MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2016

BIG MUDDY CREEK MITIGATION SITE ROOSEVELT COUNTY, MONTANA



Prepared for:



December 2016

Prepared by:



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Montana Department of Transportation Wetland Mitigation Monitoring Report: Year 2016

BIG MUDDY CREEK MITIGATION SITE ROOSEVELT COUNTY, MONTANA CONSTRUCTED: 2011

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

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Cover: View looking northwest from Photo Point 1.

1.0 INTRODUCTION

The north parcel of the Big Muddy Creek Wetland Mitigation Site was completed in spring 2011 and the south parcel in 2012. This report presents the results of the sixth year of postconstruction monitoring at the north parcel and the fifth year at the south parcel. 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 2016 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.

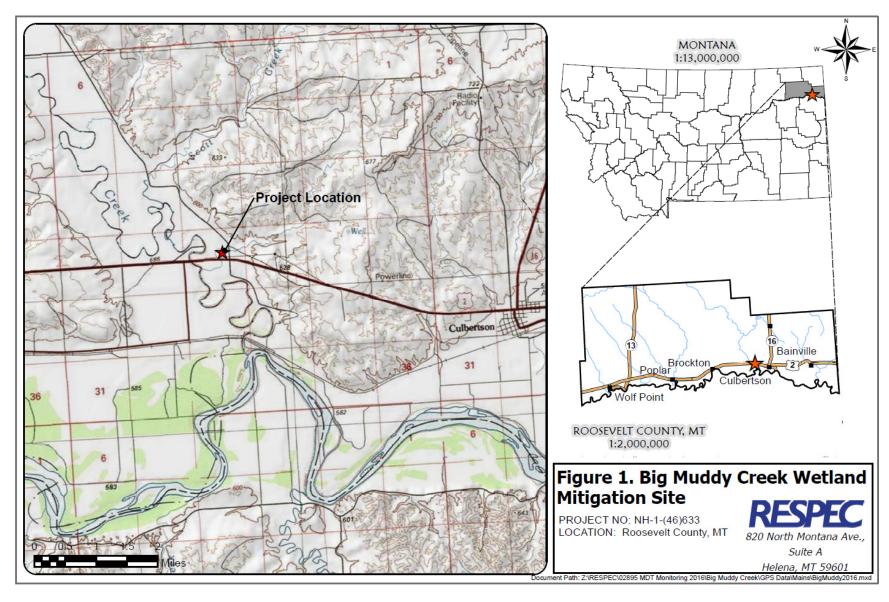


Figure 1-1. Project Location of the Big Muddy Creek Site.

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 2016 monitoring event was completed on June 20, 2016. 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 (USDA), 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 2016.

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 2016 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* (July 2015), 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 during the investigation and mapped on the 2016 aerial photos (Appendix A). The noxious weed species that were identified are color-coded. The locations are denoted with the symbol "x", "A," or "a," which represent 0.0–0.1 acre, 0.1–1.0 acre, or greater than 1.0 acre in extent,

respectively. The letters T, L, M, and H represent the cover classes and stand for less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively.

2.3 SOIL

Soil information was obtained from the *Web Soil Survey for Roosevelt County, Montana* [USDA, 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 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 Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology that were described in the 2010 Regional Supplement 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 on-site 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 2016 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 2016 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 2016 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 2016 [Western Regional Climate Center, 2016]. The annual precipitation recorded in the years 2010, 2011, 2012, 2013, 2014, and 2015 was 20.53, 17.43, 12.44, 19.82, 12.51, and 13.18 inches, respectively. The historic precipitation average from January to August 31 was 10.68 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), and 11.28 inches (2016). These data suggest that the region received above-average precipitation in 2010 and 2011, below-average precipitation in 2012, and near-average precipitation

from 2013 through 2016. 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 field survey, 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 2016 monitoring for the first 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 2016 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 June site visit, which is likely a result of poor winter snowpack conditions in the watershed.

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 2016 marked the sixth year of postconstruction monitoring at the north parcel and the fifth year at the south parcel of the Big Muddy Creek site. A total of 75 plant species were observed site wide from 2011 through 2016, 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 2016 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).

Five vegetation communities were observed on the north parcel in 2016 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 spp.
- Upland Type 16 Bromus inermis/Pascopyrum smithii.

Table 3-1. Vegetation Species Observed From 2011 Through 2016 at the Big Muddy Site (Page 1 of 2)

| Scientific Names | Common Names | GP Indicator Status ^(a) |
|-------------------------|--------------------------|------------------------------------|
| 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 | NL |
| 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 2016 at the Big Muddy Site (Page 2 of 2)

| Scientific Names | Common Names | GP Indicator Status ^(a) |
|---------------------------|----------------------------|------------------------------------|
| Medicago sativa | Alfalfa | UPL |
| Melilotus officinalis | Yellow Sweet-Clover | FACU |
| Mentha arvensis | American Wild Mint | FACW |
| 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 |
| Stipa viridula | Green Needlegrass | NL |
| 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 |

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

Type 16 represented the drier areas that border the excavated depressions. All of the cells on the north parcel lacked standing water in 2016, so community Type 18 – Open Water/*Schoenoplectus* spp. was absent from the site.

Three vegetation communities were observed on the south parcel in 2016: 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 June 2016 monitoring event. 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 0.65 acre of the north parcel in 2016 and generally included the seeded emergent vegetation found along the margins of the open water boundary in the constructed 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*), broad-leaf cat-tail (*Typha latifolia*), and 16 other species that were observed at less than 5 percent cover. 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 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 west and north 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 north 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* spp. was observed on 2.91 acres in 2016 and is located in the two southern cells of the north parcel. The community was not inundated during the June 2016 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 2016 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 2.51 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 north 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 four vegetation communities, including wetland Types 3 – *Schoenoplectus* spp., 9 – *Puccinellia nuttalliana/Iva axillaris*, and 15 – Bare Ground/*Schoenoplectus* spp. 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 2016 monitoring event, obvious vegetation community changes occurred along T-1 with community Type 9 increasing from 36 percent in 2015 to 57 percent in 2016. Wetland Type 18 – Open Water/*Schoenoplectus* spp. decreased from 20 percent in 2015 to 0 percent in 2016. The percent of upland community that was identified along the transect decreased from 30.1 percent in 2012 to 19.6 percent in 2016, which reflects the transition from upland to wetland vegetation cover.

T-2 was added in 2012 to monitor the additional mitigation area south of US Highway 2 and was established across the excavated basin that had been constructed in 2011. T-2 intersected wetland Types 12 – *Puccinellia nuttalliana/Iva axillaris* and 17 – *Teucrium canadense/Chenopodium album* and upland Type 14 – *Agropyron cristatum/Bromus inermis*. Hydrophytic vegetation has remained constant from 2012 through 2015 and composes approximately 91.8 percent of the transect. The data recorded on T-1 are summarized in tabular and graphical formats in Table 3-3 and Charts 3-3 and 3-4. Nuttall's alkali grass remained the dominant species within the constructed wetland cell south of the highway in 2016. Upland vegetation also remained constant from 2012 through 2016 and comprised approximately 8.2 percent of the transect, which was primarily caused by the abrupt topographic transition into wetland.

Table 3-2. Data Summary for T-1 (North Parcel) From 2011 Through 2016 at the Big Muddy Site

| Monitoring Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|------|------|------|------|------|------|
| Transect Length (feet) | 647 | 647 | 647 | 647 | 647 | 647 |
| Vegetation Community Transitions Along Transect | 11 | 11 | 11 | 11 | 11 | 8 |
| Vegetation Communities Along Transect | 4 | 4 | 3 | 4 | 5 | 4 |
| Hydrophytic Vegetation Communities Along Transect | 2 | 2 | 2 | 2 | 4 | 3 |
| Total Vegetative Species | 21 | 24 | 20 | 25 | 29 | 21 |
| Total Hydrophytic Species | 12 | 11 | 9 | 10 | 12 | 10 |
| Total Upland Species | 9 | 13 | 11 | 15 | 17 | 11 |
| Estimated % Total Vegetative Cover | 40 | 50 | 70 | 70 | 70 | 70 |
| Estimated % Unvegetated | 60 | 50 | 30 | 30 | 30 | 30 |
| % Transect Length Comprising Hydrophytic Vegetation Communities | 20.7 | 32.1 | 49.8 | 51.6 | 83.0 | 80 |
| % Transect Length Comprising Upland Vegetation Communities | 29.8 | 30.1 | 18.1 | 18.1 | 17.0 | 20 |
| % Transect Length Comprising Unvegetated Open Water | 49.5 | 37.7 | 32.1 | 20.1 | 0 | 0 |
| % Transect Length Comprising Mudflat | 0.0 | 0.0 | 0.0 | 10.2 | 0 | 0 |

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 each covered less than 0.1 acre with trace and moderate cover classes. One infestation of Canada thistle was observed on the south parcel for the first time in 2016. This infestation covered less than 0.1 acre and had a low cover class. Two infestations of field bindweed (*Convovulus arvensis*), which is a Priority 2B noxious weed, were observed on the south parcel. The infestations each covered less than 0.1 acre with trace and low cover classes. 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 was identified within wetland Type 3 in the north parcel from 2013 through 2016. In 2016, 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* [USDA, 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* [USDA, 2014].

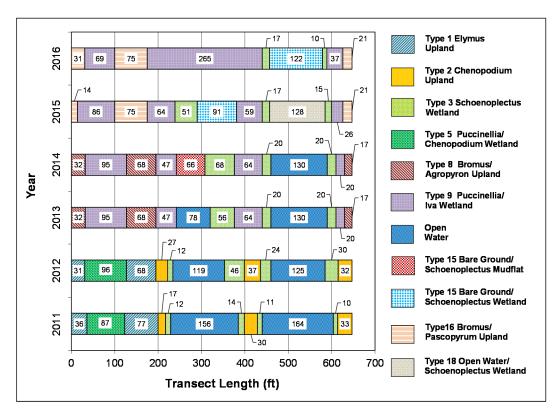


Chart 3-1. Transect Map Showing Community Types on T-1 (North Parcel) From 2011 Through 2016.

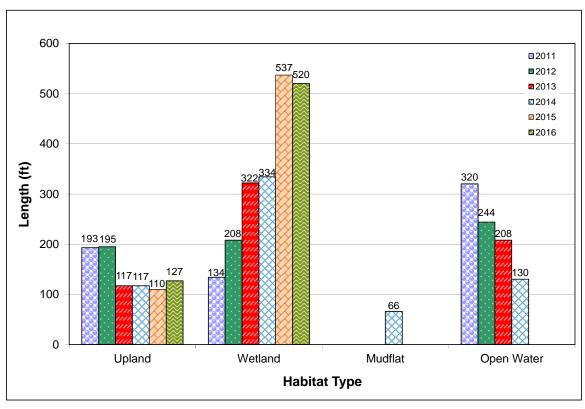


Chart 3-2. Length of Habitat Types Within T-1 From 2011 Through 2016 at the Big Muddy Site.

Table 3-3. Data Summary for T-2 (South Parcel) From 2012 Through 2016 at the Big Muddy Site

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

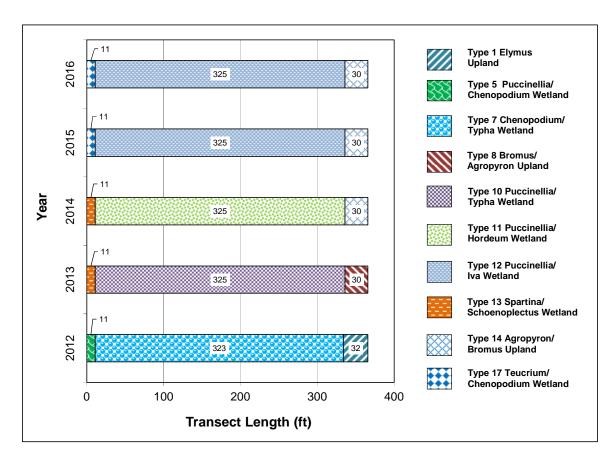


Chart 3-3. Transect Map Showing Community Types on T-2 (South Parcel) From 2012 Through 2016 From Start to Finish at the Big Muddy Site.

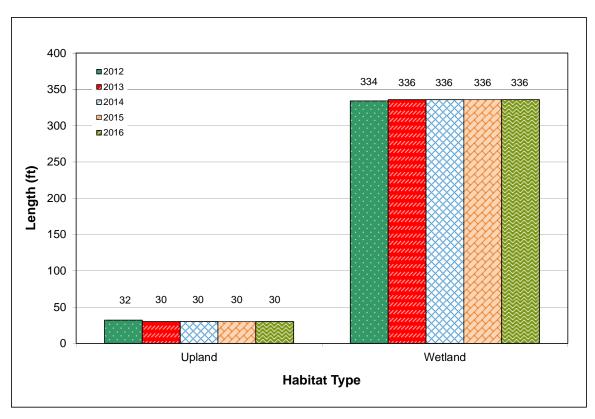


Chart 3-4. Length of Habitat Types Within T-2 (South Parcel) From 2012 Through 2016 at the Big Muddy Site.

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 2016 monitoring event. DP-1W and DP-2W are located in areas that met the wetland criteria. The upper horizon of the soil profile at DP1-W 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 1 percent strong brown (7.5 YR 4/6) redox concentrations in the matrix. 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 be too young to have formed hydric indicators [USACE, 2010]. This soil meets the National Technical Committee for Hydric Soils (NTCHS) technical standard for hydric soil because it was saturated to surface with evidence of inundation earlier in the year. 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 mitigation parcel and two data points (DP-1W and DP-1U) located in the south mitigation parcel were evaluated to confirm the wetland boundary determinations (Figure A-2, Appendix A; Wetland Determination Data forms, Appendix B). The 2016 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 2015, and a decrease of 0.13 acre since 2014; this data is presented in Table 3-4. The change from 2014 to 2015 was the result of a newly defined upland area (community Type 16) observed in the center of the north parcel in wetland Type 9 during the 2015 survey. A total of 8.12 acres of wetland habitat was identified in the north parcel in 2016. The 6.0-acre extent of overall wetland and aquatic habitat in the south parcel remained constant from 2013 through 2016.

Table 3-4. Total Wetland Acres Delineated From 2011 Through 2016 at the Big Muddy Site

| Wetland and Aquatic Habitat | 2011 (acres) | 2012 (acres) | 2013 (acres) | 2014 (acres) | 2015 (acres) | 2016 (acres) |
|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Created Wetland - North Parcel | 1.14 | 1.14 | 3.65 | 4.61 | 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 | 5.05 | 3.87 | 2.91 | 0.00 | 0.00 |
| Subtotal for North Parcel | 6.92 | 6.92 | 8.25 | 8.25 | 8.12 | 8.12 |
| Created Wetland – South Parcel | _ | 4.11 | 4.17 | 4.17 | 4.17 | 4.17 |
| Preexisting Wetland – South Parcel | _ | 1.83 | 1.83 | 1.83 | 1.83 | 1.83 |
| Open Water – South Parcel | _ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Subtotal for South Parcel | - | 5.94 | 6.00 | 6.00 | 6.00 | 6.00 |
| Total | 6.92 | 12.87 | 14.25 | 14.25 | 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 2016 is presented in Table 3-5 and the site Wetland Mitigation Site Monitoring form (Appendix B). Eleven bird species as well as rabbit scat and deer tracks were observed in 2016. Wildlife observations in 2016 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 2016. These values are provided in Table 3-6. Four AAs were assessed in 2016 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 completed in 2016 are located in Appendix B.

Table 3-5. Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2016 (Page 1 of 2)

| Common Name | Scientific Name |
|------------------------------------|--------------------------|
| A | Amphibian |
| Boreal Chorus Frog | Pseudacris maculata |
| Northern Leopard Frog | Rana pipiens |
| Woodhouse's Toad | Bufo woodhousii |
| | 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 ^(a) | Thamnophis radix |
| Prairie Rattlesnake | Crotalus viridis |
| Unknown Snake | |
| | Bird |
| American Avocet | Recurvirostra americana |
| American Coot | Fulica americana |
| American Goldfinch | Spinus tristus |
| American Wigeon | Anas americana |
| Bank Swallow | 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-winged Blackbird | Agelaius phoeniceus |
| Ring-necked Pheasant | Phasianus colchicus |
| Sparrow | unknown species |
| Spotted Sandpiper | Actitis macularius |
| Swainson's Hawk | Buteo swainsoni |

Table 3-5. Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2016 (Page 2 of 2)

| Common Name | Scientific Name | | | | | | |
|-------------------------|-------------------------------|--|--|--|--|--|--|
| Bird | | | | | | | |
| Tree Swallow | Tachycineta bicolor | | | | | | |
| Western Meadowlark | Sturnella neglecta | | | | | | |
| Western Sandpiper | Calidris mauri | | | | | | |
| Wilson's Phalarope | Phalaropus tricolor | | | | | | |
| Wilson's Snipe | Gallinago delicata | | | | | | |
| Yellow-headed Blackbird | Xanthocephalus xanthocephalus | | | | | | |

⁽a) Species identified by MDT personnel.Species that were identified in 2016 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 2016.

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 2016. The AA received high ratings in 2016 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 a total of 57.30 functional units in 2016.

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/lva axillaris*. The AA was rated as a Category III wetland with 61 percent of the total possible points and 25.44 functional units in 2016, the same as 2015. 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 2016 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 2016. 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 a total 36.05 functional units in 2016.

Table 3-6. Functions and Values of the Big Muddy Site From 2011 Through 2016 (Page 1 of 2)

| Function and Value Parameters From the 2008 Montana Wetland Assessment Method | 2011 (Creation) AA-1 | 2011 (Preservation) AA-2 | 2012 ^(a) (Creation) AA-1 | 2012 ^(a) (Preservation) AA-2 | 2013 Creation North Parcel | 2013 Preservation North Parcel | 2013 Creation South Parcel | 2013 Preservation South Parcel | 2014 Creation North Parcel | 2014 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) | High (0.9) | 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 (0.4) | 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) | Mod (0.4) | 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 (0.9) | 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 (1.0) | 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) | High (0.9) | Mod (0.4) | Mod (0.7) | Mod (0.7) | Mod (0.4) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) | 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 (0.2) | 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 (0.15) | 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 | 6.6/10 | 6.0/10 | 5.8/10 | 7.1/10 | 5.6/10 |
| % of Possible Score Achieved | 53.5% | 65.5% | 66.5% | 70.5% | 71.0% | 66.0% | 60.0% | 58.0% | 71.0% | 56.0% |
| Overall Category | III | II | II | II | II | II | 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 | 7.52 | 0.73 |
| Functional Units (acreage × actual points) | 33.12 | 4.78 | 68.56 | 18.05 | 53.39 | 4.82 | 25.02 | 10.61 | 53.39 | 4.09 |

Table 3-6. Functions and Values of the Big Muddy Site From 2011 Through 2016 (Page 2 of 2)

| Function and Value Parameters From the 2008 Montana Wetland Assessment Method | 2014 Creation South Parcel | 2014 Preservation South Parcel | 2015 Creation North Parcel | 2015 Preservation North Parcel | 2015 Creation South Parcel | 2015 Preservation South Parcel | 2016 Creation North Parcel | 2016 Preservation North Parcel | 2016 Creation South Parcel | 2016 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 (1.0) | High (0.9) | High (0.9) | High (1.0) | High (0.9) | 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) | High (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 × actual points) | 25.44 | 10.61 | 53.21 | 4.09 | 25.44 | 10.61 | 53.21 | 4.09 | 25.44 | 10.61 |

⁽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 to 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. The infestations each covered less than 0.1 acre with trace to moderate cover classes. Two infestations of field bindweed and one infestation of Canada thistle, were observed in the south parcel. The infestations each covered less than 0.1 acre with a trace to low cover class. 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 2016 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 2016 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 ^(a) | Proposed Acres | Preliminary Credit Estimate (acres) | Performance Standard 1 | Performance Standard 2 | Performance Standard 3 | Scaled % Credit Criteria ^(b) |
|--------------|--|---|-------------------|--|---|---|--|---|
| | Creation: Establishment ^(c) (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 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 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 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 ^(a) | Proposed Acres | Preliminary Credit Estimate (acres) | Performance Standard 1 | Performance Standard 2 | Performance Standard 3 | Scaled % Credit Criteria ^(b) |
|--------------|---|---|-------------------|--|---|--|--|--|
| cel | Creation: Establishment (emergent marsh and open water in south parcel) ^(d) | tablishment nergent 1:1 5.47 trsh and open ter in south | | 5.47 | Satisfy 1987 Wetland Manual and 2010 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) ^(d) | 4:1 | 1.83 | 0.46 | Satisfy 1987 Wetland Manual and 2010 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 | | | | |

⁽a) USACE, 2005.

⁽b) Percentages to be applied to credit estimate acres in Column 5.
(c) Incidentally created wetlands will be credited according to parameters listed under "Creation: Establishment."
(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 ^(a) (area between cells [1.76 acres] and passive creation in northern tip of site [1.03 acres]) | Satisfy 1987 Wetland Manual and 2010 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 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 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 ^(b) (emergent marsh and open water in south parcel) | Satisfy 1987 Wetland Manual and 2010 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 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. |

Incidentally created wetlands will be credited according to parameters listed under "Creation: Establishment."

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 2016 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 |
|--------------|---|-------------------------------------|-----------------------------|---------------------------------|-------------------------|-----------------------------|---------------------------------|-------------------------|-----------------------------|---------------------------------|-------------------------|
| | 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 |
| North 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 |
| No | Wetland Preservation (north parcel) | 4:1 | 0.73 | 100% | 0.18 | 0.73 | 100% | 0.18 | 0.73 | 100% | 0.18 |
| | Upland Buffer (north parcel) | 5:1 | 3.70 | 100% | 0.74 | 3.69 | 100% | 0.74 | 2.37 | 100% | 0.47 |
| | North Subtotal | | 10.62 | _ | 5.26 | 10.18 | | 4.95 | 10.62 | | 5.92 |
| leo | Wetland Creation: Establishment (wetland cell in south parcel) | 1:1 | _ | | | 4.55 | 70% | 3.19 | 4.17 | 70% | 2.92 |
| South Parcel | Wetland Preservation (south parcel) | 4:1 | _ | | | 1.83 | 100% | 0.46 | 1.83 | 100% | 0.46 |
| Sou | Upland Buffer (south parcel) | 5:1 | _ | | | 1.31 | 100% | 0.26 | 1.25 | 100% | 0.25 |
| | South Subtotal | | | | | 7.69 | | 3.90 | 7.25 | | 3.63 |
| | Total | | 10.62 | | 5.26 | 17.87 | | 8.86 | 17.87 | | 9.55 |

| | Compensatory Mitigation Type | 2014 Delineated Acres | Scaled % Credit Standards | 2014 Credit Acres | 2015 Delineated Acres | Scaled % Credit Standards | 2015 Credit Acres | 2016 Delineated Acres | Scaled % Credit Standards | 2016 Credit Acres |
|--------------|---|-----------------------------|---------------------------------|-------------------------|-----------------------------|---------------------------------|-------------------------|-----------------------------|---------------------------------|-------------------------|
| | Wetland Creation: Establishment (area between constructed cells in north parcel) | 1.76 | 100% | 1.76 | 1.63 | 100% | 1.63 | 1.63 | 100% | 1.63 |
| th Parcel | Wetland Creation: Establishment (wetland cells in north parcel) | 5.76 | 70% | 4.03 | 5.76 | 100% | 5.76 | 5.76 | 100% | 5.76 |
| North | Wetland Preservation (north parcel) | 0.73 | 100% | 0.18 | 0.73 | 100% | 0.18 | 0.73 | 100% | 0.18 |
| | Upland Buffer (north parcel) | 2.37 | 100% | 0.47 | 2.50 | 100% | 0.50 | 2.50 | 100% | 0.50 |
| | North Subtotal | 10.62 | | 6.45 | 10.62 | | 8.07 | 10.62 | | 8.07 |
| cel | Wetland Creation: Establishment (wetland cell in south parcel) | 4.17 | 100% | 4.17 | 4.17 | 100% | 4.17 | 4.17 | 100% | 4.17 |
| South Parcel | Wetland Preservation (south parcel) | 1.83 | 100% | 0.46 | 1.83 | 100% | 0.46 | 1.83 | 100% | 0.46 |
| Sou | Upland Buffer (south parcel) | 1.25 | 100% | 0.25 | 1.25 | 100% | 0.25 | 1.25 | 100% | 0.25 |
| | South Subtotal | 7.25 | | 4.88 | 7.25 | | 4.88 | 7.25 | | 4.88 |
| | Total | 17.87 | | 11.33 | 17.87 | | 12.95 | 17.87 | | 12.95 |

