KINDSFATER MITIGATION SITE

Project Overview

Watershed: Watershed #13 – Upper Yellowstone River Basin

Monitoring Year: 2019

Years Monitored: 7th year of monitoring

Corps Permit Number: NWO-2007-00824-MTB

Monitoring Conducted By: RESPEC/HDR/TREC for MDT

Dates Monitoring Was Conducted: July 22, 2019

Purpose of the Approved Project:

The site is intended to provide 32.7 acres of wetland mitigation credits to assist Montana Department of Transportation (MDT) in meeting compensatory mitigation requirements for proposed construction projects in Watershed #13 – Upper Yellowstone. The objectives of this project included creating, restoring, enhancing, and preserving wetland habitat within the historic Kindsfater gravel pit. Construction included excavating 14 wetland cells to shallow groundwater elevation that range in size from 0.24 to 1.39 acres.

Site Location:

Latitude: 45.693478 **Longitude:** –108.693517

County: Yellowstone **Nearest Town:** Laurel, MT

Map Included: Yes

Mitigation Site Construction Started: 2012 **Construction Ended:** 2012

Dates of Any Recent Corrective or Maintenance Activities (since previous report):

Activity: Weed Spraying **Date:** July 6, 2019 **Specific recommendations for any additional corrective actions:** Weed treatment will continue in 2020.

Anticipated Wetland Credit Acres: 32.70

Wetland Credit Acres Generated to Date: 19.50

Previous Monitoring Reports:
https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml

Requirements (from approved mitigation plan, banking instrument, or Department of Army (DA) permit conditions)

Monitoring Period: 5 years from construction completion or until concurrence by the US Army Corps of Engineers (USACE).

Performance Standards: A summary of performance standards established for the Kindsfater site and whether or not they are being achieved is provided in Table 1.

Table 1. Summary of Performance Standards

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	The three parameter criteria for hydrology, vegetation, and soils are met as outlined in the 1987 Wetland Manual and 2010 Regional Supplement.	Y	Areas identified as wetland habitat within the mitigation site meet the three parameter criteria.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Hydrology	Soil saturation present for at least 12.5 percent of the growing season.	Y	Areas identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of the growing season.
Hydric Soil	Hydric soil conditions present or appear to be forming.	Y	The constructed wetland complex exhibits weak hydric soil development including faint redoximorphic concentrations observed within several of the excavated depressions. Preexisting hydric soil characteristics are present in several areas identified as wetland before project construction.
	Soil is sufficiently stable to prevent erosion.	Y	Disturbed soil is stable and does not exhibit signs of erosion.
	Soil is able to support plant cover.	Y	Plant cover has continued to develop across disturbed soils.
Hydrophytic Vegetation	Achieved when wetlands delineated as hydrophytic using technical guidelines.	Y	Areas identified as wetland habitat within the mitigation site support a prevalence of hydrophytic vegetation (OBL, FACW, and FAC).
	Noxious weeds do not exceed 5 percent cover.	Y	Although several noxious weed infestations have been mapped across this site, these infestations are generally located outside of excavated wetlands. Overall, the estimated noxious weed cover within delineated wetlands is less than 5 percent.
	Hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 80 percent in created wetland areas within 5 years following site construction.	Y	The majority of created wetlands exhibited 80 percent hydrophytic vegetation cover during the 2019 monitoring event. Wetlands that do not exhibit vegetation cover were intentionally designed to provide rocky shorebird habitat and did not receive topsoil treatment following construction. All wetlands that were designed to provide 80 percent vegetative cover are currently achieving that performance standard.
Woody Plants	Plantings will be considered successful where they exceed 50 percent survival after 5 years.	N	Approximately 12 percent of the woody plantings observed were alive in 2019, which does not meet the 50 percent survival criteria. However, several wetland cells exhibit at least 45 percent cover by volunteer woody species that are expected to continue expanding across the site. This cover values of volunteer woody species has been included in the success criteria determination for this performance criteria and almost meets the 50 percent.
Herbaceous Plants	At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation will be at least 80 percent.	Y	The majority of created wetlands exhibited 80 percent hydrophytic vegetation cover during the 2019 monitoring event. Wetlands that do not exhibit vegetation cover were intentionally designed to provide rocky shorebird habitat and did not receive topsoil treatment following construction. All wetlands that were designed to provide 80 percent hydrophytic vegetative cover are currently achieving that performance standard.
Open-Water Areas	Open water that is established within the designated wetland cells will be considered successful and creditable.	Y	Seasonal open water was present within two of the three wetland enhancement cells (Cells 8 and 12). Wetland Cell 10 lacked open water in 2019. Overall, water depths ranged from 2 to 5 inches deep. These areas were generally vegetated with various herbaceous and woody hydrophytic species.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Upland Buffer	Success will be achieved when noxious weeds do not exceed 5 percent cover within the buffer areas on site.	Y	Noxious weed infestations, including field bindweed, leafy spurge, gypsy-flower, spotted knapweed, and Canada thistle, have been mapped within the site but do not exceed 5 percent. MDT will continue to implement weed-control measures to maintain this criteria.
	Any area disturbed within creditable buffer zones must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.	Y	Upland buffers surround wetland areas within the site exhibited greater than 50 percent aerial cover of non-weed species.
Weed Control	Success will be achieved where < 5 percent absolute cover of noxious weed species occurs across the site.	Y	The estimated coverage of noxious weeds within the constructed wetlands is below 5 percent; state-listed noxious weed species across the entire site has been estimated at less than 5 percent absolute cover in 2019.
Fencing	Install wildlife-friendly fencing along the easement boundaries.	Y	Wildlife-friendly fencing has been installed around the easement boundaries and is in good condition.
Monitoring	Monitor the site for a minimum of 5 years or longer as determined by the USACE.	Y	Comprehensive site monitoring has been ongoing for 7 years.

Summary Data

Wetland Delineation – The total wetland acreage delineated in 2019 (including preexisting wetland areas) was 33.3 acres, which is a slight increase from the 2018 acreage (32.4 acres). The delineation confirmed 17.4 acres in preservation areas, 8.3 acres in the restoration areas (reestablishment and rehabilitation), 2.9 acres in the enhancement area, and 4.7 acres of created wetland in the excavated cells (Table 2). Uplands accounted for 82.4 acres of the mitigation site. USACE wetland determination date forms [USACE, 2010] are provided in Appendix B.

Table 2. Wetland Acres Delineated From 2014 Through 2019 at the Kindsfater Site

Habitat Type	2014 Acreage	2015 Acreage	2016 Acreage	2017 Acreage	2018 Acreage	2019 Acreage
Preservation	21.3	21.3	20.3	20.5	17.6	17.4
Reestablishment (Restoration)	7.9	7.9	7.8	6.8	6.1	7.3
Rehabilitation (Restoration)	0.9	0.9	0.9	1.0	1.0	1.0
Enhancement	3.0	3.0	3.4	3.0	3.0	2.9
Creation	1.8	1.8	2.0	2.2	4.7	4.7
Total Wetland Habitat	**34.9**	**34.9**	**34.4**	**33.4**	**32.4**	**33.3**

Vegetation – A total of 150 plant species were identified on the site from 2013 through 2019, including 9 new species (4 wetland and 5 upland) in 2019 (see the plant list in Appendix B). Vegetation plant communities were identified by plant composition and dominance. The following vegetation community types were identified in 2019:

- Wetland Type 2 – *Eleocharis palustris/Schoenoplectus pungens*
- Wetland Type 3 – *Alopecurus arundinaceus/Poa palustris*

- Wetland Type 5 – *Typha latifolia*
- Wetland Type 8 – *Populus deltoides*
- Wetland Type 9 – *Salix exigua*
- Wetland Type 10 – *Poa palustris*
- Wetland Type 11 – Phalaris *arundinacea*
- Wetland Type 16 – *Juncus spp./Carex spp.*
- Upland Type 4 – *Elaeagnus angustifolia*
- Upland Type 6 – *Elymus trachycaulus/Bromus spp.*
- Upland Type 7 – *Bromus tectorum/Agropyron cristatum*
- Upland Type 12 – *Alopecurus arundinaceus/Poa pratensis*
- Upland Type 14 – *Elymus spp./Bromus spp.*
- Upland Type 15 – *Bromus spp./Nassella viridula*
- Upland Type 17 – *Bromus spp./Poa pratensis*.

The community composition for each community type is provided in full detail on the Wetland Mitigation Site Monitoring form (Appendix B), and the community boundaries are shown on Figure A-3 (Appendix A).

Vegetation cover was measured along three transects in 2019 (Figure A-2, Appendix A). Details of each transect are provided in the Wetland Mitigation Site Monitoring form in Appendix B. Photographs of the transect end points are provided in Appendix C. Table 3 summarizes the data for T-1. T-1 is 300 feet long and intersected upland community Type 15 and wetland community Types 8 and 9; 55 percent of the transect crossed wetland habitat, which is a 6 percent increase since 2018. Total vegetative cover along this transect was 84 percent in 2019. The number of upland species that were documented along the transect increased slightly while the number of wetland species remained static. Site conditions and timing of the survey might explain the slight increase in upland species observed.

Table 3. Data Summary for T-1 From 2016 Through 2019 at the Kindsfater Site

Monitoring Year	2016	2017	2018	2019
Transect Length (feet)	**300**	**300**	**300**	**300**
Vegetation Community Transitions Along Transect	4	4	4	4
Vegetation Communities Along Transect	4	4	5	3
Hydrophytic Vegetation Communities Along Transect	2	2	2	2
Total Vegetative Species	40	38	35	40
Total Hydrophytic Species	14	13	12	12
Total Upland Species	26	25	23	28
Estimated % Total Vegetative Cover	75	75	85	84
Estimated % Unvegetated	25	25	15	16
% Transect Length Comprising Hydrophytic Vegetation Communities	40.3	40.3	49.3	55
% Transect Length Comprising Upland Vegetation Communities	59	59.7	50.7	45
% Transect Length Comprising Unvegetated Open Water	0	0	0	0
% Transect Length Comprising of Mudflat	0	0	0	0

Data collected on T-2 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in Table 4. T-2 is 388 feet long and intersects wetland community Types 2 and 5; 100 percent of the transect crossed wetland habitat in 2019, which has remained constant since monitoring began in 2013. Total vegetative cover along this transect was 88 percent in 2019.

Table 4. Data Summary for T-2 From 2016 Through 2019 at the Kindsfater Site

Monitoring Year	2016	2017	2018	2019
Transect Length (feet)	**388**	**388**	**388**	**388**
Vegetation Community Transitions Along Transect	2	2	2	2
Vegetation Communities Along Transect	2	2	2	3
Hydrophytic Vegetation Communities Along Transect	2	2	2	2
Total Vegetative Species	35	39	26	27
Total Hydrophytic Species	18	23	20	20
Total Upland Species	17	16	6	7
Estimated % Total Vegetative Cover	60	65	75	88
Estimated % Unvegetated	40	35	25	12
% Transect Length Comprising Hydrophytic Vegetation Communities	100	100	100	100
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	0	0	0	0
% Transect Length Comprising of Mudflat	0	0	0	0

Data collected on T-3 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in Table 5. T-3 is 292 feet long and intersected upland community Types 6 and 12 and wetland community Type 5; 92 percent of the transect crossed wetland habitat in 2019, which is unchanged from 2018. Total vegetative cover along this transect was 88 percent in 2019.

