EASTON RANCH MITIGATION SITE

Project Overview

Watershed: Watershed #13 – Upper Yellowstone River Basin

Monitoring Year: 2019

Years Monitored: 10th year of monitoring

Corps Permit Number: NWO-2006-90370-MTB

Monitoring Conducted By: RESPEC/HDR/Trec for MDT

Dates Monitoring Was Conducted: July 26, 2019

Purpose of the Approved Project:

The site was constructed to provide 27.41 acres of compensatory wetland mitigation credits for wetland impacts associated with future transportation project-related wetland impacts in Watershed #13 – Upper Yellowstone River Basin. Construction entailed excavating a series of wetland cells and a flood channel that bisects the 32.65-acre mitigation area. The wetland project was designed to increase flood storage, improve wildlife habitat, and restore riparian and wetland habitat that had been impacted by past agricultural practices within the Shields River Watershed. The project includes creating, restoring, and preserving wetlands as well as establishing an upland buffer around project wetlands.

Site Location:

Latitude: 46.329611 **Longitude:** –110.382625

County: Meagher **Nearest Town:** Wilsall, MT

Map Included: Yes

Mitigation Site Construction Started: 2009 **Construction Ended:** 2009

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

Activity: Weed Spraying **Date:** July 2, 2019 **Specific recommendations for any additional corrective actions:** Weed treatment will continue in 2020.

Activity: Ditch Cleaning **Date:** June 24, 2019 **Specific recommendations for any additional corrective actions:** Periodic cleaning of irrigation delivery ditch to facilitate water delivery into the northeastern corner of the mitigation site.

Anticipated Wetland Credit Acres: 27.41

Wetland Credit Acres Generated to Date: 13.10

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 Easton Ranch 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	Meet the three parameter criteria for hydrology, vegetation, and soils as outlined in the 1987 Wetland Delineation Manual and 2010 Mountains, Valleys, Coast Region.	Y	Areas identified as wetland habitat within the mitigation site meet the three parameter criteria.
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 of 12.5 percent of the growing season.
	Groundwater wells will be left undisturbed within the site for the purpose of monitoring groundwater elevations during the growing season.	N	No groundwater wells remain on site. Because of construction activities, the original monitoring wells were removed from the site.
	Groundwater is filling the depressional wetlands excavated into the upland areas of the site.	Y	Indicators of groundwater filling the depressional wetlands include sparsely vegetated concave surfaces, saturation to the surface, and inundation.
	Construction stream channel is stable.	Y	The constructed floodplain channel is stable with minimal bank erosion identified throughout the mitigation area.
Hydric Soil	Hydric soil conditions present or appear to be forming.	Y	Hydric soil characteristics, including redeoximorphic concentrations and depleted matrix, have developed throughout most of the constructed wetlands.
	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).
Woody Plants	Trees and shrubs will be installed and survival will be assessed.	Y	Trees and shrubs have been planted throughout the mitigation site and are assessed during each yearly monitoring visit.
	Scrub/shrub wetlands habitat will be achieved where 30 percent absolute cover by cuttings, planted, and volunteer woody plants is reached within the defined monitoring period or site is showing signs of progression toward that goal at the end of the defined monitoring period.	Y	Approximately 25 percent of the wetland areas identified within the site are dominated by woody vegetation. Planted woody species continue to survive and develop along the constructed flood channel. Natural recruitment of aspen, willows, and cottonwoods within the site continue to establish. The site appears to exhibit progress toward these success criteria.
Herbaceous Plants	At least 80 percent ocular vegetation coverage by desirable hydrophytic vegetation.	Y	Preferred hydrophytic vegetation consist of greater than 80 percent of total vegetation cover within delineated wetlands.