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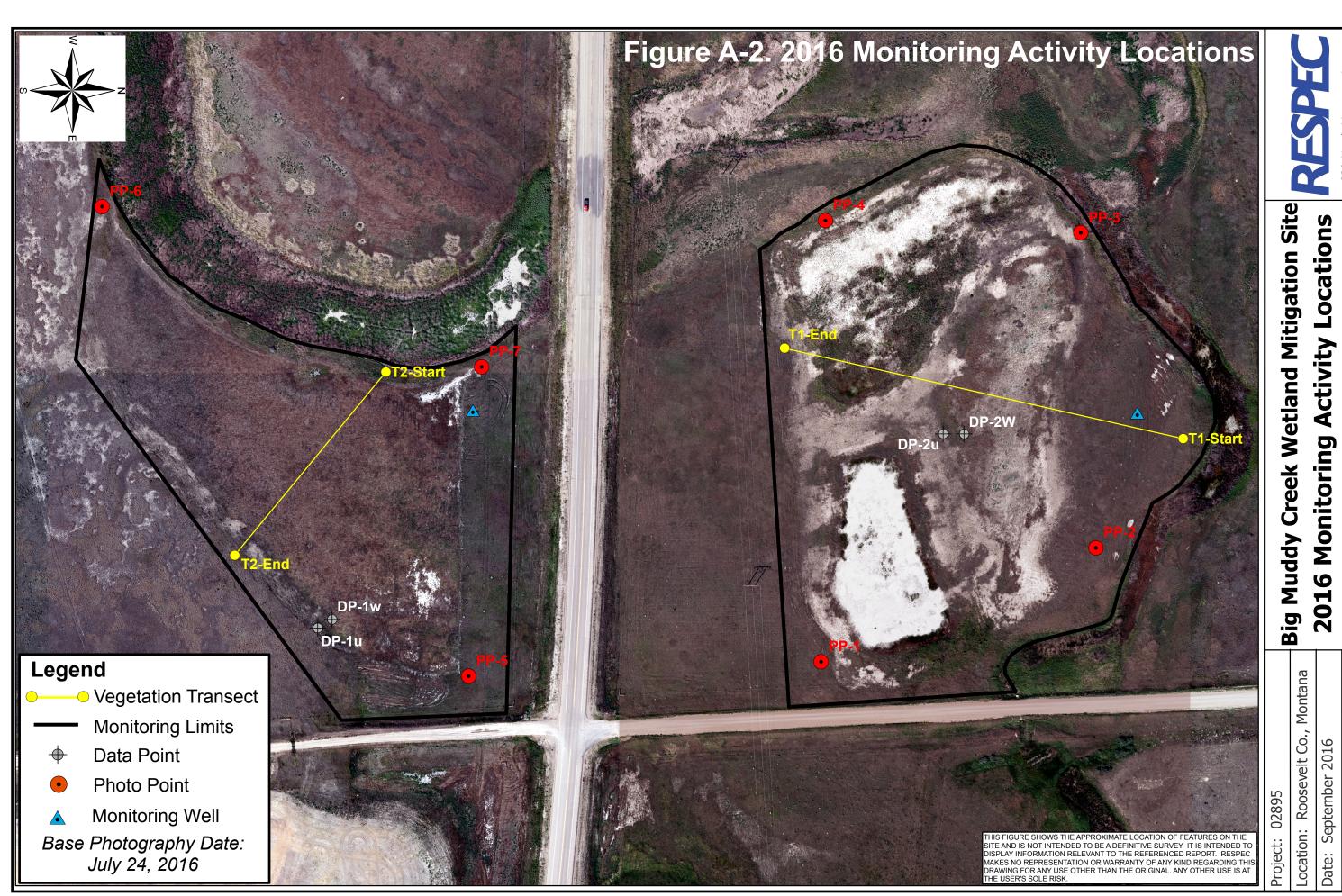
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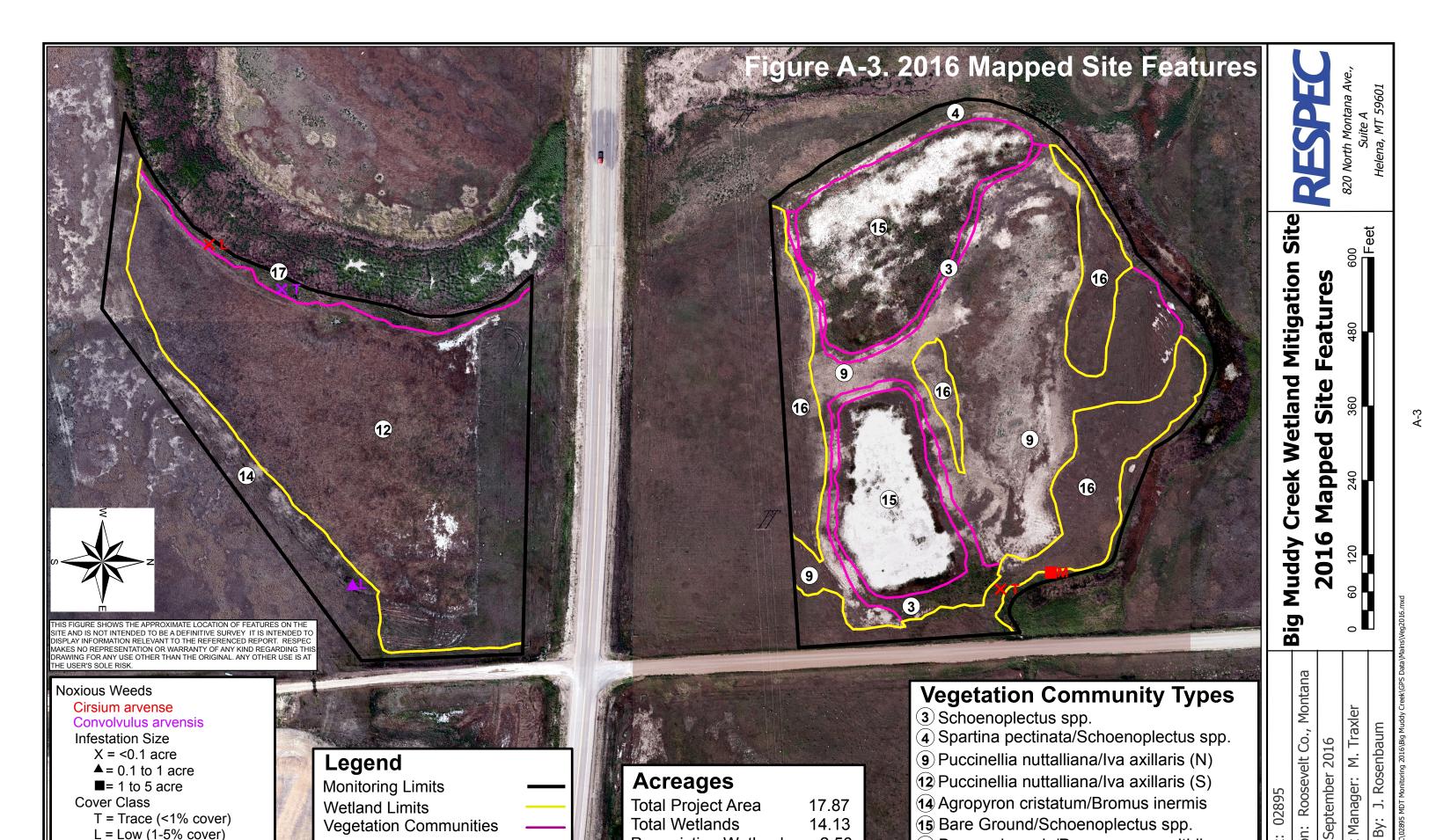
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APPENDIX A PROJECT AREA MAPS

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





Pre-existing Wetlands

Upland Buffer

Base Photography Date:

July 24, 2016

2.56

3.76

Project:

16 Bromus inermis/Pascopyrum smithii

17) Teucrium canadense/Chenopodium album

L = Low (1-5% cover)

M = Moderate (6-25% cover)

H = High (26-100% cover)

APPENDIX B MONITORING FORMS

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

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

| A L W In | egal Description: | June 29, 20 west of Cu 639.75 on T 28N as: partly c Date: Augu | lbertson Highway 2 R <u>55E</u> Soloudy, 70 degree ast 20, 2011 | Person ection 21 es Monit | Time of I | strict: <u>Glene</u> Day: Visits in Ye | dive ear: <u>1</u> |
|-------------------|--|---|---|--|--|--|---|
| | | | Н | YDROLO | GY | | |
| In Po D If O S F | ercent of assessment at emergent assessment area ther evidence of | ent area un vegetation is not inun hydrology s, salt crus water ma | Average Depth: 9 der inundation: 0 - open water boundated then are the on the site (ex. – est, geomorphic prks. | 0 feet Range % dary: NA feet soils saturated drift lines, eecosition, inu | | es of surfac | e: <u>Yes</u> .): |
| | | oter helevy | around curtace (1 | n taati | | | |
| | ecord depth of w | | Ĭ | | Well Number | Depth | 1 |
| | | Depth | Well Number | Depth | Well Number | Depth | |
| | ecord depth of w | | Ĭ | | Well Number | Depth | |
| | ecord depth of w Well Number Well 1 | | Ĭ | | Well Number | Depth | |
| | ecord depth of w Well Number Well 1 | | Ĭ | | Well Number | Depth | |
| R | well Number Well 1 Well 2 dditional Activiti Map emergent Observe extent elevations (drift | Depth des Checkli vegetation- of surface tilines, ero | Well Number st: open water bound | dary on aerin site visit a taining, etc. | al photograph. nd look for eviden | | urface water |
| A C | dditional Activiti Map emergent Observe extent elevations (drift Use GPS to sur | Depth des Checkli vegetation- of surface ct lines, ero | st: -open water bound water during each sion, vegetation shadwater monitoring | dary on aerin site visit a taining, etc. | al photograph. nd look for eviden | | urface water |
| A C C | dditional Activiti Map emergent Observe extent elevations (drift Use GPS to sur | Depth des Checkli vegetation- of surface it lines, ero vey ground | st: -open water bound water during each sion, vegetation shwater monitoring | dary on aeri n site visit a taining, etc. g well locati | al photograph. nd look for eviden | ce of past su | |
| A ☐ ☐ ☐ C A | dditional Activiti Map emergent Observe extent elevations (drift Use GPS to sur | des Checkli vegetation- of surface et lines, ero vey ground ROBLEM iodic overl | st: -open water bound water during each sion, vegetation solwater monitoring each state water | dary on aeri n site visit a taining, etc. g well locati | al photograph. nd look for eviden) ons, if present. | ce of past su | ows and large |
| A C C A st au | dditional Activities Map emergent Observe extent elevations (drift Use GPS to sur OMMENTS / Prea receives per orm events. Grond south side of | Depth des Checkli vegetation- of surface it lines, ero vey ground ROBLEM iodic overl bundwater Hwy 2. Co | well Number st: -open water bound water during each sion, vegetation s dwater monitoring S: bank flow from t connection between | dary on aerin site visit a taining, etc. g well location. The unname veen stream ssions with | al photograph. nd look for eviden) ons, if present. ed tributary durin and constructed periodic to perm | ce of past su | ows and large n both north lation. Well 1 |
| A | dditional Activities Map emergent Observe extent elevations (drift Use GPS to sur OMMENTS / Prea receives per corm events. Gro d south side of cated in norther | Depth des Checkli vegetation- of surface et lines, ero vey ground ROBLEM iodic overl oundwater Hwy 2. Co en tract, W | well Number st: -open water bound water during each sion, vegetation s dwater monitoring S: bank flow from t connection between | dary on aerication site visit a taining, etc. g well location stream exeen stream existing with couthern training with the couthern training area. | al photograph. nd look for eviden) ons, if present. ed tributary durin | ce of past su | ows and large n both north lation. Well 1 |

VEGETATION COMMUNITIES

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

| Dominant Species | % Cover | Dominant Species | % Cover |
|--------------------------|-----------|---------------------------|----------|
| Schoenoplectus maritimus | | 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

| Dominant Species | % Cover | Dominant Species | % Cover |
|-------------------------|------------|--------------------------|----------|
| 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: **14** Community Title (main spp): **Agropyron cristatum / Bromus inermis**

| 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 spp.**

| 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 | | 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 | Dominant Species | % 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: _____

| Dominant Species | % Cover | Open Water / Schoenoplectu 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% | | |
| omments / Problems: This veg Community Number: Co | | | of surface wate |
| Dominant Species | % Cover | Dominant Species | % Cover |
| | | | |
| | | | |
| | | | |
| | | | |
| Comments / Problems | | | |
| community Number: Com | 181 | | % Cover |
| | munity Title (main spp): % Cover | : Dominant Species | % Cover |
| community Number: Com | 181 | | % Cover |
| ommunity Number: Com | 181 | | % Cover |
| Comments / Problems: Community Number: Com Dominant Species | 181 | | % Cover |
| Dominant Species | 181 | | % Cover |
| ommunity Number: Com Dominant Species | 181 | | % Cover |
| community Number: Com | % Cover | Dominant Species | % Cover |

Comments / Problems: ____ **Additional Activities Checklist:**

Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

| Plant Species | Number Originally Planted | Number Observed | Mortality Causes |
|---------------|---------------------------------|--------------------|------------------|
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Comments / Problems: <u>No woody species were installed on this site. The wetlands were revegetated with seed and salvaged material. Numerous volunteer seedlings (less than 1-inch diameter) were observed within the site, including cottonwoods, aspen, and willows.</u>

Site: Big Muddy
Transect Number: 1

Date: June 29, 2016 Examiner: M. and T. Traxler

Approximate Transect Length: 647 feet Compass Direction from Start: 220 Note:

| Transect Interval Length: 31 feet (station 0-31) | | |
|--|------------|--|
| Vegetation Community Type: Bromus inermis / Pascopyr | um smithii | |
| Plant Species Co | | |
| Distichlis spicata | 5 = > 50% | |
| Pascopyrum smithii | 3 = 11-20% | |
| Artemisia cana | 2 = 6-10% | |
| Agropyron cristatum | 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: 69 feet (station 31-100) | | |
|--|------------|--|
| Vegetation Community Type: Puccinellia nuttalliana / Iva a | axillaris | |
| Plant Species | Cover | |
| Distichlis spicata | 5 = > 50% | |
| Puccinellia nuttalliana | 5 = > 50% | |
| Iva axillaris | 3 = 11-20% | |
| Suaeda calceoliformis | 2 = 6-10% | |
| Chenopodium sp. | 1 = 1-5% | |
| Bromus inermis | 1 = 1-5% | |
| Hordeum jubatum | 1 = 1-5% | |
| | | |
| | | |
| | | |
| | | |
| Total Vegetative Cover: | 90% | |

| Transect Interval Length: 75 feet (station 100-175) | |
|--|------------|
| 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% |
| Distichlis spicata | 2 = 6-10% |
| Grindelia squarrosa | 2 = 6-10% |
| Chenopodium sp. | 1 = 1-5% |
| Pascopyrum smithii | 1 = 1-5% |
| Bassia scoparia | 1 = 1-5% |
| Hordeum jubatum | 2 = 6-10% |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 75% |

Site: Big Muddy
Transect Number: 1

Date: June 29, 2016 Examiner: M. and T. Traxler
Approximate Transect Length: 647 feet Compass Direction from Start: 220 Note:

| Transect Interval Length: 17 feet (station 440-457) | |
|---|------------|
| Vegetation Community Type: Schoenoplectus spp. / | |
| Plant Species | Cover |
| Spartina pectinata | 3 = 11-20% |
| Alopecurus arundinaceus | 1 = 1-5% |
| Eleocharis palustris | 1 = 1-5% |
| Puccinellia nuttalliana | 1 = 1-5% |
| Schoenoplectus acutus | 1 = 1-5% |
| Sonchus arvensis | 1 = 1-5% |
| Bare Ground | 1 = 1-5% |
| Hordeum jubatum | 1 = 1-5% |
| Rumex crispus | 1 = 1-5% |
| Schoenoplectus maritimus | 1 = 1-5% |
| | |
| Total Vegetative Cover: | 85% |

| Transect Interval Length: 122 feet (station 457-579) | |
|--|-----------|
| Vegetation Community Type: Bare Ground / Schoenoplectus spp. | |
| Plant Species | Cover |
| Schoenoplectus maritimus | 5 = > 50% |
| Mud Flat / Bare Ground | 2 = 6-10% |
| Schoenoplectus acutus | 2 = 6-10% |
| Hordeum jubatum | 1 = 1-5% |
| Chenopodium album | 1 = 1-5% |
| Spartina pectinata | + = < 1% |
| | |
| | |
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| | |
| | |
| Total Vegetative Cover: | 70% |

| Transect Interval Length: 10 feet (station 579-589) | |
|---|------------|
| Vegetation Community Type: Schoenoplectus spp. / | |
| Plant Species | Cover |
| Bare Ground | 5 = > 50% |
| Spartina pectinata | 3 = 11-20% |
| Puccinellia nuttalliana | 2 = 6-10% |
| Schoenoplectus maritimus | 1 = 1-5% |
| Hordeum jubatum | 1 = 1-5% |
| Schoenoplectus acutus | 1 = 1-5% |
| | |
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| | |
| Total Vegetative Cover: | 50% |

| Transect Interval Length: 37 feet (station 589-626) | |
|--|------------|
| Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris | |
| Plant Species | Cover |
| Bare Ground | 4 = 21-50% |
| Distichlis spicata | 3 = 11-20% |
| Sonchus arvensis | 3 = 11-20% |
| Puccinellia nuttalliana | 2 = 6-10% |
| Grindelia squarrosa | + = < 1% |
| Hordeum jubatum | + = < 1% |
| | |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 90% |

Site: Big Muddy
Transect Number: 1

Date: June 29, 2016 Examiner: M. and T. Traxler

Approximate Transect Length: 647 feet Compass Direction from Start: 220 Note:

| Transect Interval Length: 21 feet (station 626-647) | |
|--|------------|
| Vegetation Community Type: Bromus inermis / Pascopyr | um smithii |
| Plant Species | Cover |
| Bromus inermis | 4 = 21-50% |
| Grindelia squarrosa | 2 = 6-10% |
| Iva axillaris | 2 = 6-10% |
| Agropyron cristatum | 1 = 1-5% |
| Pascopyrum smithii | 1 = 1-5% |
| | |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 90% |

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

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

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

Site: Big Muddy
Transect Number: 2

Date: June 29, 2016 Examiner: M. and T. Traxler
Approximate Transect Length: 366 feet Compass Direction from Start: 130 Note:

| Transect Interval Length: 11 feet (station 0-11) | |
|---|-----------|
| Vegetation Community Type: Teucrium canadense / Chenopodium | |
| album | |
| Plant Species | Cover |
| Symphoricarpos albus | 2 = 6-10% |
| Iva axillaris | 2 = 6-10% |
| Spartina pectinata | 2 = 6-10% |
| Chenopodium album | 1 = 1-5% |
| Teucrium canadense | 1 = 1-5% |
| Rosa woodsii | +=<1% |
| Symphyotrichum sp. | +=<1% |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 80% |

| 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% |
| Achillea millefolium | +=<1% |
| Vicia americana | + = < 1% |
| Grindelia squarrosa | + = < 1% |
| Symphoricarpos albus | + = < 1% |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 80% |

| Transect Interval Length: 325 feet (station 11-336) | | | | |
|--|------------|--|--|--|
| 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% | | | |
| Suaeda calceoliformis | 1 = 1-5% | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Total Vegetative Cover: | 80% | | | |

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

| Cover Estima | ite | Indicator Class | Source |
|--------------|------------|------------------------|---------------|
| + = < 1% | 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.

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: |
|------------|-------------------|
|------------|-------------------|

| \boxtimes | One photograph fo | or each of the four | cardinal directions | surrounding the wetland. |
|-------------|-------------------|---------------------|---------------------|--------------------------|
| | | | | |

At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.

At least one photograph showing the buffer surrounding the wetland.

One photograph from each end of the vegetation transect, showing the transect.

| 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 / Problems: | |
|----------------------|--|
| | |

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: |
|---|
| |
| Comments / Problems: |
| WETLAND DELINEATION (attach COE delineation forms) |
| At each site conduct these checklist items: Delineate wetlands according to the 1987 Army COE manual and regional supplement. Delineate wetland – upland boundary onto aerial photograph. |
| 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? <u>No</u> 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? $\underline{\mathbf{No}}$ If yes, are the structures working properly and in good working order? $\underline{\mathbf{NA}}$ If no, describe the problems below. |
| Comments / Problems: |

WILDLIFE

| Were man-made nesting structures installed? No |
|---|
| If yes, type of structure: How many? |
| Are the nesting structures being used? <u>NA</u> |
| Do the nesting structures need repairs? |
| |
| |

Mammals and Herptiles

Birds

| Mammal and Hamtile Species | Number | ımber Indirect Indication of Use | | | on of Use |
|-----------------------------|----------|----------------------------------|-------------|---------|-----------|
| Mammal and Herptile Species | Observed | Tracks | Scat | Burrows | Other |
| Rabbit sp. | | | \boxtimes | | |
| Deer sp. | | | | | |
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Additional Activities Checklist:

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

Comments / Problems: <u>Site contained no standing water during 2016 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>6/29/16</u> |
|-----------------|----------------------|
| Survey Time: | to |

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|----------------------|----|----------|---------|--------------|---|----------|---------|
| Western Meadowlark | 18 | LFFO | UP | | | | |
| Mourning Dove | 6 | LFFO | UP MA | | | | |
| Pheasant | 1 | L | UP | | | | |
| Franklin Gull | 2 | FO | UP | | | | |
| Brewer's Blackbird | 7 | FO | UP | | | | |
| Yellow-headed | 10 | FO L | UP MA | | | | |
| Blackbird | | | | | | | |
| Sparrow sp. | 2 | L | UP | | | | |
| Red-winged Blackbird | 7 | L | MA MF | | | | |
| Mallard | 2 | | MA | | | | |
| Killdeer | 9 | LFFO | MF UP | | | | |
| Tree Swallow | 2 | FO | MA | | | | |
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BEHAVIOR CODES

