MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2013

Meriwether East
Glacier County, Montana



Prepared for:

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Control Number B594

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1. INTRODUCTION

The Meriwether East Wetland Mitigation 2013 Monitoring Report documents the results of the sixth and final year of monitoring at the Meriwether East mitigation site. The Meriwether East Wetland Mitigation Site was constructed during 2005 to partially mitigate for wetland impacts associated with the Montana Department of Transportation (MDT) Meriwether-East project NH 1-3(36)234F. The mitigation project constructed along Highway 2 in Glacier County consists of two areas. Site 1 was built near milepost 236 and was designed to encompass approximately 2.67 acres. Site 2 was built near milepost 239 and was designed to encompass approximately 6.62 acres (Figure 1). Combined, the Meriwether East mitigation projects were designed to create 9.29 acres of wetland in areas that did not contain wetlands historically. A credit ratio of 1:1 was to be applied to wetland creation. No performance standards were established for this site.

Figures 2 and 3 (Appendix A) of the monitoring report show the Mapped Site Features and Monitoring Activity Locations, respectively. Appendix B contains the Montana Department of Transportation (MDT) Mitigation Monitoring Form, the US Army Corps of Engineers (USACE) Routine Wetland Determination Data Forms (Environmental Laboratory 1987), and the MDT Montana Wetland Assessment Form. Appendix C contains project site photographs and Appendix D includes the project plan sheet.

2. METHODS

Sites 1 and 2 were reviewed on July 20, 2009, to document vegetation, soil, and hydrologic conditions (PBJ&J 2009). Site 1 showed no indication of wetland development after four consecutive years of monitoring. In contrast to Site 1, Site 2 did show wetland development and monitoring at this site has been completed from 2006 through 2010 and in 2013.

Site 2 was visited on August 7 and 8, 2013. Information contained on the Wetland Mitigation Site Monitoring Form and USACE Routine Wetland Determination Data Forms (Environmental Laboratory 1987) was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) (Figure 2, Appendix A). Information collected included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird and wildlife use documentation, photographs, and a non-engineering examination of the infrastructure established within the mitigation project area.

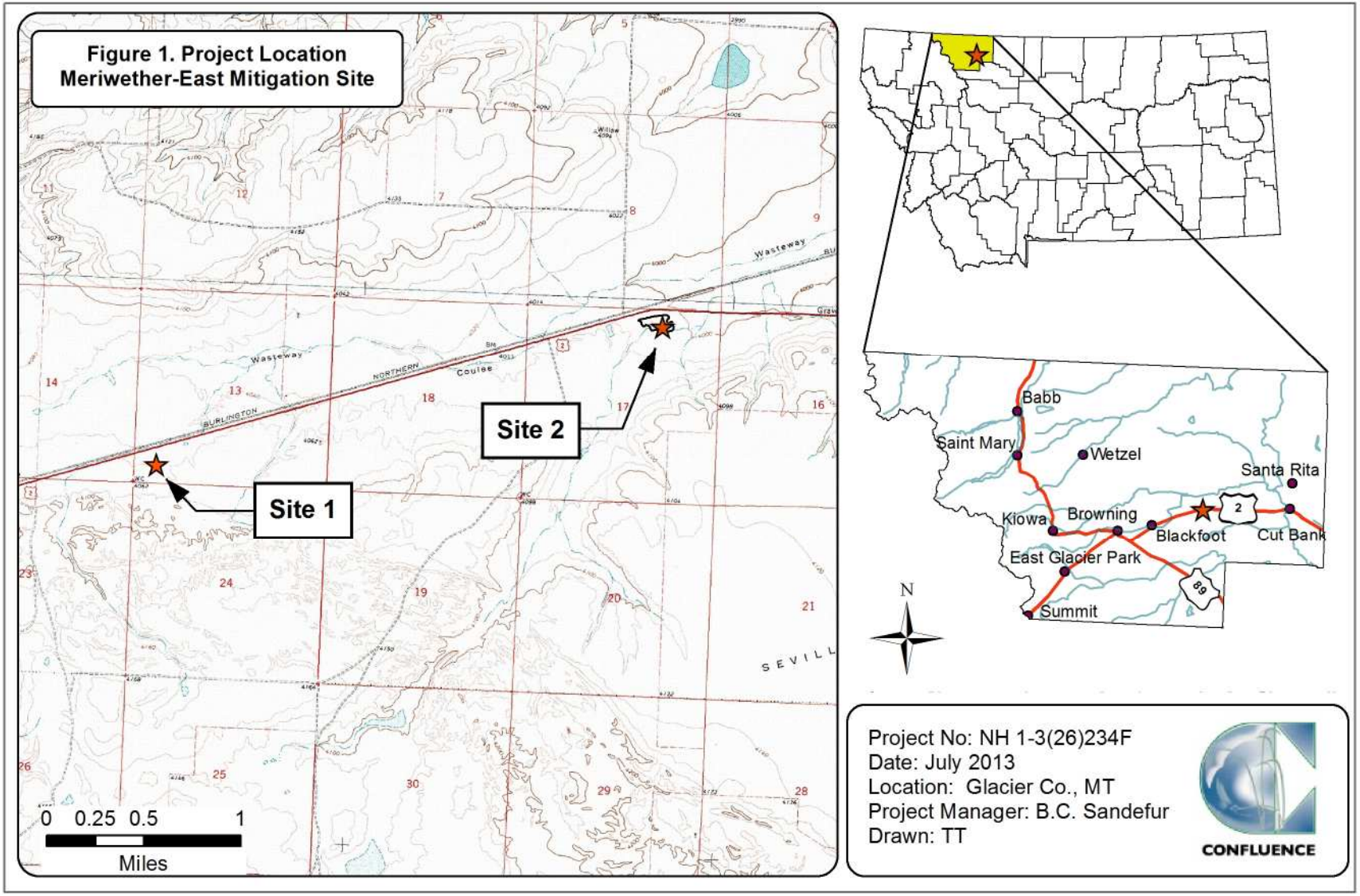


Figure 1. Project location Meriwether East Mitigation Site.

2.1. Hydrology

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (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 there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28.5 degrees Fahrenheit (Environmental Laboratory 1987). The growing season recorded at the Cut Bank Federal Aviation Administration (FAA) Airport (242173) meteorological station is approximately 136 days. Areas defined as wetlands would require a minimum of 17 days of continuous inundation or saturation within 12 inches of the ground surface to meet wetland hydrology criteria.

Hydrological indicators as outlined on the wetland data form were documented at five points established within the project area. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on electronic field data sheets (Appendix B). Onsite hydrologic assessments allow evaluation of mitigation goals addressing inundation/saturation requirements.

No groundwater monitoring wells were in use at the site. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded electronically on the wetland data form (Appendix B).

2.2. Vegetation

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

Temporal changes in vegetation were evaluated through annual assessments of a static belt transect (Figure 2, Appendix A). Vegetation composition was assessed and recorded along a single vegetation belt transect approximately 10 feet wide and 500 feet long (Figure 2, Appendix A). The transect location was recorded with a GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent cover of each vegetation species within the "belt" was estimated using the same values and cover types listed for the community polygon data on the aerial photograph (Appendix B). Photographs were taken at the endpoints of the transect during the monitoring event (Appendix C). No woody species were planted at the site.

The Montana State Noxious Weed List (September 2010), prepared by the Montana Department of Agriculture, was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photo (Figure 3, Appendix A). The noxious weed species identified are color-coded on the map. The locations are denoted with the symbol "+", "▲", or "■" representing 0 to 0.1 acre, 0.1 to 1.0 acre, or greater than 1 acre in extent, respectively. Cover classes are represented by T, L, M, or H, for less than 1 percent, 1 to 5 percent, 6 to 25 percent, and 26 to 100 percent, respectively, as listed on Figure 3 (Appendix A).

2.3. Soil

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

2.4. Wetland Delineation

Waters of the U.S. including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Manual. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 1987 Manual must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). Previous years' reports used the 1988 National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). A Routine Level-2 on-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas within the project boundaries. The information was recorded electronically on the wetland data form (Appendix B).

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 identified on the 2013 aerial photograph. Wetland areas were estimated using geographic information system (GIS) methods.

2.5. Wildlife

Observations and other positive indicators of mammal, reptile, amphibian, and bird species were recorded on the mitigation monitoring form during the site visit.

Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list has been compiled for each monitoring report (Table 4).

2.6. Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008) was used to evaluate functions and values on the site from 2010 to 2013. This method provides an objective means of assigning wetlands an overall rating and provides regulators 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. An MWAM was completed for one assessment area (AA) that encompassed the entire mitigation site (Appendix B).

2.7. Photo Documentation

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

2.8. GPS Data

Site features and survey points were collected with a resource grade Trimble GeoHX GPS unit during the 2013 monitoring season. Points were collected using WAAS-enabled differential corrected satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto an aerial photograph and then digitized. Site features and survey points that were mapped included fence boundaries, photograph points, transect endpoints, wetland boundaries, and vegetation community boundaries.

2.9. Maintenance Needs

The boundaries of Site 2 were inspected for potential problems. This was a cursory examination and did not constitute an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

The average total annual precipitation recorded at the Cut Bank FAA Airport (242173) from December 1903 to December 2012 was 11.15 inches (WRCC 2013). Annual precipitation totals were 7.22 inches (2010), 6.17 inches (2011),

and 7.77 inches (2012). The long-term average for precipitation totals from the period of January through August is 9.04 inches. Totals for this eight month period were 6.44 inches (2010), 4.37 inches (2011), and 6.96 inches (2012). These data indicate precipitation rates from 2010 through 2012 were well below the long-term average.

