MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT

FORSYTH – NORTHWEST: WEST SITE (SITE 1); MIDDLE SITE (SITE 2); EAST SITE (SITE 3)

ROSEBUD COUNTY, MONTANA

PROJECT COMPLETED: 2012 (EAST, WEST, AND MIDDLE)

MONITORING REPORT #6: DECEMBER 2018

Prepared for:

VISION ZERO
zero deaths · zero serious injuries
MONTANA DEPARTMENT OF TRANSPORTATION

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Helena, Montana 59620

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MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2018

FORSYTH – NORTHWEST MITIGATION SITE

WEST SITE (SITE 1); MIDDLE SITE (SITE 2); EAST SITE (SITE 3)

ROSEBUD COUNTY, MONTANA

Forsyth East, Middle, and West Constructed: 2012
MDT Project Number STPP 14-6 (9) 259 CN 4059 (Forsyth – Northwest)
Control Number 1396

USACE Number: NOW-2002-90-599 Control Number 1514 (Forsyth – Northwest)
NOW-2006-906-76 MTB (Forsyth – Northwest)

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December 2018

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Cover: View looking southwest from Photo Point 9 at the West Site.

1.0 INTRODUCTION

The 2018 Forsyth – Northwest (FNW) wetland monitoring report documents the sixth year of monitoring at three of the four FNW sites: (1) West, (2) Middle, and (3) East. Monitoring at the Treasure County Line site (4) was ended following the 2017 monitoring event because the site had reached its maximum wetland development potential and monitoring was no longer warranted. The FNW sites were developed to mitigate for a cumulative total of 8.98 acres of wetland impacts associated with two Montana Department of Transportation (MDT) highway construction projects: (1) the Volborg – North and South project constructed in 2004 and (2) the FNW project constructed in 2012. This report includes monitoring results for each of the three sites and a discussion of the mitigation credits developed for the FNW project. To simplify the wetland crediting documented in this report, the final wetland acreages from the 2017 Treasure County Line monitoring report are provided in this report.

The three wetland mitigation sites are located in Rosebud County in the Sagebrush Steppe ecoregion of the Northwest Great Plains. The sites are within Watershed #14 – Middle Yellowstone. All three sites are located northwest of Forsyth along Montana Highway 12 at mile markers 262.3 (Site 3: East), 261.9 (Site 2: Middle), and 260 (Site 1: West) within the Big Porcupine Creek subbasin, as shown in Figure 1-1. Figures A-2, A-5, and A-8 (Appendix A) show the monitoring activity locations, while Figures A-3, A-6, and A-9 show mapped site features for each site, respectively. Figures A-4, A-7, and A-10 (Appendix A) show the 2018 wetland delineation boundaries compared to the pre-project wetland boundaries at each site. Appendix B contains the MDT Wetland Mitigation Site Monitoring forms, the US Army Corps of Engineers (USACE) Great Plains (GP) Regional Supplement Wetland Determination Data forms [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] for each site. Appendix C contains photographs of the project areas, and Appendix D includes the project plan sheets.

1.1 IMPACTS AND MITIGATION

Wetland impacts for the FNW project were identified in USACE permit #NWO-2006-90676-MTB and a wetland mitigation monitoring plan prepared by MDT and dated February 15, 2012. The wetland mitigation sites are intended to provide credits for impacts caused by the Volborg – North and South project (constructed in 2004) and the FNW project (completed in 2012). The Treasure County Line site was constructed in 1999 before the 2.18 acres of impact that resulted from the FNW project. The 2012 mitigation plan outlined that this site had produced 1.78 acres of wetland credit, which was awarded at a 1:1 credit ratio. Applying standard wetland compensatory mitigation ratios [USACE, 2005], 11 acres was the total area of required mitigation presented in the approved wetland mitigation plan. Table 1-1 provides a summary of the impacts, appropriate ratios, and anticipated mitigation requirements. The anticipated wetland mitigation acreages produced by the FNW project are listed by site and mitigation type in Table 1-2. Mitigation requirements and estimated credit development are discussed in more detail in Section 3.5 of this report.

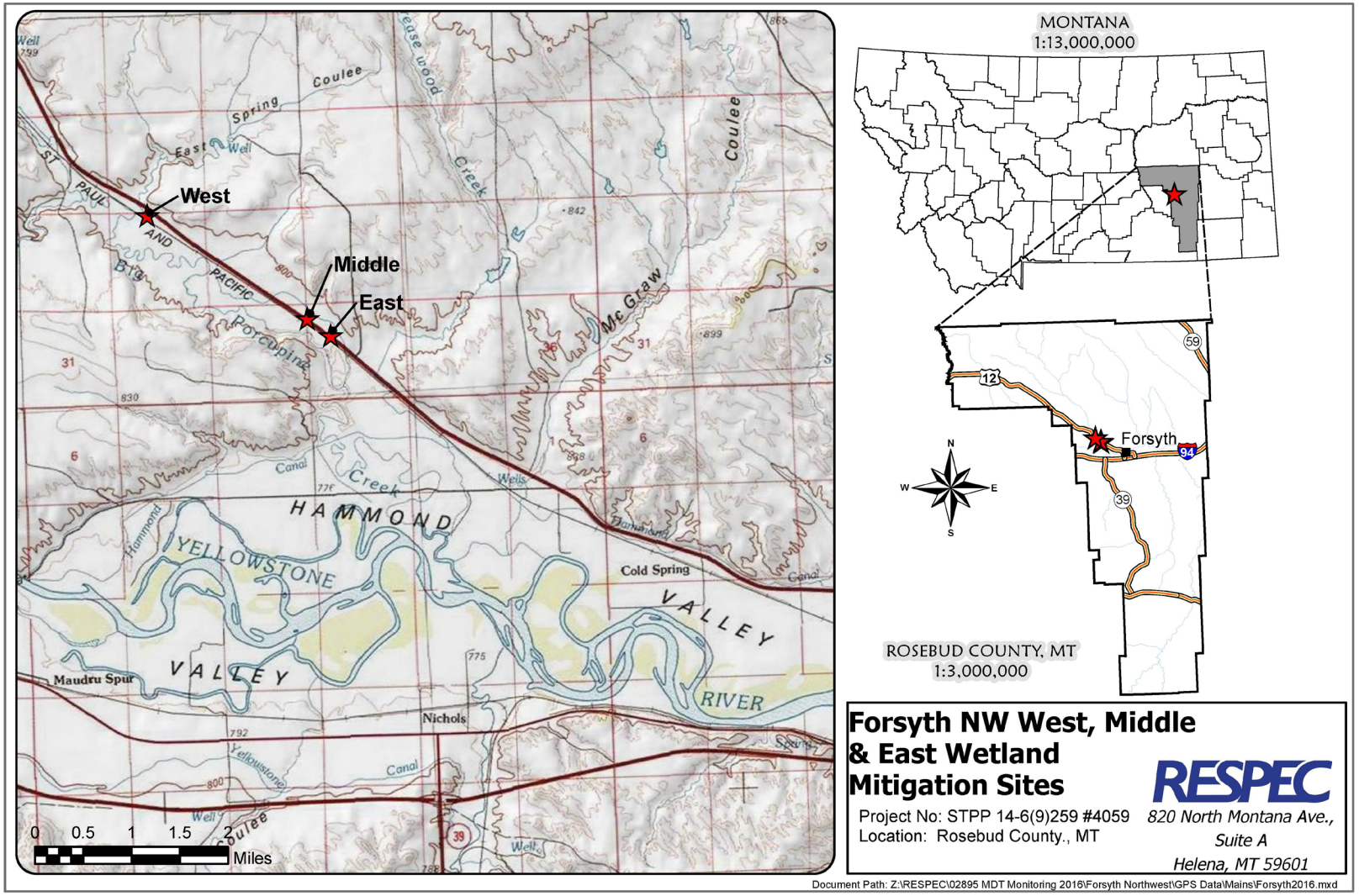

Figure 1-1. Locations of the Forsyth – Northwest Mitigation Sites: West (Site 1), Middle (Site 2), and East (Site 3).

Table 1-1. Wetland Impacts to be Mitigated at the Forsyth – Northwest Sites

MDT Project	Impacts (acres)	Credits (acres)	Balance Remaining (acres)	Ratio	Mitigation (acres)
Volborg – North and South	6.80	0.00	6.80	1.5:1	10.20
Forsyth – Northwest	2.18	1.78	0.40	2:1	0.80
Total	**8.98**	**1.78**	**–**	**–**	**11.00**

Table 1-2. Anticipated Wetland Mitigation Acreages for the Forsyth – Northwest Sites

Wetland Mitigation Site	Expected Credits	
	Mitigation Type	Acre
Site 1: West	Creation	9.09
	Preservation	1.29
	Total for Site 1	**10.38**
Site 2: Middle	Creation	0.34
Site 3: East	Creation	1.07
Total for Sites 1, 2, and 3		**11.79**
Site 4: Treasure County Line	Previous Creation (Credit)	1.78
Total for All FNW Sites (1–4)		**13.57**

1.2 GENERAL MITIGATION OBJECTIVES

The MDT-developed performance standards and monitoring requirements (as presented in the approved mitigation plan) for the FNW sites are listed below. Aside from monitoring requirements, no quantitative metrics or criteria are associated with the success of these mitigation sites.

1. **Vegetation Community:**
   a. Establish permanent photo points
   b. Establish vegetation transects to monitor the development of each vegetative community and its diversity
   c. Develop a plant species list during each monitoring visit
   d. Plot vegetative communities on as-built plants
   e. Determine areal coverage of vegetative community from as-built plans, aerial photographs, or by conventional or global positioning system (GPS) survey every other year, starting in 2013
   f. Monitor for and control invasive weed species.
2. **Soils:**
   a. Establish monitoring points for hydric soil development
   b. Monitor and document the development of hydric soils by using a Munsell Soil Chart
   c. Document the progression of reducing soil conditions as the soil transitions from an aerobic state to an anaerobic (hydric) state.

3. **Hydrology:**
   a. Delineate inundated areas no earlier than the second weekend of June every other year, starting in 2013
   b. Survey and document the hydrology within the new wetland area no earlier than the second weekend of June every other year, starting in 2013
   c. Measure the horizontal and vertical extent of the soil saturation zone at the margins of the wetlands.
4. **Wildlife Community:**
   a. **Birds:** Create and maintain a cumulative list of bird species observed
   b. **Mammals:** Create and maintain a list of mammalian species observed either directly or indirectly (e.g., tracks and scat) during the biennial monitoring visits
   c. **Herptiles:** Create and maintain a list of the amphibian and reptile species observed either directly or indirectly (e.g., tracks and nests) during the biennial monitoring visits.
5. **MDT Functional Assessment:**
   a. A formal MDT Functional Assessment will be completed during each monitoring period.
6. **Routine Wetland Determination:**
   a. A Routine Wetland Determination form will be completed during each monitoring period according to the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and to the terms in the most applicable USACE 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (2010 GP Regional Supplement) [USACE, 2010].

1.3 MITIGATION SITES

The following sections provide a general discussion of the three wetland mitigation sites monitored in 2018. For details related to the Treasure County Line site, please see the 2017 Forsyth Northwest monitoring report [RESPEC 2017]. The discussion includes location, site topography, mitigation objectives, and targeted wetland community goals.

1.3.1 West Site – Site 1

The West site is a 13.71-acre site owned by MDT and located at the mouth of East Spring Coulee in the floodplain of Big Porcupine Creek. The site is intended to provide 10.38 acres of compensatory wetland mitigation. Approximately 1.29 acres of preexisting wetlands will be preserved at this site. The monitoring area boundary is shown on Figures A-3 and A-4 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix
- Constructing a water retention dike on the eastern end of the project site.

The targeted wetland community types included emergent, scrub/shrub, and forested classes dominated by herbaceous hydrophytes, willows, and cottonwoods. Site construction was completed in summer 2012, and the revegetation was completed from August through October 2012.

1.3.2 Middle Site – Site 2

The Middle site is a 1.80-acre site owned by MDT. The site is adjacent to US Highway 12 and situated among old meander scars across the Big Porcupine Creek floodplain. This area is intended to provide 0.34 acre of compensatory wetland mitigation. The monitoring area boundary is shown on Figures A-5 and A-6 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in the summer of 2012, and the revegetation was completed from August through October in 2012.

1.3.3 East Site – Site 3

The East site is a 2.74-acre site owned by MDT. The site is located approximately 1,000 feet from the Middle site and is directly adjacent to US Highway 12. The East site is intended to provide 1.07 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures A-7 and A-8 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in the summer of 2012, and the revegetation was completed from August through October in 2012.

2.0 METHODS

All three sites were monitored on July 11, 2018. Information contained in the Wetland Mitigation Site Monitoring forms and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity locations for the West, Middle, and East, sites were mapped with a GPS as illustrated on Figures A-2, A-5, and A-8, respectively (Appendix A). The collected information included wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird- and wildlife-use documentation, photographic documentation, functional assessments, and a nonengineering examination of the infrastructure established within the mitigation project area. Monitoring methods have remained relatively

consistent at this site since the onset of monitoring. The 2013 Forsyth Northwest monitoring report [Confluence Consulting, Inc., 2013] provides a more detailed description of monitoring methods at this site. The 2013 monitoring report can be found online (*https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2013_REPORTS/FORSYTH_NORTHWEST_2013_FINAL.PDF*).

3.0 RESULTS

3.1 WEST SITE – SITE 1

3.1.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 through 2017 was 14.5 inches [Western Regional Climate Center, 2018]. Annual precipitation in recent years was 19.5 inches (2013), 18.3 inches (2014),10.0 inches (2015), 19.8 inches (2016), and 12.2 inches in 2017. These data indicate that above-average precipitation was recorded at the site in 2013, 2014, and 2016, while below-average precipitation was recorded in 2015 and 2017. In June 2017, the governor of Montana issued Executive Order 5-2017 that declared a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in eastern Montana [DNRC, 2017]. The precipitation in 2018 from January through August totaled 19.5 inches at the Forsyth (243098) meteorological station. This 8-month total is approximately 8.6 inches above the long-term average (10.8 inches).

The main source of hydrology at the West site is runoff from precipitation events in the East Spring Coulee watershed. Surface runoff from East Spring Coulee flows directly into the site. Additional hydrology is provided by a seasonally high groundwater table. With precipitation levels that are significantly above average between January and August in 2018, the mitigation site received heavy runoff from the East Spring Coulee and filled the mitigation site with water to full capacity. 2018 is the first year since 2013 when monitoring began that this site has been completely flooded during the monitoring event (Appendix C).

Mitigation activities included excavating to lower the ground surface of uplands to match adjacent existing wetlands and the construction of a dike across two wetland/ephemeral swales along the lower end of the site (east side) to impound periodic surface water. In 2013, high surface water flows within the site breached the western portion of the dike structure and required the MDT maintenance forces to make repairs in the fall of 2013. This same dike structure failed again at the same location in 2014 and required additional repairs by MDT maintenance forces. The dike failed again in 2015 and required the MDT Aquatic Resource Section to reevaluate the original design of the dike structure and develop a new dike structure to accommodate high flow events that pass over the structure. A new design was approved by the USACE in 2016, and construction was undertaken in the spring of 2017 to rebuild the dike and harden the outlet structure with rip-rap to prevent future failures. In the spring of 2018, the dike structure was subject to high flow events, and water was impounded behind the dike for the first time since 2013.

Two data points (DP-1W and DP-1U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located west of Transect 2 (T-2) start. The soil at DP-1W was saturated to the surface and standing water in the pit occurred at 14 inches. No primary or secondary indicators of wetland hydrology were observed at DP-1U, which is located in upland community Type 5 – *Symphoricarpos albus/Pascopyron smithii*. These matched data points were moved in 2018 because the previous location of DP-1W was under significant water in 2018 with no vegetation visible.

3.1.2 Vegetation

A total of 79 plant species were identified during the 2013 through 2018 field surveys, as listed in Table 3-1. One new species— small soapweed yucca (*Yucca glauca*), which is an upland cactus species—was identified for the first time along the south site fence. The indicator status for all of the plants was derived from the 2016 NWPL [Lichvar et al., 2016]. The mitigation area contains several mature eastern cottonwoods (*Populus deltoides*) near the center of the site and a few large fragile willows (*Salix fragilis*) along the undisturbed existing wetland swales. Seventeen vegetation communities have been mapped across the site from 2013 through 2018 with only seven of those communities persisting in 2018. The high-water levels across the site in 2018 essentially flooded out several community types that were present in 2017. The seven community types on this site in 2018 include the following:

- Upland Type 1 – *Bromus tectorum*/*Sarcobatus vermiculatus*
- Upland Type 5 – *Symphoricarpos albus*/*Pascopyrum smithii*
- Upland Type 6 – *Pascopyrum smithii*/*Bromus tectorum*
- Wetland Type 8 – *Typha latifolia*/*Eleocharis palustris*
- Wetland Type 9 – *Eleocharis palustris*/Open Water
- Wetland Type 16 - *Alopecurus arundinaceus/Hordeum jubatum*
- Wetland Type 17 – Open Water.

The species composition for each community is included on the West site's Wetland Mitigation Site Monitoring form (Appendix B) and discussed below. Vegetation community boundaries are shown in Figure A-3 (Appendix A).

Upland Community Type 1 – *Bromus tectorum/Sarcobatus vermiculatus* was identified on 1.2 acres along the side slope of the railroad grade along the southwestern boundary. Dominant species included cheatgrass (*Bromus tectorum*), greasewood (*Sarcobatus vermiculatus*), western wheatgrass (*Pascopyrum smithii*), and false meadow rye grass (*Schedonorus pratensis*).

Upland Community Type 5 – *Symphoricarpos albus*/*Pascopyrum smithii* was identified on 1.1 acres located in undisturbed upland along the southern boundary of the project area. Dominant species included common snowberry (*Symphoricarpos albus*), western wheatgrass, greasewood, and Japanese brome (*Bromus arvensis*).

Table 3-1. Vegetation Species Observed at the West Site From 2013 Through 2018 (Page 1 of 2)

Common Names	Scientific Names	GP Indicator Status[(a)]
Crested Wheatgrass	*Agropyron cristatum*	UPL
Northern Water-Plantain	*Alisma triviale*	OBL
Red-Root	*Amaranthus retroflexus*	FACU
Perennial Ragweed	*Ambrosia psilostachya*	FACU
Grand Redstem	*Ammannia robusta*	OBL
Aquatic macrophytes	*Aquatic macrophytes*	NL
Biennial Wormwood	*Artemesia biennis*	FACU
Showy Milkweed	*Asclepias speciose*	FAC
Silverscale	*Atriplex argentea*	FAC
Mexican-Fireweed	*Bassia scoparia*	FACU
California Brome	*Bromus carinatus*	UPL
Smooth Brome	*Bromus inermis*	UPL
Japanese Brome	*Bromus arvensis*	UPL
Cheatgrass	*Bromus tectorum*	UPL
Sedge	*Carex* sp.	NL
Lamb's Quarters	*Chenopodium album*	FACU
Red Goosefoot	*Chenopodium rubrum*	OBL
Chicory	*Cichorium intybus*	FACU
Canada Thistle	*Cirsium arvense*	FACU
Bastard-Toadflax	*Comandra umbellata*	UPL
Field Bindweed	*Convolvulus arvensis*	UPL
Tufted Hair Grass	*Deschampsia caespitosa*	FACW
Herb Sophia	*Descurainia sophia*	UPL
Coastal Saltgrass	*Distichlis spicata*	FACW
Large Barnyard Grass	*Echinochloa crus-galli*	FAC
Russian Olive	*Elaeagnus angustifolia*	FACU
Common Spike-Rush	*Eleocharis palustris*	OBL
Nodding Wild Rye	*Elymus canadensis*	FACU
Intermediate Wheatgrass	*Elymus hispidus*	UPL
Streamside Wild Rye	*Elymus lanceolatus*	FACU
Creeping Wild Rye	*Elymus repens*	FACU
Slender Wild Rye	*Elymus trachycaulus*	FACU
Leafy Spurge	*Euphorbia esula*	UPL
Tall Mannagrass	*Glyceria elata*	OBL
American Licorice	*Glycyrrhiza lepidota*	FACU
Curly-Cup Gumweed	*Grindelia squarrosa*	UPL
Common Sunflower	*Helianthus annuus*	FACU
Meadow Barley	*Hordeum brachyantherum*	FAC
Foxtail Barley	*Hordeum jubatum*	FACW
Seaside Barley	*Hordeum marinum*	FACU
Deer-Root	*Iva axillaris*	FAC
Prickly Lettuce	*Lactuca serriola*	FAC

Table 3-1. Vegetation Species Observed at the West Site From 2013 Through 2018 (Page 2 of 2)

Common Names	Scientific Names	GP Indicator Status[(a)]
Clasping Pepperwort	*Lepidium perfoliatum*	FAC
Prairie Flax	*Linum lewisii*	UPL
Yellow Sweet Clover	*Melilotus officinalis*	FACU
Alkali Muhly	*Muhlenbergia asperifolia*	FACW
Green Needle Grass	*Nassella viridula*	UPL
Western Wheatgrass	*Pascopyrum smithii*	FACU
Reed Canary Grass	*Phalaris arundinacea*	FACW
Flat-Stem Bluegrass	*Poa compressa*	FACU
Fowl Bluegrass	*Poa palustris*	FACW
Kentucky Bluegrass	*Poa pratensis*	FACU
Yard Knotweed	*Polygonum aviculare*	FACU
Eastern Cottonwood	*Populus deltoides*	FAC
Nuttall's Alkali Grass	*Puccinellia nuttalliana*	OBL
Mexican Coneflower	*Ratibida columnifera*	UPL
Golden Currant	*Ribes aureum*	FACU
Wax Currant	*Ribes cereum*	UPL
Prairie Rose	*Rosa arkansana*	FACU
Curly Dock	*Rumex crispus*	FAC
Arum-Leaf Arrowhead	*Sagittaria cuneata*	OBL
Red Saltwort	*Salicornia rubra*	OBL
Fragile Willow	*Salix fragilis*	FAC
Greasewood	*Sarcobatus vermiculatus*	FAC
False Meadow Rye Grass	*Schedonorus pratensis*	FACU
Hard-Stem Club-Rush	*Schoenoplectus acutus*	OBL
Saltmarsh Club-Rush	*Schoenoplectus maritimus*	OBL
Yellow Bristle Grass	*Setaria pumila*	FACU
Field Sow-Thistle	*Sonchus arvensis*	FAC
Freshwater Cordgrass	*Spartina pectinata*	FACW
Alkali-Sacaron	*Sporobolis airoides*	FAC
Common Snowberry	*Symphoricarpos albus*	UPL
Salt-cedar	*Tamarix chinensis*	UPL
Common Dandelion	*Taraxacum officinale*	FACU
Field Pennycress	*Thlaspi arvense*	FACU
Meadow Goat's-beard	*Tragopogon dubius*	UPL
Narrow-Leaf Cattail	*Typha angustifolia*	OBL
Broad-Leaf Cattail	*Typha latifolia*	OBL
Rough Cockleburr	*Xanthium strumarium*	FAC
Small Soapweed Yucca	***Yucca glauca***	UPL

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2018 are in bold.

Upland Community Type 6 – *Pascopyrum smithii*/*Bromus tectorum* was identified on 0.9 acre in undisturbed upland adjacent to Montana Highway 12 along the northeastern boundary. This community replaced a portion of upland community Type 1 because of changes in species composition and their associated cover classes. The community was dominated by cheatgrass, yellow sweet clover (*Melilotus officinalis*), and western wheatgrass.

Wetland Community Type 8 – *Typha latifolia*/*Eleocharis palustris* was identified on 0.6 acre across the site in 2018. This community type was 100 percent inundated during the site visit and is expected to expand should similar hydrological conditions persist in future years. The community was dominated by common spike-rush (*Eleocharis palustris*) and broad-leaf cattail (*Typha latifolia*).

Wetland Community Type 9 – *Eleocharis palustris*/Open Water was identified on 3.2 acres on the western half of the flooded mitigation site. The most abundant species in the community were common spike-rush, aquatic macrophytes, and saltmarsh club-rush (*Schoenoplectus maritimus*). Open water likely persisted in this community type throughout the 2018 growing season.

Wetland Community Type 16 – *Alopecurus arundinaceus/Hordeum jubatum* was identified in a new 0.10-acre wetland area along the projects southwest border (Figure A-3, Appendix A). This community type was dominated by creeping meadow-foxtail *(Alopecurus arundinaceus)*, foxtail barley *(Hordeum jubatum)*, and arum-leaf arrowhead (Sagittaria cuneate).

Wetland Community Type 17 – Open Water was identified on 6.7 acres of the mitigation site in 2018. Significantly above-average precipitation between January and July resulted in the entire excavation/diked area to be inundated with standing water. This community type replaced several types previously identified in the eastern half of the site. Flooded dead and dying vegetation was noted across this community type and individual wetland plants were beginning to emerge including cattail and creeping spike-rush.

Vegetation cover was measured along two transects at the West site in 2018 (Figure A-3, Appendix A). Data recorded on T-1 are summarized in Table 3-2 and Charts 3-1 and 3-2. Photographs of the West transect start and end points are provided in Appendix C. T-1 is located in the eastern half of the site and extends 282 feet from southwest to northeast. In 2017, this transect crossed upland community Type 5 – *Symphoricarpos albus/Pascopyrum smithii*, Type 6 – *Pascopyrum smithii/Bromus tectorum*, and Type 11 – *Pascopyrum smithii/Elymus repens*; and wetland community Type 8 – *Typha latifolia/Eleocharis palustris* and Type 12 – *Hordeum jubatum/Elymus trachycaulus*. In 2018, this transect started in Type 5 and the remaining transect crossed Type 17 – open water. All other community types from 2017 were flooded under 2–3 feet of standing water. This transect spans the 2017 construction zone created as part of the dike repair on this end of the site. Wetland habitat is expected to evolve along this transect in the future following the 2017 dike repair, and exceptional inundation in 2018.

Table 3-2. T-1 Data Summary for the West Site From 2013 Through 2018

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**282**	**282**	**282**	**282**	**282**	**282**
Vegetation Community Transitions Along Transect	6	6	7	7	5	1
Vegetation Communities Along Transect	3	3	5	5	5	1
Hydrophytic Vegetation Communities Along Transect	1	1	2	4	2	0
Total Vegetative Species	27	35	37	26	18	5
Total Hydrophytic Species	10	10	10	5	4	0
Total Upland Species	17	25	27	21	14	5
Estimated % Total Vegetative Cover	75	80	80	90	46	5
Estimated % Unvegetated	25	20	20	10	54	95
% Transect Length Comprising Hydrophytic Vegetation Communities	15.6	18.8	37	37	34	0
% Transect Length Comprising Upland Vegetation Communities	84.4	81.2	63	63	66	5
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	95
% Transect Length Comprising Mudflat	0	0	0	0	0	0

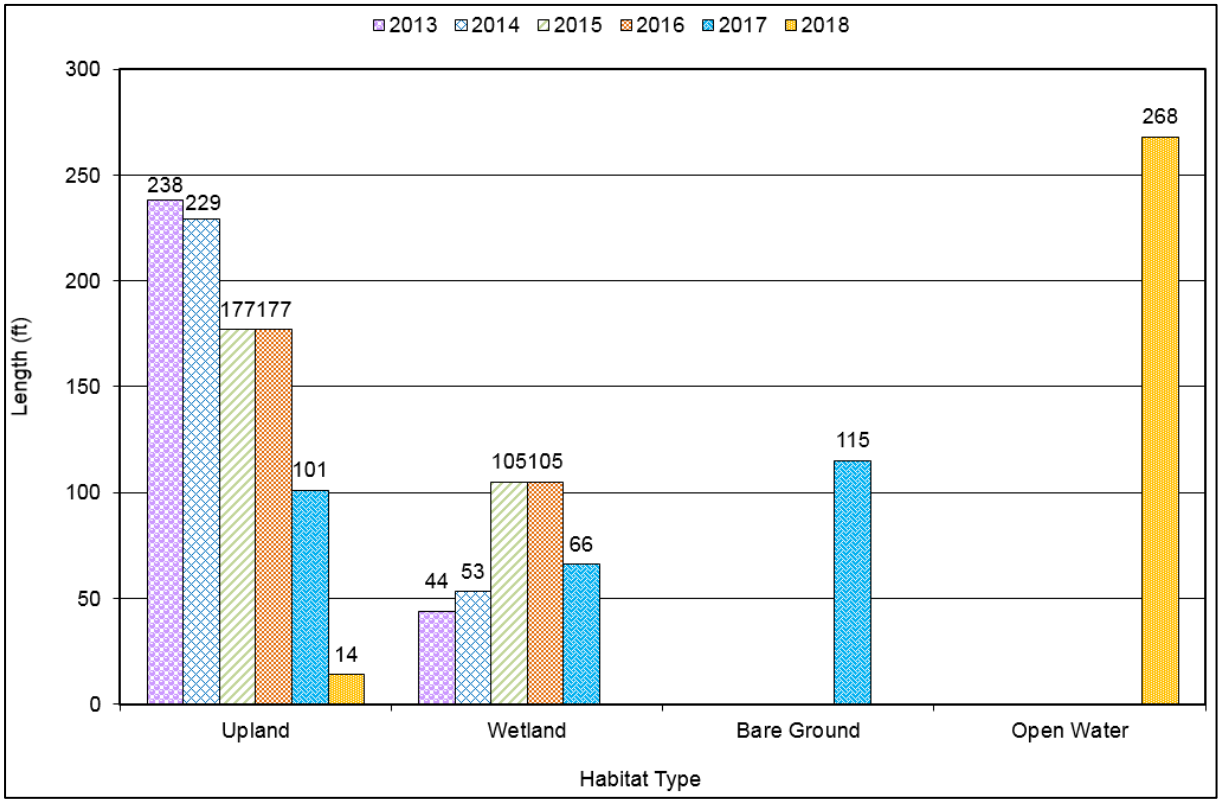

Chart 3-1. T-1 Map for the West Site Showing Vegetation Types From Transect Start (0 Foot) to End (282 Feet) From 2013 Through 2018.