BP = One of a breeding pairBD = Breeding displayF = Foraging

FO = Flyover **L** = Loafing

N = Nesting

Weather: _____

HABITAT CODES

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

MF = Mud Flat OW = Open Water

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

WETLAND DETERMINATION DATA FORM - Great Plains Region

| roject/Site: Big Muddy | | | ity/County: | Roosevelt | | Saiii | pling Date: _ | 29-Jun-16 |
|-------------------------------------|----------------------------|--|---|--|---|---|--|---------------------------------------|
| pplicant/Owner: MDT | | | | State: | _MTS | ampling Point | : D | P-1U |
| vestigator(s): M. and T. Traxler | | | Section, To | wnship, Ra | nge: S 21 | T _28N | R 55E | |
| andform (hillslope, terrace, etc.): | Shoulder slope | | Local relief (| concave, c | convex, none): fla | t | Slope: 1 | 0.0%5 |
| - bregion (LRR): LRR F | · | Lat.: 48, | 163729 | | Long.: -104.617 | 7384 | - | n: WGS84 |
| Map Unit Name: Lohler silty clay | | | | | | classification: | | |
| climatic/hydrologic conditions on | | time of year | yes v | ● No C | | ain in Remarks | | |
| | | • | | | (2) 0 | | | No O |
| re Vegetation, Soil | , or Hydrology | significantly (| | | ormal Circumstan | - | | 140 🗢 |
| re Vegetation, Soil | , or Hydrology 🔃 | naturally pro | blematic? | (If nee | eded, explain any | answers in Re | marks.) | |
| ımmary of Findings - At | tach site map sh | nowing sa | mpling p | oint loc | ations, trans | ects, impo | ortant fea | atures, e |
| drophytic Vegetation Present? | Yes ○ No • | | Is the | Sampled A | rea | | | |
| Hydric Soil Present? | Yes 🔾 No 💿 | | | • | _{l?} Yes O No 🤄 | | | |
| etland Hydrology Present? | Yes O No 💿 | | within | a Wetland | is tes ○ No ⊲ | 2 | | |
| temarks: | | | | | | | | |
| ata point in upland, vegetation co | mmunity 14. | | | | | | | |
| | | | | | | | | |
| EGETATION - Use scient | tific names of pl | anto | Dominant | FWS Res | gion: GP | | | |
| EGETATION - USE SCIEN | unc names or pr | | _Species? _ | | J | | | |
| Tree Stratum (Plot size: 30 Foot | t Radius) | Absolute % Cover | | Indicator Status | Dominance Test | | | |
| 1. | | - | | | Number of Domin That are OBL, FAC | | 0 | (A) |
| <u>)</u> . | | | | | | , 6. 17.6. | | |
| 3. | | 0 | | | Total Number of E Species Across All | | 2 | (B) |
| 1. | | 0 | | | Species Across Air | Juata. | | (b) |
| | | 0 | = Total Co | ver | Percent of domi | | 0.00 | / (A/D |
| apling/Shrub Stratum (Plot size: | 15 Foot Radius) | | | | That Are OBL, F | ACW, or FAC: | 0.09 | (A/B) |
| abilita/Silitab Stratum (* 1888) | , | | | | | | | |
| | | 0 | | | Prevalence Inde | x worksheet: | | |
| 1 2 | | 0 | | | Prevalence Inde | | Multiply by: | |
| 1 | | 0 | | | | over of: | | 0 |
| 1 | | 0 0 | | | Total % C | over of: | x 1 = | 0 4 |
| 1 | | 0 0 0 | | | Total % C OBL species | over of: 1 0 2 | x 1 = x 2 = | |
| 1 | | 0 0 | = Total Co | ver | Total % C OBL species FACW species | over of: 1 0 2 5 | x 1 = x 2 = x 3 = | 4 |
| 1 | Radius) | 0 0 0 0 | | | Total % C OBL species FACW species FAC species | over of: 1 0 2 5 25 | x 1 = x 2 = x 3 = x 4 =1 | 4 15 |
| 1 | Radius) | 0 0 0 0 0 0 | 13.5% | UPL | Total % C OBL species FACW species FAC species FACU species | over of: I 0 2 5 25 42 | x 1 = x 2 = x 3 = x 4 =1 x 5 =2 | 4 15 100 210 |
| 1 | Radius) | 0 0 0 0 0 0 | | | Total % C OBL species FACW species FAC species FACU species UPL species Column Totals | over of: I 0 2 5 25 42 | x 1 = x 2 = x 3 = x 4 =1 x 5 =2 (A)3 | 4 15 100 210 329 (B) |
| 1 | Radius) | 0 0 0 0 0 0 | 13.5% У 33.8% | UPL UPL | Total % C OBL species FACW species FACU species UPL species Column Totals Prevalence | over of: I 0 2 5 25 42 : 74 Index = B/A = | x 1 = x 2 = x 3 = x 4 =1 x 5 =2 (A)3 | 4 15 100 210 329 (B) |
| 1 | Radius) | 0 0 0 0 0 0 | 13.5% 33.8% 6.8% | UPL UPL UPL | Total % C OBL species FACW species FACU species FACU species UPL species Column Totals Prevalence Hydrophytic Veg | over of: I 0 2 5 25 42 : 74 Index = B/A = | x 1 = x 2 = x 3 = x 4 =1 x 5 =2 (A)3 4.44 tors: | 4 15 100 210 329 (B) |
| 1 | Radius) | 0 0 0 0 0 0 0 | 13.5% 33.8% 6.8% 2.7% 6.8% 1.4% | UPL UPL FACW | Total % C OBL species FACW species FACU species UPL species Column Totals Prevalence Hydrophytic Veg | over of: | x 1 = | 4 15 100 210 329 (B) |
| 1 | Radius) | 0 0 0 0 0 0 0 25 5 2 5 1 25 | 13.5% 33.8% 6.8% 2.7% 6.8% 1.4% 33.8% | UPL UPL FACW FAC UPL FACU | Total % C OBL species FACW species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te | over of: | x 1 = x 2 = x 3 = x 4 =1 x 5 =2 (A)3 4.44 tors: | 4 15 100 210 329 (B) |
| 1 | Radius) | 0 0 0 0 0 0 0 25 5 2 5 1 25 1 | 13.5% 33.8% 6.8% 2.7% 6.8% 1.4% 33.8% | UPL UPL FACW UPL | Total % C OBL species FACW species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominal 3 - Prevaler | over of: | x 1 = | 4 15 100 210 329 (B) |
| 1 | Radius) | 0 0 0 0 0 0 0 25 5 2 5 1 25 1 | 13.5% 33.8% 6.8% 2.7% 6.8% 1.4% 33.8% 1.4% 0.0% | UPL UPL FACW FAC UPL FACU | Total % C OBL species FACW species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominan 3 - Prevaler 4 - Morphol | over of: | x 1 = | 4 15 100 210 329 (B) 6 |
| 1 | Radius) | 0 0 0 0 0 0 0 0 25 5 2 5 1 25 1 0 0 | ☐ 13.5% ✓ 33.8% ☐ 6.8% ☐ 6.8% ☐ 1.4% ✓ 33.8% ☐ 1.4% ☐ 0.0% | UPL UPL FACW FAC UPL FACU UPL | Total % C OBL species FACW species FACU species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominan 3 - Prevaler 4 - Morphol data in Re | over of: 0 2 5 25 42 : 74 Index = B/A = petation Indica set for Hydroph nce Test is > 56 nce Index is ≤ 3 ogical Adaptat | x 1 = | 4 15 100 210 329 (B) 6 |
| 1 | Radius) | 0 0 0 0 0 0 0 25 5 2 5 1 25 1 | 13.5% 33.8% 6.8% 2.7% 6.8% 1.4% 33.8% 1.4% 0.0% | UPL UPL FACW FAC UPL FACU UPL | Total % C OBL species FACW species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 2 - Dominar 3 - Prevaler 4 - Morphol data in Re | over of: 0 2 5 25 42 : 74 Index = B/A = setation Indica est for Hydroph nce Test is > 5 ice Index is ≤3 ogical Adaptat marks or on a | x 1 = | 4 15 100 210 329 (B) 6 ion |
| 1 | Radius) 30 Foot Radius) | 0 0 0 0 0 0 0 25 5 2 5 1 25 1 0 0 | ☐ 13.5% ✓ 33.8% ☐ 6.8% ☐ 6.8% ☐ 1.4% ✓ 33.8% ☐ 1.4% ☐ 0.0% | UPL UPL FACW FAC UPL FACU UPL | Total % C OBL species FACW species FACU species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominan 3 - Prevaler 4 - Morphol data in Re | over of: 0 2 5 25 42 : 74 Index = B/A = setation Indica est for Hydroph nce Test is > 5 ice Index is ≤3 ogical Adaptat marks or on a | x 1 = | 4 15 100 210 329 (B) 6 ion |
| 1 | Radius) 30 Foot Radius) | 0 0 0 0 0 0 0 0 25 5 2 5 1 25 1 0 0 74 | ☐ 13.5% ✓ 33.8% ☐ 6.8% ☐ 6.8% ☐ 1.4% ✓ 33.8% ☐ 1.4% ☐ 0.0% | UPL UPL FACW FAC UPL FACU UPL | Total % C OBL species FACW species FACU species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominar 3 - Prevaler 4 - Morphol data in Re Problematic 1 Indicators of | over of: 0 2 5 25 42 : 74 Index = B/A = setation Indica est for Hydroph nce Test is > 5 ice Index is ≤3 ogical Adaptat marks or on a | x 1 = | 4 15 100 210 329 (B) 6 ion |
| 1 | Radius) 30 Foot Radius) | 0 0 0 0 0 0 0 0 10 25 5 2 5 1 25 1 0 0 0 | 13.5% 33.8% 6.8% 2.7% 6.8% 1.4% 33.8% 1.44% 0.0% Total Cov | UPL UPL FACW FAC UPL FACU UPL FACU UPL | Total % C OBL species FACW species FACU species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominar 3 - Prevaler 4 - Morphol data in Re Problematic 1 Indicators of be present. | over of: 0 2 5 25 42 : 74 Index = B/A = setation Indica est for Hydroph nce Test is > 5 ice Index is ≤3 ogical Adaptat marks or on a | x 1 = | 4 15 100 210 329 (B) 6 ion |
| 1 | Radius) 30 Foot Radius) | 0 0 0 0 0 0 0 0 25 5 2 5 1 25 1 0 0 74 | ☐ 13.5% ✓ 33.8% ☐ 6.8% ☐ 6.8% ☐ 1.4% ✓ 33.8% ☐ 1.4% ☐ 0.0% | UPL UPL FACW FAC UPL FACU UPL FACU UPL | Total % C OBL species FACW species FACU species FACU species UPL species Column Totals Prevalence Hydrophytic Veg 1 - Rapid Te 2 - Dominar 3 - Prevaler 4 - Morphol data in Re Problematic 1 Indicators of | over of: 0 2 5 25 42 : 74 Index = B/A = setation Indica est for Hydroph nce Test is > 5 nce Index is ≤3 ogical Adaptat marks or on a Hydrophytic V hydric soil and | x 1 = | 4 15 100 210 329 (B) 6 ion |

US Army Corps of Engineers

Soil Sampling Point: DP-1U

| Depth | ription: (Describ Mat | | чериі пее | | tne indic dox Featu | | me | absence of indicators.) |
|----------------------------------|--------------------------------------|------------|-------------|---------------------|------------------------|--------------------|------------------|--|
| (inches) | Color (mois | | % | Color (moist) | <u>%</u> | _Tvpe ¹ | Loc ² | Texture Remarks |
| 0-16 | 10YR 3 | ′1 ′ | 100 | | | | | Silty Clay Loam |
| | | | | | | | | |
| | | | - | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | - | | | - | | | | |
| 1Type: C=Cc | oncentration. D=De | nletion P | M-Paducac | Matrix CS-Cover | ed or Coat | ad Sand Gra | ins 21 ocs | ation: PL=Pore Lining. M=Matrix |
| | Indicators: (App | | | | | | iiiis Loca | Indicators for Problematic Hydric Soils ³ : |
| Histosol | | il Cable t | O all LKKS | Sandy Gleyed | - | , | | 1 cm Muck (A9) (LRR I, J) |
| | ipedon (A2) | | | Sandy Redox | | | | Coastal Prairie Redox (A16) (LRR F, G, H) |
| Black His | | | | Stripped Matri | | | | Dark Surface (S7) (LRR G) |
| | n Sulfide (A4) | | | Loamy Mucky | Mineral (F | 1) | | High Plains Depressions (F16) |
| | Layers (A5) (LRR I | | | Loamy Gleyed | | 2) | | (LRR H outside of MLRA 72 and 73) |
| | ck (A9) (LRR F,G,H | | | Depleted Matr | ` ' | | | Reduced Vertic (F18) |
| | Below Dark Surfac | e (A11) | | Redox Dark S | ` ' | | | Red Parent Material (TF2) |
| | rk Surface (A12) uck Mineral (S1) | | | Depleted Dark | | -7) | | |
| | lucky Peat or Peat | (S2) (LBB | G H) | High Plains De | , , | (F16) | | Other (Explain in Remarks) |
| | cky Peat or Peat (S | | | | and 73 o | | | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematics. |
| | _ayer (if present) | | | V | | | | Tryandings mast be present, amoss distarbed of problems |
| Type: | Layer (II present) | • | | | | | | |
| Depth (inc | chos): | | | | | | | Hydric Soil Present? Yes No • |
| Remarks: | | | | | | | | |
| | 91 to all a ska on a la sa | | | | | | | |
| NO NYONE SOI | il indicators obse | rvea aur | ing neia si | irvey. | | | | |
| | | | | | | | | |
| Hydrolog | У | | | | | | | |
| Wetland Hv | drology Indicator | rs: | | | | | | Secondary Indicators (minimum of two require |
| - | licators (minimur | | required: | check all that an | nlv) | | | Surface Soil Cracks (B6) |
| | Water (A1) | | .oquou | Salt Crust (E | | | | Sparsely Vegetated Concave Surface (B8) |
| | iter Table (A2) | | | Aquatic Inve | • | (B13) | | Drainage Patterns (B10) |
| Saturation | ` , | | | Hydrogen S | | | | Oxidized Rhizospheres on Living Roots (C3) |
| | arks (B1) | | | Dry Season | | | | (where tilled) |
| | it Deposits (B2) | | | Oxidized Rh | | | oots (C3) | Crayfish Burrows (C8) |
| | oosits (B3) | | | | not tilled) | | | Saturation Visible on Aerial Imagery (C9) |
| Algal Ma | t or Crust (B4) | | | Presence of | - | | | Geomorphic Position (D2) |
| | oosits (B5) | | | Thin Muck S | | | | FAC-neutral Test (D5) |
| Inundati | on Visible on Aeria | Imagery | (B7) | Other (Expla | • | • | | Frost Heave Hummocks (D7) (LRR F) |
| | tained Leaves (B9) | 3 3 | ` , | | | , | | _ |
| Field Observ | | | | | | | | |
| Surface Water | | Yes 🔾 | No 💿 | Depth (inc | :hes): | | | |
| | | Yes O | No ● | • | | | - | |
| Water Table F | | | | Depth (inc | ches): | | Wetla | and Hydrology Present? Yes O No 💿 |
| Saturation Pre (includes capi | | Yes 🔾 | No 💿 | Depth (inc | ches): | | _ | |
| | corded Data (str | eam gau | ge, monito | or well, aerial pho | otos, prev | ious inspe | ctions), if | available: |
| | | | | | | | | |
| Remarks: | | | | | | | | |
| No evidence | of hydrologic inc | dicators | observed o | during field surve | Y. | | | |
| | <i>y</i> | | | J | , | | | |
| | | | | | | | | |

US Army Corps of Engineers Great Plains - Version 2.0

WETLAND DETERMINATION DATA FORM - Great Plains Region

| | | | City/County: R | posevelt | Samp | oling Date: 29-Jun-16 |
|--|-----------------------------|---|--|--|--|--|
| pplicant/Owner: MDT | | | | State: MT | Sampling Point: | DP-1W |
| vestigator(s): M. and T. Traxler | | | Section, Town | ship, Range: S 21 | T 28N | R _55E |
| andform (hillslope, terrace, etc.): | Lowland | | Local relief (co | oncave, convex, none | e): flat | Slope: 0.0%0 |
| - bregion (LRR): LRR F | | Lat.: 48 | .163785 | Long.: -1(|)4.61745 | Datum: WGS84 |
| Map Unit Name: Lohler silty clay | | | | | NWI classification: | |
| climatic/hydrologic conditions on | | sic time of year | 2 Vas (| No (If no | , explain in Remarks | |
| . , | ·· _ | • | • | (=: | • | Yes ● No ○ |
| re Vegetation, Soil | , or Hydrology | significantly | | | nstances" present? | |
| re Vegetation, Soil | , or Hydrology | naturally pro | blematic? | (If needed, explain | any answers in Rer | marks.) |
| ımmary of Findings - At | ttach site map s | showing sa | mpling poi | nt locations, t | ransects, impo | ortant features, e |
| ydrophytic Vegetation Present? | Yes No | | | | | |
| Hydric Soil Present? | Yes No | | | impled Area | | |
| • | Yes No | | within a | Wetland? Yes | No O | |
| etland Hydrology Present? | res 🙂 NO 🔾 | | | | | |
| Remarks: vata point in excavated basin sout | h of highway on sout | heastern edge (| of wetland cell | | | |
| | ogaj, o ood. | ouoto ougo | or trottand com | | | |
| | | | | | | |
| EGETATION - Use scien | tific names of _l | plants | Dominant F —Species? — | WS Region: GP | | |
| /51 · · · · · · · · · · · · · · · · · · · | | | Rel.Strat. I | ndicator Dominance | e Test worksheet: | |
| Tree Stratum (Plot size: 30 Foo | | _% Cover | Cover S | | Dominant Species | |
| 1 | | | H | That are OB | L, FACW, or FAC: | (A) |
| <u>2</u> 3. | | 0 | H | | er of Dominant | |
| · Ł. | | | H | Species Acro | oss All Strata: | (B) |
| | | | = Total Cove | Percent of | dominant Species | |
| apling/Shrub Stratum (Plot size: | 15 Foot Radius) | | - Total Cove | | BL, FACW, or FAC: | 100.0% (A/B) |
| 1 | | 0 | | Prevalence | Index worksheet: | |
| | | | | | | |
| <u>2</u> | | 0 | | Tota | % Cover of: | Aultiply by: |
| | | | | | | Multiply by: |
| 3 4 | | | | | es <u>50</u> > | _ |
| 3 4 | | | | OBL speci FACW speci FAC speci | es <u>50</u> > | x 1 = <u>50</u> |
| 3 | | 0 | = Total Cove | OBL speci FACW speci FAC speci | es <u>50</u> > si es <u>35</u> > es <u>2</u> > | x 1 = 50 x 2 = 70 |
| 345(Plot size: _5 Foot I | | 0 0 0 | _ | OBL speci FACW speci FAC speci FACU speci UPL speci | es <u>50</u> > siles <u>35</u> > ses <u>2</u> > siles <u>0</u> > siles <u>0</u> > siles <u>0</u> > siles <u>1</u> = siles 1 | x 1 = 50 x 2 = 70 x 3 = 6 |
| 3 | | 0 0 0 | ✓ 40.2% F | FACW Speci FAC Speci FACU Speci FACU Speci UPL Speci | es 50 2 2 3 es 0 2 2 3 es 0 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | $\mathbf{x} \ 1 = \underline{50}$ $\mathbf{x} \ 2 = \underline{70}$ $\mathbf{x} \ 3 = \underline{6}$ $\mathbf{x} \ 4 = \underline{0}$ $\mathbf{x} \ 5 = \underline{0}$ |
| 3 | Radius) | 0 0 0 0 0 | ✓ 40.2% F | FACW speci FACW speci FACU speci FACW speci FACW Column To | es 50 35 si es 2 35 si es 0 36 si es 0 36 si es 87 6 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| 3 | Radius) | 0 0 0 0 0 35 2 50 | ✓ 40.2% F 2.3% F ✓ 57.5% (| FACW speci FAC speci FACU speci FACU speci UPL speci Column To | es | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| 4. Herb Stratum (Plot size: 5 Foot l 1. Hordeum jubatum 2. Iva axillaris 3. Puccinellia nuttalliana 4. | Radius) | 0 0 0 0 0 | ✓ 40.2% F | FACW speci FAC speci FACU speci FACU speci UPL speci Column To | es 50 35 si es 2 35 si es 0 36 si es 0 36 si es 87 6 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| 3 | Radius) | 0 0 0 0 0 | ✓ 40.2% F 2.3% F ✓ 57.5% C 0.0% | FACW speci FACU speci FACU speci FACU speci Column To Preval | es | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| 3 | Radius) | 0 0 0 0 0 35 2 50 0 | ✓ 40.2% F 2.3% F 57.5% G 0.0% 0.0% | FACW speci FAC speci FACU speci FACU speci UPL speci Col umn To Preval Hydrophyti | es 50 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | x 1 =50 x 2 =70 x 3 =6 x 4 =0 x 5 =0 (A)126 (B) 1.448 tors: sytic Vegetation |
| 3 | Radius) | 0 0 0 0 35 2 50 0 0 0 | ✓ 40.2% F | FACW speci FACW speci FACU speci FACU speci Column To Preval Hydrophyti | es 50 35 ses 2 35 ses | x 1 =50 x 2 =70 x 3 =6 x 4 =0 x 5 =0 (A)126 1.448 tors: vytic Vegetation |
| 3. 4. 5. Herb Stratum (Plot size: 5 Foot II. Hordeum jubatum 2. Iva axillaris 3. Puccinellia nuttalliana 4. 5. 6. 7. 8. 9. | Radius) | 0 0 0 0 35 2 50 0 0 0 | ✓ 40.2% F | FACW speci FACW speci FACU speci FACU speci UPL speci Col umn To Preval Hydrophyti | es | x 1 =50 x 2 =70 x 3 =6 x 4 =0 x 5 =0 (A)126(B) 1.448 |
| 3 | Radius) | 35 2 50 0 0 0 | ✓ 40.2% F | FACW speci FACW speci FACU speci FACU speci Column To Preval Hydrophyti V 1 - Rai V 2 - Doi V 3 - Preduction | es 50 35 ces 2 35 ces 2 35 ces 50 56 ces 50 56 ces 50 56 ces 50 66 | x 1 =50 x 2 =70 x 3 =6 x 4 =0 x 5 =0 (A)126(B) 1.448 |
| 3 | Radius) | 0 0 0 0 35 2 50 0 0 0 | ✓ 40.2% F | FACW speci FACW speci FACU speci UPL speci Col umn To Preval Hydrophyti | es 50 2 es 2 2 es es 0 35 es 9 4 es 9 4 es 9 50 es 9 6 es 9 7 ence Index = B/A = 6 c Vegetation Indicator cold Test for Hydroph minance Test is > 50 evalence Index is < 3 rphological Adaptati in Remarks or on a matic Hydrophytic V | x 1 =50 |
| 3. 4. 5. | Radius) 30 Foot Radius) | 0 0 0 0 35 2 50 0 0 0 0 0 0 | ✓ 40.2% F | FACW speci FACW speci FACU speci UPL speci Col umn To Preval Hydrophyti | es 50 2 es 2 35 es 2 36 es 90 | x 1 =50 x 2 =70 x 3 =6 x 4 =0 x 5 =0 (A)126(B) 1.448 |
| 3 | Radius) 30 Foot Radius) | 0 0 0 0 0 0 35 2 50 0 0 0 0 0 0 0 | ✓ 40.2% F | OBL speci FACW speci FACU speci FACU speci Col umn To DBL Preval Hydrophyti V 1 - Rai V 2 - Doi V 3 - Pre 1 - A Mo data r Proble | es 50 2 es 2 35 es 2 36 es 90 | x 1 =50 |
| 3. 4. 5. | Radius) 30 Foot Radius) | 0 0 0 0 0 0 35 2 50 0 0 0 0 0 0 0 0 | ✓ 40.2% F 2.3% F 57.5% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Total Cove | OBL speci FACW speci FACU speci FACU speci UPL speci Col umn To Preval Hydrophyti 1 - Rai 2 - Doo 3 - Pre 4 - Mo data r Proble 1 Indicato be present | es 50 2 es 2 35 es 2 36 es 0 37 es 47 es 87 ence Index = B/A = 66 c Vegetation Indicator of Test for Hydroph minance Test is > 50 evalence Index is ≤ 3 rphological Adaptation Remarks or on a matic Hydrophytic Vers of hydric soil and to | x 1 =50 |
| 3. 4. 5. | Radius) 30 Foot Radius) | 0 0 0 0 0 0 35 2 50 0 0 0 0 0 0 0 | ✓ 40.2% F | OBL speci FACW speci FACU speci FACU speci UPL speci Col umn To Preval Hydrophyti 1 - Rai 2 - Doo 3 - Pre 4 - Mo data r Proble 1 Indicato be present | es 50 2 es 2 35 es 2 36 es 0 37 es 0 37 es 0 37 ence Index = B/A = 37 color Test for Hydroph minance Test is > 50 evalence Index is ≤ 3 rphological Adaptati in Remarks or on a matic Hydrophytic V ers of hydric soil and t. | x 1 =50 |