Table 5. Data Summary for T-3 From 2016 Through 2019 at the Kindsfater Site

Monitoring Year	2016	2017	2018	2019
Transect Length (feet)	**292**	**292**	**292**	**292**
Vegetation Community Transitions Along Transect	1	1	1	2
Vegetation Communities Along Transect	2	2	2	3
Hydrophytic Vegetation Communities Along Transect	1	1	1	2
Total Vegetative Species	28	31	23	24
Total Hydrophytic Species	15	19	11	15
Total Upland Species	13	12	12	9
Estimated % Total Vegetative Cover	70	75	85	88
Estimated % Unvegetated	30	25	15	12
% Transect Length Comprising Hydrophytic Vegetation Communities	89.7	89.7	91.8	91.8
% Transect Length Comprising Upland Vegetation Communities	10.3	10.3	8.2	8.2
% Transect Length Comprising Unvegetated Open Water	0	0	0	0
% Transect Length Comprising of Mudflat	0	0	0	0

Priority 2B noxious weeds that were identified within the Kindsfater mitigation site in 2019 included spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), field bindweed (*Convolvulus arvensis*), and gypsy-flower (*Cynoglossum officinale*). Infestation areas were mapped in 2019 and are shown on Figure A-3 in Appendix A. MDT has an ongoing weed-control program for their mitigation sites that includes conducting an annual assessment of weeds that are identified at each location and containing and controlling the identified populations. MDT completed noxious weed spraying at the Kindsfater site on July 6, 2019. Performance standards for noxious weeds across the site are currently being met.

A few thousand cuttings and containerized materials were planted in approximately 27 clusters (Figure A-2, Appendix A) around the Kindsfater site. The woody planting zones were generally located around the excavated wetland cells. Each individual cluster was monitored in 2019 with the number of live plants counted and recorded by species. Approximately 12 percent of the observed plantings were alive during the 2019 evaluations, which is a slight increase from 2018 (11 percent) and is likely caused by narrow-leaf willow and eastern cottonwood root sprouts or plant regrowth from the base. Low survival is likely caused by a lack of sufficient moisture. A few additional *Juniperus scopulorum*, *Rosa woodsii*, and *Shepherdia argentea* young plants were observed during the July 2019 monitoring. The planted and surviving species are listed on the Wetland Mitigation Site Monitoring form (Appendix B).

Hydrology – The hydrology for the site is supplied from multiple sources, including a shallow seasonal groundwater table, direct precipitation, and surface runoff. During the July 2019 monitoring, all areas that had been defined as wetlands across the site were saturated or exhibited signs of periodic saturation within 12 inches (1 foot) of the ground. Shallow surface water documented in some of the cells ranged in depth from 1-4 inches. Inundation was present in many of these cells including Cells 8, 11, 12, 13 and a small area within 4 and 14. Constructed Cells 3, 4, 5, 6, 7, 8, 13, and 14 represented isolated wetland depressions surrounded by upland habitat. The remaining constructed cells were situated within a contiguous wetland mosaic with frequent surface drainages between cells. Shallow groundwater flows through the cells that were constructed along the upper terrace then discharges into the natural slope wetlands to recharge the depressional wetlands along the lower terrace.

Long-term groundwater monitoring conducted by the US Geological Survey (USGS) at the Kindsfater site indicates that groundwater levels steadily declined through 2015 likely from prolonged drought conditions in the region) and have since steadily increased because of higher-than-average precipitation in the region over the last 4 years. Groundwater elevations are likely also influenced by active gravel mining operations directly north of the Kindsfater wetland site.

Photographs – Photographs were taken at photo points 1–12 (PP1 to PP12), transect endpoints, and data points and are provided in Appendix C with comparisons between 2019 and the first year of monitoring. Please refer to previous years' monitoring reports for all previous annual photographs (https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml).

Soils – The Yellowstone County Soil Survey [US Department of Agriculture, 2016] indicates that five soil series were mapped within the monitoring area and include the Bew silty clay loam, Shoreu gravelly loam, Wanetta clay loam, Larim gravelly loam, and alluvial land (wet). Soil test pits were excavated at eight locations across the site (Figure A-2, Appendix A). DP-1W, DP-2W, DP-3W, and DP-4W are located in areas that exhibited or are developing hydric soil characteristics. The soil profile at DP-1W located in wetland Type 16 – *Juncus spp.* revealed a grayish-brown (10YR 5/2) sand with prominent redox concentrations below 4 inches. No hydric soil indicators were observed for DP-1U.

The soils at DP-2W included a grayish-brown (10YR 5/2) clay loam with small cobbles located within community Type 8 – *Populus deltoides*. This soil met the hydric soil criteria for hydrogen sulfide odor (A4) in 2018 but odor was not detected in 2019. These soils are still developing hydric indicators following construction. DP-2U, which is located upslope from DP-2W, exhibited a brown (10YR 4/3) silt loam and did not meet the criteria for any hydric soil indicators.

The soil profile at DP-3W, which was a new data point in 2018, revealed a 10-inch A Horizon of 10YR4/2 loam over a 10-inch layer of 10YR 3/2 clay loam with 10 percent 10YR 5/8, redoximorphic concentrations. The soil met the criteria for depleted matrix (F3) and classification as a hydric soil. DP-3U, which is located upslope from DP-3W, exhibited a dark grayish-brown (10YR 4/2) clay loam and did not meet the criteria for any hydric soil indicators.

The soil profile at DP-3W, which is located in wetland Type 11 – *Phalaris arundinacea*, revealed a dark gray (10YR 4/1) silt loam that lacked hydric soil indicators because of its location in a constructed wetland where soils may be too young to have formed hydric indicators. The soil profile at DP-4W, which is located in wetland Type 10 – *Poa palustris*, revealed a grayish-brown (10YR 5/2) silty clay loam and the faint redox concentrations noted in 2018 were not observed in 2019. This area has a modified soil profile and hydric soil indicators are developing.

Functional Assessment – The 2019 results of the functional assessments are summarized in the Table 6. A completed Montana Wetland Assessment Method (MWAM) form [Berglund and McEldowney, 2008] for the Kindsfater Site is provided in Appendix B. Overall, the existing and created wetlands rate as a Category III wetlands and the site has generated 172.54 Functional Units.

Table 6. Montana Wetland Assessment Method Summary for the Kindsfater Site

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2019 AA1 (Existing Wetlands)	2019 AA2 (Created Wetlands)
Listed/Proposed Threatened & Endangered (T&E) Species Habitat	Low (0)	Low (0)
Montana Natural Heritage Program Species (MTNHP) Habitat	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.5)	Mod (0.5)
General Fish/Aquatic Habitat	N/A	N/A
Flood Attenuation	N/A	N/A
Short- and Long-Term, Surface-Water Storage	Mod (0.6)	High (0.9)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	High (0.9)	High (0.9)
Production Export/Food Chain Support	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Low (0.3)
Recreation/Education Potential (bonus points)	Low (0.05)	Low (0.05)
Actual Points/Possible Points	**5.75/9**	**6.05/9**
% of Possible Score Achieved	**63.9%**	**67%**
Overall Category	**III**	**II**
Total Acreage of Assessed Wetlands Within Site Boundaries	**14.96**	**26.42**
Functional Units (acreage × actual points)	**86.02**	**159.85**

Wildlife – Twenty bird species were identified in 2019 across the site. The two bluebird (*Sialia spp.*) boxes installed at the site were in trees that have fallen over and the boxes are not being used. In addition to the bird species, very small frogs of unknown species were seen in wetlands across the site and deer tracks were also noted. MDT personnel who visited the Kindsfater site in June 2019 observed chorus frogs (*Psuedacris maculata*) and juvenile spadefoot toads (*Spea bombifrons*) within the project wetlands. In September 2019, the Yellowstone Academy released 50 ring-necked pheasants (*Phasianus colchicus*) that were raised by students as a community project into the Kindsfater wetland area.

Credit Summary – Table 7 summarizes the current estimated wetland credits based on the USACE-approved credit ratios [USACE, 2005] and the wetland delineation that was completed in July 2019. A total of 33.3 acres of wetland habitat were delineated at the Kindsfater site in 2019, including 4.7 acres of creation, 7.3 acres of reestablishment, 1.0 acre of rehabilitation, 2.9 acres of enhancement, and 17.4 acres of wetland preservation. A total of 40.6 acres, including 7.3 acres of upland buffer, were used to calculate the mitigation credited acres. After applying the USACE-approved ratios to these values, a total of 19.5 acres of mitigation credits have been estimated in 2019, which is below the targeted 32.7 acres that were anticipated at this site. Although 2019 represents the seventh year of monitoring, attaining the full target value of 32.7 credit acres may prove difficult without an increase of groundwater or supplemental water into the mitigation area.

Table 7. Wetland Mitigation Credits Estimated for the Kindsfater Ranch Site (2017–2019)

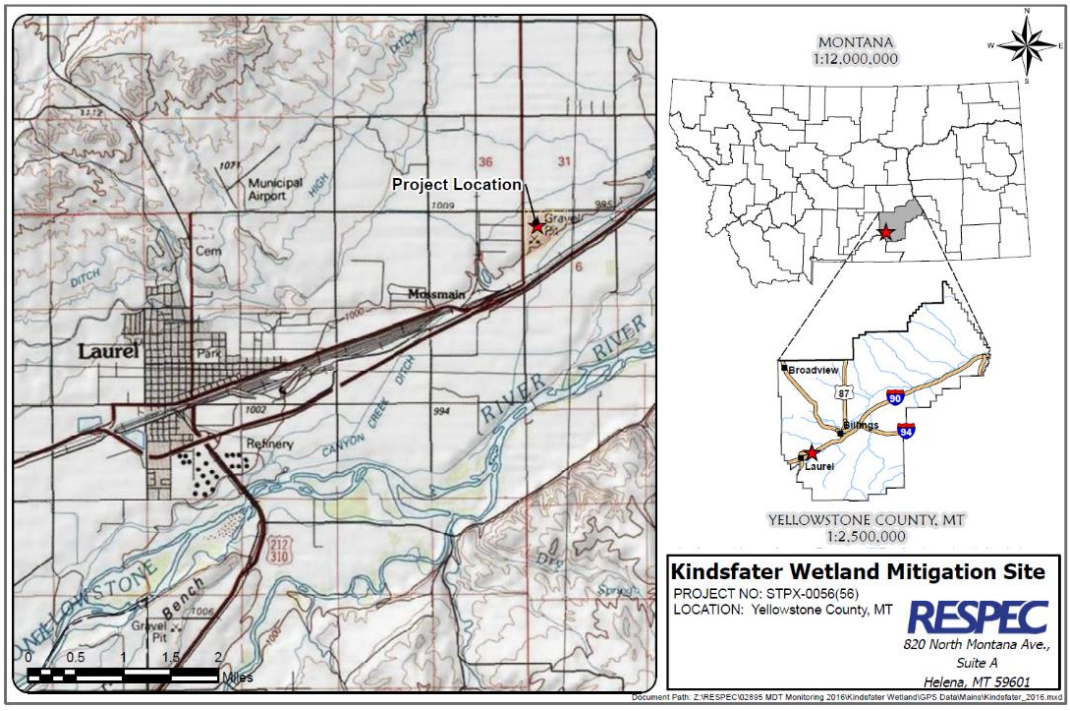
Compensatory Mitigation Type	Mitigation Area Description	Wetland Type[a]	Anticipated Mitigation Surface Area (acres)	USACE-Approved Mitigation Ratios	Anticipated Mitigation Credit (acres)	2017 Delineated Acres[b]	2017 Mitigation Credit (acres)	2018 Delineated Acres[b]	2018 Mitigation Credit (acres)	2019 Delineated Acres[b	2019 Mitigation Credit (acres)
Creation (Establishment)	Wetland Cells 7, 9, 13, & 14	Lacustrine emergent	4.6	1:1	4.6	2.2	2.2	4.7	4.7	4.7	4.7
Restoration (Reestablishment)	Wetland Cells 1–6 and partial Cell 18	Lacustrine emergent and Palustrine emergent, scrub-shrub	14.0	1:1	14.0	6.8	6.8	6.1	6.1	7.3	7.3
Restoration (Rehabilitation)	Areas adjacent to Wetland Cells 1–12	Palustrine emergent, scrub-shrub	9.2	1.5:1	6.1	1.0	0.7	1.0	0.7	1.0	0.7
Enhancement	Wetland Cells 10–12 & Partial Cell 8	Palustrine emergent, scrub-shrub	3.1	3:1	1.0	3.0	1.0	3.0	1.0	2.9	0.9
Preservation	Existing Wetland Areas	Palustrine emergent, scrub-shrub	21.9	4:1	5.5	20.5	5.1	17.6	4.4	17.4	4.4
Upland Buffer	50-foot-wide upland perimeter	N/A	7.3	5:1	1.5	7.3	1.5	7.3	1.5	7.3	1.5
Total			**60.1**		**32.7**	**40.8**	**17.3**	**39.7**	**18.4**	**40.6**	**19.5**

(a) Cowardin et al. [1979].