Performance Standards	Success Criteria	Criteria Achieved (Y/N)	Discussion
Wetland Acreage Development	Provide 27.41 net credit acres for the project area.	N	A total of 13.10 acres of wetland credit has been generated for the mitigation site and includes 9.63 acres of created wetland, 1.56 acres of restored wetland, 1.10 acres of preserved wetland, establishment of a 11.5-acre upland buffer, and 0.67-acre debit from project impacts.
	Emergent wetland habitat will be 70–75% of mitigation wetland.	N	Emergent wetland habitat comprises approximately 68% of total wetland areas delineated in 2019.
	Scrub/shrub wetland habitat will be 15–20% of wetland area.	Y	Scrub/shrub wetland habitat comprises approximately 30% of total wetland areas delineated in 2019.
	Open water will be < 5% of wetland area.	Y	Aquatic macrophytes habitat comprises approximately 2% of total wetland areas delineated in 2019. These inundated areas (<3-ft deep) seasonally fluctuate throughout the growing season and support a diversity of submergent and emergent vegetation. The intent of this criterion was to minimize the amount of deep open-water habitat greater than 3 feet in depth.
Floodplain Channel Restoration	Considered stable when banks are vegetated with a majority of deep-rooting riparian and wetland plant species.	Y	Streambanks along the constructed channel are vegetated with a diversity of deep-rooting and wetland plant species.
	Bank stability will be evaluated by reference reach comparison.	Y	Banks within the constructed floodplain channel are stable and compare to reference reach conditions with no signs of erosion or channel movement.
	Vegetation transect across the floodplain will be monitored.	Y	Vegetation transect across the floodplain has been monitored yearly and supports a prevalence of species with a root-stability index greater than 6.
Bank Stabilization (Shields River)	Area visually inspected and photo-documented.	Y	The results of annual inspection and photo documentation along the Shields River in the northwestern corner of the site are presented in the mitigation monitoring reports.
	Stability achieved when the banks are vegetated with a majority of deep-rooting riparian and wetland plant species.	N	The banks of the Shields River are generally dominated by upland pasture grasses. Soil lifts and the riprap installed along the bank are eroding near the northwestern corner of the site. Installed willow cuttings did not establish along this bank.
Upland Buffer	Noxious weeds do not exceed 10 percent cover within upland buffer area.	Y	Noxious weed cover is estimated to be 5 percent within the upland buffer.
	Any area disturbed within creditable buffer zone must have at least 50 percent aerial cover of non-weed species by end of monitoring period.	Y	Disturbed areas have established greater than 50 percent cover by non-weed species.
Weed Control	Less than 5 percent absolute cover of state-listed noxious weed species across the site.	Y	State-listed noxious weed species across the site is estimated to be 2 percent absolute cover.
Fencing	Install wildlife-friendly fencing along the easement boundaries.	Y	Wildlife-friendly fencing has been removed from the western and southern portions of the easement boundaries in an effort to promote wildlife movement across the wetland and the Shields River riparian corridor. The remaining fences are in good condition.
Monitoring	Monitor the site for a minimum period of 5 years or longer as determined by the USACE.	Y	Comprehensive site monitoring has been ongoing for approximately 10 years, since the completion of construction activities in 2009.

Summary Data

Wetland Delineation – The total wetland acreage delineated in 2019, including preexisting wetland areas, was 12.29 acres (as shown on figures in Appendix A), which is a slight increase of 0.70 acre since 2018. The total wetland area at the site has remained fairly constant over the 10 years of monitoring and ranges from a low of 11.53 in the first of year of monitoring in 2010 to a high of 12.64 in 2014. Yearly fluctuations in wetland acreage can be directly attributed to wetland hydrology, which is a combination of elevated groundwater and supplemental irrigation water that is released onto the site each summer.

Functional Assessment – Montana Wetland Assessment Method (MWAM) forms for the Easton Ranch Site are provided in Appendix B. Since monitoring began in 2010, the site has been divided into three Assessment Areas (AA) for the purpose of functional assessment. Creation, Restoration, and Preservation AAs all rate as Category II wetlands with moderate to high ratings for a number of parameters, including General Wildlife Habitat, MT Natural Heritage Program Species Habitat, Flood Attenuation, Short- and Long-Term Surface-Water Storage, and Sediment/Nutrient/Toxicant Removal.