US Army Corps of Engineers

Soil Sampling Point: DP-1W

| Depth | | | | | | iii iii tiie | absence of indicato | 13.) |
|---|--|--------------------------------|--|---|---|--------------|--|--|
| (inches) | Matrix Color (moist) | % | Red Color (moist) | lox Featur <u>%</u> | res _Tvpe 1 | Loc2 | Texture | Remarks |
| 0-8 | 10YR 3/1 | 95 | 5YR 4/6 | 5 | C | M | Silty Clay | Kemane |
| 8-16 | 2.5Y 4/3 | 70 | | 30 | | | Silty Clay | Redox color: (Gley 1) 3/N |
| | 2.01 | | | | | | only oldy | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | - | |
| 1Tuno: C. Co | nacetration D. Donlati | ion DM Doduc | and Matrix CC Cayor | ad or Coato | d Cond Croi | 21 000 | otion. DL Doro Lining | NA Moteix |
| | oncentration. D=Depleti Indicators: (Applica | | | | a Sana Gran | IS -LUC | ation: PL=Pore Lining. | roblematic Hydric Soils ³ : |
| Histosol | | ible to all LKI | Sandy Gleyed | _ | | | | 49) (LRR I, J) |
| | ipedon (A2) | | Sandy Redox (| | | | | ie Redox (A16) (LRR F, G, H) |
| Black His | | | Stripped Matri | | | | | (S7) (LRR G) |
| Hydroger | n Sulfide (A4) | | Loamy Mucky | Mineral (F1 |) | | High Plains D | Depressions (F16) |
| | Layers (A5) (LRR F) | | Loamy Gleyed | |) | | (LRR H o | utside of MLRA 72 and 73) |
| | ck (A9) (LRR F,G,H) | 11\ | Depleted Matr | | | | Reduced Ver | tic (F18) |
| | Below Dark Surface (A rk Surface (A12) | 11) | Redox Dark Su Depleted Dark | ` , | 7) | | Red Parent N | , , |
| | uck Mineral (S1) | | Redox depress | | /) | | | Dark Surface (TF12) |
| | Mucky Peat or Peat (S2) | (LRR G. H) | High Plains De | ` , | 'F16) | | | in in Remarks) |
| | cky Peat or Peat (S3) (L | | _ 3 | and 73 of | . , | | | rophytic vegetation and wetland e present, unless disturbed or problematic. |
| Restrictive I | Layer (if present): | · | | | | | 1 | · · · · · · · · · · · · · · · · · · · |
| Type: | ayer (ii present). | | | | | | | |
| Depth (inc | ches). | | | | | | Hydric Soil Prese | nt? Yes 💿 No 🔾 |
| Remarks: | | | | | | | <u> </u> | |
| Soil moist to | surface | | | | | | | |
| John Moist to | Juliuce. | | | | | | | |
| l | | | | | | | | |
| | | | | | | | | |
| Hydrolog | ıy | | | | | | | |
| | l y drology Indicators: | | | | | | Secondary II | ndicators (minimum of two required) |
| Wetland Hyd | - | one required | t; check all that app | oly) | | | | ndicators (minimum of two required) |
| Wetland Hyd | drology Indicators: | one required | l; check all that app ✓ Salt Crust (B | | | | Surface | |
| Primary Ind Surface | drology Indicators: licators (minimum of | one required | | 311) | B13) | | Surface Sparsel | Soil Cracks (B6) |
| Primary Ind Surface | drology Indicators: licators (minimum of Water (A1) ater Table (A2) | one required | ✓ Salt Crust (B | 311) ertebrates (l | • | | Surface Sparsel Drainag | Soil Cracks (B6) y Vegetated Concave Surface (B8) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatio | drology Indicators: licators (minimum of Water (A1) ater Table (A2) | one required | Salt Crust (B | 311) ertebrates (l ulfide Odor | (C1) | | Surface Sparsel Draina Oxidize | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) |
| Wetland Hyd Primary Ind Surface V High Wa Saturatic Water M | drology Indicators: licators (minimum of Water (A1) on (A3) | one required | Salt Crust (B Aquatic Inve | 311) ertebrates (l ulfide Odor Water Table | (C1) e (C2) | ots (C3) | Surface Sparsel Drainag Oxidize | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) dd Rhizospheres on Living Roots (C3) |
| Wetland Hyd Primary Ind Surface V High Wa Saturatio Water M. Sedimen | drology Indicators: licators (minimum of Water (A1) ster Table (A2) on (A3) larks (B1) | one required | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi | 311) ertebrates (l ulfide Odor Water Table | (C1) e (C2) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) d Rhizospheres on Living Roots (C3) where tilled) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatic Water M Sedimen Drift dep | drology Indicators: licators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) | one required | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi | ertebrates (l ertebrates (l ulfide Odor Water Table izospheres not tilled) | (C1) e (C2) on Living Ro | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) d Rhizospheres on Living Roots (C3) where tilled) n Burrows (C8) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatic Water M Sedimen Drift dep Algal Ma | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) posits (B3) | one required | Salt Crust (B Aquatic Inve Hydrogen St Dry Season Oxidized Rhi (where | ertebrates (l ulfide Odor Water Table izospheres not tilled) Reduced In | (C1) e (C2) on Living Ro on (C4) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rphic Position (D2) utral Test (D5) |
| Wetland Hyd Primary Ind Surface V High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) | | Salt Crust (B Aquatic Inve Hydrogen St Dry Season Oxidized Rhi (where | ertebrates (I ulfide Odor Water Table izospheres not tilled) Reduced In urface (C7) | (C1) e (C2) on Living Ro on (C4) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) od Rhizospheres on Living Roots (C3) where tilled) n Burrows (C8) ion Visible on Aerial Imagery (C9) rphic Position (D2) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Inundatio | drology Indicators: licators (minimum of Water (A1) hter Table (A2) on (A3) larks (B1) ht Deposits (B2) hosits (B3) ht or Crust (B4) hosits (B5) | | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season V Oxidized Rhi (where Presence of Thin Muck S | ertebrates (I ulfide Odor Water Table izospheres not tilled) Reduced In urface (C7) | (C1) e (C2) on Living Ro on (C4) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rphic Position (D2) utral Test (D5) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Inundatio | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) ion Visible on Aerial Imatained Leaves (B9) | agery (B7) | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (I ulfide Odor Water Table izospheres not tilled) Reduced In urface (C7) | (C1) e (C2) on Living Ro on (C4) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rphic Position (D2) utral Test (D5) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatic Water M Sedimen Drift dep Algal Ma Iron Dep Inundatic Water-St | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) larks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) ion Visible on Aerial Imatained Leaves (B9) vations: | agery (B7) | Salt Crust (B Aquatic Inve Hydrogen St Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Irr urface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rphic Position (D2) utral Test (D5) |
| Primary Ind Surface N High Wa Saturatic Water M Sedimen Drift dep Algal Ma Iron Dep Inundati Water-St | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) posits (B3) at or Crust (B4) posits (B5) don Visible on Aerial Imatained Leaves (B9) vations: r Present? Yes | agery (B7) | Salt Crust (B Aquatic Inve Hydrogen St Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) sin in Rema | (C1) e (C2) on Living Ro on (C4) | ots (C3) | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rephic Position (D2) utral Test (D5) leave Hummocks (D7) (LRR F) |
| Wetland Hyo Primary Ind Surface N High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Inundatio Water-St Field Observ Surface Water Saturation Press | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) don Visible on Aerial Imatained Leaves (B9) vations: r Present? Yes esent? Yes | agery (B7) No • No • | Salt Crust (B Aquatic Inve Hydrogen St Dry Season \ Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) | | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) dd Rhizospheres on Living Roots (C3) where tilled) n Burrows (C8) ion Visible on Aerial Imagery (C9) rphic Position (D2) utral Test (D5) eave Hummocks (D7) (LRR F) |
| Wetland Hyderimary Ind Surface N High Wa Saturatio Water M. Sedimen Drift dep Algal Ma Iron Dep Inundatio Water-St Field Observ Surface Water Water Table F Saturation Precincludes capi | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) ion Visible on Aerial Imatained Leaves (B9) vations: r Present? Yes esent? Yes ellary fringe) | egery (B7) No • No • No • | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) rks) | Wetla | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo FAC-ne Frost H | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rephic Position (D2) utral Test (D5) leave Hummocks (D7) (LRR F) |
| Wetland Hyde Primary Ind Surface N High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Inundatio Water-St Field Observ Surface Water Water Table F Saturation Pre (includes capi | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) don Visible on Aerial Imatained Leaves (B9) vations: r Present? Yes esent? Yes | egery (B7) No • No • No • | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) rks) | Wetla | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo FAC-ne Frost H | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rephic Position (D2) utral Test (D5) leave Hummocks (D7) (LRR F) |
| Wetland Hyd Primary Ind Surface N High Wa Saturatio Water M Sedimen Drift dep Algal Ma Iron Dep Inundati Water-St Field Observ Surface Water Water Table F Saturation Pre (includes capi Describe Rec | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) ion Visible on Aerial Imatained Leaves (B9) vations: r Present? Yes esent? Yes ellary fringe) | egery (B7) No • No • No • | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) rks) | Wetla | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo FAC-ne Frost H | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rephic Position (D2) utral Test (D5) leave Hummocks (D7) (LRR F) |
| Wetland Hyo Primary Ind Surface N High Wa Saturatio Water M. Sedimen Drift dep Algal Ma Iron Dep Inundati Water-St Field Observ Surface Water Water Table F Saturation Pre (includes capi Describe Re | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) don Visible on Aerial Imatined Leaves (B9) vations: r Present? Yes esent? Yes esent? yes ecorded Data (stream | No O No O No O No O gauge, mon | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season \ Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) rks) | Wetla | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo FAC-ne Frost H | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rephic Position (D2) utral Test (D5) leave Hummocks (D7) (LRR F) |
| Wetland Hyc Primary Ind Surface V High Wa Saturatio Water M. Sedimen Drift dep Algal Ma Iron Dep Inundati Water-St Field Observ Surface Water Water Table F Saturation Precincludes capi Describe Rec | drology Indicators: dicators (minimum of Water (A1) ater Table (A2) on (A3) darks (B1) at Deposits (B2) oosits (B3) at or Crust (B4) oosits (B5) ion Visible on Aerial Imatained Leaves (B9) vations: r Present? Yes esent? Yes ellary fringe) | No O No O No O No O gauge, mon | Salt Crust (B Aquatic Inve Hydrogen Su Dry Season \ Oxidized Rhi (where Presence of Thin Muck S Other (Expla | ertebrates (luffide Odor Water Table izospheres not tilled) Reduced Inurface (C7) nin in Rema | (C1) e (C2) on Living Ro on (C4) rks) | Wetla | Surface Sparsel Drainag Oxidize (w Crayfisl Saturat Geomo FAC-ne Frost H | e Soil Cracks (B6) y Vegetated Concave Surface (B8) ge Patterns (B10) de Rhizospheres on Living Roots (C3) where tilled) in Burrows (C8) ion Visible on Aerial Imagery (C9) rephic Position (D2) utral Test (D5) leave Hummocks (D7) (LRR F) |

US Army Corps of Engineers Great Plains - Version 2.0

WETLAND DETERMINATION DATA FORM - Great Plains Region

| Project/Site: Big Muddy | | | City/County: | Roosevelt | Sampling Date: 29-Jun-16 |
|---|---------------------|---------------------|---------------------|-------------|---|
| Applicant/Owner: MDT | | | | State: | : MT Sampling Point: DP-2U |
| investigator(s): M. and T. Traxler | | | Section, To | wnship, Ra | ange: S 21 |
| Landform (hillslope, terrace, etc.): Lo | owland | | Local relief | (concave, c | convex, none): flat Slope: 0.0% 0.0 |
| Subregion (LRR): LRR F | | Lat.: 48 | | | Long.: -104.618452 |
| - | | 40 | . 100432 | | |
| oil Map Unit Name: Lohler silty clay | | | | (a) N: (| NWI classification: Not Mapped |
| e climatic/hydrologic conditions on t | | is time of year | ? Ye | s • No C | (2.1.1.) |
| Are Vegetation, Soil | , or Hydrology | significantly | disturbed? | Are "N | lormal Circumstances" present? Yes No |
| Are Vegetation, Soil | , or Hydrology | naturally pro | blematic? | (If nee | eded, explain any answers in Remarks.) |
| Summary of Findings - Att | ach site map s | howing sa | mpling p | oint loc | ations, transects, important features, etc. |
| Hydrophytic Vegetation Present? | Yes ○ No ● | | | | |
| Hydric Soil Present? | Yes ○ No ● | | | Sampled A | |
| Wetland Hydrology Present? | Yes ○ No ● | | withi | n a Wetland | _{d?} Yes ○ No ● |
| Remarks: | | | | | |
| Data point located in upland area be | tween wetland depre | essions. | | | |
| | | | | | |
| | | | | | |
| VEGETATION - Use scient i | ific names of p | lants | Dominant | FWS Re | gion: GP |
| | | Absolute | Species? Rel.Strat. | Indicator | Dominance Test worksheet: |
| Tree Stratum (Plot size: 30 Foot F | Radius) | % Cover | Cover | Status | Number of Dominant Species |
| 1 | | | <u> </u> | | That are OBL, FACW, or FAC: (A) |
| 2. 3. | | | H | | Total Number of Dominant |
| 4. | | | <u> </u> | | Species Across All Strata: (B) |
| T | | 0 | | | Percent of dominant Species |
| Sapling/Shrub Stratum_ (Plot size: _1 | L5 Foot Radius) | 0 | = Total Co | over | That Are OBL, FACW, or FAC: 50.0% (A/B) |
| 1. | | 0 | | | Presidence Today workshoots |
| 2 | | | | | Prevalence Index worksheet: Total % Cover of: Multiply by: |
| 3 | | | | | Total % Cover of: Multiply by: OBL species 0 x 1 = 0 |
| 4. | | | | | FACW species $30 \times 2 = 60$ |
| 5 | | 0 | | | FAC species x 3 = |
| | | 0 | = Total Co | ver | FACU species x 4 = 60 |
| Herb Stratum (Plot size: 5 Foot Ra | idius) | | | | UPL species $\frac{15}{15}$ x 5 = $\frac{75}{15}$ |
| | | 5 | 8.3% | UPL | · |
| | | 30 | 50.0% | FACW | Column Totals:60 (A)195 (B) |
| 3. Grindelia squarrosa | | | 16.7% | UPL | Prevalence Index = B/A = 3.25 |
| 4. Pascopyrum smithii 5. | | | 25.0% | FACU | Hydrophytic Vegetation Indicators: |
| 6. | | | 0.0% | | 1 - Rapid Test for Hydrophytic Vegetation |
| 7. | | | 0.0% | | 2 - Dominance Test is > 50% |
| 8. | | | 0.0% | | 3 - Prevalence Index is ≤3.0 ¹ |
| 9. | | 0 | 0.0% | | 4 - Morphological Adaptations (Provide supporting |
| 10. | | | 0.0%_ | | data in Remarks or on a separate sheet) |
| | | 60 | = Total Co | ver | Problematic Hydrophytic Vegetation ¹ (Explain) |
| | O Foot Radius) | | | | ¹ Indicators of hydric soil and wetland hydrology must |
| Woody Vine Stratum (Plot size: 3 | | 0 | | | be present. |
| Woody Vine Stratum (Plot size: 3 | | 0 | | | |
| | | | | | |
| 1 | | | = Total Co | over | Hydrophytic |
| 1 2 | | 0 | = Total Co | over | Hydrophytic Vegetation Present? Yes No No |

US Army Corps of Engineers

Soil Sampling Point: DP-2U

| Profile Description: (Depth | Matrix | | | dox Featu | | | _ | • | | |
|--|---|---|---|--|--|------------------------|----------------|--|---|--|
| | or (moist) | % | Color (moist) | % | Type 1 | Loc2 | Text | ure | Re | marks |
| 0-16 10YR | 4/2 | 100 | | | | | Silty Clay | | Soil was moi surface, red | ist to cent heavv rai: |
| | | | | | | | | | J u , 1000, 10 | 30.1.2 1.104 1 7 1 41.1 |
| | | | - H | | | | - | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | _ | | |
| 1Type: C=Concentration | n. D=Depletic | n. RM=Reduce | ed Matrix, CS=Cover | ed or Coat | ed Sand Gra | ains ² Loca | ation: PL=Pore | E Lining. M=Ma | ıtrix | |
| Hydric Soil Indicator | rs: (Applicat | ole to all LRR | s, unless otherwi | se noted. |) | | Indicato | rs for Proble | matic Hydric S | Soils ³ : |
| Histosol (A1) | | | Sandy Gleyed | | | | | n Muck (A9) (LF | - | |
| Histic Epipedon (A | 2) | | Sandy Redox | | | | = | | ox (A16) (LRR F | F. G. H) |
| Black Histic (A3) | , | | Stripped Matri | ix (S6) | | | | Surface (S7) (| | , -, ., |
| Hydrogen Sulfide (| | | Loamy Mucky | Mineral (F | 1) | | High | Plains Depress | sions (F16) | |
| Stratified Layers (A | 5) (LRR F) | | Loamy Gleyed | Matrix (F2 | 2) | | (1 | RR H outside | of MLRA 72 a | nd 73) |
| 1 cm Muck (A9) (LI | RR F,G,H) | | ☐ Depleted Mati | rix (F3) | | | | uced Vertic (F1 | | · |
| Depleted Below Da | rk Surface (A1 | 1) | Redox Dark S | urface (F6) | | | | Parent Materia | | |
| Thick Dark Surface | (A12) | | Depleted Dark | c Surface (| F7) | | | Shallow Dark | | |
| Sandy Muck Minera | ıl (S1) | | Redox depres | sions (F8) | | | | er (Explain in R | | |
| 2.5 cm Mucky Peat | or Peat (S2) (| LRR G, H) | High Plains D | epressions | (F16) | | | | ic vegetation ar | nd wetland |
| 5 cm Mucky Peat o | r Peat (S3) (LF | RR F) | (MLRA 72 | and 73 o | f LRR H) | | | | | rbed or problemation |
| Restrictive Layer (if | present): | | | | | | | | | |
| | | | | | | | | | | |
| Type: | | | | | | | | | | |
| Type: | | | | | | | Hydric Soi | l Present? | Yes O | No 💿 |
| Depth (inches): | | | | | | | Hydric Soi | l Present? | Yes O | No 💿 |
| | | | | | | | Hydric Soi | l Present? | Yes O | lo |
| Depth (inches): Remarks: | ors observed | during field s | survey. | | | | Hydric Soi | l Present? | Yes O | vo ● |
| Depth (inches): Remarks: | ors observed | during field s | survey. | | | | Hydric Soi | I Present? | Yes O | No • |
| Depth (inches): Remarks: Io hydric soil indicato | ors observed | during field s | survey. | | | | Hydric Soi | I Present? | Yes O | No ● |
| Depth (inches): Remarks: Io hydric soil indicato | ors observed | during field s | survey. | | | | Hydric Soi | I Present? | Yes O | No ● |
| Depth (inches): | | during field s | survey. | | | | | | | |
| Depth (inches): | ndicators: | | | ply) | | | | | ors (minimum | |
| Depth (inches): | ndicators: | | ; check all that ap | | | | | ndary Indicat Surface Soil C | ors (minimum Gracks (B6) | n of two required) |
| Depth (inches): | ndicators: minimum of (| | ; check all that ap | 311) | (B13) | | | ndary Indicat Surface Soil C Sparsely Vege | ors (minimum Tracks (B6) Stated Concave | n of two required) |
| Depth (inches): | ndicators: minimum of (| | ; check all that ap | 311) ertebrates | | | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt | ors (minimum Gracks (B6) etated Concave erns (B10) | n of two required) Surface (B8) |
| Depth (inches): | ndicators: minimum of (| | ; check all that ap Salt Crust (I Aquatic Invo | 311) ertebrates ulfide Odo | r (C1) | | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz | ors (minimum Tracks (B6) etated Concave erns (B10) ospheres on Liv | n of two required) Surface (B8) |
| Depth (inches): | ndicators: minimum of () (A2) | | ; check all that ap Salt Crust (I Aquatic Invo | 311) ertebrates ulfide Odo Water Tab | r (C1) le (C2) | tests (C2) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv | n of two required) Surface (B8) |
| Depth (inches): | ndicators: minimum of () (A2) | | ; check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh | 311) ertebrates ulfide Odo Water Tab izospheres | r (C1) le (C2) on Living F | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where to | ors (minimum Fracks (B6) etated Concave erns (B10) ospheres on Liv tilled) | n of two required) Surface (B8) ving Roots (C3) |
| Depth (inches): | ndicators: minimum of () (A2) | | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh | 311) ertebrates ulfide Odo Water Tab izospheres not tilled | r (C1) le (C2) on Living F | Poots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where to | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv | n of two required) Surface (B8) ving Roots (C3) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) | | ; check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh | 311) ertebrates ulfide Odo Water Tab izospheres not tilled | r (C1) le (C2) on Living F | Poots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where to | ors (minimum Fracks (B6) etated Concave erns (B10) ospheres on Liv tilled) ows (C8) sible on Aerial I | n of two required) Surface (B8) ving Roots (C3) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) | | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh | 311) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced I | r (C1) le (C2) s on Living F ron (C4) | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where to Crayfish Burro | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) | n of two required) Surface (B8) ving Roots (C3) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) | one required; | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where | B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced I Surface (C7 | r (C1) le (C2) on Living F ron (C4) | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) | n of two required) Surface (B8) ring Roots (C3) magery (C9) |
| Depth (inches): | ndicators: minimum of o) (A2) (B2) (B4) on Aerial Imag | one required; | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S | B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced I Surface (C7 | r (C1) le (C2) on Living F ron (C4) | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv tilled) ows (C8) sible on Aerial In Position (D2) | n of two required, Surface (B8) ring Roots (C3) magery (C9) |
| Depth (inches): | ndicators: minimum of o) (A2) (B2) (B4) on Aerial Imag | one required; | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S | B11) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced I Surface (C7 | r (C1) le (C2) on Living F ron (C4) | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv tilled) ows (C8) sible on Aerial In Position (D2) | n of two required) Surface (B8) ring Roots (C3) magery (C9) |
| Depth (inches): | ndicators: minimum of () (A2) (B2) (B4) on Aerial Imag | one required; | s check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain | 311) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced I Surface (C7 | r (C1) le (C2) on Living F ron (C4) | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv tilled) ows (C8) sible on Aerial In Position (D2) | n of two required) Surface (B8) ring Roots (C3) magery (C9) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) on Aerial Imagives (B9) Yes | one required: gery (B7) | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S | 311) ertebrates ulfide Odo Water Tab izospheres not tilled Reduced I Surface (C7 | r (C1) le (C2) on Living F ron (C4) | Roots (C3) | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv tilled) ows (C8) sible on Aerial In Position (D2) | n of two required) Surface (B8) ring Roots (C3) magery (C9) |
| Depth (inches): | ndicators: minimum of () (A2) (B2) (B4) on Aerial Imag | one required: gery (B7) | s check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain | ann) ertebrates ulfide Odo Water Tab izospheres not tilled; Reduced I Gurface (C7 ain in Rem | r (C1) le (C2) on Living F ron (C4) | - | Seco | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum fracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) fest (D5) dummocks (D7) | n of two required) Surface (B8) Fing Roots (C3) magery (C9) (LRR F) |
| Depth (inches): | ndicators: minimum of o) (A2) (B2) (B4) on Aerial Imag ves (B9) Yes Yes | one required; gery (B7) No No No | check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain | and tilled and the series and tilled and til | r (C1) le (C2) on Living F ron (C4) | - | | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum cracks (B6) etated Concave erns (B10) ospheres on Liv tilled) ows (C8) sible on Aerial In Position (D2) | n of two required) Surface (B8) ring Roots (C3) magery (C9) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) on Aerial Imag ves (B9) Yes Yes (B4) | gery (B7) No • No • No • | Check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain) | and the states of the states o | r (C1) Ile (C2) Ile (C2) Ile (C4) Ile (| - Wetl | Seco | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum fracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) fest (D5) dummocks (D7) | n of two required) Surface (B8) Fing Roots (C3) magery (C9) (LRR F) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) on Aerial Imag ves (B9) Yes Yes (B4) | gery (B7) No • No • No • | Check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain) | and the states of the states o | r (C1) Ile (C2) Ile (C2) Ile (C4) Ile (| - Wetl | Seco | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum fracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) fest (D5) dummocks (D7) | n of two required) Surface (B8) Fing Roots (C3) magery (C9) (LRR F) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) on Aerial Imag ves (B9) Yes Yes (B4) | gery (B7) No • No • No • | Check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain) | and the states of the states o | r (C1) Ile (C2) Ile (C2) Ile (C4) Ile (| - Wetl | Seco | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum fracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) fest (D5) dummocks (D7) | n of two required) Surface (B8) Fing Roots (C3) magery (C9) (LRR F) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) on Aerial Imag ves (B9) Yes Yes (B4) | gery (B7) No • No • No • | Check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain) | and the states of the states o | r (C1) Ile (C2) Ile (C2) Ile (C4) Ile (| - Wetl | Seco | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum fracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) fest (D5) dummocks (D7) | n of two required) Surface (B8) Fing Roots (C3) magery (C9) (LRR F) |
| Depth (inches): | ndicators: minimum of (1) (A2) (B2) (B4) on Aerial Imag ves (B9) Yes Yes Yes ata (stream | gery (B7) No No No No gauge, monit | Check all that ap Salt Crust (I Aquatic Invo Hydrogen S Dry Season Oxidized Rh (where Presence of Thin Muck S Other (Explain) Depth (inco Depth (inco Depth (inco | and the states of the states o | r (C1) Ile (C2) Ile (C2) Ile (C4) Ile (| - Wetl | Seco | ndary Indicat Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where t Crayfish Burro Saturation Vis Geomorphic F FAC-neutral T Frost Heave H | ors (minimum fracks (B6) etated Concave erns (B10) ospheres on Live tilled) ows (C8) sible on Aerial In Position (D2) fest (D5) dummocks (D7) | n of two required) Surface (B8) Fing Roots (C3) magery (C9) (LRR F) |