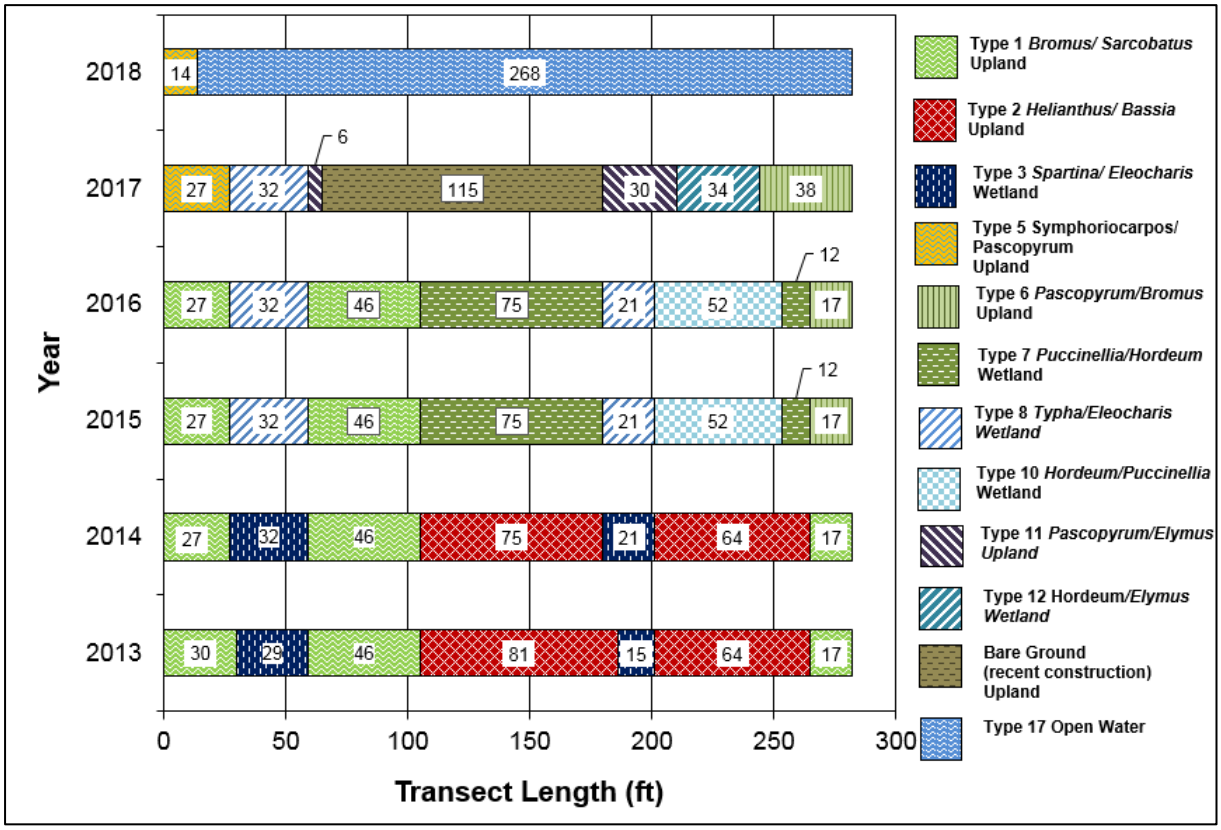

Chart 3-2. Length of Vegetation Communities Within T-1 at the West Site From 2013 Through 2018.

Transect 2 (T-2) data are summarized in Table 3-3 and Charts 3-3 and 3-4. T-2 is located in the western half of the site and extends 261 feet from southwest to northeast, with intervals that alternate between upland community Types 5 and 6 and wetland community Type 9 – *Eleocharis plaustris*/Open Water. Hydrophytic vegetation communities composed 90 percent of T-2 in 2018. A transition from pioneer to climax wetland community is also occurring along T-2, where weedy species and excavated bare soils in 2014 have been replaced by over 80 percent cover of an obligate wetland species (*Eleocharis*).

Infestations of two Priority 2B noxious weeds (Canada thistle [*Cirsium arvense*] and leafy spurge [*Euphorbia esula*]) were mapped within the project site (Figure A-3, Appendix A). Overall, the weed infestations are low (< 1 percent cover) across the site because several were flooded by 2018 water levels across the site.

No containerized shrubs or trees were installed at this site. Revegetation efforts included a combination of salvaged wetland materials from impacted wetlands along the road re-construction project and seeding after construction. The seeding mixture included wand panic grass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and Nuttall's alkaligrass *(Puccinellia nuttalliana)*. Woody species are regenerating naturally within the site, including eastern cottonwood and fragile willow. The areas that were recently disturbed by dike repair in 2017 were re-seeded with an upland seed mix.

Table 3-3. T-2 Data Summary for the West Site From 2013 Through 2018

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**261**	**261**	**261**	**261**	**261**	**261**
Vegetation Community Transitions Along Transect	2	2	2	2	3	2
Vegetation Communities Along Transect	2	2	3	3	4	3
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	2	1
Total Vegetative Species	21	26	29	28	19	13
Total Hydrophytic Species	8	11	9	8	9	4
Total Upland Species	13	15	20	20	10	9
Estimated % Total Vegetative Cover	10	20	20	82	92	20
Estimated % Unvegetated	90	80	80	13	8	80
% Transect Length Comprising Hydrophytic Vegetation Communities	87	87	87	87	87	90
% Transect Length Comprising Upland Vegetation Communities	13	13	13	13	13	10
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

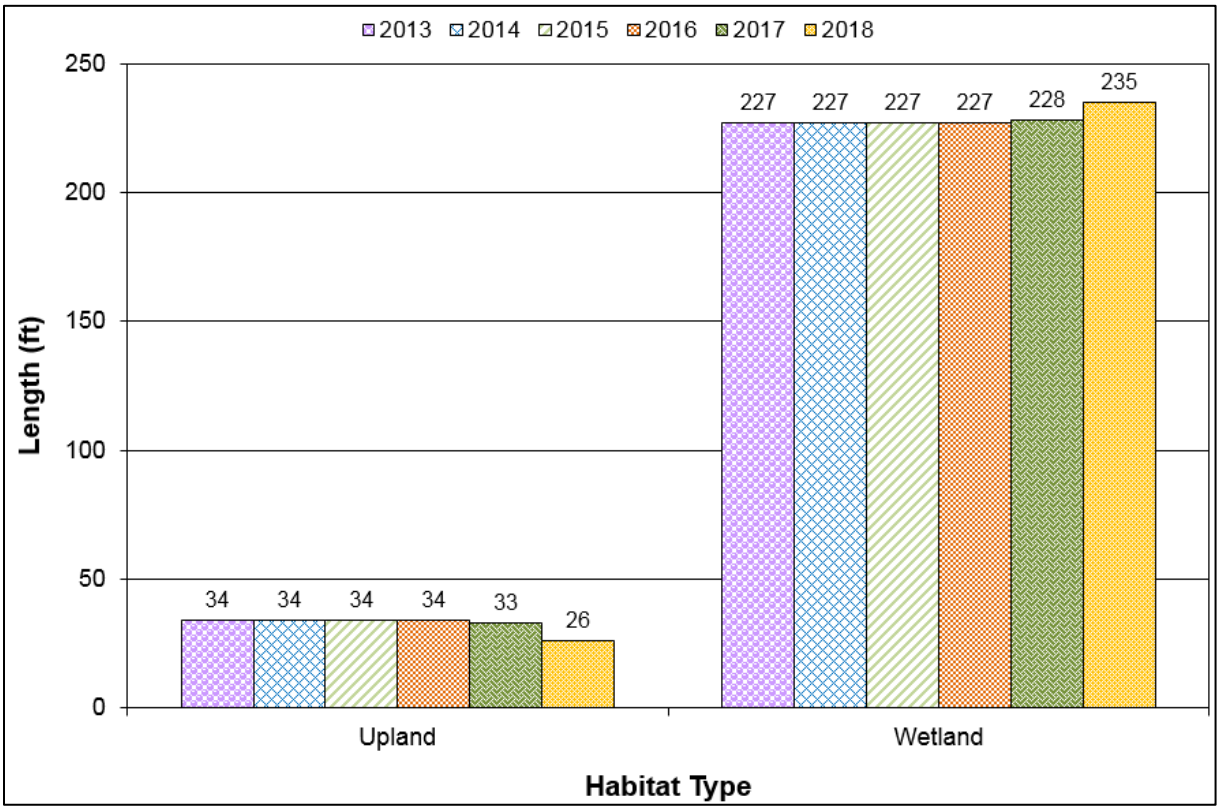

Chart 3-3. T-2 Map for the West Site Showing Vegetation Types From Transect Start (0 Foot) to End (261 Feet) From 2013 Through 2018.

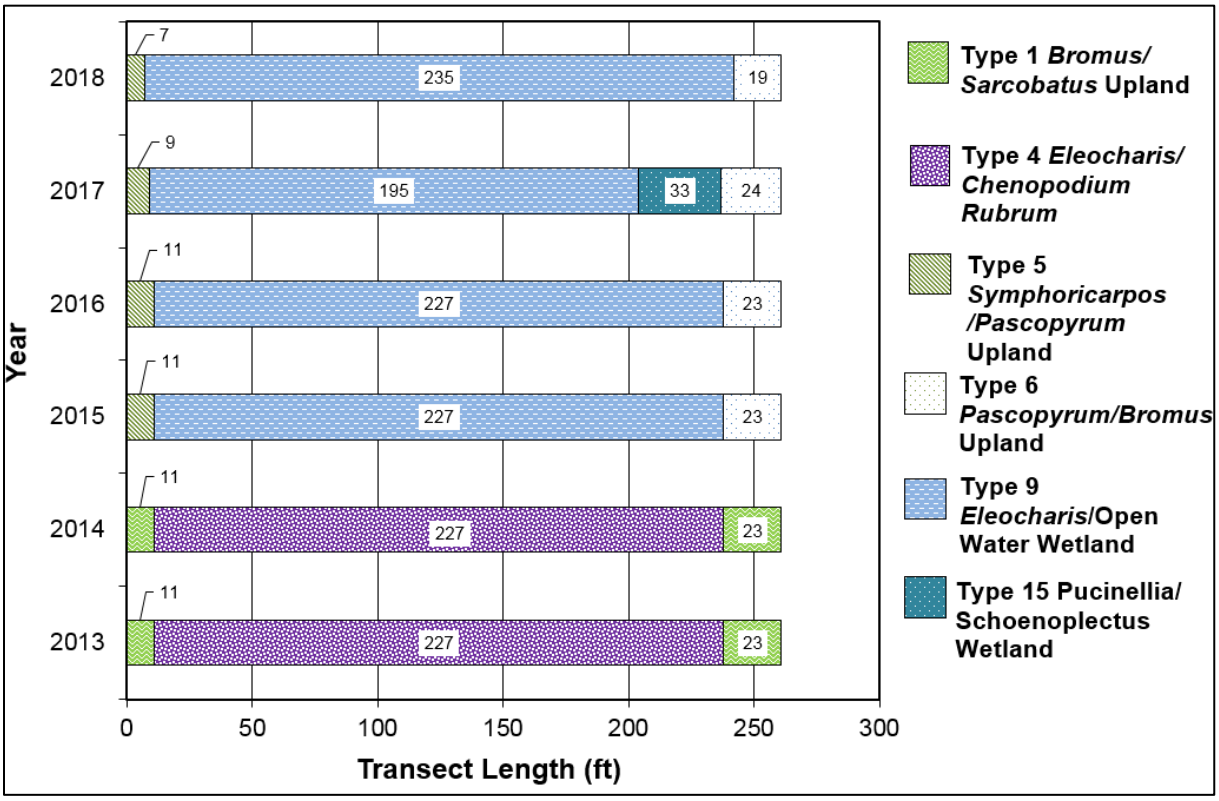

Chart 3-4. Length of Vegetation Communities Within T-2 for the West Site From 2013 Through 2018.

3.1.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates two soil complexes occurring within the project site. These soil complexes are identified as the Borollic Camborthids-Ustic Torrifluvents complex and Marvan soils. The Borollic Camborthids-Ustic Torrifluvents complex is 1 percent hydric and Marvan silty clay is 0 percent hydric [US Department of Agriculture, 2016]. The Marvan Series consist of very deep, well-drained, light (2.5Y 6/2) to dark (2.5Y 4/2) brownish gray clay mapped on alluvial fans, stream terraces, and drainageways [US Department of Agriculture, 1999].

Soil test pits were excavated at two locations, both within what was originally mapped as the Marvan silty clay soil series (DP-1W and DP-1U; Figure A-2, Appendix A). DP-1W is located on the edge of the wetland depression. The soil profile revealed a 10YR 5/1 clay loam from 0 to 20 inches with 10 percent prominent 10YR 5/6 mottles. This soil qualifies as a Hydric Soil Indicator (F3) Depleted Matrix. DP-1U is located in upland community Type 5 – *Symphoricarpos albus*/*Pascopyrum smithii*. The soil profile revealed a brown (10YR 3/2) clay loam and did not meet the criteria for any hydric soil indicators. Because of the extensive surface water at the site in 2018, the matched data point location was moved to the west side of the depression as the original location for DP-1W was under 2 feet of water.

3.1.4 Wetland Delineation

Two data points were used to determine the wetland and upland boundaries in 2018 (Figures A-2 and A-3, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data form (Appendix B). The total acreage of aquatic habitat at the West site in 2018 was 10.55 acres, which is an increase of 4.66 acres since 2017. The increase in aquatic habitat is directly related to the increased precipitation received in 2018 and a repaired dike structure that was working as intended. The 2018 acreage included approximately 1.29 acres of preexisting wetland, 2.54 acres of created wetland, and 6.72 acres of open water. Water levels within the impoundment during the site visit were at or very near the top of the dike and maximum inundation across the site was achieved in 2018. A summary of wetland habitat acreage at the West site is provided in Table 3-4.

Table 3-4. Wetland Habitat Acreages Delineated at the West Site

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)	2018 (acres)
Existing Wetland	1.29	1.29	1.29	1.29	1.29	1.29
Created Wetland	4.15	4.56	4.72	4.72	4.6	9.26[(a)]
Total	**5.44**	**5.85**	**6.01**	**6.01**	**5.89**	**10.55**

(a) Created wetland acreage in 2018 includes 6.72 acres of open water.

3.1.5 Wildlife

A list of wildlife species that were observed directly or indirectly during the field surveys from 2013 through 2018 is presented in Table 3-5 and the Wetland Mitigation Site Monitoring form (Appendix B). The wildlife observations from 2018 included eight bird species, of which cliff swallows (*Petrochelidon pyrrhonota*) and Canada geese (*Branta canadensis*) were the most common. A family group of belted kingfishers (*Megaceryle alcyon*) was observed on the site during the field visit. No nesting structures have been installed at the site.

Table 3-5. Wildlife Species Observed at the West Site From 2013 Through 2018 (Page 1 of 2)

Common Name	Scientific Name
Birds	
American Avocet	*Recurvirostra americana*
American coot	***Fulica americana***
American Goldfinch	*Spinus tristus*
Bald Eagle	*Haliaeetus leucocephalus*
Bank Swallow	*Riparia*
Barn Swallow	*Hirundo rustica*
Belted Kingfisher	***Megaceryle alcyon***
Blue-winged Teal	*Anas discors*
Brewer's Blackbird	***Euphagus cyanocephalus***
Brown Thrasher	*Toxostoma rufum*
Canada Goose	***Branta candensis***
Cedar Waxwing	*Bombycilla cedrorum*
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	***Tyrannus***
Golden Eagle	*Aquila chrysaetos*
Grasshopper Sparrow	*Ammodramus savannarum*
Great Blue Heron	*Ardea herodias*
House Wren	*Troglodytes aedon*
Killdeer	***Charadrius vociferus***
Lark Bunting	*Calamospiza melanocorys*
Mallard	*Anas platyrhynchos*
Mourning Dove	***Zenaida macroura***
Northern Harrier	*Circus cyaneus*
Orchard Oriole	*Icterus spurius*
Red-Winged Blackbird	*Agelaius phoeniceus*
Rock Wren	*Salpinctes obsoletus*
Song Sparrow	*Melospiza melodia*
Swainson's Hawk	*Buteo swainsoni*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	***Sturnella neglecta***
Western Sandpiper	*Calidris mauri*
Wilson's Phalarope	*Phalaropus tricolor*
Yellow Warbler	*Dendroica petechia*
Fish	
Fish sp.	*Unknown species*

Table 3-5. Wildlife Species Observed at the West Site From 2013 Through 2018 (Page 2 of 2)

Common Name	Scientific Name
Mammals	
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Meadow Vole	*Microtus pennsylvanicus*
Porcupine	*Erethizon dorsatum*
Raccoon	*Procyon lotor*
White-tailed Deer	*Odocoileus virginianus*
Reptile	
Plains Garter Snake	*Thamnophis radix*

Species that were identified in 2018 are in bold.

3.1.6 Functional Assessment

The results of the functional assessments from 2013 through 2018 are summarized in Table 3-6. The completed MWAM form for the West site is included in Appendix B. This site was evaluated as one AA (AA-1) that encompassed 10.55 acres in 2018. The AA was rated as a Category III wetland in 2018 with 60 percent of the total possible points. The site received a high rating for Montana Natural Heritage Program (MTNHP) species habitat based on the presence of grand redstem (*Ammannia robusta*) within the site, which was observed in 2013 and 2014. The site also received high ratings for short- and long-term surface water storage and recreation/education potential. The site achieved 69.1 functional units in 2018, which is a substantial increase of 27.6 units since 2017.

3.1.7 Photographic Documentation

Photographs from Photo Points 1 through 5 (PP1–PP5) (Figure A-3, Appendix A), the transect start and end points, and wetland determination data points are shown Appendix C.

3.1.8 Maintenance Needs

Infestations of two Priority 2B noxious weeds (Canada thistle and leafy spurge) were mapped within the project site (Figure A-3, Appendix A). Overall, weed infestations are down (< 1 percent cover) across the site from what was observed in 2017 because several previously mapped infestations were flooded in 2018, and weed-spraying activities likely have a positive impact. MDT has an ongoing weed-control program that assesses and employs weed-control measures within their wetland mitigation sites on a yearly basis. Weeds were sprayed at this site on July 2, 2018. In general, noxious weed cover has decreased because of yearly weed control by MDT.

The dike failure that occurred at the site during high flows in 2013 was repaired by MDT before the 2013 field survey and was intact when inspected in 2013. However, the structure appeared to be inadequately stabilized and susceptible to future failure. An examination of this structure in June 2014 indicated that the structure failed again during high spring flows, which eroded a channel down to the elevation of the original ephemeral thalweg. The dike was not repaired in 2015. MDT worked with the USACE to facilitate a permanent engineered repair for the dike. Because of

Table 3-6. Montana Wetland Assessment Method Summary for the West Site From 2013 Through 2018

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017	2018
Listed/Proposed Threatened and Endangered (T&E) Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)	E (1)	E (1)	Mod (0.7)	Mod (0.5)
General Fish/Aquatic Habitat	N/A	N/A	Mod (0.4)	Mod (0.4)	Low (0.3)	Low (0.3)
Flood Attenuation	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.6)	Mod (0.5)
Short- and Long-Term Surface Water Storage	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (0.9)
Sediment/Nutrient/Toxicant Removal	Mod (0.4)	Mod (0.4)	Mod (0.6)	Mod (0.6)	High (1.0)	Mod (0.7)
Sediment/Shoreline Stabilization	Low (0.3)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.6)	Mod (0.6)
Production Export/Food Chain Support	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.8)	Mod (0.7)
Groundwater Discharge/Recharge	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)
Uniqueness	Mod (0.4)	Mod (0.5)	Mod (0.6)	Mod (0.6)	Mod (0.4)	Mod (0.5)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)	High (0.15)	High (0.15)	High (0.15)
Actual Points/Possible Points	**5.45/10**	**6.75/10**	**7.65/11**	**7.65/11**	**7.05/11**	**6.45/11**
% of Possible Score Achieved	**54.5%**	**67.5%**	**69.6%**	**69.6%**	**64.0%**	**59.0%**
Overall Category	**III**	**III**	**II**	**II**	**III**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**5.44**	**5.85**	**6.01**	**6.01**	**5.89**	**10.55**
Functional Units (acreage × actual points)	**29.6**	**39.5**	**46.0**	**46.0**	**41.5**	**68.09**

this coordination, MDT received an NWP #3 permit from the USACE to conduct repairs in the fall/winter of 2016/2017. The dike was reconstructed in the late spring of 2017 and was in good functioning condition in 2018; photographs of the dike are included in Appendix C. Fencing around the perimeter of the monitoring areas was in good condition in 2018.

3.1.9 Current Credit Summary

Approximately 10.55 aquatic habitat acres that consisted of approximately 1.29 acres of preexisting wetland habitat and 9.26 acres of created wetlands and open water habitat were delineated in 2018. Approximately 3.16 acres of upland habitat was mapped on the site in 2018. Table 3-7 presents the calculated credit acres for individual mitigation types with appropriate credit ratios applied using the USACE crediting system. The West site's types and ratios included preservation (4:1), creation (1:1), and upland buffer (5:1). The accrued credit acres at the West site in 2018 totaled 10.21, which is a substantial increase from 2017 (6.48 acres).

No quantitative performance measures or success criteria have been established for this wetland mitigation area. Monitoring requirements that are listed within the approved wetland mitigation plan are being satisfied. In general, the areas that were delineated as wetlands met the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. Noxious weed cover in 2018 was less than 1 percent site wide.

Table 3-7. Credit Summary for the West Site

Wetland	Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres	2018 Delineated Acres	2018 Estimated Credit Acres
Preserved Wetland	4:1	1.29	0.32	1.29	0.32	1.29	0.32	1.29	0.32	1.29	0.32
Created Wetland	1:1	4.56	4.56	4.72	4.72	4.72	4.72	4.60	4.60	9.26	9.26
Upland Buffer	5:1	7.86	1.57	7.70	1.54	7.70	1.54	7.82	1.56	3.16	0.63
Total		**13.71**	**6.45**	**13.71**	**6.58**	**13.71**	**6.58**	**13.71**	**6.48**	**13.71**	**10.21**

3.2 MIDDLE SITE – SITE 2

3.2.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 through 2017 was 14.5 inches [Western Regional Climate Center, 2018]. Annual precipitation in recent years was 19.5 inches (2013), 18.3 inches (2014),10.0 inches (2015), 19.8 inches (2016), and 12.2 inches in 2017. These data indicate that above-average precipitation was recorded at the site in 2013, 2014, and 2016, while below-average precipitation was recorded in 2015 and 2017. In June 2017, the governor of Montana issued Executive Order 5-2017 that declared a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in eastern Montana [DNRC, 2017]. The precipitation in 2018 from January through August totaled 19.5 inches at the Forsyth (243098) meteorological station. This 8-month total is approximately 8.6 inches above the long-term average (10.8 inches).

This site is situated near abandoned meander bends associated with Big Porcupine Creek that exhibit wetland characteristics. The site may experience occasional flooding during high flows in Big Porcupine Creek but is not intended to exhibit perennial hydrology because of its proximity to Montana Highway 12. The excavated depression exhibited signs of inundation that persisted for an extended period before the field survey. Positive hydrologic indicators that were observed at this site included surface soil cracks, and geomorphic position. The site was not inundated at the time of the 2018 field survey.

Two data points (DP-1W and DP-1U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located in an area of the excavated depression that met the wetland criteria. Hydrologic indicators at the data point included surface soil cracks, and geomorphic position. DP-1U did not meet the wetland hydrology criteria.

3.2.2 Vegetation

A comprehensive list of the 57 species identified on site from 2013 through 2018 is presented in Table 3-8. No new species were identified at this site in 2018. The indicator status for all of the plants was derived from the 2016 NWPL [Lichvar et al., 2016]. Upland community Type 1 – *Pascopyrum smithii/Helianthus annuus* and wetland community Type 2 – *Rumex crispus/Eleocharis palustris* were identified in 2013 and 2014 and transitioned into upland community Type 3 – *Pascopyrum smithii/Elymus canadensis* and wetland community Type 4 – *Puccinellia nuttalliana/Hordeum jubatum*, respectively, in 2015 and persisted in 2018. The vegetation community boundaries are shown on Figure A-6 (Appendix A). The species composition for each community is discussed below and included on the Middle site's Wetland Mitigation Site Monitoring form (Appendix B).

Table 3-8. Vegetation Species Observed at the Middle Site From 2013 Through 2018 (Page 1 of 2)

Common Names	Scientific Names	GP Indicator Status[(a)]
Northern Water-Plantain	*Alisma triviale*	OBL
Field Meadow-Foxtail	*Alopecurus pratensis*	FACW
Perennial Ragweed	*Ambrosia psilostachya*	FACU
Grand Redstem	*Ammannia robusta*	OBL
Wild Oats	*Avena fatua*	UPL
Mexican-Fireweed	*Bassia scoparia*	FACU
California Brome	*Bromus carinatus*	UPL
Japanese Brome	*Bromus arvensis*	UPL
Cheatgrass	*Bromus tectorum*	UPL
Lamb's Quarters	*Chenopodium album*	FACU
Canada Thistle	*Cirsium arvense*	FACU
Field Bindweed	*Convolvulus arvensis*	UPL
Tufted Hair Grass	*Deschampsia caespitosa*	FACW
Slender Hair Grass	*Deschampsia elongata*	FAC
Large Barnyard Grass	*Echinochloa crus-galli*	FAC
Common Spike-Rush	*Eleocharis palustris*	OBL
Nodding Wild Rye	*Elymus canadensis*	FACU
Streamside Wild Rye	*Elymus lanceolatus*	FACU
Creeping Wild Rye	*Elymus repens*	FACU
Slender Wild Rye	*Elymus trachycaulus*	FACU
Leafy Spurge	*Euphorbia esula*	UPL
American Mannagrass	*Glyceria grandis*	OBL
Curly-Cup Gumweed	*Grindelia squarrosa*	UPL
Common Sunflower	*Helianthus annuus*	FACU
Foxtail Barley	*Hordeum jubatum*	FACW
Prickly Lettuce	*Lactuca serriola*	FAC
Clasping Pepperwort	*Lepidium perfoliatum*	FAC
Prairie Flax	*Linum lewisii*	UPL
Field Cottonrose	*Logfia arvensis*	UPL
Yellow Sweet Clover	*Melilotus officinalis*	FACU
Alkali Muhly	*Muhlenbergia asperifolia*	FAC
Common Panic Grass	*Panicum capillare*	FAC
Western Wheatgrass	*Pascopyrum smithii*	FACU
Flat-Stem Bluegrass	*Poa compressa*	FACU
Fowl Bluegrass	*Poa palustris*	FACW
Yard Knotweed	*Polygonum aviculare*	FACU

Table 3-8. Vegetation Species Observed at the Middle Site From 2013 Through 2018 (Page 2 of 2)

Common Names	Scientific Names	GP Indicator Status[(a)]
Eastern Cottonwood	*Populus deltoides*	FAC
Nuttall's Alkali Grass	*Puccinellia nuttalliana*	OBL
Prairie Coneflower	*Ratibida columnifera*	UPL
Prairie Rose	*Rosa arkansana*	FACU
Common Sheep Sorrel	*Rumex acetosella*	FAC
Curly Dock	*Rumex crispus*	FAC
Narrow-Leaf Willow	*Salix exigua*	FACW
Fragile Willow	*Salix fragilis*	FAC
Greasewood	*Sarcobatus vermiculatus*	FAC
Meadow False Rye Grass	*Schedonorus pratensis*	FACU
Saltmarsh Club-Rush	*Schoenoplectus maritimus*	OBL
Yellow Bristle Grass	*Setaria pumila*	FACU
Buffalo Bur	*Solanum rostratum*	UPL
Common Snowberry	*Symphoricarpos albus*	UPL
Salt-cedar	*Tamarix chinensis*	UPL
Field Pennycress	*Thlaspi arvense*	FACU
Meadow Goat's-beard	*Tragopogon dubius*	UPL
Broad-Leaf Cattail	*Typha latifolia*	OBL
Rough Cockleburr	*Xanthium strumarium*	FAC

(a) 2016 NWPL [Lichvar et al., 2016]

Upland Type 3 – *Pascopyrum smithii/Elymus canadensis* is located in upland that surrounds the excavated depression, adjacent to Montana Highway 12, and within the monitoring boundary. This community replaced upland community Type 1 – *Pascopyrum smithii/Helianthus annuus* because of a shift in species composition and their associated cover classes. The community was dominated by western wheatgrass and eastern cottonwood saplings, yellow sweet clover, and Japanese brome.

Wetland Type 4 – *Puccinellia nuttaliana/Hordeum jubatum* (Nutall's alkali grass/foxtail barley) was identified within the excavated depression. This community replaced wetland community Type 2 – *Rumex crispus/Eleocharis palustris* because of a shift in species composition and their associated cover classes. Common species included Nuttall's alkaligrass, foxtail barley, common spike-rush false meadow rye grass, and curly dock (*Rumex crispus*).

One vegetation transect, T-1, was established at the site that runs perpendicular to the linear excavated wetland (Figure A-5, Appendix A). Thirty-eight percent of the transect was located in wetland habitat. Vegetation transect results are detailed on the Middle site's Wetland Mitigation Site Monitoring form in Appendix B and are summarized in Table 3-9 and Charts 3-5 and 3-6. Photographs of the transect start and end points are provided in Appendix C.

