saturation Present?  Saturation Present?  Sincludes capillary fringe)	tors:  um of one require  rial Imagery (B7)  9)  Yes	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Oxidized Rhi (where Presence of Thin Muck Su Other (Expla	oly)  11)  rtebrates (B1  ilfide Odor (C  Water Table (C  Zospheres or (C  Not tilled)  Reduced Iror  urface (C7)  in in Remark  mes):  mes):	C1) (C2) n Living Roots n (C4) s)	Wetla	Secondary Ind Surface S Sparsely S Drainage Oxidized (whe Crayfish E Saturation Geomorp FAC-neut Frost Hea	cators (mi oil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5) ve Hummoc	nimum of two require (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2) ) ks (D7) (LRR F)
Depth (inches):  Remarks:  Io hydric soil indicators observed by the land Hydrology  Wetland Hydrology Indicate  Primary Indicators (minimum of the land water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aer  Water-Stained Leaves (B5)  Field Observations:  Surface Water Present?  Water Table Present?  Saturation Present?  Saturation Present?  Sincludes capillary fringe)	tors:  um of one require  rial Imagery (B7)  9)  Yes	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Oxidized Rhi (where Presence of Thin Muck Su Other (Expla	oly)  11)  rtebrates (B1  ilfide Odor (C  Water Table (C  Zospheres or (C  Not tilled)  Reduced Iror  urface (C7)  in in Remark  mes):  mes):	C1) (C2) n Living Roots n (C4) s)	Wetla	Secondary Ind Surface S Sparsely S Drainage Oxidized (whe Crayfish E Saturation Geomorp FAC-neut Frost Hea	cators (mi oil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5) ve Hummoc	nimum of two require (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2) ) ks (D7) (LRR F)
Depth (inches):  Remarks:  Io hydric soil indicators observed by the land Hydrology  Wetland Hydrology Indicate Primary Indicators (minimal Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aer  Water-Stained Leaves (B5)  Field Observations:  Surface Water Present?  Water Table Present?  Saturation Present?  Includes capillary fringe)  Describe Recorded Data (specific processes)	tors:  um of one require  rial Imagery (B7)  9)  Yes	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Oxidized Rhi (where Presence of Thin Muck Su Other (Expla	oly)  11)  rtebrates (B1  ilfide Odor (C  Water Table (C  Zospheres or (C  Not tilled)  Reduced Iror  urface (C7)  in in Remark  mes):  mes):	C1) (C2) n Living Roots n (C4) s)	Wetla	Secondary Ind Surface S Sparsely S Drainage Oxidized (whe Crayfish E Saturation Geomorp FAC-neut Frost Hea	cators (mi oil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5) ve Hummoc	nimum of two require (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2) ) ks (D7) (LRR F)
Depth (inches):  Remarks:  o hydric soil indicators observed by the land Hydrology  Vetland Hydrology Indicate Primary Indicators (minimal Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aer  Water-Stained Leaves (B5)  Field Observations: Surface Water Present?  Water Table Present?  Saturation Present?	tors:  um of one require  rial Imagery (B7)  9)  Yes	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Oxidized Rhi (where Presence of Thin Muck Su Other (Expla	oly)  11)  rtebrates (B1  ilfide Odor (C  Water Table (C  Zospheres or (C  Not tilled)  Reduced Iror  urface (C7)  in in Remark  mes):  mes):	C1) (C2) n Living Roots n (C4) s)	Wetla	Secondary Ind Surface S Sparsely S Drainage Oxidized (whe Crayfish E Saturation Geomorp FAC-neut Frost Hea	cators (mi oil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5) ve Hummoc	nimum of two require (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2) ) ks (D7) (LRR F)
Depth (inches):	tors:  um of one require  ial Imagery (B7)  Yes  No ( Ye	ed; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Oxidized Rhi (where Presence of Thin Muck Si Other (Expla	oly)  11)  rtebrates (B1  lifide Odor (C  Water Table of the company of the compa	C1) (C2) In Living Roots In (C4) In Living Roots In (C4) In (C	Wetla	Secondary Ind Surface S Sparsely S Drainage Oxidized (whe Crayfish E Saturation Geomorp FAC-neut Frost Hea	cators (mi oil Cracks (B egetated Co Patterns (Bi thizosphere re tilled) urrows (C8) Visible on a ic Position (al Test (D5) ve Hummoc	nimum of two required (6) concave Surface (B8) (0) s on Living Roots (C3) Aerial Imagery (C9) (D2) ) ks (D7) (LRR F)

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# WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy			city/County:	Roosevelt		Sampling	g Date: 12-Jul-	-17
Applicant/Owner: MDT				State	: MT Sampling	Point:	DP-1\	W
investigator(s): M. Traxler			Section, To		inge: S 21 T 28	_	55E	
Landform (hillslope, terrace, etc.):	Lowland		Local relief	(concave, o	convex, none): flat	SI	lope: 0.0%	0.0 °
- Subregion (LRR): LRR F		<b>Lat.:</b> 48	.163785		Long.: -104.61745		Datum: W(	GS84
oil Map Unit Name: Lohler silty clay					NWI classific	cation: Not	Manned	
e climatic/hydrologic conditions on		time of vear	? Ye	s • No			Паррса	
Are Vegetation , Soil		significantly		Are "N	ormal Circumstances" pre	· .	Yes • No	$\bigcirc$
Are Vegetation , Soil ,		naturally pro			eded, explain any answers			
Summary of Findings - At				•			•	es, etc.
Hydrophytic Vegetation Present?	Yes   No					•		
Hydric Soil Present?	Yes  No			Sampled A				
Wetland Hydrology Present?	Yes   No		withi	n a Wetland	<sub>1?</sub> Yes • No ·			
Remarks:	105 0 110 0							
Data point in excavated basin south	n of highway, on southe	astern edge o	of wetland ce	ell.				
VEGETATION - Use scien	tific names of nl	ante	Dominant	FWS Re	gion: GP			
VEGETATION - USE SCIEN	— Tallies of pie		_Species?		- 	· oot:		
Tree Stratum (Plot size: 30 Foot	t Radius )	Mosolute  Mosolute	Rel.Strat. Cover	Indicator Status				
1		0			Number of Dominant Speci That are OBL, FACW, or FA		3	(A)
2		0			Total Number of Deminant			
3		0			Total Number of Dominant Species Across All Strata:		3	(B)
4		0					-	
Sapling/Shrub Stratum (Plot size:	15 Foot Radius )	0	= Total Co	over	Percent of dominant Spe That Are OBL, FACW, or		100.0%	(A/B)
1		0			Prevalence Index works	heet:		
2		0			Total % Cover of:		iply by:	
3		0				0 x 1		-
4		0			FACW species 25	5 x 2	= 50	
5			<u> </u>		FAC species 25	5 x 3	<b>=</b> 75	
(0)	Seedle and A	0	= Total Co	over	FACU species0	) x 4	= 0	
Herb Stratum (Plot size: 5 Foot F	(adius )				UPL species0	<u> </u>	<b>=</b> 0	ı
7:			<b>✓</b> 25.0% <b>✓</b> 25.0%	FACW	Column Totals: 10	0 (A)	175	(B)
2 5 . 11:11:			<b>✓</b> 25.0% <b>✓</b> 50.0%	- FAC OBL	Prevalence Index =		1.75	
$_{\it A}$		0	0.0%	OBL				
5		0	0.0%		Hydrophytic Vegetation	Indicators	•	
6.		0	0.0%		1 - Rapid Test for H	ydrophytic	: Vegetation	
7.		0	0.0%		2 - Dominance Test			
8. 9.		0			<b>✓</b> 3 - Prevalence Inde	x is ≤3.0 <sup>1</sup>		
10.					4 - Morphological A			porting
10.		0			data in Remarks o		-	in)
(0)	20 Fast Dadius )	100	= Total Co	over			• •	•
Woody Vine Stratum (Plot size:					Indicators of hydric s be present.	oil and we	tland hydrolog	gy must
1								
2					Hardwan barti a			
% Bare Ground in Herb Stratum	5	0	= Total Co	over	Hydrophytic Vegetation Present?  Yes	No O		
					Present:			
Remarks:								
Vegetation at data point unchanged	d from 2016.							

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Soil Sampling Point: DP-1W

Profile Desc	•		e depth ne	eded to				nfirm the	absence of indicators	5.)
Depth (inches)	Ma	atrix siet)	%	Color (	Red (moist)	lox Featu _%_	res Tvpe 1	Loc2	Texture	Remarks
0-8	10YR	3/1	95	5YR	4/6	5	C	M	Silty Clay	Kemars
8-16	2.5Y	4/3	70	3110		30			Silty Clay	Redox color: (Gley 1) 3/N
1Type: C=Co	oncentration. D=I	Depletion.	RM=Reduce	ed Matrix,	CS=Cover	ed or Coat	ed Sand Gra	ins <sup>2</sup> Loca	ation: PL=Pore Lining. N	1=Matrix
Hydric Soil	Indicators: (A	pplicable	to all LRR	s, unless	otherwis	se noted.	)		Indicators for Pr	oblematic Hydric Soils <sup>3</sup> :
Histosol	` '				ndy Gleyed				1 cm Muck (As	, , ,
	pipedon (A2)				ndy Redox					Redox (A16) (LRR F, G, H)
Black His	` '			=	ipped Matri	. ,	-1)		Dark Surface (	, , ,
	n Sulfide (A4) I Layers (A5) (LRI	) E\			amy Mucky	-	-			epressions (F16)
	ck (A9) (LRR F,G,	-			amy Gleyed pleted Matr	•	2)		_ `	tside of MLRA 72 and 73)
	l Below Dark Surf	-			dox Dark Si	. ,	)		Reduced Verti	` '
= .	rk Surface (A12)	(,		$\equiv$	pleted Dark	•	•		Red Parent Ma	oteriai (1F2) Dark Surface (TF12)
	uck Mineral (S1)				dox depress	,	. ,		Other (Explain	,
2.5 cm M	Mucky Peat or Pea	t (S2) (LR	R G, H)	Hig	h Plains De	epressions	s (F16)			ophytic vegetation and wetland
5 cm Mu	cky Peat or Peat	(S3) (LRR	F)		(MLRA 72	and 73 c	of LRR H)			present, unless disturbed or problematic
Restrictive I	Layer (if preser	ıt):								
Type:									Under Call Day	
Depth (in	ches):								Hydric Soil Present	t? Yes   No
Remarks:										
Soil moist to	within 2" of su	ırface.								
l landual an										
Hydrolog	•									
-	drology Indicat									dicators (minimum of two required)
	licators (minim	um of on	e required;						Surface S	Soil Cracks (B6)
	Water (A1)				alt Crust (E	,			= ' '	Vegetated Concave Surface (B8)
	ater Table (A2)				quatic Inve		. ,		= -	e Patterns (B10)
Saturation					lydrogen Si				Oxidized	Rhizospheres on Living Roots (C3)
	larks (B1)				ry Season		. ,	. (00)	_	nere tilled)
	nt Deposits (B2)					-	s on Living R	oots (C3)		Burrows (C8)
	posits (B3)				-	not tilled	-			on Visible on Aerial Imagery (C9)
	at or Crust (B4)				resence of		` ,			phic Position (D2)
	posits (B5)				hin Muck S	-	-		=	tral Test (D5)
	ion Visible on Aer		y (B7)	∐ C	Other (Expla	ain in Rem	narks)		☐ Frost He	ave Hummocks (D7) (LRR F)
	tained Leaves (B	9)								
Field Observ Surface Wate		Yes O	No 💿		Depth (inc	hes).				
Water Table I		Yes O								
Saturation Pro					Depth (inc	_		Wetla	and Hydrology Preser	nt? Yes • No O
(includes capi	illary fringe)	Yes O	No ●	.,	Depth (inc					
Describe Re	ecorded Data (s	tream ga	uge, monit	or well,	aerial pho	otos, prev	vious inspe	ctions), if	available:	
Remarks:										
	o within 2" of s	urface. hi	ut no satur	ation or	water in i	oit.				
20	2 0/ 5/									

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# WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy			City/County:	Roosevelt		Samp	oling Date: <u>12-</u>	Jul-17
Applicant/Owner: MDT				State:	. <u>MT</u> \$	Sampling Point:	DP-	-2U
Investigator(s): M. Traxler			Section, To	wnship, Ra	nge: <b>S</b> 21	<b>T</b> 28N	<b>R</b> 55E	
Landform (hillslope, terrace, etc.):	Lowland		Local relief	(concave, o	convex, none): fla	t	<b>Slope:</b> 0.0	0.0 °
Subregion (LRR): LRR F		Lat.: 48	.166432		Long.: -104.61	8452	Datum:	WGS84
oil Map Unit Name: Lohler silty clay					NWI	classification:	Not Mapped	
e climatic/hydrologic conditions on		time of year?	? Ye	s • No		- lain in Remarks		
Are Vegetation , Soil	, or Hydrology 🗌	significantly	disturbed?	Are "N	ormal Circumstan	nces" present?	Yes 💿 N	No O
Are Vegetation, Soil	, or Hydrology 🔲 📊	naturally pro	hlematic?		eded, explain any	•	marks.)	
Summary of Findings - At	_			•			,	ures, etc.
Hydrophytic Vegetation Present?	Yes ○ No •							
Hydric Soil Present?	Yes ○ No •			Sampled A		<u> </u>		
Wetland Hydrology Present?	Yes O No 💿		withi	n a Wetland	<sub>l?</sub> Yes O No (	9		
Remarks:								
Data point located in upland area b	oetween wetland depress	sions.						
VEGETATION - Use scien	tific names of pla	ants	Dominant Species?	FWS Re	gion: GP			
Tree Stratum (Plot size: 30 Foo	at Radius 1		Rel.Strat.	Indicator	Dominance Test	t worksheet:		
1		_ <b>% Cover</b> 0	Cover	Status	Number of Domin That are OBL, FAG		1	(4)
2.					mat are Obt, FAG	CW, OF FAC:	1	(A)
3.		0			Total Number of I Species Across All		2	(B)
4.		0			Species Across Air	i Stiata.		(b)
		0	= Total Co	ver	Percent of dom		50.0%	(A/D)
Sapling/Shrub Stratum (Plot size:	15 Foot Radius )				That Are OBL, F	-ACW, or FAC:		(A/B)
1					Prevalence Inde	x worksheet:		
2					Total % C	Cover of: N	Multiply by:	
3 4.					OBL species		x 1 = <u>0</u>	_
5.					FACW species		x 2 = <u>60</u>	
			= Total Co	ver	FAC species		x 3 =0	_
Herb Stratum (Plot size: 5 Foot	Radius )				FACU species		<b>x 4 =</b> <u>68</u>	
1 Duamous in sumais		5	8.1%	UPL	UPL species		x 5 = 75	
2 5		30	<b>✓</b> 48.4%	FACW	Column Totals	s: <u>62</u> (	(A) <u>203</u>	B(B)
		10	16.1%	UPL	Prevalence	Index = B/A =	3.274	
			24.2%	FACU	Hydrophytic Veg	getation Indicat	tors:	
5. Melilotus officinalis 6.			3.2%	FACU	1 - Ranid Te	est for Hydroph	vtic Vegetation	•
7			0.0%			nce Test is > 50		•
8			0.0%			nce Index is ≤3	_	
9.			0.0%		4 - Morphol	logical Adaptati	ons <sup>1</sup> (Provide s	supporting
10.		0	0.0%		data in Re	emarks or on a	separate sheet	)
		62	= Total Co	ver	Problemation	c Hydrophytic V	'egetation <sup>1</sup> (Ex	plain)
Woody Vine Stratum (Plot size:	30 Foot Radius )				<sup>1</sup> Indicators of	hydric soil and	wetland hydro	ology must
1		0			be present.			
2		0						
		0	= Total Co	ver	Hydrophytic Vegetation	_		
% Bare Ground in Herb Stratum	40				Present?	Yes O No	lacktriangle	
Remarks:	<u> </u>							
	- F00/ dl i	d !	2.0					
Dominance test is not greater than	1 50% and prevalence in	uex is above	3.0.					