Hydrology at the Meriwether East Mitigation Site was designed to be supplied by groundwater seepage from the adjacent wetland, surface runoff from snow melt, and direct precipitation. Approximately five percent of Site 2's surface was inundated during the site evaluation. The average depth of inundation was 0.5 foot with a range in depths of 0.0 to 1.0 foot.

Five data points, MW TP-1 through MW TP-5 were sampled in 2013 to define the wetland and upland boundaries. The five data points were located in areas that met the wetland criteria. Secondary indicators at TP-1 and TP-5 were a positive FAC-Neutral test and geomorphic position. Test pit TP-2 had surface soil cracks in a nearby bare area and a positive FAC-neutral test. Data point TP-3 exhibited a positive FAC-Neutral test, surface soil cracks, and geomorphic position as indicators of wetland hydrology. The soil at TP-4 was saturated at 10 inches below the ground surface (bgs).

3.2. Vegetation

Vegetation community types were based on topography, hydrology, and plant composition and dominance. Vegetation community data and individual plant species were recorded for Site 2 (Monitoring Forms, Appendix B). A comprehensive plant list of 95 vegetation species was compiled for the Meriwether East Site 2 for 2006 to 2010 and 2013 (Table 1).

At Site 2, three vegetation community types were documented within the project boundaries in 2013. Two other vegetation communities that bordered the mitigation site were included in this evaluation. The plant community types included upland Type 3 –*Pascopyrum smithii* (genus changed from *Agropyron* in 2012)/*Poa secunda* (species changed from *juncifolia* in 2012), wetland Type 6 – *Hordeum jubatum*/*Puccinellia nuttalliana*, wetland Type 7 – *Poa secunda*/*Juncus arcticus (*species changed from *balticus* in 2012*)*, wetland Type 8 – *Typha latifolia*/*Eleocharis palustris,* and wetland Type 9 – *Eleocharis palustris/Schoenoplectus* spp. Wetland Type 7 was present before construction of this project. Wetland Type 9 was newly defined in 2013 based on changes in the dominant plant species (Figure 3, Appendix A).

Community Type 3 – *Pascopyrum smithii/Poa secunda* is an upland grassland that borders Site 2 to the west and southwest. The community acreage was not included on Figure 3 or the Mitigation Monitoring Form as this community was completely outside of the monitoring boundary. Dominant species within this community included western-wheat grass (*Pascopyrum smithii*), curly blue grass (*Poa secunda*), foxtail barley (*Hordeum jubatum*), American licorice (*Glycyrrhiza*

lepidota), yellow sweetclover (*Melilotus officinalis*), and 21 additional species at less than five percent cover.

Community Type 6 – *Hordeum jubatum/Puccinellia nuttalliana* is a 3.56 acre wetland that has been dominated by foxtail barley and Nuttall's alkali grass (*Puccinellia nuttalliana*) since 2008. A total of 26 predominantly hydrophytic species were identified within this community at low cover classes in 2013.

Community Type 7 – *Poa secunda/Juncus arcticus* is an undisturbed wetland that was delineated prior to project development in October 2002 by URS-BRW, Inc. (2003). The wetland borders Site 2 to the east (Figure 3, Appendix A) and, like community 3, located completely outside of the monitoring boundary. The dominant plants included curly blue grass, arctic rush, American licorice, western-wheat grass, Nuttall's alkali grass, and foxtail barley.

Wetland community Type 8 – *Typha latifolia/Eleocharis palustris* was 0.72 acre in extent and dominated by broad-leaf cat-tail (*Typha latifolia*), common spike rush (*Eleocharis palustris*), arctic rush, and soft-stem club-rush (*Schoenoplectus tabernaemontani*). Narrow-leaf willow (*Salix exigua)* and yellow willow (*Salix lutea*) were noted in the community. Narrow-leaf willow saplings were observed spreading from the roots. The willows are located at the north edge of the broad-leaf cat-tail community.

Wetland community Type 9 – *Eleocharis palustris/Schoenoplectus* spp. was vegetated with a diverse assemblage of club-rushes, salt marsh (*Schoenoplectus maritimus)*, common three-square (*S. pungens*), pale great club rush (*S. heterochaetus*), and soft-stem. This community of 2.34 acres was identified in 2013 to reflect the increasing dominance of club-rush. Additional hydrophytic species included arctic rush, foxtail barley, alkali buttercup (*Ranunculus cymbalaria*), field meadow foxtail (*Alopecurus pratensis*), broad-leaf cat-tail, and American sloughgrass (*Beckmannia syzigachne*).

One Priority 2B weed, Canadian thistle (*Cirsium arvense*), was found in community 3 outside the project boundary in 2013. The cover was 26 to 100 percent within an area less than 0.1 acre in size (Figure 3, Appendix A). The site was sprayed for noxious weeds in 2010. No woody species were planted at the site. Volunteer willows are sprouting in Community 8.

The 2006 through 2010 and 2013 transect data for Site 2 are summarized in Table 2 and Charts 1 and 2 (Monitoring Form, Appendix B). Photographs were taken at the endpoints of Transect 1 (Appendix C). The 500-foot transect traverses the upland community west of the mitigation site, two wetland communities within the mitigation area, and the pre-existing wetland community east of the mitigation site. Wetland Type 5 *Puccinellia/Eleocharis* transitioned to Wetland Type 9 *Eleocharis/Schoenoplectus* between 2010 and 2013. Hydrophytic species dominated 97.6 percent of the vegetation transect in 2013,

similar to the previous three years. The open water area identified in 2008 and 2009 was vegetated with emergent species in 2010 and 2013.

Table 1. Vegetation species observed from 2006 through 2010 and in 2013 at the Meriwether-East Wetland Mitigation Site 2.

SCIENTIFIC NAME	COMMON NAME	GP INDICATOR STATUS[1]
Achillea millefolium	Common Yarrow	FACU
Agoseris glauca	Pale Goat-Chicory	FACU
Agropyron cristatum	**Crested Wheatgrass**	**UPL**
Agropyron sp.	Wheatgrass	
Agrostis gigantea	Black Bent	FAC
Algae, green	Algae, green	NL
Alisma gramineum	Narrow-Leaf Water-Plantain	OBL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Antennaria rosea	Rosy Pussytoes	UPL
Arabis spp.	Rockcress	
Artemisia frigida	Prairie Sagewort	UPL
Artemisia ludoviciana	White Sagebrush	UPL
Aster spp.	Aster	
Astragalus agrestis	Cock's-Head	FACU
Bassia scoparia	Mexican Fireweed	FAC
Beckmannia syzigachne	American Slough Grass	OBL
Bouteloua gracilis	Blue Grama	NL
Bromus inermis	Smooth Brome	FAC
Carex praegracilis	**Clustered Field Sedge**	**FACW**
Carex spp.	Sedge	
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium glaucum	Oak-Leaf Goosefoot	FAC
Chenopodium hybridum	Mapleleaf Goosefoot	UPL
Chenopodium sp.	Goosefoot	
Cirsium arvense	Canadian Thistle	FACU
Crepis runcinata	Fiddle-Leaf Hawk's-Beard	FAC
Deschampsia caespitosa	Tufted Hairgrass	FACW
Distichlis spicata	Coastal Salt Grass	FACW
Dodecatheon pulchellum	Dark-Throat Shootingstar	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus spp.	Wild Rye	
Elymus trachycaulus	Slender Wild Rye	FACU
Epilobium palustre	Marsh Willowherb	OBL
Erigeron caespitosus	Tufted Fleabane	UPL
Gaillardia aristata	Common Gaillaridia	UPL
Galium boreale	Northern Bedstraw	FACU
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Gutierrezia sarothrae	Broom Snakeweed	UPL
Hordeum brachyantherum	Meadow Barley	FAC

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).

New species identified in 2013 are bolded.

Table 1. (continued). Vegetation species observed from 2006 through 2010 and in 2013 at the Meriwether-East Wetland Mitigation Site 2.

SCIENTIFIC NAME	COMMON NAME	GP INDICATOR STATUS[1]
Hordeum jubatum	Fox-Tail Barley	FACW
Juncus arcticus	Arctic Rush	FACW
Juncus tenuis	Lesser Poverty Rush	FAC
Koeleria macrantha	Prairie Junegrass	UPL
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Liatris punctata	**Dotted Blazing Star**	**UPL**
Lomatium spp.	Desert Parsley	
Medicago sativa	Alfalfa	UPL
Melilotus alba	White Sweetclover	UPL
Melilotus officinalis	Yellow Sweetclover	FACU
Oxytropis spp.	Locoweed	
Pascopyrum smithii	Western-Wheat Grass	FACU
Plantago lanceolata	English Plantain	FAC
Poa palustris	Fowl Blue Grass	FACW
Poa pratensis	Kentucky Blue Grass	FACU
Poa secunda	Curly Blue Grass	FACU
Polygonum spp.	Knotweed	
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus tremuloides	Quaking Aspen	FAC
Potentilla anserina	Silverweed	UPL
Potentilla concinna	Elegant Cinquefoil	UPL
Potentilla hippiana	Wooly Cinquefoil	UPL
Pseudoroegneria spicata	Blue-Bunch Wheatgrass	UPL
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Ranunculus cymbalaria	Alkali Buttercup	OBL
Ranunculus sceleratus	Cursed Buttercup	OBL
Ratibida columnifera	Upright Prairie Coneflower	UPL
Rosa spp.	Rose	
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Salicornia rubra	Red Saltwort	OBL
Salix exigua	Narrow-Leaf Willow	FACW
Salix lutea	Yellow Willow	FACW
Salsola kali	Russian Thistle	FACU
Schoenoplectus acutus	Common Tule	OBL
Schoenoplectus heterochaetus	**Pale Great Club-Rush**	**OBL**
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Common Three-Square	OBL
Schoenoplectus tabernaemontani	**Soft-Stem Club-Rush**	**OBL**
Sisyrinchium montanum	Strict Blue-Eyed-Grass	FAC
Solidago multiradiata	Rocky Mountain Goldenrod	FACU
Sonchus arvensis	**Field Sow-Thistle**	**FAC**
Spergularia salina	Saltmarsh Sandspurry	OBL

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).