US Army Corps of Engineers Great Plains - Version 2.0

WETLAND DETERMINATION DATA FORM - Great Plains Region

| roject/Site: Big Muddy | | | City/County: | Roosevelt | | Samp | oling Date: 29-Ju | ın-16 |
|--|----------------------------|--|--|--------------------|--|---|--|--------------------|
| pplicant/Owner: MDT | | | | State: | : _MT Sam | pling Point: | DP-2 | 2W |
| vestigator(s): M. and T. Traxler | | | Section, To | wnship, Ra | nge: S 21 | r 28N | R 55E | |
| andform (hillslope, terrace, etc.): | Lowland | | Local relief | (concave, c | convex, none): flat | | Slope: 0.0 | <u> </u> |
| - bregion (LRR): LRR F | | Lat.: 48 | 166514 | | Long.: -104.61843 | 6 | Datum: \ | |
| Map Unit Name: Lohler silty clay | | | .100014 | | | | | 10301 |
| | | ia kiwa afaraw | y vos | ● No C | | _ | Not Mapped | |
| climatic/hydrologic conditions on | | - | | | (=: 110) GAP10111 | | • | o |
| re Vegetation, Soil ✓ | , or Hydrology | significantly | disturbed? | Are "N | ormal Circumstances | " present? | res 🔾 IN | J © |
| re Vegetation, Soil | , or Hydrology | naturally pro | blematic? | (If nee | eded, explain any ans | wers in Ren | marks.) | |
| ımmary of Findings - At | ttach site map s | howing sa | mpling p | oint loc | ations, transed | cts, impo | rtant featu | res, et |
| ydrophytic Vegetation Present? | Yes No | | | | <u> </u> | | | • |
| Hydric Soil Present? | Yes No | | | Sampled A | | | | |
| • | Yes No | | within | a Wetland | _{I?} Yes • No • | | | |
| etland Hydrology Present? | res © NO C | | | | | | | |
| Remarks: Pata point located on concave, dep | nressional salt flat | | | | | | | |
| ata point iodatou on contactor dop | or coordinar cart matr | | | | | | | |
| | | | | | | | | |
| EGETATION - Use scien | itific names of p | lants | Dominant Species? | FWS Re | gion: GP | | | |
| (District 20 Fee | + Dadina \ | | Rel.Strat. | Indicator | Dominance Test we | orksheet: | | |
| Tree Stratum (Plot size: 30 Foo | | <u>% Cover</u> | Cover | Status | Number of Dominant | | | |
| <u>. </u> | | | H | | That are OBL, FACW, | or FAC: | 3 | (A) |
| <u>2</u> 3. | | 0 | | | Total Number of Dom | | | |
| , 1. | | | H | | Species Across All Str | ata: | 3 | (B) |
| | | | = Total Co | ver | Percent of dominar | nt Species | | |
| apling/Shrub Stratum (Plot size: | 15 Foot Radius) | | _ 10tai 00 | | That Are OBL, FAC | W, or FAC: | 100.0% | _ (A/B) |
| 1 | | 0 | | | Prevalence Index w | vorksheet: | | |
| | | | | | | | | |
| 2 | | 0 | LI | | Total % Cove | er of: N | Multiply by: | |
| 3. | | | | | Total % Cove | | Multiply by: (1 =25 | _ |
| 3 4 | | 0 | | | | 25 > | | _ |
| 3 4 | | 0 0 | | | OBL species | 25 40 | 1 = <u>25</u> | |
| 3 | | 0 | = Total Co | ver | OBL species FACW species FAC species | 25 × 40 × 0 | 1 = 25 80 | |
| 345(Plot size: 5 Foot I | | 0 0 0 0 | | | OBL species FACW species FAC species | 25 × 40 × 0 × 0 | (1 = 25 (2 = 80 (3 = 0 | _ |
| 34 | Radius) | 0 0 0 | ✓ 30.8% | FACW | OBL species FACW species FAC species FACU species | 25 × 40 × 0 × 0 × 0 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| 3 | Radius) | 0 0 0 0 0 | ✓ 30.8% ✓ 38.5% | FACW OBL | OBL species FACW species FAC species FACU species UPL species Column Totals: | 25 × 40 × 0 × 0 × 0 × 0 × 65 (65 (65) | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| 3 | Radius) | 0 0 0 0 0 20 25 5 | ✓ 30.8% | FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc. | 25 40 3 0 3 0 3 0 3 0 0 3 0 0 0 0 0 0 0 0 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| 4. Herb Stratum (Plot size: 5 Foot f 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum | Radius) | 0 0 0 0 0 20 25 5 15 | ✓ 30.8% ✓ 38.5% | FACW OBL FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc | 25 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | |
| 3 | Radius) | 0 0 0 0 20 25 5 15 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% | FACW OBL FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta | 25 | (1 = | |
| 3. 4. 5. Herb Stratum (Plot size: 5 Foot I) 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. 6. 7. | Radius) | 0 0 0 0 20 25 5 15 0 0 | ✓ 30.8% ✓ 38.5% 7.7% ✓ 23.1% 0.0% 0.0% 0.0% | FACW OBL FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance | 25 | (1 = 25 (2 = 80 (3 = 0 (4 = 0 (5 = 0 (A) 105 tors: ytic Vegetation | |
| 3. 4. 5. Herb Stratum (Plot size: 5 Foot form) 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. 6. 7. | Radius) | 0 0 0 0 20 25 5 15 0 0 | ✓ 30.8% ✓ 38.5% | FACW OBL FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence | 25 | (1 = | |
| 3 | Radius) | 0 0 0 0 20 25 5 15 0 0 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% | FACW OBL FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologi | 25 | (1 = 25 (2 = 80 (3 = 0 (4 = 0 (5 = 0 (A) 105 1.615 tors: ytic Vegetation | - - - (B) |
| 3 | Radius) | 20 25 5 15 0 0 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% | FACW OBL FACW FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologidata in Rema | 25 | (1 = | (B) |
| 3 | Radius) | 0 0 0 0 20 25 5 15 0 0 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% | FACW OBL FACW FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologidata in Rema Problematic Hy | 25 25 240 27 26 26 26 26 26 26 26 26 26 26 26 26 26 | (1 = 25 (2 = 80 (3 = 0 (4 = 0 (5 = 0 (A) 105 1.615 tors: ytic Vegetation 10% .01 ons 1 (Provide susperate sheet) regetation 1 (Exp | (B) |
| 3. 4. 5. | Radius) | 0 0 0 0 20 25 5 15 0 0 0 0 0 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% | FACW OBL FACW FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologidata in Rema | 25 25 240 27 26 26 26 26 26 26 26 26 26 26 26 26 26 | (1 = 25 (2 = 80 (3 = 0 (4 = 0 (5 = 0 (A) 105 1.615 tors: ytic Vegetation 10% .01 ons 1 (Provide susperate sheet) regetation 1 (Exp | (B) |
| 3 | Radius) 30 Foot Radius) | 0 0 0 0 0 20 25 5 15 0 0 0 0 0 0 65 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% | FACW OBL FACW FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologicata in Rema Problematic Hy Indicators of hydrophytics Indicators of hydrophytics Indicators of hydrophytics Problematic Hy Indicators of hydrophytics Problematic Hydrophytics Pro | 25 25 240 27 26 26 26 26 26 26 26 26 26 26 26 26 26 | (1 = 25 (2 = 80 (3 = 0 (4 = 0 (5 = 0 (A) 105 1.615 tors: ytic Vegetation 10% .01 ons 1 (Provide susperate sheet) regetation 1 (Exp | (B) |
| 3. 4. 5. Herb Stratum (Plot size: 5 Foot II 1. Distichlis spicata 2. Puccinellia nuttalliana 3. Suaeda calceoliformis 4. Hordeum jubatum 5. 6. 7. 8. 9 | Radius) 30 Foot Radius) | 0 0 0 0 20 25 5 15 0 0 0 0 0 65 | ✓ 30.8% ✓ 38.5% 7.7% ✓ 23.1% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Total Co | FACW OBL FACW FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologidata in Rema Problematic Hydrophytic Hydrophytic Hydrophytic Hydrophytic Vegeta 1 Indicators of hydrophytic Hydrophytic Hydrophytic Vegeta 1 Indicators of hydrophytic Hydrophytic Hydrophytic Vegeta 1 Indicators of hydrophytic Hydrophytic Vegeta 1 Indicators of hydrophytic Vegeta 2 Indicators of hydrophytic Vegeta 1 Indicators of hydrophytic Vegeta | 25 25 240 27 26 26 26 26 26 26 26 26 26 26 26 26 26 | (1 = 25 (2 = 80 (3 = 0 (4 = 0 (5 = 0 (A) 105 1.615 tors: ytic Vegetation 10% .01 ons 1 (Provide susperate sheet) regetation 1 (Exp | (B) |
| 3 | Radius) 30 Foot Radius) | 0 0 0 0 0 20 25 5 15 0 0 0 0 0 0 65 | ✓ 30.8% ✓ 38.5% ✓ 7.7% ✓ 23.1% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% ○ 0.0% | FACW OBL FACW FACW | OBL species FACW species FAC species FACU species UPL species Column Totals: Prevalence Inc Hydrophytic Vegeta 1 - Rapid Test 2 - Dominance 3 - Prevalence 4 - Morphologidata in Rema Problematic Hy Indicators of hydrophytic Wagetation | 25 25 240 27 26 26 26 26 26 26 26 26 26 26 26 26 26 | (1 = | (B) |

US Army Corps of Engineers

Soil Sampling Point: DP-2W

| Type: C-Concentration. D-Depletion. RM-Reduced Matrix. CS-Covered or Coated Sand Grains Type: C-Concentration. D-Depletion. RM-Reduced Matrix. CS-Covered or Coated Sand Grains Type: C-Concentration. D-Depletion. RM-Reduced Matrix. CS-Covered or Coated Sand Grains Type: C-Concentration. D-Depletion. RM-Reduced Matrix Sandy Gleyed Matrix (Sandy Gleyed | Remarks |
|--|-----------------------------|
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A1) Sandy Gleyed Matrix S4 Black Histic (A3) Stripped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Loamy Mucky Mineral (F2) Loamy Mucky Mineral (F2) Loamy Mucky Mineral (F3) Reduced Vertic (F18) | is as moist as DP-2U |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Sandy Redox (S5) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR L7) Stripped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) 1 cm Muck (A9) (LRR L7) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F2) Loamy Mucky Mineral (F1) High Plains Depressions (F3) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Depleted Below Dark Surface (A11) Depleted Dark Surface (F6) Sandy Muck Mineral (S1) Sandy Muck Mineral (S1) Sandy Muck Mineral (S1) Ser m Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F8) Some Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F8) Some Mucky Peat or Peat (S2) (LRR F) (MLRA 72 and 73 of LRR H) Type: Depth (inches): Type: Depth (inches): Type: Depth (inches): Seemarks: Depth (inches): Seemarks: Hydric Soil Present? Yes Wetland Hydrology Indicators: Frimary Indicators (minimum of one required; check all that apply) Surface Water (A1) High Plains Depressions (F16) Sourface Water (A1) Sediment Deposits (B2) Oxidized Rhizosphere on Living Roots (C3) Water Marks (B1) Sediment Deposits (B2) Oxidized Rhizosphere on Eventual Eve | |
| tydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histic Epipedon (A2) Sandy Gleyed Matrix S4 Histic Epipedon (A2) Sandy Gleyed Matrix S4 Histic (A3) Stripped Matrix (S6) Dark Surface (S7) (LRR 6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) High Plains Depressions (LRR F) Loamy Mucky Mineral (F2) Stratified Layers (A5) (LRR F) Depleted Matrix (F2) Tink Dark Surface (A11) Redox Dark Surface (F6) Red Parent Material (TF2) Thick Dark Surface (A12) Depleted Below Dark Surface (A11) Redox Dark Surface (F7) Depleted Below Dark Surface (A12) Sandy Muck Mineral (S1) Send Mucky Peat or Peat (S2) (LRR G, H) Depleted Dark Surface (F7) Send Mucky Peat or Peat (S3) (LRR F) Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) Mucky Peat or Peat (S2) (LRR F) Mucky Peat or Peat | |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A2) Sandy Redox (S5) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR L7) Stripped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) 1 cm Muck (A9) (LRR L7) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F2) Loamy Mucky Mineral (F1) High Plains Depressions (F3) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Depleted Below Dark Surface (A11) Depleted Dark Surface (F6) Sandy Muck Mineral (S1) Sandy Muck Mineral (S1) Sandy Muck Mineral (S1) Ser m Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F8) Some Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F8) Some Mucky Peat or Peat (S2) (LRR F) (MLRA 72 and 73 of LRR H) Type: Depth (inches): Type: Depth (inches): Type: Depth (inches): Seemarks: Depth (inches): Seemarks: Hydric Soil Present? Yes Wetland Hydrology Indicators: Frimary Indicators (minimum of one required; check all that apply) Surface Water (A1) High Plains Depressions (F16) Sourface Water (A1) Sediment Deposits (B2) Oxidized Rhizosphere on Living Roots (C3) Water Marks (B1) Sediment Deposits (B2) Oxidized Rhizosphere on Eventual Eve | |
| Prydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) | |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) | |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) | |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Stripped Matrix S4 Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Loamy Gleyed Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Loamy Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Depleted Below Dark Surface (A11) Reduced Vertic (F18) Reduced Vertic (F | |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A1) Black Histic Epipedon (A2) Sandy Gleyed Matrix S4 Black Histic (A3) Stripped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Thick Dark Surface (S7) (LRR G) High Plains Depressions (F1) Sandy Matrix (F2) Loamy Mucky Mineral (F1) Depleted Below Dark Surface (A11) Depleted Below Dark Surface (F6) Sandy Muck Mineral (S1) Sendy Muck Mineral (S1) Sendy Muck Mineral (S1) Depleted Dark Surface (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F8) Sorn Mucky Peat or Peat (S2) (LRR G, H) Depleted Dark Surface (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) Depleted Dark Surface (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Weter Muck (A9) Hydric Soil Present? Yes Remarks: Soil meets NTCHS technical standard for hydric soil. Soil was saturated to surface and had been inundated earlier in the sprin would have meet the requirements for Depleted Matrix indicators. If soil had 2% redox concentrations rather than the 1% of would have meet the requirements for Depleted Matrix indicator. Hydrology Wetland Hydrology Indicators: Primary Indicators (minimum of one required: check all that apply) Secondary Indicators (minimum of one required: check all that apply) Sparsely Vegatase High Water Table (A2) Aquatic Invertebrates (B13) Drainage Patterns (Mydroed Patterns) Wetland Hydrology Indicators: Finance Water Marks (B1) Secondary Indicators (C1) Sparsely Vegatase Oxidized Rhizosphere on Living Roots (C3) Crayins Burrows (C Crayins Burrows (C Foresence of Reduced Iron (C4) Secondary Indicators (Crayins Burrows) For Crayins Burrows (C Foresence of Re | |
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1) Histosol (A1) Black Histic Epipedon (A2) Sandy Gleyed Matrix S4 Black Histic (A3) Stripped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Thick Dark Surface (S7) (LRR G) High Plains Depressions (F1) Sandy Matrix (F2) Loamy Mucky Mineral (F1) Depleted Below Dark Surface (A11) Depleted Below Dark Surface (F6) Sandy Muck Mineral (S1) Sendy Muck Mineral (S1) Sendy Muck Mineral (S1) Depleted Dark Surface (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F8) Sorn Mucky Peat or Peat (S2) (LRR G, H) Depleted Dark Surface (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) Depleted Dark Surface (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Sorn Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F6) Weter Muck (A9) Hydric Soil Present? Yes Remarks: Soil meets NTCHS technical standard for hydric soil. Soil was saturated to surface and had been inundated earlier in the sprin would have meet the requirements for Depleted Matrix indicators. If soil had 2% redox concentrations rather than the 1% of would have meet the requirements for Depleted Matrix indicator. Hydrology Wetland Hydrology Indicators: Primary Indicators (minimum of one required: check all that apply) Secondary Indicators (minimum of one required: check all that apply) Sparsely Vegatase High Water Table (A2) Aquatic Invertebrates (B13) Drainage Patterns (Mydroed Patterns) Wetland Hydrology Indicators: Finance Water Marks (B1) Secondary Indicators (C1) Sparsely Vegatase Oxidized Rhizosphere on Living Roots (C3) Crayins Burrows (C Crayins Burrows (C Foresence of Reduced Iron (C4) Secondary Indicators (Crayins Burrows) For Crayins Burrows (C Foresence of Re | |
| Histosol (A1) Sandy Gleyed Matrix S4 1 cm Muck (A9) (LRR I. J. Histic Epipedon (A2) Sandy Redox (S5) Coastal Prairite Redox (A1 Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) High Plains Depressions (Stratified Layers (A5) (LRR F) Loamy Mucky Mineral (F2) (LRR H outside of MI 1 cm Muck (A9) (LRR F,G,H) Depleted Matrix (F3) Redox Dark Surface (A11) Redox Dark Surface (F6) Red Parent Material (TR2) Thick Dark Surface (A12) Depleted Dark Surface (F6) Red Parent Material (TR2) Sandy Muck Mineral (S1) Redox depressions (F8) Very Shallow Dark Surface (A12) Depleted Dark Surface (F7) Very Shallow Dark Surface (A12) Depleted Dark Surface (F7) Very Shallow Dark Surface (A12) Redox depressions (F8) Very Shallow Dark Surface (A12) Sc m Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) 3Indicators of hydrophytic vege hydrology must be present, un Restrictive Layer (if present): Type: Depth (inches): Hydric Soil Present? Yes Remarks: ioil meets NTCHS technical standard for hydric soil. Soil was saturated to surface and had been inundated earlier in the sprin eeds more time to develop more prominent hydric soil indicators. If soil had 2% redox concentrations rather than the 1% of voucled have meet the requirements for Depleted Matrix indicators. If soil had 2% redox concentrations rather than the 1% of voucled have meet the requirements for Depleted Matrix indicators. Water Marks (B1) | Hvdric Soils ³ : |
| Histic Epipedon (A2) | • |
| Hydrogen Sulfide (A4) | |
| Stratified Layers (A5) (LRR F) | 1 |
| □ 1 cm Muck (A9) (LRR F,G,H) □ Depleted Matrix (F3) □ Reduced Vertic (F18) □ Depleted Below Dark Surface (A11) □ Redox Dark Surface (F6) □ Red Parent Material (TF2) □ Depleted Dark Surface (F6) □ Red Parent Material (TF2) □ Sandy Muck Mineral (S1) □ Redox depressions (F8) □ Other (Explain in Remarks 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) □ High Plains Depressions (F16) □ Indicators of hydrophytic vege hydrology must be present, un Restrictive Layer (if present): Type: □ Depth (inches): □ Redox depressions (F16) □ Indicators of hydrophytic vege hydrology must be present, un Restrictive Layer (if present): Type: □ Depth (inches): □ Redox depressions (F16) □ Indicators of hydrophytic vege hydrology must be present, un Restrictive Layer (if present): □ Indicators (F16) □ Indicators (F17) □ Indicators (F18) □ Indicato | F16) |
| Depleted Below Dark Surface (A11) | RA 72 and 73) |
| Thick Dark Surface (A12) | |
| Sandy Muck Mineral (S1) | (7540) |
| □ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) □ High Plains Depressions (F16) □ 3 Indicators of hydrophytic vege hydrology must be present, un Hydric Soil Present? □ Pepth (inches): □ Hydric Soil Present? □ Pepth (inches): □ Hydric Soil Present? □ Present Hydric Soil Present? □ Pepth (inches): □ Hydric Soil Present? □ Present (B16) □ Present Hydric Soil Present? □ Present (B17) □ Present (B17) □ Present (B17) □ Present (B17) □ Present (B18) □ Present (B18) □ Present (B19) □ Present | |
| S cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 and 73 of LRR H) hydrology must be present, un Restrictive Layer (if present): Type: | |
| Type: | |
| Pepth (inches): | |
| Remarks: Coll Indicators | |
| Soil meets NTCHS technical standard for hydric soil. Soil was saturated to surface and had been inundated earlier in the spring spring to develop more prominent hydric soil indicators. If soil had 2% redox concentrations rather than the 1% of would have meet the requirements for Depleted Matrix indicator. Itydrology | ● No ○ |
| needs more time to develop more prominent hydric soil indicators. If soil had 2% redox concentrations rather than the 1% of would have meet the requirements for Depleted Matrix indicator. | |
| needs more time to develop more prominent hydric soil indicators. If soil had 2% redox concentrations rather than the 1% of would have meet the requirements for Depleted Matrix indicator. Hydrology Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) High Water Table (A2) Aquatic Invertebrates (B13) Drainage Patterns (IIII) Sparsely Vegetated Hydrogen Sulfide Odor (C1) Water Marks (B1) Sediment Deposits (B2) Drift deposits (B3) (where not tilled) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Algal Mat or Crust (B4) Inon Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations: | a. The wetland likely |
| Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) High Water Table (A2) Aquatic Invertebrates (B13) Drainage Patterns (IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII | |
| Wetland Hydrology Indicators: Secondary Indicators (n Primary Indicators (minimum of one required; check all that apply) ✓ Surface Soil Cracks Surface Water (A1) ✓ Salt Crust (B11) Sparsely Vegetated High Water Table (A2) Aquatic Invertebrates (B13) Drainage Patterns (Invertebrates (B13) ✓ Saturation (A3) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres (C2) ✓ Water Marks (B1) Dry Season Water Table (C2) (where tilled) ✓ Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C ✓ Drift deposits (B3) (where not tilled) ✓ Saturation Visible on Presence of Reduced Iron (C4) ✓ Geomorphic Position ✓ Iron Deposits (B5) Thin Muck Surface (C7) ✓ FAC-neutral Test (D ✓ Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost Heave Hummon Human Water-Stained Leaves (B9) | |
| Primary Indicators (minimum of one required; check all that apply) 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 Aerial Imagery (B7) Water Marks (B9) Field Observations: Surface Soil Cracks Surfac | |
| Surface Water (A1) High Water Table (A2) Aquatic Invertebrates (B13) Drainage Patterns (I ✓ Saturation (A3) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water Mater (A1) Sparsely Vegetated Aquatic Invertebrates (B13) Drainage Patterns (I Oxidized Rhizosphere (where Table (C2) (where tilled) ✓ Saturation Remarks (C3) Crayfish Burrows (C3) Were not tilled) ✓ Saturation Visible on ✓ Geomorphic Position FAC-neutral Test (D Frost Heave Hummon Water-Stained Leaves (B9) | ninimum of two required |
| 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 Aerial Imagery (B7) Water Marks (B9) Aquatic Invertebrates (B13) Drainage Patterns (I Oxidized Rhizosphere (C2) (where Table (C2) (where Table (C2) (where Illed) ✓ Saturation Visible on Crayfish Burrows (C3) ✓ Saturation Visible on Presence of Reduced Iron (C4) ✓ FAC-neutral Test (D Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations: | |
| ✓ Saturation (A3) Hydrogen Sulfide Odor (C1) Oxidized Rhizospher ✓ Water Marks (B1) Dry Season Water Table (C2) (where tilled) ✓ Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C ✓ Drift deposits (B3) (where not tilled) ✓ Saturation Visible on Algal Mat or Crust (B4) Presence of Reduced Iron (C4) ✓ Geomorphic Position ✓ Iron Deposits (B5) Thin Muck Surface (C7) ✓ FAC-neutral Test (D ✓ Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost Heave Hummon ✓ Water-Stained Leaves (B9) | Concave Surface (B8) |
| ✓ Water Marks (B1) □ Dry Season Water Table (C2) (where tilled) □ Sediment Deposits (B2) □ Oxidized Rhizospheres on Living Roots (C3) □ Crayfish Burrows (C □ Drift deposits (B3) (where not tilled) ✓ Saturation Visible on Saturation Visible on Presence of Reduced Iron (C4) ✓ Geomorphic Position □ Iron Deposits (B5) □ Thin Muck Surface (C7) ✓ FAC-neutral Test (D □ Inundation Visible on Aerial Imagery (B7) □ Other (Explain in Remarks) □ Frost Heave Hummon □ Water-Stained Leaves (B9) | 310) |
| ✓ Water Marks (B1) □ Dry Season Water Table (C2) (where tilled) □ Sediment Deposits (B2) □ Oxidized Rhizospheres on Living Roots (C3) □ Crayfish Burrows (C □ Drift deposits (B3) (where not tilled) ✓ Saturation Visible on Saturation Visible on Presence of Reduced Iron (C4) ✓ Geomorphic Position □ Iron Deposits (B5) □ Thin Muck Surface (C7) ✓ FAC-neutral Test (D □ Inundation Visible on Aerial Imagery (B7) □ Other (Explain in Remarks) □ Frost Heave Hummon □ Water-Stained Leaves (B9) | es on Living Roots (C3) |
| □ Drift deposits (B3) (where not tilled) □ Saturation Visible or □ Algal Mat or Crust (B4) □ Presence of Reduced Iron (C4) □ Geomorphic Position □ Iron Deposits (B5) □ Thin Muck Surface (C7) □ FAC-neutral Test (D □ Inundation Visible on Aerial Imagery (B7) □ Other (Explain in Remarks) □ Frost Heave Hummo □ Water-Stained Leaves (B9) | |
| Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks) Frost Heave Hummon Frost | 3) |
| ☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7) ☐ FAC-neutral Test (D☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks) ☐ Frost Heave Hummon Water-Stained Leaves (B9) Field Observations: | n Aerial Imagery (C9) |
| Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost Heave Hummo Water-Stained Leaves (B9) Field Observations: | ı (D2) |
| Water-Stained Leaves (B9) Field Observations: | ō) |
| Field Observations: | icks (D7) (LRR F) |
| | |
| Surface Water Present? Yes No Depth (inches): | |
| | |
| Water Table Present? Yes No Depth (inches): | |
| Wetland Hydrology Present? Ye | s 💿 No 🔾 |
| Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0 | |
| Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available: | |
| | |
| Remarks: | |
| Soil saturated to the surface at the data plot but no surface water present. | |
| | |
| | |

US Army Corps of Engineers Great Plains - Version 2.0

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

| ١. | Project Name: Big Muddy 2. MDT Project #: NH 1-10(626) 3. Control #: 4058-001 | | | | | | | | | |
|----|--|---|--|--|-------------------|--|--|--|--|--|
| 3. | Evaluation Date: 6/29/2016 4. Evaluator(s): M&T Traxler 5. Wetland/Site #(s): North Cell - Created | | | | | | | | | |
| ò. | Wetland Location(s): Township 28 N, Range 55 E, Section 21; Township N, Range E, Section | | | | | | | | | |
| | Approximate Stationing or Roadposts: ~639.75 on Hwy 2 | | | | | | | | | |
| | Watershed: 12 - Lower Missouri County: _ Roosevelt | | | | | | | | | |
| 7. | 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) 7.39 (measured, e.g. GPS) | | | | | | | | | |
| | ✓ Mitigation wetlands; p✓ Other | oost-construction | (see manual for det | ermining AA) 7.39 (measu | | | | | | |
| 0 | ✓ Mitigation wetlands; p✓ Other | | (see manual for det | èrmining AA) <u>7.39</u> (mèasu efinitions.) | red, e.g. GPS) | | | | | |
| 0 | ✓ Mitigation wetlands; p✓ Other | oost-construction | (see manual for det | ermining AA) 7.39 (measu | | | | | | |
| 10 | | oost-construction TLAND AND AQUATIC HABIT | (see manual for det | èrmining AA) <u>7.39</u> (mèasu 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) | ermining 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 | ermining AA) 7 <u>.39</u> (measu efinitions.) Water Regime Permanent / Perennial | % OF AA 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 | ermining AA) 7.39 (measurefinitions.) Water Regime Permanent / Perennial Seasonal / Intermittent | % OF AA 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.

| | Predominan | 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 dominated by open water, low productivity in open water. 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.