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Soil Sampling Point: DP-2U

Depth	Matrix		eded to document Red	lox Featu	ires				
	olor (moist)	%	Color (moist)	%	Tvpe 1	Loc2	Texture		Remarks
0-16 10	/R 4/2	100					Silty Clay	Soil mois	st at 12"
			"					<u> </u>	
							-		
T C. C	tian D. Danlatia	- DM Dadwa	ad Matrice CC Carran			21	tion. Di Dave Linian I	4 Natrii	
**			ed Matrix, CS=Covere			IIIS <sup>2</sup> LOCa	tion: PL=Pore Lining. I		via Caila 3.
yaric Soii Indicat Histosol (A1)	ors: (Applican	ie to all LKK	s, unless otherwis  Sandy Gleyed		)		Indicators for Pr	-	ric Solis :
Histic Epipedon (	Δ2)		Sandy Redox (				1 cm Muck (A	9) (LRR 1, J) : Redox (A16) (LF	DD E C H)
Black Histic (A3)	,)		Stripped Matri				Dark Surface		(((1, 0, 11)
Hydrogen Sulfide	(A4)		Loamy Mucky		1)			epressions (F16)	
Stratified Layers	. , . ,		Loamy Gleyed	Matrix (F	2)		(LRR H ou	tside of MLRA 7	2 and 73)
1 cm Muck (A9)			Depleted Matr	` '			Reduced Verti	c (F18)	
Depleted Below I	•	1)	Redox Dark Su	•			Red Parent M	aterial (TF2)	
Thick Dark Surface	. ,		Depleted Dark	,	F/)		·	Dark Surface (TF	12)
Sandy Muck Mine 2.5 cm Mucky Pe	` ,	IDD C U)	Redox depress High Plains De		(E16)		Other (Explain	,	
5 cm Mucky Peat	, , ,	. ,	(MLRA 72	•	• •		<sup>3</sup> Indicators of hydro		n and wetland disturbed or problem
	. , ,	ux 1 )	(111104 72	and 75 C	i Likk II)		Tiyurology must be	present, unless t	ilsturbed or problem
strictive Layer (i	f present):								
Type:							Hydric Soil Presen	t? Yes 🔾	No 💿
Depth (inches):							Hydric Soil Presen	t? Yes 🔾	No 💿
							Hydric Soil Presen	t? Yes 🔾	No •
Depth (inches):	tors observed	during field s	survey.				Hydric Soil Presen	t? Yes O	No •
Depth (inches):emarks:	itors observed	during field s	Survey.				Hydric Soil Presen	t? Yes 🔾	No •
Depth (inches):emarks: hydric soil indica	tors observed	during field s	survey.				Hydric Soil Presen	t? Yes O	No •
Depth (inches):emarks: hydric soil indica		during field s	survey.						
Depth (inches):emarks: hydric soil indica	Indicators:						Secondary In	dicators (minin	
Depth (inches):emarks: hydric soil indicated the properties of	Indicators:		; check all that app				Secondary In		
Depth (inches):emarks: hydric soil indicators  rdrology  etland Hydrology imary Indicators  Surface Water (A	Indicators: (minimum of o		; check all that app	311)			Secondary In  Surface  Sparsely	dicators (minin Soil Cracks (B6) Vegetated Conc	num of two requir
Depth (inches):emarks: hydric soil indica /drology etland Hydrology rimary Indicators Surface Water (A High Water Table	Indicators: (minimum of o		; check all that app Salt Crust (B	311) ertebrates	. ,		Secondary In  Surface  Sparsely	dicators (minin Soil Cracks (B6)	num of two requir
pepth (inches):emarks: p hydric soil indicated by drology  ydrology  yetland Hydrology rimary Indicators  Surface Water (A)  High Water Tabl  Saturation (A3)	Indicators: (minimum of o		; check all that app Salt Crust (B Aquatic Inve	311) ertebrates ulfide Odo	r (C1)		Secondary In Surface Sparsely Drainag	dicators (minin Soil Cracks (B6) Vegetated Conc e Patterns (B10)	num of two requir
pepth (inches):emarks: b hydric soil indicated by drology  /etland Hydrology rimary Indicators  Surface Water (A) High Water Tabl Saturation (A3) Water Marks (B1)	Indicators: (minimum of o (11) e (A2)		; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season	311) ertebrates ulfide Odo Water Tab	r (C1) ble (C2)		Secondary In Surface Sparsely Drainag Oxidizec	dicators (minin Soil Cracks (B6) Vegetated Conc e Patterns (B10) I Rhizospheres or nere tilled)	num of two requir ave Surface (B8)
pepth (inches):emarks: hydric soil indicate per per per per per per per per per pe	Indicators: (minimum of on) (m		; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi	811) ertebrates ulfide Odo Water Tab izospheres	r (C1) ble (C2) s on Living R	oots (C3)	Secondary In Surface Sparsely Drainag Oxidized (wl) Crayfish	dicators (minin Soil Cracks (B6) Vegetated Conce Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8)	num of two requir ave Surface (B8) n Living Roots (C3)
pepth (inches):emarks: hydric soil indicators with the period of the	Indicators: (minimum of onl) e (A2) ) its (B2)		; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi (where	811) ertebrates ulfide Odo Water Tab izospheres <b>not tilled</b>	r (C1) ble (C2) s on Living R	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati	dicators (minin Soil Cracks (B6) Vegetated Conce Patterns (B10) Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri	num of two requir ave Surface (B8) n Living Roots (C3)
Depth (inches): emarks: b hydric soil indicators ydrology rimary Indicators Surface Water (A High Water Tabl Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Crus	Indicators: (minimum of		; check all that app Salt Crust (B Aquatic Inve Hydrogen St Dry Season Oxidized Rhi (where Presence of	B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced 1	r (C1)  ole (C2)  s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor	dicators (minin Soil Cracks (B6) Vegetated Conce Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri chic Position (D2	num of two requir ave Surface (B8) n Living Roots (C3)
pepth (inches):emarks:	Indicators: (minimum of	one reguired;	; check all that app Salt Crust (B Aquatic Inve Hydrogen St Oxidized Rhi (where Presence of Thin Muck S	B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced 1 urface (C7	r (C1) ple (C2) s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5)	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9)
Depth (inches): emarks: b hydric soil indicators ydrology fetland Hydrology rimary Indicators Surface Water (A High Water Tabl Saturation (A3) Water Marks (B1 Sediment Depos Drift deposits (B Algal Mat or Crus	Indicators: (minimum of	one reguired;	; check all that app Salt Crust (B Aquatic Inve Hydrogen St Dry Season Oxidized Rhi (where Presence of	B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced 1 urface (C7	r (C1) ple (C2) s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri chic Position (D2	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9)
Depth (inches): demarks: demar	Indicators: (minimum of on the control of the contr	one reguired;	; check all that app Salt Crust (B Aquatic Inve Hydrogen St Oxidized Rhi (where Presence of Thin Muck S	B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced 1 urface (C7	r (C1) ple (C2) s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5)	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9)
Depth (inches):	Indicators: (minimum of on the control of the contr	one required; gery (B7)	; check all that app Salt Crust (B Aquatic Inve Hydrogen St Oxidized Rhi (where Presence of Thin Muck S	B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced 1 urface (C7	r (C1) ple (C2) s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5)	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9)
Depth (inches):  demarks:	Indicators: (minimum of	one required; gery (B7)	; check all that app Salt Crust (B Aquatic Inve Hydrogen St Oxidized Rhi (where Presence of Thin Muck S	st11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced i urface (C7	r (C1) ple (C2) s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5)	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9)
Depth (inches): demarks: demar	Indicators: (minimum of	one required; gery (B7)	; check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Explain	st11) ertebrates ulfide Odo Water Tat izospheres not tilled Reduced i urface (C7 in in Rem	r (C1) ple (C2) s on Living R  (ron (C4)	oots (C3)	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) have Hummocks (	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9) )
Depth (inches):	Indicators: (minimum of of the content of the conte	pone required; gery (B7)  No  No	check all that app Salt Crust (B Aquatic Inve Hydrogen St Oxidized Rhi (where Presence of Thin Muck S Other (Expla	st11) ertebrates ulfide Odo Water Tat izospheres not tilled Reduced I urface (C7 in in Rem hes): hes):	r (C1) ple (C2) s on Living R  (ron (C4)	-	Secondary In Surface Sparsely Drainag Oxidizec (w) Crayfish Saturati Geomor FAC-neu	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) ave Hummocks (	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9) )
Depth (inches):	indicators: (minimum of on the content of the conte	gery (B7)  No • No • No •	check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season I Oxidized Rhi (where Presence of Thin Muck S Other (Expla)  Depth (inc	st11) ertebrates ulfide Odo Water Tat izospheres not tilled Reduced i urface (C7 inin in Rem hes): hes):	r (C1) ple (C2) s on Living R ) (ron (C4) ') arks)	- Wetla	Secondary In Surface Sparsely Drainage Oxidizec (wi Crayfish Saturati Geomor FAC-neu Frost He	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) have Hummocks (	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9) )
pepth (inches):emarks: b hydric soil indicated by drology  /etland Hydrology  rimary Indicators  Surface Water (A High Water Tabl Saturation (A3)  Water Marks (B1 Sediment Deposits (B Algal Mat or Cruit Iron Deposits (B Inundation Visib Water-Stained Lefield Observations urface Water Present Present? aturation Present? includes capillary frin	indicators: (minimum of on the content of the conte	gery (B7)  No • No • No •	check all that app Salt Crust (B Aquatic Inve Hydrogen St Oxidized Rhi (where Presence of Thin Muck S Other (Expla	st11) ertebrates ulfide Odo Water Tat izospheres not tilled Reduced i urface (C7 inin in Rem hes): hes):	r (C1) ple (C2) s on Living R ) (ron (C4) ') arks)	- Wetla	Secondary In Surface Sparsely Drainag Crayfish Saturati Geomor FAC-neu Frost He	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) have Hummocks (	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9) )
Depth (inches):	indicators: (minimum of on the content of the conte	gery (B7)  No • No • No •	check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season I Oxidized Rhi (where Presence of Thin Muck S Other (Expla)  Depth (inc	st11) ertebrates ulfide Odo Water Tat izospheres not tilled Reduced i urface (C7 inin in Rem hes): hes):	r (C1) ple (C2) s on Living R ) (ron (C4) ') arks)	- Wetla	Secondary In Surface Sparsely Drainag Crayfish Saturati Geomor FAC-neu Frost He	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) have Hummocks (	num of two requir ave Surface (B8) In Living Roots (C3) al Imagery (C9) )
Depth (inches):emarks: b hydric soil indicated bydrology  Vetland Hydrology rimary Indicators Surface Water (A High Water Tabl Saturation (A3) Water Marks (B1 Sediment Deposits (B Algal Mat or Crusting Iron Deposits (B Inundation Visib Water-Stained Lettel Observations urface Water Present facturation Present? Includes capillary fringescribe Recorded	indicators: (minimum of on the content of the conte	gery (B7)  No • No • No •	check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season I Oxidized Rhi (where Presence of Thin Muck S Other (Expla)  Depth (inc	st11) ertebrates ulfide Odo Water Tat izospheres not tilled Reduced i urface (C7 inin in Rem hes): hes):	r (C1) ple (C2) s on Living R ) (ron (C4) ') arks)	- Wetla	Secondary In Surface Sparsely Drainag Crayfish Saturati Geomor FAC-neu Frost He	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) have Hummocks (	num of two require ave Surface (B8) In Living Roots (C3) al Imagery (C9) )
Depth (inches):	Indicators: (minimum of of oth) e (A2)  ) its (B2) 3) st (B4) 5) le on Aerial Imageaves (B9) : t? Yes (Yes)  ge) Yes (Data (stream of	gery (B7)  No No No gauge, monit	check all that app Salt Crust (B Aquatic Inve Hydrogen Su Dry Season I Oxidized Rhi (where Presence of Thin Muck S Other (Expla)  Depth (inc	ertebrates ulfide Odo Water Tatizospheres not tilled Reduced I urface (Crain in Rem hes):	r (C1) ple (C2) s on Living R ) (iron (C4) ') arks)	- Wetla	Secondary In Surface Sparsely Drainag Crayfish Saturati Geomor FAC-neu Frost He	dicators (minin Soil Cracks (B6) Vegetated Conce e Patterns (B10) I Rhizospheres or nere tilled) Burrows (C8) on Visible on Aeri ohic Position (D2 tral Test (D5) have Hummocks (	num of two require ave Surface (B8) In Living Roots (C3) al Imagery (C9) )

US Army Corps of Engineers Great Plains - Version 2.0

# WETLAND DETERMINATION DATA FORM - Great Plains Region

			City/County:	Roosevelt	Samı	oling Date: 29-Jun-16
pplicant/Owner: MDT				State:	Sampling Point	DP-2W
vestigator(s): M. and T. Traxler			Section, To	wnship, Ra	nge: S 21 T 28N	<b>R</b> _55E
andform (hillslope, terrace, etc.): Lowland			Local relief	(concave, o	convex, none): flat	Slope: 0.0%0.
bregion (LRR): LRR F		Lat.: 48	.166514		Long.: -104.618436	Datum: WGS84
I Map Unit Name: Lohler silty clay			.100311		NWI classification:	
climatic/hydrologic conditions on the site	tunical for th	ic time of year	o Va	s • No		
		-			ormal Circumstances" present?	Yes No 💿
	ydrology	significantly			•	
	ydrology	naturally pro		•	eded, explain any answers in Re	•
ummary of Findings - Attach s		showing sa	mpling p	oint loc	ations, transects, impo	ortant features, et
ydrophytic Vegetation Present? Yes			Is the	Sampled A	rea	
Hydric Soil Present? Yes			withi	n a Wetland	<sub>I?</sub> Yes • No •	
/etland Hydrology Present? Yes	No O		Within	i a wedane	••	
Remarks: Data point located on concave, depressiona VEGETATION - Use scientific na		olants	Dominant	FWS Re	gion: GP	
		Absolute	Species? Rel.Strat.	Indicator	Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: 30 Foot Radius	)	% Cover		Status	Number of Dominant Species	
1					That are OBL, FACW, or FAC:	3(A)
2					Total Number of Dominant	
3. 4.					Species Across All Strata:	3(B)
4					Percent of dominant Species	
Sapling/Shrub Stratum (Plot size: 15 Foot	Radius )	0	= Total Co	over	That Are OBL, FACW, or FAC:	100.0% (A/B)
1		0			Durandan as Turdan made astr	
1					Prevalence Index worksheet:  Total % Cover of:	Multiply by:
3.						<b>x 1 =</b> 25
					<u> </u>	
1					EACW species 30	
						x 2 = 60
4		0	= Total Co	over	FAC species 20	x 2 = 60 x 3 = 60
4.		0	= Total Co	over	FAC species 20 S	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata	)	0 0 0	<b>✓</b> 26.7%	- FACW	FAC species 20 : FACU species 0 : UPL species 0 :	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana	)	0 0 0 20 25	✓ 26.7% ✓ 33.3%	FACW OBL	FAC species 20 SPACU species 0 SPACU SPECIES Column Totals: 75	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis	)	0 0 0 20 25 5	✓ 26.7% ✓ 33.3% □ 6.7%	FACW OBL FACW	FAC species 20 : FACU species 0 : UPL species 0 :	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum	)	0 0 0 20 25 5 5	✓ 26.7% ✓ 33.3%   6.7%  6.7%	FACW OBL FACW FACW	FAC species 20 SPACU species 0 SPACU SPECIES Column Totals: 75	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. Sonchus arvensis	)	0 0 0 20 25 5 5 20	✓ 26.7% ✓ 33.3%   6.7%  ✓ 6.7%  ✓ 26.7%	FACW OBL FACW	FAC species 20 :  FACU species 0 :  UPL species 75 :  Prevalence Index = B/A =	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. Sonchus arvensis 6.	)	0 0 0 20 25 5 5 20	✓ 26.7% ✓ 33.3%   6.7%  6.7%	FACW OBL FACW FACW	FAC species 20  FACU species 0  UPL species 75  Column Totals: 75  Prevalence Index = B/A = Hydrophytic Vegetation Indica	$x \ 2 = 60$ $x \ 3 = 60$ $x \ 4 = 0$ $x \ 5 = 0$ $x \ 5 = 1.933$ tors:
4. 5.  Herb Stratum (Plot size: 5 Foot Radius  1. Distichlis spicata  2. Puccinellia nuttalliana  3. Suaeda calceoliformis  4. Hordeum jubatum  5. Sonchus arvensis  6.  7.  8.	)	0 0 0 20 25 5 5 20 0	✓ 26.7% ✓ 33.3%   6.7%  ✓ 26.7%  ✓ 0.0%	FACW OBL FACW FACW	FAC species 20 FACU species 0 UPL species 0 Column Totals: 75 Prevalence Index = B/A = Hydrophytic Vegetation Indica 1 - Rapid Test for Hydroph	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors:
4. 5.  Herb Stratum (Plot size: 5 Foot Radius  1. Distichlis spicata  2. Puccinellia nuttalliana  3. Suaeda calceoliformis  4. Hordeum jubatum  5. Sonchus arvensis  6.  7.  8.  9.	)	0 0 0 20 25 5 5 20 0	✓ 26.7% ✓ 33.3%   6.7%   6.7%  ✓ 26.7%  ✓ 0.0%   0.0%	FACW OBL FACW FACW	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A = Hydrophytic Vegetation Indica  1 - Rapid Test for Hydroph  2 - Dominance Test is > 50  3 - Prevalence Index is ≤ 3  4 - Morphological Adaptati	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: cytic Vegetation 1.00 1.01 1
4. 5.  Herb Stratum (Plot size: 5 Foot Radius  1. Distichlis spicata  2. Puccinellia nuttalliana  3. Suaeda calceoliformis  4. Hordeum jubatum  5. Sonchus arvensis  6.  7.  8.  9.	)	0 0 0 20 25 5 5 20 0	✓ 26.7% ✓ 33.3% □ 6.7% □ 6.7% ✓ 26.7% □ 0.0% □ 0.0% □ 0.0%	FACW OBL FACW FACW	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A =  Hydrophytic Vegetation Indica  ✓ 1 - Rapid Test for Hydroph  ✓ 2 - Dominance Test is > 50  ✓ 3 - Prevalence Index is ≤ 3  — 4 - Morphological Adaptatic data in Remarks or on a	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: ytic Vegetation 1.90 1.00 (B)
4. 5.  Herb Stratum (Plot size: 5 Foot Radius  1. Distichlis spicata  2. Puccinellia nuttalliana  3. Suaeda calceoliformis  4. Hordeum jubatum  5. Sonchus arvensis  6.  7.  8.  9.	)	0 0 0 20 25 5 5 20 0 0	✓ 26.7% ✓ 33.3% □ 6.7% □ 6.7% ✓ 26.7% □ 0.0% □ 0.0% □ 0.0% □ 0.0%	FACW OBL FACW FACW	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A = Hydrophytic Vegetation Indica  1 - Rapid Test for Hydroph  2 - Dominance Test is > 50  3 - Prevalence Index is ≤ 3  4 - Morphological Adaptati	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: ytic Vegetation 1.90 1.00 (B)
4. 5. Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. Sonchus arvensis 6. 7. 8. 9.	Radius_)	0 0 0 20 25 5 5 20 0 0 0 0 0	✓ 26.7% ✓ 33.3%   6.7% ✓ 6.7% ✓ 0.0%   0.0%   0.0%   0.0%   0.0%   0.0%	FACW OBL FACW FACW	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A =  Hydrophytic Vegetation Indica  ✓ 1 - Rapid Test for Hydroph  ✓ 2 - Dominance Test is > 50  ✓ 3 - Prevalence Index is ≤ 3  — 4 - Morphological Adaptatic data in Remarks or on a	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: cytic Vegetation 0% 0.01 closs 1 (Provide supporting separate sheet) (egetation (Explain)
4	Radius_)	0 0 0 20 25 5 5 20 0 0 0 0 75	✓ 26.7% ✓ 33.3%   6.7% ✓ 6.7% ✓ 0.0%   0.0%   0.0%   0.0%   0.0%   0.0%	FACW OBL FACW FACW	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A =  Hydrophytic Vegetation Indica  1 - Rapid Test for Hydroph  2 - Dominance Test is > 56  3 - Prevalence Index is ≤ 3  4 - Morphological Adaptatic data in Remarks or on a  Problematic Hydrophytic V  1 Indicators of hydric soil and	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: cytic Vegetation 0% 0.01 closs 1 (Provide supporting separate sheet) vegetation (Explain)
4. 5.  Herb Stratum (Plot size: 5 Foot Radius 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. Sonchus arvensis 6. 7. 8. 9. 10.  Woody Vine Stratum (Plot size: 30 Foot F	Radius_)	0 0 0 20 25 5 5 20 0 0 0 0 75	✓ 26.7% ✓ 33.3%   6.7%  6.7% ✓ 26.7%   0.0%  0.0%  0.0%  0.0%  Total Co	FACW OBL FACW FACW FAC	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A =  Hydrophytic Vegetation Indica  1 - Rapid Test for Hydroph  2 - Dominance Test is > 56  3 - Prevalence Index is ≤ 3  4 - Morphological Adaptatic data in Remarks or on a  Problematic Hydrophytic V  1 Indicators of hydric soil and be present.	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: cytic Vegetation 0% 0.01 closs 1 (Provide supporting separate sheet) vegetation (Explain)
4. 5.  Herb Stratum (Plot size: 5 Foot Radius  1. Distichlis spicata  2. Puccinellia nuttalliana  3. Suaeda calceoliformis  4. Hordeum jubatum  5. Sonchus arvensis  6.  7.  8.  9.  10.  Woody Vine Stratum (Plot size: 30 Foot Foot Foot Foot Foot Foot Foot Foo	Radius_)	0 0 0 20 25 5 5 20 0 0 0 0 75	✓ 26.7% ✓ 33.3%   6.7% ✓ 6.7% ✓ 0.0%   0.0%   0.0%   0.0%   0.0%   0.0%	FACW OBL FACW FACW FAC	FAC species 20  FACU species 0  UPL species 0  Column Totals: 75  Prevalence Index = B/A =  Hydrophytic Vegetation Indica  1 - Rapid Test for Hydroph  2 - Dominance Test is > 56  3 - Prevalence Index is ≤ 3  4 - Morphological Adaptatic data in Remarks or on a  Problematic Hydrophytic V  1 Indicators of hydric soil and	x 2 = 60 x 3 = 60 x 4 = 0 x 5 = 0 (A) 145 (B) 1.933 tors: cytic Vegetation 10% 100s 1 (Provide supporting separate sheet) (egetation (Explain)) wetland hydrology must