New species identified in 2013 are bolded.

Table 1. (continued). Vegetation species observed from 2006 through 2010 and in 2013 at the Meriwether-East Wetland Mitigation Site 2.

SCIENTIFIC NAME	COMMON NAME	GP INDICATOR STATUS[1]
Stipa nelsonii	Nelson's Needlegrass	UPL
Suaeda calceoliformis	Paiuteweed	FACW
Symphyotrichum campestre	Western Meadow Aster	UPL
Symphyotrichum ciliatum	**Alkali American-Aster**	**FACW**
Symphyotrichum ericoides	White Heath American-Aster	FACU
Taraxacum officinale	Common Dandelion	FACU
Thermopsis rhombifolia	Prairie Golden-Banner	UPL
Tragopogon dubius	Yellow Salisify	UPL
Triglochin maritima	Seaside Arrow-Grass	OBL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Vicia americana	American Purple Vetch	FACU

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).

New species identified in 2013 are bolded.

Table 2. Data summary for Transect 1 from 2006 through 2010 and in 2013 at the Meriwether-East Wetland Mitigation Site 2.

Monitoring Year	2006	2007	2008	2009	2010	2013
Transect Length (feet)	**500**	**500**	**500**	**500**	**500**	**500**
Vegetation Community Transitions along Transect	6	3	2	2	3	3
Vegetation Communities along Transect	5	3	3	3	4	4
Hydrophytic Vegetation Communities along Transect	3	2	2	2	3	3
Total Vegetative Species	18	18	19	19	34	32
Total Hydrophytic Species	12	13	13	12	19	18
Total Upland Species	6	5	6	7	15	14
Estimated % Total Vegetative Cover	30	50	75	85	87	90
% Transect Length Comprising Hydrophytic Vegetation Communities	48.0	48.0	97.4	97.4	97.6	97.6
% Transect Length Comprising Upland Vegetation Communities	0.0	0.0	0.0	0.0	2.4	2.4
% Transect Length Comprising Unvegetated Open Water / Mudflat	49.4	52.0	2.6	2.6	0.0	0.0
% Transect Length Comprising Bare Substrate	2.6	0.0	0.0	0.0	0.0	0.0

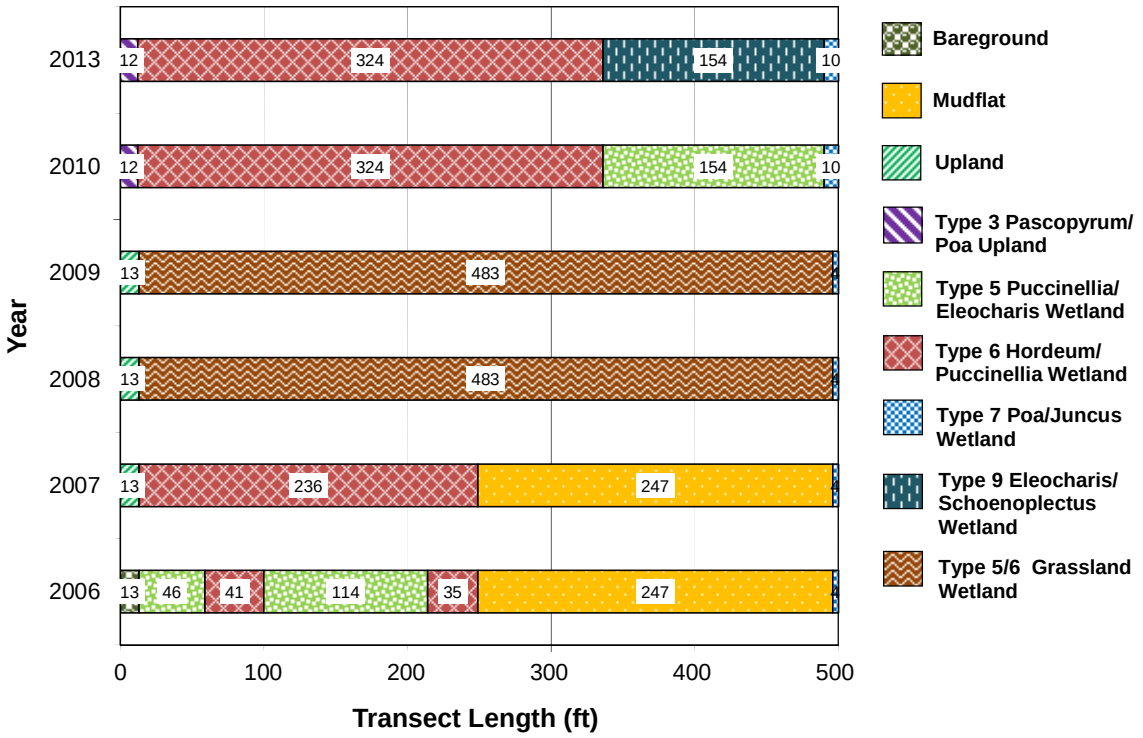


Chart 1. Transect map showing vegetation community types on Transect 1 from start (0 feet) to end (500 feet) from 2006 through 2010 and in 2013.

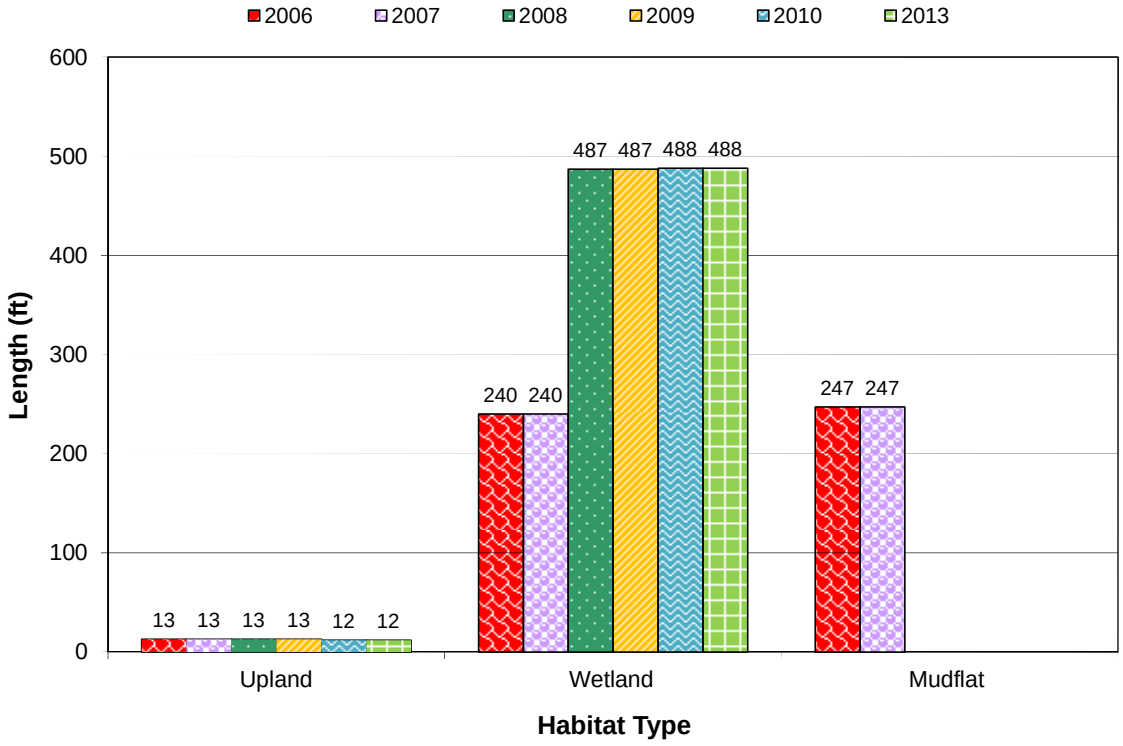


Chart 2. Length of vegetation communities within Transect 1 from 2006 through 2010 and in 2013.

3.3. Soil

Soils at the Meriwether East Mitigation Site 2 are mapped by the NRCS as saline land. The five test pits MW TP-1 to MW TP-5 were situated in areas that were classified as wetlands. The test pit at TP-1 revealed a very dark gray (10YR 3/1) clay loam with 50 percent gravel and no redoximorphic features. The soil profile at TP-2 consisted of a very dark gray (10 YR 3/1) clay soil with yellowish brown (10 YR 5/8) redox concentrations. Soil depletions were also present. Test pit TP-3 revealed a grayish brown (2.5Y 5/2) clay with 15 percent gravel and yellowish brown (10YR 5/8) redoximorphic features. The soil profile at TP-4 was a dark gray (10YR 4/1) clay with 15 percent gravel and yellowish brown (10YR 5/6) redox features. The TP-5 test pit contained a grayish brown (2.5Y 5/2) sandy clay soil with 30 percent gravel and olive yellow (2.5Y 6/6) redox features. The low chroma colors within the diagnostic soil horizon at each test pit and the presence of redox features in TP-2 through TP-5 were positive indicators of hydric soil.

3.4. Wetland Delineation

Wetland development throughout Site 2 was achieved in 2009 and has persisted through 2013 (Figure 3, Appendix A). Since 2009, the wetland community has continued to mature and establish a diversity of hydrophytic plants. The constructed wetland includes palustrine emergent wetland habitat, which extended across the entire acreage within the monitoring boundaries. A total of 6.62 acres of wetland habitat were delineated in 2013 and does not include wetland communities Type 3 and Type 7, located outside the monitoring boundary.