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

| 14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS | | | | | | | | | | | | | | | | | | | | |
|---|---|------------------------------|-----------------------------|------------------------|--------------------------------|-------------------|-------------------|----------------|-------------------------|-------------------|--------------------|-----------------------|------------------|---------------------------------|--------------------------|-----------------------|---------|--------|---------|---------------|
| Primary or critical habitat (li Secondary habitat (list spe Incidental habitat (list spec No usable habitat | 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/P | rimar | y S | us/P | rimary | Do | c/Sec | onda | ry S | sus/Se | conda | ry | Doc/Ir | nciden | tal | Sus/l | Incide | ntal | None | • |
| Functional Point/Rating | | | | | - | | | | | | | | | | | | | | 0L | |
| Sources for documented us | e (e.g. | obser | vation | s, red | cords): | USFV | vs dat | abas | e for F | Roosev | elt Cou | inty | | | | | | | | |
| 14B. HABITAT FOR PLANTS Do not include species | | | | | S1, S | 52, OR | S3 B | Y TH | E MOI | NTANA | NATU | JRAI | _ HERI | TAGE | PROC | 3RAN | Л | | | |
| i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual. Primary or critical habitat (list species) | | | | | | | | | | | | | | | | | | | | |
| | Doc/P | | | | rimary | | c/Sec | | | sponali Sus/Se | | | Doc/Ir | | | Suc/I | ncider | atal | None | 7 |
| Highest Habitat Level | DOC/P | rimar | y s | us/P | rimary | DO | c/Sec | onua | iry e | us/se | conua | У | DOC/II | iciaen | tai | Sus/I | nciaei | itai | None | ł |
| S1 Species | | | | | | | | | | | | | | | | | | | | |
| S2 and S3 Species 5M | | | | | | | | | | | | | | | | | | | | |
| | Functional Point/Rating Sources for documented use (e.g. observations, records): Suspected species identified by MTNHP for Roosevelt County | | | | | | | | | | | | J | | | | | | | |
| | Sources for documented use (e.g. observations, records): Suspected species identified by MTNHP for Roosevelt County 14C. GENERAL WILDLIFE HABITAT RATING | | | | | | | | | | | | | | | | | | | |
| i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence. | | | | | | | | | | | | | | | | | | | | |
| ☐ 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 | tures, ailable | game | trails | etc. | , | | few little spar | to no v | vildlife wildlife acent u | observ sign upland | vation food | source | ng pea | | periods AA |
| Moderate: Based on any or solutions of scattere of common occurrence of adequate adjacent uplared interview with local biological | ed wildl wildlife and food | ife gro sign : d sour | oups of such a ces | r indi Is sca | at, trac | ks, ne | | | | | | k peri | iods | | | | | | | |
| ii. Wildlife Habitat Features For class cover to be consider percent composition of the AA S/I = seasonal/intermittent; T/ | red eve \ (see # | enly dis #10). <i>- i</i> | stribute Abbrev | ed, th viatio | ne mos | t and surfac | least p e wate | reval r dur | ent ve ations | getate are as | d class follows | ses n s: P/l | nust be = per | withir mane | 1 20% (nt/pere | of ead | ch othe | | | |
| Structural Diversity | | | | | High | | | | | | Þ | Mo | derate | ļ | | | | | .ow | |
| (see #13) Class Cover Distribution (all vegetated classes) | | □ E | ven | | | ☐ Un | even | | | ⊠E | ven | | | ☐ Un | even | | | E | | |
| 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) | | | | - | | | | | Е | | | | | | | | | | | |
| ☐ Moderate Disturbance at AA (see #12i) | | | - | | - | | | | | | | | | | | | | | | |
| ☐ High Disturbance at | | | | | | | | | | | | | | | | | | | | |
| AA (see #12i) | | | | | | | | | <u> </u> | | | | | | | | | | | |
| 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 | | | | | | | | | | s Ratir | | ٠ | | | | 1 | | | | |
| (i) | | ⊠ Exc | eptio | nal | | | High | | | ☐ Mc | derate | • | | ☐ Lo | w | | | | | |
| Substantial | | | | | | | | | | | | | | | | 4 | | | | |
| | | | 9H | | | | | | - | | | | | | | \dashv | | | | |
| Comments: Several bird spec | cies an | | | cks o | bserve | d duri | | visit | s. No: | | | in ex | cavate | | s in 20° | <u>-</u> ∥ 16 - li | mitina | factor | in prov | /idina |
| habitat for waterfowl and other | | | | | 200,70 | <u> </u> | | | | | | 0/ | | | | | | | 6101 | |

| | | Wetland/Site #(s): North Cell - Created | | | | | | | | | | | | | | | | | | |
|-------|---|---|---|-----------------------------|---------|--------------------------|-----------------|-------------------------|-----------------|---------------------------------|------------------------|---------|---------|------------|---------------------------|---|----------|-----------|----------------|-----------|
| 14D. | GENERAL FISH HABIT If the AA is not used by entrapped in a canal], the | fish, fis | sh use | | restora | able du | ue to h | | const | raints | , or is n | ot des | ired fr | om a r | manag | ement | perspe | ective | [such | as fish |
| | Assess this function if the precluded by perched co | | | | | e exist | ing sit | uation | is "co | orrecta | ıble" su | ch tha | t the A | A cou | ıld be ι | ised by | y fish [| i.e., fis | sh use | is |
| | Type of Fishery: \square C | old Wa | ter (C | W) [|] Warı | m Wat | er (W \ | N) (| se the | CW o | or WW | guideli | nes in | the m | anual t | o comp | olete th | e mat | rix. | |
| i. Ha | bitat Quality and Know | n / Sus | pecte | d Fish | Spec | ies in | AA: l | Jse m | atrix t | o sele | ct the f | unction | al poi | nt and | l rating | | | | | _ |
| Wat | ation of Surface er in AA | □ P | erman | ent / P | erenn | ial | | □s | easo | nal / lı | ntermit | tent | | □ 1 | empo | rary / I | Ephen | neral | | |
| | atic Hiding / Resting / ape Cover | Opt | Optimal Adequate Poor Optimal Adequate Poor Optimal Adequate Poor | | | | | | | | | | | oor | | | | | | |
| | rmal Cover: imal / suboptimal | 0 | s | 0 | s | 0 | s | 0 | s | 0 | S | 0 | s | 0 | s | 0 | s | 0 | s | |
| FW | P Tier I fish species | | | | | | | | | | | | | | | | | | | |
| | P Tier II or Native ne fish species | | | | | | | | | | | | | | | | | | | 1 |
| | Tier III or Introduced ne fish | | | | | | | | | | | | | | | | | | | |
| | P Non-Game Tier IV or fish species | | | | | | | | | | | | | | | | | | | |
| Sour | ces used for identifying | fish s | pp. po | otentia | lly fou | ınd in | AA: | | | | | | | | | | | | | <u> </u> |
| ii. M | odified Rating: NOTE: N | Modifie | d scor | e cann | ot exc | eed 1. | 0 or b | e less | than | 0.1. | | | | | | | | | | |
| МDЕ | fish use of the AA signific Q list of waterbodies in ne ort, or do aquatic nuisand | eed of | TMDL | dévelo | pmen | t with i | listed ' | "Proba | ble In | npaire | d Uses | " inclu | ding c | old or | warm i | vater f | ishery | or aqu | uatic li | fe |
| b) Do | es the AA contain a docu e fish or introduced game | ımente fish? | ed spar | wning a | area o | <i>r other</i> ore in | <i>critica</i> | al habi 1 0.1 = | tat fea | <i>iture (l</i> r ⊠ l | i.e., saı \0 | nctuary | pool, | upwe | elling a | ea; sp | ecify ii | n comi | ments, |) for |
| | nal Score and Rating: _ | | | | | | | | | | | r inlet | or out | let. | | | | | | |
| 14E. | FLOOD ATTENUATION Applies only to wetlands If wetlands in AA are no | that a | re sub | NA (p ject to n in-ch | floodir | ng via | in-cha | nnel o flow, o | r over check | bank the N | flow. A box a | and pro | ceed | to 14F | ₹. | | | | | |
| | nchment Ratio (ER) Est- prone width = estimated | | | | | | | | | | | | | | | | | | e of th | e stream. |
| | / | = | | _ | | | | | 4 | . | | | | | | | Á | gr. | | |
| flood | prone width / bankfull wid | dth = e | ntrenc | hment | ratio | | 2 x | Bank | full De | epth | | | alvay. | | | N. S. | a F | • | rone W idth | Vidth |
| | | | | | | | | | | | В | ankfull | Deptn | Pinno. | cccl ^d | | | | | |
| | Slightly Entr | | d | | | | | y Ent | | ed | | | | | renche | | | | | |
| C s | ER 2 tream type D stream t | | E st | ream ty | /ре | | | 1.41 – eam ty | | | A stre | am typ | ре | | : 1.0 – ream ty | | G st | ream t | ype | |
| | W | 7 | | T. | | | 7 | | | | | | | Ę | | <u></u> | | | | |

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Entrenched **Estimated or Calculated Entrenchment** ☐ Slightly Entrenched Moderately Entrenched C, D, E stream types (Rosgen 1994, 1996) B stream type A, F, G stream types Percent of Flooded Wetland Classified as \boxtimes Forested and/or Scrub/Shrub 75% 25-75% 75% 25-75% 75% 25-75% <25% <25% <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: 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 $\ \ \Box$ | NA (proceed to 14G) |
|------|---|---|
| | Applies to wetlands that flood or pond from overbank or in-channel f | low, precipitation, upland surface flow, or groundwater flow. |
| | If no wetlands in the AA are subject to flooding or ponding, then che | ck 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 | \boxtimes | >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 | 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 of substantia sedimenta toxicants, present. | ial to delive or compou other funct Ily impaire tion, sourc | er sedime nds at lev ions are n d. Minor es of nutr | nts, els ot ients 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 "probat nt, nutrients, or surroundin gh levels of so such that other or 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 | |
| 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 | ☐ 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 | General Wildlife Habitat Rating (14Ciii) | | | | | | | | |
|-----------------------------|--|--|--|--|--|--|--|--|--|
| (14Diii) | ⊠ E/H □ M □ 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 | \boxtimes | Vegeta | ted Co | mponent | >5 ac | res | ☐ Vegetated Component 1-5 acres | | | | | | | ☐ Vegetated Component <1 acre | | | | | | | |
|-------|-------------|--------|--------|---------|---------|-----|---------------------------------|----|-------------------|----|-----|----|--------|-------------------------------|-----|----|-------|----|--|--|--|
| В | ⊠⊦ | ligh | Ш | oderate | ate Low | | w 🔲 High | | ☐ High ☐ Moderate | | Low | | ☐ High | | | | ☐ Low | | | | |
| 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 C | HAIN S | SUPPORT (con | tinued) | | | | | | |
| iii. Modified Rating: Note: Modified sc | ore can | not exceed 1.0 | or be less than | ո 0.1. | | | | | |
| Vegetated Upland Buffer: Area wir mowing or clearing (unless for weed Is there an average 50-foot wide v | control) |). | | | · | | • | · | |
| iv. Final Score and Rating: <u>.8H</u> Com | ments: | : Vegetated wet | land area ~5.9 | 3-ac., av | erage 50-foot | upland buffer | surround | ling mitigation | 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 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 f a natu etland e ring dro but no i | t season/drough ral slope. edge. ught periods. inlet. | nt. | □ P€ □ W □ St | etland contain | ors strate present v is inlet but no d wn 'losing' stre | outlet. | | |
| iii. Rating: Use the information from i a | ınd ii ab | ove and the tab | ole below to se | lect the f | unctional poin | t and rating. | | | _ |
| Criteria | | Duration of S <u>WITH W</u> ⊠ P/P | Saturation at A ATER THAT I S. | S RECH | inds <i>FROM G</i> A <i>RGING THE</i> ☐ T | GROUNDWAT GROUNDWA | ER <u>DISC</u> TER SYS ☐ No | STEM | |
| ☑ Groundwater Discharge or Recharge | arge | 1H | | | | | | |] |
| ☐ Insufficient Data/Information Comments: | | | | | | | | | |
| 14K. UNIQUENESS i. Rating: Working from top to bottom, | | | | | | | | | |
| Replacement Potential | spring forest | ontains fen, bo gs or mature (; ted wetland OF ciation listed as TNHP | -80 yr-old) ≷ plant | cited ra diversi contair | es not contain are types ANI ty (#13) is high as plant asso as "S2" by the | O structural gh OR ciation | previou associ | es not containusly cited rar ations AND s ty (#13) is low | e types OR tructural |
| Estimated Relative Abundance (#11) | □ Rare | e 🗆 Common | □ Abundant | | | □ Abundant | □ Rare | □ Common | |
| | | | | | | | | | .3L |
| Moderate Disturbance at AA (#12i) | | | | | 1 | | | | |
| ☐ 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 | es a recr | reational or edu | | tunity. | · | 0, 0 | , | | |
| ii. Check categories that apply to the | | Other: | | ⊠ Coı | nsumptive Re | creational 🛚 | Non-con | sumptive recr | eational |
| iii. Rating: Use the matrix below to sele | ect the fu | unctional point a | and rating. | | | | | | |
| Known or F | | | F | -1 A | | | 17 | D | |
| | otentia | I Recreational | | | | | Known | Potential | |
| Public ownership or public easemer Private ownership with general publ | otentia | I Recreational | access (no po | ermissio | n required) | | .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 | | |
| A LINE LINE WILL LINE | | |

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 | 3.695 | | | | | | | |
| C. General Wildlife Habitat | high 0.90 | 1.00 | 6.651 | * | | | | | | |
| D. General Fish Habitat | NA | NA | 0 | | | | | | | |
| E. Flood Attenuation | mod 0.50 | 1.00 | 3.695 | | | | | | | |
| 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 | 5.912 | | | | | | | |
| J. Groundwater Discharge / Recharge | high 1.00 | 1.00 | 7.39 | * | | | | | | |
| K. Uniqueness | low 0.30 | 1.00 | 2.217 | | | | | | | |
| L. Recreation / Education Potential (bonus point) | high 0.20 | | 1.478 | | | | | | | |
| Total Points | 7.2 | 10 | 53.208 Total | Functional Units | | | | | | |
| Percent of Possible Score 72% (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 ☐ 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: <u>Big Muddy</u> 2. MDT Project #: <u>NH 1-10(626)</u> 3. Control #: <u>4058-001</u> | | | | | | | | | | | |
|---|--|--|--|----------------|--|--|--|--|--|--|--|
| 3. Evaluation Date: 6/29/2016 | 4. Evaluator(s): M&T Traxle | er 5. Wetland/Site #(s): North | 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 2 | | | | | | | | | | | |
| Watershed: 12 - Lower Missouri County: _ Roosevelt | | | | | | | | | | | |
| 8. Wetland Size (acre):(visually estimated) Purpose of Evaluation: | | | | | | | | | | | |
| = 0 /1 | oost-construction | | | | | | | | | | |
| ☐ Other | TLAND AND AQUATIC HABIT | (see manual for de | termining AA) 0.73 (measu | | | | | | | | |
| ☐ Other | | (see manual for de | termining AA) 0.73 (measu | | | | | | | | |
| Other | TLAND AND AQUATIC HABIT | (see manual for de FATS IN AA (See manual for d | termining AA) <u>0.73</u> (measu efinitions.) | red, e.g. GPS) | | | | | | | |
| Other 10. CLASSIFICATION OF WE HGM Class (Brinson) | TLAND AND AQUATIC HABIT | (see manual for de FATS IN AA (See manual for d | termining AA) <u>0.73</u> (measu efinitions.) Water Regime | red, e.g. GPS) | | | | | | | |
| Other 10. CLASSIFICATION OF WE HGM Class (Brinson) | TLAND AND AQUATIC HABIT | (see manual for de FATS IN AA (See manual for d | termining AA) <u>0.73</u> (measu efinitions.) Water Regime | red, e.g. GPS) | | | | | | | |
| Other 10. CLASSIFICATION OF WE HGM Class (Brinson) | TLAND AND AQUATIC HABIT | (see manual for de FATS IN AA (See manual for d | termining AA) <u>0.73</u> (measu efinitions.) Water Regime | red, e.g. GPS) | | | | | | | |
| Other 10. CLASSIFICATION OF WE HGM Class (Brinson) | TLAND AND AQUATIC HABIT | (see manual for de FATS IN AA (See manual for d | termining AA) <u>0.73</u> (measu efinitions.) Water Regime | red, e.g. GPS) | | | | | | | |
| Other 10. CLASSIFICATION OF WE HGM Class (Brinson) | TLAND AND AQUATIC HABIT | (see manual for de FATS IN AA (See manual for d | termining AA) <u>0.73</u> (measu efinitions.) Water Regime | red, e.g. GPS) | | | | | | | |

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

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.

| | Predominan | 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.

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

| 14A. HABITAT FOR FEDER | 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) | | | | | | | | | | | | | | | | | | | | |
| i. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating. | | | | | | | | | | | | | | | | | | | | |
| Highest Habitat Level | Doc/l | Prima | ry S | us/P | rimary | Do | c/Sec | onda | ry S | us/Sed | conda | ry | Doc/Ir | nciden | ıtal | Sus/ | Incide | ntal | None | • |
| Functional Point/Rating | | | | - | | | | | | - | - | | | | | | | | 0L | |
| Sources for documented use (e.g. observations, records): <u>USFWS database for Roosevelt County</u> | | | | | | | | | | | | | | | | | | | | |
| 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. | | | | | | | | | | | | | | | | | | | | |
| i. 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 | | | | | | _ | | | | | _ | | | | | O // | | -1-1 | N | 7 |
| Highest Habitat Level | Doc/I | Prima | ry S | us/P | rimary | Do | c/Sec | onda | ry S | us/Sec | conda | ry | Doc/Ir | nciden | ital | Sus/I | ncide | ntal | None | 4 |
| S1 Species Functional Point/Rating S2 and S3 Species | | | | - | | | | | | | | | | | | | | | | |
| Functional Point/Rating | | | | - | | | | | | .5 | М | | | | | | | | | |
| Sources for documented us | e (e.g. | obse | rvation | s, red | cords): | MTNI | IP trac | cker f | or Roc | sevelt | Count | У | | | ı | | | | | 4 |
| 14C. GENERAL WILDLIFE I | HABIT | AT RA | ATING | | | | | | | | | | | | | | | | | |
| i. Evidence of Overall Wildl | ife Us | e in th | e AA: | Che | ck sub | stantia | al, mod | derate | e, or lo | w base | ed on s | uppo | rting e | evidend | ce. | | | | | |
| ☐ 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, g habit | or hig tracks at feat | jh spe s, nes ures | ecies d t struct not ava | tures, ailable | game | trails, | etc. | • | | few little spar | or no v to no v se adj | wildlife wildlife acent u | obser sign upland | vatior food | source | ng pea | eck]. ak use dge of <i>F</i> | |
| Moderate: Based on any or solutions of scatters common occurrence of adequate adjacent uplar interview with local biol | ed wild wildlife and foo | llife gro e sign d sou | oups o such a rces | r indi as sca | at, trac | ks, ne | | | | | | 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 \ (see : | enly di #10). | stribut Abbre | ed, th viatio | ne mos | t and surfac | least p e wate | reval r dura | ent ve ations | getate are as | d class follows | ses m s: P/F | nust be P = per | withir rmane | n 20% nt/pere | of ea ennial | ch othe | | | |
| Structural Diversity | | | | | High | | | | | | - IX | 1 Mo | derate | , | | | | | οw | |
| (see #13) Class Cover Distribution | | □ Ε | ven | | | ☐ Un | even | | | ⊠ E | | <u></u> | | Un | even | | | | | |
| (all vegetated classes) Duration of Surface | P. /P | | | | | | | | D. | | | | D. " | 6" | | | D.''D | | 1 | |
| 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 | | | | | | | | | | Н | | | | | | | | | | |
| (see #12i) ☐ Moderate Disturbance | | | | | | | | | | | | | | | | | | | | |
| at AA (see #12i) | | | | | | | | | | | | | | | | - | | | | |
| ☐ High Disturbance at AA (see #12i) | | | | | | | | | | | | | | | | | | | | |
| iii. Rating: Use the conclusion | ons fro | <u>m i</u> an | <u>nd ii</u> ab | ove a | and the | <u>m</u> atri | x belov | w to s | elect t | he fun | <u>ctio</u> nal | poin | t and r | ating. | | | | | | |
| Evidence of Wildlife Use | | | | | W | /ildlife | Habit | at Fe | ature | s Ratir | ng (ii) | | | | | | | | | |
| (i) | | _ Exc | ceptio | nal | | \boxtimes | High | | | □ Мо | derate | 9 | | ☐ Lo | w | _ | | | | |
| Substantial | | | | | | | | | | | | | | | | _ | | | | |
| | | | | | - | | 7M | | - | | | | - | | | | | | | |
| Minimal Comments: Seesand waterf | ovel le c | hitat - | | nt - | nnhil-i- | n h | | ores: | | - | | | | | | _ | | | | |
| Comments: Seasonal waterfo | owi nai | oitat, a | abunda | ant ar | nphibia | an bre | eaing a | areas | <u>.</u> | | | | | | | | | | | |

AA contains no outlet or restricted outlet

AA contains unrestricted outlet

25-75%

.5M

| | | | | | | , | Wetla | nd/Sit | e #(s): | North (| Cell - F | rese | vation | | | | | |
|--|---|---|--|---|----------|---|---|--|--|--|--|-------------|--|---------------------------|--|--|----------------------------------|--------------------------|
| I4D. GENERAL FISH HABIT If the AA is not used by entrapped in a canal], the | fish, fis | sh use is | | rable di | ue to h | | const | traints | , or is n | ot des | ired fro | om a r | nanag | ement | perspe | ective | [such a | as fish |
| Assess this function if the precluded by perched contact the contact and the precluded by perched contact the precluded by perched contact the precluded by the | | | | he exist | ting sit | tuation | is "co | orrecta | able" su | ch tha | t the A | A cou | ıld be u | used by | / fish [i | i.e., fis | sh use | is |
| Type of Fishery: C | old Wa | ater (CW) |) 🔲 Wa | rm Wat | er (W | W) U | se the | e CW o | or WW | guideli | nes in | the m | anual t | o comp | olete th | e mat | rix. | |
| . Habitat Quality and Know | n / Sus | spected | Fish Spe | cies in | AA: l | Use m | atrix t | o sele | ct the f | unction | al poi | nt and | l rating | | | | | |
| Duration of Surface | □Р | ermaner | nt / Peren | nial | | □s | easo | nal / lı | ntermit | tent | | ПТ | empo | rary / I | Enhem | neral | | |
| Water in AA Aquatic Hiding / Resting / | | ¬ | , r c.c | т г | 1 | - | 7 | | | Г | 1 |] | ¬ | Г Г | 7 | го. с. | 1 | |
| Escape Cover | Opti | imal A | Adequate | Po | oor | Opti | mal | Ade | quate | Po | or | Opt | timal | Adec | quate | Po | oor | |
| 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 | fish e | inn note | entially fo | und in | ΔΔ- | IL | l | <u> </u> | <u> </u> | <u> </u> | <u> </u> | | | | | | | 1 |
| i. Modified Rating: NOTE: It a) Is fish use of the AA signific MDEQ list of waterbodies in no support, or do aquatic nuisand b) Does the AA contain a documentive fish or introduced game ii. Final Score and Rating: | cantly respect of the plant of | educed by TMDL de tor animal ed spawn YES naments: Name Subjected from in the control of the | by a culve evelopment and species ing area of the dispersion of the manual for ection of the | rt, dike, nt with s (see) or other core in ed to 14 ing via I or over addition where 2 | or oth | ther ma "Proba ndix E) al habit a 0.1 = annel o flow, c | n-mac ble In occu tat fee r over check e). En h banl | de strumpaire in fis ature (or \textsquare I or \textsqua | d Uses th habit i.e., san No flow. A box a thment epth ele | " included at? □ notuary and pro ratio = | yes, yeol, yeol, yeol, yeol, | reduce upwe | warm to ce score score score score are score a | water free in i kerea; sp | ishery by 0.1 : ecify in nkfull v on eac | or aque = (in comination of comination o | uatic lift or VI ments) e of the | fe N0 I for |
| C stream type D stream | | E strea | am type | | | eam ty | | | A stre | eam typ | oe | | ream ty | | G str | ream t | rype | |
| . Rating: Working from top to | bottor | m. use th | ne matrix h | pelow to | o selec | ct the f | unctio | onal no | oint and | d rating | l. | | | | | | | |
| Estimated or Calculated | | | t 🗆 S | Slightly | Entrer | nched | | Mod | erately | Entrer | | | | Entren | | |] | |
| (Rosgen 1994, 1996) Percent of Flooded Wetland | d Clas | منائما دء | | D, E str | eam t | ypes | | | stream | n type | \square | _ | A, F, G | strea | m type | S | l | |
| Forested and/or Scrub/Sh | | Silled as | 5 75% | 25-7 | 」 75% | └ <25% | | ∐ '5% | ∐ 25-75 | 5% < | ⊠ ≲25% | 75 | _ | ☐ 25-75° | % < | □ 25% | | |

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.

25-75%

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

| 14F. | F. SHORT AND LONG TERM SURFACE WATER STORAGE | NA (proceed to 14G) |
|------|--|--|
| | Applies to wetlands that flood or pond from overbank or in-channel flo | ow, precipitation, upland surface flow, or groundwater flow. |
| | If no wetlands in the AA are subject to flooding or ponding, then chec | k 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.

| 14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVA | L \[\sum \text{NA} \text{ (proceed to 14H)} \] |
|--|--|
|--|--|

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 | has potent nutrients, such that substantia sedimenta | es or surro tial to deliv or compou other funcire illy impaire ition, sourc or signs of | er sedime inds at lev ions are r d. Minor es of nutr | ents, rels not rients or | Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present. | | | | | |
|--|--|---|--|-----------------------------------|---|------|-----------------|------|--|--|
| % Cover of Wetland Vegetation in AA | ⊠≥ | 70% | □ < | 70% | □≥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: 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 S | 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 | | | | | | | |
| ☐ 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 | | Vegeta | ited Co | mponent | t >5 ac | res | | Vegeta | ated Co | mponent | 1-5 ac | | | | | | | |
|-------|-------------------|--------|---------|---------|---------|-----|------------|--------|---------|---------|--------|----|-----|----|-----|-----|-----|----|
| В | ☐ High ☐ Moderate | | ☐ Low | | ☐ High | | ☐ Moderate | | ☐ Low | | ☐ High | | | | 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 | | | | | | | | | | | | | | | | | | |

15. GENERAL SITE NOTES: _____

| echanical |
|---------------------------------|
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| ing layer. decreases. |
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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 | 0.365 | | | | | | |
| C. General Wildlife Habitat | mod 0.70 | 1.00 | 0.511 | * | | | | | |
| D. General Fish Habitat | NA | NA | 0 | | | | | | |
| E. Flood Attenuation | mod 0.50 | 1.00 | 0.365 | | | | | | |
| F. Short and Long Term Surface Water Storage | low 0.30 | 1.00 | 0.219 | * | | | | | |
| G. Sediment / Nutrient / Toxicant Removal | high 1.00 | 1.00 | 0.73 | * | | | | | |
| H. Sediment / Shoreline Stabilization | high 0.90 | 1.00 | 0.657 | | | | | | |
| I. Production Export / Food Chain Support | mod 0.40 | 1.00 | 0.292 | | | | | | |
| J. Groundwater Discharge / Recharge | mod 0.70 | 1.00 | 0.511 | * | | | | | |
| K. Uniqueness | mod 0.40 | 1.00 | 0.292 | | | | | | |
| L. Recreation / Education Potential (bonus point) | high 0.20 | | 0.146 | | | | | | |
| Total Points 5.6 10 4.088 Total Fun | | | | | | | | | |
| Percent of Possible | e Score 56% (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)

| Evaluation Date: 6/29/2016 4. Evaluator(s): M&T Traxler 5. Wetland/Site #(s): South 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 Missouri County: _ Roosevelt | | | | | | | | | | | | | | |
| 7. Evaluating Agency: RESPEC for MDT Purpose of Evaluation: Wetland potentially affected by MDT project Mitigation wetlands; pre-construction Mitigation wetlands; post-construction Other Other 10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.) 8. Wetland Size (acre): (visually estimated) 4.17 (measured, e.g. GPS) 4.17 (measured, e.g. GPS) | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | % OF AA | | | | | | | | | | |
| | | 1 | / | % OF AA | | | | | | | | | | |
| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | | | | | | | | | | | |
| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | | | | | | | | | | | |
| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | | | | | | | | | | | |
| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | | | | | | | | | | | |
| HGM Class (Brinson) | Class (Cowardin) | Modifier (Cowardin) | Water Regime | | | | | | | | | | | |

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.

| | Predominant 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.