US Army Corps of Engineers

Soil Sampling Point: DP-2W

	ription: (Describe to	the depth ne				nfirm the	absence of indicators	s.)
Depth (inches)	Matrix Color (moist)	%	Color (moist)	lox Featu <u>%</u>	Tvpe 1	Loc <sup>2</sup>	Texture	Remarks
0-15	10YR 4/2	95	7.5YR 4/6	5	С		Silty Clay	Soil is as moist as DP-2U
				-			-	
1Tupo: C=Co	 oncentration. D=Depletion	n DM-Doduc	and Matrix, CS=Covers	ad or Coat	od Sand Cra	inc 21 oca	ition: PL=Pore Lining. N	4_Matrix
, · ·	Indicators: (Applicat					IIIS -LUCA		oblematic Hydric Soils <sup>3</sup> :
Histosol		JIE LU AII LKN	Sandy Gleyed	-	,		1 cm Muck (A	
	ipedon (A2)		Sandy Redox (					e Redox (A16) (LRR F, G, H)
Black His			Stripped Matri	. ,			Dark Surface (	
	n Sulfide (A4)		Loamy Mucky	Mineral (F	1)		High Plains De	epressions (F16)
	Layers (A5) (LRR F)		Loamy Gleyed	`	2)		(LRR H ou	tside of MLRA 72 and 73)
	ck (A9) (LRR F,G,H)	4)	Depleted Matr	. ,			Reduced Verti	c (F18)
_ ·	Below Dark Surface (A1 rk Surface (A12)	11)	<ul><li>✓ Redox Dark St</li><li>✓ Depleted Dark</li></ul>	, ,			Red Parent Ma	` '
	uck Mineral (S1)		Redox depress	•	7)		_ '	Dark Surface (TF12)
_ `	lucky Peat or Peat (S2) (	(LRR G. H)	High Plains De	, ,	(F16)		Other (Explain	•
	cky Peat or Peat (S3) (LF	, ,	(MLRA 72	•	• •			ophytic vegetation and wetland present, unless disturbed or problematic
	_ayer (if present):		<u> </u>				7 3,	. , ,
Type:	, с ( р. сосс).							
Depth (inc	rhes):						Hydric Soil Present	t? Yes 💿 No 🔾
Remarks:								
Soil meets N	TCHS technical standa	ard for hydri	c soil and had beer	n inundat	ed earlier i	n the sprir	na	
		a. a . o , a					.5.	
Hydrolog	У							
Wetland Hy	drology Indicators:						Secondary In	dicators (minimum of two required)
Primary Ind	icators (minimum of	one required	; check all that app	oly)			✓ Surface	Soil Cracks (B6)
Surface	Water (A1)		✓ Salt Crust (E	311)			Sparsely	Vegetated Concave Surface (B8)
High Wa	iter Table (A2)		Aquatic Inve	rtebrates	(B13)		Drainage	e Patterns (B10)
Saturation	on (A3)		Hydrogen Su	ulfide Odo	r (C1)		Oxidized	Rhizospheres on Living Roots (C3)
<b>✓</b> Water M	arks (B1)		Dry Season	Water Tab	le (C2)		(wh	nere tilled)
Sedimen	t Deposits (B2)		Oxidized Rhi	izospheres	on Living R	oots (C3)	Crayfish	Burrows (C8)
Drift dep	oosits (B3)		(where	not tilled	)		<b>✓</b> Saturation	on Visible on Aerial Imagery (C9)
Algal Ma	t or Crust (B4)		Presence of	Reduced I	ron (C4)		✓ Geomorp	ohic Position (D2)
Iron Dep	oosits (B5)		☐ Thin Muck S	urface (C7	)		<b>✓</b> FAC-neu	tral Test (D5)
Inundati	on Visible on Aerial Ima	gery (B7)	Other (Expla	in in Rem	arks)		Frost He	ave Hummocks (D7) (LRR F)
Water-St	tained Leaves (B9)							
Field Observ								
Surface Water	r Present? Yes	O No 💿	Depth (inc	hes):				
Water Table F	Present? Yes	O No •	Depth (inc	hes).				
Saturation Pre				· —		Wetla	and Hydrology Presei	nt? Yes 💿 No 🔾
(includes capi	VAC '	O No 💿	Depth (inc	hes):		-		
Describe Re	corded Data (stream	gauge, moni	tor well, aerial pho	tos, prev	ious inspe	ctions), if	available:	
Remarks:								
Soil moist at	t 6".							

US Army Corps of Engineers Great Plains - Version 2.0

### MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1.	Project Name: Big Muddy	2. MD1 Project #: NH 1-10(62	26) 3. Control #: 4058-001		
3.	Evaluation Date: July 12, 2	017 4. Evaluator(s): Mark Tra	axler 5. Wetland/Site #(s): N	orth Cell - Created	
6.	Wetland Location(s): Tow	nship <u>28 N</u> , Range <u>55 E</u> , Sectio	on <u>21;</u> Township <u>N</u> , Range _	E, Section	
	Approximate Stationing or	Roadposts: ~639.75 on Hwy	<u>2</u>		
	Watershed: 12 - Lower Mis	ssouri County: Roosevelt			
7.	Evaluating Agency: Respe Purpose of Evaluation:  Wetland potentially af Mitigation wetlands; p	fected by MDT project	8. Wetland Size (acre	(visually estimated) 7.39 (measured, e.g. GPS)	
	<ul><li>☑ Mitigation wetlands; p</li><li>☑ Other</li></ul>			(AA) Size (acre): ${7.39}$ (visual termining AA)	
10	<ul><li>✓ Mitigation wetlands; p</li><li>✓ Other</li></ul>		(see manual for det	termining AA) 7.39 (measu	
10	<ul><li>✓ Mitigation wetlands; p</li><li>✓ Other</li></ul>	oost-construction	(see manual for det	termining AA) 7.39 (measu	
10		oost-construction TLAND AND AQUATIC HABIT	(see manual for det	termining AA) <u>7.39</u> (measu efinitions.)	red, e.g. GPS)
10		oost-construction TLAND AND AQUATIC HABIT Class (Cowardin)	(see manual for det FATS IN AA (See manual for de Modifier (Cowardin)	Permining AA) <u>7.39</u> (measu efinitions.) Water Regime	red, e.g. GPS)
10	Mitigation wetlands; p     Other      CLASSIFICATION OF WE     HGM Class (Brinson)     Depressional	TLAND AND AQUATIC HABIT Class (Cowardin) Unconsolidated Bottom	(see manual for det FATS IN AA (See manual for de Modifier (Cowardin) Excavated	Permining AA) 7.39 (measu efinitions.) Water Regime Permanent / Perennial	<b>% OF AA</b> 40
10	Mitigation wetlands; p Other  CLASSIFICATION OF WE HGM Class (Brinson)  Depressional Depressional	TLAND AND AQUATIC HABIT Class (Cowardin) Unconsolidated Bottom Emergent Wetland	(see manual for det FATS IN AA (See manual for de Modifier (Cowardin) Excavated	efinitions.)  Water Regime  Permanent / Perennial  Seasonal / Intermittent	<b>% OF AA</b> 40
10	Mitigation wetlands; p Other  CLASSIFICATION OF WE HGM Class (Brinson)  Depressional Depressional	TLAND AND AQUATIC HABIT Class (Cowardin) Unconsolidated Bottom Emergent Wetland	(see manual for det FATS IN AA (See manual for de Modifier (Cowardin) Excavated	efinitions.)  Water Regime  Permanent / Perennial  Seasonal / Intermittent	<b>% OF AA</b> 40

Comments:

- 11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.) abundant
- 12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

	Predominar	t Conditions Adjacent to (within	500 feet of) AA
Conditions within 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	
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%.			
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%.			

Comments (types of disturbance, intensity, season, etc.): Constructed wetland cells continue to exhibit vegetation development. Grazing eliminated within project boundaries. Adjacent land used for agriculture (grazing). Hwy 2 bisects the mitigation site. Big Muddy Creek borders boundary of constructed wetlands.

- ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis
- iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA includes the constructed cells north of Hwy 2. Constructed cells have had only seasonal saturation the last two years allowing for some emergent vegetation to establish. Area between constructed wetland cells and riverine wetland has gradually converted to wetland since construction.
- 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 peristence of additional		Modified Rating
3 (or 2 if one is forested) classes		NA	NA	NA
2 (or 1 if forested) classes		NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	
1 class, monoculture (1 species comprises 90% of total cover)		NA	NA	NA

Comments: Vegetation is predominantly emergent. No woody overstory associated with creek.

habitat for waterfowl and other wildlife.

Wetland/Site #(s): North Cell - Created

4A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS																				
AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.  Primary or critical habitat (list species)																				
ii. Rating: Based on the stro	ngest h	abitat	chose	n in	14A(i) a					pondin	ig func	tiona	l point	and ra	ting.					_
Highest Habitat Level	Doc/F	Primar	y S	us/P	rimary	Do	c/Sec	onda	ry S	us/Se	conda	ry	Doc/lı	nciden	tal	Sus/	Incide	ntal	None	•
Functional Point/Rating				-	-					_									0L	
Sources for documented us	<b>se</b> (e.g.	obsei	vation	s, red	cords):	USFV	VS dat	abas	e for F	Roosev	elt Cou	unty								_
4B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM Do not include species listed in 14A above.																				
																0/	!.	-1-1	N	1
Highest Habitat Level	Doc/F	rimai	y S	us/P	rimary	Do	c/Sec	onda	ry S	us/Se	conda	ry	Doc/II	nciden	tal	Sus/I	ncider	ntal	None	
S1 Species Functional Point/Rating				-				•												
S2 and S3 Species				_						5	M									
Functional Point/Rating		-1	(		I - V	0	(   .						( D -	10	0	t I .		0		
Sources for documented us observed onsite.	<b>se</b> (e.g.	obsei	vation	s, red	coras):	Susp	ectea s	speci	es idei	ntifiea i	<u>oy IVI I r</u>	NHP 1	for Ro	oseven	Coun	ty. Lo	oggerne	ead Si	nrike	
14C. GENERAL WILDLIFE	HABIT	AT RA	TING																	
i. Evidence of Overall Wildl	ife Use	in th	e AA:	Che	ck sub	stantia	al, mod	derate	e, or lo	w base	ed on s	suppo	orting e	evidenc	e.					
☐ Substantial: Based on an ☐ observations of abunda ☐ abundant wildlife sign s ☐ presence of extremely ☐ interview with local biol	ant wild such as limiting	llife #s s scat, i habita	or hig tracks at feat	h spe , nes ures	ecies d t struct not ava	tures, ailable	game	trails,	etc.	•		few little spar	or no v to no s se adj	wildlife wildlife acent u	obser sign upland	vatior food	source	ng pea es	eck]. ak use   dge of <i>F</i>	
<ul> <li>Moderate: Based on any of some solutions of scatters of scatters of scatters of scatters of scatters of the scat</li></ul>	ed wild wildlife and foo	life gro e sign d sour	oups o such a ces	r indi as sca	at, trac	ks, ne	latively st strud	few ctures	specie s, gam	s durir e trails	ng peal s, etc.	k peri	ods							
ii. Wildlife Habitat Features For class cover to be conside percent composition of the AA S/I = seasonal/intermittent; T/	red eve A (see #	enly di #10).	stribut Abbre	ed, th viatio	ne mos	t and surfac	least p e wate	reval r dur	ent <b>ve</b> ations	<b>getate</b> are as	d class follows	ses m s: P/F	nust be	withir rmane	20% ont/pere	of ea ennial	ch othe			
Structural Diversity					High						$\triangleright$	Mo	derate	)					.ow	
(see #13)  Class Cover Distribution (all vegetated classes)		E	ven		_	☐ Un	even			⊠ E	ven			☐ Un	even			E	ven	
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α
■ Low Disturbance at AA									Е											
(see #12i)  ☐ Moderate Disturbance									<u> </u>											
at AA (see #12i)																				
☐ <b>High Disturbance</b> at AA (see #12i)																				
iii. Rating: Use the conclusi	ons fro	m i an	d ii ab	ove a								poin	t and r	ating.		<b>-</b>				
Evidence of Wildlife Use		⊲ r		ma!	W			at Fe	eature	s Ratir		_		<b>□</b> • ≈						
(i) ☐ Substantial		<u> </u>	eptio	ııdı			High			iVIC	derate	<del>U</del>		Lo	vv	$\exists$				
<b>⊠</b> Moderate			9H						+	-						1				
☐ Minimal										-						1				
Comments: Several bird spe	cies an	ıd anir	nal tra	cks o	bserve	ed duri	ng site	visit	s. No s	surface	water	in ex	cavate	ed cells	s in 20	<u> 17 - I</u>	<u>imiting</u>	factor	in prov	<u>iding</u>

Wetland/Site #(s): North Cell - Created																			
If the AA is not used by	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 the NA box and proceed to 14E.  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																		
Assess this function if the precluded by perched c					e exist	ing sit	uation	is "co	orrecta	ıble" su	ch tha	the A	A cou	ıld be ι	used by	y fish [i	.e., fis	h use	is
Type of Fishery:   C	old Wa	ter ( <b>C</b> \	<b>W</b> ) $\Box$	] Warı	m Wat	er ( <b>W</b> \	W) U	se the	CW o	or WW	guideli	nes in	the m	anual t	to comp	olete th	e matı	ix.	
Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.																			
	Vater in AA																		
Aquatic Hiding / Resting / Escape Cover	Onti	Optimal Adequate Poor Optimal Adequate Poor Optimal Adequate Poor																	
Thermal Cover:	0	S	0	S	0	S	O	s	0	S	0	s	0	s	0	S	0	S	
optimal / suboptimal		0   S   O   S																	
FWP Tier I fish species FWP Tier II or Native																			
Game fish species FWP Tier III or Introduced																			
Game fish																			
FWP Non-Game Tier IV or No fish species																			
Sources used for identifying	fish s	pp. pc	otential	lly fou	ınd in	AA:								ı					4
ii. Modified Rating: NOTE:	Modifie	d scor	e canno	ot exc	eed 1.	0 or b	e less	than (	0.1.										
a) Is fish use of the AA significe MDEQ list of waterbodies in no support, <b>or</b> do aquatic nuisand	ed of	TMDL	develo	pmen	t with i	isted	"Proba	able In	npaire	d Uses	" includ	ding co	old or	warm i	water f	ishery	or aqu	ıatic li	fe
b) Does the AA contain a docu native fish or introduced game											nctuary	pool,	upwe	elling aı	rea; sp	ecify ir	n comi	nents,	) for
iii. Final Score and Rating:	Com	ments	s: Close	ed we	tland c	ells w	ith no	direct	surfa	ce wate	r inlet	or out	et.						
14E. FLOOD ATTENUATION Applies only to wetlands If wetlands in AA are no	that a	re sub		floodir	ng via	in-cha					and pro	ceed	to 14F	₹.					
Entrenchment Ratio (ER) Es Flood-prone width = estimated																		e of th	e stream.
/	=		_					49	Ø.							ģ	200		
flood prone width / bankfull wid	dth = er	ntrenc	hment ı	ratio		2 x	k Bank	full De	epth 3	West Control	New Y	6 XXIV	Α.	No.	De Christian	F	lood-p	rone W	/idth
									1. (%)	00000000 D	ankfull	D	<b>&amp;</b> • • •	•••		<b>8</b> Bank	full W	idth	
										В	ankiuii	Deptn	1000	ood -					
Slightly Entr		d					ly Ent		ed					renche					
C stream type D stream t		E st	ream ty	ре			<b>1.41</b> – eam ty			A stre	am typ	oe		<b>: 1.0</b> – ream ty		G sti	eam t	уре	
	 												F				<sup>/</sup>		

Rating: Working from top to bottom, use the matrix below to select the functional point and rating.											
Estimated or Calculated Entrenchment	☐ SI	ightly Entrei	nched		erately Enti	renched	☐ Entrenched				
(Rosgen 1994, 1996)	C, D	, E stream t	ypes	В	stream typ	е	A, F, G stream types				
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	75%	 25-75%	 <25%	75%	25-75%	⊠ <25%	75%	 25-75%			
AA contains no outlet or restricted outlet						.5M					
AA contains unrestricted outlet											

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? 

YES NO Comments: AA is adjacent to unnamed tributary of Big Muddy Creek and contains no outlet. Unnamed tributary is within MDT conservation area. Floodprone and bankfull widths not measured, visual estimation of B stream type.