Table 3-9. T-1 Data Summary for the Middle Site From 2013 Through 2018

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**50**	**50**	**50**	**50**	**50**	**50**
Vegetation Community Transitions Along Transect	2	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1	1
Total Vegetative Species	16	20	21	11	17	17
Total Hydrophytic Species	6	8	7	3	4	5
Total Upland Species	10	12	14	8	13	12
Estimated % Total Vegetative Cover	40	50	90	85	83	85
Estimated % Unvegetated	60	50	10	15	17	15
% Transect Length Comprising Hydrophytic Vegetation Communities	52	52	30	30	38	38
% Transect Length Comprising Upland Vegetation Communities	48	48	70	70	62	62
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

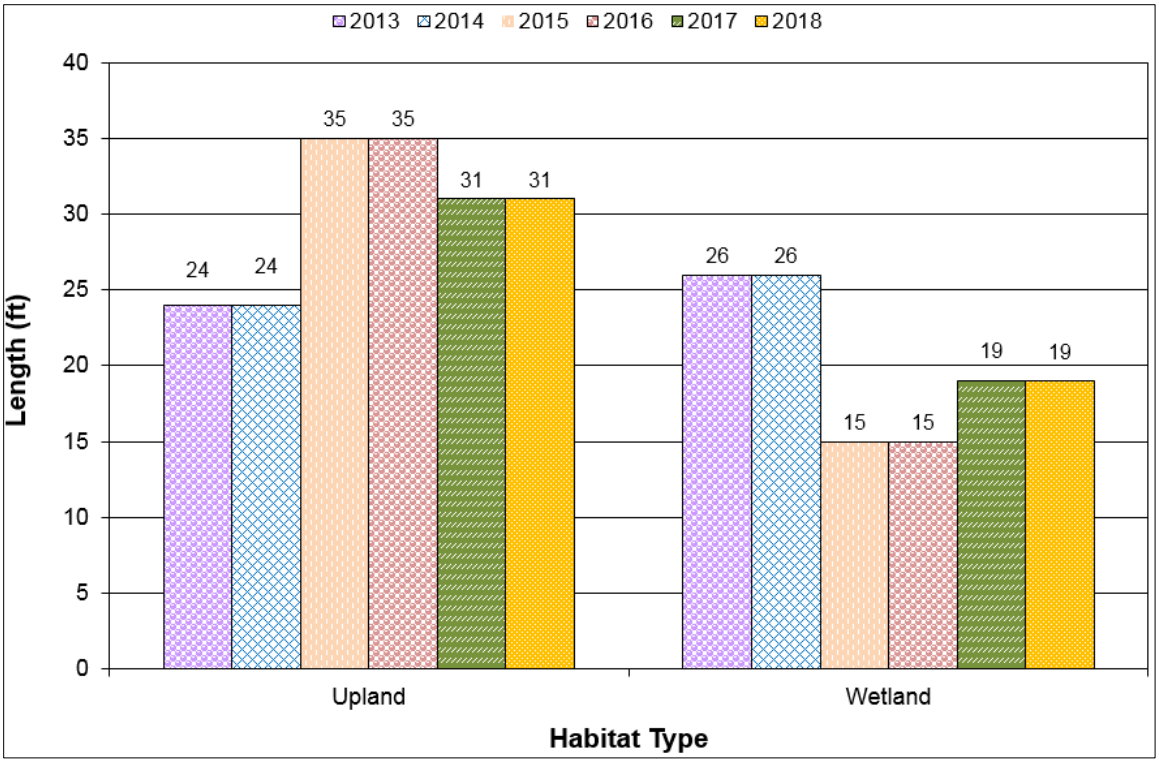

Chart 3-5. T-1 Map for the Middle Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (50 Feet) From 2013 Through 2018.

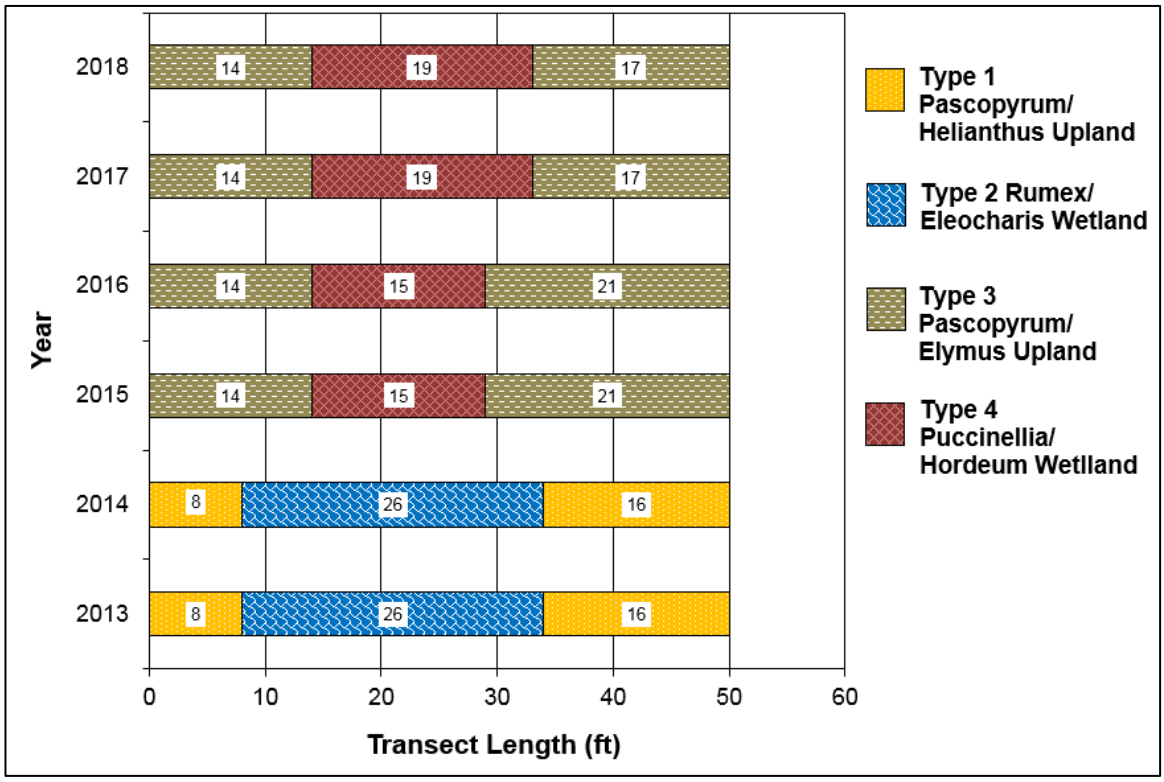

Chart 3-6. Length of Vegetation Communities Within T-1 at the Middle Site From 2013 Through 2018.

Infestations of two Priority 2B noxious weeds were identified at the site: salt-cedar and Canada thistle (Figure A-6, Appendix A). No woody vegetation was installed within the site. Revegetation efforts at the site included seeding a mixture of wand panic grass, American mannagrass, Baltic rush, Nebraska sedge, and Nuttall's alkaligrass after construction. Cottonwood seedlings have been observed along the margin of the wetland at the apparent edge of early-season inundation every year since 2013.

3.2.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates only one mapped soil for the project area, Harlem silty clay (0–2 percent slopes). These very deep, well-drained soils are seen on floodplains and are occasionally flooded.

Soil test pits were examined at two locations, both within what was originally mapped as the Harlem silty clay soil series (DP-1W and DP-1U; Figure A-5, Appendix A). DP-1W is located in an excavated depression near the center of the site. The soil profile revealed a dark olive-brown (2.5Y 3/2) clay loam. Soils at this pit currently lack redox features because the wetland is in the early stages of development. Given the dominance of hydrophytic vegetation and soil cracks on the surface, the depression appears to be saturated for extended periods during the growing season and hydric soil indicators will develop over time. DP-1U is located in upland community Type 3 – *Pascopyrum smithii/Elymus canadensis*, approximately 10 feet northeast of DP-1W. The soil profile revealed a dark olive-brown (2.5Y 3/3) clay loam and did not meet the criteria for any hydric soil indicators.

3.2.4 Wetland Delineation

Two data points were used to determine the upland and wetland boundaries in 2018 (Figures A-5 and A-6, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data forms (Appendix B). The total acreage of aquatic habitat at the Middle site in 2018 was 0.58 acre within the 1.8-acre project area, as shown in Table 3-10. The floor of the excavated depression was identified as wetland based on the presence of positive wetland hydrology indicators, hydric soil, and the predominance of hydrophytic species.

Table 3-10. Wetland and Upland Habitat Acreages Delineated at the Middle Site From 2013 Through 2018

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)	2018 (acres)
Project Area	1.80	1.80	1.80	1.80	1.80	1.80
Created Wetland	0.49	0.49	0.49	0.49	0.58	0.58
Upland Buffer	1.31	1.31	1.31	1.31	1.22	1.22

3.2.5 Wildlife

A list of wildlife species observed directly and indirectly during the field surveys from 2013 through 2018 is shown in Table 3-11 and in the Wetland Mitigation Site Monitoring form (Appendix B). Because of high temperatures and mid-afternoon conditions, only one bird species, eastern kingbird (*Tyrannus tyrannus*), was observed within the mitigation site in 2018.

Table 3-11. Wildlife Species Observed at the Middle Site From 2013 Through 2018

Common Name	Scientific Name
Amphibians and Reptiles	
Frog sp.	
Plains Garter Snake	*Thamnophis radix*
Birds	
American Goldfinch	*Spinus tristus*
Common Nighthawk	*Chordeiles minor*
Eastern Bluebird	*Sialia sialis*
Eastern Kingbird	***Tyrannus tyrannus***
Killdeer	*Charadrius vociferus*
Mourning Dove	*Zenaida macroura*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Mammals	
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Raccoon	*Procyon lotor*

Species that were identified in 2018 are bolded.

3.2.6 Functional Assessment

The results of the functional assessments from 2013 through 2018 are summarized in Table 3-12. The Middle site's MWAM form is provided in Appendix B. The Middle site was evaluated as one AA and encompassed 0.58 acre. The prominent factor that adversely impacted the overall score and functional units at the site in 2013 was the general condition of the AA: a high percentage of bare ground, low vegetation cover, and low quality of wildlife habitat. The disturbance rating went from high in 2013 to moderate in 2014 based on the increased vegetation cover in disturbed areas. The Montana-listed S2 species of concern (grand redstem) was documented growing within the constructed wetland in 2013 and provided a high MTNHP rating. The flood attenuation rating was modified based on the lack of connection to Big Porcupine Creek. The sediment/shoreline stabilization increased in 2015 to reflect the increase in percent cover of wetland species with stability ratings greater than or equal to 6. Ratings for general wildlife habitat, sediment/ nutrient/toxicant removal, and uniqueness increased from 2013 to 2016 because of less disturbance and higher wetland vegetation cover; no change was observed from 2017 to 2018. This site achieved 42.2 percent of the possible score and a total of 2.0 functional units in 2018, which is an increase of 0.1 unit since 2016 because of the increase in wetland acreage. Continual development of the vegetation cover will result in increased functional units, although the small size of the AA will limit the total score.

Table 3-12. Montana Wetland Assessment Method Summary for the Middle Site From 2013 Through 2018

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017	2018
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	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	High (1.0)	N/A	N/A	N/A	N/A	N/A
Short- and Long-Term Surface Water Storage	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	N/A	N/A	N/A	N/A	N/A	N/A
Uniqueness	Low (0.1)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	N/A	N/A	N/A	N/A	N/A	N/A
Actual Points/Possible Points	**3.9/9**	**3.3/9**	**3.8/9**	**3.8/9**	**3.8/9**	**3.8/9**
% of Possible Score Achieved	**43.3%**	**36.7%**	**42.2%**	**42.2%**	**42.2%**	**42.2%**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**0.49**	**0.49**	**0.49**	**0.49**	**0.58**	**0.58**
Functional Units (acreage × actual points)	**1.9**	**1.6**	**1.9**	**1.9**	**2.2**	**2.2**

3.2.7 Photographic Documentation

Photographs from Photo Points 1 and 2 (PP1 and PP2) (Figure A-5, Appendix A), the transect start and end points, and wetland determination data points are provided in Appendix C.

3.2.8 Maintenance Needs

Five minor infestations of Canada thistle, which is a Priority 2B noxious weed, were identified at this site in 2018 (Figure A-6, Appendix A) and should be controlled to prevent further spread and colonization. All infestations have a low cover class (1–5 percent). Fencing along the mitigation area was in good condition. No man-made water-control structures or bird boxes have been installed at this site.

3.2.9 Current Credit Summary

Table 3-13 shows the total delineated acres and credit acres estimated for the Middle site from 2014 through 2018. The 2018 wetland delineation was 0.58 acre, an increase of 0.09 acre since 2016. The site accrued 0.82 estimated credit acre in 2018. No performance standards were identified for this site. Two noxious weeds were identified within the mitigation site boundaries but exhibited very low percent areal cover (1–5 percent). The percent cover of native hydrophytes was low. The cover of wetland vegetation will increase if favorable hydrologic conditions persist.

Table 3-13. Credit Summary for the Middle Site

Wetland	Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres	2018 Delineated Acres	2018 Estimated Credit Acres
Preserved Wetland	1:1	0.49	0.49	0.49	0.49	0.49	0.49	0.58	0.58	0.58	0.58
Upland Buffer	5:1	1.31	0.26	1.31	0.26	1.31	0.26	1.22	0.24	1.22	0.24
Total		**1.80**	**0.75**	**1.80**	**0.75**	**1.80**	**0.75**	**1.80**	**0.82**	**1.80**	**0.82**

3.3 EAST SITE – SITE 3

3.3.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 through 2017 was 14.5 inches [Western Regional Climate Center, 2018]. Annual precipitation in recent years was 19.5 inches (2013), 18.3 inches (2014),10.0 inches (2015), 19.8 inches (2016), and 12.2 inches in 2017. These data indicate that above-average precipitation was recorded at the site in 2013, 2014, and 2016, while below-average precipitation was recorded in 2015 and 2017. In June 2017, the governor of Montana issued Executive Order 5-2017 that declared a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in eastern Montana [DNRC, 2017]. The precipitation in 2018 from January through August totaled 19.5 inches at the Forsyth (243098) meteorological station. This 8-month total is approximately 8.6 inches above the long-term average (10.8 inches).

The East site is very similar to the Middle site. The main sources of hydrology at the East site are shallow groundwater, direct precipitation, and surface runoff from adjacent uplands. Old meander scars of Big Porcupine Creek with relic and contemporary wetland characteristics are located directly adjacent to the site. Positive hydrologic indicators that were observed at this site included surface soil cracks and geomorphic position.

Four data points (DP-1W, DP-1U, DP-2W, and DP-2U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located in the northwest end of the site in an area that met the wetland criteria. Positive indicators of wetland hydrology at this data point included a FAC test, soil cracks, and geomorphic position. No signs of wetland hydrology were observed at DP-1U, which is located upslope of the wetland boundary. DP-2W is located in the southeast end of the site in an area that met the wetland criteria. Positive indicators of wetland hydrology at this data point included a FAC test, soil cracks, and geomorphic position. No signs of wetland hydrology were observed at DP-2U, which is located upslope of the wetland boundary.

3.3.2 Vegetation

A comprehensive list of 58 species compiled during the field surveys from 2013 through 2018 is presented in Table 3-14. One new plant species (freshwater cordgrass [*Spartina pectinate]*) was observed in 2018. The indicator status for all of the plants was derived from the 2016 NWPL [Lichvar et al., 2016]. Two community types were identified and mapped at this site in 2018 (Figure A-9, Appendix A) and included upland Type 3 – *Pascopyrum smithii/Elymus* spp. and wetland Type 4 – *Hordeum jubatum/Eleocharis palustris*. The species composition for each community is included on the East site's Wetland Mitigation Site Monitoring form (Appendix B) and discussed in this section.

Table 3-14. Vegetation Species Observed at the East Site From 2013 Through 2018 (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Crested Wheatgrass	*Agropyron cristatum*	UPL
Algae, green	Algae, green	NL
Northern Water-Plantain	*Alisma triviale*	OBL
Creeping Meadow-Foxtail	*Alopecurus arundinaceus*	FACW
Field Meadow-Foxtail	*Alopecurus pratensis*	FACW
Perennial Ragweed	*Ambrosia psilostachya*	FACU
Grand Redstem	*Ammannia robusta*	OBL
Fringed Sage	*Artemisia frigida*	UPL
Mexican-Fireweed	*Bassia scoparia*	FACU
California Brome	*Bromus carinatus*	UPL
Smooth Brome	*Bromus inermis*	UPL
Japanese Brome	*Bromus arvensis*	UPL
Cheatgrass	*Bromus tectorum*	UPL
Lamb's Quarters	*Chenopodium album*	FACU
Field Bindweed	*Convolvulus arvensis*	UPL
Herb Sophia	*Descurainia sophia*	UPL
Large Barnyard Grass	*Echinochloa crus-galli*	FAC
Common Spike-Rush	*Eleocharis palustris*	OBL
Nodding Wild Rye	*Elymus canadensis*	FACU
Creeping Wild Rye	*Elymus repens*	FACU
Slender Wild Rye	*Elymus trachycaulus*	FACU
Wild Rye	*Elymus* sp.	UPL
Field Fluffweed	*Filago arvensis*	UPL
Tall Mannagrass	*Glyceria elata*	OBL
Curly-Cup Gumweed	*Grindelia squarrosa*	UPL
Common Sunflower	*Helianthus annuus*	FACU
Needle-and-Thread	*Hesperostipa comata*	UPL
Foxtail Barley	*Hordeum jubatum*	FACW
Prickly Lettuce	*Lactuca serriola*	FAC
Clasping Pepperwort	*Lepidium perfoliatum*	FAC
Prairie Flax	*Linum lewisii*	UPL
Alfalfa	*Medicago sativa*	UPL
Yellow Sweet Clover	*Melilotus officinalis*	FACU
Alkali Muhly	*Muhlenbergia asperifolia*	FACW
Western Wheatgrass	*Pascopyrum smithii*	FACU

Table 3-14. Vegetation Species Observed at the East Site From 2013 Through 2018 (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Flat-stem Bluegrass	*Poa compressa*	FACU
Kentucky Bluegrass	*Poa pratensis*	FACU
Yard Knotweed	*Polygonum aviculare*	FACU
Eastern Cottonwood	*Populus deltoides*	FAC
Nuttall's Alkali Grass	*Puccinellia nuttalliana*	OBL
Prairie Coneflower	*Ratibida columnifera*	UPL
Common Sheep Sorrel	*Rumex acetosella*	FAC
Curly Dock	*Rumex crispus*	FAC
Arum-Leaf Arrowhead	*Sagittaria cuneata*	OBL
Narrow-Leaf Willow	*Salix exigua*	FACW
Fragile Willow	*Salix fragilis*	FAC
Saltmarsh Club-Rush	*Schoenoplectus maritimus*	OBL
Tall Hedge-Mustard	*Sisymbrium altissimum*	FACU
Buffalo Bur	*Solanum rostratum*	UPL
Freshwater Cord Grass	***Spartina pectinata***	**FACW**
Salt-Cedar	*Tamarix chinensis*	UPL
Common Dandelion	*Taraxacum officinale*	FACU
Field Pennycress	*Thlaspi arvense*	FACU
Meadow Goat's-Beard	*Tragopogon dubius*	UPL
Narrow-Leaf Cattail	*Typha angustifolia*	OBL
Broad-Leaf Cattail	*Typha latifolia*	OBL
Speedwell	*Veronica* sp.	UPL

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2018 are bolded.

Upland community Type 3 represented the upland areas that surround the excavated wetland, as well as the upland area in the center of the excavated depression. Dominant species included western wheatgrass, nodding wild rye (*Elymus canadensis*), and slender wild rye *(Elymus trachycaulus).*

Wetland Type 4 – *Hordeum jubatum/Eleocharis palustris* is located within the excavated depression in the eastern and western portions of the site. The community was dominated by foxtail barley, common spike-rush, and western wheatgrass. Other species observed included saltmarsh club-rush, field meadow-foxtail, and Kentucky bluegrass (*Poa pratensis*). Seedlings of narrow-leaf willows *(Salix exigua),* fragile willows, and cottonwood persisted in this community in 2018.

Vegetation cover was measured along two transects: one on each end of the East site (Figure A-8, Appendix A). Data recorded for T-1 are summarized in Table 3-15 and Charts 3-7 and 3-8. The East site's Wetland Mitigation Site Monitoring form (Appendix B) also displays this site's data.

Photographs of the transect start and end points are provided in Appendix C. T-1 is located at the northwestern end of the site and extends 125 feet. This transect begins at the fenced boundary in upland community Type 3 – *Pascopyrum smithii/Elymus* spp., crosses wetland community Type 4 – *Hordeum jubatum/Eleocharis palustris* and terminates in upland community Type 3. Upland habitat along the edge of the constructed wetland has transitioned to a climax community. Wetland habitat along this transect is not expected to increase considerably because of the distinct topographic break that defines the wetland boundary.

Table 3-15. T-1 Data Summary for the East Site From 2013 Through 2018

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**125**	**125**	**125**	**125**	**125**	**125**
Vegetation Community Transitions Along Transect	2	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1	1
Total Vegetative Species	16	24	26	22	17	17
Total Hydrophytic Species	5	7	8	9	7	7
Total Upland Species	11	17	18	11	10	10
Estimated % Total Vegetative Cover	40	40	90	90	95	95
Estimated % Unvegetated	60	60	10	10	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	51.2	52	50	50	50	52
% Transect Length Comprising Upland Vegetation Communities	48.8	48	50	50	50	48
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

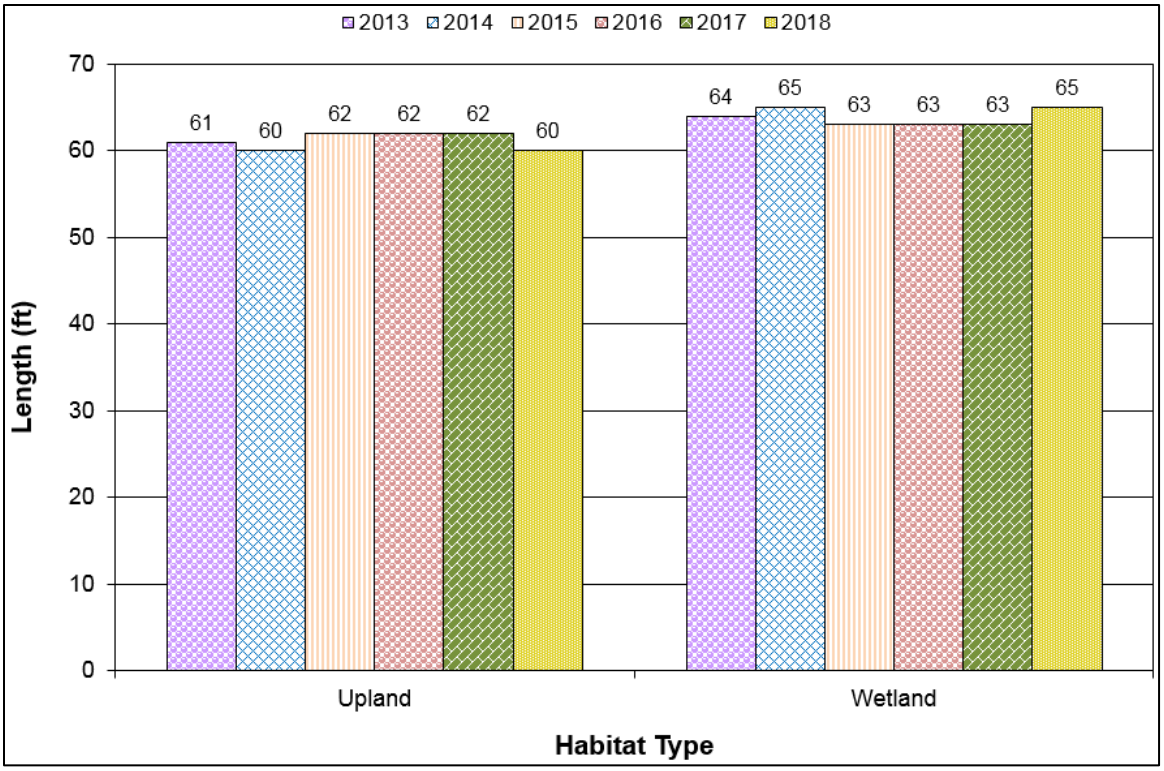

Chart 3-7. T-1 Map for the East Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (125 Feet) From 2013 Through 2018.

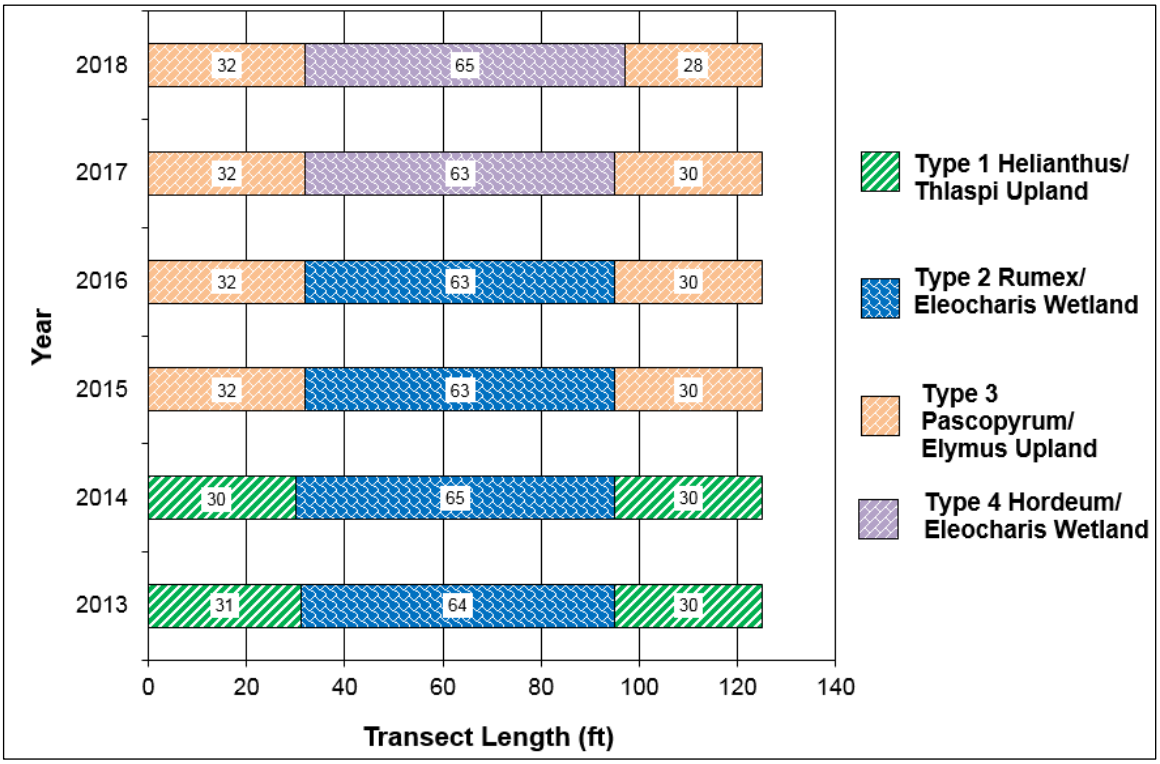

Chart 3-8. Length of Vegetation Communities Within T-1 at the East Site From 2013 Through 2018.

T-2 is very similar to T-1 and is located at the southeastern end of the site. This transect begins at the fenced boundary in upland community Type 3 – *Pascopyrum smithii/Elymus* spp., crosses wetland community Type 4 – *Horeum jubatum/Eleocharis palustris*, and terminates in upland community Type 3. T-2 data are summarized in Table 3-16 and Charts 3-9 and 3-10.

Table 3-16. T-2 Data Summary for the East Site From 2013 Through 2018

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**181**	**181**	**181**	**181**	**181**	**181**
Vegetation Community Transitions Along Transect	2	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1	1
Total Vegetative Species	12	24	26	26	11	14
Total Hydrophytic Species	5	9	8	6	4	6
Total Upland Species	7	15	18	20	7	8
Estimated % Total Vegetative Cover	40	55	90	94	98	98
Estimated % Unvegetated	60	45	10	6	2	2
% Transect Length Comprising Hydrophytic Vegetation Communities	63	63	44	44	55	55
% Transect Length Comprising Upland Vegetation Communities	37	37	56	56	45	45
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

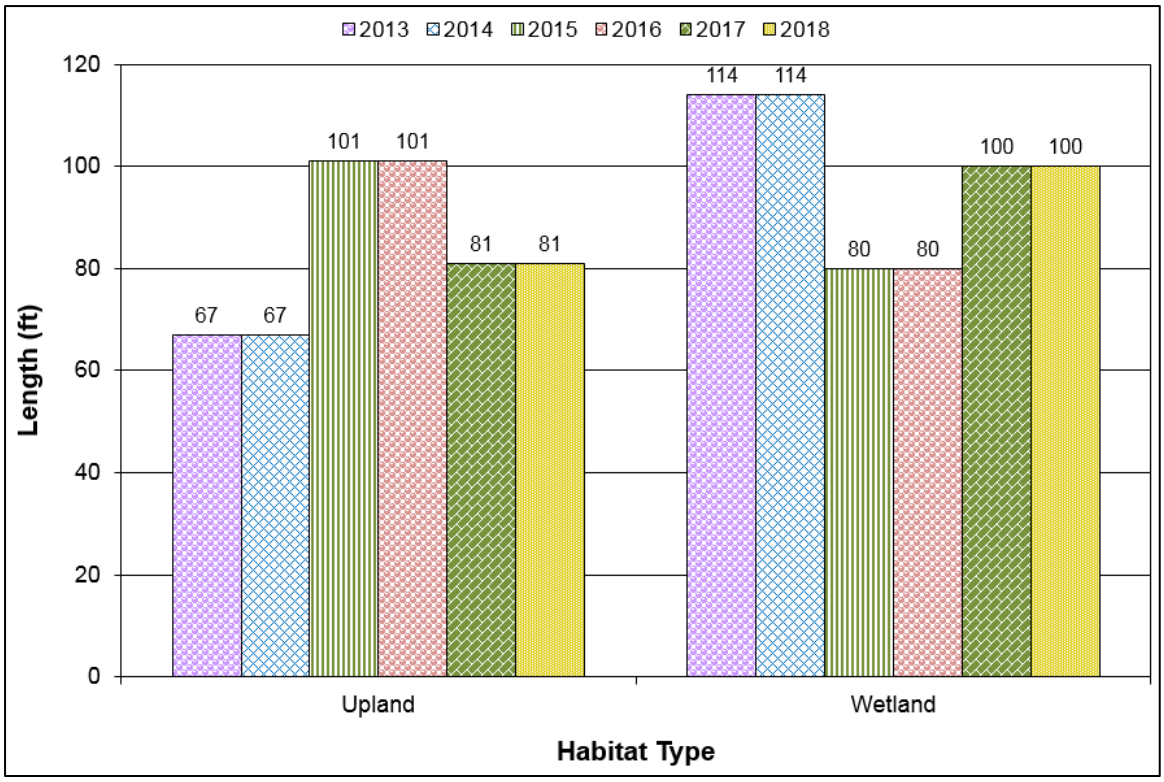

Chart 3-9. T-2 Map for the East Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (181 Feet) From 2013 Through 2018.