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 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) | | | | | | | | | | | | | | | | | | | | |
| | _ | | | | | _ | | | | pondin | g func | tiona | l point | and ra | ting. | | | | | |
| Highest Habitat Level | Doc/P | rimar | y S | us/P | rimary | Do | c/Sec | onda | ry S | us/Se | conda | ry | Doc/Ir | nciden | tal | Sus/ | Incide | ntal | None |) |
| Functional Point/Rating | - | | | - | | | | | | - | | | | | | | | | 0L | |
| Sources for documented us | e (e.g. | obser | vation | s, red | cords): | USFV | VS dat | abas | e for F | Roosev | elt Cou | ınty | | | | | | | | |
| 14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM Do not include species listed in 14A above. | | | | | | | | | | | | | | | | | | | | |
| 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 II. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating. | | | | | | | | | | | | | | | | | | | | |
| | | | | | | _ | | | | | | | | | | | | | | = |
| Highest Habitat Level | Doc/P | rimar | y S | us/P | rimary | Do | c/Sec | onda | ry S | us/Se | conda | ry | Doc/Ir | rciden | tal : | Sus/I | ncider | ntal | None | 4 |
| S1 Species Functional Point/Rating | | | | | | | | | | | | | | | | | | | | |
| S2 and S3 Species Functional Point/Rating | - | | | - | | | | | | .5 | M | | | | | | | | | |
| Functional Point/Rating | | | | | | | | | | | | | | | | | | | | |
| 14C. GENERAL WILDLIFE H | IABITA | AT RA | TING | | | | | | | | | | | | | | | | | |
| i. Evidence of Overall Wildli | fe Use | in th | e AA: | Che | ck sub | stantia | al, mod | lerate | e, or lo | w base | ed on s | uppo | rting e | vidend | ce. | | | | | |
| Substantial: Based on any of the following [check]. □ observations of abundant wildlife #s or high species diversity (during any period) □ few or no wildlife observations during peak use periods □ presence of extremely limiting habitat features not available in the surrounding area □ little to no wildlife sign □ sparse adjacent upland food sources □ interview with local biologist with knowledge of the AA □ interview with local biologist with knowledge of AA | | | | | | | | | | | | | | | | | | | | |
| ⊠ observations of scattere ⊠ common occurrence of □ adequate adjacent upla □ interview with local biological. | ed wildl wildlife nd food | ife gro sign : d sour | oups o such a ces | r indi as sca | at, trac | ks, ne | | | | | | k peri | ods | | | | | | | |
| ii. Wildlife Habitat Features: For class cover to be consider percent composition of the AA S/I = seasonal/intermittent; T/E | ed eve (see # | enly di: #10). | stribut Abbre | ed, th viatio | ne mos | t and surfac | least p e wate | reval r dur | ent ve ations | getate are as | d class follows | ses m s: P/F | nust be P = per | withir mane | n 20% (nt/pere | of ea ennial | ch othe | ersity er in te | is from erms of | #13. their |
| Structural Diversity (see #13) | | | | | High | | | | ⊠ Moderate | | | | | | | | | | .ow | |
| Class Cover Distribution (all vegetated classes) | | □ E | ven | | | ☐ Un | even | | | ⊠E | ven | | | ☐ Un | even | | | □ E | | |
| 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 (see #12i) | | | | | | | | | | Н | | | | | | | | | | |
| ☐ Moderate Disturbance | | | | | | | | | | | | | | | | | | | | |
| at AA (see #12i) High Disturbance at | | | | | | | | | | 1 | | | | | | | | | | |
| AA (see #12i) | | | | | | | | | | | | | | | | | | | | |
| | _ | | | | | | | | | | | | | | | | | | | |
| iii. Rating: Use the conclusion | ons froi | m i an | d ii ab | ove a | | | | | | | | poin | t and r | ating. | | _ | | | | |
| Evidence of Wildlife Use | 1 - | ¬ =v/ | contio | nal | ٧١ | | | at Fe | eature | s Ratir | ng (II) oderate | | | ☐ Lo | | | | | | |
| (i) ☐ Substantial | | | eptio | ııaı | | | High | | | IVIC | alt | • | | | ** | - | | | | |
| | | | | | 1 | | .7M | | 1 | | | | | | | | | | | |
| ☐ Minimal | | | | | | | | | | | | | | | | | | | | |
| Comments: Several bird spec | ies an | d sign | s of w | ildlife | obser | ved di | uring si | te vis | sits. | | | | | | | | | | | |

B-37

A, F, G stream types

| | Wetland/Site #(s): South Cell - Created | | | | | | | | | | | | | | | | | | |
|--|---|-------------|----------------|-------------|----------|----------------|-------------------------|-----------------|---------------|------------------|----------|----------------|------------------|---------------------------|----------|----------|---------|----------------|-----------|
| If the AA is not used by | 14D. GENERAL FISH HABITAT Note Note Note Note Note 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. | | | | | | | | | | | | | | as fish | | | | |
| | 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]. | | | | | | | | | | | | | | | is | | | |
| Type of Fishery: | old Wa | ater (CI | w) [| -] Warr | n Wat | er (W\ | N) U | se the | CW o | or WW | guideli | nes in | the m | anual t | о сотр | lete th | e matı | ix. | |
| i. Habitat Quality and Know | n / Sus | specte | d Fish | Spec | ies in | AA: l | Jse m | atrix to | o sele | ct the f | unction | al poi | nt and | l rating | | | | | |
| Duration of Surface Water in AA | □ P | erman | ent / P | erenn | ial | | □s | easoı | nal / Ir | ntermit | tent | | □ T | empo | rary / I | Ephen | neral | | |
| Aquatic Hiding / Resting / Escape Cover | / | | | Po | oor | Optimal A | | Ade | Adequate Poor | | | Opt | imal | Adec | uate | Poor | | | |
| 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 spp. potentially found in AA: | | | | | | | | | | | | | | | | | | | |
| ii. Modified Rating: NOTE: | | | | • | | | e less | than (| 0.1. | | | | | | | | | | |
| a) Is fish use of the AA signifi | cantly r | educed | d by a d | culvert | dike. | or oth | ner ma | n-mad | de stru | ıcture d | or activ | ity. or | is the | wateri | body ir | nclude | d on th | ne curr | ent final |
| MDEQ list of waterbodies in r support, or do aquatic nuisan | eed of | TMDL | develo | pmen | t with i | listed ' | "Proba | ble In | npaire | d Uses | " includ | ding co | old or | warm ı | vater f | ishery | or aqu | ıatic lit | e |
| b) Does the AA contain a doc native fish or introduced game | | | | | | | | | | | nctuary | pool, | upwe | lling ar | rea; sp | ecify ir | n comi | ments) | for |
| iii. Final Score and Rating: | Com | nments | s: Clos | ed we | tland c | ell wit | h no d | irect s | surface | e water | inlet o | r outle | et. | | | | | | |
| 14E. FLOOD ATTENUATION Applies only to wetland If wetlands in AA are no | s that a | are sub | NA (priject to | floodir | ng via | in-cha | nnel o flow, o | r over check | bank t | flow. A box a | and pro | ceed | to 14F | ·. | | | | | |
| Entrenchment Ratio (ER) Es Flood-prone width = estimate | | | | | | | | | | | | | | | | | | e of the | e stream. |
| / | = | | _ | | | | | 9 | × | | | | | | | Á | 900 | | |
| flood prone width / bankfull wi | dth = e | ntrenc | hment | ratio | | 2 x | Bankt | full De | pth | | W. | ENEX | = XX X | | No. | | | rone W idth | idth |
| | | | | | | | | | | В | ankfull | Depth | /ww | ood | | | | | |
| Slightly Ent | renche | ed | | | Mod | eratel | y Enti | rench | ed | | | | Ent | renche | ed | | | | |
| ER 2 C stream type D stream | | F sti | ream ty | /ne | | | 1.41 – eam ty | | | A stre | am tyr | ne l | | : 1.0 – ream ty | | G st | ream t | vne | |
| S distant type | | | L. | 5 | | 7- | | - / | | 7.5.10 | | | - | | == | | |) po | |
| i. Rating: Working from top t | | | | | | | | | | | | | | | ntren | ala a d | | | |

Percent of Flooded Wetland Classified as \boxtimes Forested and/or Scrub/Shrub 75% 25-75% 75% 25-75% 75% 25-75% <25% <25% <25% AA contains no outlet or restricted outlet .5M AA contains unrestricted outlet ------------------------

C, D, E stream types

(Rosgen 1994, 1996)

B stream type

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

| 14 | 4F. SHORT AND LONG TERM SURFACE WATER STORAGE |
|----|--|
| | Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. |
| | If no wetlands in the AA are subject to flooding or ponding, 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 | \boxtimes | >5 acre fo | 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.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVALApplies 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 | nutrients, such that substantia sedimenta | tial to deliv or compou other funct illy impaire | er sedime nds at lev ions are r d. Minor es of nutr | ents, els oot ients or | Waterbody is need of TMDI causes" relat toxicants or A has potential nutrients, or of 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 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 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 | Genera | I Wildlife Habitat Rati | ng (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 | | | | | | ☑ Vegetated Component 1-5 acres | | | | | ☐ Vegetated Component <1 acre | | | | | |
|-------|-----|--------------------------------|-----|---------|-----|-----|--------|---------------------------------|------|--------|-----|-----|-------------------------------|------|------|--------|-----|-----|
| В | ⊦ | ligh | M | oderate | | Low | _ _ | ligh | ⊠ Mc | 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 | | | | | | | | | | | | | | | | | | |
| 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 C | CHAIN S | | | | | | | | |
|---|--|--|---|---|--|--|--|---|---|
| | | UPPURI (CON | tinued) | | | | | | |
| iii. Modified Rating: Note: Modified sc | ore cann | ot exceed 1.0 | or be less that | n 0.1. | | | | | |
| Vegetated Upland Buffer: Area wir 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 buff | 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 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 of a natur etland ecuring drou but no ir | season/drougl al slope. lge. ight periods. nlet. | nt. | ☐ Pe ☐ W ☐ St | etland contain | ors strate present v is inlet but no o wn 'losing' stre | outlet. | , , , | 0 , |
| iii. Rating: Use the information from i a | and ii abo | | | | | | | | a |
| | | Duration of S | Saturation at | AA Wetla | inds <u>FROM C</u> | ROUNDWAT | ER DISC | <i>HARGE</i> or | |
| Criteria | | <u>WITH W</u> □ P/P | <u>'ATER THAT I</u> ⊠ S | | <u>ARGING THE</u> □ T | GROUNDWA | No □ | | |
| ☐ Groundwater Discharge or Recharge | arge | | .7M | | <u></u> | | | 110 | 1 |
| ☐ Insufficient Data/Information | u. go | | | <u>' </u> | | | | | 1 |
| Comments: | | | | | | | | | • |
| 14K. UNIQUENESS | | | | | | | | | |
| | | | | | | | | | |
| i. Rating: Working from top to bottom, | use the r | natrix below to | select the fun | ctional p | oint and rating | J. | | | |
| i. Rating: Working from top to bottom, Replacement Potential | AA cor spring foreste | ntains fen, bo s or mature (: ed wetland OF ation listed a: | g, warm >80 yr-old) ⋜ plant | AA doo cited ra diversi contain | oint and rating es not contain are types ANI ty (#13) is high ns plant asso as "S2" by the | n previously O structural gh OR ciation | previo | es not contai usly cited rar ations AND s ty (#13) is lo | e types OR tructural |
| | AA cor spring foreste associ the MT | ntains fen, bo s or mature (: ed wetland OF ation listed a: | g, warm >80 yr-old) ⋜ plant | AA doc cited ra diversi contain listed a | es not contain are types ANI ty (#13) is hig as plant asso | n previously D structural gh OR ciation e MTNHP | previou associ diversi | usly cited rar ations AND s ty (#13) is lo | e types OR tructural |
| Replacement Potential Estimated Relative Abundance (#11) Low Disturbance at AA (#12i) | AA cor spring foreste associ the MT | ntains fen, bo s or mature (; ed wetland OF ation listed a NHP | g, warm >80 yr-old) R plant s "S1" by | AA doc cited ra diversi contain listed a | es not containare types ANI ty (#13) is high ns plant asso as "S2" by the | n previously D structural gh OR ciation e MTNHP Abundant | previou associ diversi | usly cited rar ations AND s ty (#13) is lo | e types OR tructural w-moderate |
| Replacement Potential Estimated Relative Abundance (#11) Low Disturbance at AA (#12i) Moderate Disturbance at AA (#12i) | AA col spring foreste associ the MT | ntains fen, bo s or mature (; ed wetland Of ation listed a NHP | g, warm -80 yr-old) R plant s "S1" by Abundant | AA doc cited radiversi contain listed a | es not container types ANI ty (#13) is high s plant asso s "S2" by the Common | n previously D structural gh OR ciation e MTNHP D Abundant | previou associ diversi | usly cited rar ations AND s ty (#13) is lo | e types OR tructural w-moderate |
| Replacement Potential Estimated Relative Abundance (#11) Low Disturbance at AA (#12i) Moderate Disturbance at AA (#12i) High Disturbance at AA (#12i) | AA cor spring foreste associ the MT | ntains fen, bo s or mature (; ed wetland Of ation listed a NHP | g, warm >80 yr-old) R plant s "S1" by | AA doc cited radiversi contain listed a | es not contain are types ANI ty (#13) is high as plant asso as "S2" by the Common | n previously D structural gh OR ciation e MTNHP Abundant | previou associ diversi | usly cited rar ations AND s ty (#13) is lo | e types OR structural w-moderate Abundant |
| Replacement Potential Estimated Relative Abundance (#11) Low Disturbance at AA (#12i) Moderate Disturbance at AA (#12i) | AA col spring foreste associ the MT | ntains fen, bo s or mature (; ed wetland Of ation listed a NHP | g, warm -80 yr-old) R plant s "S1" by Abundant | AA doc cited radiversi contain listed a | es not container types ANI ty (#13) is high s plant asso s "S2" by the Common | n previously D structural gh OR ciation e MTNHP D Abundant | previou associ diversi | usly cited rar ations AND s ty (#13) is lo | e types OR structural w-moderate Abundant |
| 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 recreii. Check categories that apply to the | AA coi spring foreste associ the MT Rare TENTIAL es a recre eational | ntains fen, bo s or mature (: ed wetland OF ation listed as NHP Common eational or edu or educational Educational/S Other: | g, warm -80 yr-old) R plant s "S1" by Abundant NA (proceed locational opport al site? X YE cientific Study | AA doc cited rediversity contain listed a Rare | es not container types ANI ty (#13) is higher assons "S2" by the Common Ill Summary ani | n previously D structural gh OR ciation e MTNHP D Abundant nd Rating pag | previous associ diversi Rare e) | usly cited rar ations AND s ty (#13) is lor Common | e types OR structural w-moderate Abundant .3L |
| 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 recreii. Check categories that apply to the iii. Rating: Use the matrix below to select | AA coi spring foreste associ the MT Rare TENTIAL es a recre eational AA: | ntains fen, bo s or mature (: ed wetland OF ation listed as NHP Common eational or edu or educational Educational/S Other: nctional point | g, warm -80 yr-old) R plant s "S1" by Abundant NA (proceed locational opporal site? X YE cientific Study | AA doc cited radiversic contain listed a listed | es not container types ANI ty (#13) is higher assons "S2" by the Common Ill Summary ani | n previously D structural gh OR ciation e MTNHP D Abundant nd Rating pag | previous associ diversi Rare e) Non-con | usly cited rar ations AND s ty (#13) is lor Common sumptive recr | e types OR tructural w-moderate Abundant .3L |
| 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 recreii. Check categories that apply to the iii. Rating: Use the matrix below to select Known or F | AA coi spring foreste associ the MT Rare TENTIAL es a recre eational AA: cot the fu | ntains fen, bo s or mature (: ed wetland OF ation listed a: NHP Common eational or edu or educational Educational/S Other: nctional point: Recreational | g, warm -80 yr-old) R plant s "S1" by Abundant NA (proceed locational opporal site? Ye cientific Study and rating. or Education | AA doo cited ra diversi contain listed a Rare to Overa tunity. ES, go to | es not container types ANI ty (#13) is higher assons "S2" by the Common Ill Summary ani ii. NO, consumptive Reconstruction | n previously D structural gh OR ciation e MTNHP D Abundant nd Rating pag | previous associ diversi Rare | usly cited rar ations AND s ty (#13) is lor Common sumptive recr | e types OR tructural w-moderate Abundant .3L |
| 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 recreii. Check categories that apply to the iii. Rating: Use the matrix below to select | AA coi spring foreste associ the MT Rare TENTIAL es a recre eational AA: cot the fu Potential nt with g | ntains fen, bo s or mature (: ed wetland OF ation listed a: NHP Common eational or edu or educational Educational/S Other: nctional point: Recreational eneral public | g, warm -80 yr-old) R plant s "S1" by Abundant NA (proceed locational opporal site? Yes cientific Study and rating. or Educational access (no p | AA doo cited radiversic contain listed a listed | es not container types ANI ty (#13) is higher assons "S2" by the Common Ill Summary ani ii. NO, consumptive Reconstruction | n previously D structural gh OR ciation e MTNHP D Abundant nd Rating pag | previous associ diversi Rare e) Non-con | usly cited rar ations AND s ty (#13) is lor Common sumptive recr | e types OR tructural w-moderate Abundant .3L |
| 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 recreii. Check categories that apply to the iii. Rating: Use the matrix below to select Known or Fublic ownership or public easemer | AA coi spring foreste associ the MT Rare TENTIAL es a recre eational AA: cot the fu Potential nt with g | ntains fen, bo s or mature (: ed wetland OF ation listed a: NHP Common eational or edu or educational Educational/S Other: nctional point: Recreational eneral public | g, warm -80 yr-old) R plant s "S1" by Abundant NA (proceed locational opporal site? Yes cientific Study and rating. or Educational access (no p | AA doo cited radiversic contain listed a listed | es not container types ANI ty (#13) is higher assons "S2" by the Common Ill Summary ani ii. NO, consumptive Reconstruction | n previously D structural gh OR ciation e MTNHP D Abundant nd Rating pag | previous associ diversi diversi la Rare | usly cited rar ations AND s ty (#13) is lor Common sumptive recr | e types OR tructural w-moderate Abundant .3L |

Wetland/Site #(s): South Celll - 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 | 2.085 | |
| C. General Wildlife Habitat | mod 0.70 | 1.00 | 2.919 | * |
| D. General Fish Habitat | NA | NA | 0 | |
| E. Flood Attenuation | mod 0.50 | 1.00 | 2.085 | |
| F. Short and Long Term Surface Water Storage | high 0.90 | 1.00 | 3.753 | * |
| G. Sediment / Nutrient / Toxicant Removal | high 1.00 | 1.00 | 4.17 | |
| H. Sediment / Shoreline Stabilization | high 0.90 | 1.00 | 3.753 | * |
| I. Production Export / Food Chain Support | mod 0.40 | 1.00 | 1.668 | |
| J. Groundwater Discharge / Recharge | mod 0.70 | 1.00 | 2.919 | * |
| K. Uniqueness | low 0.30 | 1.00 | 1.251 | |
| L. Recreation / Education Potential (bonus point) | high 0.20 | | 0.834 | |
| Total Points | 6.1 | 10 | 25.437 Total | Functional Units |
| Percent of Possible | le Score 61% (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 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 <u>wetland</u> component < 1 acre (do <u>not</u> include upland vegetated buffer); and |
| Percent of possible score < 35% (round to nearest whole #). |
| The country of possible seeds a control (realist to hearest miles in). |
| |
| |
| 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: 6/29/2016 | Evaluation Date: 6/29/2016 4. Evaluator(s): M&T Traxler 5. Wetland/Site #(s): South Cell - Preservation | | | | | | | | | |
| Wetland Location(s): Township 28 N, Range 55 E, Section 21; Township N, Range E, Section | | | | | | | | | | |
| Approximate Stationing or | Approximate Stationing or Roadposts: ~639.75 on Hwy 2 | | | | | | | | | |
| Watershed: 12 - Lower Mis | ssouri County: Roosevelt | | | | | | | | | |
| Purpose of Evaluation: Wetland potentially af Mitigation wetlands; p Mitigation wetlands; p Other | Wetland potentially affected by MDT project Mitigation wetlands; pre-construction Mitigation wetlands; post-construction 9. Assessment Area (AA) Size (acre): (visually estimated) | | | | | | | | | |
| | TLAND AND AQUATIC HABIT | \ | , | 2/ 27 11 | | | | | | |
| 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.) common
- 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 abandonded 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 | | 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.