Wetland/Site #(s): North Cell - Created

14F	F. SHORT AND LONG TERM SURFACE WATER STORAGE	■ NA (proceed to 14G)	
	Applies to wetlands that flood or pond from overbank or in-chann		
	If no wetlands in the AA are subject to flooding or ponding, then	check the NA box and proceed	to 14G.
i. F	Rating: Working from top to bottom, use the matrix below to select	the functional point and rating.	Abbreviations for surface water durations are as

. Training. Training main top to bettern, dee and maint below	to concert the ramonantal point	t and raining. The erroriance	ioi ouiliaco mator auratron	0 4.0 40
follows: P/P = permanent/perennial; S/I = seasonal/interm	ittent; and T/E = temporary/e	ephemeral [see manual for	further definitions of these	terms].
Estimated Maximum Acre Feet of Water Contained				_
in Wotlands within the AA that are Subject to	⊠ ⊳5 acro foot	1 1 to 5 acro foot	C1 acro foot	

in Wetlands within the AA that are Subject to Periodic Flooding or Ponding		>5 acre fo	eet	□ 1.1	to 5 ac	re feet	□≤	≤1 acre t	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								
Wetlands in AA flood or pond < 5 out of 10 years									

**Comments:** Constructed cells were either inundated at time of site visit or showed sufficient signs of inundation during early growing season. Cells with greater than 5 ac ft of storage potential.

#### 14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL NA (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	AA receive has potent nutrients, such that substantia sedimenta toxicants, present.	tial to delive or compou other funct ally impaire tion, source	er sedime inds at lev ions are r d. Minor es of nutr	ents, els ot ients or	Waterbody is need of TMDI causes" relat toxicants or A has potential nutrients, or of functions are sedimentation or signs of etc.	developmer ed to sedime AA receives of to deliver hig compounds s substantially n, sources of	nt for "probal nt, nutrients, or surroundin gh levels of s such that oth y impaired. M nutrients or	ole or g land use ediments, er ajor
% 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							
AA contains unrestricted outlet								

Comments: Vegetation cover along shoreline around constructed cells has developed to greater than 70%.

#### 

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.

If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability	Duration of S	urface Water Adjacent to Roo	ted Vegetation
Ratings of 6 (see Appendix F).	□ Permanent / Perennial	☐ Seasonal / Intermittent	☐ Temporary / Ephemeral
⊠ ≥ 65%	1H		
□ 35-64%			
☐ < 35%			

Comments: Shoreline vegetation consists of Schoenoplectus, Distichlis, and Typha.

#### 14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating	Genera	I Wildlife Habitat Rati	ng (14Ciii)
(14Diii)	⊠ E/H		L
☐ E/H			
■ M			
L			
⊠ NA	Н		

**ii. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14li); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

Α		Vegeta	ted Co	mponent	>5 ac	res		Vegeta	ated Co	mponent	1-5 ac	res		Veget	ated Co	mponen	t <1 ac	re
В	⊠⊦	ligh	Ш	oderate		Low	_	ligh		derate		Low	_	ligh	☐ Mo	derate		.ow
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P		.7M																
S/I																		
T/E/A																		

			Wetlar	nd/Site #(	s): North Cell	- Created			
14I. PRODUCTION EXPORT / FOOD (	CHAIN S	SUPPORT (con	tinued)						
iii. Modified Rating: Note: Modified so	ore can	not exceed 1.0	or be less than	า 0.1.					
<b>Vegetated Upland Buffer:</b> Area wi mowing or clearing (unless for weed Is there an average 50-foot wide v	control)	).					•	·	
iv. Final Score and Rating: 8H Com	nments:	: Vegetated we	tland area ~5.9	93-ac., av	erage 50-foot	upland buffer	surroundi	ing mitigation	site.
14J. GROUNDWATER DISCHARGE / Check the appropriate indicators i	RECHA	RGE							
i. Discharge Indicators  The AA is a slope wetland. Springs or seeps are known Vegetation growing during of Wetland occurs at the toe of Seeps are present at the word AA permanently flooded during Wetland contains an outlet, Shallow water table and the Other:	dormant of a natu etland e ring dro but no i	t season/drougl ral slope. dge. ught periods. inlet.	ht.	□ P€ □ W □ St	etland contain	ors strate present v is inlet but no o wn 'losing' stre	outlet.		
iii. Rating: Use the information from i a	and ii ab	ove and the tal	ole below to se	lect the f	unctional poin	t and rating.			_
Criteria			Saturation at <i>I</i> VATER THAT I □ S	S RECH				STEM	
☐ Groundwater Discharge or Rech	arge	1H						-	
☐ Insufficient Data/Information				•		•			
Comments:									
14K. UNIQUENESS  i. Rating: Working from top to bottom,	use the	matrix below to	select the fun	ctional p	oint and rating	1.			
Replacement Potential	AA co spring forest	ontains fen, bo gs or mature (: led wetland Of liation listed a	og, warm >80 yr-old) ⋜ plant	AA doe cited ra diversi contair	es not contain are types ANI ty (#13) is high as plant asso as "S2" by the	n previously O structural gh OR ciation	previou associa	s not containusly cited rare ations AND s y (#13) is low	e types OR tructural
Estimated Relative Abundance (#11)	□ Rare	e ☐ Common	□ Abundant			□ Abundant	□ Rare	□ Common	
									.3L
Moderate Disturbance at AA (#12i)									
High Disturbance at AA (#12i)									
14L. RECREATION / EDUCATION PO Affords 'bonus' points if AA provide	es a recr	reational or edu		tunity.	•	• • •	,		
i. Is the AA a known or potential recre	eational	l or education	al site? 🛚 YE	<b>S</b> , go to	ii. 🔲 <b>NO</b> , cl	heck the NA b	ox.		
ii. Check categories that apply to the		Other:		⊠ Coı	nsumptive Re	creational 🗵	Non-cons	sumptive recre	eational
iii. Rating: Use the matrix below to sele	act the fi	unctional point	and rating.						
Vn aum au l						-			
	otentia	l Recreational	or Education				Known	Potential	
Public ownership or public easemer Private ownership with general public	otentiant with o	l Recreational general public	or Education access (no po	ermissio	n required)		Known .2H	Potential 	

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	
Private ownership with general public access (no permission required)		
Private or public ownership without general public access, or requiring permission for public access		

Comments: MDT-owned site with known hunting.

15. GENERAL SITE NOTES: \_\_\_\_\_

# Wetland/Site #(s): North Cell - Created

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	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	3.70	
C. General Wildlife Habitat	high 0.90	1.00	6.65	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.50	1.00	3.70	
F. Short and Long Term Surface Water Storage	high 1.00	1.00	7.39	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	7.39	
H. Sediment / Shoreline Stabilization	high 1.00	1.00	7.39	*
I. Production Export / Food Chain Support	high 0.80	1.00	5.91	
J. Groundwater Discharge / Recharge	high 1.00	1.00	7.39	*
K. Uniqueness	low 0.30	1.00	2.22	
L. Recreation / Education Potential (bonus point)	high 0.20		1.48	
Total Points	7.2	10	53.21 Total	Functional Units
Percent of Possible	le Score 72% (round	to nearest whol	e number)	

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; if not 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 (AA) RATING: Check the appropriate category based on the criteria outlined above.

## MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy	2. WID I Project #: NH 1-10(62	3. Control #. 4036-001		
3. Evaluation Date: July 12, 2	017 <b>4. Evaluator(s)</b> : Mark Tr	axler 5. Wetland/Site #(s): N	orth Cell - Preservation	
6. Wetland Location(s): Town	nship <u>28 N</u> , Range <u>55 E</u> , Sectio	on <u>21;</u> Township <u>N</u> , Range _	<u>E</u> , Section	
Approximate Stationing or	Roadposts: ~639.75 on Hwy	<u>2</u>		
Watershed: 12 - Lower Mis	souri County: Roosevelt			
7. Evaluating Agency: RESPI Purpose of Evaluation:  ☐ Wetland potentially af ☐ Mitigation wetlands; p ☐ Other  10. CLASSIFICATION OF WE	fected by MDT project re-construction ost-construction	9. Assessment Area (see manual for de	(AA) Size (acre): (visually estimated)  (AA) Size (acre): (visually estimated)  (AA) Size (acre): (visually estimated)	
	II AND AND ACHARIC HARI	I A I S IN AA (See manijal for d		
HGM Class (Brinson)		Modifier (Cowardin)	· · · · · · · · · · · · · · · · · · ·	% OF AA
	Class (Cowardin)  Emergent Wetland	·	Water Regime Seasonal / Intermittent	<b>% OF AA</b> 100
HGM Class (Brinson)	Class (Cowardin)	·	Water Regime	
HGM Class (Brinson)	Class (Cowardin)	·	Water Regime	
HGM Class (Brinson)	Class (Cowardin)	·	Water Regime	
HGM Class (Brinson)	Class (Cowardin)	·	Water Regime	

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)

#### 12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

	Predominar	t Conditions Adjacent to (within	500 feet of) AA
Conditions within 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	
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%.			
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%.			

Comments (types of disturbance, intensity, season, etc.): <u>Grazing eliminated within project area.</u> <u>Grazing still occurs on the pastures located north of the project site.</u> <u>Existing wetland associated with Big Muddy Creek.</u>

- ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis
- iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA encompasses existing emergent wetland associated with an abandoned oxbow of Big Muddy Creek that borders mitigation site on west and north boundaries. The wetland within the mitigation site is currently managed in natural state. The preservation AA was not disturbed during construction.

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 peristence of additional		Modified Rating
3 (or 2 if one is forested) classes		NA	NA	NA
2 (or 1 if forested) classes		NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	
1 class, monoculture (1 species comprises 90% of total cover)		NA	NA	NA

Comments: Emergent vegetation class but is comprised of various species so not considered a monoculture.

Wetland/Site #(s): North Cell - Preservation

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS																				
i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.  Primary or critical habitat (list species)																				
	_																			
Highest Habitat Level	Doc/F	rima	ry S	us/P	rimary	Do	c/Sec	onda	ry S	us/Sed	conda	ry	Doc/Ir	nciden	tal	Sus/	Incide	ntal	None	•
Functional Point/Rating	-			-	-					-	-								0L	
Sources for documented us	<b>se</b> (e.g.	obse	rvation	s, red	cords):	<u>USFV</u>	VS dat	abas	e for R	oosev	elt Cou	<u>ınty</u>								
14B. HABITAT FOR PLANT Do not include species					S1, S	2, OR	S3 B	Y TH	E MON	NTANA	NATU	JRAL	. HER	ITAGE	PRO	SRAN	И			
i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.  Primary or critical habitat (list species)  Secondary habitat (list species)  Incidental habitat (list species)  No usable habitat  D S Blue Heron (S3), Loggerhead Shrike (S3B)  Greater Sage-Grouse (S2)  S																				
ii. Rating: Based on the stro											_									7
Highest Habitat Level	Doc/F	rima	ry S	us/P	rimary	Do	c/Sec	onda	ry S	us/Sec	conda	ry	Doc/Ir	nciden	tal :	Sus/I	ncider	ntal	None	
S1 Species Functional Point/Rating S2 and S3 Species	-			-																
Functional Point/Rating	-			-						.5	М									
Sources for documented us	<b>se</b> (e.g.	obsei	rvation	s, red	cords):	MTNI	IP trac	ker f	or Roc	sevelt	Count	y. Lo	ggerh	ead Sh	nrike ol	oserv	ed ons	site.		4
14C. GENERAL WILDLIFE	HABITA	AT RA	TING		ŕ							-								
i. Evidence of Overall Wildl	ite Use	in th	e AA:	Cne	CK SUD	stantia	ai, mod	ierate	e, or io	w base	ea on s	suppo	rting e	eviaeno	ce.					
☐ Substantial: Based on an ☐ observations of abunda ☐ abundant wildlife sign s ☐ presence of extremely ☐ interview with local biol	ant wild such as limiting	life #s scat, habita	or hig tracks at feat	h spe , nes ures	ecies d t struct not ava	ures, ailable	game t	trails,	etc.			few little spar	or no v to no v se adi	wildlife wildlife acent (	sign upland	/atior food	ns durii source	ng pea		periods A
<ul> <li>Moderate: Based on any of some observations of scatters of common occurrence of adequate adjacent upla interview with local biol</li> </ul>	ed wildl wildlife and food	ife gro sign d sour	oups o such a ces	r indi as sca	at, trac	ks, ne	atively st strud	few ctures	specie s, gam	s durin e trails	ig peal , etc.	k peri	ods							
ii. Wildlife Habitat Features For class cover to be conside percent composition of the AA	red eve \ (see #	enly di #10).	stribut Abbrev	ed, th viatio	ne mos ns for :	t and I surfac	east p e wate	reval r dur	ent <b>ve</b> ations	<b>getate</b> are as	d class follows	ses m s: P/F	nust be P = pei	withir rmane	n 20% ( nt/pere	of eac nnial	ch othe			
S/I = seasonal/intermittent; T/ Structural Diversity	E = terr	трогаг				A = a	bsent	see i	nanua	i for fu	rtner a	enniti	ions oi	tnese	terms					
(see #13)					High						$\geq$	∏ Мо	derate	•					ow	
Class Cover Distribution (all vegetated classes)		□Е	ven			☐ Un	even			⊠ E	ven			☐ Un	even			□E	ven	
Duration of Surface	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α
Water in ≥ 10% of AA																				
(see #12i)										Н										
☐ Moderate Disturbance																				
at AA (see #12i)																				
☐ <b>High Disturbance</b> at AA (see #12i)																				
iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.																				
Evidence of Wildlife Use					W	/ildlife	Habit	at Fe	ature	s Ratir	ng (ii)	•								
(i)		Exc	ceptio	nal		$\boxtimes$	High			☐ Mo	derate	<u> </u>		☐ Lo	w					
Substantial										-	-									
					_		7M		_							-				
Minimal Comments: Seasonal waterfowl habitat, abundant amphibian breeding areas.																				
Comments: Seasonal Water	owi nat	niai, a	เมนกฉล	ırıı ar	npriible	ui bree	euing a	ıreas	<u>-</u>											

Percent of Flooded Wetland Classified as

AA contains no outlet or restricted outlet

AA contains unrestricted outlet

Forested and/or Scrub/Shrub

							Wetla	nd/Sit	e #(s):	North (	Cell - F	rese	<u>rvation</u>					
Identify and 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 the NA box and proceed to 14E.  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												as fish						
Assess this function if the precluded by perched contact the contact that the precluded by perched contact the precluded by perched				he exis	ting sit	tuation	is "co	orrecta	ıble" su	ch tha	t the A	A cou	ıld be u	used by	/ fish [	i.e., fis	sh use	is
Type of Fishery:   C	old Wa	ter (CW)	☐ Wa	rm Wa	ter ( <b>W</b>	W) U	se the	CW o	or WW	guideli	nes in	the m	anual t	o comp	lete th	e mati	rix.	
i. Habitat Quality and Know	n / Sus	spected F	ish Spe	cies in	AA:	Use m	atrix t	o sele	ct the f	unction	al poir	nt and	rating					_
Duration of Surface Water in AA	□ P	ermanen	t / Perer	nial		□s	easo	nal / lı	ntermit	tent		П П	empo	rary / I	Ephen	neral		
Aquatic Hiding / Resting / Escape Cover	Opt	imal A	dequate	Po	oor	Opti	Ditimal Adequate Poor Optimal Adequate Poor								Adequate Poo			
Thermal Cover: optimal / suboptimal	0	s	o s	0	S	0	s	0	S	0	S	0	S	0	S	0	S	
FWP Tier I fish species																		
FWP Tier II or Native Game fish species		-																
FWP Tier III or Introduced Game fish																		
FWP Non-Game Tier IV or No fish species																		
Sources used for identifying	i fish s	pp. pote	ntially fo	ound in	AA:	1	I	1	1	l	l I			1				1
ii. Modified Rating: NOTE:						e less	than	0.1.										
a) Is fish use of the AA signific MDEQ list of waterbodies in n support, <b>or</b> do aquatic nuisand	eed of	TMDL de	velopme	nt with	listed	"Proba	ble In	npaire	d Uses	" includ	ding co	old or	warm ı	water f	ishery	or aqu	uatic lit	fe
b) Does the AA contain a doct native fish or introduced game										nctuary	pool,	upwe	elling ar	rea; sp	ecify ii	n comi	ments)	for
iii. Final Score and Rating:							_											
14E. FLOOD ATTENUATION Applies only to wetlands If wetlands in AA are no	s that a	re subjec	<b>A</b> (proce t to flood n-channe	ling via	in-cha	innel o	r over check	bank the N	flow. A box a	and pro	oceed t	to 14F	₹.					
Entrenchment Ratio (ER) Es Flood-prone width = estimated																	e of the	e stream.
. /	=	, ,					6		•					•		ge.		
flood prone width / bankfull wi	dth = e	ntrenchm	ent ratio		2 >	k Bank	full De	epth	В	ankfull	Depth			No.	a St	flood-p kfull W	rone W	idth/
<b>A</b> = :				1				. 11				-						
Slightly Enti ER 2	2			Mod		1.41 <b>–</b>	2.2	ed				ER =	renche : 1.0 –	1.4				
C stream type D stream		E strea	m type	,	B str	eam ty	/pe		A stre	eam typ	oe 1	F sti	ream ty	ype -	G st	ream t	ype	
												Ę				<u> </u>		
i. Rating: Working from top to	hottor	m usath	a matriv	helow t	റ ടേല്ട	ot the f	unctic	nal n	nint and	l ratino								
Estimated or Calculated				Slightly	Entrer	nched			erately					Entren	ched		1	
(Rosgen 1994, 1996)				D, E sti				В	stream	n type			A, F, G			s		

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? 

YES 

NO Comments: Unnamed tributary of Big Muddy Creek not physically measured, but the channel cross-section most resembles "Moderately entrenched/B stream type", which has an entrenchment ratio ranging from 1.41 to 2.2.

75%

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25-75%

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<25%

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75%

---

25-75%

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 $\boxtimes$ 

<25%

.5M

---

75%

---

<25%

---

25-75%

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Wetland/Site #(s): North Cell - Preservation

14F.	IF. SHORT AND LONG TERM SURFACE WATER STORAGE $\ \square$ N	IA (proceed to 14G)
	Applies to wetlands that flood or pond from overbank or in-channel flo	w, precipitation, upland surface flow, or groundwater flow.
	If no wetlands in the AA are subject to flooding or ponding, then check	the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual 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 fo	eet	□ 1.1	to 5 ac	re 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								.3L		
Wetlands in AA flood or pond < 5 out of 10 years										

Comments: AA is 0.73 acres, without potential to support greater than 1 ft of surface water.