(b) The 2017–2019 credit areas are derived were from a .dgn file (5034000ENDETZ01.DGN) provided by MDT. A shapefile of the credit areas (MDT_Crediting_polys.shp) was created in Autodesk Civil 3D, exported, laid over the 2018 delineated wetland boundaries in ArcMap, and used to calculate acreages.

Maps, Plans, Photos

Site Location Map



Project Area Maps/Figures: See Appendix A

Data Forms: See Appendix B (Site Monitoring form, plant list, USACE data forms, and MWAM forms)

Photos: See Appendix C

Plans: See Appendix D of 2018 Monitoring Report
https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2018-REPORTS/2018-FINAL-Rostad-Ranch.PDF

Conclusions

Based on the results of the seventh year of monitoring, the Kindsfater mitigation site is continuing to develop into a diverse wetland ecosystem. The site is meeting a majority of the project's performance standards except those associated with survival of woody plantings. Woody planting survival was estimated at 12 percent in 2019 with substantial volunteer woody plants noted in several areas. The site is slowly trending positively toward planned wetland credit acreage goals but is currently 13.2 acres short of the intended goal.

References

Berglund, J. and R. McEldowney, 2008. *MDT Montana Wetland Assessment Method,* PBS&J Project B43072.00, prepared by Post, Buckley, Schuh, & Jernigan, Helena, MT, for the Montana Department of Transportation, Helena, MT.

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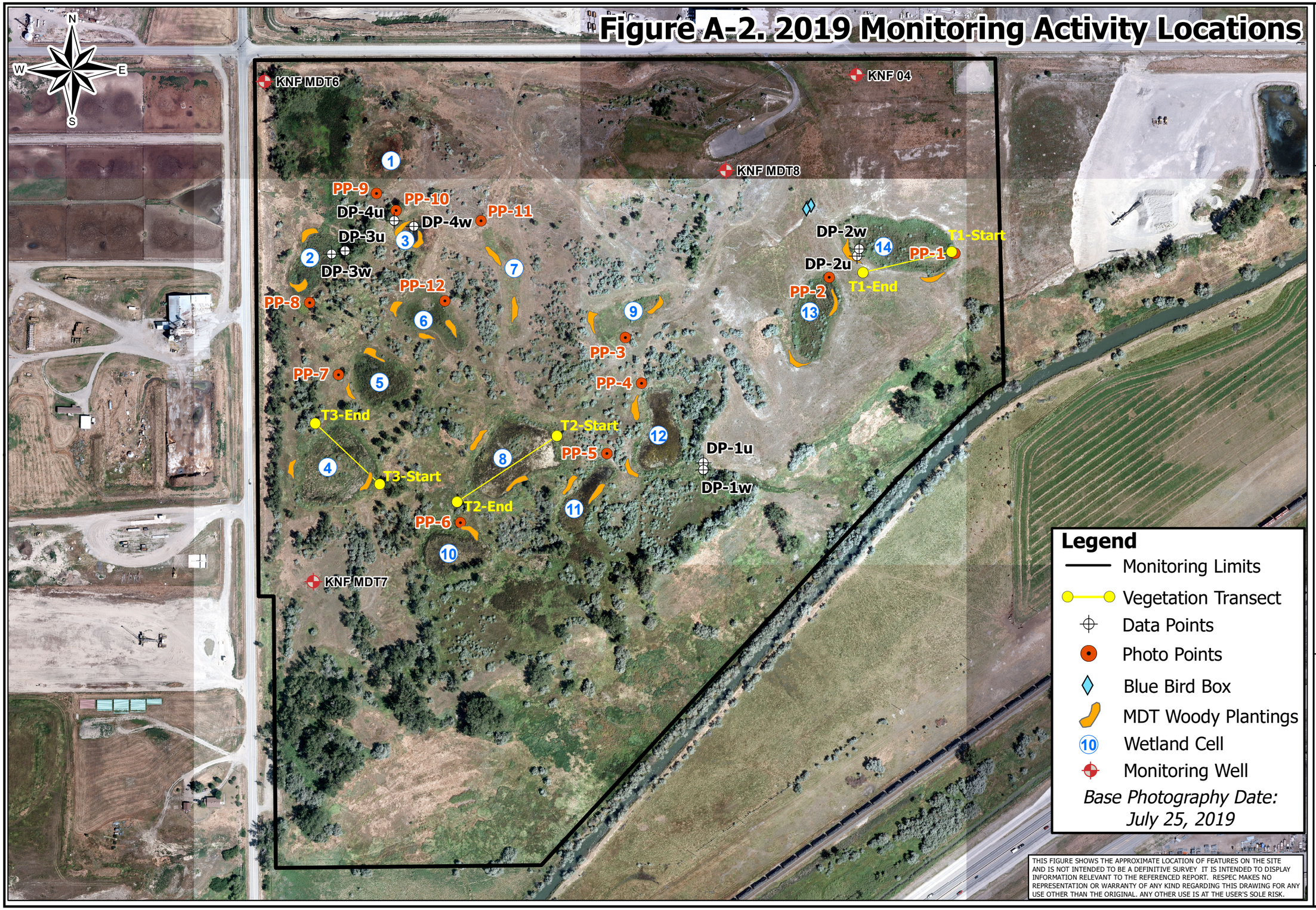
US Department of Agriculture, 2016. "Web Soil Survey for Yellowstone County, Montana," *usda.gov,* retrieved June 20, 2016, from *http://websoilsurvey.nrcs.usda.gov/app/*

APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

Figure A-2. 2019 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points
- Blue Bird Box
- MDT Woody Plantings
- Wetland Cell
- Monitoring Well

Base Photography Date: July 25, 2019

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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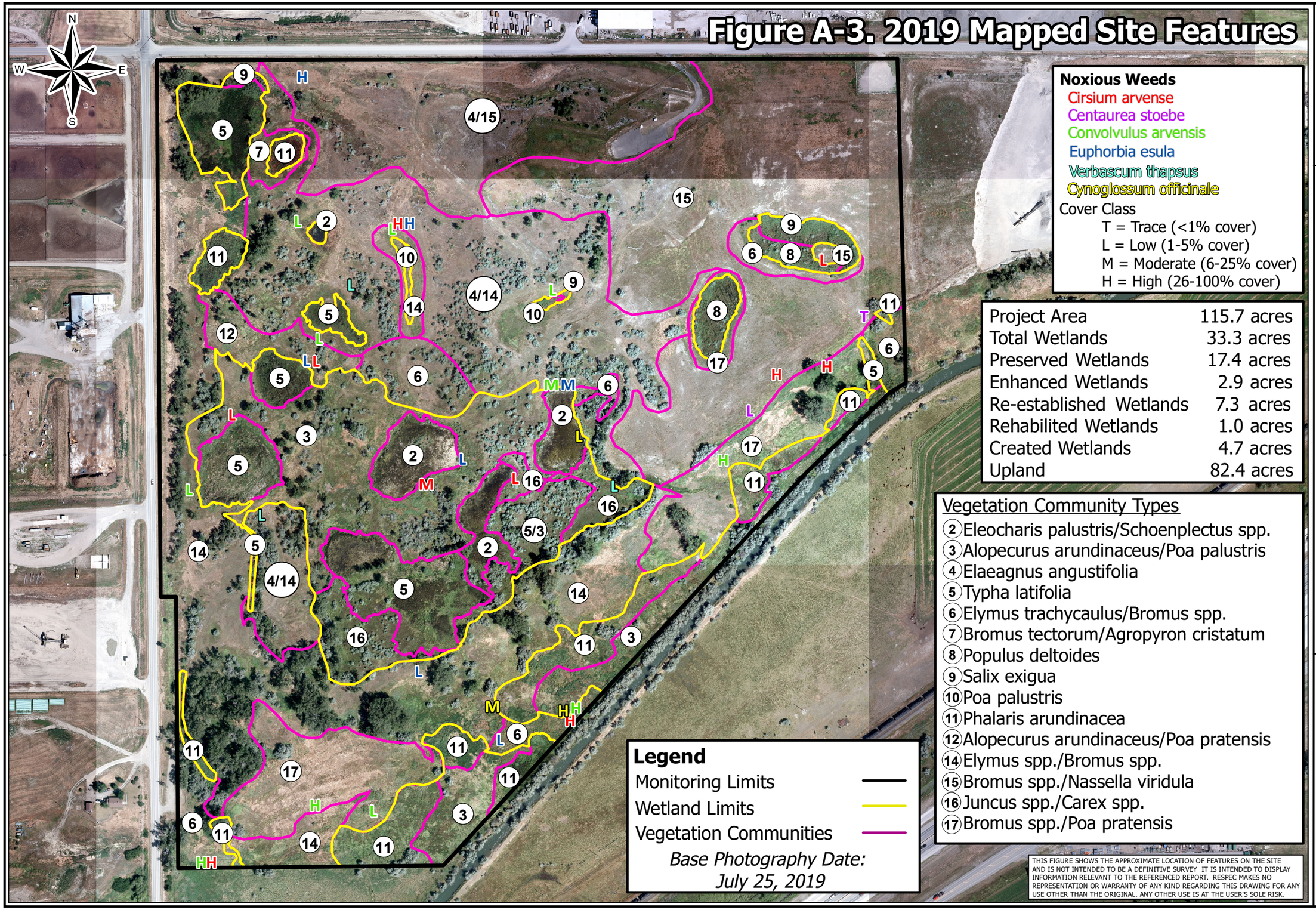
Kindsfater Wetland Mitigation Site
2019 Monitoring Activity Locations

0 125 250 500 750 1,000 1,250 Feet

Project:	STPX-0056(56)
Location:	Yellowstone Co., Montana
Date:	November 2019
Project Manager:	M. Traxler
Drawn By:	JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\Kindsfater Wetland\GPS Data\Mains\Monitor2019.mxd

Figure A-3. 2019 Mapped Site Features



Noxious Weeds
- Cirsium arvense
- Centaurea stoebe
- Convolvulus arvensis
- Euphorbia esula
- Verbascum thapsus
- Cynoglossum officinale

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

Project Area	115.7 acres
Total Wetlands	33.3 acres
Preserved Wetlands	17.4 acres
Enhanced Wetlands	2.9 acres
Re-established Wetlands	7.3 acres
Rehabilited Wetlands	1.0 acres
Created Wetlands	4.7 acres
Upland	82.4 acres

Vegetation Community Types
- 2 Eleocharis palustris/Schoenplectus spp.
- 3 Alopecurus arundinaceus/Poa palustris
- 4 Elaeagnus angustifolia
- 5 Typha latifolia
- 6 Elymus trachycaulus/Bromus spp.
- 7 Bromus tectorum/Agropyron cristatum
- 8 Populus deltoides
- 9 Salix exigua
- 10 Poa palustris
- 11 Phalaris arundinacea
- 12 Alopecurus arundinaceus/Poa pratensis
- 14 Elymus spp./Bromus spp.
- 15 Bromus spp./Nassella viridula
- 16 Juncus spp./Carex spp.
- 17 Bromus spp./Poa pratensis