3.5. Wildlife

A comprehensive list of wildlife species observed directly or indirectly since the initiation of monitoring has been compiled for the Meriwether East Site 2 (Table 3). Specific information on wildlife sightings at Site 2 can be found in the Monitoring Form in Appendix B.

An American crow (*Corvus brachyrhynchos*) and red-winged blackbird (*Agelaius phoeniceus*) were observed during the 2013 monitoring event. Deer tracks and beds were also noted onsite.

Table 3. Wildlife species observed at the Meriwether-East Wetland Mitigation Site 2 from 2006 through 2010 and in 2013.

COMMON NAME	SCIENTIFIC NAME
BIRD	
American Avocet	*Recurvirostra americana*
American Crow	***Corvus brachyrhynchos***
Dark-eyed Junco	*Junco hyemalis*
Horned Lark	*Eremophila alpestris*
Killdeer	*Charadrius vociferus*
Red-winged Blackbird	***Agelaius phoeniceus***
Spotted Sandpiper	*Actitis macularius*
Song Sparrow	*Melospiza melodia*
Willet	*Tringa semipalmata*
Wilson's Phalarope	*Phalaropus tricolor*
MAMMAL	
Deer Sp.	
Pronghorn	Antilocapra americana

Species identified in 2013 are bolded.

3.6. Functional Assessment

The revised 2008 Montana Wetland Assessment Method (MWAM) was used from 2008 to 2010 and in 2013 to assess the values and functions of the wetland at Site 2 (Functional Assessment Form, Appendix B). The 1999 version of the Montana Wetland Assessment Form was used in 2006 and 2007 to assess the values and functions of the wetland area. The 1999 and 2008 MWAMs differ, although general comparisons can be made.

Site 2 continued to be rated as a Category III wetland in 2013 (Table 4). High ratings were awarded for Short and Long Term Water Storage and Sediment/Nutrient/Toxicant Removal (Table 4). The constructed wetland, designed to be a seasonal prairie pothole, is functioning as designed containing water in wetter years and drying out in years with decreased precipitation. The functional assessment score increased by over seven points between 2007 and 2008 as a result of improvements in the MWAM and increased cover of wetland habitat. The percent functional points decreased by 3.0 in 2010, a result of the score for Flood Attenuation being assessed incorrectly in 2008 and 2009. A range of 25 percent to 75 percent was incorrectly selected for the percent of forested or scrub/shrub cover site wide. The score of 0.6 for Flood Attenuation accurately assesses the shrub/scrub cover at less than 25 percent. Additionally, a revision to the production export/food chain support indicating the Meriwether AA has no surface water outlet decreased this rating from high to moderate in 2013. Functional units at the site totaled 32.8 in 2013.

Table 4. Summary of 2006 to 2010 and 2013 wetland function/value ratings and functional points at the Meriwether-East Wetland Mitigation Site 2.

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2006[1] Site 2	2007[1] Site 2	2008[2] Site 2	2009[2] Site 2	2010[2] Site 2	2013[2] Site 2
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
General Wildlife Habitat	Mod (0.5)	Low (0.2)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	NA
Flood Attenuation	Mod (0.5)	Mod (0.5)	High (0.9)	High (0.9)	Mod (0.6)	Mod (0.6)
Short and Long Term Surface Water Storage	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment / Nutrient / Toxicant Removal	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment / Shoreline Stabilization	NA	NA	NA	NA	NA	NA
Production Export / Food Chain Support	Mod (0.6)	Mod (0.6)	High (0.8)	High (0.8)	High (0.8)	Mod (0.5)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	Low (0.1)	Low (0.1)	NA	NA	NA	High (0.15)
Actual Points/Possible Points	4.6 / 10.0	4.3 / 10.0	5.3 / 9.0	5.4 / 9.0	5.1 / 9.0	4.95 / 9.0
% of Possible Score Achieved	46%	43%	59%	60%	57%	55%
Overall Category	III	III	III	III	III	III
Total Acreage of Delineated Wetlands and Other Aquatic Habitats	**6.62**	**6.64**	**6.62**	**6.62**	**6.62**	**6.62**
Functional Units (acreage x actual points)	**30.5**	**28.5**	**35.1**	**35.7**	**33.8**	**32.8**

[1]Conducted using the 1999 version of the MDT Montana Wetland Assessment Method.

[2]Conducted using the 2008 version of the MDT Montana Wetland Assessment Method.

3.7. Photo Documentation

An aerial photograph taken on July 15, 2013, was used as background imagery for Figures 2 and 3 in Appendix A. A panoramic photo taken at Photo Point 1 is included on page C-1 of Appendix C. Representative photographs of the transect endpoints and the data points are shown on pages C-2 and C-3, respectively.

3.8. Current Credit Summary

No wetlands were present onsite prior to construction of Site 2. The goal of this mitigation project was to create 6.62 acres of wetland habitat within the project boundaries. No specific performance criteria were established at this site. The acreage goal at Site 2 was achieved in 2009 with the delineation of 6.62 acres of wetland habitat. The wetland community has continued to mature and establish a diversity of hydrophytic plants. A total of 32.8 functional units have been developed at the Meriwether East wetland mitigation site. Consistent wetland hydrology and a seed source from adjacent natural wetlands were integral to the development and maintenance of this wetland mitigation site.

3.9. Maintenance Needs

No structures are present within the wetland mitigation area except for a fence surrounding the mitigation site and adjacent wetland and upland. One area of Canadian thistle less than 0.1 acre in extent with a cover density exceeding 25 percent was located along the west boundary. Weed spraying was completed at this site in 2010 as part of MDT's ongoing weed management plan.

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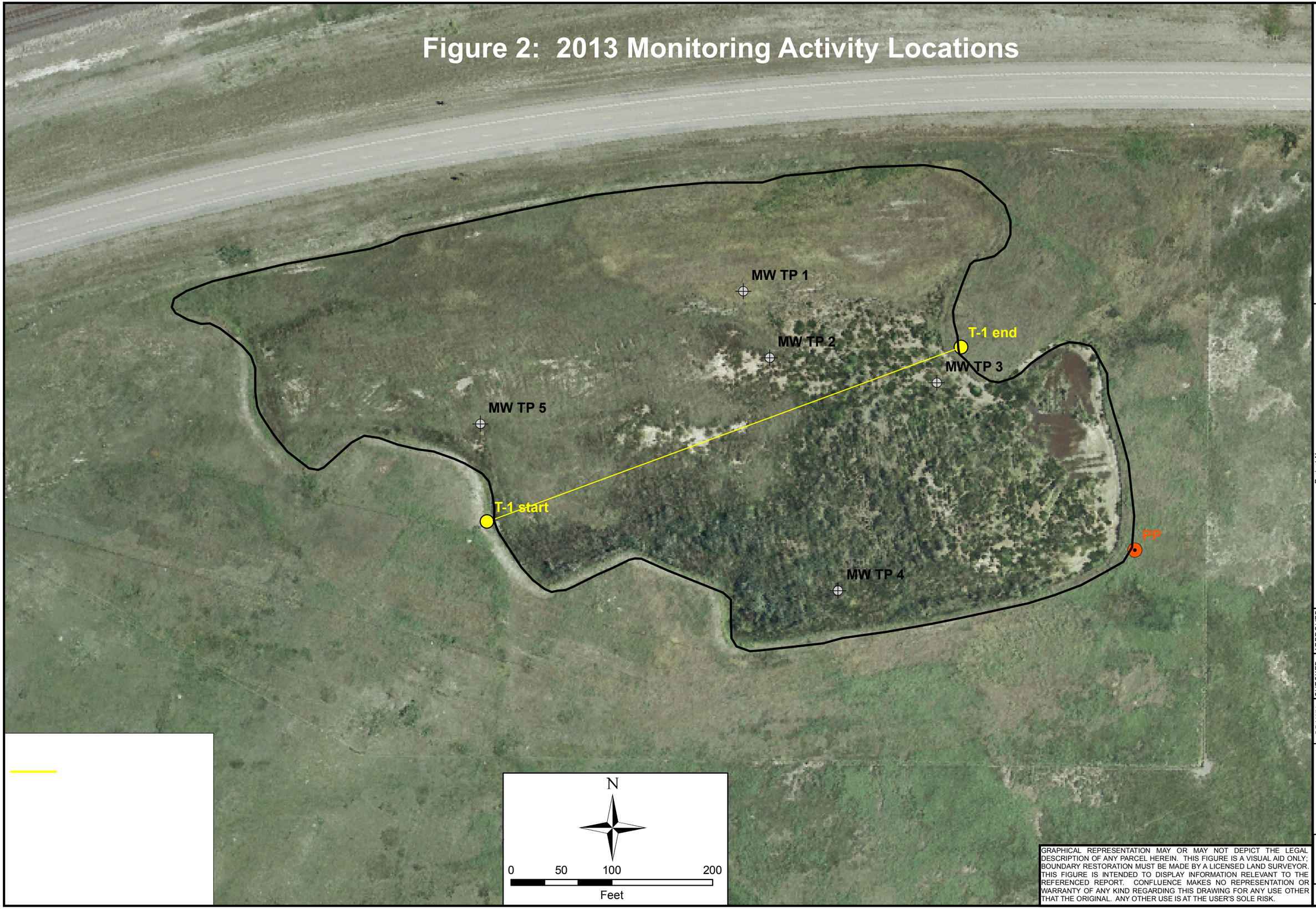
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Appendix A