Vegetation – A total of 180 plant species were identified on the site from 2010 through 2019. Four new species were identified at the site in 2019. Vegetation plant communities were identified by plant composition and dominance. The following seven upland and ten wetland vegetation community types were identified in 2019:

- Upland Type 1 – *Phleum pratense/Poa pratensis*
- Upland Type 10 – *Bromus inermis/Populus tremuloides*
- Upland Type 13 – *Bromus inermis/Phleum pratense*
- Upland Type 16 – *Elymus repens/Poa pratensis*
- Upland Type 17 – *Phleum pratense/Elymus repens*
- Upland Type 18 – *Lotus corniculatus/Phleum pretense*
- Upland Type 20 – *Lotus corniculatus/Populus balsamifera*
- Wetland Type 3 – *Carex spp.*
- Wetland Type 4 – *Salix drummondiana*
- Wetland Type 5 – *Populus balsamifera*
- Wetland Type 7 – Aquatic Macrophytes
- Wetland Type 11 – *Juncus spp.*
- Wetland Type 12 – *Eleocharis palustris/Typha latifolia*
- Wetland Type 14 – *Juncus spp./Populus balsamifera*
- Wetland Type 15 – *Juncus spp./Salix spp.*
- Wetland Type 19 – *Typha latifolia*
- Wetland Type 21 – *Carex spp./Juncus spp.*

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 site monitoring form in Appendix B. Photographs of the transect end points are provided in Appendix C. Table 2 summarizes the data for Transect T-1. T-1 is 1,376 feet long; runs south to north across the east side of the site (Figure A-2, Appendix A); and intersects upland

community Types 1, 10, 16, 17, and 18 and wetland community Types 7, 11, 15, and 21. Eighty-one percent of the transect crossed wetland habitat, which is the same as 2018. Total vegetative cover has remained relatively constant at 85–89 percent from 2016 to 2019.

Table 2. Data Summary for T-1 From 2016 Through 2019 at the Easton Ranch Site

Monitoring Year	2016	2017	2018	2019
Transect Length (feet)	**1,376**	**1,376**	**1,376**	**1,376**
Vegetation Community Transitions Along Transect	14	14	12	12
Vegetation Communities Along Transect	6	6	8	10
Hydrophytic Vegetation Communities Along Transect	2	2	4	4
Total Vegetative Species	54	58	50	52
Total Hydrophytic Species	34	41	32	32
Total Upland Species	20	17	18	20
Estimated % Total Vegetative Cover	85	85	89	89
Estimated % Unvegetated	15	15	11	11
% Transect Length Comprising Hydrophytic Vegetation Communities	22.7	22.7	19.1	19.3
% Transect Length Comprising Upland Vegetation Communities	77.3	77.3	80.9	80.7
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0.0	0.0
% Transect Length Comprising of Mud Flat	0.0	0.0	0.0	0.0

Data collected on T-2 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in Table 3. T-2 is 1,333 feet long, runs north to south across the west side of the site, and intersects upland community Types 1, 13, and 18 and wetland community Types 3, 7, 11, 14, 15, and 21. Forty-six percent of the transect crossed wetland habitat in 2019 which is a 6 percent increase since 2018. Total vegetative cover along the transect was 95 percent in 2019.