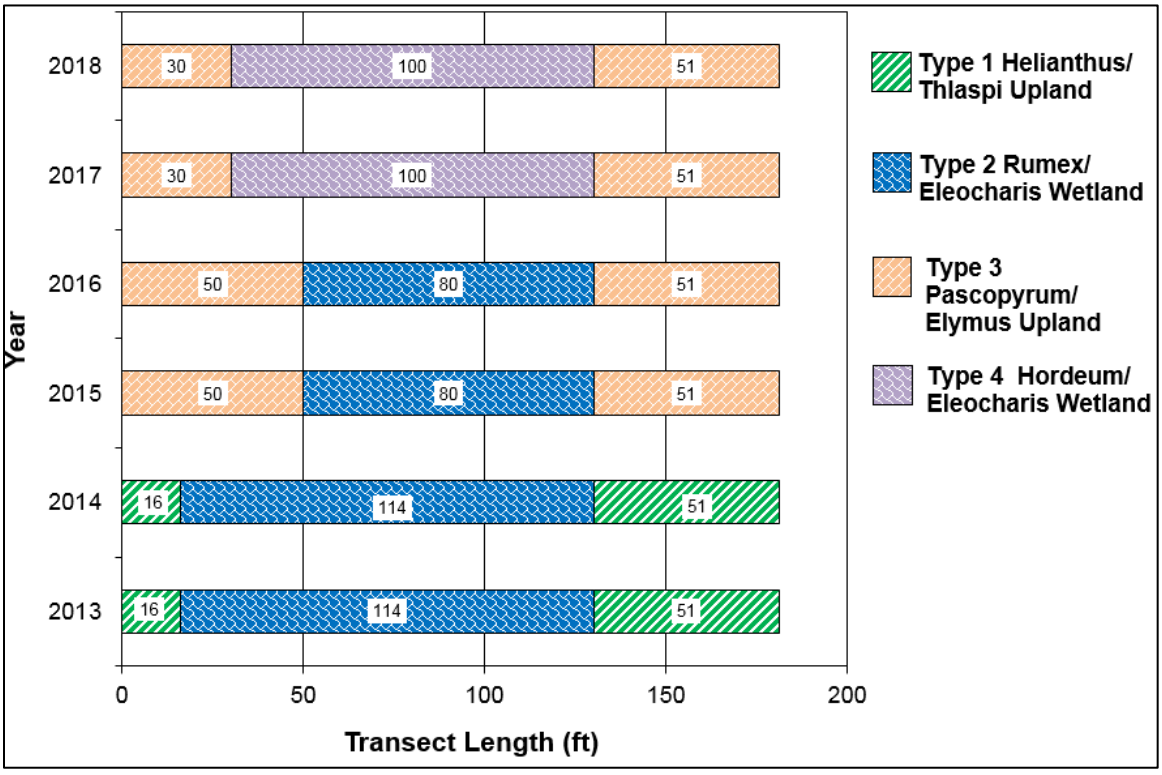

Chart 3-10. Length of Vegetation Communities Within T-2 at the East Site From 2013 Through 2018.

Infestations of two Priority 2B noxious weed (salt-cedar) and field bindweed were mapped in several locations and are shown in Figure A-9 (Appendix A). No woody plants were installed at the East site. Mature cottonwoods and willows in the area appear to be providing natural regeneration of cottonwoods and willows; seedlings of both genera were documented within the wetland community.

3.3.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates only one mapped soil for the project area: Harlem silty clay (0–2 percent slopes). These very deep, well-drained soils are seen on floodplains and are occasionally flooded. This map unit series is identified on the *Montana Hydric Soil List* [Natural Resources Conservation Service, 2014].

Soil test pits were examined at four locations, all within what was originally mapped as the Harlem silty clay soil series (DP-1W, DP-1U, DP-2W, and DP-2U; Figure A-8, Appendix A). DP-1W is located in the western edge of the wetland depression within an area that met the wetland criteria. The soil profile revealed a dark grayish brown (2.5Y 3/2), clay loam with very dark grayish brown (2.5 Y 4/4), redoximorphic concentrations along pore linings. The soil met the criteria for redox dark surface (F6) and classification as a hydric soil. DP-1U is located approximately 10 feet northwest of DP-1W on the side slope of the excavated basin in the adjacent uplands. The soil profile revealed a dark olive-brown (2.5Y 3/3), clay loam and did not meet the criteria for any hydric soil indicators. DP-2W is located in the eastern edge of the wetland depression within an area that met the wetland criteria. The soil profile revealed a 10YR 3/2 clay loam with bright 10YR 5/8 redoximorphic concentrations along pore linings. The soil met the criteria for depleted matrix (F3) and classification as a hydric soil. DP-2U is located approximately 10 feet southwest of DP-2W on the side slope of the excavated basin in the adjacent uplands. The soil profile revealed a very dark grayish brown (2.5Y 3/2) clay loam and did not meet the criteria for any hydric soil indicators.

3.3.4 Wetland Delineation

Four data points were evaluated in 2018 to determine the wetland and upland boundaries at the site (Figures A-8 and A-9, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data forms (Appendix B). The total acreage of aquatic habitat at the East site in 2018 was 0.56 acre, which is an increase of 0.13 acre since 2017 (0.43 acre), which is shown in Table 3-17. Ground surface elevation may be contributing to the development of an upland community within the central area of the excavation, which appears to be slightly higher than the surrounding ground.

Table 3-17. Wetland/Upland Habitat Acreages Delineated at the East Site From 2013 Through 2018

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)	2018 (acres)
Project Area	2.74	2.74	2.74	2.74	2.74	2.74
Created Wetland	1.19	1.19	0.46	0.43	0.43	0.56
Upland Buffer	1.55	1.55	2.28	2.31	2.31	2.18

3.3.5 Wildlife

A list of wildlife species observed directly and indirectly at the site during the field survey from 2013 through 2018 is presented in Table 3-18 and the Wetland Mitigation Site Monitoring form (Appendix B). Only one bird species (cliff swallow*)* was observed at the site because of the mid-afternoon survey time and high mid-summer temperatures.

Table 3-18. Wildlife Species Observed at the East Site From 2013 Through 2018

Common Name	Scientific Name
Amphibians	
Northern Leopard Frog	*Rana pipiens*
Birds	
American Goldfinch	*Spinus tristus*
American Robin	*Turdus migratorius*
Bald Eagle	*Haliaeetus leucocephalus*
Bank Swallow	*Riparia*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Grackle	*Quiscalus quiscula*
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	*Tyrannus tyrannus*
Field Sparrow	*Spizella pusilla*
Killdeer	*Charadrius vociferus*
Lark Sparrow	*Chondestes grammacus*
Mourning Dove	*Zenaida macroura*
Red-Winged Blackbird	*Agelaius phoeniceus*
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Western Sandpiper	*Calidris mauri*
Mammals	
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Raccoon	*Procyon lotor*
Reptiles	
Western Hog-nosed Snake	*Heterodon nasicus*

Species that were identified in 2018 are in bold.

3.3.6 Functional Assessment

The results of the functional assessments from 2013 through 2018 are summarized in Table 3-19. The completed East site's MWAM form is included in Appendix B. The total aquatic habitat developed to date within the 2.74-acre project area is 0.56 acre. The site was evaluated as one AA

and rated as a Category III wetland with 48.9 percent of the total possible points. The Montana-listed S2 species of concern (grand redstem and western hog-nosed snake) were documented in 2013 and 2015, respectively, and provided a high MTNHP species habitat rating. The disturbance rating improved from high in 2013 to moderate from 2014 through 2018. Sediment/shoreline stabilization improved from a low to moderate rating from 2015 to 2016 because of an increase in percent cover of wetland species with stability ratings greater than or equal to 6. Short- and long-term surface water storage was given a low rating in 2015 because of the decrease in water contained in the AA's wetlands that are subject to periodic flooding/ponding. The site achieved 2.5 functional units in 2018.

Table 3-19. Montana Wetland Assessment Method Summary for the Middle Site From 2013 Through 2018

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017	2018
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	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	N/A	N/A	N/A	N/A	N/A	N/A
Short- and Long-Term Surface Water Storage	Mod (0.6)	Mod (0.6)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.1)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	N/A	N/A	N/A	N/A	N/A	N/A
Actual Points/Possible Points	**3.6/9**	**4.3/9**	**4.4/9**	**4.4/9**	**4.4/9**	**4.4/9**
% of Possible Score Achieved	**40.0%**	**47.8%**	**48.9%**	**48.9%**	**48.9%**	**48.9%**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**1.19**	**1.19**	**0.46**	**0.43**	**0.43**	**0.56**
Functional Units (acreage × actual points)	**4.3**	**5.1**	**2.0**	**1.9**	**1.9**	**2.5**

3.3.7 Photographic Documentation

Photographs of Photo Points 1 through 3 (PP1–PP3), the transect start and end points, and the wetland determination data points (Figure A-7, Appendix A) are provided in Appendix C.

3.3.8 Maintenance Needs

Low infestations of noxious weeds continue to persist at the site (Figure A-8, Appendix A). Yearly control measures will continue to eliminate noxious weed infestations. The fence along the eastern side of the site was in good working order. No man-made water-control structures have been installed at the East site. A survey may be required to determine if the central area of the excavated area is higher than the northwestern and southeastern ends.

3.3.9 Current Credit Summary

The wetland acreage delineated in 2018 totaled 0.56 acre, which was an increase of 0.13 acre since 2017. This increase was likely driven by the above-average precipitation received at the site in 2018. Upland buffer accounted for 2.18 acres within the East site monitoring boundary. Applying standard wetland compensatory mitigation ratios [USACE, 2005], the site attained an estimated 1.00 credit acre in 2018, which is shown in Table 3-20. No performance standards have been established for this site.

Table 3-20. Credit Summary for the East Site

Wetland	Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres	2018 Delineated Acres	2018 Estimated Credit Acres
Created Wetland	1:1	1.19	1.19	0.46	0.46	0.43	0.43	0.43	0.43	0.56	0.56
Upland Buffer	5:1	1.55	0.31	2.28	0.46	2.31	0.46	2.31	0.46	2.18	0.44
Total		**2.74**	**1.50**	**2.74**	**0.92**	**2.74**	**0.89**	**2.74**	**0.89**	**2.74**	**1.00**

3.4 COMPREHENSIVE CREDIT SUMMARY FOR FORSYTH – NORTHWEST

The wetland areas that were impacted during construction of the Volborg – North and South project in 2004 totaled 6.80 acres. Per the USACE requirement, the impacts were to be mitigated at a 1.5:1 ratio. During the construction of the FNW project, an additional 2.18 acres of unavoidable wetland impacts occurred. Credits that were generated by the 1999 construction of the Treasure County Line site have been applied to the FNW debits at a 1:1 ratio based on the development of this mitigation wetland site before the impacts actually occurred.

The total credits estimated for all four FNW sites in 2018 was 14.60 acres (Table 3-21). This value was 1.82 credit acres in excess of the required 12.78 credit acres. The increase in credit acreage in 2018 is a direct result of the improved dike structure at the west site and significantly higher than average precipitation in the first half of 2018, which led to maximum inundation at the west site during monitoring. Minimal potential exists for wetland expansion at the Middle and Treasure County Line sites because development has already extended to near the margins of the excavated footprint. No quantitative metrics or performance criteria are associated with the success of these mitigation sites. The monitoring requirements that were identified within the approved mitigation plan are being satisfied.

Table 3-21. Credit/Debit Summary for the Forsyth – Northwest Project

Project Site	Actual Acres	Type	Debit Ratio	Debit Acres
Volborg – North and South	6.80	Debit	1.5:1	10.20
FNW Previously Mitigated	1.78	Debit	1:1[(a)]	1.78
FNW Remaining	0.40	Debit	2:1	0.80
Total	**8.98**	**Total Debits**		**12.78**
Mitigation Site	**Actual Acres**	**Mitigation Type**	**Credit Ratio**	**Credit Acres**
Site 1: West	9.26	Creation Credit	1:1	9.26
	1.29	Preservation Credit	4:1	0.32
	3.16	Upland Buffer Credit	5:1	0.63
Site 2: Middle	0.58	Creation Credit	1:1	0.58
	1.22	Upland Buffer Credit	5:1	0.24
Site 3: East	0.56	Creation Credit	1:1	0.56
	2.18	Upland Buffer Credit	5:1	0.44
Site 4: Treasure County Line	1.74	Previous Creation Credit	1:1	1. 74
	4.15	Upland Buffer Credit	5:1	0.83
Total	**24.14**	**Total Credits**		**14.60**
Net Credits				**1.82**

(a) The wetland mitigation monitoring plan for FNW [2012] indicates that credits created at the Treasure County Line site will be applied to FNW impacts at a 1:1 ratio because the mitigation site was constructed before the impacts.

4.0 REFERENCES

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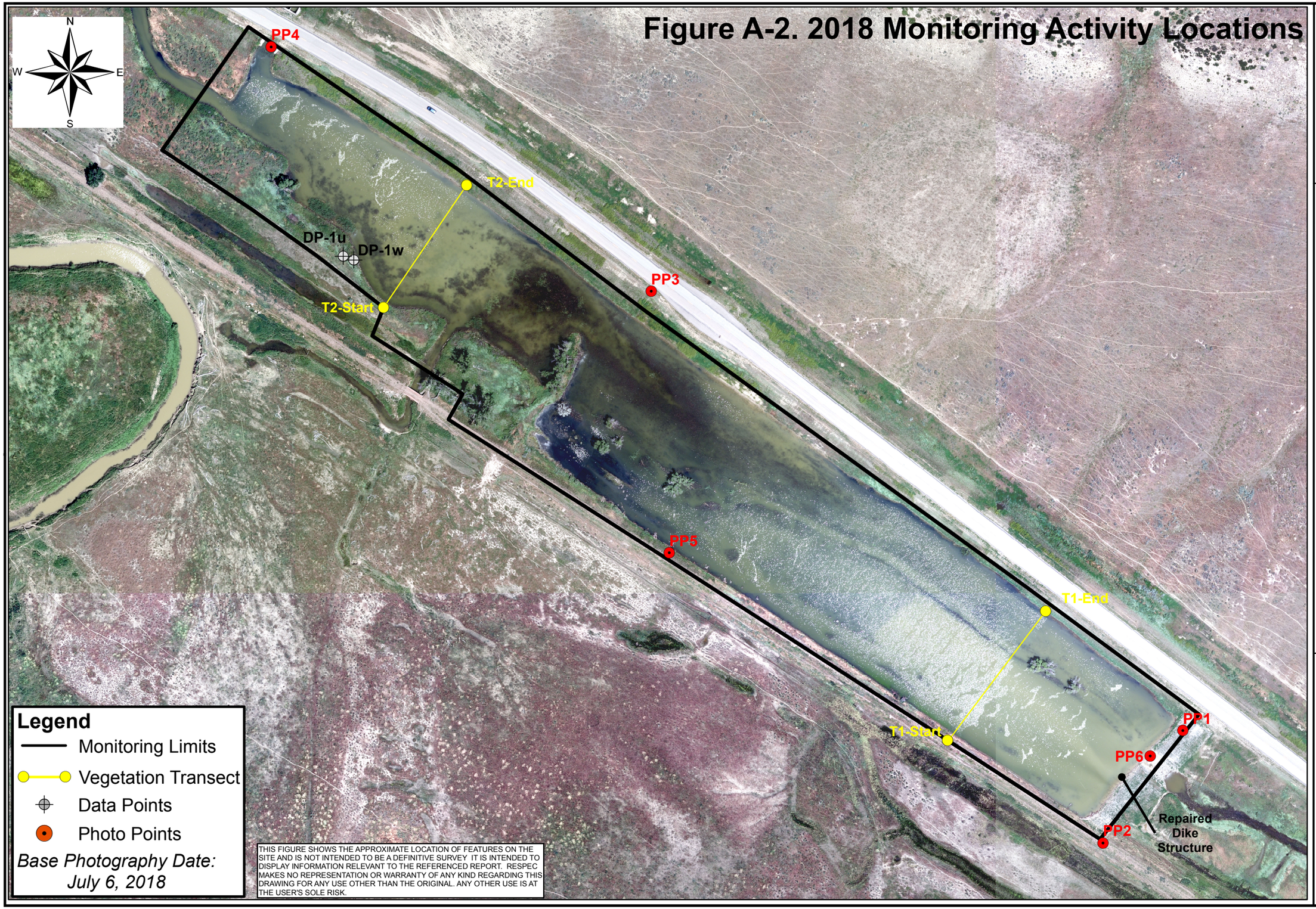
APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

Figure A-2. 2018 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 6, 2018

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

RESPEC
820 North Montana Ave., Suite A
Helena, MT 59601

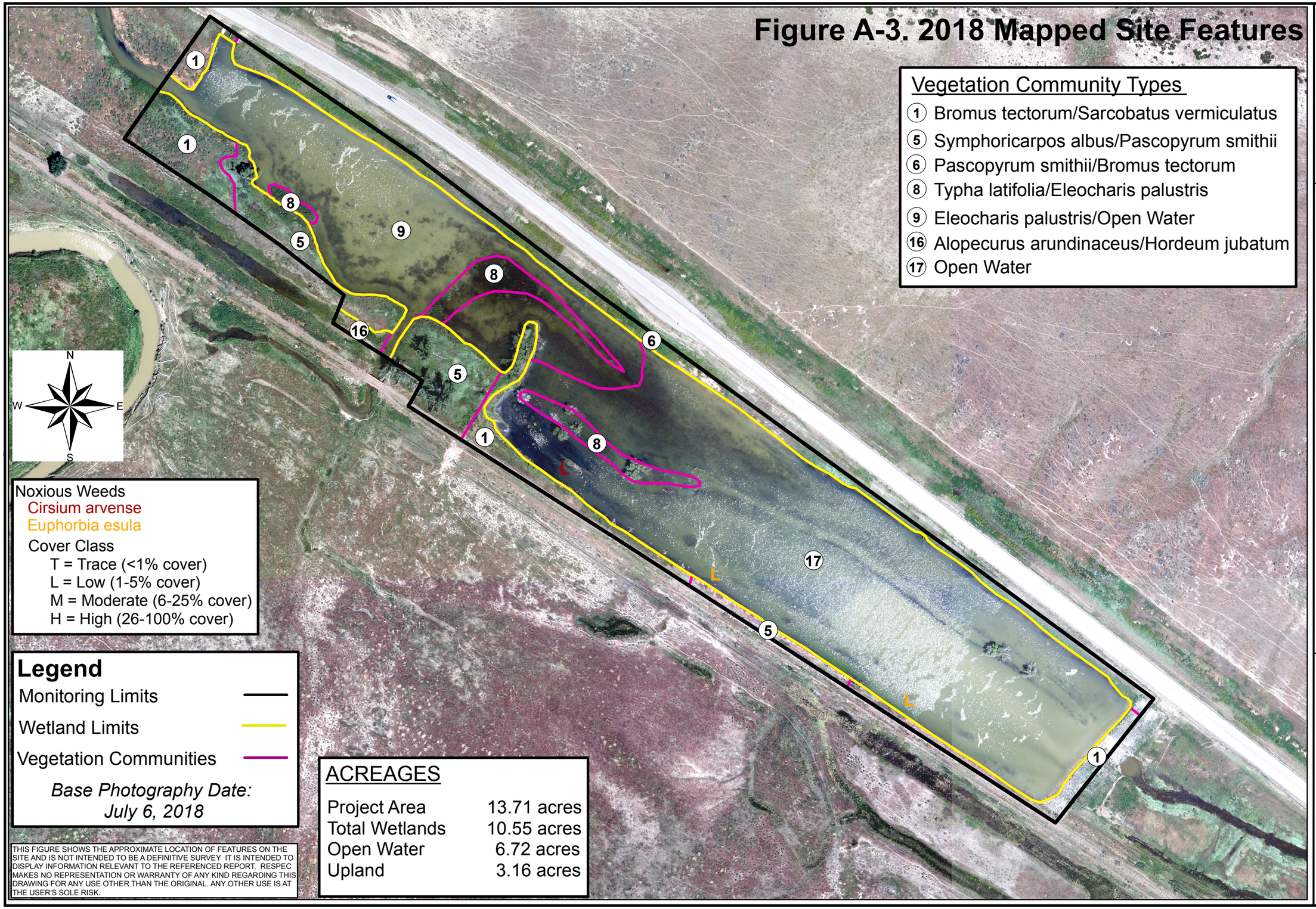
Forsyth NW - West Site
2018 Monitoring Activity Locations

0 65 130 260 390 520 650 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Wains\West Site\Monitor2018.mxd

Figure A-3. 2018 Mapped Site Features



Vegetation Community Types

1. Bromus tectorum/Sarcobatus vermiculatus
5. Symphoricarpos albus/Pascopyrum smithii
6. Pascopyrum smithii/Bromus tectorum
8. Typha latifolia/Eleocharis palustris
9. Eleocharis palustris/Open Water
16. Alopecurus arundinaceus/Hordeum jubatum
17. Open Water

Noxious Weeds
Cirsium arvense
Euphorbia esula
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 6, 2018

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ACREAGES

Project Area	13.71 acres
Total Wetlands	10.55 acres
Open Water	6.72 acres
Upland	3.16 acres

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Suite A
Helena, MT 59601

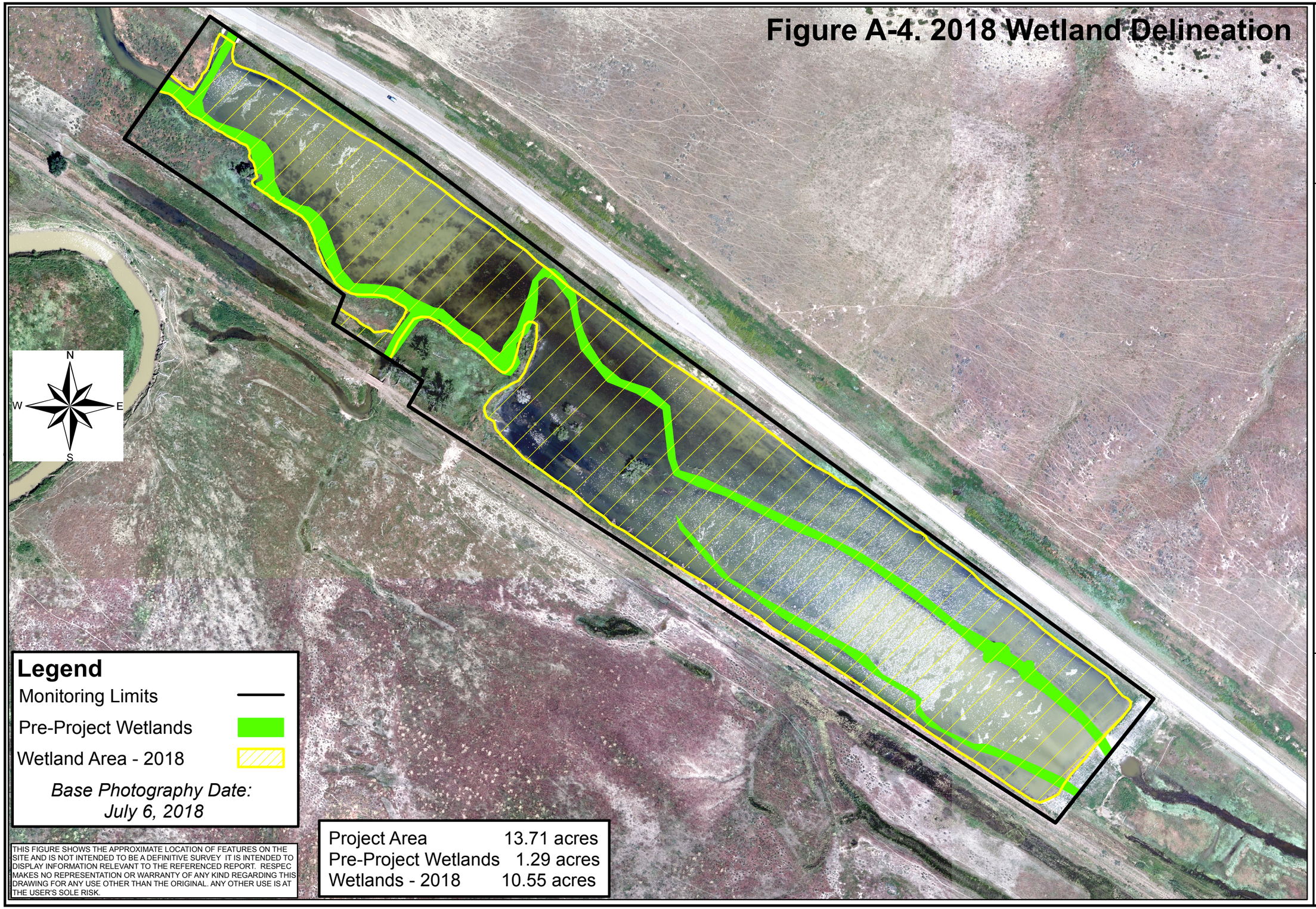
Forsyth NW - West Site
2018 Mapped Site Features

0 65 130 260 390 520 650 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\West Site\Veg2018.mxd

Figure A-4. 2018 Wetland Delineation



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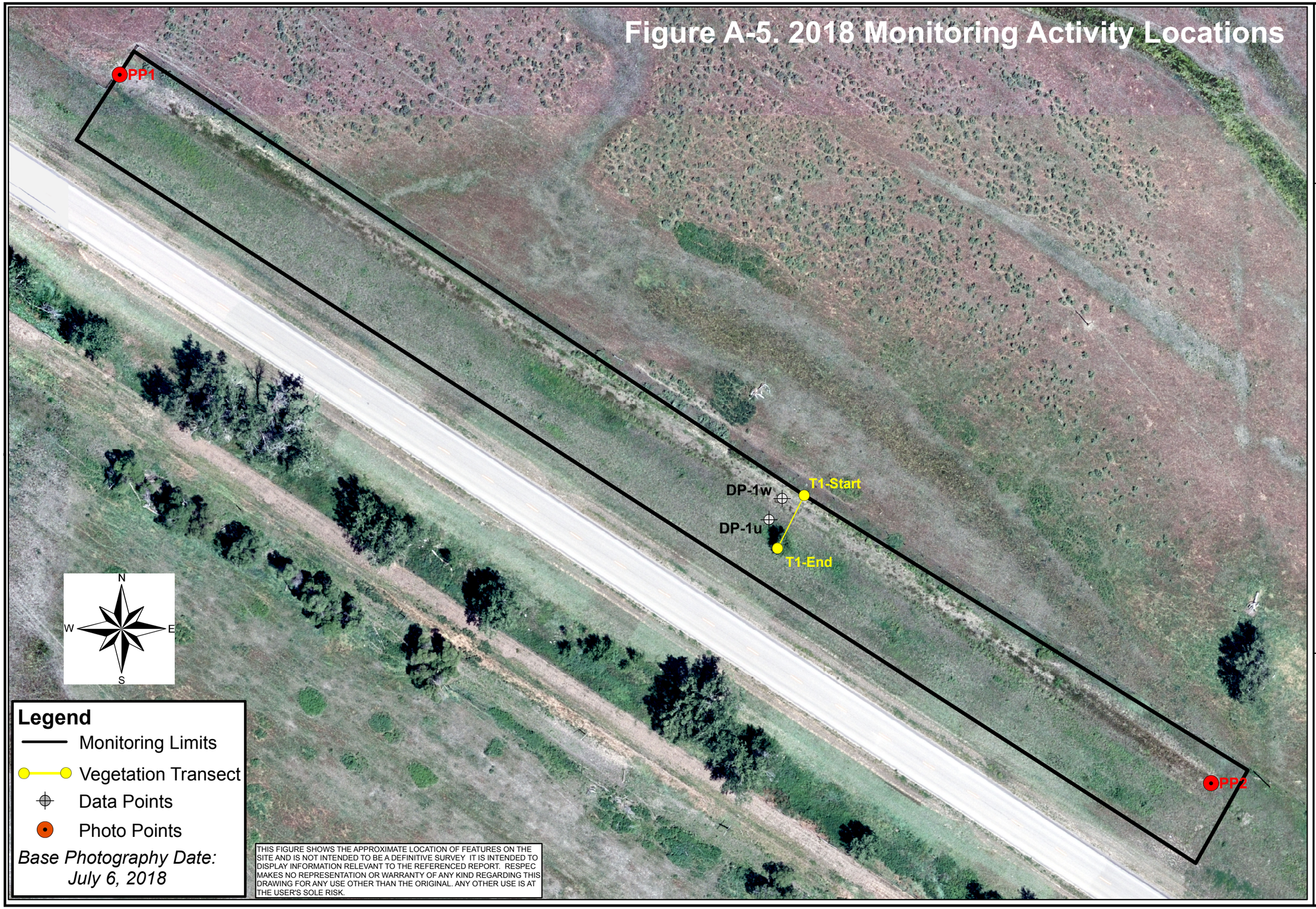
Forsyth NW - West Site
2018 Wetland Delineation

0 65 130 260 390 520 650 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\West Site\Delin2018.mxd