#### 

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	AA receive has potent nutrients, such that of substantial sedimental toxicants, present.	ial to delivor compou other funct ally impaire tion, source	er sedime inds at lev ions are r d. Minor es of nutr	ents, rels not rients or	Waterbody is need of TMDL causes" relat toxicants or A has potential nutrients, or c functions are sedimentation or signs of eu	developmer ed to sedime AA receives of to deliver hig compounds s substantially n, sources of	nt for "probal nt, nutrients, or surroundin gh levels of so such that other y impaired. M nutrients or	ole or g land use ediments, er ajor
% Cover of Wetland Vegetation in AA	⊠≥.	70%	_ <	70%	□≥7	70%	□ < 70%	
Evidence of Flooding / Ponding in AA		□No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains no or restricted outlet	1H							
AA contains unrestricted outlet								

Comments: Cover of veg in existing riverine wetland >70%. Wetland converges with unnamed tributary of Big Muddy Creek, culvert under highway considered restricted outlet.

#### 14H. SEDIMENT / SHORELINE STABILIZATION NA (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.

If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability	Duration of Surface Water Adjacent to Rooted Vegetation								
Ratings of 6 (see Appendix F).	☐ Permanent / Perennial	Seasonal / Intermittent	☐ Temporary / Ephemeral						
⊠ ≥ 65%		.9H							
□ 35-64%									
☐ < 35%									

Comments: Existing wetland forms shoreline on west side of constructed cells and eventually converges with Big Muddy Creek. Bulrush, sedge, cattail, and rush species provide stability

#### 14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating	General Wildlife Habitat Rating (14Ciii)									
(14Diii)	☐ E/H	oxtimes M	L							
☐ E/H										
□ L										
⊠ NA		M								

**ii. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14li); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

Α	☐ Vegetated Component >5 acres							Vegeta	ated Co	mponent	ponent 1-5 acres						re	
В		ligh	M	oderate		Low		ligh	□ Mc	derate		Low	_	ligh	⊠ Mo	derate	L	.ow
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P																		
S/I																.3L		
T/E/A																		

15. GENERAL SITE NOTES: \_\_\_\_\_

			Wetlaı	nd/Site #(	s): North Cell	<ul> <li>Preservation</li> </ul>			
14I. PRODUCTION EXPORT / FOOD O	CHAIN SU	UPPORT (con	tinued)						
iii. Modified Rating: Note: Modified so	ore canno	ot exceed 1.0	or be less that	n 0.1.					
Vegetated Upland Buffer: Area wire mowing or clearing (unless for weed Is there an average 50-foot wide v	control).				•		•	·	
iv. Final Score and Rating: <u>.4M</u> Con	_				•	_ ,			<u> </u>
<del>-</del>	-								
14J. GROUNDWATER DISCHARGE / Check the appropriate indicators i	_	-							
i. Discharge Indicators  The AA is a slope wetland. Springs or seeps are known Vegetation growing during of Wetland occurs at the toe of Seeps are present at the word AA permanently flooded du Wetland contains an outlet, Shallow water table and the Other:	dormant soft a natural etland ed ring drough but no in estimate is safet is	season/drougl al slope. Ige. ght periods. nlet. aturated to the	nt. e surface.	☐ Pe	etland contain ream is a knov her:	trate present v s inlet but no o wn 'losing' stre	outlet.		
iii. Rating: Use the information from i a									7
			Saturation at <i>I</i> ATER THAT I						
Criteria		□ P/P	<u>ATEN HATI</u> ⊠ S		<u> </u>	GROUNDWA	□ No		
									1
☑ Groundwater Discharge or Recharge	arge		. / ۱۷						
			l	L		ary.			
	perenniall	ly, but saturati	ion is present y	year roun	d along tributa	.			1
☐ Insufficient Data/Information  Comments: Surface water not present	use the m	natrix below to natrins fen, bo s or mature (: ed wetland Of ation listed a	on is present y o select the fur g, warm >80 yr-old) R plant	ectional po	 d along tributa	n previously o structural gh OR ciation	AA doe previou associa	es not contai usly cited rar ations AND s ty (#13) is lov	e types OR tructural
☐ Insufficient Data/Information Comments: Surface water not present p  14K. UNIQUENESS i. Rating: Working from top to bottom,	use the n  AA con springs foreste associa the MT	natrix below to natrins fen, bo s or mature (: ed wetland Of ation listed a	on is present y o select the fur g, warm >80 yr-old) R plant	AA doe cited ra diversi contair	d along tributa bint and rating es not contain are types ANI ty (#13) is hig as plant asso as "S2" by the	n previously o structural gh OR ciation	AA doe previou associa diversi	usly cited rar ations AND s	e types OR structural w-moderate
☐ Insufficient Data/Information  Comments: Surface water not present part of the surface water not part of the surfac	use the n  AA con springs foreste associa the MT	natrix below to natrix below to ntains fen, bo s or mature (: ed wetland Of ation listed a NHP	o select the fur g, warm >80 yr-old) R plant s "S1" by	AA doe cited ra diversi contair	d along tributa bint and rating es not contain are types ANI ty (#13) is hig as plant asso as "S2" by the	n previously O structural gh OR ciation e MTNHP	AA doe previou associa diversi	usly cited rar ations AND s ty (#13) is low Common  .4M	e types OR structural w-moderate
□ Insufficient Data/Information Comments: Surface water not present p  14K. UNIQUENESS i. Rating: Working from top to bottom,  Replacement Potential  Estimated Relative Abundance (#11)  □ Low Disturbance at AA (#12i)  ■ Moderate Disturbance at AA (#12i)	use the m  AA con springs foreste associa the MT  Rare	natrix below to ntains fen, bo s or mature (: ed wetland Of ation listed a NHP	on is present you select the fur g, warm >80 yr-old) R plant s "S1" by	vear round AA doe cited ra diversi contair listed a	d along tributa  bint and rating es not contail are types ANI ty (#13) is hig as plant asso as "S2" by the  Common	n previously D structural gh OR ciation MTNHP Abundant	AA doe previou associ diversi	usly cited rar ations AND s ty (#13) is low	e types OR structural w-moderate  Abundant
☐ Insufficient Data/Information Comments: Surface water not present p  14K. UNIQUENESS i. Rating: Working from top to bottom,  Replacement Potential  Estimated Relative Abundance (#11)  ☐ Low Disturbance at AA (#12i)  ☐ Moderate Disturbance at AA (#12i)  ☐ High Disturbance at AA (#12i)	use the m AA con springs foreste associa the MT	natrix below to ntains fen, bo s or mature (: ed wetland Of ation listed a NHP	on is present you select the fung, warm >80 yr-old) R plant s "S1" by	AA doe cited ra diversi contair listed a	bint and rating s not contain ty (#13) is high s plant asso is "S2" by the Common	n previously D structural gh OR ciation MTNHP  Abundant	AA doe previou associo diversi	usly cited rar ations AND s ty (#13) is low Common  .4M	e types OR structural w-moderate
□ Insufficient Data/Information Comments: Surface water not present p  14K. UNIQUENESS i. Rating: Working from top to bottom,  Replacement Potential  Estimated Relative Abundance (#11)  □ Low Disturbance at AA (#12i)  ■ Moderate Disturbance at AA (#12i)	use the m  AA con springs foreste associa the MT  Rare TENTIAL es a recree	natrix below to ntains fen, bo s or mature (: d wetland Of ation listed a NHP  Common cational or edu	on is present you select the furge, warm >80 yr-old) R plant s "S1" by	AA doe cited ra diversi contair listed a Rare	d along tributa  bint and rating es not contain are types ANI ty (#13) is hig as plant asso as "S2" by the Common Ill Summary an	n previously D structural gh OR ciation e MTNHP D Abundant nd Rating page	AA doe previou associo diversi Rare	usly cited rar ations AND s ty (#13) is low	e types OR structural w-moderate  Abundant
□ Insufficient Data/Information Comments: Surface water not present p	use the m  AA con springs foreste associa the MT  Rare TENTIAL es a recre eational	natrix below to ntains fen, bo s or mature (: ed wetland Of ation listed a NHP  Common  eational or edu or education Educational/S Other:	on is present you select the furing, warm >80 yr-old) R plant s "S1" by	retional por AA doe cited radiversi contair listed a Rare	bint and rating as not contain are types ANI ty (#13) is higher assons "S2" by the Common	n previously D structural gh OR ciation MTNHP D Abundant nd Rating page	AA doe previou associ diversi □ Rare	usly cited rar ations AND s ty (#13) is low	e types OR structural w-moderate  Abundant
☐ Insufficient Data/Information Comments: Surface water not present p	use the m  AA con springs foreste associa the MT  Rare TENTIAL es a recre eational AA:	natrix below to natrix below to natrix below to natrix below to natrix fen, bo s or mature (sed wetland Of ation listed a NHP	on is present you select the furing, warm >80 yr-old) R plant s "S1" by DA Abundant NA (proceed acational opporal site? Yes cientific Study and rating.	retional positional positional positional positional reduction and results to Overantunity.	bint and rating as not contain are types ANI ty (#13) is higher assons "S2" by the Common	n previously D structural gh OR ciation MTNHP D Abundant nd Rating page	AA doe previou associ diversi Rare	usly cited rar ations AND s ty (#13) is lov  Common  .4M    sumptive recr	e types OR structural w-moderate  Abundant
☐ Insufficient Data/Information Comments: Surface water not present p	use the m  AA con springs foreste associa the MT  Rare TENTIAL es a recre eational AA:  act the fur	matrix below to ntains fen, bo s or mature (sed wetland Of ation listed a NHP	on is present y select the fur g, warm >80 yr-old) R plant s "S1" by  Abundant NA (proceed acational oppor al site? YE cientific Study and rating.	to Overartunity.	d along tributa bint and rating s not contain are types ANI ty (#13) is hig as plant asso as "S2" by the Common Ill Summary ar ii.  NO, ch	n previously D structural gh OR ciation MTNHP D Abundant nd Rating page	AA doe previou associo diversi Rare e)	usly cited rar ations AND s ty (#13) is lov  Common  .4M    sumptive recr	e types OR structural w-moderate  Abundant
□ Insufficient Data/Information Comments: Surface water not present p	Derenniall  AA consprings foreste associathe MT  Rare TENTIAL es a recree eational of AA:	natrix below to natrix below to natrix below to natrix below to natrix fen, bo so or mature (sed wetland Of ation listed a NHP	on is present you select the furing, warm >80 yr-old) R plant s "S1" by DAD DE	to Overartunity.  S, go to  Cormal Area	d along tributa bint and rating s not contain are types ANI ty (#13) is hig as plant asso as "S2" by the Common Ill Summary ar ii.  NO, ch	n previously D structural gh OR ciation MTNHP D Abundant nd Rating page	AA doe previou associ diversi Rare	usly cited rar ations AND s ty (#13) is lov  Common  .4M    sumptive recr	e types OR structural w-moderate  Abundant
☐ Insufficient Data/Information Comments: Surface water not present p	use the magnetic accession and the further statement of the further sta	natrix below to ntains fen, bo s or mature (: ed wetland Of ation listed a NHP	o select the fur g, warm >80 yr-old) R plant s "S1" by  Abundant NA (proceed locational oppor al site? Y Y cicentific Study and rating. or Educatior access (no p	to Overartunity.  S, go to  Cor	d along tributa  bint and rating es not contail are types ANI ty (#13) is hig as plant asso as "S2" by the Common Ill Summary ar ii. NO, ch asumptive Recontail	n previously D structural gh OR ciation MTNHP D Abundant nd Rating page	AA doe previou associo diversi Rare e) Ox.	sumptive recr	e types OR structural w-moderate  Abundant
□ Insufficient Data/Information Comments: Surface water not present p	Derenniallose the management of the management of the furborn of the management of t	natrix below to ntains fen, bo s or mature (: ed wetland Of ation listed a NHP	o select the fur g, warm >80 yr-old) R plant s "S1" by  Abundant NA (proceed locational oppor al site? Y Y cicentific Study and rating. or Educatior access (no p	to Overartunity.  S, go to  Cor	d along tributa  bint and rating es not contail are types ANI ty (#13) is hig as plant asso as "S2" by the Common Ill Summary ar ii. NO, ch asumptive Recontail	n previously D structural gh OR ciation MTNHP D Abundant nd Rating page	AA doe previou associ diversi	sumptive recr	e types OR structural w-moderate  Abundant

# Wetland/Site #(s): North Cell - Preservation

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	low 0.00	1.00	0									
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	0.37									
C. General Wildlife Habitat	mod 0.70	1.00	0.51	*								
D. General Fish Habitat	NA	NA	0									
E. Flood Attenuation	mod 0.50	1.00	0.37									
F. Short and Long Term Surface Water Storage	low 0.30	1.00	0.22	*								
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	0.73	*								
H. Sediment / Shoreline Stabilization	high 0.90	1.00	0.66									
I. Production Export / Food Chain Support	mod 0.40	1.00	0.29									
J. Groundwater Discharge / Recharge	mod 0.70	1.00	0.51	*								
K. Uniqueness	mod 0.40	1.00	0.29									
L. Recreation / Education Potential (bonus point)	high 0.20		0.15									
Total Points	5.6	10		Functional Units								
Percent of Possible	Percent of Possible Score 56% (round to nearest whole number)											

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  "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 IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not 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 (AA) RATING: Check the appropriate category based on the criteria outlined above.

# MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy	2. MDT Project #: NH 1-10(62	26) <b>3. Control #</b> : 4058-001									
3. Evaluation Date: July 12, 20	017 4. Evaluator(s): Mark Tr	axler 5. Wetland/Site #(s): S	outh Cell - Created								
6. Wetland Location(s): Town	nship <u>28 N</u> , Range <u>55 E</u> , Sectio	on <u>21;</u> Township <u>N</u> , Range _	E, Section								
Approximate Stationing or	Roadposts: ~639.75 on Hwy	2									
Watershed: 12 - Lower Mis	souri County: Roosevelt										
Evaluating Agency: RESPEC for MDT Purpose of Evaluation:  Wetland potentially affected by MDT project Mitigation wetlands; pre-construction Mitigation wetlands; post-construction Other (visually estimated)  9. Assessment Area (AA) Size (acre): (visually estimated) (see manual for determining AA) 4.17 (measured, e.g. GPS)											
<u> </u>	ost-construction										
☐ Other			ermining AA) 4.17 (measi								
☐ Other		(see manual for det	ermining AA) 4.17 (measi								
Other	TLAND AND AQUATIC HABI	(see manual for det TATS IN AA (See manual for de	ermining AA) <u>4.17</u> (measi efinitions.)	ured, e.g. GPS)							
Other  10. CLASSIFICATION OF WE HGM Class (Brinson)	TLAND AND AQUATIC HABI Class (Cowardin)	(see manual for det  TATS IN AA (See manual for de  Modifier (Cowardin)	ermining AA) 4.17 (measi efinitions.)  Water Regime	wred, e.g. GPS)							
Other  10. CLASSIFICATION OF WE HGM Class (Brinson)	TLAND AND AQUATIC HABI Class (Cowardin)	(see manual for det  TATS IN AA (See manual for de  Modifier (Cowardin)	ermining AA) 4.17 (measi efinitions.)  Water Regime	wred, e.g. GPS)							
Other  10. CLASSIFICATION OF WE HGM Class (Brinson)	TLAND AND AQUATIC HABI Class (Cowardin)	(see manual for det  TATS IN AA (See manual for de  Modifier (Cowardin)	ermining AA) 4.17 (measi efinitions.)  Water Regime	wred, e.g. GPS)							
Other  10. CLASSIFICATION OF WE HGM Class (Brinson)  Depressional	TLAND AND AQUATIC HABI Class (Cowardin)	(see manual for det  TATS IN AA (See manual for de  Modifier (Cowardin)	ermining AA) 4.17 (measi efinitions.)  Water Regime	wred, e.g. GPS)							
Other  10. CLASSIFICATION OF WE HGM Class (Brinson)	TLAND AND AQUATIC HABI Class (Cowardin)	(see manual for det  TATS IN AA (See manual for de  Modifier (Cowardin)	ermining AA) 4.17 (measi efinitions.)  Water Regime	wred, e.g. GPS)							

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual. abundant

#### 12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

	Predominar	t Conditions Adjacent to (within	500 feet of) AA
Conditions within 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	
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%.			
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%.			

Comments (types of disturbance, intensity, season, etc.): Constructed wetland cell with continued vegetation development. AA adjacent to Hwy 2.

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 peristence of additional v		Modified Rating
3 (or 2 if one is forested) classes		NA	NA	NA
2 (or 1 if forested) classes		NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	
1 class, monoculture (1 species comprises 90% of total cover)		NA	NA	NA

Comments: Vegetation class only includes emergent wetland but is comprised of various species so not considered a monoculture.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA includes the constructed cell south of Hwy 2. Hwy 2 and an unnamed tributary of Big Muddy borders this AA.