Table 3. Data Summary for T-2 From 2016 Through 2019 at the Easton Ranch Site

Monitoring Year	2016	2017	2018	2019
Transect Length (feet)	**1,333**	**1,333**	**1,333**	**1,333**
Vegetation Community Transitions Along Transect	10	11	14	14
Vegetation Communities Along Transect	5	6	8	9
Hydrophytic Vegetation Communities Along Transect	3	4	5	6
Total Vegetative Species	61	58	54	59
Total Hydrophytic Species	41	45	44	46
Total Upland Species	20	13	10	13
Estimated % Total Vegetative Cover	85	85	87	90
Estimated % Unvegetated	15	15	13	10
% Transect Length Comprising Hydrophytic Vegetation Communities	40.4	40.5	40.9	46.1
% Transect Length Comprising Upland Vegetation Communities	59.6	59.5	59.1	53.9
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0.0	0.0
% Transect Length Comprising of Mud Flat	0.0	0.0	0.0	0.0

Data collected on T-3 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in Table 4. T-3 is 732 feet long, runs west to east across the south end of the site, and intersects upland community Types 1 and 13 and wetland community Types 11 and 14. Approximately 51 percent of the transect crossed wetland habitat in 2019 and total vegetative cover was 91 percent.

Table 4. Data Summary for T-3 From 2016 Through 2019 at the Easton Ranch Site

Monitoring Year	2016	2017	2018	2019
Transect Length (feet)	**732**	**732**	**732**	**732**
Vegetation Community Transitions Along Transect	4	4	6	6
Vegetation Communities Along Transect	3	3	4	4
Hydrophytic Vegetation Communities Along Transect	1	1	2	2
Total Vegetative Species	45	42	42	40
Total Hydrophytic Species	28	29	30	27
Total Upland Species	17	13	12	13
Estimated % Total Vegetative Cover	85	85	90	91
Estimated % Unvegetated	15	15	10	9
% Transect Length Comprising Hydrophytic Vegetation Communities	44.4	47.3	51.1	51.5
% Transect Length Comprising Upland Vegetation Communities	55.5	52.7	48.9	48.5
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0.0	0.0
% Transect Length Comprising of Mud Flat	0.0	0.0	0.0	0.0

Several hundred cuttings and containerized vegetative materials were planted along the constructed flood channel to increase channel stability. Consistent with monitoring activities of the past several years, a thorough survey of the project area was conducted in 2019 to locate and identify surviving cuttings and containerized saplings. Approximately 22 red-osier dogwood (*Cornus alba*), 48 sandbar willow (*Salix exigua*), 64 speckled alder (*Alnus incana*), and 65 willow cuttings were identified as surviving in 2019. The amount of woody volunteer species continues to increase, especially quaking aspen (*Populus tremuloides*) saplings along the northern and northeastern project boundaries in 2019. Volunteer thinleaf alder, sandbar willows, and cottonwoods were noted along the channel. All of the plants observed were well-established. Young cottonwoods were also observed along CT7, CT11, and CT18 (Transect 1). Thinleaf alder and red-osier dogwood were observed primarily along or within the channel. Additional volunteer cottonwoods were observed around the perimeter of CT5 located in the southern portion of the project.

During the July 2019 monitoring, seven small infestations of Canada thistle (*Cirsium arvense*), which is a Priority 2B noxious weed, were identified on site and were located primarily in uplands or along the site perimeter (Figure A-3, Appendix A). The cover classes ranged from a trace (< 1 percent), low (1–5 percent) to moderate (6–25 percent) cover. Canada thistle was observed in community Type 1 – *Phleum pratense/Poa pratensis*, Type 3– *Carex* spp., Type 5 – *Populus balsamifera*, Type 11 – *Juncus* spp., Type 13 – *Bromus inermis/Phleum pratense*, and Type 18 – *Lotus corniculatus/Phleum pratense* . One infestation of gypsy-flower (*Cynoglossum officinale*) was observed on site in community Type 1. One location of musk thistle (*Cardus nutas*) and common mullein (*Verbascum thapsus*), which are designated as noxious weeds by Park County, were also observed in community Types 18 and 11. Ongoing weed control/spraying has been very effective in reducing overall infestation size and density across the site, especially reducing the extent of gypsy-flower. Montana Department of Transportation (MDT) has an ongoing weed-control program and contractors sprayed weeds on July 2, 2019.