Figures 2 and 3

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana

Figure 2: 2013 Monitoring Activity Locations



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

LOCATION: Glacier Co., MT

PROJECT NO: NH 1-3(26)234F

FILE: Meriwether/Monitor2013.mxd

Project Name
Meriwether-East Mitigation Site 2

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	SW	LU

SCALE: Noted

Drawn: September 18, 2013

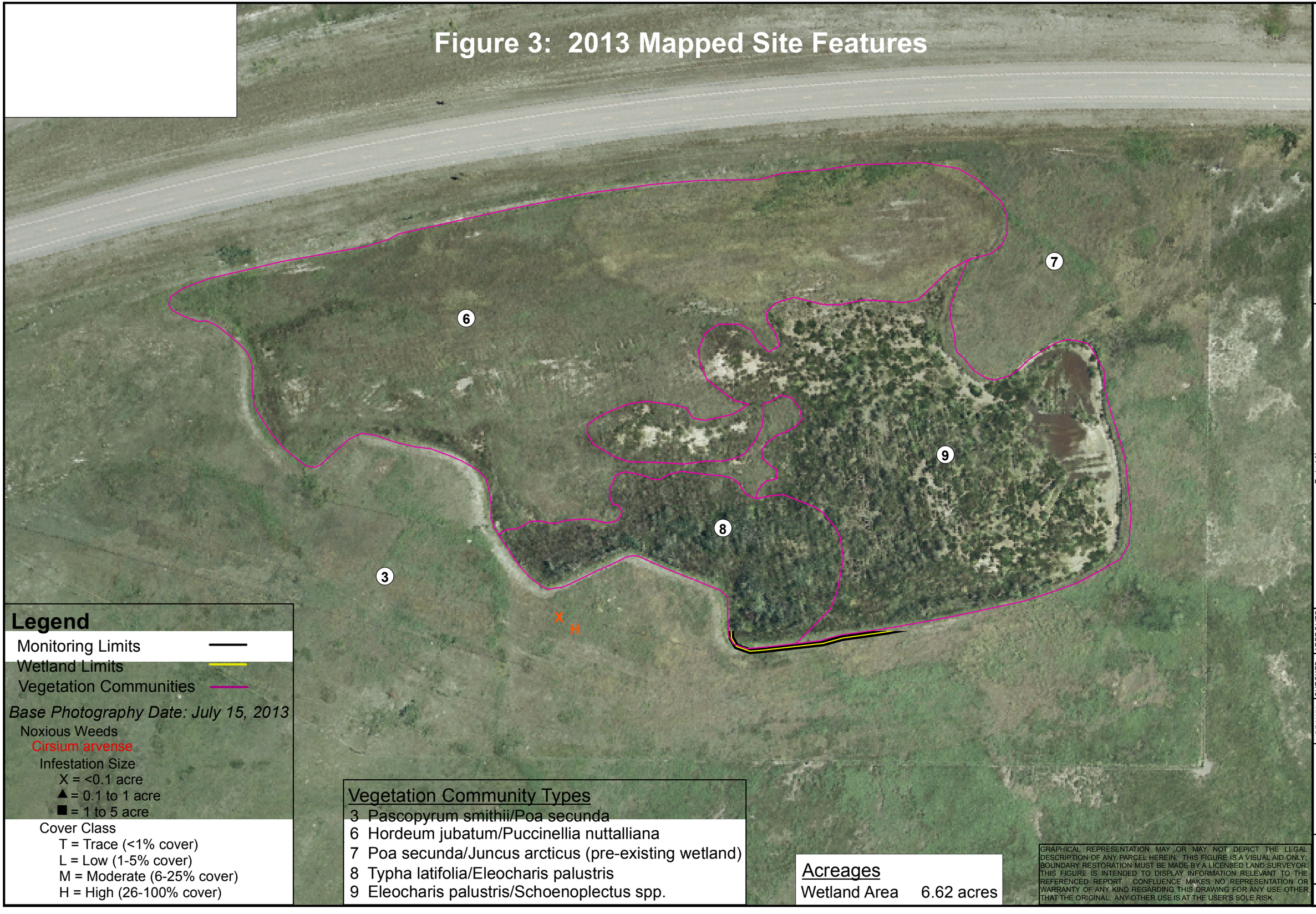
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure
2

REV -

Figure 3: 2013 Mapped Site Features



Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 15, 2013

Noxious Weeds

Cirsium arvense

Infestation Size

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

Cover Class

- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (6-25% cover)
- H = High (26-100% cover)

Vegetation Community Types

3 Pascopyrum smithii/Poa secunda
6 Hordeum jubatum/Puccinellia nuttalliana
7 Poa secunda/Juncus arcticus (pre-existing wetland)
8 Typha latifolia/Eleocharis palustris
9 Eleocharis palustris/Schoenoplectus spp.

Acreages

Wetland Area 6.62 acres

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

LOCATION: Glacier Co., MT

PROJECT NO: NH 1-3(26)234F

FILE: Meriwether/Veg2013.mxd

Project Name: Meriwether-East Mitigation Site 2

Drawing Title: 2013 Mappes Site Features

DRAWN BCS | CHECKED SW | APPROVED LU

SCALE: Noted

Drawn: September 24, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2013 Wetland Mitigation Site Monitoring Form
2013 USACE Wetland Determination Data Forms
2013 MDT Functional Assessment Form

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Meriwether East Assessment Date/Time 8/7/2013 1:00:00 PM

Person(s) conducting the assessment: S. Wall

Weather: Partly cloudy high 80s Location: Highway 2 west of Cutbank

MDT District: Great Falls Milepost: 239

Legal Description: T 33N R 8W Section(s) 17

Initial Evaluation Date: 8/8/2006 Monitoring Year: 6 #Visits in Year: 1

Size of Evaluation Area: 6.64 (acres)

Land use surrounding wetland:

Highway, railroad, rangeland, wetland to the east

HYDROLOGY

Surface Water Source: Precipitation, snow melt, shallow groundwater

Inundation: ☑ Average Depth: 0.5 **(ft)** Range of Depths: 0-1 **(ft)**

Percent of assessment area under inundation: 5 %

Depth at emergent vegetation-open water boundary: 0.5 **(ft)**

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

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

Algal mats, soil cracks

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	**Water Surface Depth (ft)**
No wells	

Additional Activities Checklist:

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

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

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

Hydrology Notes:

No open water, all inundated areas are vegetated.

VEGETATION COMMUNITIES

Site Meriwether East

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

Community # 3 **Community Type:** Pascopyrum smithii / Poa secunda **Acres** 0

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agoseris glauca	0
Agropyron cristatum	0	Agropyron sp.	0
Artemisia frigida	1	Aster sp.	1
Bare Ground	0	Elymus trachycaulus	0
Glycyrrhiza lepidota	3	Grindelia squarrosa	1
Hordeum jubatum	4	Juncus arcticus	1
Lactuca serriola	0	Medicago sativa	0
Melilotus officinalis	2	Pascopyrum smithii	4
Poa pratensis	1	Poa secunda	4
Polypogon monspeliensis	0	Pseudoroegneria spicata	0
Rosa woodsii	0	Sisyrinchium montanum	0
Sonchus arvensis	1	Suaeda calceoliformis	0
Symphyotrichum ericoides	0	Taraxacum officinale	1
Tragopogon dubius	0	Vicia americana	0

Comments:

Upland plant community percentages are based on approximately 50-foot band around the wetland.

Community # 6 **Community Type:** Hordeum jubatum / Puccinellia nuttalliana **Acres** 3.56

Species	Cover class	Species	Cover class
Agropyron sp.	0	Algae, green	1
Alopecurus pratensis	1	Aster sp. (purple)	0
Bare Ground	0	Carex praegracilis	1
Chenopodium sp.	0	Distichlis spicata	1
Eleocharis palustris	0	Elymus sp.	0
Glycyrrhiza lepidota	0	Grindelia squarrosa	0
Hordeum jubatum	5	Juncus arcticus	2
Lactuca serriola	0	Melilotus officinalis	0
Polypogon monspeliensis	0	Populus tremuloides	0
Puccinellia nuttalliana	5	Ranunculus cymbalaria	0
Rumex crispus	0	Schoenoplectus maritimus	1
Schoenoplectus tabernaem	0	Sonchus arvensis	1
Suaeda calceoliformis	0	Symphyotrichum ciliatum	0
Triglochin maritima	0		

Comments:

Community # 7 Community Type: Poa secunda / Juncus arcticus **Acres** 0

Species	Cover class	Species	Cover class
Agoseris glauca	0	Alopecurus pratensis	0
Artemisia frigida	0	Aster sp.	0
Aster sp. (purple)	1	Bromus inermis	0
Carex praegracilis	0	Distichlis spicata	0
Elymus trachycaulus	0	Glycyrrhiza lepidota	3
Grindelia squarrosa	0	Hordeum jubatum	3
Juncus arcticus	3	Lactuca serriola	0
Liatris punctata	0	Melilotus officinalis	0
Pascopyrum smithii	3	Poa pratensis	0
Poa secunda	3	Puccinellia nuttalliana	3
Rosa woodsii	2	Rumex crispus	0
Sonchus arvensis	2	Suaeda calceoliformis	2
Taraxacum officinale	2	Tragopogon dubius	0
Triglochin maritima	0		

Comments:

This area is pre-existing wetland outside of monitoring boundary.

Community # 8 Community Type: Typha latifolia / Eleocharis palustris **Acres** 0.72

Species	Cover class	Species	Cover class
Algae, green	1	Alopecurus pratensis	0
Eleocharis palustris	4	Epilobium palustre	0
Juncus arcticus	3	Polypogon monspeliensis	0
Puccinellia nuttalliana	0	Ranunculus cymbalaria	1
Salix exigua	1	Salix lutea	0
Schoenoplectus heterocha	1	Schoenoplectus maritimus	3
Schoenoplectus tabernaem	3	Triglochin maritima	0
Typha latifolia	5		

Comments:

Salix exigua is spreading from root sprouts. The salix are at the northern edge of the typha community.