Legend
- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 25, 2019

RESPEC
815 E. Front Street
Suite 3
Missoula, MT 59802

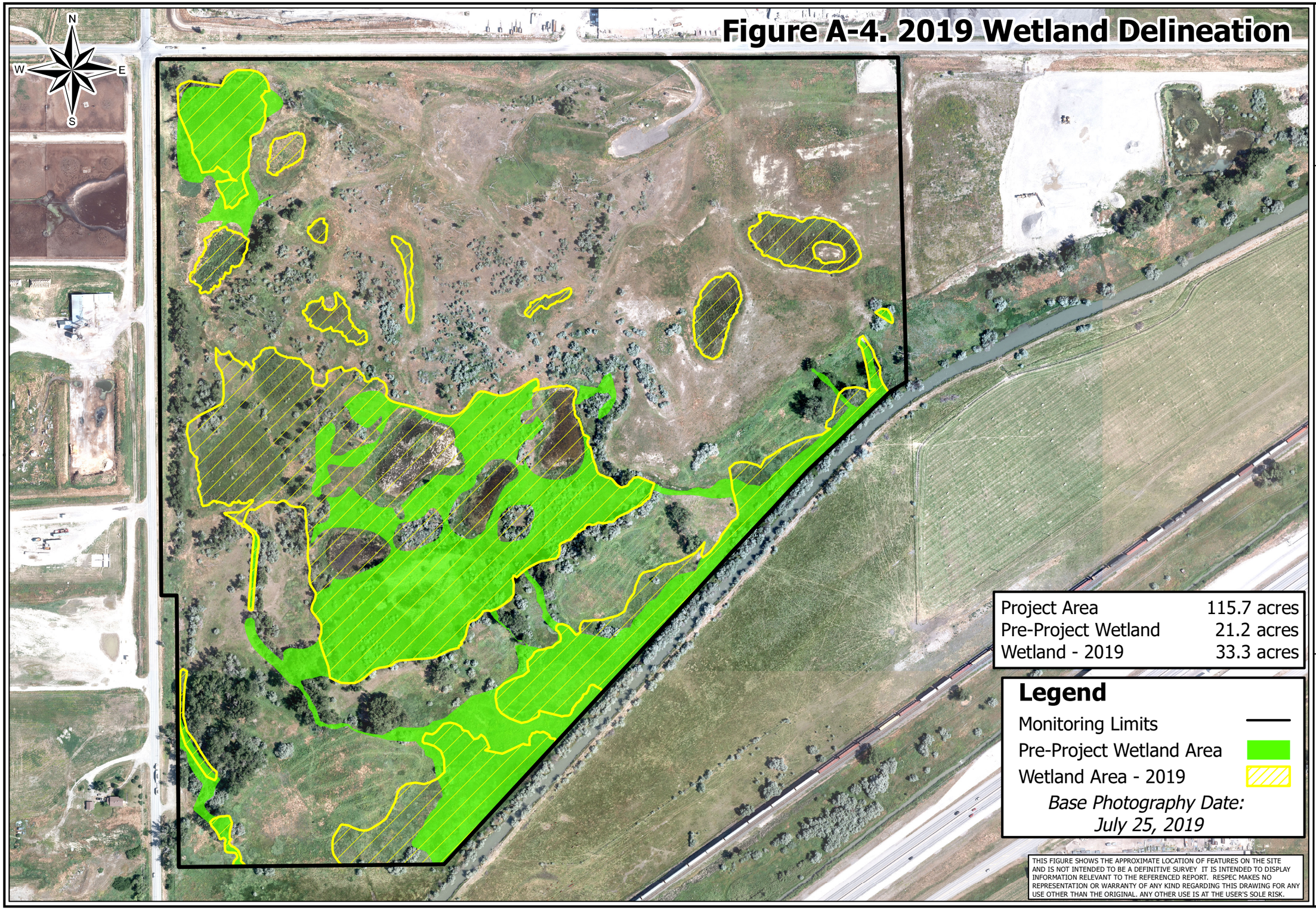
Kindsfater Wetland Mitigation Site
2019 Mapped Site Features

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: November 2019
Project Manager: M. Traxler
Drawn By: JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\Kindsfater Wetland\GPS Data\Wains\Veg2019.mxd

Figure A-4. 2019 Wetland Delineation



RESPEC
815 E. Front Street
Suite 3
Missoula, MT 59802

Kindsfater Wetland Mitigation Site
2019 Wetland Delineation

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: November 2019
Project Manager: M. Traxler
Drawn By: JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\Kindsfater Wetland\GPS Data\Mains\Delin2019.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Kindsfater** Project Number: _____
Assessment Date: **July 22, 2019** Person(s) conducting the assessment: **T. Traxler, C. Hoschouer, and C. Seibert**
Location: **Laurel, MT** MDT District: **Billings** Milepost: **NA**
Legal Description: T **2S** R **25E** Section **6**
Weather Conditions: **Warm, clear, calm 80F** Time of Day: **8:30 am**
Initial Evaluation Date: **August 22, 2013** Monitoring Year: **4** # Visits in Year: **1**
Size of evaluation area: **115.69 acres** Land use surrounding wetland: **Commercial and agriculture**

HYDROLOGY

Surface Water Source: **Groundwater**
Inundation: **Present** Average Depth: **2** Range of Depths: **1-4 inches**
Percent of assessment area under inundation: **15%**
Depth at emergent vegetation-open water boundary: **0.20 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **Yes**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Saturation visible on aerial imagery, shallow ponded water in several of the wetland cells and signs of ponded water also noted in several wetland cells - water marks, geomorphic position and drainage patterns. Flowing water noted in the northwest corner of the site. Shallow surface water noted in numerous cells.

Groundwater Monitoring Wells: **Present**
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:
There are several wells within this site that are monitored by the USGS and are included on Figure A-2.

VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Eleocharis palustris/Schoenoplectus pungens**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	3 = 11-20%	Schoenoplectus acutus	1 = 1-5%
Schoenplectus pungens	3 = 11-20%	Juncus gerardii, Juncus balticus	1 = 1-5%
Salix exigus, Salix lutea	2 = 6-10%	Populus deltoides	1 = 1-5%
Phalaria arundinacea	2 = 6-10%	Typha latifolia	1 = 1-5%
Carex pellita	2 = 6-10%	Scirpus microcarpus	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Water, rocks, mud flats	4 = 21-50%

Comments / Problems: **In 2019 Bromus spp. was removed as a codominant, there was a reduction in the Populus deltoides due to the open water within this community type over the past year.**

Community Number: **3** Community Title (main spp): **Alopecurus arundinaceus/Poa palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	4 = 21-50%	Pascopyrum smithii	1 = 1-5%
Poa palustris	3 = 11-20%	Carex nebrascensis	1 = 1-5%
Poa pratensis	3 = 11-20%	Populus deltoides	2 = 6-10%
Elymus repens	2 = 6-10%	Sonchus arvensis	1 = 1-5%
Bromus tectorum	2 = 6-10%	Typha latifolia	+ = < 1%
Elymus trachycaulus	2 = 6-10%	Mentha arvensis	+ = < 1%

Comments / Problems: **Existing slightly drier wetland community. Many other species were recorded representing 1 percent of less. Noted young Populus deltoides seedlings along the western boundary and an increase in Poa pratensis along the stream/ditch channel to the south. Juncus spp. (CT 16) and Phalaris arundinacea (CT 11) are replacing some areas previously mapped as CT 3.**

Community Number: **4** Community Title (main spp): **Elaeagnus angustifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Elaeagnus angustifolia	5 = > 50%	Elymus repens	1 = 1-5%
Populus deltoides	2 = 6-10%		
Populus angustifolia	1 = 1-5%		
Elaeagnus commutata	1 = 1-5%		
Elymus trachycaulus	1 = 1-5%		
Bromus tectorum	1 = 1-5%		

Comments / Problems: **Scrub-shrub and forested community interspersed throughout upland community Types 14 and 15.**

Community Number: **5** Community Title (main spp): **Typha latifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	5 = > 50%	Phalaris arundinacea	1 = 1-5%
Schoenoplectus acutus	3 = 11-20%	Persicaria amphibia	1 = 1-5%
Alopecurus arundinaceus	2 = 6-10%	Schoenoplectus pungens	1 = 1-5%
Marrubium vulgare	1 = 1-5%	Carex pellita	1 = 1-5%
Solanum dulcamara	1 = 1-5%	Salix lutea	1 = 1-5%
Polypogon monspeliensis	1 = 1-5%	Eleocharis palustris	1 = 1-5%

Comments / Problems: **Pre-construction existing wetland community but expanding in 2018 and 2019.**

VEGETATION COMMUNITIES (continued)

Community Number: **6** Community Title (main spp): **Elymus trachycaulus/Bromus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus trachycaulus	3 = 11-20%	Convolvulus arvensis	1 = 1-5%
Bromus tectorum	3 = 11-20%	Cynoglossum officinale	1 = 1-5%
Poa pratensis	2 = 6-10%	Nassella viridula	1 = 1-5%
Elymus repens	2 = 6-10%	Cirsium arvense	1 = 1-5%
Bromus inermis	2 = 6-10%	Poa compressa	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Melilotus officinalis	+ = < 1%

Comments / Problems: **Community generally located along the drier slope between the upper and lower terraces and along the western project boundary. In 2018 noticed a reduction in E. trachycaulus and an increase in E. repens and Bromus inermis (new CT 14) as well as Poa pratensis (CT 17).**

Community Number: **7** Community Title (main spp): **Bromus tectorum/Agropyron cristatum**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	4 = 21-50%	Melilotus officinalis	1 = 1-5%
Agropyron cristatum	2 = 6-10%	Verbena bracteata	1 = 1-5%
Nassella viridula	2 = 6-10%	Bromus japonicus	1 = 1-5%
Artemisia frigida	2 = 6-10%	Convolvulus arvense	+ = < 1%
Medicago sativa	1 = 1-5%	Opuntia polyacantha	+ = < 1%
Marrubium vulgare	1 = 1-5%	Bare ground	2 = 6-10%

Comments / Problems: **Drier upland community type primarily in the southeastern portion of the project area. In 2018, noted a decrease in the cover by Agropyron cristatum.**

Community Number: **8** Community Title (main spp): **Populus deltoides**

Dominant Species	% Cover	Dominant Species	% Cover
Populus deltoides	4 = 21-50%	Juncus balticus	1 = 1-5%
Salix exigua	3 = 11-20%	Juncus gerardii	1 = 1-5%
Poa palustris	2 = 6-10%	Salix lutea	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Carex praegracilis	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%	Elymus trachycaulus	1 = 1-5%
Polypogon monspeliensis	1 = 1-5%	Bare ground/Rock	2 = 6-10%

Comments / Problems: **Natural encroachment of young Populus deltoides seedlings and saplings were the dominant species across several of the depressional wetlands. In 2019, a few cells transitioned from a dominance of Populus deltoids to Schoenoplectus pungens/Eleocharis palustris or Typha latifolia due to standing water.**

Community Number: **9** Community Title (main spp): **Salix exigua**

Dominant Species	% Cover	Dominant Species	% Cover
Salix exigua	4 = 21-50%	Salix lutea	1 = 1-5%
Populus deltoides	2 = 6-10%	Eleocharis palustris	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%	Typha latifolia	1 = 1-5%
Juncus balticus	2 = 6-10%	Scirpus microcarpus	1 = 1-5%
Poa palustris	2 = 6-10%	Epilobium ciliatum	1 = 1-5%
Schoenoplectus acutus	2 = 6-10%	Elymus trachycaulus	1 = 1-5%

Comments / Problems: **New community type in 2016 and in 2018 has continued to develop within portions of the depressional wetlands.**

VEGETATION COMMUNITIES (continued)

Community Number: **10** Community Title (main spp): **Poa palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Poa palustris	4 = 21-50%	Eleocharis palustris	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Carex nebrascensis	1 = 1-5%
Bromus arvensis	2 = 6-10%	Cirsium arvense	+ = < 1%
Alopecurus arundinaceus	2 = 6-10%	Lactuca serriola	+ = < 1%
Poa pratensis	2 = 6-10%	Polypogon monspeliensis	+ = < 1%
Salix exigua	1 = 1-5%	Phalaris arundinacea	+ = < 1%

Comments / Problems: **Several of the restored wetland cells have converted from Community Type 2 (Eleocharis palustris/Bromus spp.) to a dominance of Poa palustris.**

Community Number: **11** Community Title (main spp): **Phalaris arundinacea**

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	5 = > 50%		
Alopecurus arundinaceus	2 = 6-10%		
Elymus repens	1 = 1-5%		

Comments / Problems: **Noted an increase in this community type in 2018 and 2019, especially along the lower bench.**

Community Number: **12** Community Title (main spp): **Alopecurus arundinaceus/Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	4 = 21-50%	Elaeagnus angustifolia	2 = 6-10%
Poa pratensis	3 = 11-20%	Agropyron cristatum	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Cirsium arvense	+ = < 1%
Elymus repens	2 = 6-10%		
Bromus tectorum	2 = 6-10%		
Populus deltoides	2 = 6-10%		

Comments / Problems: **A new community type in 2017 primarily along the western project boundary previously Community Type 4/7.**

Community Number: **14** Community Title (main spp): **Elymus spp./Bromus spp**.