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

| 14A. HABITAT FOR FEDER | SITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS | | | | | | | | | | | | | | | | | | | |
|--|--|-------------------------------|--------------------------|-------------------|----------|-----------------|-------------------|----------------|-------------------------|------------------|--------------------|-----------------|--------------------|----------------|---------------|------------------|---------|--------------------|-------------------|---------------|
| i. AA is Documented (D) or Primary or critical habitat (Ii Secondary habitat (Iist spe Incidental habitat (Iist spec No usable habitat | ist spe cies) ies) | ecies) | | D [D [D [|] | | | | | | | | | | | | | | | |
| ii. Rating: Based on the strong | _ | | | | | | | | | | | | | | | | | . [| | |
| Highest Habitat Level | Doc/ | Prima | ry S | us/P | rimary | / Do | c/Sec | onda | ry S | us/Sed | conda | ту | Doc/Ir | nciden | tal | Sus/ | Incide | ntal | None | • |
| Functional Point/Rating | | | | | | | | | | | - | | | | | | | | 0L | |
| Sources for documented us | e (e.g | . obse | rvation | s, re | cords): | USFV | VS dat | abas | e for R | Roosev | elt Cou | ınty | | | | | | | | |
| 14B. HABITAT FOR PLANT Do not include species | | | | | S1, S | 82, OR | S3 B | Y TH | E MON | NTANA | NATU | JRAL | HER | ITAGE | PRO | GRAN | Л | | | |
| i. AA is Documented (D) or Primary or critical habitat (Ii Secondary habitat (list spe Incidental habitat (list spec No usable habitat | ist spe | | | D [D [D [| | lue He | eron (S | <u>3)</u> | | | n manı | ual. | | | | | | | | |
| ii. Rating: Based on the stro | | | | | | | | | | spondir | ng func | tiona | al point | and ra | ating. | | | | | = |
| Highest Habitat Level | Doc/ | Prima | 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 | 5M | | | | | | | | | | | | | | | | | | | |
| | rces for documented use (e.g. observations, records): MTNHP tracker for Roosevelt County | | | | | | | | | | | | | | | | | | | |
| 14C. GENERAL WILDLIFE HABITAT RATING i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence. 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 interview with local biologist with knowledge of the AA | | | | | | | | | | | | | | | | | | | | |
| Moderate: Based on any or sold sold sold sold sold sold sold sold | ed wild wildlife and foc | llife gro e sign od sou | oups o such a rces | r indi as sca | at, trac | ks, ne | | | | | | c peri | ods | | | | | | | |
| ii. Wildlife Habitat Features For class cover to be conside percent composition of the AA S/I = seasonal/intermittent; T/ | red ev | enly di #10). | stribut Abbre | ed, tł viatio | ne mos | t and surfac | least p e wate | reval r dur | ent ve ations | getate are as | d class follows | ses m s: P/F | nust be P = per | withir mane | 120% ont/pere | of eac ennial | ch othe | ersity er in te | is from rms of | #13. their |
| Structural Diversity | | | | | High | | | | | | \boxtimes | Mo | derate |) | | | | | ow | |
| (see #13) Class Cover Distribution (all vegetated classes) | | | ven | _ | | ☐ Un | even | | | ⊠ E | | _ | | ☐ Un | even | | | E | | |
| 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 | | Ī | | | | | | | | Н | | | | | | | | | | |
| (see #12i) | | | | | | | | | | ļ | | | | | | | | | | |
| ☐ Moderate Disturbance at AA (see #12i) | | | | | | | | | | | | | | | | | | | | |
| ☐ High Disturbance at AA (see #12i) | | | | | | | | | | | | - | | | | | | | | |
| iii. Rating: Use the conclusion | ons fro | m i ar | ıd ii ab | ove a | and the | matri | x belov | w to s | select t | he fun | ctional | poin | t and r | ating. | | | | | | |
| Evidence of Wildlife Use | | Wildlife Habitat Fea | | | | | | | | | | | | | | | | | | |
| (i) | | ☐ Ex | ceptio | nal | | \boxtimes | High | | - | | derate |) | ☐ Low | | 4 | | | | | |
| ☐ Substantial | | | | | | | 71.4 | | | | | | | | | 4 | | | | |
| | - | | | | | | .7M | | | | <u></u> | | | | | - | | | | |
| Comments: | | | | | <u> </u> | | | | <u> </u> | | | | <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): | South | Cell - | Prese | rvation | <u>l</u> | | | | |
|--|-----------|-----------|----------|-------|----------------------------|-----------------|----------------------|-----------------|--|---------------------|----------|----------------------|--|---------------------------|----------|--------------|----------------|-----------|----------------|
| 14D. GENERAL FISH HABIT If the AA is not used by entrapped in a canal], the | fish, fis | sh use is | not re | stora | to 14 ble du proce | ue to h | abitat 14E. | const | raints | , or is n | ot desi | red fro | om a r | nanag | ement | perspe | ective | [such a | as fish |
| Assess this function if the precluded by perched controls. | | | | | e exist | ing sit | uation | is "co | rrecta | ıble" su | ch that | the A | A cou | ld be ι | ised by | / fish [i | i.e., fis | sh use | is |
| Type of Fishery: Co | old Wa | ter (CW) | | Warr | n Wat | er (W\ | N) U | se the | CW o | or WW | guideli | nes in | the m | anual t | о сотр | lete th | e mati | rix. | |
| i. Habitat Quality and Knowi | ı / Sus | pected F | ish S | peci | es in | AA: l | Jse m | atrix t | o sele | ct the f | unction | al poi | nt and | l rating | | | | | _ |
| Duration of Surface Water in AA | □Р | ermanen | t / Pe | renn | ial | | □s | easo | nal / lı | ntermit | tent | | □ T | empo | rary / I | Ephen | neral | | |
| Aquatic Hiding / Resting / Escape Cover | Opti | imal A | dequ | ate | Po | oor | Opti | mal | Ade | quate | Po | or | Op | imal | Adec | 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 | fich c | nn note | ntially | v fou | nd in | ۸۸- | | | | | | | | | | | | | į |
| | | | _ | | | | | | | | | | | | | | | | |
| ii. Modified Rating: NOTE: N | | | | | | | | | | | | | | | | | | | |
| a) Is fish use of the AA signific MDEQ list of waterbodies in ne support, or do aquatic nuisand | ed of | TMDL de | velop | meni | with I | listed ' | "Proba | ble In | npaire | d Uses | " includ | ding co | old or | warm ı | vater f | ishery | or aqu | ıatic lif | ^f e |
| b) Does the AA contain a docu native fish or introduced game | | | | | | | | | | | nctuary | pool, | upwe | lling ar | ea; sp | ecify ir | ı comi | ments) | for |
| iii. Final Score and Rating: _ | | | | | | | | _ ` | | | | | | | | | | | |
| 14E. FLOOD ATTENUATION Applies only to wetlands If wetlands in AA are no | that a | re subiec | t tö flo | oodin | to 14 g via i or ove | in-cha | nnel o flow, d | r over check | bank the N | flow. A box a | ınd pro | ceed | to 14F | ÷. | | | | | |
| Entrenchment Ratio (ER) Es Flood-prone width = estimated | | | | | | | | | | | | | | | | | | e of the | e stream. |
| / | = | | | | | | | 6 | | | | | | | | | O ^C | | |
| flood prone width / bankfull wid | tth = ei | ntrenchm | ent ra | atio | | 2 | D 1 | . 11 D | A STATE OF THE PARTY OF THE PAR | Mark Co | Ye way | lai | _, - | J. | Vac | – / F | lood-p | rone W | idth/ |
| | | | | | | 2 X | Banki | un De | pin 🦠 | | ******** | GNGY. | ************************************** | •••• | | Bank | cfull W | idth | |
| | | | | | | | | | | В | ankfull | Depth | free. | ood - | | | | | |
| Slightly Entr | enche | d | | | Mod | eratel | y Enti | ench | ed | | | | Ent | renche | ed | | | | |
| ER 2 C stream type D stream t | | E strea | m tvn | e | | | 1.41 – eam ty | | | A stre | am tyr | ne l | | : 1.0 – ream ty | | G sti | ream t | vne | |
| o discarrity po | | | | - 📶 | | D | | - 4 | | 710110 | | | | | 4 | <u> </u> | | | |
| | | | | | | | | | | | | | \\. | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| Rating: Working from top to Estimated or Calculated | | | | | | seled Entrer | | | | oint and erately | | | | | Entrend | ched | | Ī | |
| (Rosgen 1994, 1996) | Liiuei | | | | | eam ty | | | | stream | | ioi i c u | | | strear | | 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%

25-75%

<25%

 \boxtimes

<25%

.4M

75%

25-75%

<25%

П

75%

25-75%

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

| 14F. | F. SHORT AND LONG TERM SURFACE WATER STORAGE $\ \square$ | NA (proceed to 14G) |
|------|---|--|
| | Applies to wetlands that flood or pond from overbank or in-channel fl | ow, precipitation, upland surface flow, or groundwater flow. |
| | If no wetlands in the AA are subject to flooding or ponding, then che | k 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 0.3 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 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 of functions are sedimentation or signs of et | 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 | ⊠ 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 14l)

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: 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 | I Wildlife Habitat Rati | ng (14Ciii) |
|-----------------------------|--------|-------------------------|-------------|
| (14Diii) | □ E/H | oxtimes 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 | | | | | | | | ☐ Vegetated Component <1 acr | | | | |
|-------|-----|--------|--------|---------|---------|-----|------------|------|------|--------|-----|-----|-------|------------------------------|------|--------|-----|-----|
| В | ⊦ | ligh | ШМ | oderate | | Low | - ⊦ | ligh | ⊠ Mc | 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 | | | | | | | | | | | | | | | | | | |
| S/I | | | | | | | | | .6M | | | | | | | | | |
| T/E/A | | | | | | | | | | | | | | | | | | |

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

| 44L BRODUCTION EVRORT / FOOD (| | | | | | | | | |
|---|---|--|---|--------------------------------|--|--|---|--|--|
| 14I. PRODUCTION EXPORT / FOOD (| CHAIN S | SUPPORT (con | ntinued) | | | | | | |
| iii. Modified Rating: Note: Modified so | ore can | not exceed 1.0 | or be less than | า 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>.7M</u> Con | - | | aroana 1070 | 0, 110, 10 | to pormitor. | | | 510 III II - <u>1711</u> | <u></u> • |
| 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 duff Wetland contains an outlet, Shallow water table and the Other: | dormant of a natu etland e ring dro but no i e site is | season/droug ral slope. dge. ught periods. nlet. saturated to the | ht. e surface. | ☐ Pe ☐ We ☐ Str ☐ Ot | etland contain ream is a know her: | trate present v s inlet but no c wn 'losing' stre | outlet. | , , , | 0 , |
| iii. Rating: Use the information from i a | and ii ab | | | | | | | | ī |
| Criteria | | | Saturation at <i>I</i> <u>/ATER THAT I</u> ⊠ S | S RECHA | | | | TEM | |
| ☐ Groundwater Discharge or Rech | arge | | .7M | | <u></u> | | | | |
| ☐ Insufficient Data/Information | | | • | • | | | | | |
| 14K. UNIQUENESS i. Rating: Working from top to bottom, | use the | matrix below to | o select the fun | ctional po | oint and rating | ı. | | | |
| Replacement Potential | Replacement Potential foreste associ | | | cited ra | s not contain are types ANI ty (#13) is hig | Structural gh OR | previou | s not contain | |
| · | assoc | iation listed a | s "S1" by | contair | is plant asso s "S2" by the | | | tions AND s y (#13) is lov | tructural |
| Estimated Relative Abundance (#11) | | iation listed a TNHP | | contair listed a | s plant asso s "S2" by the | | diversit | | tructural |
| Estimated Relative Abundance (#11) Low Disturbance at AA (#12i) | the M | iation listed a TNHP | | contair listed a | s plant asso s "S2" by the | e MTNHP | diversit | y (#13) is lov | tructural w-moderate |
| ✓ Low Disturbance at AA (#12i)✓ Moderate Disturbance at AA (#12i) | the M | iation listed a TNHP Common | ☐ Abundant | contair listed a | s plant asso s "S2" by the Common | MTNHP ☐ Abundant | diversity Rare | y (#13) is lov ⊠ Common | tructural w-moderate |
| ✓ Low Disturbance at AA (#12i) ✓ Moderate Disturbance at AA (#12i) ✓ High Disturbance at AA (#12i) | the M | iation listed a TNHP Common | ☐ Abundant | contair listed a | s plant asso s "S2" by the Common | Abundant | diversity Rare | y (#13) is lov ⊠ Common .4M | tructural w-moderate |
| | the M Rare TENTIA es a recre eational AA: | iation listed a TNHP Common Co | NA (proceed ucational opporal site? YE | contair listed a | s plant asso s "S2" by the Common | e MTNHP Abundant nd Rating page | Rare | y (#13) is lov Common .4M | tructural w-moderate Abundant |
| | the M Rare TENTIA es a recre eational AA: | iation listed a TNHP Common Co | NA (proceed ucational opporal site? YE Scientific Study and rating. | to Overatunity. | s plant asso s "S2" by the Common Il Summary ar | e MTNHP Abundant nd Rating page | diversity Rare e) DX. Non-cons | y (#13) is lov Common .4M umptive recre | tructural w-moderate Abundant eational |
| | the M Rare TENTIA es a recreational AA: Cect the fu | iation listed a TNHP Common Co | □ Abundant NA (proceed ucational oppor al site? ☑ YE Scientific Study | to Overatunity. | s plant asso s "S2" by the Common | e MTNHP Abundant nd Rating page | diversity Rare E) Non-cons Known | y (#13) is lov ⊠ Common .4M | tructural w-moderate Abundant eational |
| | the M Rare TENTIA es a recreational AA: ect the fu | iation listed a TNHP Common Co | NA (proceed acational opporal site? YE Scientific Study and rating. | to Overatunity. S, go to Cor | s plant asso s "S2" by the Common | e MTNHP Abundant nd Rating page | e) Known .2H | y (#13) is lov Common .4M umptive recrease Potential | tructural w-moderate Abundant eational |
| | the M Rare TENTIA es a recreeational AA: Cotentia t with g ic acces | iation listed a TNHP Common Co | NA (proceed acational opporal site? YE Scientific Study and rating. | to Overatunity. S, go to Cor | s plant asso s "S2" by the Common Il Summary ar ii. NO, chasumptive Reconstruction required) | e MTNHP Abundant nd Rating page neck the NA becreational | Rare Rare Rare Rare Rare Rare Rare Rare | y (#13) is lov Common .4M umptive recre | tructural w-moderate Abundant eational |
| | the M Rare TENTIA es a recre eational AA: Cotentia nt with g ic accegenera | iation listed a TNHP Common Co | NA (proceed acational opporal site? YE Scientific Study and rating. | to Overatunity. S, go to Cor | s plant asso s "S2" by the Common Il Summary ar ii. NO, chasumptive Reconstruction required) | e MTNHP Abundant nd Rating page neck the NA becreational | e) Known .2H | y (#13) is lov Common .4M umptive recrease Potential | tructural w-moderate Abundant eational |

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Wetland/Site #(s): South Celll - 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 | 0.915 | |
| C. General Wildlife Habitat | mod 0.70 | 1.00 | 1.281 | * |
| D. General Fish Habitat | NA | NA | 0 | |
| E. Flood Attenuation | mod 0.40 | 1.00 | 0.732 | |
| F. Short and Long Term Surface Water Storage | low 0.30 | 1.00 | 0.549 | |
| G. Sediment / Nutrient / Toxicant Removal | high 0.90 | 1.00 | 1.647 | * |
| H. Sediment / Shoreline Stabilization | high 1.00 | 1.00 | 1.83 | * |
| I. Production Export / Food Chain Support | mod 0.70 | 1.00 | 1.281 | |
| J. Groundwater Discharge / Recharge | mod 0.70 | 1.00 | 1.281 | * |
| K. Uniqueness | mod 0.40 | 1.00 | 0.732 | |
| L. Recreation / Education Potential (bonus point) | high 0.20 | | 0.366 | |
| Total Points | 5.8 | 10 | 10.614 Total | Functional Units |
| Percent of Possible | 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 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. |
| |

APPENDIX C PROJECT AREA PHOTOGRAPHS

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



Photo Point: 1 Bearing: North

Location: SE Property Corner Year: 2011



Photo Point: 1 Bearing: North

Location: SE Property Corner Year: 2013



Photo Point: 1 Bearing: North

Location: SE Property Corner Year: 2014



Bearing: North

Photo Point: 1 Location: SE Property Corner Year: 2015



Photo Point: 1 Bearing: North

Location: SE Property Corner

Year: 2016



Photo Point: 1 Bearing: Northwest

Location: SE Property Corner Year: 2011



Photo Point: 1 Bearing: Northwest

Location: SE Property Corner Year: 2013



Photo Point: 1 Bearing: Northwest

Location: SE Property Corner Year: 2014



Bearing: Northwest

Photo Point: 1 Location: SE Property Corner Year: 2015



Photo Point: 1 Bearing: Northwest

Location: SE Property Corner



Photo Point: 1 Bearing: Southwest

Location: SE Property Corner Year: 2011



Photo Point: 1 Bearing: Southwest

1 Location: SE Property Corner thwest Year: 2013



Photo Point: 1 Bearing: Southwest

Location: SE Property Corner Year: 2014



Bearing: Southwest Year: 2015



Photo Point: 1 Bearing: Southwest

Location: SE Property Corner



Location: NE Property Corner

Year: 2016

Photo Point: 2

Bearing: North

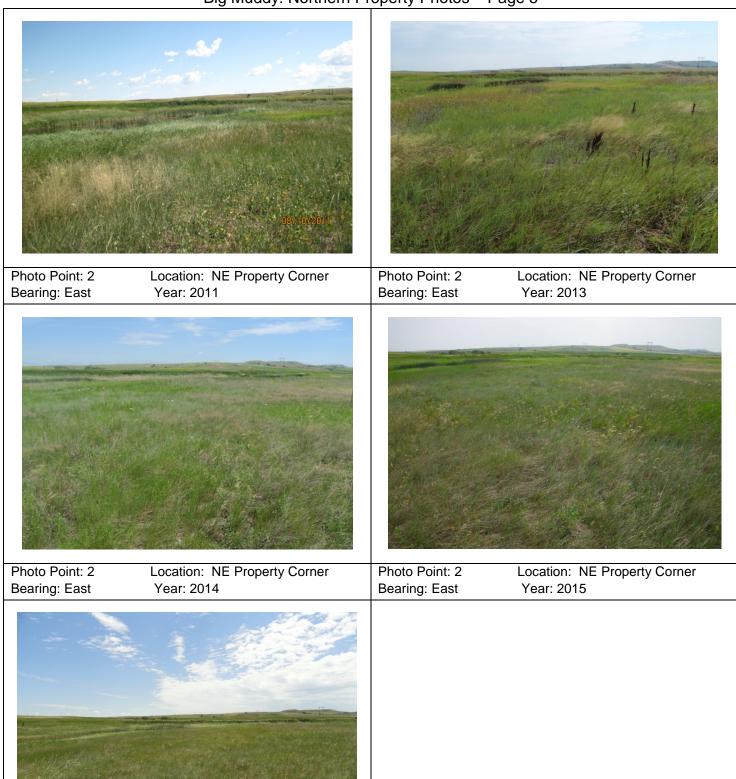
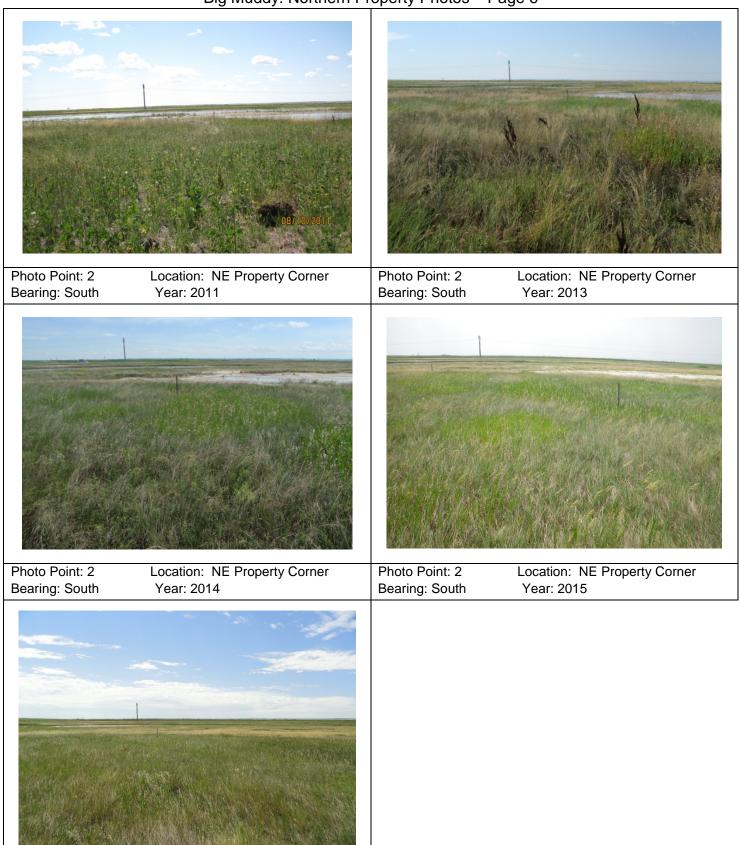


Photo Point: 2 Bearing: East Location: NE Property Corner



C-7

Location: NE Property Corner

Year: 2016

Photo Point: 2

Bearing: South



Year: 2016

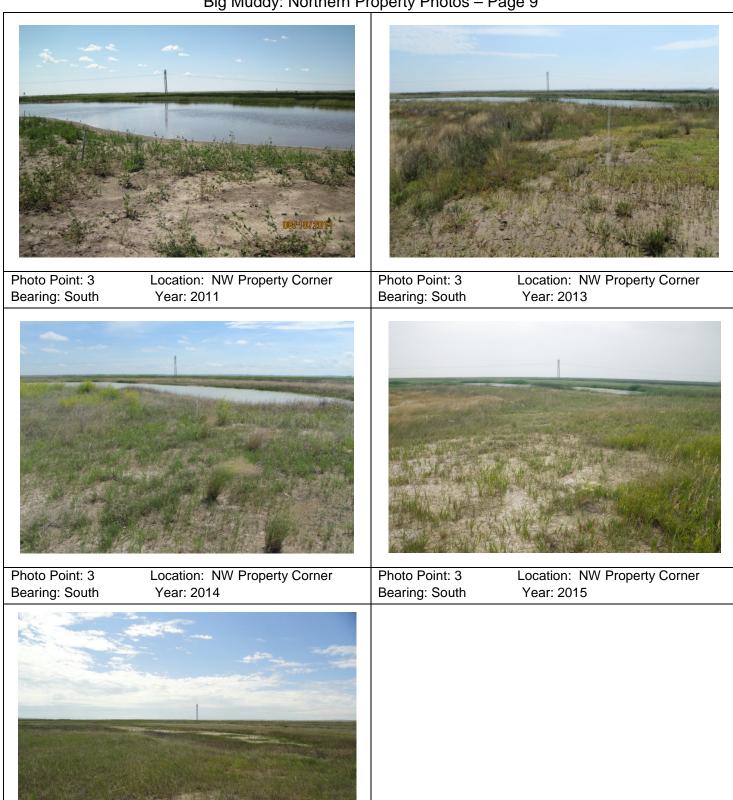
Bearing: West



Year: 2016 Bearing: East

Location: NW Property Corner

Photo Point: 3



Bearing: South

Photo Point: 3

Location: NW Property Corner





Photo Point: 3 Bearing: West

Location: NW Property Corner Year: 2013



Photo Point: 3 Bearing: West

Location: NW Property Corner Year: 2014



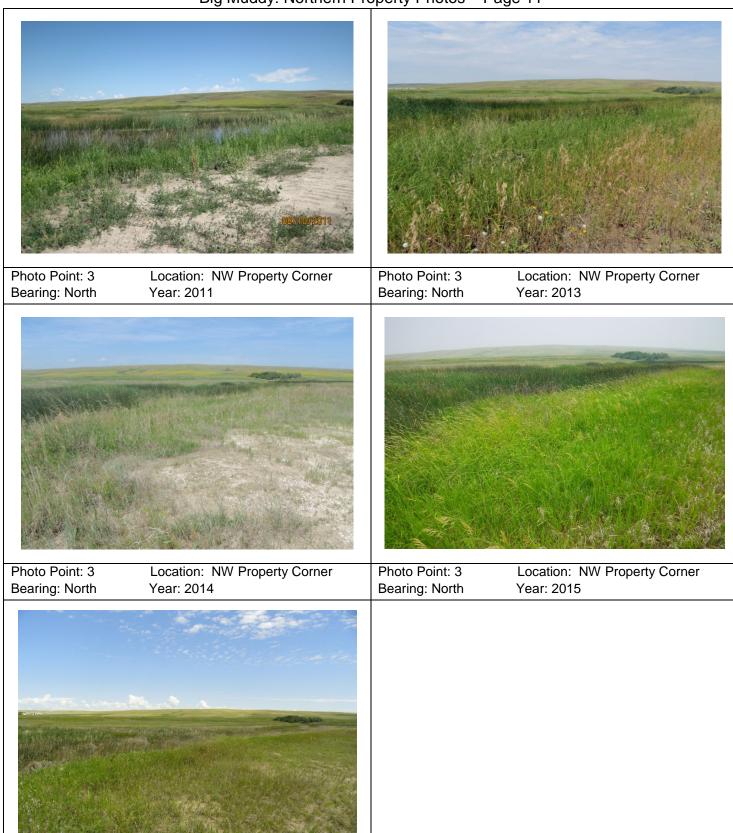
Photo Point: 3 Bearing: West

Location: NW Property Corner Year: 2015



Photo Point: 3 Bearing: West

Location: NW Property Corner



Location: NW Property Corner

Year: 2016

Photo Point: 3

Bearing: North



Photo Point: 4 Bearing: North

Location: SW Property Corner Year: 2011



Photo Point: 4 Bearing: North

Location: SW Property Corner Year: 2013



Photo Point: 4 Bearing: North

Location: SW Property Corner Year: 2014



Photo Point: 4 Bearing: North

Location: SW Property Corner Year: 2015



Bearing: North Year: 2016



Photo Point: 4 Bearing: Northeast

Location: SW Property Corner Year: 2011



Photo Point: 4 Bearing: Northeast

Location: SW Property Corner Year: 2013



Photo Point: 4
Bearing: Northeast

Location: SW Property Corner Year: 2014



Photo Point: 4
Bearing: Northeast

Location: SW Property Corner Year: 2015



Photo Point: 4 Bearing: Northeast

Location: SW Property Corner



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 Year: 2015



Photo Point: 4
Bearing: Northwest

Location: SW Property Corner



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2013



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

Big Muddy: Southern Property Photos – Page 2



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2013



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

Big Muddy: Southern Property Photos – Page 3



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2013



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



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

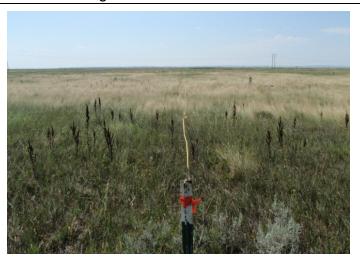


Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2016



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



Bearing 220 degrees

Location: North Parcel Year 2015



Transect 1: Start
Bearing 220 degrees

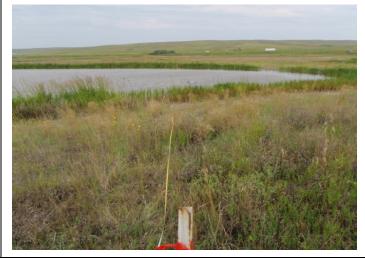
Location: North Parcel

Year 2016



Transect 1: Finish Bearing 40 degrees

Location: North Parcel Year 2011



Transect 1: Finish Bearing 40 degrees

Location: North Parcel Year 2013



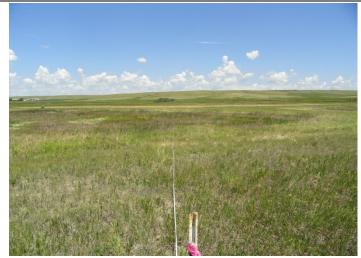
Transect 1: Finish
Bearing 40 degrees

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 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



Transect 2: Start
Bearing 130 degrees

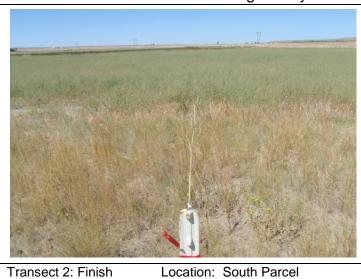
Location: South Parcel Year 2015



Transect 2: Start Bearing 130 degrees

Location: South Parcel

Year 2016



Bearing 310 degrees

Location: South Parcel Year 2011



Transect 2: Finish Bearing 310 degrees

Location: South Parcel 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

Big Muddy: Data Point Photos - Page 1



Year 2016

Year 2016

APPENDIX D PROJECT PLAN SHEETS

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