Wetland/Site #(s): South Cell - Created

14A. HABITAT FOR FEDER	ALLY	LISTE	D OR	PRO	POSE	D THE	REATE	NED	OR E	NDAN	GERE	D PL	ANTS.	OR A	NIMAL	.S				
i. AA is Documented (D) or Primary or critical habitat (I Secondary habitat (list spe Incidental habitat (list spec No usable habitat	ist spe cies)			D [ D [ D [		heck t	oox bas	sed o	n defir	nitions	in man	ual.								
ii. Rating: Based on the stro	_					_												_		_
Highest Habitat Level Doc/Primary Sus/Primary Doc/Secondary Sus/Secondary Doc/Incidental Sus/Incidental None																				
Functional Point/Rating				-						-	-								0L	
Sources for documented us	e (e.g.	obsei	rvation	s, re	cords):	USFV	VS dat	abas	e for R	oosev	elt Cou	<u>ınty</u>								
<b>14B. HABITAT FOR PLANT</b> Do not include species					S1, S	32, OR	S3 B	Y TH	E MON	NTANA	NATU	JRAL	_ HER	ITAGE	PRO	GRA	VI			
<ul> <li>i. AA is Documented (D) or Primary or critical habitat (I Secondary habitat (list special Incidental habitat (list special No usable habitat</li> </ul>	ist spe cies) ies)	ecies)		D [ D [2 D [2	] S _	lue He reater	eron (S Sage-	3), Lo Grou	oggerh se (S2	ead SI	nrike (S	<u>S3B)</u>								
ii. Rating: Based on the stro					. ,													- 1		7
Highest Habitat Level	Doc/F	Prima	ry S	us/P	rimary	/ Do	c/Sec	onda	ry S	us/Sec	conda	ry	Doc/Ir	nciden	tal	Sus/I	ncide	ntal	None	ļ
S1 Species Functional Point/Rating				-																
S2 and S3 Species										5	M									
Functional Point/Rating													, 5					1.0		
Sources for documented us observed onsite.	s <b>e</b> (e.g.	obsei	rvation	s, red	cords):	Suspe	ected s	реск	es ider	itified t	DY MIN	NHP 1	for Roo	oseveli	Coun	ty. L	oggern	iead S	hrike	
14C. GENERAL WILDLIFE	HABIT	AT RA	ATING																	
i. Evidence of Overall Wildl	ife Use	e in th	e AA:	Che	ck sub	stantia	al, mod	lerate	e, or lo	w base	ed on s	uppo	rting e	evidenc	e.					
□ Substantial: Based on an □ observations of abunda □ abundant wildlife sign s □ presence of extremely □ interview with local biol	ant wild such as limiting ogist w	llife #s s scat, g habit vith kn ollowir	or hig tracks at feat owledo	th spear, nest ures ge of eck].	ecies d t struct not ava the AA	tures, ailable	game in the	trails, surro	etc. ounding	g area		few little spar inter	or no v to no v se adja view w	wildlife wildlife acent u	obser sign upland	vatior food	source	ng pea		periods AA
<ul> <li>☑ observations of scatter</li> <li>☑ common occurrence of</li> <li>☐ adequate adjacent upla</li> <li>☐ interview with local biol</li> </ul>	wildlife and foo	e sign d soui	such a ces	as sca	at, trac	ks, ne	latively st strud	few s ctures	specie s, gam	s durin e trails	ig peal , etc.	c peri	ods							
<b>ii. Wildlife Habitat Features</b> For class cover to be conside percent composition of the AA S/I = seasonal/intermittent; T/	red eve \ (see #	enly di #10).	stribut Abbre	ed, th viatio	ne mos	t and I surfac	least p e wate	reval r dura	ent <b>ve</b> ations	<b>getate</b> are as	d class follows	ses m s: P/F	nust be = pei	withir rmane	120% nt/pere	of ea ennial	ch othe			
Structural Diversity					High						×	Mo	derate	)					.ow	
(see #13) Class Cover Distribution		E	ven			☐ Un	even			⊠ E¹			l	☐ Un	even					
(all vegetated classes)  Duration of Surface																l				
Water in ≥ 10% of AA	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	A	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α
■ Low Disturbance at AA     ■ Low Disturbance at										Η										
(see #12i)  ☐ Moderate Disturbance																				
at AA (see #12i)																				
☐ High Disturbance at																				
AA (see #12i)									<u> </u>				<u> </u>		<u> </u>					
iii. Rating: Use the conclusi	ons fro	m i an	ıd ii ab	ove a	and the	matri	x belov	v to s	elect t	he fun	ctional	poin	t and r	ating.						
Evidence of Wildlife Use																				
(i)		Exc	ceptio	nal			High				derate	)		☐ Lo	w	4				
☐ Substantial							 71.4									4				
					-		7M									-				
Comments: Several bird spe	cies an	nd siar		ildlife	obser			te vis	sits		-		<u> </u>							
	cioo un	.a oigi	.5 51 11		55001	. Ju ut	9 31	.U VIC												

								Wetla	nd/Sit	e #(s):	South	Cell -	Create	<u>ed</u>					
14D. GENERAL FISH HABIT If the AA is not used by entrapped in a canal], the	fish, fis	sh use		restora	able di	ue to h		const	raints	or is n	ot des	ired fro	om a r	manag	ement	perspe	ective	[such a	as fish
Assess this function if the precluded by perched c					e exist	ing sit	uation	is "co	orrecta	ıble" su	ch tha	t the A	A cou	ıld be ι	used by	/ fish [i	i.e., fis	h use	is
Type of Fishery:   C	old Wa	ter (C	<b>W</b> ) [	] War	m Wat	er ( <b>W</b>	<b>W</b> ) (	se the	CW o	r WW	guideli	nes in	the m	anual t	o comp	lete th	e matı	ix.	
i. Habitat Quality and Know	n / Sus	pecte	d Fish	Spec	ies in	AA:	Use m	atrix t	o sele	ct the f	unction	nal poi	nt and	I rating					•
Duration of Surface Water in AA	□ P	erman	ent / P	erenr	ial		□s	easo	nal / lı	ntermit	tent		ד □	empo	rary / I	Ephen	neral		
Aquatic Hiding / Resting / Escape Cover	Opt	imal	Adeq	uate	Po	oor	Opt	imal	Ade	_ quate	Po	or	Opt	imal	Aded	uate	Po	oor	
Thermal Cover: optimal / suboptimal	0	s	0	s	0	s	0	s	0	s	0	s	0	S	0	S	0	S	
FWP Tier I fish species																			
FWP Tier II or Native Game fish species																			
FWP Tier III or Introduced Game fish																			
FWP Non-Game Tier IV or No fish species																			
Sources used for identifying	fish s	pp. pc	tentia	lly fou	ınd in	AA:	"			<u> </u>		<u> </u>							
ii. Modified Rating: NOTE: I	Modifie	d scor	e cann	ot exc	eed 1.	0 or b	e less	than	0.1.										
a) Is fish use of the AA signific MDEQ list of waterbodies in n support, <b>or</b> do aquatic nuisand	eed of	TMDL	develo	pmen	t with	listed	"Proba	ible In	npaire	d Uses	" includ	ding co	old or	warm ı	vater f	ishery	or aqu	ıatic lif	e e
b) Does the AA contain a doct native fish or introduced game	umente e fish?	d spa	wning a	area o	<i>r other</i> ore in	critica	al habi 0.1 =	tat fea	ature (	i.e., saı <b>10</b>	nctuary	pool,	upwe	lling ar	ea; sp	ecify ir	n comi	nents)	for
iii. Final Score and Rating:											inlet c	r outle	<u>et.</u>						
14E. FLOOD ATTENUATION Applies only to wetlands If wetlands in AA are no	s that a	re sub	NA (p ject to n in-ch	floodii	ng via	in-cha	nnel c	r over check	bank the N	flow. A box a	and pro	ceed	to 14F	₹.					
Entrenchment Ratio (ER) Es Flood-prone width = estimated																		e of the	e stream.
/	=		_					4	Ø.							ģ	920		
flood prone width / bankfull wid	dth = e	ntrenc	hment	ratio		2 >	k Bank	full De	pth	Me V	NEW Y	EXEX.	. ♦	3	A CANALAN	#	-	rone W	idth
										В	ankfull	Depth				₿ Bank	ciuii w	ıatn	
Slightly Enti		d					ly Ent		ed					renche					
C stream type D stream		E st	ream ty	/ре			<b>1.41</b> – eam ty			A stre	am typ	oe_		: <b>1.0 –</b> ream ty		G st	ream t	уре	
						<u></u>							Ē				/ <del></del>		
<u> </u>				l l															

. Rating: vvorking from top to bottom, use the matrix below to select the functional point and rating.										
Estimated or Calculated Entrenchment	☐ SI	ightly Entre	nched		enched	ned Entrenched				
(Rosgen 1994, 1996)	C, D	, E stream t	ypes	В	stream typ	е	A, F, G stream types			
Percent of Flooded Wetland Classified as										
Forested and/or Scrub/Shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%	
AA contains no outlet or restricted outlet						.5M				
AA contains unrestricted outlet										

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? 

YES 

NO Comments: Unnamed tributary of Big Muddy Creek not physically measured, but the channel cross-section most resembles "Moderately entrenched/B stream type", which has an entrenchment ratio ranging from 1.41 to 2.2.

Wetland/Site #(s): South Cell - Created

14F.	SHORT AND LONG TERM SURFACE WATER STORAGE	☐ NA (proceed to 14G)
	Applies to wetlands that flood or pond from overbank or in-chann	el flow, precipitation, upland surface flow, or groundwater flow.
	If no wetlands in the AA are subject to flooding or ponding, then of	check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual 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 fe	eet	□ 1.1	to 5 ac	re feet		≤1 acre f	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		.9H							
Wetlands in AA flood or pond < 5 out of 10 years									

Comments: Constructed cell showed signs of inundation during early growing season. Cell is 4.17-ac with storage potential >1.5 ft deep.

#### 

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	AA receive has potent nutrients, such that substantia sedimenta toxicants, present.	tial to deliv or compou other funct Illy impaire tion, sourc	er sedime inds at lev ions are r d. Minor es of nutr	ents, rels not rients or	Waterbody is need of TMDI causes" relat toxicants or A has potential nutrients, or c functions are sedimentation or signs of eu	developmer ed to sedime AA receives of to deliver hig compounds s substantially n, sources of	nt for "probat nt, nutrients, or surroundin gh levels of so such that other y impaired. M	ole or g land use ediments, er ajor
% Cover of Wetland Vegetation in AA	⊠≥	70%	□<	70%	□≥7	70%	□<	70%
Evidence of Flooding / Ponding in AA	⊠ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains no or restricted outlet	1H							
AA contains unrestricted outlet								

Comments: Vegetation cover within constructed cell estimated to be >70%.

#### 14H. SEDIMENT / SHORELINE STABILIZATION NA (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.

If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability	Duration of S	urface Water Adjacent to Roo	ted Vegetation
Ratings of 6 (see Appendix F).	☐ Permanent / Perennial	Seasonal / Intermittent	☐ Temporary / Ephemeral
⊠ ≥ 65%		.9H	
□ 35-64%			
☐ < 35%			

Comments: Shoreline vegetation consists of Schoenoplectus, Distichlis, and Puccinellia.

#### 14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating	General Wildlife Habitat Rating (14Ciii)								
(14Diii)	☐ E/H	$\boxtimes$ M	L						
☐ E/H									
■ M			-						
⊠ NA		M							

**ii. Rating:** Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14li); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

Α	☐ Vegetated Component >5 acres							☑ Vegetated Component 1-5 acres						☐ Vegetated Component <1 acre					
В	☐ High		■ Moderate		Low		☐ High				Low		☐ High		■ Moderate		Low		
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
P/P																			
S/I										.3L									
T/E/A																			

Comments: MDT-owned site with known hunting.

15. GENERAL SITE NOTES: \_\_\_\_\_

Wetland/Site #(s): South Cell - Created

				,					
14I. PRODUCTION EXPORT / FOOD (	CHAIN S	UPPORT (con	tinued)						
iii. Modified Rating: Note: Modified so	ore cann	not exceed 1.0	or be less thar	า 0.1.					
Vegetated Upland Buffer: Area wi mowing or clearing (unless for weed Is there an average 50-foot wide v	control).						•	·	
iv. Final Score and Rating: <u>.4M</u> Con	nments:	Average 50-fo	ot upland buffe	er surrou	nding mitigation	on site.			
14J. GROUNDWATER DISCHARGE / Check the appropriate indicators i	-	-							
i. Discharge Indicators  The AA is a slope wetland. Springs or seeps are known Vegetation growing during Wetland occurs at the toe of Seeps are present at the word AA permanently flooded dured Wetland contains an outlet, Shallow water table and the Other:	dormant of a natur etland ecuring drou but no ir	season/drough al slope. dge. ught periods. nlet.	nt.	☐ Pe ☐ W	etland contain	rs trate present v s inlet but no o wn 'losing' stre	outlet.		
iii. Rating: Use the information from i a	and ii abo						ED DICC	UADOE an	7
			Saturation at A ATER THAT I						
Criteria		☐ P/P	⊠ S		□ T		☐ No		
☐ Groundwater Discharge or Rech	arge		.7M						]
☐ Insufficient Data/Information									]
Comments:  14K. UNIQUENESS  i. Rating: Working from top to bottom,	usa tha r	matriy helow to	select the fun	ctional n	oint and rating				
Replacement Potential	AA cor spring foreste	ntains fen, bo is or mature (> ed wetland OF iation listed as	g, warm ⊳80 yr-old) ≷ plant	AA doe cited ra diversi contair	es not contain are types ANI ty (#13) is high as plant asso as "S2" by the	n previously O structural gh OR ciation	previou associa	es not contai usly cited rar ations AND s ty (#13) is lo	e types OR tructural
Estimated Relative Abundance (#11)	□ Rare	□ Common	□ Abundant	□ Rare	□ Common	□ Abundant	□ Rare	□ Common	
Low Disturbance at AA (#12i)									.3L
Moderate Disturbance at AA (#12i)									
High Disturbance at AA (#12i)									
Comments:  14L. RECREATION / EDUCATION PO Affords 'bonus' points if AA provide i. Is the AA a known or potential recr ii. Check categories that apply to the iii. Rating: Use the matrix below to sele	es a recreeational	eational or edu or educational Educational/S Other:	al site? XE YE cientific Study	tunity. E <b>S</b> , go to	ii. <b>ПNO</b> , cl	neck the NA be	ox.	sumptive recr	eational
		Recreational		al Area			Known	Potentia	
Public ownership or public easemer					n required)		.2H		<del>-</del>
Private ownership with general publ									
	ic acces	ss (no permiss	sion required)						

#### Wetland/Site #(s): South CellI - Created

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	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	2.09	
C. General Wildlife Habitat	mod 0.70	1.00	2.92	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.50	1.00	2.09	
F. Short and Long Term Surface Water Storage	high 0.90	1.00	3.75	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	4.17	
H. Sediment / Shoreline Stabilization	high 0.90	1.00	3.75	*
I. Production Export / Food Chain Support	mod 0.40	1.00	1.67	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	2.92	*
K. Uniqueness	low 0.30	1.00	1.25	
L. Recreation / Education Potential (bonus point)	high 0.20		0.83	
Total Points	6.1	10	25.44 Total	Functional Units
Percent of Possible	le Score 61% (round	to nearest whol	e number)	

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 IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not 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 (AA) RATING: Check the appropriate category based on the criteria outlined above.

#### MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy	2. MDT Project #: NH 1-10(62	26) 3. Control #: 4058-001								
3. Evaluation Date: July 12, 2	017 4. Evaluator(s): Mark Tr	axler 5. Wetland/Site #(s): S	outh Cell - Preservation							
6. Wetland Location(s): Tow	nship <u>28 N</u> , Range <u>55 E</u> , Sectio	on <u>21</u> ; Township <u>N</u> , Range _	E, Section							
Approximate Stationing or	Roadposts: ~639.75 on Hwy	<u>2</u>								
Watershed: 12 - Lower Mis	ssouri County: Roosevelt									
Watershed: 12 - Lower Missouri County: _Roosevelt  Evaluating Agency: RESPEC for MDT										
HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA						
Riverine	Emergent Wetland		Seasonal / Intermittent	30						
Depressional	Emergent Wetland		Seasonal / Intermittent	70						

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)

#### 12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

	Predominar	nt Conditions Adjacent to (within	500 feet of) AA
Conditions within 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	
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%.			
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%.			

Comments (types of disturbance, intensity, season, etc.): Grazing eliminated within AA. AA not disturbed during construction.

- ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis
- iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA encompasses existing emergent wetland associated with an abandoned oxbow of Big Muddy Creek and adjacent lowland located in the southern parcel.

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 peristence of additional v		Modified Rating
≥3 (or 2 if one is forested) classes		NA	NA	NA
2 (or 1 if forested) classes		NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	
1 class, monoculture (1 species comprises ≥90% of total cover)		NA	NA	NA

Comments: Emergent vegetation class comprised of various obligate species including Typha and Schoenoplectus

Wetland/Site #(s): South Cell - Preservation

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or						heck l	oox ba	sed o	n defi	nitions	in mar	nual.								
Primary or critical habitat ( <b>list species</b> ) 🔲 D 🔲 S																				
Secondary habitat (list spe				D [	]s _															
Incidental habitat (list spec	ies)			D [	]s _															
No usable habitat					⊠s ¯															
ii. Rating: Based on the strong	ngest h	abitat	chose	n in	14A(i)	above	, selec	t the	corres	spondin	g func	tiona	l point	and ra	iting.					
Highest Habitat Level	Doc/P	rimar	y S	us/P	rimary	Do	c/Sec	onda	ry S	Sus/Se	conda	ry	Doc/Ir	nciden	tal	Sus/	Incide	ntal	None	•
Functional Point/Rating				_						-									0L	
Sources for documented us	<b>e</b> (e.a.	obser	vation	s. red	cords):	USFV	VS dat	abas	e for F	Roosev	elt Cou	untv								
4B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM Do not include species listed in 14A above.  AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.																				
Secondary habitat ( <b>list species</b> )  Incidental habitat ( <b>list species</b> )  D  S  Blue Heron (S3), Loggerhead Shrike (S3B)  D  S  Greater Sage-Grouse (S2)																				
No usable habitat					]s		-													
ii. Rating: Based on the stro	ngest h	nabitat	t chose	en in	14A(i)	above	e, sele	ct the	corre	spondii	ng fund	ctiona	al point	and ra	ating.					=
Highest Habitat Level	Doc/P	rimar	y S	us/P	rimary	Do	c/Sec	onda	ry S	Sus/Se	conda	ry	Doc/Ir	nciden	tal	Sus/I	ncider	ntal	None	
S1 Species Functional Point/Rating	-			-				•		-										
S2 and S3 Species Functional Point/Rating	-			-						.5	M									
Sources for documented us	d use (e.g. observations, records): MTNHP tracker for Roosevelt County. Loggerhead Shrike observed onsite.																			
14C GENERAL WILDLIEF	JARITA	AT D A	TING																	
14C. GENERAL WILDLIFE HABITAT RATING  i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.																				
							,		,				9							
■ 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  ■ 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																				
☐ interview with local biol					the AA							inte	view w	vith loc	al biol	ogist	with kr	nowled	lge of A	ιA
Moderate: Based on any or sold by	ed wildl wildlife and food	life gro sign : d sour	oups o such a ces	r indi as sca	at, trac	ks, ne	atively st stru	few ctures	species, gam	es durir ne trails	ng peal , etc.	k per	iods							
ii. Wildlife Habitat Features																				
For class cover to be conside percent composition of the AA																		er in te	rms of	their
S/I = seasonal/intermittent; T/																	,			
Structural Diversity (see #13)		iporai	угори		High	7. – u	DOONE	[000]	Tidiride	21 101 14			derate		tomio	j.			.ow	
Class Cover Distribution		E	ven			☐ Un	even			⊠E	ven			☐ Un	even			□ E	ven	
(all vegetated classes)  Duration of Surface	P/P	S/I	T/E		P/P	S/I	T/E	_	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α	P/P	S/I	T/E	Α
Water in ≥ 10% of AA		3/1	1/⊑	Α	P/P	3/1	1/5	Α	P/P	3/1	1/E	A	P/P	3/1	1/E	A	P/P	3/1	1/E	A
(see #12i)										Н										
☐ Moderate Disturbance at AA (see #12i)																				
☐ <b>High Disturbance</b> at AA (see #12i)																				
()								1		1			<u> </u>							
iii. Rating: Use the conclusion	ons froi	m i an	d ii ab	ove a	and the	matri	x belo	w to s	elect	the fun	ctional	poin	t and r	ating.		_				
Evidence of Wildlife Use					W			tat Fe	ature	s Ratir										
(i)		_] Exc	eptio	nal			High			_ Mc	derate	e		☐ Lo	w	_				
Substantial										-										
Moderate							.7M									4				
☐ Minimal										-						_				
Comments:																				