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	4 = 21-50%	Elymus lanceolatus	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Agropyron cristatum	1 = 1-5%
Bromus inermis	2 = 6-10%	Convolvulus arvensis	1 = 1-5%
Bromus tectorum	3 = 11-20%	Artemisia frigida	1 = 1-5%
Bromus japonicus	1 = 1-5%	Nassella viridula	1 = 1-5%
Melilotus officinalis	1 = 1-5%	Pascopyrum smithii	1 = 1-5%

Comments / Problems: **A new community type in 2018 along the southeastern boundary (lower terrace), and across the western and central portion of the project area, previously CT 6 or CT 7.**

VEGETATION COMMUNITIES (continued)

Community Number: **15** Community Title (main spp): **Bromus spp./Nassella viridula**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	4 = 21-50%	Verbena bracteata	1 = 1-5%
Bromus inermis	2 = 6-10%	Bromus japonicus	1 = 1-5%
Nassella viridula	3 = 11-20%	Convolvulus arvense	+ = < 1%
Agropyron cristatum	2 = 6-10%	Opuntia polyacantha	+ = < 1%
Medicago sativa	2 = 6-10%	Marrubium vulgare	1 = 1-5%
Artemisia dracunculus	2 = 6-10%	Bare ground	2 = 6-10%

Comments / Problems: **A new community type in 2018 noting the increase in Nassella viridula and the reduction of Agropyron cristatum (CT 7).**

Community Number: **16** Community Title (main spp): **Juncus spp./Carex spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	3 = 11-20%	Typha latifolia	2 = 6-10%
Juncus torreyi	1 = 1-5%	Persicaria amphibia	1 = 1-5%
Juncus gerardii	1 = 1-5%	Phalaris arundinacea	2 = 6-10%
Carex nebrascensis	2 = 6-10%	Alopecurus arundinaceus	1 = 1-5%
Carex aquatilis	2 = 6-10%	Carex utriculata	1 = 1-5%
Carex pellita	2 = 6-10%	Eleocharis palustris	1 = 1-5%

Comments / Problems: **A new community type noted in 2018 where Juncus is replacing small areas of declining Community Type 5 or Community Type 2. In 2019 Carex spp. was added as a codominant.**

Community Number: **17** Community Title (main spp): **Bromus spp./Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	3 = 11-20%	Alopecurus arundinaceus	1 = 1-5%
Bromus tectorum	3 = 11-20%	Lactuca serriola	1 = 1-5%
Poa pratensis	3 = 11-20%	Elymus trachycaulus	1 = 1-5%
Elymus repens	1 = 1-5%	Cirsium arvense	1 = 1-5%
Pascopyrum smithii	2 = 6-10%	Convolvulus arvense	1 = 1-5%
Poa compressa	1 = 1-5%	Bare ground	1 = 1-5%

Comments / Problems: **A new small community type in 2018 along portions of the the lower slope and terrace in the southern portion of the project, formerly Community Type 6.**

Additional Activities Checklist:

☒ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
Cornus alba	130	0	
Crataegus douglasii	50	0	
Juniperus scopulorum	50	3	
Populus spp.	140	42	
Prunus virginiana	50	6	
Rosa woodsii	50	3	
Salix spp.	2800	303	Salix exigua best survival
Shepherdia argentea	50	2	
	3320	359	

Comments / Problems: **Approximately 27 woody planting areas were mapped by MDT in 2013, generally located around the excavated basins. Locations for the planted vegetation are shown on Figure A-2. During the 2019 monitoring, each individual planting group was monitored and live woody plants were counted by species. Approximately 12 percent of the woody plants were alive in 2019, this is a slight increase from 2018, a few additional Juniperus scopulorum, Rosa woodsii and Shepherdia argentea young plants observed during the July 2019 monitoring.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **July 22, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **240˚** Note: _____

Transect Interval Length: **10 ft (station 0 to 10)**	
Vegetation Community Type: Bromus spp./Nassella viridula	
Plant Species	**Cover**
Bromus tectorum	4 = 21-50%
Bromus inermis	2 = 6-10%
Nassella viridula	2 = 6-10%
Taraxacum officinale	1 = 1-5%
Agropyron cristatum, Elymus trachycaulus	1 = 1-5%
Fumaria vaillantii	1 = 1-5%
Medicago lupulina, Melilotus officinale	1 = 1-5%
Tragopogon dubius, Lactuca serriola	1 = 1-5%
Sporobolus cryptendrus	1 = 1-5%
Convolvulus arvensis, Verbascum thapsus	1 = 1-5%
Bare ground, litter	4 = 21-50%
Total Vegetative Cover:	70%

Transect Interval Length: **50 ft (station 10 to 60)**	
Vegetation Community Type: Salix exigua	
Plant Species	**Cover**
Salix exigua	4 = 21-50%
Populus deltoides	3 = 11-20%
Juncus balticus	2 = 6-10%
Schoenoplectus pungens	2 = 6-10%
Nepeta cataria	1 = 1-5%
Bromus inermis	1 = 1-5%
Juncus gerardii	1 = 1-5%
Cirsium arvense	1 = 1-5%
Salix spp., Salix lutea	1 = 1-5%
Poa palustris	1 = 1-5%
Bare ground, litter	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **70 ft (station 60 to 130)**	
Vegetation Community Type: Bromus spp./Nassella viridula	
Plant Species	**Cover**
Bromus tectorum	4 = 21-50%
Bromus inermis	2 = 6-10%
Nassella viridula	3 = 11-20%
Sporobolus cryptendrus	2 = 6-10%
Melilotus officinalis, Agrostis stolonifera	2 = 6-10%
Bromus japonicus, Elymus repens	2 = 6-10%
Artemisia frigida, Elymus trachycaulus	1 = 1-5%
Sisymbrium altissimum	1 = 1-5%
Erigeron canadensis	1 = 1-5%
Cirsium arvense	1 = 1-5%
Helianthus annuus, Lactuca serriola, Marrubium vulgare	1 = 1-5%
Bare ground, litter	3 = 11-20%
Total Vegetative Cover:	80%

Transect Interval Length: **115 ft (station 130 to 245)**	
Vegetation Community Type: Populus deltoides	
Plant Species	**Cover**
Populus deltoides	4 = 21-50%
Salix exigua, Salix lutea	4 = 21-50%
Elaeagnus angustifolia	1 = 1-5%
Poa palustris	1 = 1-5%
Juncus balticus	1 = 1-5%
Melicago lupulina	1 = 1-5%
Cirsium arvense, Convolvulus arvensis	1 = 1-5%
Bromus inermis	1 = 1-5%
Sonchus arvensis	1 = 1-5%
Elymus trachcaulus	1 = 1-5%
Bare ground, rock, litter	2 = 6-10%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **July 22, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **240˚** Note: _____

Transect Interval Length: **55 ft (station 245 to 300)**	
Vegetation Community Type: Bromus spp./Nassella viridula	
Plant Species	**Cover**
Bromus tectorum, Bromus japonicus	4 = 21-50%
Nassella viridula, Agropyron cristatusm	3 = 11-20%
Bromus inermis	2 = 6-10%
Sporobolus cryptandrus	1 = 1-5%
Poa pratensis, Poa compressa, Poa palustris	1 = 1-5%
Salix exigua	1 = 1-5%
Lactuca serriola, Erodium cicutarium	1 = 1-5%
Convolvulus arvensis, Cirsium arvense	1 = 1-5%
Melilotus officinalis, Melilotus albus	2 = 6-10%
Medicago lupulina, Tragopogon dubius	1 = 1-5%
Bare ground, litter, rock	3 = 11-20%
Total Vegetative Cover:	80%

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

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: **Kindsfater** Date: **July 22, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **2** Approximate Transect Length: **388 feet** Compass Direction from Start: **255**° Note: _____

Transect Interval Length: **25 ft (station 0 to 25)**	
Vegetation Community Type: Alopecurus arundinaceus/Poa palustris	
Plant Species	**Cover**
Alopecurus arundinaceus	3 = 11-20%
Poa palustris	2 = 6-10%
Eleocharis palustris	1 = 1-5%
Populus deltoides	1 = 1-5%
Elaeagnus angustifolia	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Elymus repens	1 = 1-5%
Bromus inermis	1 = 1-5%
Salix lutea	1 = 1-5%
Schoenoplectus pungens	1 = 1-5%
Total Vegetative Cover:	85%

Transect Interval Length: **8 ft (station 25 to 33)**	
Vegetation Community Type: Typha latifolia	
Plant Species	**Cover**
Typha latifolia	4 = 21-50%
Alopecurus arundinaceus	3 = 11-20%
Eleocharis palustris	1 = 1-5%
Hordeum jubatum, Poa palustris	1 = 1-5%
Elymus repens	1 = 1-5%
Salix exigua, Salix lutea	2 = 6-10%
Carex pellita	1 = 1-5%
Populus deltoides	1 = 1-5%
Schoenoplectus acutus	1 = 1-5%
Juncus gerardii	1 = 1-5%
Mud flats	3 = 11-20%
Total Vegetative Cover:	80%

Transect Interval Length: **315 ft (station 33 to 348)**	
Vegetation Community Type: Eleocharis palustris/Schoenoplectus spp.	
Plant Species	**Cover**
Schoenoplectus pungens	3 = 11-20%
Schoenoplectus acutus	2 = 6-10%
Eleocharis palustris	3 = 11-20%
Salix exigua, Salut lutea	2 = 6-10%
Carex pellita	1 = 1-5%
Typha latifolia	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Juncus gerardii	1 = 1-5%
Juncus balticus	1 = 1-5%
Veronica anagallis-aquatica	1 = 1-5%
Open water	4 = 21-50%
Mud flats	3 = 11-20%
Total Vegetative Cover:	65%

Transect Interval Length: **40 ft (station 348 to 388)**	
Vegetation Community Type: Alopecurus arundinaceus/Poa palustris	
Plant Species	**Cover**
Alopecurus arundinaceus	4 = 21-50%
Poa palustris	3 = 11-20%
Poa pratensis	2 = 6-10%
Schoenoplectus pungens	2 = 6-10%
Typha latifolia	2 = 6-10%
Carex pellita	2 = 6-10%
Populus deltoides	1 = 1-5%
Phalaris arundinacea	1 = 1-5%
Agropyron trachycaulum	1 = 1-5%
Juncus balticus	1 = 1-5%
Bare ground, litter, rock	3 = 11-20%
Total Vegetative Cover:	85%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **July 22, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **3** Approximate Transect Length: **292 feet** Compass Direction from Start: **290˚** Note: _____

Transect Interval Length: **100 ft (station 0 to 100)**	
Vegetation Community Type: Alopecurus arundinaceus/Poa palustris	
Plant Species	**Cover**
Alopecurus arundinaceus	4 = 21-50%
Poa palustris	2 = 6-10%
Typha latifolia	2 = 6-10%
Carex utriculata, Carex nebrascensis, Carex aquatilis	1 = 1-5%
Schoenoplectus acutus	2 = 6-10%
Phalaris arundinacea	1 = 1-5%
Lycopus asper	1 = 1-5%
Populus deltoides, Elaeagnus angustifolia	1 = 1-5%
Persicaria amphibia	1 = 1-5%
Poa pratensis	1 = 1-5%
Bare ground, litter	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **168 ft (station 100 to 268)**	
Vegetation Community Type: Typha latifolia	
Plant Species	**Cover**
Typha latifolia	4 = 21-50%
Schoenoplectus acutus	3 = 11-20%
Alopecurus arundinaceus	3 = 11-20%
Phalaris arundinacea	2 = 6-10%
Juncus balticus, Eleocharis palustris	1 = 1-5%
Salix exigua, Populus deltoides	1 = 1-5%
Polygonum amphibium	1 = 1-5%
Poa palustris	1 = 1-5%
Carex utriculata, Carex aquatilis	2 = 6-10%
Carex pellita	1 = 1-5%
Bare ground, litter, open water	3 = 11-20%
Total Vegetative Cover:	85%