Figure A-5. 2018 Monitoring Activity Locations



RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

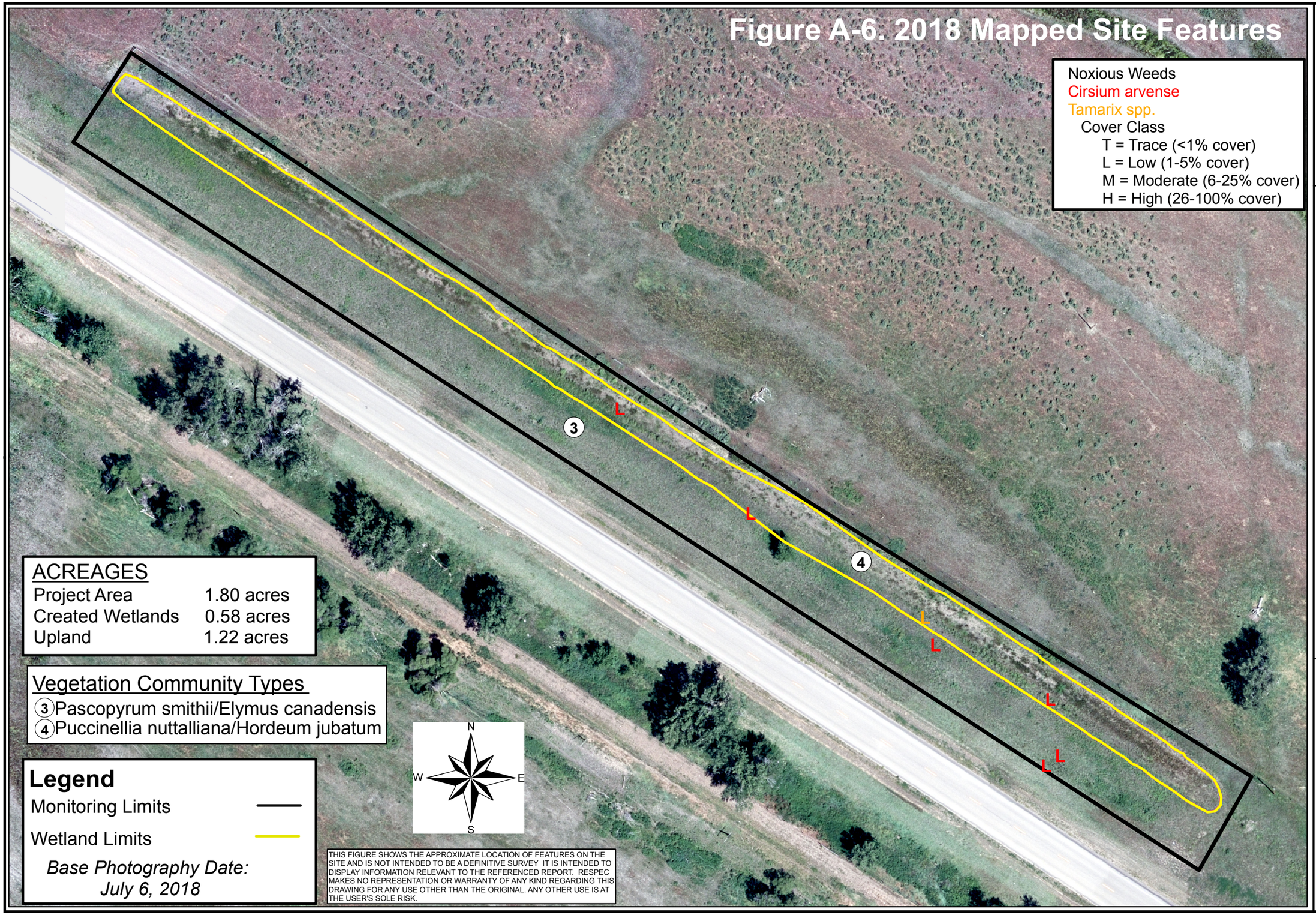
Forsyth NW - Middle Site
2018 Monitoring Activity Locations

0 30 60 120 180 240 300 Feet

Project:	STPP 14-6(9)259
Location:	Rosebud Co., Montana
Date:	December 2018
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\Middle Site\Monitor2018.mxd

Figure A-6. 2018 Mapped Site Features



ACREAGES	
Project Area	1.80 acres
Created Wetlands	0.58 acres
Upland	1.22 acres

Vegetation Community Types

(3) Pascopyrum smithii/Elymus canadensis
(4) Puccinellia nuttalliana/Hordeum jubatum

Legend

Monitoring Limits

Wetland Limits

Base Photography Date: July 6, 2018

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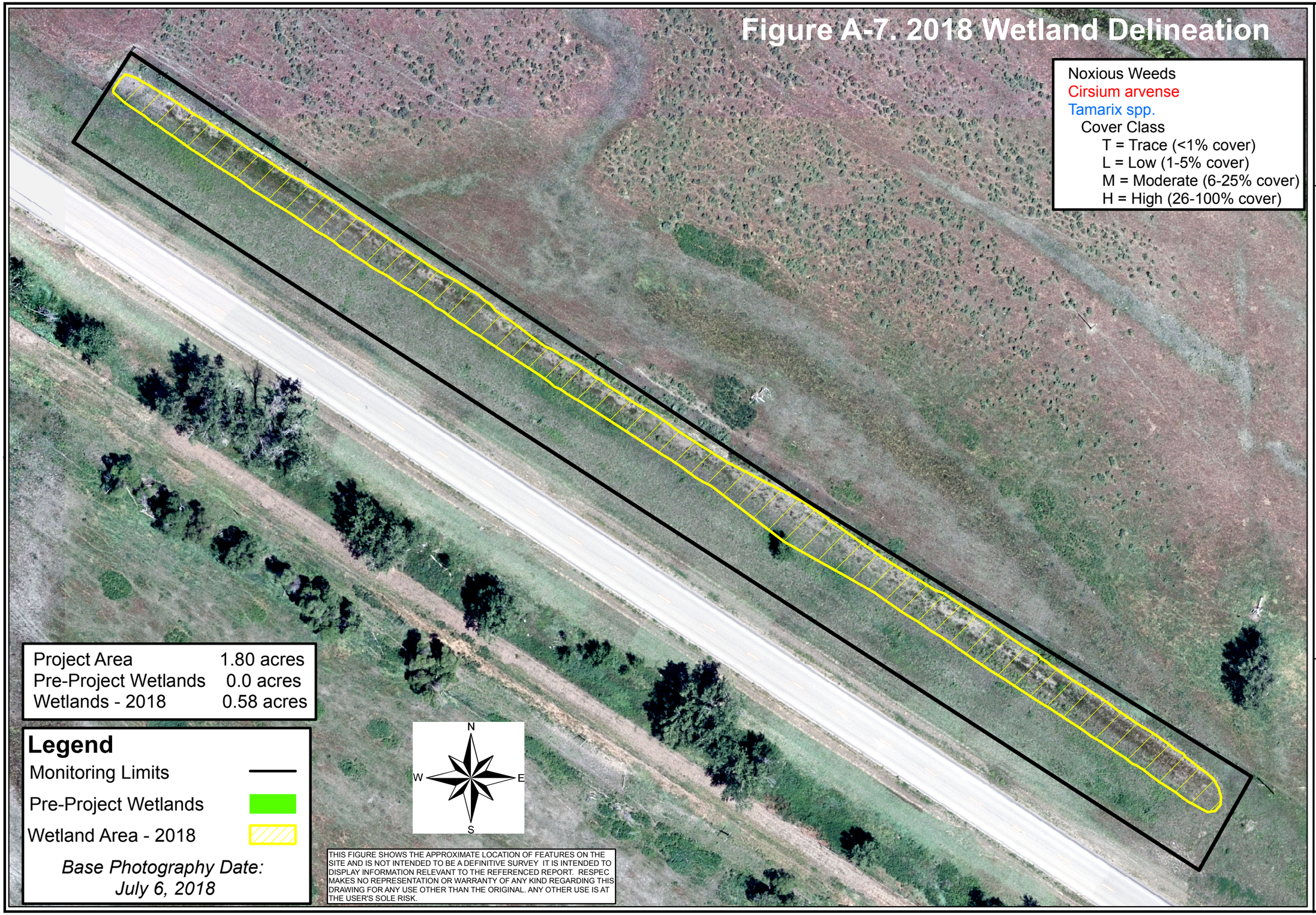
Forsyth NW - Middle Site
2018 Mapped Site Features

0 30 60 120 180 240 300 Feet

Project:	STPP 14-6(9)259
Location:	Rosebud Co., Montana
Date:	December 2018
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\Middle Site\Veg2018.mxd

Figure A-7. 2018 Wetland Delineation



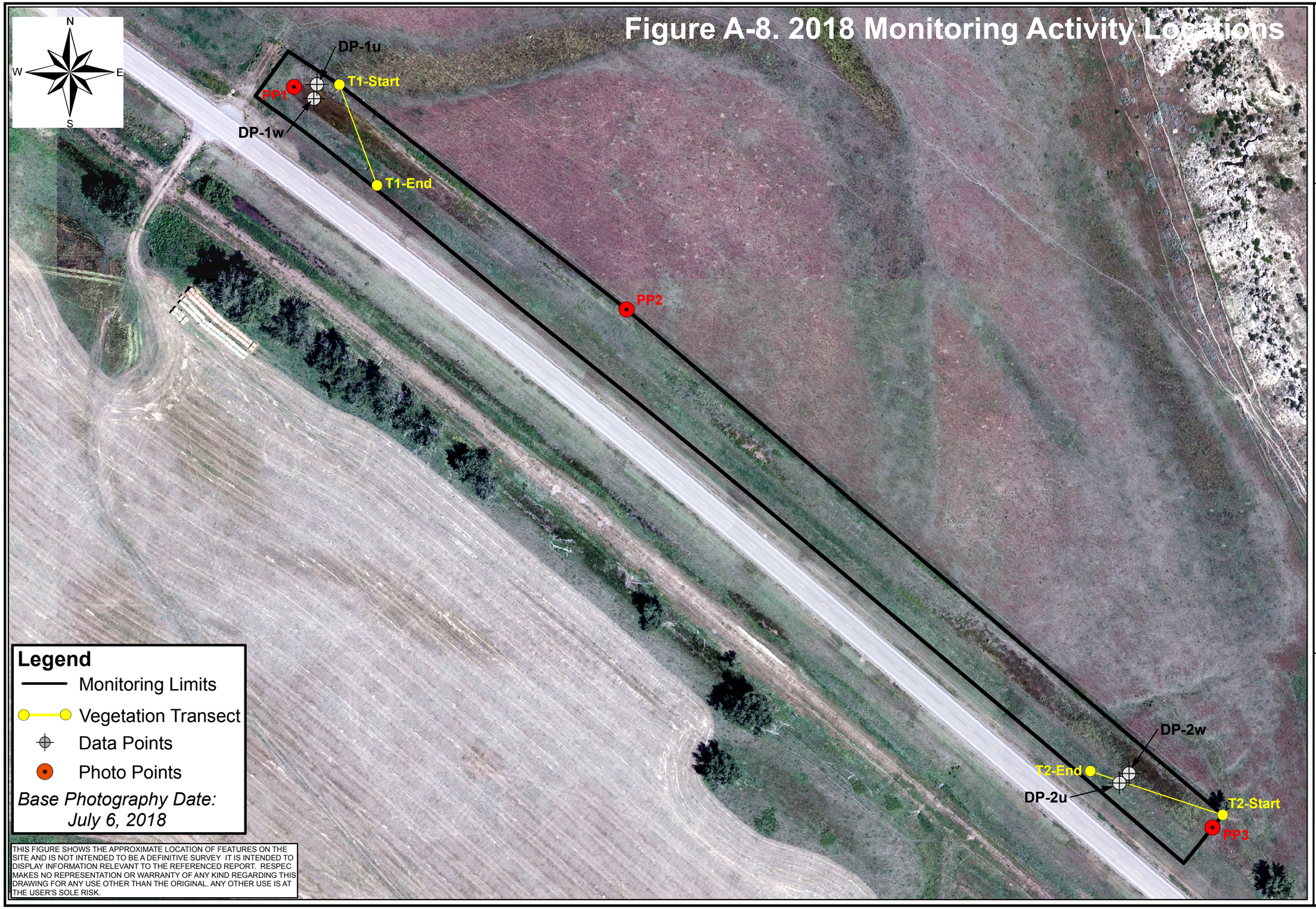
RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

Forsyth NW - Middle Site
2018 Wetland Delineation

0 30 60 120 180 240 300 Feet

Project:	STPP 14-6(9)259
Location:	Rosebud Co., Montana
Date:	December 2018
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

Figure A-8. 2018 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 6, 2018

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

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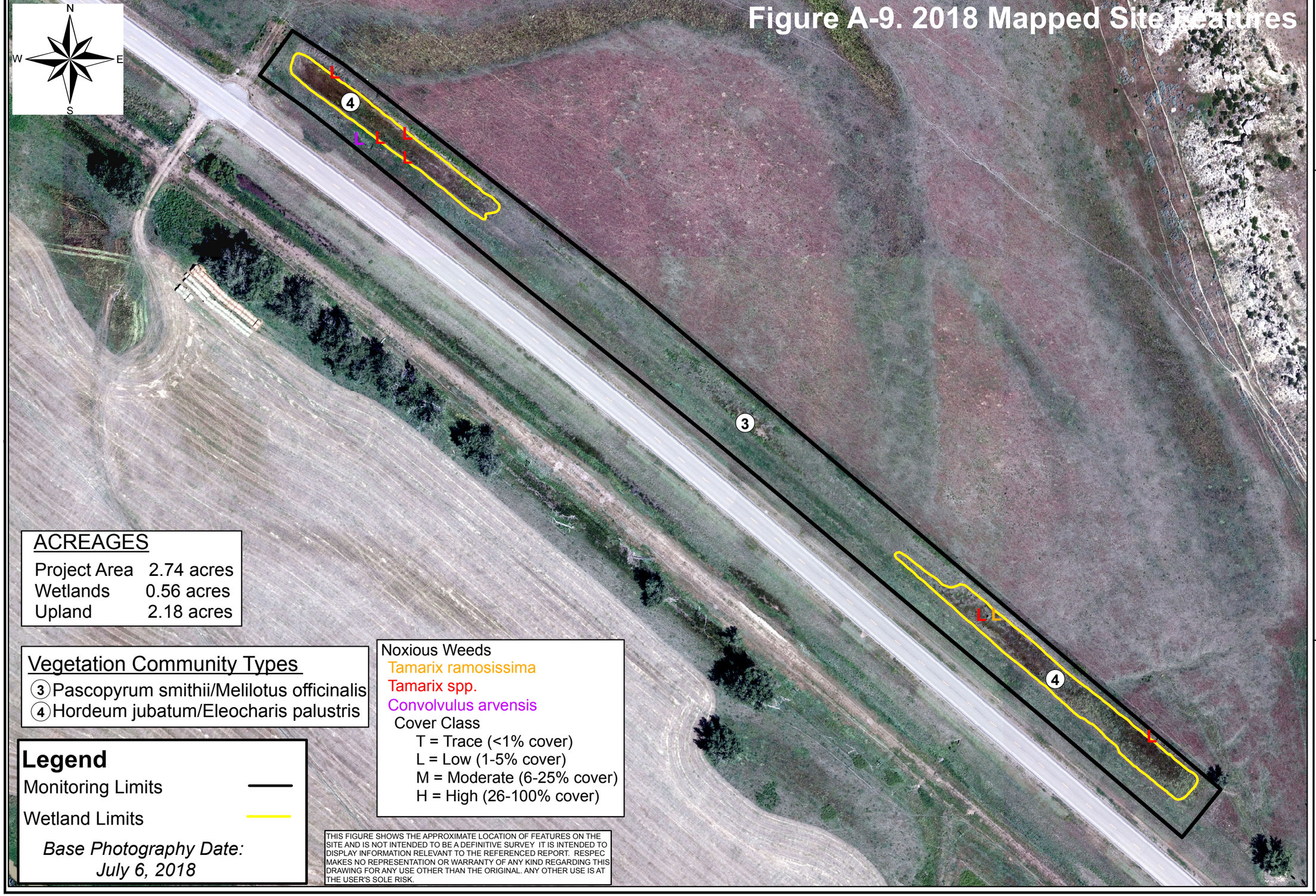
Forsyth NW - East Site
2018 Monitoring Activity Locations

0 50 100 200 300 400 500 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Wains\East Site\Monitor2018.mxd

Figure A-9. 2018 Mapped Site Features



ACREAGES

Project Area	2.74 acres
Wetlands	0.56 acres
Upland	2.18 acres

Vegetation Community Types

(3) Pascopyrum smithii/Melilotus officinalis
(4) Hordeum jubatum/Eleocharis palustris

Legend

Monitoring Limits

Wetland Limits

Base Photography Date: July 6, 2018

Noxious Weeds
Tamarix ramosissima
Tamarix spp.
Convolvulus arvensis
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

RESPEC
820 North Montana Ave., Suite A
Helena, MT 59601

Forsyth NW - East Site
2018 Mapped Site Features

0 50 100 200 300 400 500 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

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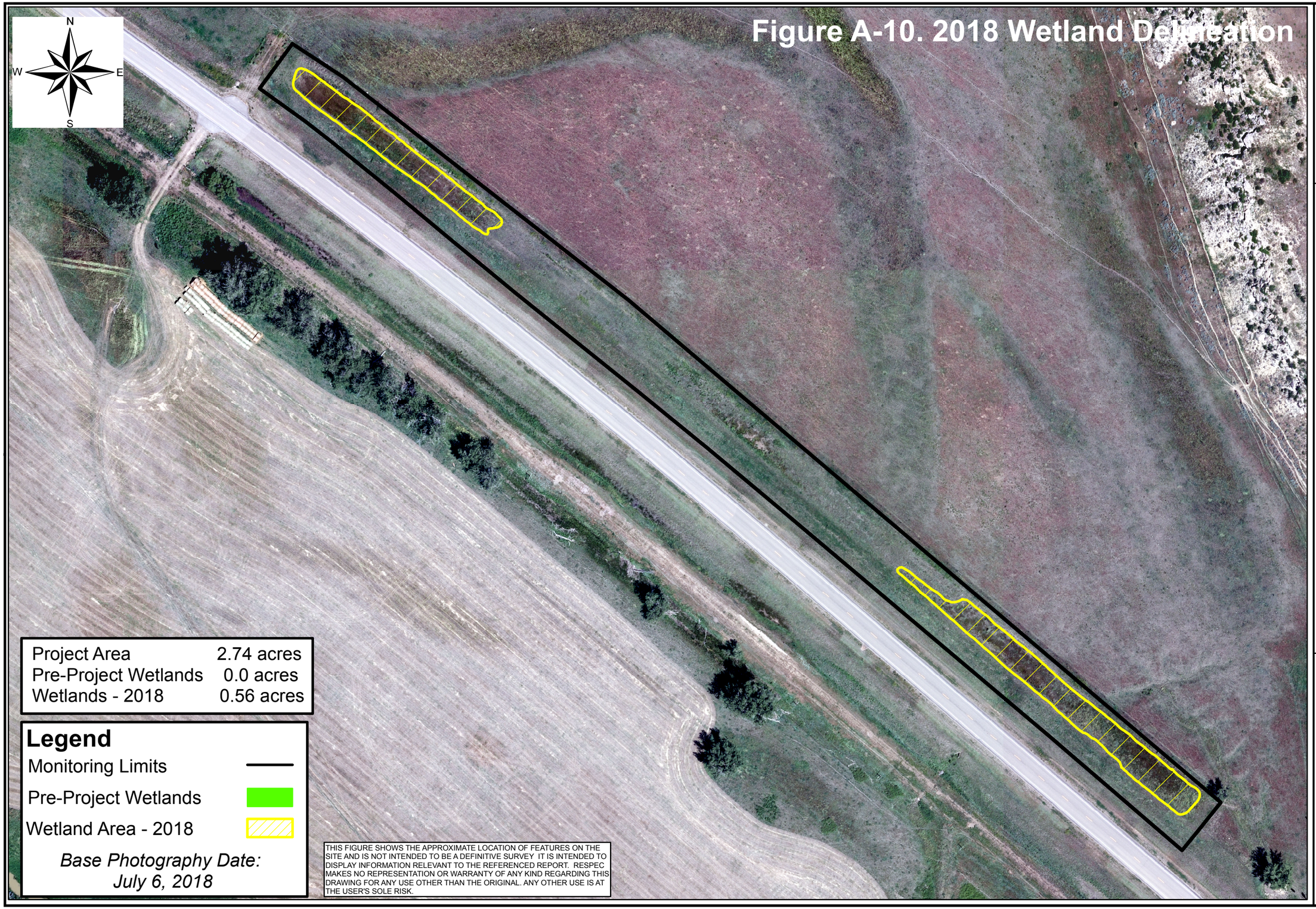
Figure A-10. 2018 Wetland Delineation



Project Area	2.74 acres
Pre-Project Wetlands	0.0 acres
Wetlands - 2018	0.56 acres

Legend

- Monitoring Limits
- Pre-Project Wetlands
- Wetland Area - 2018

Base Photography Date: July 6, 2018

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

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Forsyth NW - East Site
2018 Wetland Delineation

0 50 100 200 300 400 500 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

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APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - West** Project Number: _____
Assessment Date: **July 11, 2018** Person(s) conducting the assessment: **M. Traxler**
Location: **~15 miles NW of Forsyth** MDT District: **Glendive**
Milepost: **RP 280 on US 12**
Legal Description: T **7N** R **39E** Section **20 & 29**
Weather Conditions: **sunny, 75 degrees, breezy** Time of Day: **8:30 AM**
Initial Evaluation Date: **August 15, 2013** Monitoring Year: **6** # Visits in Year: **1**
Size of evaluation area: **13.71 acres** Land use surrounding wetland: **Agriculture, grazing, US 12**

HYDROLOGY

Surface Water Source: **Periodic flooding from Big Porcupine Creek, surface runoff from East Spring Coulee, and seasonal high groundwater**
Inundation: **Present** Average Depth: **1 feet** Range of Depths: **0.5-3.5 ft**
Percent of assessment area under inundation: **80%**
Depth at emergent vegetation-open water boundary: **2 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **No**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Entire wetland area inundated in 2018.

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☐ Map emergent vegetation-open water boundary on aerial photograph.
☐ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
Mitigation area receives surface water when East Spring Creek Coulee produces surface flow and from periodic flooding of Big Porcupine Creek with potential for high water velocities through constructed wetland. The entire site was flooded at the time of assessment due to 2018 being a very high water year.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Bromus tectorum / Sacobatus vermiculatus**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	2 = 6-10%	Elymus repens	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Euphorbia esula	1 = 1-5%
Sarcobatus vermiculatus	2 = 6-10%	Thalspi arvense	1 = 1-5%
Schedonorus pratensis	2 = 6-10%	Bassia scoparia	1 = 1-5%
Bare Ground	1 = 1-5%	Chenopodium album	1 = 1-5%
Bromus inermis	1 = 1-5%	Hordeum jubatum	1 = 1-5%

Comments / Problems: _____

Community Number: **5** Community Title (main spp): **Symphocarpos albus / Pascopyrum smithii**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	5 = > 50%	Hordeum jubatum	1 = 1-5%
Symphoricarpos albus	2 = 6-10%	Chenopodium album	1 = 1-5%
Bassia scoparia	1 = 1-5%	Poa pratensis	3 = 11-20%
Bromus japonicus	1 = 1-5%	Sarcobatus vermiculatus	3 = 11-20%
Cirsium arvense	+ = < 1%	Thlaspi arvense	2 = 6-10%
Poa compressa	2 = 6-10%	Bromus inermis	1 = 1-5%

Comments / Problems: _____

Community Number: **6** Community Title (main spp): **Pascopyrum smithii / Bromus tectorum**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	3 = 11-20%	Elymus trachycaulus	1 = 1-5%
Pascopyrum smithii	5 = > 50%	Lepidium perfoliatum	2 = 6-10%
Bromus japonicus	1 = 1-5%	Hordeum jubatum	1 = 1-5%
Melilotus officinalis	3 = 11-20%	Linum lewisii	1 = 1-5%
Bassia scoparia	2 = 6-10%	Thlaspi arvense	+ = < 1%
Elymus canadensis	1 = 1-5%	Hordeum marinum	+ = < 1%

Comments / Problems: _____

Community Number: **7** Community Title (main spp): **Puccinellia nuttalliana / Hordeum jubatum**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%	Schedonorus pratensis	+ = < 1%
Hordeum jubatum	+ = < 1%	Bare Ground	+ = < 1%
Puccinellia nuttalliana	+ = < 1%	Elymus repens	+ = < 1%
Bassia scoparia	+ = < 1%	Glycyrrhiza lepidota	+ = < 1%
Grindelia squarrosa	+ = < 1%	Helianthus annuus	+ = < 1%
Lactuca serriola	+ = < 1%	Pascopyrum smithii	+ = < 1%

Comments / Problems: **Entire community under standing water in 2018. All vegetation dead. 2017 species left in table for reference purposes.**

VEGETATION COMMUNITIES (continued)

Community Number: **8** Community Title (main spp): **Typha latifolia / Elocharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	5 = > 50%		
Typha latifolia	3 = 11-20%		
Schoenoplectus acutus	+ = < 1%		
Typha angustifolia	2 = 6-10%		
Salix amygdaloides	1 = 1-5%		
Spartina pectinata	1 = 1-5%		

Comments / Problems: **Populus deltoides (2ft tall)-<1%; Schoenoplectus maritimus-1; Sonchus arvensis-<1**

Community Number: **9** Community Title (main spp): **Eleocharis palustris / Open Water**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%		
Eleocharis palustris	3 = 11-20%		
Typha latifolia	1 = 1-5%		
Schoenoplectus maritimus	3 = 11-20%		
Polygonum aviculare	+ = < 1%		
Populus deltoides	+ = < 1%		

Comments / Problems: _____

Community Number: **11** Community Title (main spp): **Pascopyrum smithii/Elymus repens**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%	Lactuca serriola	+ = < 1%
Pascopyrum smithii	+ = < 1%	Populus deltoides	+ = < 1%
Schedonorus pratensis	+ = < 1%	Tragopogon dubius	+ = < 1%
Chenopodium album	+ = < 1%	Bromus tectorum	+ = < 1%
Elymus repens	+ = < 1%	Spartina pectinata	+ = < 1%
Grindelia squarrosa	+ = < 1%	Glycyrrhiza lepidota	+ = < 1%

Comments / Problems: **Entire community under standing water in 2018. All vegetation dead. 2017 species left in table for reference purposes.**

Community Number: **12** Community Title (main spp): **Hordeum jubatum/Elymus trachycaulus**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%	Muhlenbergia asperifolia	+ = < 1%
Elymus repens	+ = < 1%		
Glycyrrhiza lepidota	+ = < 1%		
Hordeum jubatum	+ = < 1%		
Elymus trachycaulus	+ = < 1%		
Grindelia squarrosa	+ = < 1%		

Comments / Problems: **Entire community under standing water in 2018. All vegetation dead. 2017 species left in table for reference purposes.**

VEGETATION COMMUNITIES (continued)

Community Number: **13** Community Title (main spp): **Elymus trachycaulus/Bromus tectorum**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%	Euphorbia esula	+ = < 1%
Poa pratensis	+ = < 1%	Eymus lanceolatus	
Populus deltoides	+ = < 1%	Elymus repens	
Bromus tectorum	+ = < 1%	Puccinellia nuttalliana	
Elymus trachycaulus	+ = < 1%		
Tragopogon dubius	+ = < 1%		

Comments / Problems: **Entire community under standing water in 2018. All vegetation dead. 2017 species left in table for reference purposes.**

Community Number: **14** Community Title (main spp): **Pascopyrum smithii/Elymus lanceolatus**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%	Ribes cereum	+ = < 1%
Bromus tectorum	+ = < 1%	Pascopyrum smithii	+ = < 1%
Elymus lanceolatus	+ = < 1%		
Symphoriocarpos albus	+ = < 1%		
Elymus trachycaulus	+ = < 1%		
Linum lewisii	+ = < 1%		

Comments / Problems: **Entire community under standing water in 2018. All vegetation dead. 2017 species left in table for reference purposes.**

Community Number: **16** Community Title (main spp): **Alopecurus arundinaceus/Hordeum jubatum**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	4 = 21-50%		
Hordeum jubatum	4 = 21-50%		
Sagittaria cuneata	3 = 11-20%		
Rumex crispus	1 = 1-5%		
Bare Ground	3 = 11-20%		

Comments / Problems: **New community in 2018**

Community Number: **17** Community Title (main spp): **Open Water**

Dominant Species	% Cover	Dominant Species	% Cover
Open Water	5 = > 50%		
Typha latifolia	+ = < 1%		
Eleocharis palustris	+ = < 1%		
Schoenoplectus maritimus	+ = < 1%		

Comments / Problems: **Nearly the entire SE half of the wetland was under open water at time of survey.**

Additional Activities Checklist:

☒ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No woody vegetation planted at site. Natural recruitment of cottonwoods and willows is occurring.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - West** Date: **July 11, 2018** Examiner: **Mark Traxler**
Transect Number: **1** Approximate Transect Length: **282 feet** Compass Direction from Start: **25**° Note: _____

Transect Interval Length: **14 feet (station 0-14)**	
Vegetation Community Type: 5: Symphoriocarpos albus/Pascopyum smithii	
Plant Species	**Cover**
Bromus tectorum	5 = > 50%
Poa pratensis	2 = 6-10%
Euphorbia esula (sprayed, some remain partially alive)	1 = 1-5%
Pascopyrum smithii	2 = 6-10%
Lepidium perfoliatum	1 = 1-5%
Bare Ground	2 = 6-10%
Total Vegetative Cover:	95%

Transect Interval Length: **268 feet (station 14-282)**	
Vegetation Community Type: 17: Open Water	
Plant Species	**Cover**
Open Water	5 = > 50%
Dead Vegetation	+ = < 1%
Total Vegetative Cover:	0%

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - West** Date: **July 11, 2018** Examiner: **Mark Traxler**
Transect Number: **2** Approximate Transect Length: **261 feet** Compass Direction from Start: **25**° Note: _____

Transect Interval Length: **7 feet (station 0-7)**	
Vegetation Community Type: 5: Symphoricarpos albus / Pascopyrum smithii	
Plant Species	**Cover**
Symphoricarpos albus	+ = < 1%
Elymus repens	4 = 21-50%
Lepidium perfoliatum	3 = 11-20%
Poa compressa	4 = 21-50%
Thlapsi arvensis	1 = 1-5%
Pascopyrum smithii	1 = 1-5%
Bare Ground	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **235 feet (station 7-242)**	
Vegetation Community Type: 9: Eleocharis palustris / Open Water	
Plant Species	**Cover**
Eleocharis palustris	2 = 6-10%
Schoenoplectus maritimus	2 = 6-10%
Open Water	5 = > 50%
Total Vegetative Cover:	5%

Transect Interval Length: **19 feet (station 242-261)**	
Vegetation Community Type: 6: Pascopyrum smithii / Bromus tectorum	
Plant Species	**Cover**
Elymus lanceoatus	1 = 1-5%
Bromus arvensis	1 = 1-5%
Bare Ground	1 = 1-5%
Melilotus officinale	4 = 21-50%
Lepidium perfoliatum	1 = 1-5%
Pascopyrum smithii	5 = > 50%
Bassia scoparia	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	95%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		**Indicator Class**	**Source**
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

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

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

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

Comments:

PHOTOGRAPHS

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

Photograph Checklist:

- ☒ 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.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1 (Pano): 46.336914 / -106.871132	270
PP-2		Photo Point 2 (Pano): 46.336468 / -106.871811	350
PP-3		Photo Point 3 (Pano): 46.339088 / -106.874611	230
PP-4		Photo Point 4 (Pano): 46.340237 / -106.877312	210
PP-5		Photo Point 5 (Pano): 46.337817 / -106.874587	45
PP-6		Completed Dike: 46.3368 / -106.8714	300
PP-6a		Completed Dike: 46.3368 / -106.8714	120
T-1 start		Transect 1 start: 46.33691 / -106.872772	25
T-1 end		Transect 1 end: 46.337456 / -106.872063	205
T-2 start		Transect 2 start: 46.339001 / -106.87645	25
T-2 end		Transect 2 end: 46.339561 / -106.875854	205
DP-1W		Wetland soil pit: 46.33925 / -106.876672	
DP-1U		Upland soil pit: 46.33927 / -106.876743	

Comments / Problems: _____

GPS SURVEYING

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

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

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

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
If yes, do they need to be repaired? **NA**
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? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **NA**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
Deer sp.		☒	☐	☐	
Fish sp.		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - West** Date: **7/11/18**
Survey Time: **8:30 am** to **11:00 am**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Eastern Kingbird	2	F FO	UP				
Western Meadowlark	1	FO L	UP				
Cliff Swallow	6	FO F	OW UP				
Canada Goose	5	F	OW				
Belted Kingfisher	3	L BP	UP OW				
Killdeer	2	FO	UP OW				
Mourning Dove	1	FO	UP OW				
American Coot	2	F	OW				
Brewer's Blackbird	2	FO	UP OW				

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

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **75 degrees, sunny**

Notes: _____

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - West **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1U**

Investigator(s): Mark Traxler **Section, Township, Range:** S 20 T 7N R 39E

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 1.0% 0.6 °

Subregion (LRR): LRR G **Lat.:** 46.33927 **Long.:** -106.876743 **Datum:** WGS84

Soil Map Unit Name: Marvan silty clay, 0-2 percent slopes **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:
New data point in 2018.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1. Sarcobatus vermiculatus	20	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	20	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Bassia scoparia	10	☐	15.4%	FACU
2. Lactuca serriola	5	☐	7.7%	FAC
3. Hordeum jubatum	10	☐	15.4%	FACW
4. Bromus arvensis	20	☑	30.8%	FACU
5. Pascopyrum smithii	20	☑	30.8%	FACU
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	65	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	10	x 2 =	20	
FAC species	25	x 3 =	75	
FACU species	50	x 4 =	200	
UPL species	0	x 5 =	0	
Column Totals:	85	(A)	295	(B)

Prevalence Index = B/A = 3.471

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Data point includes various upland grasses and forbs.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1U

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

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

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators observed.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

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 ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - West **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-1W

Investigator(s): Mark Traxler **Section, Township, Range:** S 20 T 7N R 39E

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR G **Lat.:** 46.33925 **Long.:** -106.876672 **Datum:** WGS84

Soil Map Unit Name: Marvan silty clay, 0-2 percent slopes **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Point on southwest side of open water. New data point in 2018.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Spartina pectinata	60	☑	75.0%	FACW
2. Rumex crispus	10	☐	12.5%	FAC
3. Eleocharis palustris	10	☐	12.5%	OBL
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	80	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 20

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10	
FACW species	60	x 2 =	120	
FAC species	10	x 3 =	30	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	80	(A)	160	(B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Narrow wetland fringe around perimeter of open water.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	5/1	90	10YR	5/6	10	D	M	Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil meets criteria for depleted matrix.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☑ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):	
Water Table Present?	Yes ◉	No ○	Depth (inches):	14
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soil saturated to the surface and standing water in pit at 14".