#### Wetland/Site #(s): South Cell - Preservation 14D. GENERAL FISH HABITAT ☑ NA (proceed to 14E) 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 the NA box and proceed to 14E. 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]. Type of Fishery: Cold Water (CW) Warm Water (WW) Use the CW or WW guidelines in the manual to complete the matrix. i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating. **Duration of Surface** ☐ Permanent / Perennial ☐ Seasonal / Intermittent ☐ Temporary / Ephemeral Water in AA Aquatic Hiding / Resting **Escape Cover** Optimal Poor Poor Optimal Adequate Optimal Adequate Adequate Poor Thermal Cover: 0 S 0 S O S 0 S 0 S 0 S 0 S 0 S 0 S optimal / suboptimal FWP Tier I fish species FWP Tier II or Native Game fish species FWP Tier III or Introduced Game fish FWP Non-Game Tier IV or ---------No fish species Sources used for identifying fish spp. potentially found in AA: ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 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? TES, reduce score in i by 0.1 = or 🖂 N0 b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? $\square$ YES, add to score in i or iia 0.1 = \_\_ or $\square$ N0 iii. Final Score and Rating: Comments: 14E. FLOOD ATTENUATION ■ NA (proceed to 14F) Applies only to wetlands that are subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F. Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width). Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream. flood prone width / bankfull width = entrenchment ratio Flood-prone Width 2 x Bankfull Depth Bankfull Width Bankfull Depth **Moderately Entrenched** Slightly Entrenched Entrenched ED > 22 FP = 1 /11 = 22 EP - 10 - 14

C stream type D stream type E stream type B stream type A stream type G stream type				EIX - 11-71		EIX - 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

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment					erately Enti					
(Rosgen 1994, 1996)	C, D	, E stream t	ypes	Е	stream typ	е	A, F, G stream types			
Percent of Flooded Wetland Classified as						$\boxtimes$				
Forested and/or Scrub/Shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%	
AA contains no outlet or restricted outlet										
AA contains unrestricted outlet						.4M				

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? ☐ YES ☐ NO Comments: Unnamed tributary of Big Muddy Creek not physically measured, but the channel cross-section most resembles "Moderately entrenched/B stream type", which has an entrenchment ratio ranging from 1.41 to 2.2.

Wetland/Site #(s): South Cell - Preservation

14F.	14F. SHORT AND LONG TERM SURFACE WATER STORAGE 🔲 NA	A (proceed to 14G)
	Applies to wetlands that flood or pond from overbank or in-channel flow,	, precipitation, upland surface flow, or groundwater flov
	If no wetlands in the AA are subject to flooding or ponding, then check the	he NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual 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 f	eet	□ 1.1	to 5 ac	re 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								.3L	
Wetlands in AA flood or pond < 5 out of 10 years									

**Comments:** AA is 0.3 acres without potential to support greater than 0.5 feet of surface water.

#### 

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	AA receive has potent nutrients, such that a substantia sedimenta toxicants, present.	tial to deliv or compou other funct illy impaire tion, sourc	er sedime inds at lev ions are n d. Minor es of nutr	ents, rels not rients or	Waterbody is need of TMDI causes" relat toxicants or A has potential nutrients, or c functions are sedimentation or signs of eu	developmer ed to sedime AA receives o to deliver hig compounds s substantially n, sources of	nt for "probal nt, nutrients, or surroundin gh levels of s such that oth or impaired. M nutrients or	ole or g land use ediments, er ajor
% Cover of Wetland Vegetation in AA	⊠≥°	70%	<	70%	□≥7	70%	□ < 70%	
Evidence of Flooding / Ponding in AA	⊠ Yes	☐ No	☐ Yes	☐ No	☐ Yes	□No	☐ Yes	☐ No
AA contains no or restricted outlet								
AA contains unrestricted outlet	.9H							

Comments: Cover greater than 70%, undisturbed during construction.

#### 14H. SEDIMENT / SHORELINE STABILIZATION NA (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.

If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability	Duration of Surface Water Adjacent to Rooted Vegetation							
Ratings of ≥6 (see Appendix F).	□ Permanent / Perennial	☐ Seasonal / Intermittent	☐ Temporary / Ephemeral					
⊠ ≥ 65%	1H							
□ 35-64%								
☐ < 35%								

Comments: AA includes shoreline of unnamed tributary of Big Muddy Creek.

#### 14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating	Genera	l Wildlife Habitat Rati	ng (14Ciii)
(14Diii)	□ E/H	$\boxtimes$ M	L
☐ E/H			
■ M			
L			
⊠ NA		M	

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14li); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

Α		Vegeta	ted Co	mponent	t >5 ac	res	$\boxtimes$	Vegeta	ated Co	mponent	1-5 ac	res	☐ Vegetated Component <1 acre				re	
В		ligh	M	oderate		Low	_ _	ligh	⊠ Mo	oderate		Low		☐ High ☐ Moderate			Low	
С	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P																		
S/I									.6M									
T/E/A																		

15. GENERAL SITE NOTES: \_\_\_\_\_

Wetland/Site #(s): South Cell - Preservation

	CHAIN SU	UPPORT (con	tinued)						
iii. Modified Rating: Note: Modified sc	ore cann	ot exceed 1.0	or be less than	า 0.1.					
Vegetated Upland Buffer: Area with mowing or clearing (unless for weed Is there an average ≥ 50-foot wide v	control).				•		•	•	
iv. Final Score and Rating: $\underline{.7M}$ Con	nments:								
<b>14J. GROUNDWATER DISCHARGE /</b> Check the appropriate indicators i	_	-							
i. Discharge Indicators  The AA is a slope wetland.  Springs or seeps are known  Vegetation growing during of wetland occurs at the toe of Seeps are present at the word AA permanently flooded du  Wetland contains an outlet,  Shallow water table and the	dormant of a natura etland ed ring drou but no ir	season/drougl al slope. lge. ght periods. nlet.	nt.	□ Pe	etland contain eam is a knov	rs trate present v s inlet but no c wn 'losing' stre	outlet.	, , ,	0 ,
iii. Rating: Use the information from i a	ınd ii abo	ve and the tal	ole below to se	lect the fu	unctional poin	t and rating.			<b>a</b>
			Saturation at						
Criteria		<u>WITH W</u> □ P/P	<u>'AIER IHAII</u> ⊠ S		ARGING THE □ T	GROUNDWA	<u>'ATER SYSTEM</u> ☐ None		
☐ Groundwater Discharge or Recha	arge		.7M		<u></u>			110	
☐ Insufficient Data/Information	g ·			Į.					
Comments:									
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i. Rating: Working from top to bottom,  Replacement Potential	AA cor springs foreste	ntains fen, bo s or mature (; ed wetland Of ation listed a	g, warm >80 yr-old) ⋜ plant	AA doe cited ra diversi contair	pint and rating is not contain are types ANI by (#13) is high as plant asso s "S2" by the	n previously O structural gh OR ciation	previou associa	es not containusly cited ranations AND sty (#13) is lov	e types OR tructural
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i. Rating: Working from top to bottom,  Replacement Potential  Estimated Relative Abundance (#11)  Low Disturbance at AA (#12i)  Moderate Disturbance at AA (#12i)  High Disturbance at AA (#12i)  Comments:  14L. RECREATION / EDUCATION POAffords 'bonus' points if AA provide  i. Is the AA a known or potential recre ii. Check categories that apply to the	AA cor springs foreste associathe MT Rare TENTIAL ss a recreseational AA:	ntains fen, bos or mature (: ed wetland Of ation listed a NHP  Common  cational or edu or educational/S Other:	g, warm >80 yr-old) R plant s "S1" by  Abundant  NA (proceed acational opporal site? YE	AA doe cited ra diversit contain listed a Rare to Overa tunity.	s not contain re types ANI ty (#13) is high splant asso s "S2" by the Common	n previously D structural In OR Ciation MTNHP D Abundant  nd Rating page	previou associa diversi Rare	usly cited ranations AND sty (#13) is low  Common  .4M	e types OR tructural w-moderate  Abundant
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i. Rating: Working from top to bottom,  Replacement Potential  Estimated Relative Abundance (#11)  Low Disturbance at AA (#12i)  Moderate Disturbance at AA (#12i)  High Disturbance at AA (#12i)  Comments:  14L. RECREATION / EDUCATION PO Affords 'bonus' points if AA provide i. Is the AA a known or potential recre ii. Check categories that apply to the  iii. Rating: Use the matrix below to select the select that apply to the Known or F	AA cor springs foreste associ the MT Rare TENTIAL sa a recre eational AA: cut the full	attains fen, bos or mature (: ed wetland Of ation listed a NHP  Common  eational or educational or educational/S Other: nctional point Recreational	g, warm >80 yr-old) R plant s "S1" by  Abundant  NA (proceed acational oppor al site? Yes cientific Study and rating.	AA doe cited ra diversit contain listed a □ Rare □ □ to Overa tunity. □ S, go to □ Cor	s not contain re types ANI ty (#13) is high splant asso s "S2" by the Common	n previously D structural In OR Ciation MTNHP D Abundant  nd Rating page	previou associa diversi la Rare	usly cited rare ations AND s ty (#13) is lov  ☐ Common ☐ .4M ☐ Sumptive recre ☐ Potential	e types OR tructural w-moderate  Abundant
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#### Wetland/Site #(s): South CellI - Preservation

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	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	0.92	
C. General Wildlife Habitat	mod 0.70	1.00	1.28	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.40	1.00	0.73	
F. Short and Long Term Surface Water Storage	low 0.30	1.00	0.55	
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	1.65	*
H. Sediment / Shoreline Stabilization	high 1.00	1.00	1.83	*
I. Production Export / Food Chain Support	mod 0.70	1.00	1.28	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	1.28	*
K. Uniqueness	mod 0.40	1.00	0.73	
L. Recreation / Education Potential (bonus point)	high 0.20		0.37	
Total Points	5.8	10		Functional Units
Percent of Possib	le Score 58% (round	I to nearest whol	e number)	

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 IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not 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 (AA) RATING: Check the appropriate category based on the criteria outlined above.

# APPENDIX C PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring Big Muddy Creek Mitigation Site Roosevelt County, Montana

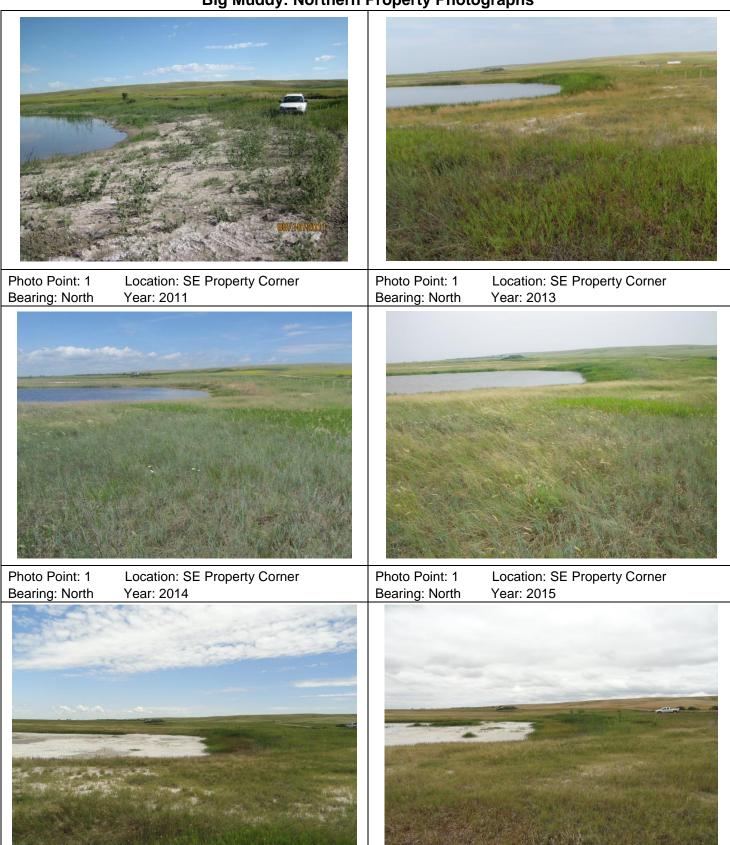


Photo Point: 1

Bearing: North

Photo Point: 1

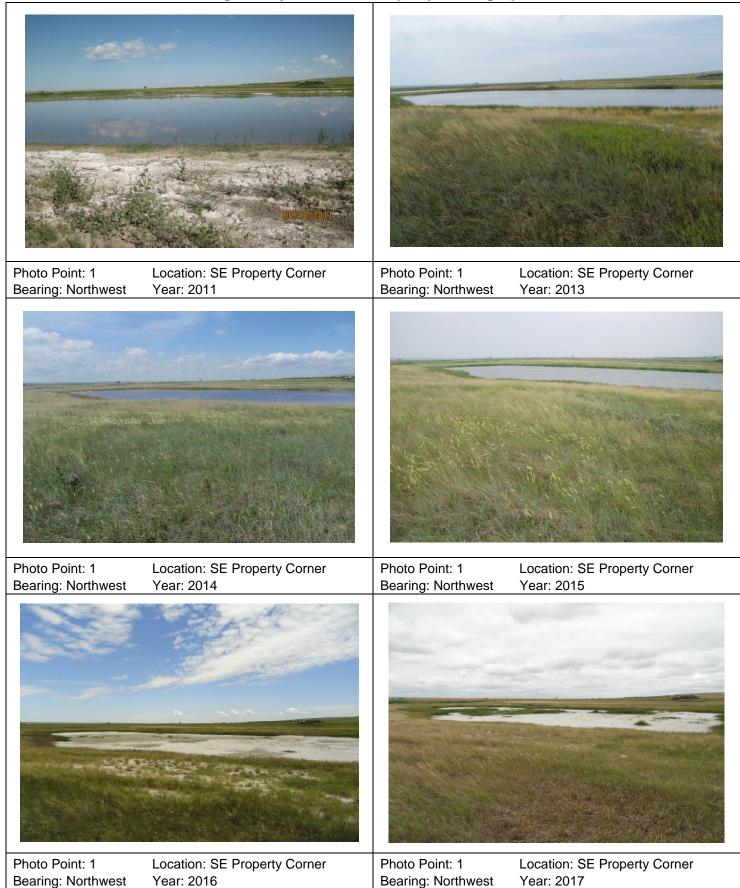
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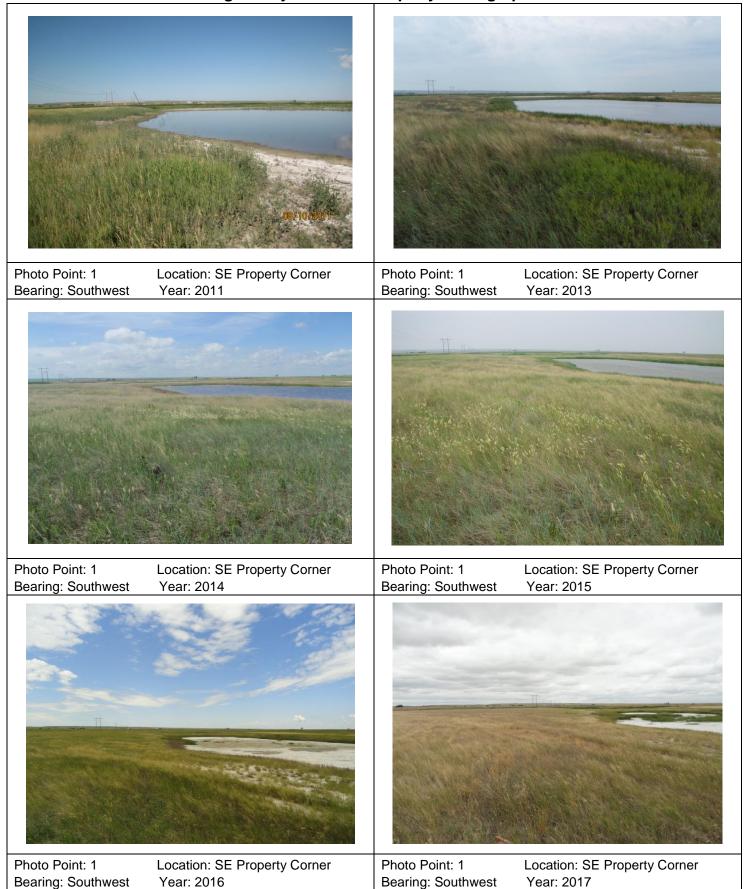
Location: SE Property Corner