Transect Interval Length: **24 ft (station 268 to 292)**	
Vegetation Community Type: Elymus spp./Bromus spp.	
Plant Species	**Cover**
Elymus repens	3 = 11-20%
Bromus tectorum	2 = 6-10%
Schedonorus pratensis	2 = 6-10%
Alopecurus arundinaceus	1 = 1-5%
Sisymbrium loeselii	1 = 1-5%
Poa pratensis	1 = 1-5%
Phalaris arundinacea	1 = 1-5%
Lepidium campestre	1 = 1-5%
Melilotus officinalis	1 = 1-5%
Convolvulus arvensis	1 = 1-5%
Tragopogon dubius	+ = < 1%
Bare ground, litter	2 = 6-10%
Total Vegetative Cover:	90%

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: **A comprehensive species list for each transect interval length was recorded during the July 2019 monitoring. Typically, species with less than 1 percent were not included on the forms but were used to calculate total upland and wetland species for the summary tables.**

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	1	Wetland cell 14 45.69342/-108.690247	280
PP-2	1	Wetland cell 13 45.695136/-108.691839	280
PP-3	1	Wetland cell 9 45.694612/-108.69443	0
PP-4	1	Wetland cell 12 45.694935/-108.691902	200
PP-5	1	Wetland cell 11 45.694748/-108.694458	10
PP-6	1	Wetland cell 10 45.694084/-108.694321	150
PP-7	1	Wetland cell 5 45.698065/-108.698065	90
PP-8	1	Wetland cell 2 45.694939/-108.698429	315
PP-9	1	Wetland cell 1 45.694302/-108.698044	90
PP-10	1	Wetland cell 3 45.694847/-108.698418	140
PP-11	1	Wetland cell 7 45.695892/-108.697601	350
PP-12	1	Wetland cell 6 45.694939/-108.696663	230
T-1-S	1	Transect 1 start 45.695357/-108.690285	240
T-1-E	1	Transect 1 end 45.695072/-108.691437	50
T-2-S	1	Transect 2 start 45.693763/-108.695288	225
T-2-E	1	Transect 2 end 45.693184/-208.696573	40
T-3-S	1	Transect 3 start 45.693317/-108.697517	290
T-3-E	1	Transect 3 end 45.693317/-108.698486	110
DP-1w DP-1u		45.413580/-108.413626 45.41363/-108.413678	
DP-2w DP-2u		45.414297/-108.412870 45.414276/-108.413014	
DP-3w DP-3u		45.414272/-108.415480 45.41432/-108.415440	
DP-4w DP-4u		45.414394/-108.414961 45.414436/-108.415050	

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? **Yes**
If yes, do they need to be repaired? **Yes**
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: **Bird boxes need to be repaired**

WILDLIFE

Birds

Were man-made nesting structures installed? **Yes**
If yes, type of structure: **bird boxes** How many? **2**
Are the nesting structures being used? **No**
Do the nesting structures need repairs? **Yes**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
White-tailed Deer (fawn)	1	☒	☐	☐	beds
Frogs (tiny)	2	☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: The trees with the two bird boxes have fallen over.

BIRD SURVEY – FIELD DATA SHEET

Site: **Kindsfater** Date: **7/22/19**
Survey Time: **8:30 am** to **6 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Robin	1	L	FO	Brewer's Blackbird	6	FO	WM
Canada Goose	12	FO	UP	American Coot	1	FO	WM
Common Yellowthroat	1	F	MA				
Eastern Kingbird	1	L	SS				
House Wren	2	F	UP				
Hungarian Partridge	12	F	WM				
European Starling	2	L FO	SS				
Mourning Doves	8	BD FO	FO				
Northern Flicker	2	L	FO				
Red-winged Blackbird	10	L BP F	MA OW WM				
Ring-necked Pheasant	1	L	UP				
Western Kingbird	1	L	SS				
Yellow Warbler	3	BD	UP				
Killdeer	1	FO	UP				
Tree Swallow	1	FO	UP				
Yellow-headed Blackbird	2	FO	WM				
Rock Pigeon	4	FO	FO				
Owl	1	L	FO				

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: **Humid, late afternoon temperature, 94 degrees around 4 pm.**

Notes:

Kindsfater: 2013-2019 Vegetation List

Scientific Names	**Common Names**	**GP Indicator Status[(a)]**
Achillea millefolium	Common Yarrow	FACU
Agropyron cristatum	Crested Wheatgrass	UPL
Agrostis stolonifera	Spreading Bent	FACW
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FACW
Alyssum alyssoides	**Pale or Yellow Alyssum**	**UPL**
Alyssum desertorum	Dwarf Alyssum	UPL
Amaranthus retroflexus	Red-Root	FACU
Artemisia absinthium	Common Sagewort	UPL
Artemisia dracunculus	Wild Tarragon	UPL
Artemisia frigida	Fringed Sage	UPL
Artemisia michauxiana	Michaux Sagewort	FAC
Asclepias speciosa	Showy Milkweed	FAC
Atriplex suckleyi	Suckley's Saltbush	UPL
Bassia scoparia (Kochia scoparia)	Mexican-Fireweed	FACU
Berteroa incana	Hoary False Alyssum	UPL
Brassica nigra	Black Mustard	UPL
Bromus arvensis	Field Brome	FACU
Bromus inermis	Smooth Brome	UPL
Bromus japonicus	Japanese Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Calamagrostis canadensis	Bluejoint	FACW
Carduus nutans	**Musk Thistle**	**UPL**
Carex aquatilis	**Leafy Tussock Sedge**	**OBL**
Carex nebrascensis	Nebraska Sedge	OBL
Carex pellita	Wooly Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex utriculata	Northwest Territory Sedge	OBL
Centaurea stoebe	Spotted Knapweed	UPL
Centaurium exaltatum	Centaury	UPL
Ceratophyllum demersum	**Coon's-Tail**	**OBL**
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cirsium arvense	Canadian Thistle	FACU
Cirsium vulgare	Bull Thistle	UPL
Conium maculatum	Poison-Hemlock	FACW
Convolvulus arvensis	Field Bindweed	UPL
Cornus alba	Red Osier	FACW
Crepis atribarba	Hawksbeard	UPL
Cynoglossum officinale	Gypsy-Flower	FACU

Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Flixweed Tansymustard	UPL
Elaeagnus angustifolia	Russian-Olive	FACU
Elaeagnus commutata	American Silver-Berry	UPL
Eleocharis palustris	Common Spike-Rush	OBL
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum hyemale	Tall Scouring-Rush	FACW
Equisetum laevigatum	Smooth Scouring Rush	FACW
Erigeron caespitosus	Tufted Fleabane	UPL
Erigeron canadensis	Canada Horseweed	FACU
Erodium cicutarium	Stork's bill	UPL
Euphorbia esula	Leafy Spurge	UPL
Fumaria vaillantii	Fumitory	UPL
Fraxinus pennsylvanica	**Green Ash**	**FAC**
Galium aparine	Sticky-Willy	FACU
Gaura parviflora	**Butterfly Weed**	**UPL**
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Helianthus annuus	Common Sunflower	FACU
Hesperostipa comata	Needle-and-Thread	UPL
Heterotheca villosa	Golden-Aster	UPL
Hordeum jubatum	Fox-Tail Barley	FACW
Hyoscyamus niger	Black Henbane	UPL
Juncus articulatus	Joint-Leaf Rush	OBL
Juncus balticus	Baltic Rush	FACW
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus gerardii	Saltmarsh Rush	FACW
Juncus longistylis	Long-style Rush	FACW
Juncus torreyi	Torrey's Rush	FACW
Juniperus scopulorum	Rocky Mountain Juniper	UPL
Koeleria macrantha	**Prairie Junegrass**	**UPL**
Lactuca serriola	Prickly Lettuce	FAC
Lemna minor	Common Duckweed	OBL
Lepidium campestre	Field Pepperweed	UPL
Logfia arvensis	Fluffweed	UPL
Lepidium perfoliatum	Clasping Pepperwort	FACU
Lycopus asper	Rough Water-Horehound	OBL
Marrubium vulgare	White Horehound	FACU
Medicago lupulina	Black Medick	FACU
Medicago sativa	Alfalfa	UPL

Melilotus albus	White Sweetclover	FACU
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Muhlenbergia asperiflora	Alkali Muhly	FACW
Nassella viridula	Green Needlegrass	UPL
Nasturium officinale	Water Cress	OBL
Nepeta cateria	Catnip	FACU
Oenothera villosa	Hairly Evening-Primrose	FACU
Onopordum acanthium	Scotch Thistle	UPL
Opuntia polyacantha	Plains Pricklypear	UPL
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Persicaria amphibia	Water Smartweed	OBL
Persicaria lapathifolia	Dock-Leaf Smartweed	OBL
Phalaris arundinacea	Reed Canary Grass	FACW
Physalis longifolia	Long-leaf Ground Cherry	UPL
Poa compressa	Flat-Stem Blue Grass	FACU
Poa palustris	Fowl Blue Grass	FACW
Poa pratensis	Kentucky Blue Grass	FACU
Polygonum aviculare	Yard Knotweed	FACU
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus angustifolia	Narrow-Leaf Cottonwood	FACW
Populus deltoides	Eastern Cottonwood	FAC
Ranunculus gmelinii	**Lesser Yellow Water Buttercup**	**FACW**
Potentilla pensylvanica	Pennsylvania Cinquefoil	FACU
Ratibida columnifera	Prairie Coneflower	UPL
Rosa woodsii	Wood's Rose	FACU
Rumex crispus	Curly Dock	FAC
Rumex salicifolius	**Willow Dock**	**FACW**
Salix exigua	Narrow-Leaf Willow	FACW
Salix lutea (S. eriocephala)	Yellow Willow	FACW
Salix sp.	Willow	NL
Salsola tragus	Prickly Russian-Thistle	FACU
Schedonorus arundinaceus	Tall False Rye Grass	FAC
Schedonorus pratensis	False Meadow Rye	FACU
Schoenocrambe linifolia	Flax-leaf Plains Mustard	UPL
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Silene latifolia	White Cockle	UPL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sisymbrium loeselii	Smallpod Tumble Mustard	UPL
Solanum dulcamara	Climbing Nightshade	FACU

Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Sphaeralcea coccinea	Scarlet Globemallow	UPL
Tanacetum vulgare	Common Tansy	FACU
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	UPL
Typha angustifolia	Narrow-Leaf Cat-Tail	OBL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Ulmus americana	American Elm	FAC
Verbascum thapsus	Great Mullein	UPL
Verbena bracteata	Carpet Vervain	FACU
Veronica anagallis-aquatica	Blue Water Speedwell	OBL
Veronica peregrina	Neckweed	FACW
Vicia americana	American Purple Vetch	FACU
Vicia sativa	Garden Vetch	FACU
Xanthium strumarium	Rough Cockleburr	FAC
Zeltnera exaltata	Desert Mountain-pink	FACW
[(a)] 2016 NWPL (Lichvar et al., 2016).		
New species identified in 2019 are **bolded**.		

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.693478 **Long.:** -108.693517 **Datum:** WGS84

Soil Map Unit Name: Larim gravelly loam, 15 to 35 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:
Upland sample point located on the west side of Populus deltoides and Elaeagnus angustifolia in the southern portion of the project. Point moved slightly in 2019.