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - West **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/11/18 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** Forsyth NW - West

6. Wetland Location(s): Township 7 N, Range 39 E, Section 20; Township 7 N, Range 39 E, Section 29

Approximate Stationing or Roadposts: RP 280 on US 12

Watershed: 14 - Middle Yellowstone **County:** Rosebud

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
10.55 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): >10.55 (visually estimated)
(see manual for determining AA) _____ (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland		Permanent / Perennial	5
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	31
Depressional	Unconsolidated Bottom	Diked	Seasonal / Intermittent	64

Comments: In 2018 the entire site flooded to the top of the dike. Emergent wetland and unconsolidated bottom habitat were present.

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

12. GENERAL CONDITION OF AA

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

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

Comments (types of disturbance, intensity, season, etc.)**:** Construction activities in 2017 to repair the dike structure temporarily increased disturbance rating at the site to high in 2017 but was reduced to moderate in 2018.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes existing and constructed wetlands within floodplain of an Unnamed Tributary of Big Porcupine. Surrounding land includes US 12 and livestock grazing.

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

Comments: Emergent wetland with occasional trees and shrubs, as well as open water with aquatic macrophytes.

Wetland/Site #(s): Forsyth NW - West

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): _____

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Ammannia robusta (S2)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Great Blue Heron (S3)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	.0L
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Ammannia observed within AA in previous year.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of 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
- ☐ interview with local biologist 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 manual 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)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	M	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☐ **Exceptional**	☐ **High**	☒ **Moderate**	☒ **Low**
☐ **Substantial**	---	---	---	---
☒ **Moderate**	---	---	.5M	---
☐ **Minimal**	---	---	---	---

Comments: Several bird species observed including family group of belted kingfisher.

Wetland/Site #(s): Forsyth NW - West

14D. GENERAL FISH HABITAT ☐ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☒ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface 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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	.3L	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

iii. Final Score and Rating: .3L **Comments:** Unidentified 3-inch fish observed during field survey in 2015 and 2018.

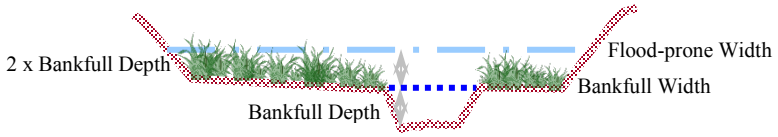
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

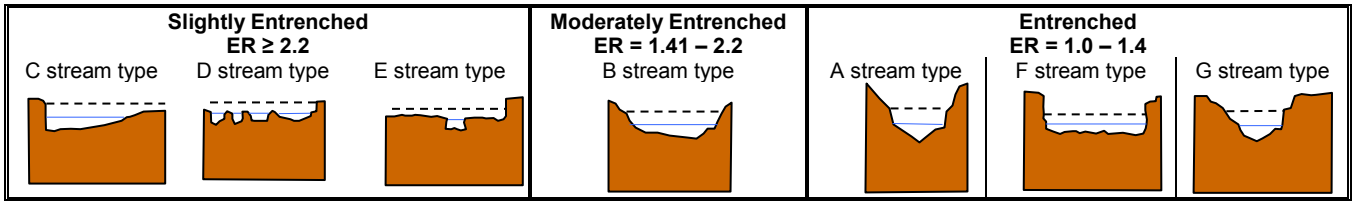
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

70 / 35 = 2.0

flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point 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		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	.5M	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** Surface water enters AA via box culvert and from overbank flow from Big Porcupine Creek; dike upgraded on SE end of wetland in 2017.

Wetland/Site #(s): Forsyth NW - West

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

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

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>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**	---	.9H	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: A large area of the AA is seasonally flooded by East Spring Coulee.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver 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 is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☐ **≥ 70%**		☒ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☐ **Yes**	☐ **No**	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	---	.7M	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: Open/standing water was present across entire site in 2018 with wetland vegetation cover estimated at 40 percent site wide.

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

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

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

Comments: AA is subject to surface water flows during runoff in UT-Big Porcupine Creek.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☒ **L**	---	M	---
☐ **NA**	---	---	---

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

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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	.7M	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - West

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: 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).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = .8H ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** Upland buffer between northern boundary of AA and highway greater than 50ft.

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and 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 select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ P/P	☒ S/I	☐ T	☐ None
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: Site hydrology is combination of seasonally high groundwater table and runoff.

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point 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)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	.5M	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: AA with several mature trees and is managed in a natural state.

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	.15H
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Property owned by MDT.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - West

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	9.50	*
C. General Wildlife Habitat	mod 0.50	1.00	5.28	*
D. General Fish Habitat	low 0.30	1.00	3.17	
E. Flood Attenuation	mod 0.50	1.00	6.33	
F. Short and Long Term Surface Water Storage	high 0.90	1.00	9.50	*
G. Sediment / Nutrient / Toxicant Removal	mod 0.70	1.00	7.39	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	6.33	
I. Production Export / Food Chain Support	mod 0.70	1.00	7.39	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	7.39	*
K. Uniqueness	mod 0.50	1.00	5.28	
L. Recreation / Education Potential (bonus point)	high 0.15		1.58	
Total Points	**6.45**	**11**	**68.09 Total Functional Units**	
Percent of Possible Score 59% (round to nearest whole number)				

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

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

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

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

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

RESPEC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - Middle** Project Number: _____
Assessment Date: **July 11, 2018** Person(s) conducting the assessment: **M. Traxler**
Location: **~8 miles NW of Forsyth** MDT District: **Glendive**
Milepost: **~262 on US 12**
Legal Description: T **7N** R **39E** Section **33**
Weather Conditions: **85 degrees, sunny** Time of Day: **2:00 PM-3:00 PM**
Initial Evaluation Date: **August 15, 2013** Monitoring Year: **6** # Visits in Year: **1**
Size of evaluation area: **1.8 acres** Land use surrounding wetland: **Ag, grazing, US Hwy 12**

HYDROLOGY

Surface Water Source: **Precipitation, runoff, shallow groundwater**
Inundation: **Absent** Average Depth: **0 feet** Range of Depths: **0**
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: **0 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **No**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Geomorphic position, surface soil cracks

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☒ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
Soil not saturated during mid-July survey but soil cracking noticed in areas saturated earlier in growing season.

VEGETATION COMMUNITIES

Community Number: **3** Community Title (main spp): **Pascopyrum smithii / Elymus canadensis**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	+ = < 1%	Symphoricarpos albus	1 = 1-5%
Bromus arvensis	+ = < 1%	Lactuca serriola	1 = 1-5%
Cirsium arvense	1 = 1-5%	Linum lewisii	1 = 1-5%
Elymus canadensis	1 = 1-5%	Pascopyrum smithii	4 = 21-50%
Populus deltoides	2 = 6-10%	Rumex crispus	1 = 1-5%
Sarcobatus vermiculatus	1 = 1-5%	Thlaspi arvense	1 = 1-5%

Comments / Problems: **Elymus trachycaulus-2; Bromus inermis-1; Grindelia squarrosa-1**

Community Number: **4** Community Title (main spp): **Puccinellia nuttalliana / Hordeum jubatum**

Dominant Species	% Cover	Dominant Species	% Cover
Bare ground	2 = 6-10%	Populus deltoides	+ = < 1%
Bromus arvensis	1 = 1-5%	Hordeum jubatum	2 = 6-10%
ELymus repens	1 = 1-5%	Puccinellia nuttalliana	3 = 11-20%
Pascopyrum smithii	2 = 6-10%	Schedonorus pratensis	2 = 6-10%
Rumex crispus	2 = 6-10%	Schoenoplectus maritimus	2 = 6-10%
Eleocharis palustris	4 = 21-50%	Salix lutea	1 = 1-5%

Comments / Problems: **Alopecurus arundinaceus-1; Poa pratensis-1; Muhlenbergia asperifolia <1**

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No planted woody vegetation. Young volunteer cottonwoods doing well around edge of wetland.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - Middle** Date: **July 11, 2018** Examiner: **Mark Traxler**
Transect Number: **1** Approximate Transect Length: **50 feet** Compass Direction from Start: **205**° Note: _____

Transect Interval Length: **14 feet (station 0-14)**	
Vegetation Community Type: 3 - Pascopyrum smithii / Elymus canadensis	
Plant Species	**Cover**
Bassia scoparia	1 = 1-5%
Pascopyrum smithii	2 = 6-10%
Schedonorus pratensis	1 = 1-5%
Lepidium perfoliatum	1 = 1-5%
Bare Ground	2 = 6-10%
Muhlenbergia asperifolia	1 = 1-5%
Bromus tectorum	4 = 21-50%
Chenopodium album	3 = 11-20%
Elymus canadensis	2 = 6-10%
Total Vegetative Cover:	60%

Transect Interval Length: **19 feet (station 14-33)**	
Vegetation Community Type: 4 - Puccinellia nuttalliana / Hordeum jubatum	
Plant Species	**Cover**
Bare Ground	2 = 6-10%
Hordeum jubatum	2 = 6-10%
Puccinellia nuttalliana	2 = 6-10%
Elymus repens	2 = 6-10%
Schedonorus pratensis	4 = 21-50%
Eleocharis palustris	2 = 6-10%
Rumex crispus	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **17 feet (station 33-50)**	
Vegetation Community Type: 3 - Pascopyrum smithii / Elymus spp.	
Plant Species	**Cover**
Bare Ground	1 = 1-5%
Elymus canadensis	+ = < 1%
Melilotus officinalis	2 = 6-10%
Schedonorus pratensis	2 = 6-10%
Elymus trachycaulus	4 = 21-50%
Pascopyrum smithii	1 = 1-5%
Symphoricarpos albus	1 = 1-5%
Populus deltoides	4 = 21-50%
Poa pratensis	+ = < 1%
Total Vegetative Cover:	95%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		**Indicator Class**	**Source**
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

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

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

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

Comments: _____

PHOTOGRAPHS

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

Photograph Checklist:

- ☒ 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.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1: 46.322174 / -106.840996	300
PP-2		Photo Point 2: 46.323803 / -106.844337	120
T-1 start		Transect 1 start: 46.322948 / -106.842323	205
T-1 end		Transect 1 end: 46.322754 / -106.842438	25
DP-1W		Wetland soil pit: 46.322942 / -106.842481	
DP-1U		Upland soil pit: 46.322911 / -106.842492	
		W & E along road buffer	

Comments / Problems: _____

GPS SURVEYING

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

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

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

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
If yes, do they need to be repaired? **NA**
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? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **No**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: **Very little wildlife or sign of wildlife noted during the 2018 field survey.**

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - Middle** Date: **7/11/18**
Survey Time: **2:30 pm** to **3:00 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Eastern Kingbird	1	FO	UP				

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

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **85 degrees, sunny**

Notes: _____

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - Middle **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1U**

Investigator(s): Mark Traxler **Section, Township, Range:** S 33 T 7N R 39E

Landform (hillslope, terrace, etc.): Shoulder slope **Local relief (concave, convex, none):** convex **Slope:** 5.0% 2.9 °

Subregion (LRR): LRR G **Lat.:** 46.322943 **Long.:** -106.842479 **Datum:** WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

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:
DP on slope above depression where no positive hydrolgy indicators are evident to date.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1. Populus deltoides	1	☐	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	1	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Elymus trachycaulus	70	☑	71.4%	FACU
2. Schedonorus pratensis	20	☑	20.4%	FACU
3. Elymus lanceolatus	5	☐	5.1%	FACU
4. Ratibida columnifera	1	☐	1.0%	UPL
5. Helianthus annuus	2	☐	2.0%	FACU
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	98	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	1	x 3 =	3
FACU species	97	x 4 =	388
UPL species	1	x 5 =	5
Column Totals:	99	(A)	396 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Well-vegetated upland buffer.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y	3/2	100					Clay Loam	
2-20	2.5Y	3/3	100					Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators observed.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

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 ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - Middle **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-1W

Investigator(s): Mark Traxler **Section, Township, Range:** S 33 T 7N R 39E

Landform (hillslope, terrace, etc.): Swale **Local relief (concave, convex, none):** concave **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR G **Lat.:** 46.322913 **Long.:** -106.842487 **Datum:** WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Data point occurs in wetland depression immediately west of the vegetation transect.

VEGETATION - Use scientific names of plants

FWS Region: -?-

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Puccinellia nuttalliana	30	☑	31.6%	OBL
2. Elymus repens	30	☑	31.6%	FACU
3. Hordeum jubatum	30	☑	31.6%	FACW
4. Schedonorus pratensis	5	☐	5.3%	FACU
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	95	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	30	x 1 =	30
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	95 (A)		230 (B)

Prevalence Index = B/A = 2.421

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Hydrophitic vegetation dominant in depression.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y	3/2	100					Clay Loam	
2-20	2.5Y	3/3	100					Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soils at this pit currently lack redox features because the wetland is in the early stages of development. Given soil cracks it is evident that the depression saturates for extended periods during the growing season and hydric soil indicators will develop over time.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☑ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

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 ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Positive secondary indicators.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - Middle **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/11/18 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** Forsyth NW - Middle

6. Wetland Location(s): Township 7 N, Range 39 E, Section 33; Township 7 N, Range 39 E, Section 34

Approximate Stationing or Roadposts: ~262 on US 12

Watershed: 14 - Middle Yellowstone **County:** Rosebud

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
0.58 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.58 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments (types of disturbance, intensity, season, etc.)**:** AA vegetation recovering from construction disturbance.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: All noxious weeds have decreased: Cirsium arvense and Tamarix spp. still persist

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA very similar to Forsyth NW - East, only smaller. AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

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

Comments: Emergent veg class present. Several cottonwood seedlings present in herbaceous layer.

Wetland/Site #(s): Forsyth NW - Middle

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): USF&WS T&E list for Rosebud County

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Scarlet Ammannia - Ammannia robusta (S2)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Great Blue Heron (S3)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): MTNHP SOC report for T7N R39E, direct observation of Ammannia in 2013.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☒ ***Minimal:*** Based on any of the following [check].
- ☒ few or no wildlife observations during peak use periods
- ☒ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of 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
- ☐ interview with local biologist 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 manual 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)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	Wildlife Habitat Features Rating (ii)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
☐ **Substantial**	---	---	---	---
☐ **Moderate**	---	---	---	---
☒ **Minimal**	---	.4M	---	---

Comments: Very few signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

Wetland/Site #(s): Forsyth NW - Middle

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface 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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

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

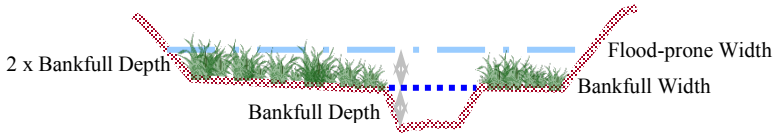
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

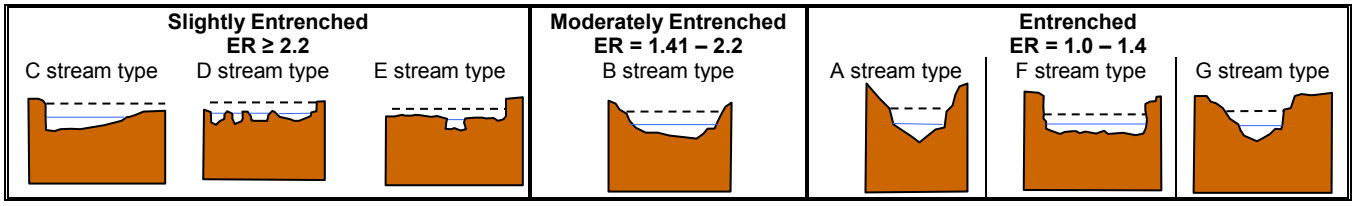
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____

flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point 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		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** AA not subject to flooding from Big Porcupine Creek.

Wetland/Site #(s): Forsyth NW - Middle

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

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

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>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**	---	---	---	---	.6M	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: AA subject to pond from precipitation and upland surface flow.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver 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 is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☐ **Yes**	☒ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	.8H	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: AA more than 70% vegetated. Only minor impairment from highway and overland runnoff

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

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

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

Comments: In 2015, observed increased percent cover by wetland species with stability ratings greater than or equal to six.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

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

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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	.3L	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - Middle

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: 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).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☐ **YES**, add 0.1 to score in **ii =** ___ ☒ **NO**

iv. Final Score and Rating: .3L **Comments:**

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and 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 select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ P/P	☐ S/I	☐ T	☐ None
☐ **Groundwater Discharge or Recharge**	---	---	---	---
☒ **Insufficient Data/Information**	NA			

Comments: AA w/out permeable substrate, holds surface water eventually lost to evaporation.

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point 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)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	.2L
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Habitat within AA typical of roadside ditch.

14L. RECREATION / EDUCATION POTENTIAL ☒ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☐ **YES**, go to ii. ☒ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

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

Comments: AA small, adjacent to highway, and with little to no recreation or education potential.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - Middle

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	0.52	*
C. General Wildlife Habitat	mod 0.40	1.00	0.23	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	1.00	0	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	0.35	*
G. Sediment / Nutrient / Toxicant Removal	high 0.80	1.00	0.46	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	0.35	*
I. Production Export / Food Chain Support	low 0.30	1.00	0.17	
J. Groundwater Discharge / Recharge	NA	NA	0	
K. Uniqueness	low 0.20	1.00	0.12	
L. Recreation / Education Potential (bonus point)	NA		0	
Total Points	**3.8**	**9**	**2.20 Total Functional Units**	
Percent of Possible Score 42% (round to nearest whole number)				

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

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

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

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

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

RESPEC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - East** Project Number: _____
Assessment Date: **July 11, 2018** Person(s) conducting the assessment: **M. Traxler**
Location: **~8 miles NW of Forsyth** MDT District: **Glendive**
Milepost: **~262.3 on US 12**
Legal Description: T **7N** R **39E** Section **34**
Weather Conditions: **80 degrees, sunny** Time of Day: **1:00 PM-2:00 PM**
Initial Evaluation Date: **August 15, 2013** Monitoring Year: **6** # Visits in Year: **1**
Size of evaluation area: **2.74 acres** Land use surrounding wetland: **Ag., US Highway 12**

HYDROLOGY

Surface Water Source: **Precipitation, runoff, shallow groundwater**
Inundation: **Absent** Average Depth: **0 feet** Range of Depths: **0**
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: **0 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **No**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
geomorphic position, surface soil cracks

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☐ Map emergent vegetation-open water boundary on aerial photograph.
☐ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
Site dry on day of investigation.

VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Rumex crispus/Eleopcharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	4 = 21-50%	Taraxacum officinalis	1 = 1-5%
Bare Ground	2 = 6-10%	Broumus arvensis	1 = 1-5%
Alopecurus pratensis	1 = 1-5%	Pascopyrum smithii	2 = 6-10%
Hordeum jubatum	1 = 1-5%	Rumex crispus	1 = 1-5%
Poa pratensis	1 = 1-5%	Tragopogon dubius	1 = 1-5%
Schoenoplectus maritimus	1 = 1-5%	Elymus repens	1 = 1-5%

Comments / Problems: **This community type has been replaced by CT4 but was left in the monitoring form for reference purposes only.**

Community Number: **3** Community Title (main spp): **Pascopyrum smithii / Elymus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	5 = > 50%	Ambrosia psilostachya	1 = 1-5%
Elymus canadensis	1 = 1-5%	Bare Ground	1 = 1-5%
Elymus trachycaulus	3 = 11-20%	Chenopodium album	1 = 1-5%
Bromus arvensis	1 = 1-5%	Elymus repens	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Lactuca serriola	1 = 1-5%
Agropyron cristatum	1 = 1-5%	Linum lewisii	1 = 1-5%

Comments / Problems: _____

Community Number: **4** Community Title (main spp): **Hordeum jubatum/Eleocharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	4 = 21-50%	Populus deltoides	+ = < 1%
Bare Ground	1 = 1-5%	Salix fragilis	+ = < 1%
Alopecurus pratensis	2 = 6-10%	Pascopyrum smithii	2 = 6-10%
Hordeum jubatum	2 = 6-10%	Rumex crispus	+ = < 1%
Poa pratensis	1 = 1-5%	Spartina pectinata	2 = 6-10%
Schoenoplectus maritimus	2 = 6-10%	Elymus repens	1 = 1-5%

Comments / Problems: **Tamarix ramosissima (<1); Convolvulus arvensis (<1)**

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No planted woody vegetation.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - East** Date: **July 11, 2018** Examiner: **Mark Traxler**
Transect Number: **1** Approximate Transect Length: **125 feet** Compass Direction from Start: **145**° Note: _____

Transect Interval Length: **32 feet (station 0-32)**	
Vegetation Community Type: Pascopyrum smithii/Elymus spp.	
Plant Species	**Cover**
Lactuca serriola	1 = 1-5%
Pascopyrum smithii	5 = > 50%
Bromus tectorum	2 = 6-10%
Melilotus officinale	2 = 6-10%
Helianthus annus	+ = < 1%
Populus deltoides	+ = < 1%
Mulhlenbergia asperifolia	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **65 feet (station 32-97)**	
Vegetation Community Type: Hordeum jubatum/Eleocharis palustris	
Plant Species	**Cover**
Eleocharis palustris	5 = > 50%
Alopecurus arundinaceus	3 = 11-20%
Elymus repens	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Schoenoplectus maritimus	2 = 6-10%
Tamarix ramosissima	1 = 1-5%
bare ground	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **28 feet (station 97-125)**	
Vegetation Community Type: Pascopyrum smithii/Elymus spp	
Plant Species	**Cover**
Elymus trachycaulus	1 = 1-5%
Pascopyrum smithii	5 = > 50%
Linum lewisii	1 = 1-5%
Chenopodium album	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Bromus tectorum	4 = 21-50%
Poa compressa	1 = 1-5%
Melilotus officinale	3 = 11-20%
Total Vegetative Cover:	100%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - East** Date: **July 11, 2018** Examiner: **Lynn Bacon**
Transect Number: **2** Approximate Transect Length: **181 feet** Compass Direction from Start: **280°** Note: _____

Transect Interval Length: **30 feet (station 0-30)**	
Vegetation Community Type: Pascopyrum smithii / Elymus spp.	
Plant Species	**Cover**
Elymus tracycaulus	4 = 21-50%
Melilotus officinales	3 = 11-20%
Bare Ground	1 = 1-5%
Hordeum jubatum	2 = 6-10%
Pascopyrum smithii	4 = 21-50%
Convolvulus arvensis	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **100 feet (station 30-130)**	
Vegetation Community Type: Hordeum jubatum / Eleocharis palustris	
Plant Species	**Cover**
Eleocharis palustris	4 = 21-50%
Schedonorus pratensis	4 = 21-50%
Helianthus annus	1 = 1-5%
Poa compressa	1 = 1-5%
Bare ground	1 = 1-5%
Hordeum jubatum	4 = 21-50%
Pascopyrum smithii	1 = 1-5%
Salix fragilis	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Rumex crispus	2 = 6-10%
Total Vegetative Cover:	98%

Transect Interval Length: **51 feet (station 130-181)**	
Vegetation Community Type: Pascopyrum smithii / Elymus spp.	
Plant Species	**Cover**
Pascopyrum smithii	5 = > 50%
Rumex crispus	1 = 1-5%
Linum lewisii	1 = 1-5%
Bare Ground	1 = 1-5%
Lepidium perfoliatum	1 = 1-5%
Helianthus anuus	1 = 1-5%
Total Vegetative Cover:	98%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		**Indicator Class**	**Source**
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

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

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

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

Comments:

PHOTOGRAPHS

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

Photograph Checklist:

- ☐ 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.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1: 46.321003 / -106.838814	125
PP-2		Photo Point 2: 46.320068 / -106.837128	210
PP-3		Photo Point 3: 46.318233 / -106.834335	305
T-1 start		Transect 1 start: 46.321045 / -106.838486	145
T-1 end		Transect 1 end: 46.320297 / -106.838493	325
T-2 start		Transect 2 start: 46.318336 / -106.834175	280
T-2 end		Transect 2 end: 46.318417 / -106.834923	100
DP-1W		Wetland soil pit #1: 46.320943 / -106.838674	
DP-1U		Upland soil pit #1: 46.320920 / -106.838707	
DP-2W		Wetland soil pit #1: 46.318503 / -106.834643	
DP-2U		Upland soil pit #2: 46.318471 / -106.834693	

Comments / Problems: _____

GPS SURVEYING

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

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

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

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **No**
If yes, do they need to be repaired? **NA**
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 working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: **Middle section of project area remains upland.**

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **No**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
none observed		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - East** Date: **7/24/17**
Survey Time: **1330** to **1500**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Cliff Swallow	1	FO	UP				

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

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **sunny, 80 degrees**

Notes: _____

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - East **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1U**

Investigator(s): Mark Traxler **Section, Township, Range:** **S** 34 **T** 7N **R** 39E

Landform (hillslope, terrace, etc.): Shoulder slope **Local relief (concave, convex, none):** concave **Slope:** 5.0% 2.9 °

Subregion (LRR): LRR G **Lat.:** 46.32092 **Long.:** -106.838707 **Datum:** WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:
Upland data point. Slope above wetland.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Pascopyrum smithii	65	☑	71.4%	FACU
2. Elymus trachycaulus	25	☑	27.5%	FACU
3. Muhlenbergia asperifolia	1	☐	1.1%	FACW
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	91	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	1	x 2 =	2	
FAC species	0	x 3 =	0	
FACU species	90	x 4 =	360	
UPL species	0	x 5 =	0	
Column Totals:	91	(A)	362	(B)

Prevalence Index = B/A = 3.978

Hydrophytic Vegetation Indicators:

☑ **1 - Rapid Test for Hydrophytic Vegetation**

☐ **2 - Dominance Test is > 50%**

☐ **3 - Prevalence Index is ≤3.0**[1]

☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**

☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Slopes dry, some bare ground occurs in patches.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y	3/3	100					Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators present.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

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 ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No evidence of primary or secondary indicators.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - East **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1W**

Investigator(s): Mark Traxler **Section, Township, Range:** S 34 T 7N R 39E

Landform (hillslope, terrace, etc.): Swale **Local relief (concave, convex, none):** concave **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR G **Lat.:** 46.320943 **Long.:** -106.838674 **Datum:** WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Wetland data point.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Eleocharis palustris	80	☑	88.9%	OBL
2. Rumex crispus	5	☐	5.6%	FAC
3. Hordeum jubatum	5	☐	5.6%	FACW
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	90	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 10

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80	
FACW species	5	x 2 =	10	
FAC species	5	x 3 =	15	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	90	(A)	105	(B)

Prevalence Index = B/A = 1.167

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Similar to 2017. Cottonwood saplings starting to develop in wetland but none occur within this data point.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5YR	3/2	90	2.5Y	4/4	10	C	PL	Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Prominent redox concentraions noted.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

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 ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Evidence of surface water earlier in summer.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - East **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-2U**

Investigator(s): Mark Traxler **Section, Township, Range:** **S** 34 **T** 7N **R** 39E

Landform (hillslope, terrace, etc.): Shoulder slope **Local relief (concave, convex, none):** concave **Slope:** 5.0% 2.9 °

Subregion (LRR): LRR G **Lat.:** 46.318471 **Long.:** -106.834693 **Datum:** WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

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:
Upland data point. Moved upland pit to pair with new wetland pit DP-2W.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Pascopyrum smithii	80	☑	84.2%	FACU
2. Melilotus officinale	5	☐	5.3%	FACU
3. Alopecurus arundinaceus	5	☐	5.3%	FACW
4. Rumex crispus	5	☐	5.3%	FAC
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	95	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	5	x 2 =	10	
FAC species	5	x 3 =	15	
FACU species	85	x 4 =	340	
UPL species	0	x 5 =	0	
Column Totals:	95	(A)	365	(B)

Prevalence Index = B/A = 3.842

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Upland vegetation on slope from road down to wetland.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-2U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y	3/2	100					Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

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 ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No evidence of primary or secondary indicators.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Forsyth NW - East **City/County:** Rosebud **Sampling Date:** 11-Jul-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-2W

Investigator(s): Mark Traxler **Section, Township, Range:** S 34 T 7N R 39E

Landform (hillslope, terrace, etc.): Swale **Local relief (concave, convex, none):** concave **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR G **Lat.:** 46.318503 **Long.:** -106.834643 **Datum:** WGS84

Soil Map Unit Name: Harlem silty clay, 0 to 2 percent slopes, occasionally flooded **NWI classification:** Not Mapped

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
New data point in 2018.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Eleocharis palustris	60	☑	63.2%	OBL
2. Hordeum jubatum	15	☐	15.8%	FACW
3. Spartina pectinata	15	☐	15.8%	FACW
4. Elymus trachycaulus	5	☐	5.3%	FACU
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	95	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 5

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	60	x 1 =	60
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	95 (A)		140 (B)

Prevalence Index = B/A = 1.474

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Spartina new in 2018. Cottonwood saplings starting to develop in wetland but none occur within this data point.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-2W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	3/2	95	10YR	5/8	5	D	M	Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil meets criteria for Depleted Matrix.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRF F)

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 ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soil moist to surface. Water clearly flowed through wetland in spring.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - East **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/11/18 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** Forsyth NW - East

6. Wetland Location(s): Township 7 N, Range 39 E, Section 34; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: ~262.3 on US 12

Watershed: 14 - Middle Yellowstone **County:** _ Rosebud _ _____

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
0.56 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.56 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments (types of disturbance, intensity, season, etc.)**:** AA vegetation cover has increased since 2013, following construction of wetland basin, bare ground <5%. Center of basin, area intended to convert to wetland, continues to qualify as upland.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Convolvulus arvensis, Tamarix ramosissima (both have decreased since 2016 but still persist)

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

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

Comments: Emergent vegetation class present, with several cottonwood maturing saplings though does not qualify as PSS yet.