Community # 9 **Community Type:** Eleocharis palustris / Schoenoplectus spp. **Acres** 2.34

Species	Cover class	Species	Cover class
Algae, green	2	Alisma gramineum	0
Alopecurus pratensis	1	Aster sp.	0
Bare Ground	3	Beckmannia syzigachne	1
Carex praegracilis	0	Chenopodium sp.	2
Distichlis spicata	0	Eleocharis palustris	5
Glycyrrhiza lepidota	0	Hordeum jubatum	2
Juncus arcticus	2	Pascopyrum smithii	0
Poa pratensis	0	Polypogon monspeliensis	0
Puccinellia nuttalliana	0	Ranunculus cymbalaria	1
Ranunculus sceleratus	0	Rumex crispus	0
Schoenoplectus heterocha	1	Schoenoplectus maritimus	4
Schoenoplectus tabernaem	4	Suaeda calceoliformis	0
Typha latifolia	1		

Comments:

This community type changed due to changes in dominant plants.

Total Vegetation Community Acreage **6.62**

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

VEGETATION TRANSECTS

Site: Meriwether East Date: 8/7/2013 1:00:00 PM

Transect Number: 1 **Compass Direction from Start:** 59

Interval Data:

Ending Station 12 **Community Type:** Pascopyrum smithii / Poa secunda

Species	Cover class	Species	Cover class
Agropyron sp.	1	Aster sp.	0
Bare Ground	3	Grindelia squarrosa	0
Hordeum jubatum	2	Juncus arcticus	0
Lactuca serriola	0	Medicago sativa	0
Pascopyrum smithii	2	Poa secunda	1
Polypogon monspeliensis	1	Sonchus arvensis	0
Symphyotrichum ericoides	1		

Ending Station 336 **Community Type:** Hordeum jubatum / Puccinellia nuttalliana

Species	Cover class	Species	Cover class
Algae, green	0	Alopecurus pratensis	0
Bare Ground	0	Carex praegracilis	1
Chenopodium sp.	0	Distichlis spicata	1
Eleocharis palustris	1	Glycyrrhiza lepidota	0
Grindelia squarrosa	0	Hordeum jubatum	5
Juncus arcticus	5	Lactuca serriola	1
Melilotus officinalis	0	Polypogon monspeliensis	1
Populus tremuloides	0	Populus tremuloides	0
Puccinellia nuttalliana	1	Ranunculus cymbalaria	2
Schoenoplectus maritimus	0	Schoenoplectus tabernaem	0
Sonchus arvensis	2	Suaeda calceoliformis	0
Triglochin maritima	2		

Ending Station 490 **Community Type:** Eleocharis palustris / Schoenoplectus spp.

Species	Cover class	Species	Cover class
Algae, green	1	Alisma gramineum	0
Alopecurus pratensis	0	Bare Ground	1
Beckmannia syzigachne	1	Carex praegracilis	0
Chenopodium sp.	1	Distichlis spicata	1
Eleocharis palustris	3	Glycyrrhiza lepidota	0
Hordeum jubatum	1	Juncus arcticus	1
Rumex crispus	0	Schoenoplectus maritimus	2
Schoenoplectus tabernaem	2	Suaeda calceoliformis	0

Ending Station 500 **Community Type:** Poa secunda / Juncus arcticus

Species	Cover class	Species	Cover class
Distichlis spicata	2	Grindelia squarrosa	0
Hordeum jubatum	4	Juncus arcticus	2
Pascopyrum smithii	1	Poa secunda	1
Puccinellia nuttalliana	5	Rumex crispus	0
Sonchus arvensis	1	Taraxacum officinale	0

Transect Notes:

500 foot transect. Transect starts 12 feet upland of the stake.

PLANTED WOODY VEGETATION SURVIVAL

Meriwether East

Planting Type	#Planted	#Alive	Notes
None Planted			

Comments

Volunteer willows are beginning to colonize the site.

Meriwether East

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Crow	1	FO	UP
Red-winged Blackbird	1	L	MA
Unknown	4	L	
Unknown Wildlife 1		FO	WM

Bird Comments

Four small birds (sparrows) flew out of the grass.

BEHAVIOR CODES

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

HABITAT CODES

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

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

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Deer Sp.		Yes	No	No	

Wildlife Comments:

Tracks were deer, species unknown. Several deer beds in the grass.

Meriwether East

PHOTOGRAPHS

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

Photograph Checklist:

☐ One photograph for each of the four cardinal directions surrounding the wetland.

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

☑ At least one photograph showing the buffer surrounding the wetland.

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

Photo #	Latitude	Longitude	Bearing	Description
132	48.622846	-112.677037	60	Transect 1 start
133	48.623372	-112.675124	240	Transect 1 end
137 stitch	48.62284	-112.674375	315	Photo point 1 panorama
142	48.623501	-112.676026	270	Test pit 1
144	48.623323	-112.675905	315	Test pit 2
146	48.623274	-112.675215	245	Test pit 3
153	48.622698	-112.675587	180	Test pit 4
154	48.623111	-112.677081	270	Test pit 5

Comments:

Meriwether East

ADDITIONAL ITEMS CHECKLIST

Hydrology

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

Photos

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

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

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

Wetland Delineation Comments

Entire area within monitoring boundary classified as wetland.

Functional Assessments

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

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired?

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

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

Fencing is in good repair. No maintenance needs noted.

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

Project/Site: Meriwether | City/County: Glacier | Sampling Date: 8/8/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MW TP 1

Investigator(s): S Wall | Section, Township, Range: S 17 T 33N R 8W

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

Subregion (LRR): LRR F/LRR E | Lat: 48.623502 | Long: -112.676024 | Datum: WGS84

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

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

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Hordeum jubatum	80	☑	FACW
2. Puccinellia nuttalliana	20	☐	OBL
3. Agropyron sp.	5	☐	NL
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	105 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: MW TP 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	90	10YR 5/2	10	D	M	Clay Loam	
8+	10YR 3/1	50					Gravel 50%	

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Geomorphic position

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

Project/Site: Meriwether | City/County: Glacier | Sampling Date: 8/8/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MW TP 2

Investigator(s): S Wall | Section, Township, Range: S 17 T 33N R 8W

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

Subregion (LRR): LRR F/LRR E | Lat: 48.623324 | Long: -112.675907 | Datum: WGS84

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

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

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Hordeum jubatum	20	☑	FACW
2. Puccinellia nuttalliana	30	☑	OBL
3. Juncus arcticus	30	☑	FACW
4. Alopecurus pratensis	5	☐	FACW
5. Chenopodium sp	5	☐	NL
6. Aster sp.	5	☐	NL
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	95 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: MW TP 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	90	10YR 5/2	5	D	M	Clay	
5-16	10YR 3/1	80	10YR 5/8	3	C	M		gravel 15%, depletions also present in

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Surface soil cracks in nearby bare area seasonally ponded.

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

Project/Site: Meriwether | City/County: Glacier | Sampling Date: 8/8/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MW TP 3

Investigator(s): S Wall | Section, Township, Range: S 17 T 33N R 8W

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

Subregion (LRR): LRR F/LRR E | Lat: 48.623273 | Long: -112.675217 | Datum: WGS84

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

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

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Beckmannia syzigachne	30	☑	OBL
2. Schoenoplectus tabernaemontani	10	☐	OBL
3. Schoenoplectus maritimus	25	☑	OBL
4. Eleocharis palustris	20	☑	OBL
5. Chenopodium sp.	5	☐	NL
6. Bare Ground	10	☐	NL
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: MW TP 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	95	10YR 5/8	1	C	M	Clay	many roots
4-16	2.5Y 5/2	60	10YR 5/8	25	C	M	Clay	gravel 15%

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Surface soil cracks and geomorphic position provide secondary hydrology indicators.

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

Project/Site: Meriwether | City/County: Glacier | Sampling Date: 8/8/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MW TP 4

Investigator(s): S Wall | Section, Township, Range: S 17 T 33N R 8W

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

Subregion (LRR): LRR F/LRRE | Lat: 48.622698 | Long: -112.675587 | Datum: WGS84

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

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

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 10 ft radius)			
1. Schoenoplectus tabernaemontani	50	☑	OBL
2. Schoenoplectus maritimus	5	☐	OBL
3. Typha latifolia	20	☑	OBL
4. Eleocharis palustris	25	☑	OBL
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: MW TP 4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	65	10YR 5/6	20	C	M	Clay	15 % gravel

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 10

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

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

Project/Site: Meriwether | City/County: Glacier | Sampling Date: 8/8/2013

Applicant/Owner: MDT | State: MT | Sampling Point: MW TP 5

Investigator(s): S Wall | Section, Township, Range: S 17 T 33N R 8W

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

Subregion (LRR): LRR F/LRR E | Lat: 48.623112 | Long: -112.677081 | Datum: WGS84

Soil Map Unit Name: Saline land

Do Normal Circumstances Exist on this site? Yes ☑

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

Is the area a potential Problem Area? Yes ☐

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 10 ft radius)			
1. Hordeum jubatum	30	☑	FACW
2. Juncus arcticus	20	☑	FACW
3. Puccinellia nuttalliana	20	☑	OBL
4. Sonchus arvensis	20	☑	FAC
5. Triglochin maritima	5	☐	OBL
6. Aster sp.	5	☐	NL
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: MW TP 5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					Clay	many roots
4-16	2.5Y 5/2	65	2.5Y 6/6	3	C	M	Sandy Clay	30 % gravel
	5/2							

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

Hydric Soil Indicators:

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

Taxonomy Subgroup: NA

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☑ No ☐

Remarks: Geomorphic position

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Meriwether East **2. MDT project#** NH 1-3(36)234 F **Control#** B594

3. Evaluation Date 8/7/2013 **4. Evaluators** S. Wall **5. Wetland/Site# (s)** Site 2

6. Wetland Location(s): T 33N **R** 8W **Sec1** 17 **T** **R** **Sec2**

Approx Stationing or Mileposts ST 284+40 to 287+50; approximately at MP 239

Watershed 10030203 **Watershed/County** Cut Bank Creek Watershed, Glacier County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 6.62

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 6.62

☐ **Mitigation Wetlands: pre-construction**

How assessed:

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	100

11. Estimated Relative Abundance Common

12. General Condition of AA

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

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is <=15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is <=15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

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

Livestock grazing occurs nearby. Grazing occurred prior to wetland creation but has been fenced and discontinued.