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. Elaeagnus angustifolia	15	☑	75.0%	FACU
2. Populus deltoides	5	☑	25.0%	FAC
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	20		= 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. Poa pratensis	40	☑	47.1%	FACU
2. Elymus repens	25	☑	29.4%	FACU
3. Bromus tectorum	20	☑	23.5%	UPL
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%	
	85		= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0		= Total Cover	

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	5	x 3 =	15	
FACU species	80	x 4 =	320	
UPL species	20	x 5 =	100	
Column Totals:	105	(A)	435	(B)

Prevalence Index = B/A = 4.143

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 includes a dominance of Poa pratensis, Elymus repens, and Bromus tectorum. Only 20 percent dominant hydrophytic vegetation and a prevalence index score of 4.143.

*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
0-12	7.5YR	3/2	100					Silt Loam	5% cobble
12+	rocks								

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:

Hydric soil indicators were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

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:

Soils were dry throughout. No primary or secondary indicators were present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Terrace **Local relief (concave, convex, none):** concave **Slope:** 0.5 % / 0.3 °

Subregion (LRR): LRR F **Lat.:** 45.693229 **Long.:** -108.693454 **Datum:** WGS84

Soil Map Unit Name: Larim gravelly loam, 15 to 35 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:
Data point moved slightly in 2019. Data point was dry during sampling.

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. Rosa woodsii	2	☑	100.0%	FACU
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	2	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Juncus balticus	40	☑	40.0%	FACW
2. Carex lasiocarpa	35	☑	35.0%	OBL
3. Sonchus arvensis	15	☐	15.0%	FAC
4. Lepidium latifolium	5	☐	5.0%	FACW
5. Agrostis stolonifera	4	☐	4.0%	FACW
6. Calamagrostis canadensis	1	☐	1.0%	FACW
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 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	35	x 1 =	35	
FACW species	50	x 2 =	100	
FAC species	15	x 3 =	45	
FACU species	2	x 4 =	8	
UPL species	0	x 5 =	0	
Column Totals:	102	(A)	188	(B)

Prevalence Index = B/A = 1.843

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:

Hydrophytic vegetation indicators include a dominance test of 66.7% and and a prevalance index of 1.843.

*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
0-4	10YR	5/2	100						Sand	
4-10	10YR	5/2	90	7.5YR	4/6	10	C	M	Sand	
10+	rock									

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:

Sandy soil with prominent redox concentrations beginning at 4".

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:

Signs of seasonal water in portions of this wetland. Drains to the south, southeast. Soils likely saturated earlier in the year.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.414276 **Long.:** -108.413014 **Datum:** WGS84

Soil Map Unit Name: Wanetta clay loam, 0 to 1% 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:
The sample point is located 10 feet south of the wetland sample point on sloped bank.

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	5	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	5	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Bromus tectorum	40	☑	50.6%	UPL
2. Melilotus officinalis	20	☑	25.3%	FACU
3. Bromus inermis	5	☐	6.3%	UPL
4. Poa pratensis	5	☐	6.3%	FACU
5. Stipa viridula	5	☐	6.3%	UPL
6. Convolvulus arvensis	1	☐	1.3%	UPL
7. Acroptilon repens	1	☐	1.3%	UPL
8. Grindelia squarrosa	1	☐	1.3%	UPL
9. Tragopogon dubius	1	☐	1.3%	UPL
10.	0	☐	0.0%	
	79	= 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	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	25	x 4 =	100
UPL species	54	x 5 =	270
Column Totals:	84	(A)	385 (B)

Prevalence Index = B/A = 4.583

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:

This sample point is in an upland with a dominance of UPL and FACU vegetation. 10% of the soil surface is covered in litter.

*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
0-14	10YR 4/3						Silt Loam	cobbles, ants

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:

Hydric soil indicators were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

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:

Soils were dry throughout. No primary or secondary indicators were present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.414297 **Long.:** -108.412870 **Datum:** WGS84

Soil Map Unit Name: Wanetta clay loam, 0 to 1% 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 ○	**Is the Sampled Area**
Hydric Soil Present? Yes ◉ No ○	**within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Sample point is located within Cell 14.

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	70	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	70	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Schoenoplectus pungens	65	☑	65.0%	OBL
2. Juncus balticus	15	☐	15.0%	FACW
3. Poa palustris	13	☐	13.0%	FACW
4. Salix lutea	5	☐	5.0%	FACW
5. Schoenoplectus acutus	2	☐	2.0%	OBL
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (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	67	x 1 =	67
FACW species	33	x 2 =	66
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	170 (A)		343 (B)

Prevalence Index = B/A = 2.018

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:

Plot has a dominance of hydrophytic vegetation.

*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
0-8	10YR	5/2	100					Clay Loam	2" cobbles
8+	rock								

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:

This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017. Hydrogen sulfide odor detected last year was not detected in 2019, but hydrophytic vegetation and wetland hydrology were 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):	6
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:

Soils were saturated to the surface and water in the soil pit at 6".

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-3U**

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.414328 **Long.:** -108.415440 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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:
Upland sample point paired with wetland sample point DP-3W. Located between wetlands.

VEGETATION - Use scientific names of plants

FWS Region: GP

Tree Stratum (Plot size: 30 Foot Radius)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1. Populus deltoides	15	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	15		= 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. Elymus repens	100	☑	100.0%	FACU
2.	0	☐	0.0%	
3.	0	☐	0.0%	
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%	
	100		= Total Cover	

Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	115 (A)		445 (B)

Prevalence Index = B/A = 3.87

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:

A dominance of Elymus repens.

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

Soil

Sampling Point: DP-3U

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
0-14	10YR	3/2	100					Silt Loam	gravelly, fibrous loam
14+	10YR	3/2	100					Silt Loam	very rocky, 2" and less cobbles 10%

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:

Hydric soil indicators were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

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:

Soils were dry throughout. No primary or secondary indicators were present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-3W

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.414272 **Long.:** -108.415480 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 percent slopes **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 along the perimeter of Cell 2, a Phalaris arundinacea dominated 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. Phalaris arundinacea	85	☑	100.0%	FACW
2.	0	☐	0.0%	
3.	0	☐	0.0%	
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%	
	85	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 15

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	0	x 1 =	0	
FACW species	85	x 2 =	170	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	85	(A)	170	(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:

A dominance of hydrophytic vegetation, primarily Phalaris arundinacea. Some bare ground due to loss of annual weedy species.

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

Soil

Sampling Point: DP-3W

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 4/1	100					Sandy Silt Loam	very rocky, earthworms

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:

No hydric soil indicators observed. Mitigation site construction may have modified soil profile and if hydrology remains, hydric soils may develop in the future (indicators of Problematic Hydric Soils - Recently Developed Wetland).

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):	3
Water Table Present?	Yes ◉	No ○	Depth (inches):	0
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:

3" of standing water. Three primary and two secondary indicators observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-4U**

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Slope **Local relief (concave, convex, none):** convex **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR F **Lat.:** 45.695449 **Long.:** -108.697276 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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:
Paired with wetland sample point DP-4W. Located along the southwestern side of wetland Cell 3. Moved slightly in 2019.

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. Elymus repens	40	☑	42.1%	FACU
2. Bromus arvensis	30	☑	31.6%	FACU
3. Bromus tectorum	15	☐	15.8%	UPL
4. Lactuca serriola	5	☐	5.3%	FAC
5. Descurainia incana	5	☐	5.3%	UPL
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: 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	5	x 3 =	15	
FACU species	70	x 4 =	280	
UPL species	20	x 5 =	100	
Column Totals:	95	(A)	395	(B)

Prevalence Index = B/A = 4.158

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:

Elymus repens and Bromus arvensis represent the majority of the cover across this data point. Bare ground covered in litter.

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

Soil

Sampling Point: DP-4U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	4/3	100					Loam	
0-14	10YR	3/3	100					Loam	20% rocks
14+	rock								

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:

Hydric soil indicators were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

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:

Soils were dry to 14". No primary or secondary indicators noted.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 22-Jul-19

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-4W

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.695567 **Long.:** -108.697051 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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:
Sample point within a constructed depressional wetland (Cell 3). Moved slightly in 2019.

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. Salix lutea	5	☑	100.0%	FACW
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	5	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Poa palustris	50	☑	50.0%	FACW
2. Juncus balticus	30	☑	30.0%	FACW
3. Bromus tectorum	15	☐	15.0%	UPL
4. Epilobium ciliatum	3	☐	3.0%	FACW
5. Elymus repens	2	☐	2.0%	FACU
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	88	x 2 =	176
FAC species	0	x 3 =	0
FACU species	2	x 4 =	8
UPL species	15	x 5 =	75
Column Totals:	105 (A)		259 (B)

Prevalence Index = B/A = 2.467

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:
Dominance test >50% and Prevalence Index <3.0.

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

Soil

Sampling Point: DP-4W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	5/2	100					Silty Clay Loam	
8+	rock								

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:

Faint mottles were observed in 2018 but were not observed in 2019. This area has a modified soil profile and hydric soil indicators are developing.

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:

			Depth (inches):
Surface Water Present?	Yes ◉	No ○	2
Water Table Present?	Yes ◉	No ○	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

About 10% of data point inundated with 2" of standing water. Three primary and three secondary indicators observed.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Kindsfater **2. MDT Project #:** STPX-0056(56) **3. Control #:** 5034

3. Evaluation Date: 7/22/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Kindsfater - created wetland

6. Wetland Location(s): Township 2 S, Range 25 E, Section 6; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: _____

Watershed: 13 - Upper Yellowstone **County:** _ _ Yellowstone _____

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)
4.7 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 4.7 (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	50
Depressional	Scrub-Shrub Wetland	Excavated	Seasonal / Intermittent	45
Depressional	Aquatic Bed	Excavated	Seasonal / Intermittent	5

Comments: Created wetlands include both emergent, open water (aquatic bed) and developing scrub-shrub classes

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.)**:** The wetland mitigation site was constructed in 2012/2013 and included substantial excavation, modification/rehabilitation to existing wetlands, and revegetation. Based on review of previous data and reports, the preserved wetland areas at higher elevations appear to be losing hydrology with excavated wetland cells retaining hydrology but also drying out. Site was re-evaluated in 2018 specifically for preserved wetlands and for existing wetland areas outside of excavated cells.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of excavated depressional wetland cells within a historic gravel pit/wetland site. Wetland mitigation construction was completed in 2013 and 2019 is the seventh monitoring year for the expanded wetland site. Land use surrounding the AA includes commerical developments, agriculture (grazing), transportation (railroad and interstate), and a shooting range within the site.

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

Comments: Palustrine emergent vegetation, aquatic bed and young palustrine scrub-shrub communities developing.

Wetland/Site #(s): Kindsfater - created wetland

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): USFWS list for species in Yellowstone County; no habitat specifications/known occurrences

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 Plains spadefoot
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
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in 2014-2018. MDT identified plains spadefoot again during a 2019 site visit

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**	---	.7M	---	---
☐ **Minimal**	---	---	---	---

Comments: Wildlife rating is expected to increase in subsequent monitoring years.

Wetland/Site #(s): Kindsfater - created wetland

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**

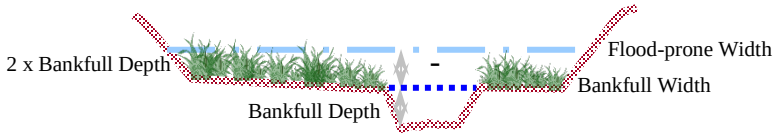
iii. Final Score and Rating: _ **Comments:** No fish habitat within mitigation site; no perennial water

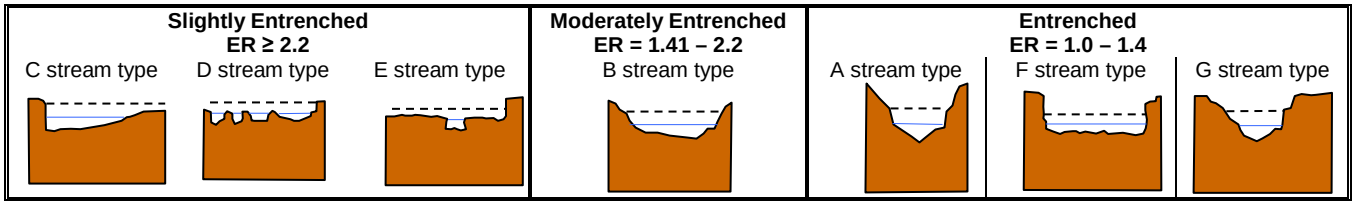
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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:** Flooding does not occur on the site as groundwater is the primary hyrdology sources; no flooding occurs from in channel or overbank flow.