Wetland/Site #(s): Forsyth NW - East

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): USF&WS T&E list for Rosebud County

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Scarlet Ammannia - Ammannia robusta (S2), Western Hog-nosed Snake
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Great Blue Heron (S3)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): MTNHP SOC report for T7N R39E, direct observation of Ammannia in 2013.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☒ ***Minimal:*** Based on any of the following [check].
- ☒ few or no wildlife observations during peak use periods
- ☒ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of 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
- ☐ interview with local biologist 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 manual 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)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	Wildlife Habitat Features Rating (ii)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
☐ **Substantial**	---	---	---	---
☐ **Moderate**	---	---	---	---
☒ **Minimal**	---	.4M	---	---

Comments: Very few signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

Wetland/Site #(s): Forsyth NW - East

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface 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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

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

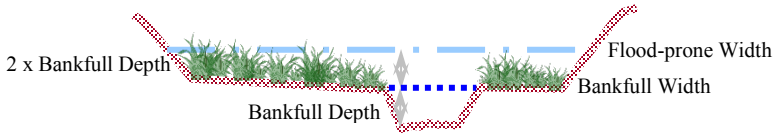
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

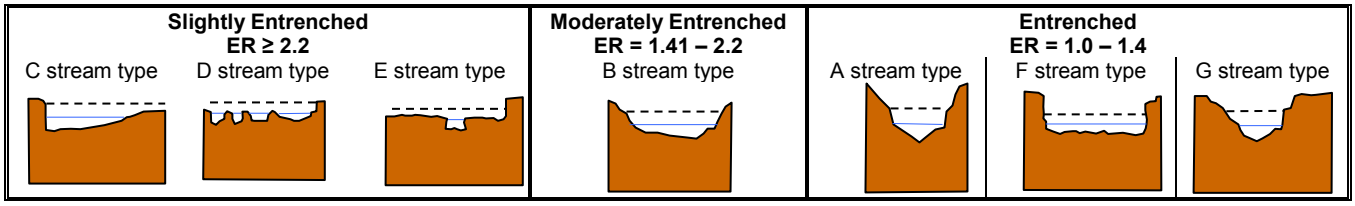
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____

flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point 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		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** AA not subject to flooding from Big Porcupine Creek.

Wetland/Site #(s): Forsyth NW - East

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

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

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>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**	---	---	---	---	---	---	---	.3L	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: AA subject to pond from precipitation and upland surface flow.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver 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 is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: AA achieved greater than 70% vegetation cover, with early succession annuals, native perennial, rhizomotous and bunch grasses, and natural Populus deltoides recruitment.

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

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

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

Comments: AA with seasonal/ephemeral water. Vegetation transitioning from annuals to perennial rhizomatous grasses and bunchgrasses, along with natural Populus deltoides recruitment.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

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

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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.3L	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - East

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: 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).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☐ **YES**, add 0.1 to score in **ii** = ___ ☒ **NO**

iv. Final Score and Rating: .3L **Comments:**

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and 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: AA hydrologically connected to a historic oxbow.

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 select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ **P/P**	☒ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: Ponding was observed on site in 2014, but not observed in 2015, 2016, 2017, or 2018.

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point 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)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	.2L
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: AA resembles a roadside ditch.

14L. RECREATION / EDUCATION POTENTIAL ☒ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☐ **YES**, go to ii. ☒ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

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

Comments: AA small, adjacent to highway, and with little to no recreation or education potential.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - East

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	0.50	*
C. General Wildlife Habitat	mod 0.40	1.00	0.22	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	low 0.30	1.00	0.17	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	0.56	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	0.34	*
I. Production Export / Food Chain Support	low 0.30	1.00	0.17	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	0.39	*
K. Uniqueness	low 0.20	1.00	0.11	
L. Recreation / Education Potential (bonus point)	NA		0	
Total Points	**4.4**	**9**	**2.46 Total Functional Units**	
Percent of Possible Score 49% (round to nearest whole number)				

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

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

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

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

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

Forsyth Northwest – West Site: Photo Point Photographs

Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2015

Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2016

Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2017

Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2018

Forsyth Northwest – West Site: Photo Point Photographs

Photo Point 2; Location: SW Corner of SE End – Shows dike breach; Bearing 350 degrees; Year 2015

Photo Point 2; Location: SW Corner of SE End – Shows dike breach; Bearing 350 degrees; Year 2016

Photo Point 2; Location: SW Corner of SE End – Shows dike repair; Bearing 350 degrees; Year 2017

Photo Point 2; Location: SW Corner of SE End – Shows dike repair; Bearing 350 degrees; Year 2018

Forsyth Northwest – West Site: Photo Point Photographs

Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2015

Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2016

Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2017

Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2018

Forsyth Northwest – West Site: Photo Point Photographs

Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2015

Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2016

Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2017

Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2018

Forsyth Northwest – West Site: Photo Point Photographs

Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2015

Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2016

Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2017

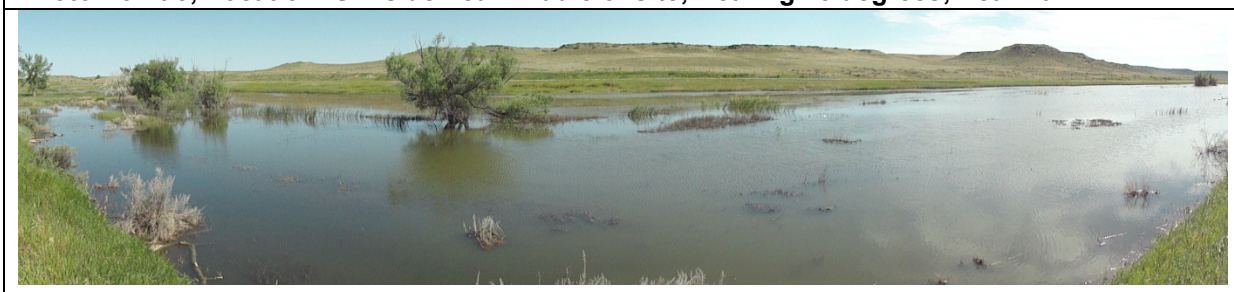


Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2018

Forsyth Northwest – West Site: Photo Point Photographs

Photo Point 6 Location: Center of new dike
Bearing: 300 degrees Year: 2017

Photo Point 6 Location: Center of new dike
Bearing: 300 degrees Year: 2018

Photo Point 6 Location: Center of new dike
Bearing: 120 degrees Year: 2017

Photo Point 6 Location: Center of new dike
Bearing: 120 degrees Year: 2018

Forsyth Northwest – West Site: Transect Photographs

Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2013

Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2014

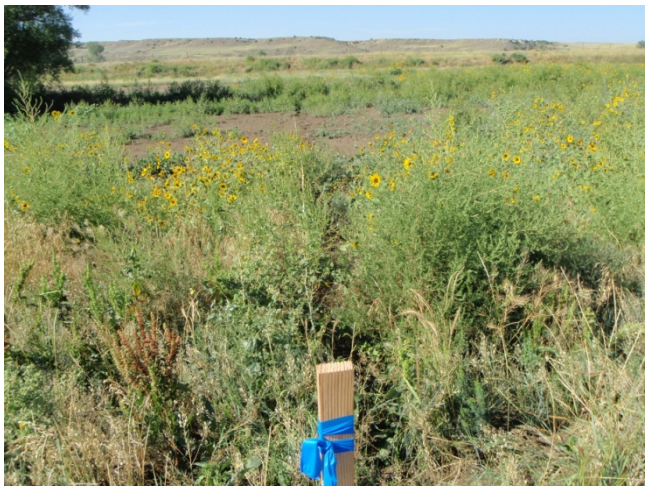
Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2015

Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2016

Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2017

Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2018

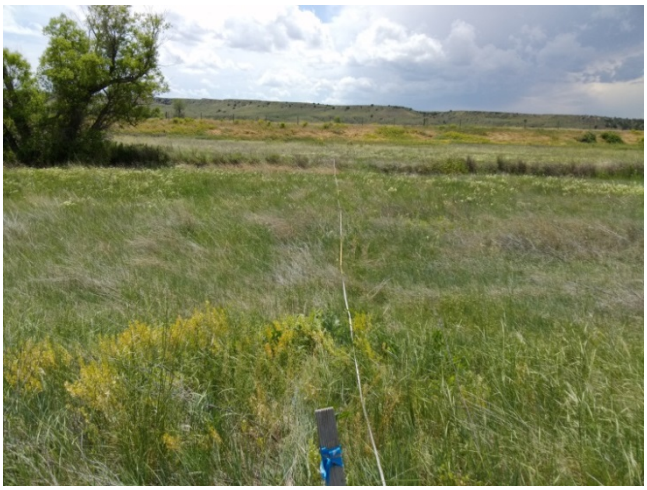
Forsyth Northwest – West Site: Transect Photographs



Transect 1: End
Bearing: 205 degrees
Location: SE end
Year: 2013

Transect 1: End
Bearing: 205 degrees
Location: SE end
Year: 2014

Transect 1: End
Bearing: 205 degrees
Location: SE end
Year: 2015



Transect 1: End
Bearing: 205 degrees
Location: SE end
Year: 2016

Transect 1: End
Bearing: 205 degrees
Location: SE end
Year: 2017

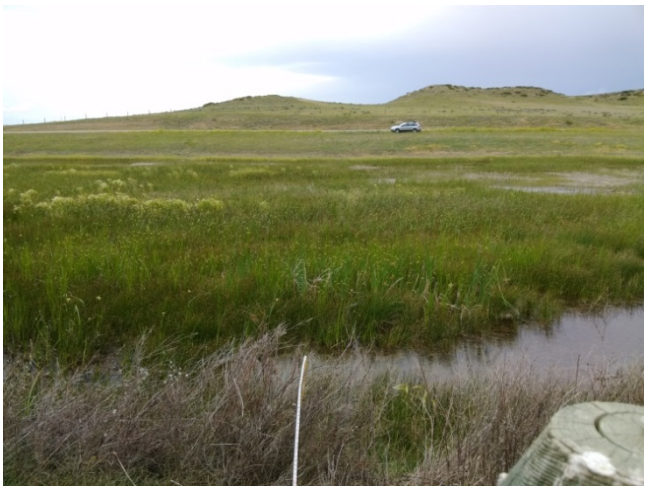
Transect 1: End
Bearing: 205 degrees
Location: SE end
Year: 2018

Forsyth Northwest – West Site: Transect Photographs

Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2013

Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2014

Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2015

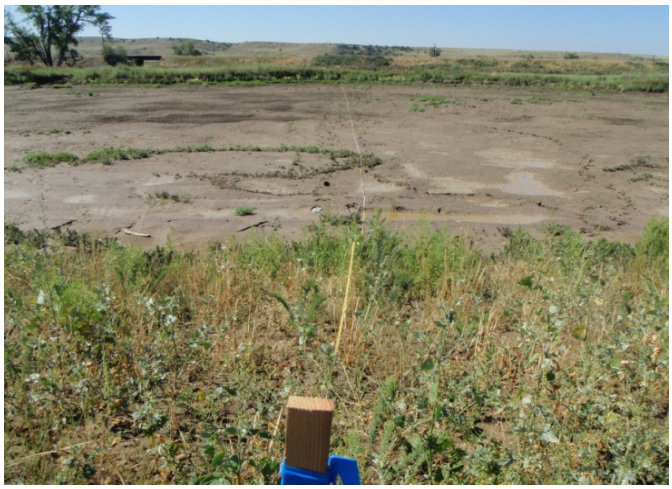


Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2016

Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2017

Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2018

Forsyth Northwest – West Site: Transect Photographs

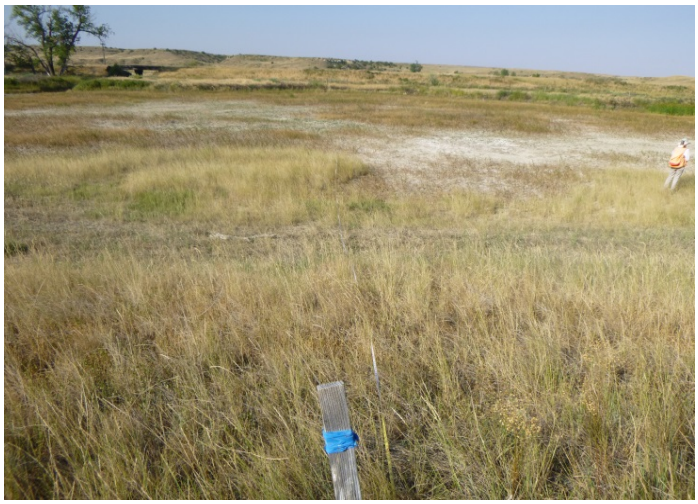


Transect 2: End
Bearing: 205 degrees
Location: Northwest End
Year: 2013

Transect 2: End
Bearing: 205 degrees
Location: Northwest End
Year: 2014

Transect 2: End
Bearing: 205 degrees
Location: Northwest End
Year: 2015

Transect 2: End
Bearing: 205 degrees
Location: Northwest End
Year: 2016



Transect 2: End
Bearing: 205 degrees
Location: Northwest End
Year: 2017

Transect 2: End
Bearing: 205 degrees
Location: Northwest End
Year: 2018

Forsyth Northwest – West Site: Data Point Photographs

	
Data Point: DP-1W Location: NW part of site Year: 2018	Data Point: DP-1U Location: NW part of site Year: 2018

Forsyth Northwest – Middle: Photo Point Photographs

Photo Point: 1 Location: Northwest End
Bearing: 120 degrees Year: 2013

Photo Point: 1 Location: Northwest End
Bearing: 120 degrees Year: 2014

Photo Point: 1 Location: Northwest End
Bearing: 120 degrees Year: 2015

Photo Point: 1 Location: Northwest End
Bearing: 120 degrees Year: 2016

Photo Point: 1 Location: Northwest End
Bearing: 120 degrees Year: 2017

Photo Point: 1 Location: Northwest End
Bearing: 120 degrees Year: 2018

Forsyth Northwest – Middle: Photo Point Photographs

Photo Point: 2 Location: Southeast end
Bearing: 300 degrees Year: 2013

Photo Point: 2 Location: Southeast end
Bearing: 300 degrees Year: 2014

Photo Point: 2 Location: Southeast end
Bearing: 300 degrees Year: 2015

Photo Point: 2 Location: Southeast end
Bearing: 300 degrees Year: 2016

Photo Point: 2 Location: Southeast end
Bearing: 300 degrees Year: 2017

Photo Point: 2 Location: Southeast end
Bearing: 300 degrees Year: 2018

Forsyth Northwest – Middle: Transect Photographs

Transect 1: Start
Bearing: 205 degrees
Location: Middle of Site
Year: 2013

Transect 1: Start
Bearing: 205 degrees
Location: Middle of Site
Year: 2014

Transect 1: Start
Bearing: 205 degrees
Location: Middle of Site
Year: 2015

Transect 1: Start
Bearing: 205 degrees
Location: Middle of Site
Year: 2016

Transect 1: Start
Bearing: 205 degrees
Location: Middle of Site
Year: 2017

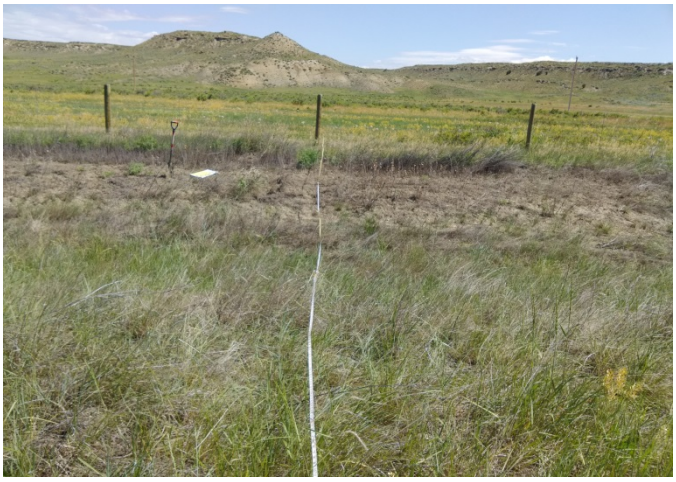
Transect 1: Start
Bearing: 205 degrees
Location: Middle of Site
Year: 2018

Forsyth Northwest – Middle: Transect Photographs

Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2013

Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2014

Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2015



Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2016

Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2017

Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2018

Forsyth Northwest – Middle: Data Point Photographs

Data Point: DP-1W Location: Middle of site
Year: 2018

Data Point: DP-1U Location: Middle of site
Year: 2018

Forsyth Northwest – East Site: Photo Point Photographs

Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2013

Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2014

Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2015

Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2016

Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2017

Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2018

Forsyth Northwest – East Site: Photo Point Photographs

Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2015

Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2016

Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2017

Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2018

Forsyth Northwest – East Site: Photo Point Photographs

Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2013

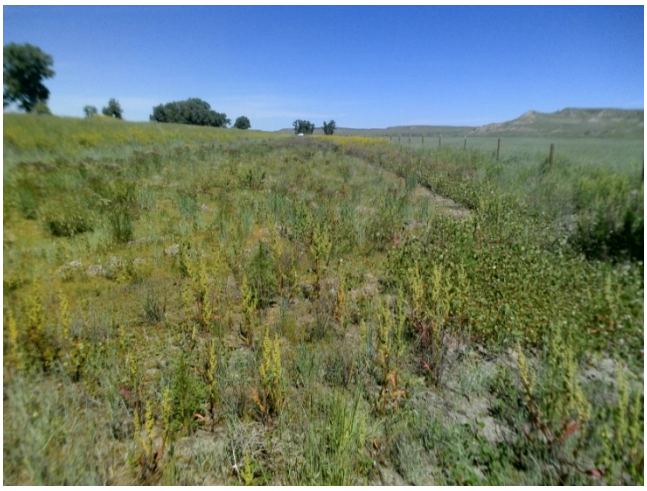


Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2014

Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2015

Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2016

Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2017

Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2018

Forsyth Northwest – East Site: Transect Photographs

Transect 1: Start
Bearing: 145 degrees
Location: Northwest End
Year 2013

Transect 1: Start
Bearing: 145 degrees
Location: Northwest End
Year 2014

Transect 1: Start
Bearing: 145 degrees
Location: Northwest End
Year 2015

Transect 1: Start
Bearing: 145 degrees
Location: Northwest End
Year 2016

Transect 1: Start
Bearing: 145 degrees
Location: Northwest End
Year 2017

Transect 1: Start
Bearing: 145 degrees
Location: Northwest End
Year 2018

Forsyth Northwest – East Site: Transect Photographs

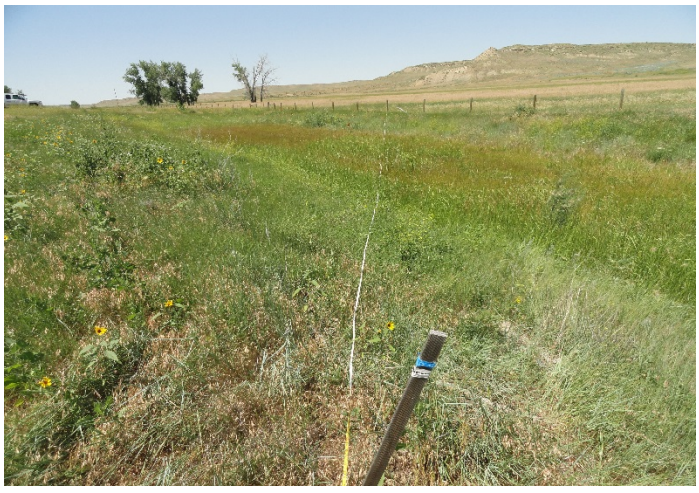
Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2013

Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2014

Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2015

Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2016

Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2017

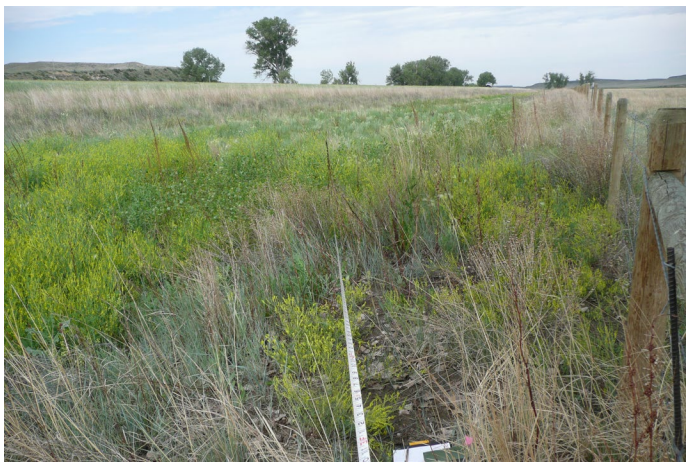


Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2018

Forsyth Northwest – East Site: Transect Photographs

Transect 2: Start
Bearing: 280 degrees
Location: Southeast End
Year 2013

Transect 2: Start
Bearing: 280 degrees
Location: Southeast End
Year 2014



Transect 2: Start
Bearing: 280 degrees
Location: Southeast End
Year 2015

Transect 2: Start
Bearing: 280 degrees
Location: Southeast End
Year 2016

Transect 2: Start
Bearing: 280 degrees
Location: Southeast End
Year 2017

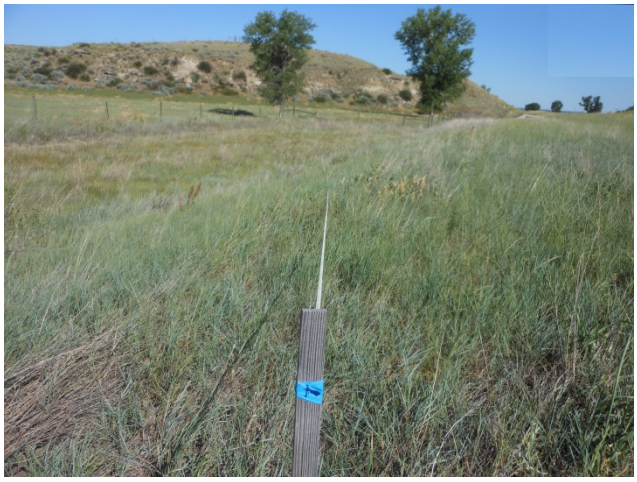
Transect 2: Start
Bearing: 280 degrees
Location: Southeast End
Year 2018

Forsyth Northwest – East Site: Transect Photographs

Transect 2: End
Bearing:100 degrees
Location: Southeast End
Year 2013

Transect 2: End
Bearing: 100 degrees
Location: Northwest End
Year 2014

Transect 2: End
Bearing: 100 degrees
Location: Northwest End
Year 2015



Transect 2: End
Bearing: 100 degrees
Location: Northwest End
Year 2016

Transect 2: End
Bearing: 100 degrees
Location: Northwest End
Year 2017

Transect 2: End
Bearing: 100 degrees
Location: Northwest End
Year 2018

Forsyth Northwest – East Site: Data Point Photographs

Data Point: DP-1W Location: Northwest end of site
Year: 2018

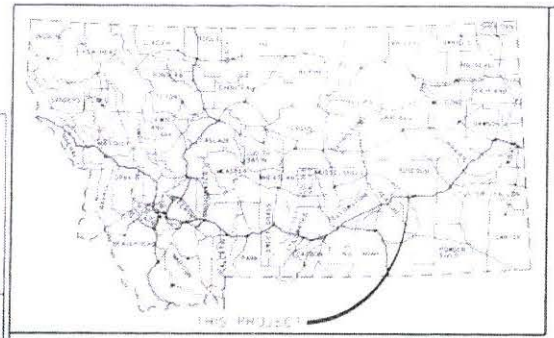
Data Point: DP-1U Location: Northwest end of site
Year: 2018

Data Point: DP-2W Location: Central part of site
Year: 2018

Data Point: DP-2U Location: Central part of site
Year: 2018

APPENDIX D
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana



MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPP 14-6(10)259
PMS OVERLAY, RECONSTRUCTION, PULVERIZATION
FORSYTH – NORTHWEST
ROSEBUD COUNTY

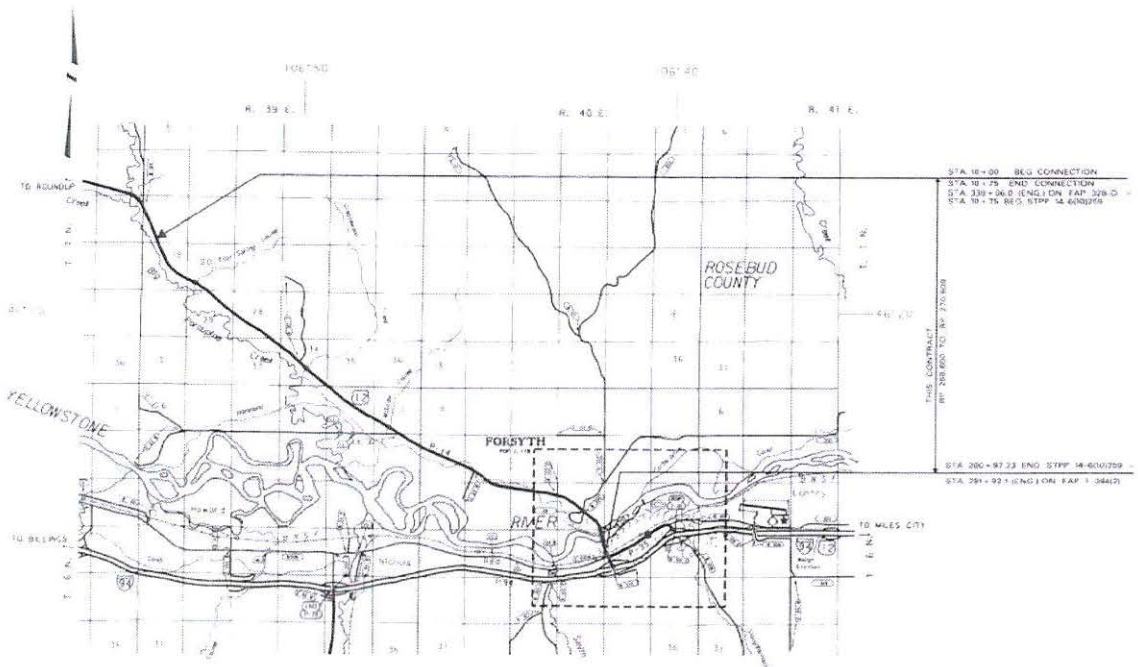
LENGTH 19.1 kilometers

DESIGN DATA

2005 A.D.T. = 240
2025 A.D.T. = 300
D.H.V. = 60
D = 55% 45%
T = 19.8%
V = 90 km/h
ALL TRUCKS = 47.0%
80 kN ESAL'S = 28.98
GROWTH RATE = 1.5%

LETTING DATE .....