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

Cirsium arvense present in uplands.

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

AA is an excavated area bordering an existing wetland. Highway 2 is located to the north. Rangeland surrounds the wetland; the wetland is fenced to exclude livestock.

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

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

Comments: Willows are present but patches are too small to form a scrub-shrub component. A few small areas of aquatic bed present, AA primarily emergent.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

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

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

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use MNHP T&E database, observations

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

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

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

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use MNHP SOC database, existing habitat observed on site

14C. General Wildlife Habitat Rating:

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

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

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

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

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

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

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

ii. Wildlife habitat features (Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Deer sign observed during the monitoring visit. Occasional pronghorn use and several bird species observed during previous monitoring events.

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☑ **NA** here and proceed to 14E.)

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

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

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

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

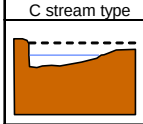
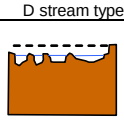
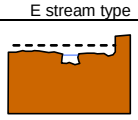
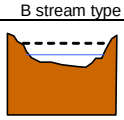
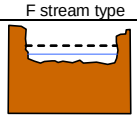
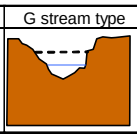
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

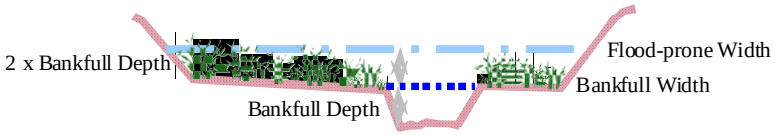
iii. Final Score and Rating: 0 NA **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

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

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

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



Floodprone width / **Bankfull width** = **Entrenchment ratio**

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? **Y** ◯ **N** ◉

Comments: The site is connected to a drainage in the adjacent pre-existing wetland. When the drainage floods water can back up into this site from stream.

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

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: The site appears to flood each year with potential of greater than 5 acre feet.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: Wetland recieves runoff from surrounding range land with potential to deliver excess nutrients to the site.

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

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

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: No shoreline present.

14I. Production Export/Food Chain Support:

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

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

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

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .5M

Comments: Surface water outlet absent.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- ☐ The AA is a slope wetland
- ☐ Springs or seeps are known or observed
- ☐ Vegetation growing during dormant season/drought
- ☐ Wetland occurs at the toe of a natural slope
- ☐ Seeps are present at the wetland edge
- ☐ AA permanently flooded during drought periods
- ☐ Wetland contains an outlet, but no inlet
- ☑ Shallow water table and the site is saturated to the surface
- ☐ Other:

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other:

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

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

Comments: A portion of the wetland was inundated during the dry season indicating year-round inundation, but most of the site is seasonally saturated.

14K. Uniqueness:

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

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

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

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

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

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

Comments:

Assessment area with public access.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Site 2

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	L	0	1	0	☐
C. General Wildlife Habitat	M	.7	1	4.634	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.6	1	3.972	☐
F. Short and Long Term Surface Water Storage	H	.9	1	5.958	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	6.62	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	M	.5	1	3.31	☑
J. Groundwater Discharge/Recharge	M	.7	1	4.634	☐
K. Uniqueness	M	.4	1	2.648	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.993	☐
Totals:		4.95	9	32.769	
Percent of Possible Score			**55** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

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

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

☑

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

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

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana



Photo Point 1 – *Panorama*
Bearing: 300 degrees

Location: Southeast corner of project area
Taken in 2009



Photo Point 1 – *Panorama*
Bearing: 300 degrees

Location: Southeast corner of project area
Taken in 2010



Photo Point 1 – *Panorama*
Bearing: 315 degrees

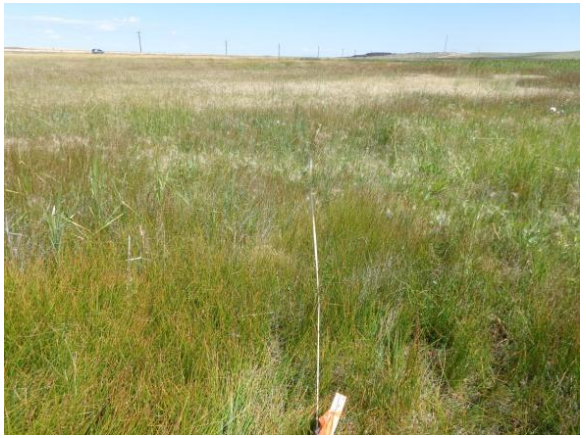
Location: Southeast corner of project area
Taken in 2013



Transect 1 – *Start*
Bearing: 40 degrees
Location: T-1 start
Taken in 2009



Transect 1 – *Start*
Bearing: 40 degrees
Location: T-1 start
Taken in 2010



Transect 1 – *Start*
Bearing: 60 degrees
Location: T-1 start
Taken in 2013



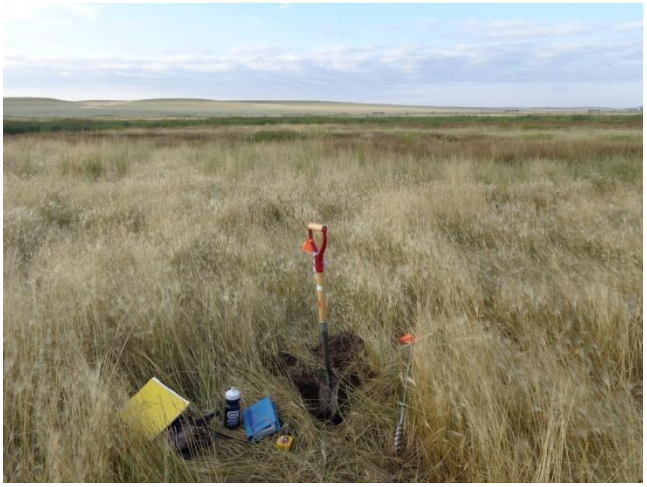
Transect 1 – *End*
Bearing: 250 degrees
Location: T-1 end
Taken in 2009



Transect 1 – *End*
Bearing: 250 degrees
Location: T-1 end
Taken in 2010



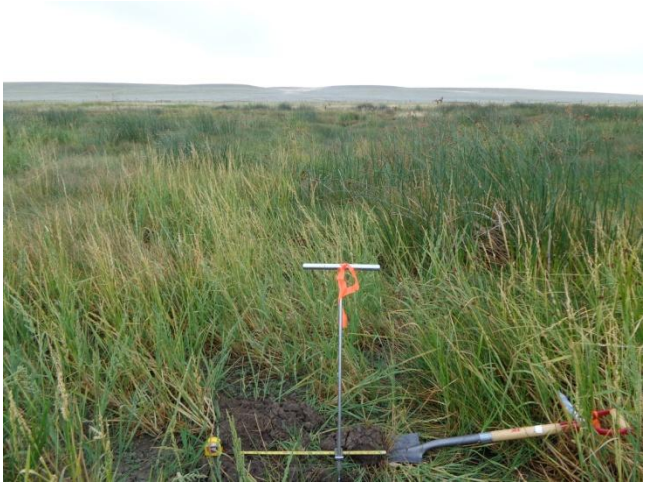
Transect 1 – *End*
Bearing: 240 degrees
Location: T-1 end
Taken in 2013



Data Point – MW TP 1
Bearing: 270 degrees
Location: Veg community 6
Taken in 2013



Data Point – MW TP 2
Bearing: 315 Degrees
Location: Veg community 9
Taken in 2013



Data Point – MW TP 3
Bearing: 245 degrees
Location: Veg community 9
Taken in 2013



Data Point – MW TP 4
Bearing: 180 degrees
Location: Veg community 8
Taken in 2013