Wetland/Site #(s): Kindsfater - created wetland

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: Estimated that AA ponds greater than 5 out of 10 years with approximately 4.7 acres inundated to approximatley 0.5 feet.

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: Isolated depressional wetland cells do not have outlets. Percent cover of wetland vegetation increased to greater than 70%.

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

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

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

Comments: The AA does not occur on a stream bank or drainage. No wave action occurs in depression wetland areas when inundated.

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**	H	---	---

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	---	---	---	---	---	---	---	.5M	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Kindsfater - created wetland

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** = 0.4 ☐ **NO**

iv. Final Score and Rating: .4M **Comments:** Adjacent upland buffer with greater than 30% plant cover.

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: Vegetation observed to be growing following regional drought conditions; gravel substrate in created depressional wetland areas.

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)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Wetlands are considered common, site has moderate disturbance, and structural diversity is moderate.

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)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Access is permitted without permission with the exception of the police shooting range.

15. GENERAL SITE NOTES: Anticipate higher wildlife ratings in subsequent monitoring years. Wetland acreage remained the same from 2018 to 2019.

Wetland/Site #(s): Kindsfater - created wetland

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	4.23	*
C. General Wildlife Habitat	mod 0.70	1.00	3.29	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	2.82	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	4.70	*
H. Sediment / Shoreline Stabilization	NA	NA	0	
I. Production Export / Food Chain Support	mod 0.50	1.00	2.35	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	3.29	*
K. Uniqueness	low 0.30	1.00	1.41	
L. Recreation / Education Potential (bonus point)	high 0.20		0.94	
Total Points	**4.9**	**8**	**23.03 Total Functional Units**	
Percent of Possible Score 61% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Kindsfater **2. MDT Project #:** STPX-0056(56) **3. Control #:** 5034

3. Evaluation Date: 7/22/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Kindsfater - preservation wetland

6. Wetland Location(s): Township 2 S, Range 25 E, Section 6; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: _____

Watershed: 13 - Upper Yellowstone **County:** _ _ Yellowstone _____

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)
28.7 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 28.7 (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
Slope	Emergent Wetland	Partly Drained	Seasonal / Intermittent	80
Slope	Scrub-Shrub Wetland	Partly Drained	Seasonal / Intermittent	20

Comments: Preservation wetlands are primarily emergent with some scrub-shrub included.

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.)**:** The wetland mitigation site was constructed in 2012 and 2013 which consisted of substantial excavation, modification/rehabilitation of existing wetlands, and revegetation. Existing wetlands (pre-construction) were preserved and rehabilitated. Preserved wetland areas at higher elevations appear to be losing hydrology and transitioning into upland communities with some excavated wetland cells retaining hydrology.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of pre-existing slope/depressional wetland areas located within a historic gravel pit/wetland site. Wetland mitigation constructed was completed in early spring 2013 and 2019 is the seventh monitoring year for the expanded wetland site. Land use surrounding the AA includes commercial developments, agriculture (grazing), transportation (railroad and interstate), and a shooting range within the site.

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	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Emergent wetland community is dominant with areas of scrub-shrub wetland.

Wetland/Site #(s): Kindsfater - preservation wetland

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): USFWS list for species in Yellowstone 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 Plains spadefoot (S3)
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
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in subsequent site visits.

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: Expect wildlife use/rating to increase for subsequent monitoring years as vegetation becomes more established and weed control efforts are implemented.

Wetland/Site #(s): Kindsfater - preservation wetland

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**

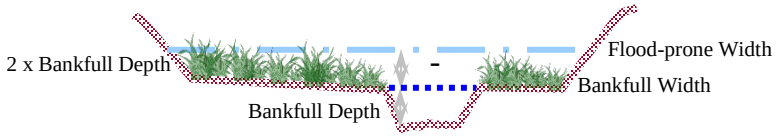
iii. Final Score and Rating: _ **Comments:** No fish habitat within mitigation site; no perennial water

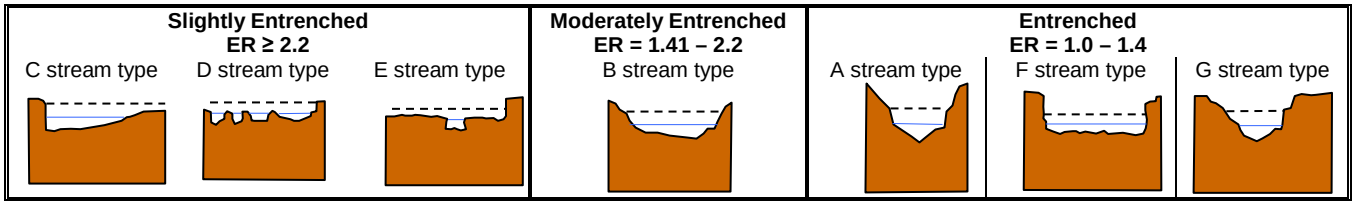
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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:** Wetlands are not subject to flooding via in-channel or overbank flow as there are no waterways on site.

Wetland/Site #(s): Kindsfater - preservation wetland

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: Estimated that AA ponds greater than 5 out of 10 years with approixmately 25 acres inundated to approximately 0.5 feet.

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**	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	.9H	---	---	---	---	---	---	---

Comments: Unrestricted drainage from the bench down to meadow below.

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%**	---	---	---
☐ **< 35%**	---	---	---

Comments: Wetlands do not occur along stream bank, open water not likely subject to wave action.

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

Wetland/Site #(s): Kindsfater - preservation wetland

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** = 0.8 ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** Surface outlet draining wetlands down-slope to meadow below site.

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: Saturation observed in portions of AA during dry season/drought conditions.

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)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Site is not unique for this area.

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)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Access is permitted without permission with the exception of the police shooting range.

15. GENERAL SITE NOTES: Constructed wetland areas were wetter in 2019 compared to 2018 but some areas appear to be losing hydrology and the vegetation communities are transitioning into upland.

Wetland/Site #(s): Kindsfater - preservation wetland

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	**25.83**	*
C. General Wildlife Habitat	mod 0.50	1.00	**14.35**	
D. General Fish Habitat	NA	NA	**0**	
E. Flood Attenuation	NA	NA	**0**	
F. Short and Long Term Surface Water Storage	high 0.90	1.00	**25.83**	*
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	**25.83**	*
H. Sediment / Shoreline Stabilization	NA	NA	**0**	
I. Production Export / Food Chain Support	mod 0.80	1.00	**22.97**	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	**20.09**	*
K. Uniqueness	low 0.30	1.00	**8.61**	
L. Recreation / Education Potential (bonus point)	high 0.20		**5.74**	
Total Points	**5.2**	**8**	**149.24 Total Functional Units**	
Percent of Possible Score 65% (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
Kindsfater
Yellowstone County, Montana

Kindsfater: Photo Point Photographs

	
Photo Point: 1. View of eastern edge of Cell 14 looking W Bearing: 280 degrees Year: 2013	Photo Point: 1. View of eastern edge of Cell 14 looking W Bearing: 280 degrees Year: 2019
	
Photo Point: 2. View of western side of Cell 13 looking SW Bearing: 280 degrees Year: 2013	Photo Point: 2. View of western side of Cell 13 looking SW Bearing: 280 degrees Year: 2019
	
Photo Point: 3. View of southern edge of Cell 9 looking NE Bearing: 0 degrees Year: 2013	Photo Point: 3. View of southern edge of Cell 9 looking NE Bearing: 0 degrees Year: 2019

Kindsfater: Photo Point Photographs

	
Photo Point: 4. View of Cell 12 looking S Bearing: 200 degrees Year: 2013	Photo Point: 4. View of Cell 12 looking S Bearing: 200 degrees Year: 2019
	
Photo Point: 5. View of Cell 11 looking SW Bearing: 10 degrees Year: 2013	Photo Point: 5. View of Cell 11 looking SW Bearing: 10 degrees Year: 2019
	
Photo Point: 6. View of western side of Cell 10 looking SW Bearing: 150 degrees Year: 2013	Photo Point: 6. View of western side of Cell 10 looking SW Bearing: 150 degrees Year: 2019

Kindsfater: Photo Point Photographs

	
Photo Point: 7. View of western side of Cell 5 looking east Bearing: 90 degrees Year: 2013	Photo Point: 7. View of western side of Cell 5 looking east Bearing: 90 degrees Year: 2019
	
Photo Point: 8. View of western edge of Cell 2 looking NW Bearing: 315 degrees Year: 2013	Photo Point: 8. View of western edge of Cell 2 looking NW Bearing: 315 degrees Year: 2019
	
Photo Point: 9. View of Cell 1 looking N Bearing: 90 degrees Year: 2013	Photo Point: 9. View of Cell 1 looking N Bearing: 90 degrees Year: 2019

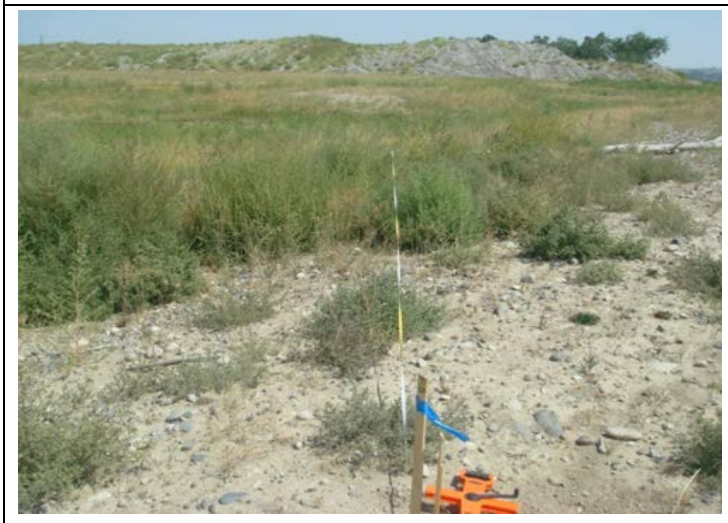
Kindsfater: Photo Point Photographs

	
Photo Point: 10. View of northern portion of Cell 3 looking SE Bearing: 140 degrees Year: 2013	Photo Point: 10. View of northern portion of Cell 3 looking SE Bearing: 140 degrees Year: 2019
	
Photo Point: 11. View of Cell 7 looking SE Bearing: 150 degrees Year: 2013	Photo Point: 11. View of Cell 7 looking SE Bearing: 150 degrees Year: 2019
	
Photo Point: 12. View of Cell 6 looking W Bearing: 230 degrees Year: 2013	Photo Point: 12. View of Cell 6 looking W Bearing: 230 degrees Year: 2019

Kindsfater: Transect Photographs

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2013

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2019



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2013

Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2019

Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2013

Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2019

Kindsfater: Transect Photographs

Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2013

Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2019

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2013

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2019

Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2013

Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2019

Kindsfater: Data Point Photographs

Data Point: DP-1W Location: Veg Community 16
Year 2019

Data Point: DP-1U Location: Veg Community 4/14
Year 2019

Data Point: DP-2W Location: Veg Community 8
Year 2019

Data Point: DP-2U Location: Veg Community 15
Year 2019

Data Point: DP-3W Location: Veg Community 11
Year 2019

Data Point: DP-3U Location: Veg Community 14
Year 2019

Kindsfater: Data Point Photographs

	
Data Point: DP-4W Location: Veg Community 10 Year 2019	Data Point: DP-4U Location: Veg Community 14 Year 2019