SURFACING SOURCE CONTRACTOR FURNISHED
CSF = 0.999347553



RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & U	STPP 14-6(10)259
P.E.	STPP 14-6(10)259

CONTROL NO. 8259

MONTANA DEPARTMENT OF TRANSPORTATION

APPROVED OCTOBER 27, 20 11

TIM REARDON
DIRECTOR OF TRANSPORTATION

BY _____
CONSULTANT DESIGN ENGINEER

TIMOTHY J. CONWAY 10439PE REGISTERED ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	2

TABLE OF CONTENTS

SUMMARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	31

TOPSOIL & SEEDING

STATION FROM	STATION TO	cubic meters: TOPSOIL SALVAGING & PLACING	hectares: SEED NO. 1	SEED NO. 2	SEED NO. 3	FERTILIZER NO. 1	FERTILIZER NO. 2	CONDITION SEEDBED AREAS 1 & 3	MULCH AREA 2	REMARKS
10+00	20+00	2598	3.1	0.9	1.0	3.1	0.9	4.	0.9	
20+00	30+00	2702	2.6	0.7	1.0	2.6	0.7	3.6	0.7	
30+00	40+00	2291	2.6	0.1	1.0	2.6	0.1	3.6	0.1	
40+00	50+00	1821	3.0		1.0	3.0		3.4		
50+00	60+00	2203	2.5	0.1	1.0	2.5	0.1	3.5	0.1	
60+00	70+00	2323	3.8	0.1	1.0	3.8	0.1	4.8	0.1	
70+00	80+00	2158	2.5	0.3	1.0	2.5	0.3	3.5	0.3	
80+00	90+00	2278	2.2	0.2	1.0	2.2	0.2	3.2	0.2	
90+00	100+00	2147	2.1	0.1	1.0	2.1	0.1	3.1	0.1	
100+00	110+00	2313	2.2	0.1	1.0	2.2	0.1	3.2	0.1	
110+00	120+00	2014	2.2		1.0	2.2		3.2		
120+00	130+00	1963	2.4	1.5	1.0	2.4	1.5	3.4	1.5	
130+00	140+00	2378	3.4	0.1	1.0	3.4	0.1	4.4	0.1	
140+00	150+00	2128	3.0	0.1	1.0	3.0	0.1	4.0	0.1	
150+00	160+00	2219	3.0		1.0	3.0		4.0		
160+00	170+00	826	2.8		1.0	2.8		3.8		
170+00	180+00	2248	1.6		1.0	1.6		2.6		
180+00	190+00	2871	6.0	0.4	1.0	6.0	0.4	7.0	0.4	
190+00	197+00	2048	2.8	1.4	0.7	2.8	1.4	3.5	1.4	
TOTAL		[illegible]	52.8	[illegible]	18.7	52.8	[illegible]	[illegible]	[illegible]	

FINISH GRADE CONTROL

STATION FROM	STATION TO	course kilometers: FINISH GRADE CONTROL	REMARKS
10+00	52+00	4.2	SUBGRADE
10+00	52+00	4.2	TOP CAC
52+00	72+20	2.0	SUBGRADE MAINLINE
52+00	72+20	2.0	BASE COURSE MAINLINE
72+20	196+98	12.5	SUBGRADE
72+20	196+98	12.5	TOP BASE COURSE
TOTAL		37.4	

APPROACH PIPE (INCLUDED IN CULVERT SUMMARY RECAP)

STATION	BASIC BID ITEMS: CULVERT PIPE mm	meters: LENGTH OF PIPE	RELAY CULVERT	CLEAN CULVERT	cubic meters: CULVERT EXCAVATION	PIPE OPTIONS mm: CONCRETE CLASS 2	STEEL 68 x 13 CORR. 1.63 THK.	ALUMINUM 68 x 13 CORR. 1.52 THK.	CORRUGATED POLYETHYLENE PIPE	END SECTIONS LEFT	END SECTIONS RIGHT	meters: HEIGHT OF COVER	SKEW ANGLE	REMOVE CULVERT mm x m	REMARKS
14+93	450	11.0			15	450				FETS	FETS	0.3			APP. LT.
39+38	450	11.5			40	450			450	FETS	FETS	0.6		610 x 10.5 RCP	APP. LT.
39+38	600	[illegible]			25	600			600	FETS	FETS	0.6		610 x 10.0 RCP	APP. RT.
49+89					15									762 x 9.3 CSP	APP. LT.
49+89					15									381 x 9.3 RCP	APP. RT.
53+35	1200	15.3			25	1200				FETS	FETS	0.4		762 x 9.0 CSP	APP. LT.
53+35	600	14.0			15	600				FETS	FETS	1.2		610 x 9.0 CSP	APP. RT.
66+26	900	11.0			15	900				FETS	FETS	2.4		610 x 8.0 CSP	APP. RT.
66+37	450	11.0			5	450				FETS	FETS	0.3			
74+18	450	11.0			10	450				FETS	FETS	0.3			APP. LT.
77+84	600	12.5			50	600			600	FETS	FETS	0.8		610 x 12.5 RCP	APP. LT.
77+84	600	12.5			50	600				FETS	FETS	0.1		610 x 12.5 RCP	APP. RT.
84+34					10									457 x 12.5 RCP	LT.
[illegible]+30	450	11.0			25	450	450	450	450	FETS	FETS	0.6		254 x 18.7 CSP	APP. RT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.5		610 x 7.7 RCP	APP. LT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.5		610 x 9.2 CSP	APP. RT.
114+82	600	11.0			20	600	600	600		FETS	FETS	0.5		457 x 12.5 CSP	APP. LT.
114+95	750	36.5			5		750	750		FETS	FETS	0.3			APP. RT.
114+95	750	2[illegible].0			5		750	750		FETS	FETS	0.3		762 x 1.0 CSP	APP. RT. REMOVE 1.0 m RT.
154+43	450	7.5			15	450	450	450	450	FETS	FETS	0.8		381 x 13.6 CSP	APP. LT.
16[illegible]+36	450	11.0			20	450	450	450	450	FETS	FETS	0.8		457 x 12.2 CSP	APP. LT.
162+12	450	11.5			20	450	450	450	450	FETS	FETS	0.5		457 x 12.1 CSP	APP. LT.
170+66	450	11.0			15	450	450	450	450	FETS	FETS	0.7		381 x 12.2 CSP	APP. LT.
171+95	450	11.0			10	450	450	450	450	FETS	FETS	0.6			APP. LT.
173+74	450	11.0			10	450	450	450		FETS	FETS	0.3			APP. LT.
183+44	600	12.5			35	600	600	600	600	FETS	FETS	1.1		610 x 11.0 CSP	APP. LT.
185+33	600	25.5			25	600	600	600	600	FETS	FETS	1.[illegible]			APP. LT.
TOTAL					*									[illegible]	

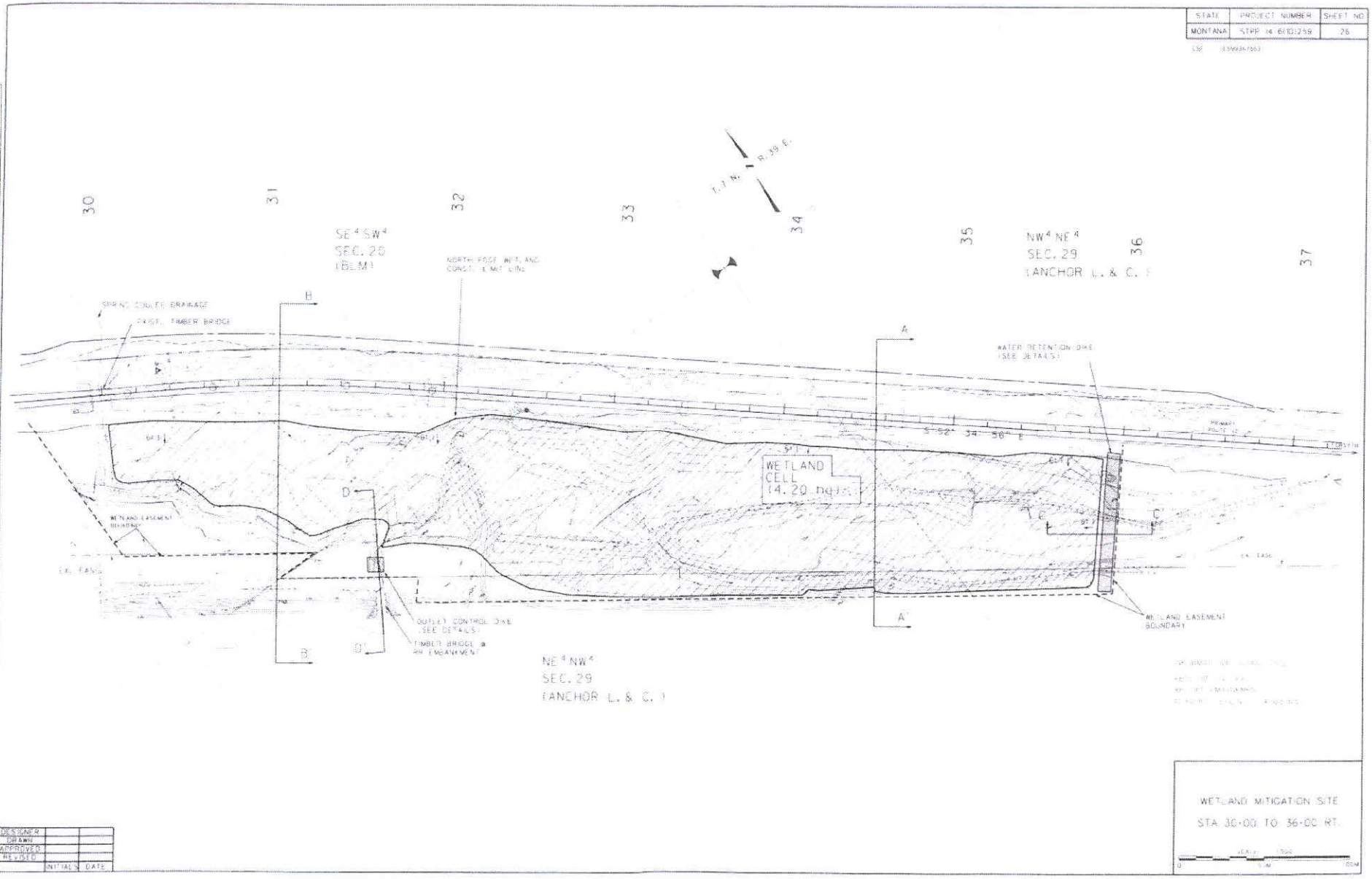
* QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY

WATER LINE

STATION	meters: STEEL CASING SCH. 80 100 mm	REMARKS
12+07	57	MIN. 0.6 m COVER CAP ENDS PLACE MARKER AT R/W LINE AT BOTH ENDS
TOTAL	57	

WETLAND SITE

STATION FROM	STATION TO	LUMP SUM: WETLAND MITIGATION SITE	REMARKS (4,2 ha)
30+00	36+00	0.6	RT
61+23	64+20	0.2	LT
68+60	71+07	0.2	LT
TOTAL		1.0	


STATE
PROJECT NUMBER
SHEET NO
MONTANA
STPP 14-6(10)259
26
MDT
MONTANA DEPARTMENT OF TRANSPORTATION
30
31
32
33
34
35
36
37
T. 1 N. - R. 39 E.
SE¼SW¼
SEC. 29
(BLM)
NW¼NE¼
SEC. 29
(ANCHOR L. & C.)
NE¼NW¼
SEC. 29
(ANCHOR L. & C.)
NORTH FORK WETLAND CONSTRUCTED CHL
SPRING COULEE DRAINAGE
PREST. TIMBER BRIDGE
WATER RETENTION DIKE
(SEE DETAILS)
WETLAND CELL
14.20 ac(±)
WETLAND EASEMENT BOUNDARY
OUTLET CONTROL DIKE
(SEE DETAILS)
TIMBER BRIDGE @ RR EMBANKMENT
WETLAND EASEMENT BOUNDARY
A
A'
B
B'
C
C'
D
D'
DESIGNER
DRAWN
APPROVED
REVISED
INITIALS
DATE
WETLAND MITIGATION SITE
STA 30+00 TO 36+00 RT.
SCALE: 1"=50'
0
50M

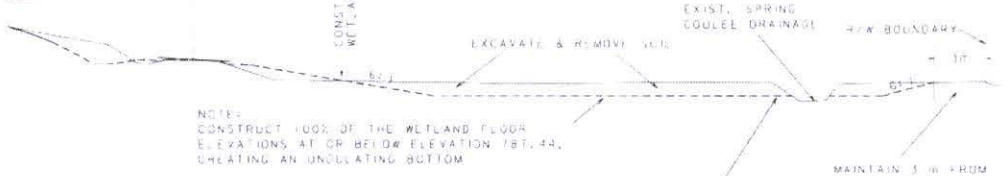
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	27

TYPICAL SECTION A-A'

NO SCALE

NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.



NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

DAYLIGHT EXCAVATION INTO EXISTING DRAINAGE ON ALL AREAS ADJACENT TO THE DRAINAGE.

MAINTAIN 3 m FROM CONSTRUCTION LIMIT TO EX. R/W

TYPICAL SECTION B-B'

NO SCALE

NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

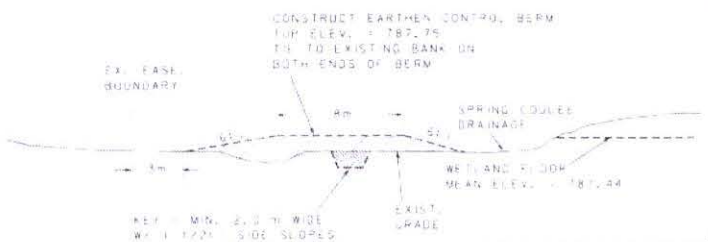
AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.

KEY - MIN. 3.0 m WIDE W/ 1 1/2:1 SIDE SLOPES (FULL LENGTH OF DIKE)

EXTEND AND CONNECT DIKE AND KEY TO ROADWAY EMBANKMENT ON NORTH END AND RAILROAD EMBANKMENT ON SOUTH END

WATER RETENTION DIKE
TYPICAL SECTION C-C'

NO SCALE



KEY - MIN. 2.3 m WIDE W/ 1 1/2:1 SIDE SLOPES (FULL LENGTH OF DIKE TO LOCATIONS WHERE TOP OF DIKE CATCHES ON EXIST. GROUND)

OUTLET CONTROL DIKE
TYPICAL SECTION D-D'

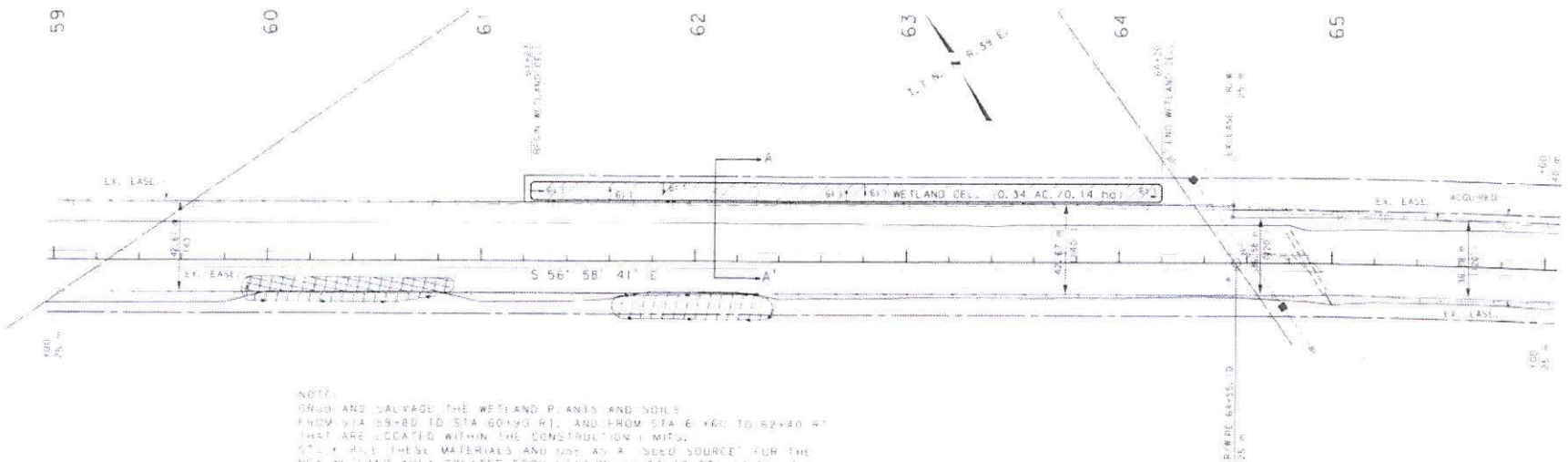
NO SCALE

NOTE: USE A 7/8 SOIL TO CONSTRUCT EMBANKMENT FOR ALL DIKES AND KEYWAYS. CONSTRUCT EMBANKMENTS AS PER SECTION 203.03.F IN THE STANDARD SPECIFICATIONS. COMPLETE MOISTURE AND DENSITY REQUIREMENTS AS PER SECTION 203.03.E IN THE STANDARD SPECIFICATIONS.

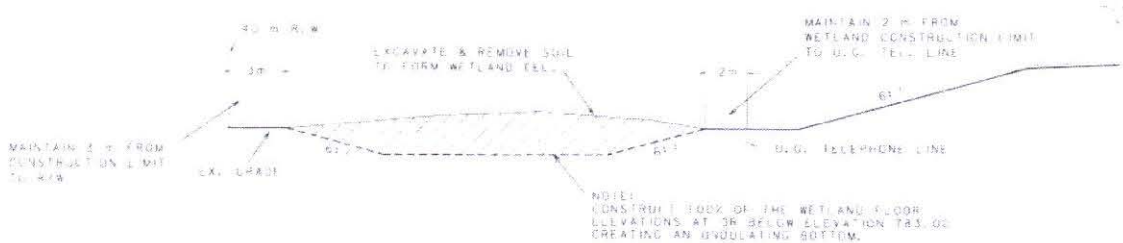
DESIGNED		
DRAWN		
APPROVED		
REVISED		
	INITIALS	DATE

WETLAND MITIGATION STA.
STA. 30+00 TO 36+00 RT.
TYPICAL SECTIONS

STATE	PROJECT NUMBER	SHEET NO
MONTANA	STPP 14-6031(25)9	28



NOTE:
DRUD AND SALVAGE THE WETLAND PLANTS AND SOILS FROM STA 59+80 TO STA 60+90 RT. AND FROM STA 6 +60 TO 62+40 RT THAT ARE LOCATED WITHIN THE CONSTRUCTION LIMITS. STOCK PILE THESE MATERIALS AND USE AS A "SEED SOURCE" FOR THE NEW WETLAND AREA CREATED FROM STATION 61+23 TO STA 64+20 LT.



NOTE:
CONSTRUCT TOPOGRAPHY OF THE WETLAND FLOOR ELEVATIONS AT 3M BELOW ELEVATION 783.03 CREATING AN UNDULATING BOTTOM.

INFORMATIONAL QUANTITIES

1325 m² UNCLASS EXC
0.14 ha SEEDING - AREA NO. 1

TYPICAL SECTION A-A'

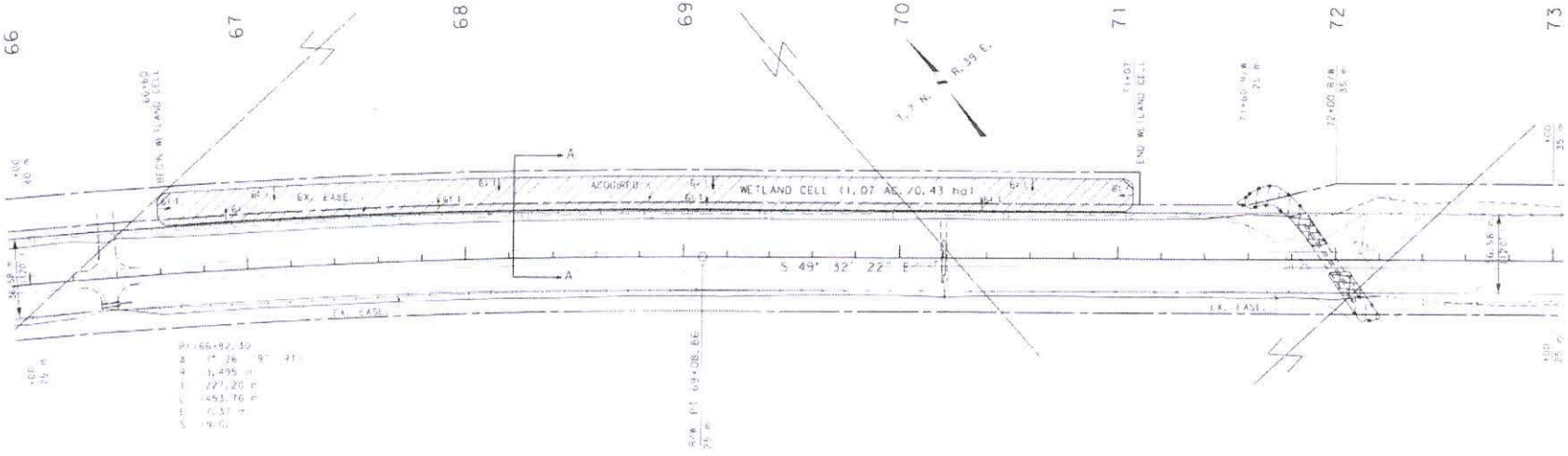
NO SCALE

WETLAND MITIGATION SITE
STA 61+23 TO 64+20 LT.

SCALE 1:1000
0 50M 100M

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	29

CSF = 0.99934350



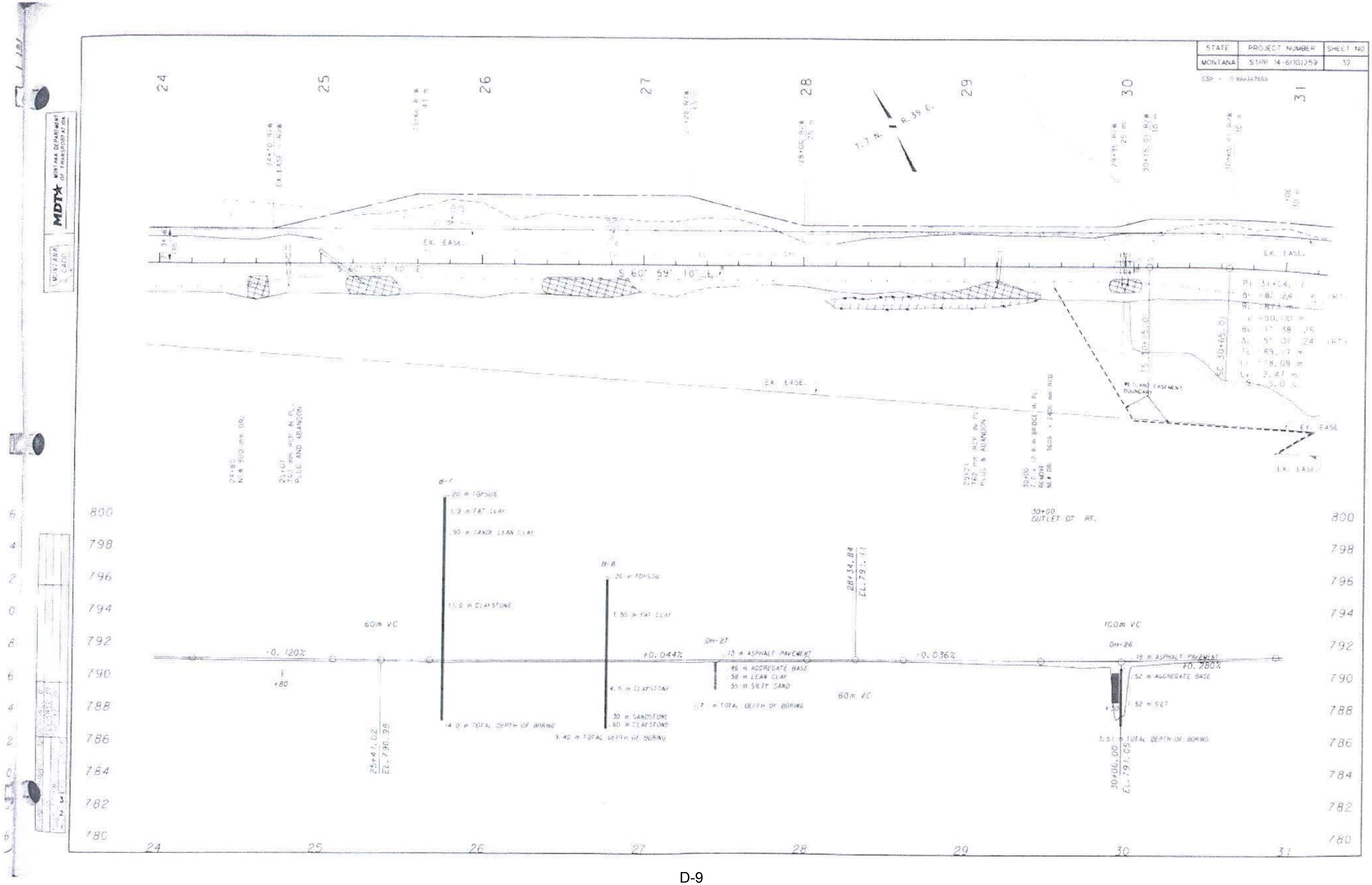
NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 1854.50 CREATING AN UNDULATING BOTTOM

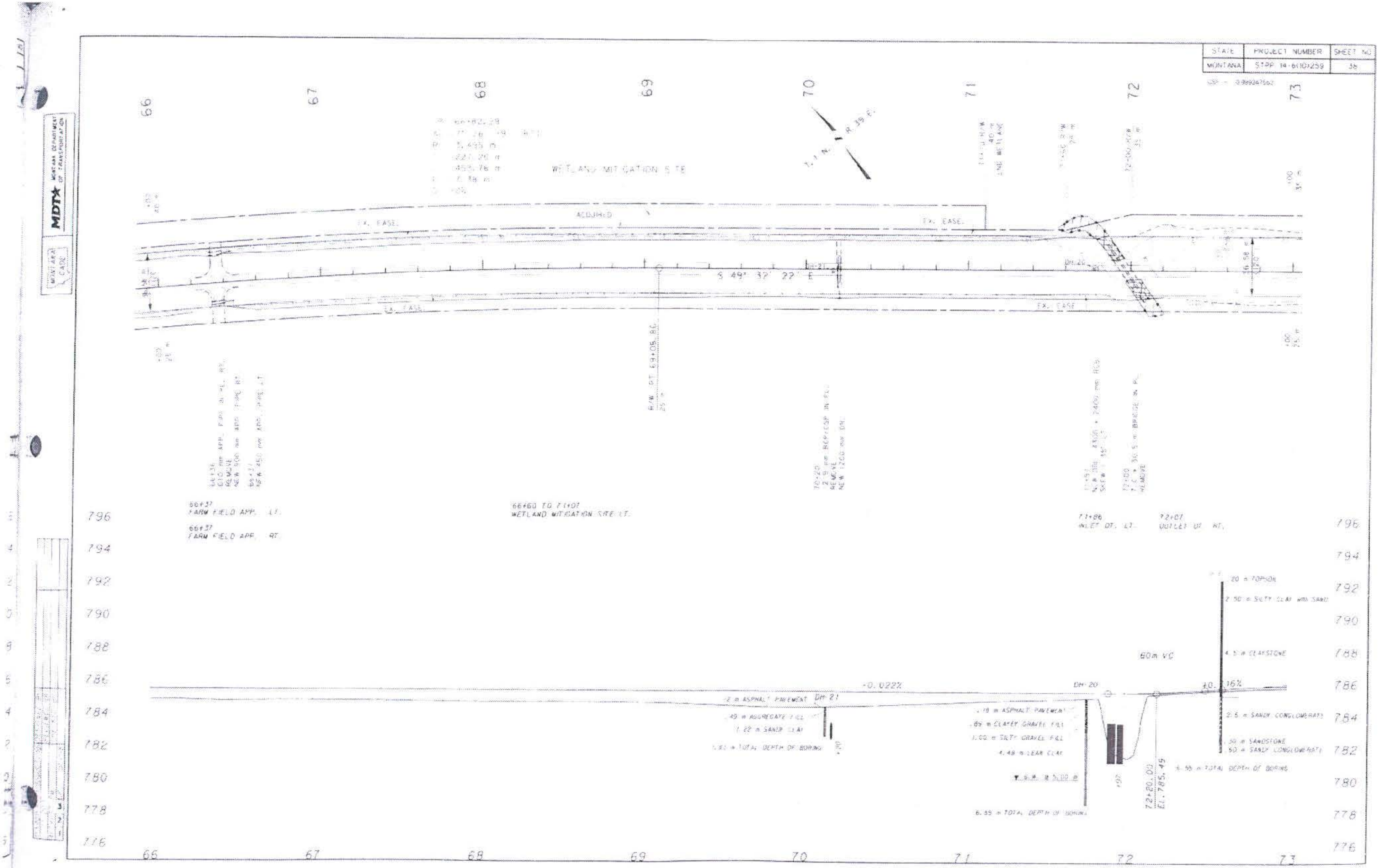
TYPICAL SECTION A-A'

NO SCALE

WETLAND MITIGATION SITE
STA 66+60 TO 71+07 LT

SCALE: 1:1000


STATE
PROJECT NUMBER
SHEET NO
MONTANA
EX. EASE.
60m VC
100m VC
-0.120%
+0.044%
-0.036%
+0.280%
30+00
OUTLET DT. RT.
WETLAND EASEMENT BOUNDARY
25+41.02
EL. 790.98
28+34.84
30+06.00
.13 m ASPHALT PAVEMENT
.46 m AGGREGATE BASE
.58 m LEAN CLAY
.55 m SILTY SAND
.18 m ASPHALT PAVEMENT
.52 m AGGREGATE BASE
14.0 m TOTAL DEPTH OF BORING
9.40 m TOTAL DEPTH OF BORING
4.5 m CLAYSTONE
1.50 m FAT CLAY
11.0 m CLAYSTONE
1.9 m FAT CLAY


STATE
PROJECT NUMBER
SHEET NO.
MONTANA
MDT
MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION SITE
ACQUIRED
EX. EASE.
S 49° 32' 22" E
66+37
FARM FIELD APP. LT.
66+37
FARM FIELD APP. RT.
66+60 TO 71+07
WETLAND MITIGATION SITE LT.
71+86
INLET DT. LT.
72+07
OUTLET DT. RT.
-0.022%
60m VC
DH-20
DH-21
72+20.00
EL. 785.45
.20 m TOPSOIL
2.50 m SILTY CLAY with SAND
4.5 m CLAYSTONE
2.5 m SANDY CONGLOMERATE
.50 m SANDSTONE
.50 m SANDY CONGLOMERATE
6.55 m TOTAL DEPTH OF BORING