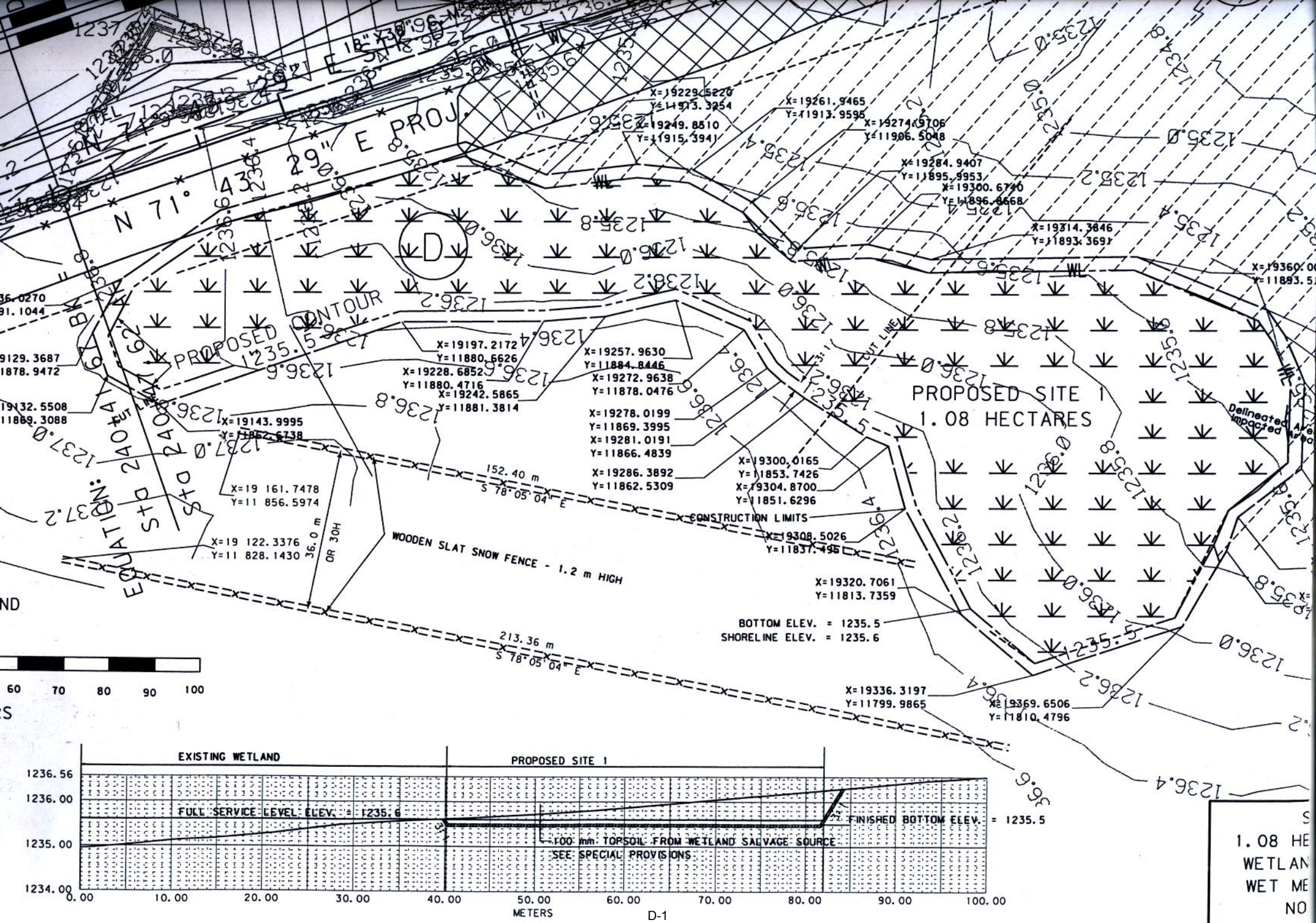


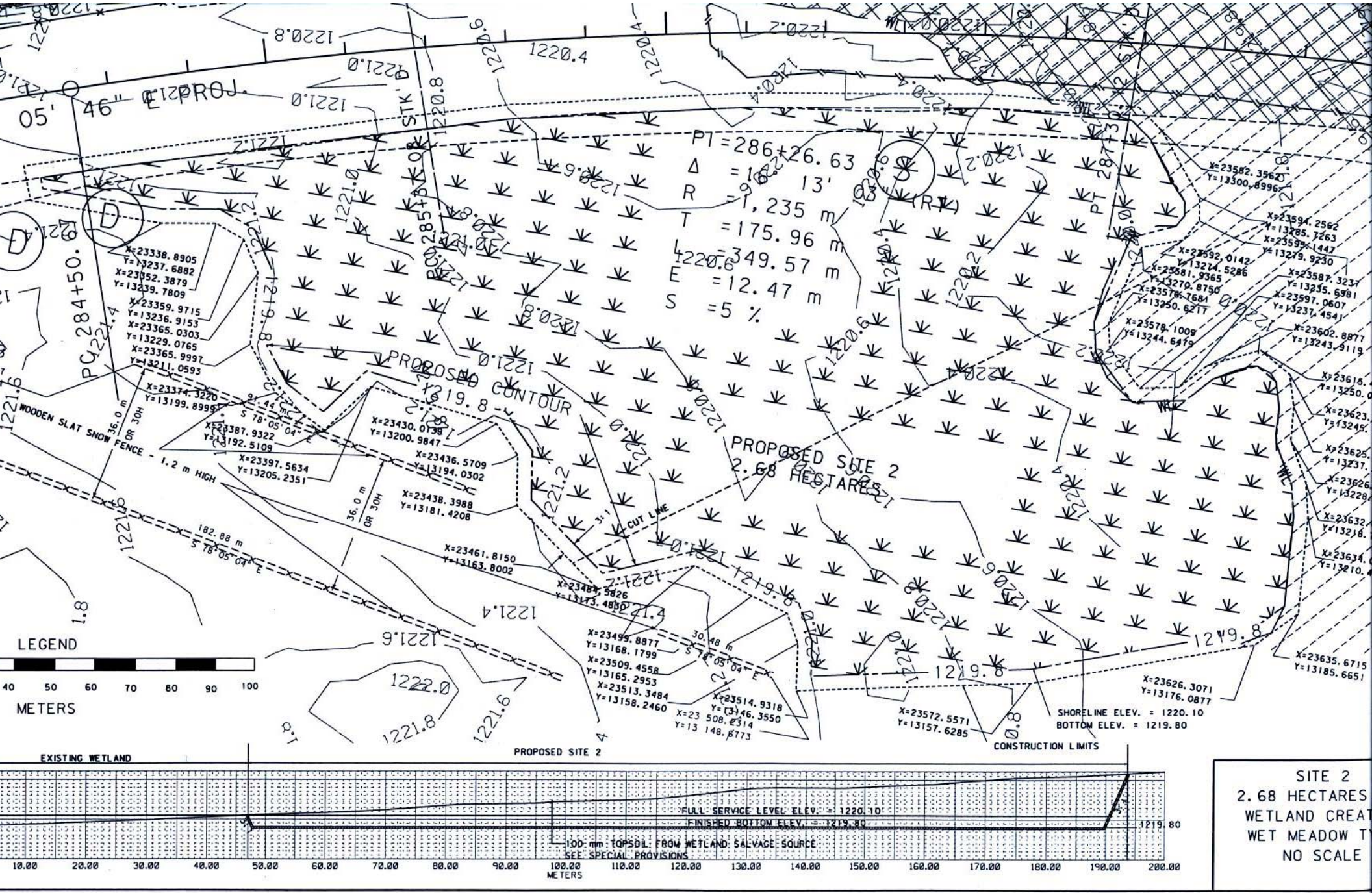
Data Point – MW TP 5
Bearing: 270 degrees
Location: Veg community 6
Taken in 2013

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Meriwether East
Glacier County, Montana


PROPOSED SITE 1
1.08 HECTARES
PROPOSED CONTOUR
1235.5
N 71° 43' 29" E PROJ.
152.40 m
S 78° 05' 04" E
213.36 m
S 78° 05' 04" E
CONSTRUCTION LIMITS
WOODEN SLAT SNOW FENCE - 1.2 m HIGH
36.0 m
OR 30H
BOTTOM ELEV. = 1235.5
SHORELINE ELEV. = 1235.6
X=19 161.7478
Y=11 856.5974
X=19 122.3376
Y=11 828.1430
X=19143.9995
Y=11862.6738
X=19197.2172
Y=11880.6626
X=19228.6852
Y=11880.4716
X=19242.5865
Y=11881.3814
X=19257.9630
Y=11884.8446
X=19272.9638
Y=11878.0476
X=19278.0199
Y=11869.3995
X=19281.0191
Y=11866.4839
X=19286.3892
Y=11862.5309
X=19300.0165
Y=11853.7426
X=19304.8700
Y=11851.6296
X=19308.5026
Y=11837.495
X=19320.7061
Y=11813.7359
X=19336.3197
Y=11799.9865
X=19369.6506
Y=11810.4796
X=19229.5220
Y=11913.3254
X=19249.8510
Y=11915.3941
X=19261.9465
Y=11913.9595
X=19274.9706
Y=11906.5048
X=19284.9407
Y=11895.9953
X=19300.6740
Y=11896.8668
X=19314.3846
Y=11893.3691
Delineated Impacted Area
EXISTING WETLAND
PROPOSED SITE 1
FULL SERVICE LEVEL ELEV. = 1235.6
FINISHED BOTTOM ELEV. = 1235.5
100 mm TOPSOIL FROM WETLAND SALVAGE SOURCE
SEE SPECIAL PROVISIONS
1236.56
1236.00
1235.00
1234.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
METERS


PROPOSED SITE 2
2.68 HECTARES
PROPOSED CONTOUR
PI=286+26.63
Δ =16° 13'
R =1,235 m
T =175.96 m
L =349.57 m
E =12.47 m
S =5 %
PC 284+50.
PC 285+00.
WOODEN SLAT SNOW FENCE - 1.2 m HIGH
182.88 m
S 78° 05' 04" E
30.48 m
CUT LINE
3:1
SHORELINE ELEV. = 1220.10
BOTTOM ELEV. = 1219.80
CONSTRUCTION LIMITS
LEGEND
METERS
EXISTING WETLAND
PROPOSED SITE 2
FULL SERVICE LEVEL ELEV. = 1220.10
FINISHED BOTTOM ELEV. = 1219.80
100 mm TOPSOIL FROM WETLAND SALVAGE SOURCE
SEE SPECIAL PROVISIONS
SITE 2
2.68 HECTARES
WETLAND CREAT
WET MEADOW T
NO SCALE