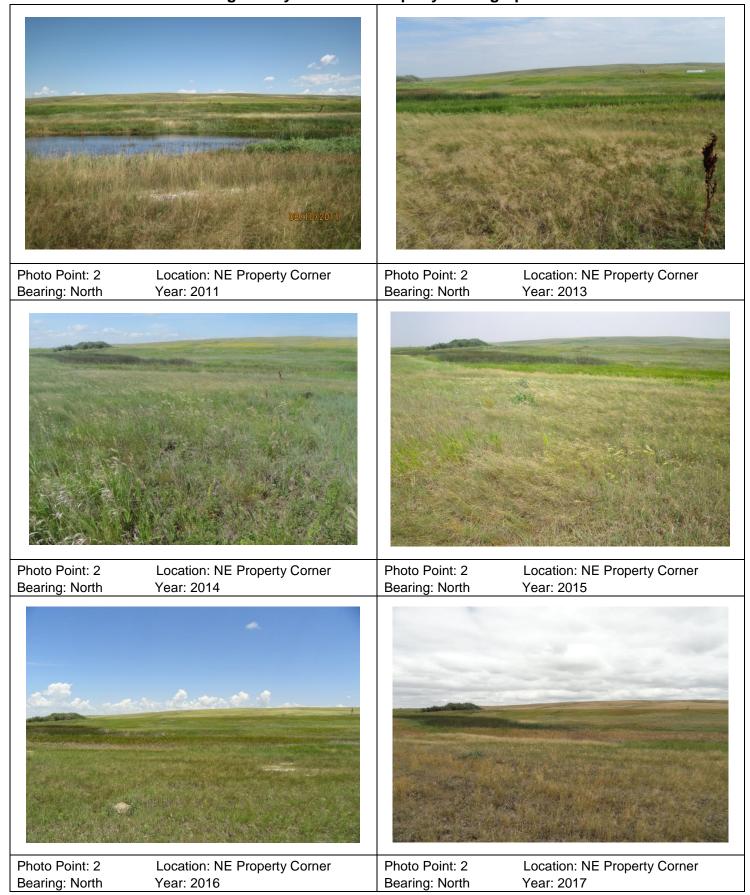
Year: 2016

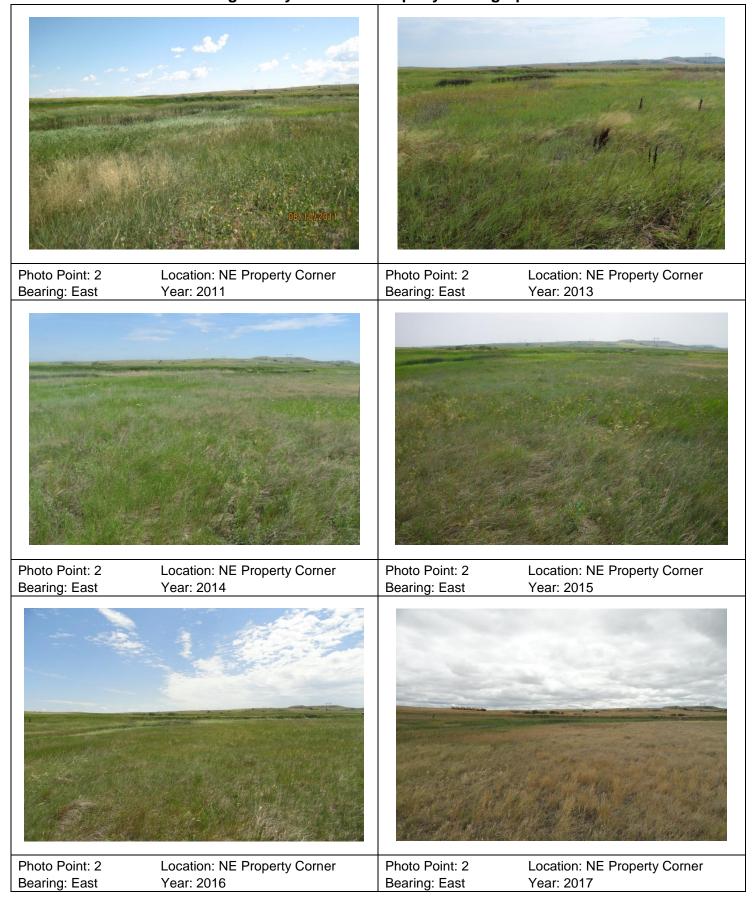
Location: SE Property Corner

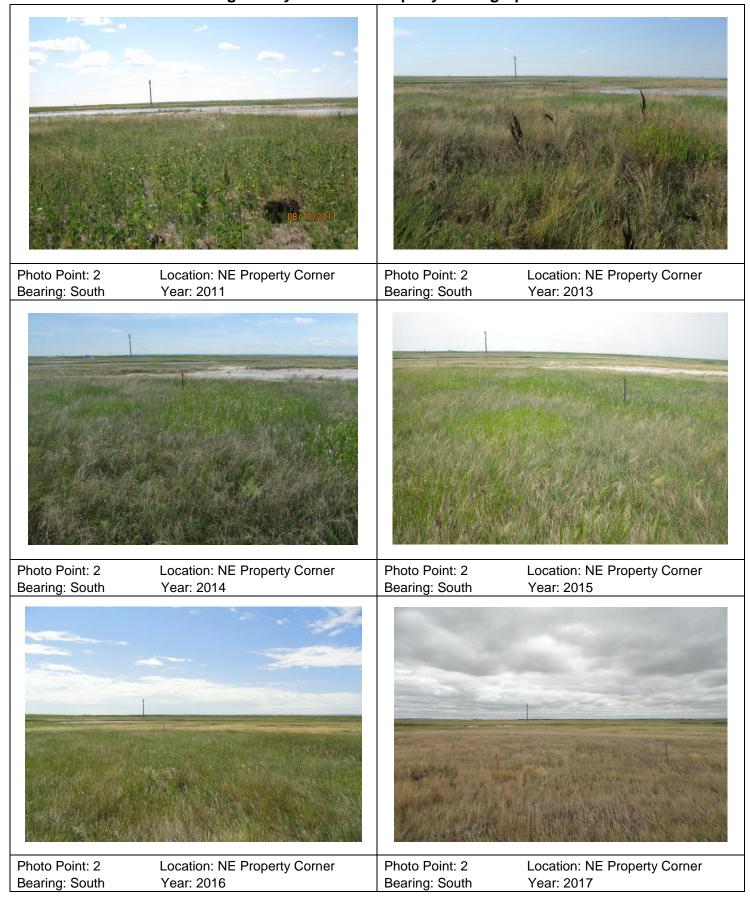
Year: 2017



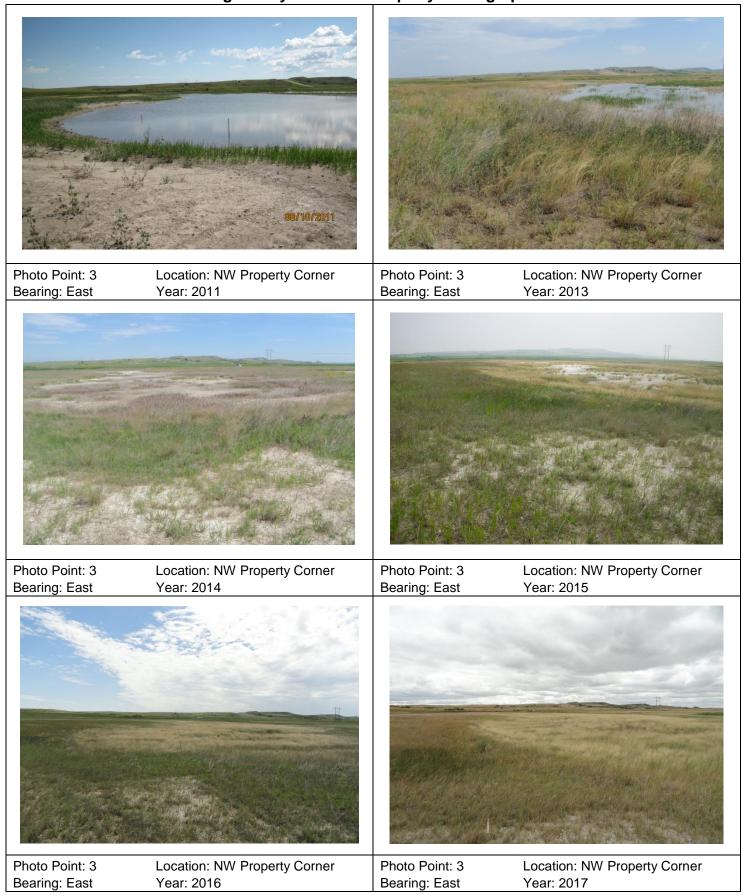


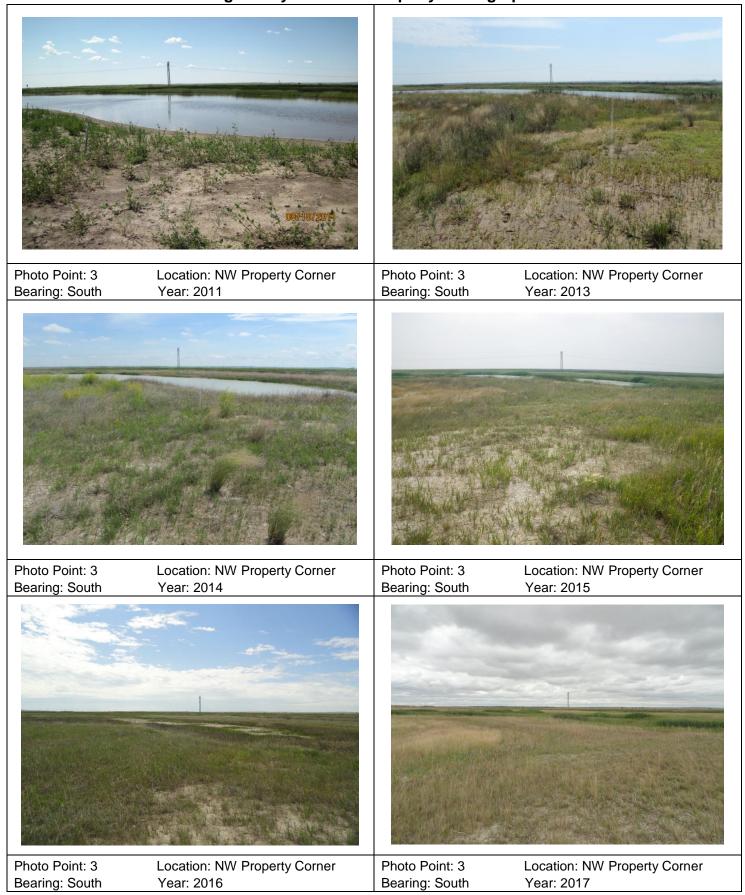




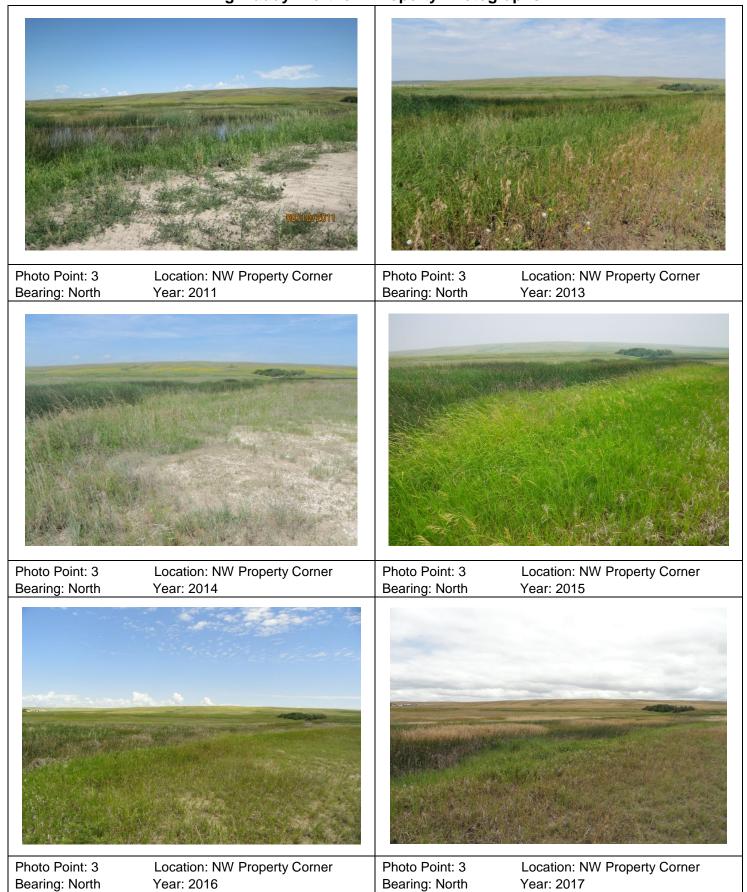












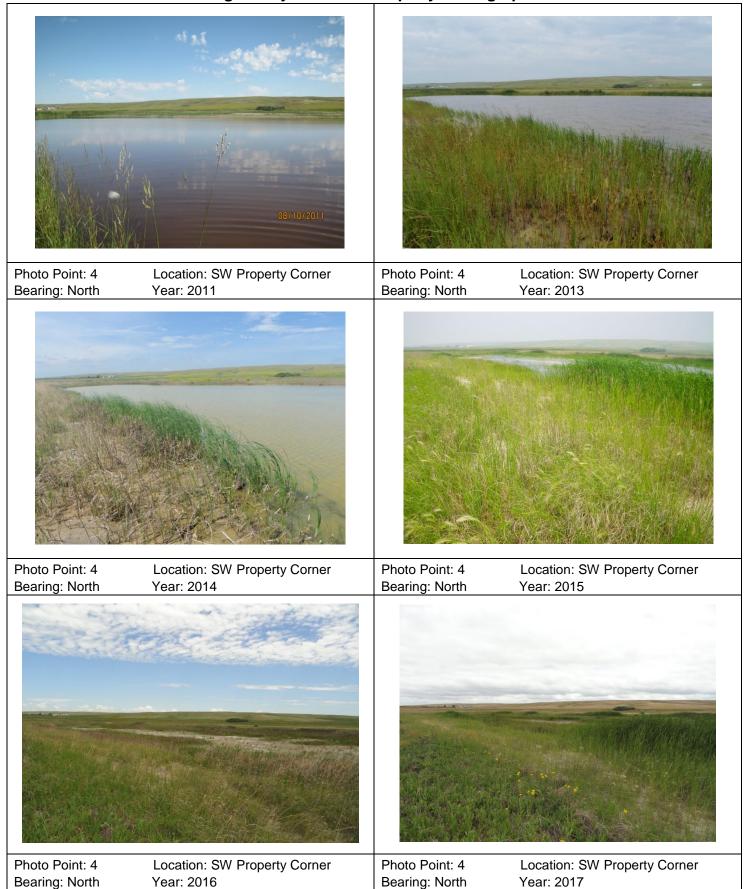




Photo Point: 4

Bearing: Northeast

Location: SW Property Corner

Year: 2016

Location: SW Property Corner

Year: 2017

Photo Point: 4

Bearing: Northeast



Photo Point: 4 Bearing: Northwest

Location: SW Property Corner Year: 2011



Photo Point: 4 Bearing: Northwest

Location: SW Property Corner Year: 2013



Photo Point: 4 Bearing: Northwest

Location: SW Property Corner Year: 2014



Bearing: Northwest

Photo Point: 4 Location: SW Property Corner Year: 2015



Photo Point: 4 Bearing: Northwest

Location: SW Property Corner

Year: 2016



Photo Point: 4 Bearing: Northwest

Location: SW Property Corner

Year: 2017



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2014



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2015



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2016



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2017



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2014



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2015



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2016



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2017



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2014



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2015



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2016



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2017



Transect 1: Start Bearing: 220 degrees

Location: North Parcel Year: 2011



Transect 1: Start Bearing: 220 degrees

Location: North Parcel Year: 2013



Transect 1: Start Bearing: 220 degrees

Location: North Parcel Year: 2014



Transect 1: Start Bearing: 220 degrees

t Location: North Parcel grees Year: 2015



Transect 1: Start Bearing: 220 degrees

Location: North Parcel Year: 2016



Transect 1: Start Bearing: 220 degrees

Location: North Parcel Year: 2017



Transect 1: Finish Bearing: 40 degrees

Location: North Parcel Year: 2011



Transect 1: Finish Bearing: 40 degrees

Location: North Parcel Year: 2013



Transect 1: Finish Bearing: 40 degrees

Location: North Parcel Year: 2014



Transect 1: Finish Bearing: 40 degrees

Location: North Parcel Year: 2015



Transect 1: Finish Bearing: 40 degrees

Location: North Parcel Year: 2016



Transect 1: Finish Bearing: 40 degrees

Location: North Parcel

Year: 2017



Transect 2: Start Bearing: 130 degrees

Location: South Parcel Year: 2011



Transect 2: Start Bearing: 130 degrees

Location: South Parcel Year: 2013



Transect 2: Start Bearing: 130 degrees

Location: South Parcel Year: 2014



Bearing: 130 degrees

Transect 2: Start Location: South Parcel Year: 2015



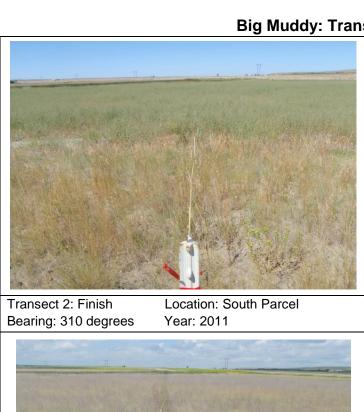
Transect 2: Start Bearing: 130 degrees

Location: South Parcel Year: 2016



Transect 2: Start Bearing: 130 degrees

Location: South Parcel Year: 2017



Transect 2: Finish Location: South Parcel Bearing: 310 degrees Year: 2013



Transect 2: Finish Bearing: 310 degrees

Location: South Parcel Year: 2014

Transect 2: Finish Bearing: 310 degrees

Location: South Parcel Year: 2015





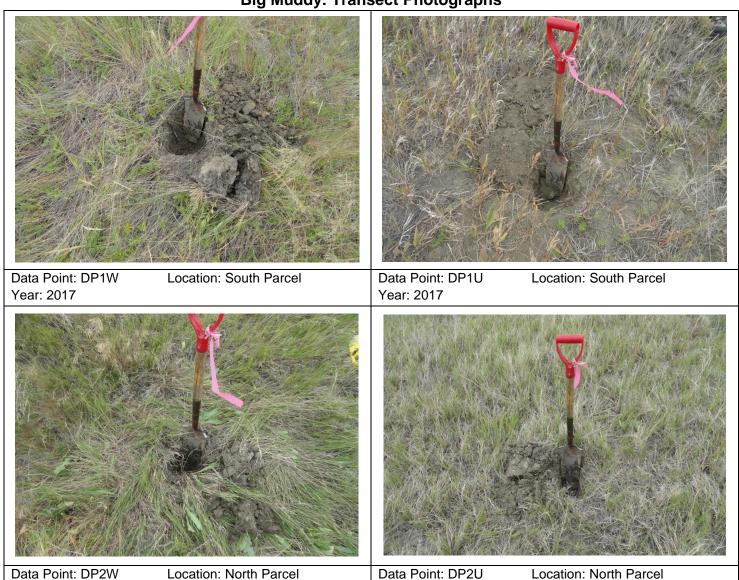
Transect 2: Finish Bearing: 310 degrees

Location: South Parcel Year: 2016

Transect 2: Finish Bearing: 310 degrees

Location: South Parcel

Year: 2017



Year: 2017

Year: 2017

# APPENDIX D PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring Big Muddy Creek Mitigation Site Roosevelt County, Montana