Hydrology – The hydrology for the site is supplied from multiple sources, including a shallow seasonal groundwater table, direct precipitation, surface runoff, flood flows from the adjacent Shields River, and surface-water diversion out of an irrigation canal. Approximately 25 percent of the site was inundated with surface water during the 2019 investigation at depths that ranged from 0 to 1.5 feet. A few of the wetland cells were saturated or inundated with shallow surface water during the July monitoring. Surface water was present in portions of the overflow channel and in a few other low areas across the site. However, surface-water levels were lower compared to 2018 as noted in depressions along Transects 1 and 2. Some signs of overland flow were noted along portions of Transect 2 with debris from high flows deposited along the stems/trunks of young trees and shrubs. Along Transect 3, signs of high flows were noted in the channel and included deposition and scour holes, but banks were generally well-vegetated and the channel bottom was stable and, in places, rocky.

Photographs – Photographs taken at photo points 1–7 (PP1 to PP7), transect endpoints, and data points 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 – Soil test pits were excavated at six locations and all were within what was originally mapped as the Meadowcreek soil series (Figure A-2, Appendix A). DP-1W, DP-2W, and DP-3W are located in areas that exhibited hydric soils. The soil at DP-1W, which is located within wetland community Type 14, consisted of a very dark gray (10YR 3/1) clay loam. This soil was disturbed during construction and is in the process of developing hydric characteristics. The paired upland soil test pit DP-1U revealed a very dark grayish-brown (10YR 3/2) silt loam and a dark brown (10YR 3/3) gravelly silt loam. The soil observed at this upland data point had no hydric soil indicators.

The profile at DP-2W, which is located within wetland community Type 11, revealed a very dark grayish-brown (10YR 3/2) silty clay loam with 2 percent dark yellowish-brown (10YR 4/6) redox concentrations at 6 inches. This soil did meet the criteria for redox dark surface (F6). The soils at DP-2W were saturated to the surface and groundwater was observed in the soil pit at 8 inches. The soil profile for DP-2U was also a very dark grayish-brown (10YR 3/2) silt loam, which lacked hydric soil indicators.

Soils at DP-3W, which is located within wetland community Type 4, were a very dark gray (10YR 3/1) silt loam in the upper 5 inches and a very dark grayish-brown (10YR 3/2) sandy silt loam to a depth of 20 inches with 3 percent dark yellowish-brown (10YR 4/6) redox concentrations that were noted at 5 inches. This soil did meet the criteria for the redox dark surface (F6). Primary hydrology indicators included saturation to the ground surface, water marks (scour), and sediment deposits. The paired upland data point DP-3U soils were very dark grayish-brown (10YR 3/2) silt loam, which lacked hydric soil or wetland hydrology indicators.

Wildlife – Sixteen bird species, three mammalian species, and one amphibian species were identified at the site in 2019 (Site Monitoring Form Appendix B). Bird boxes installed in 2017 were checked and appeared to be in good working condition. Of particular interest was the sighting of a black bear (*Ursus americanus*) near the mitigation site by MDT staff during a 2019 summer site visit**.**

Stream Bank Stabilization – During the 2013 high-flow event (spring 2013), significant bank erosion occurred immediately upstream of PP4B. This erosion exposed the riprap and undermined the riprap along an approximately 85-foot-long reconstructed bank and undermined the coir-wrapped soil lifts, which caused significant loss of soil and willow cuttings. Photo point PP4B, which is located on the southern side of the river, had to be relocated because of bank erosion and woody debris accumulation. Additional bank erosion has been noted since the dramatic lateral cutting event of 2013, and this section of bank remains exposed and vulnerable. The 2018 runoff period was supported by above-average precipitation in June. In 2019, bank erosion continues along the downstream or southern portion of the 85-foot-long bank and resulted in areas of undercutting or loss of finer textured subsoils.

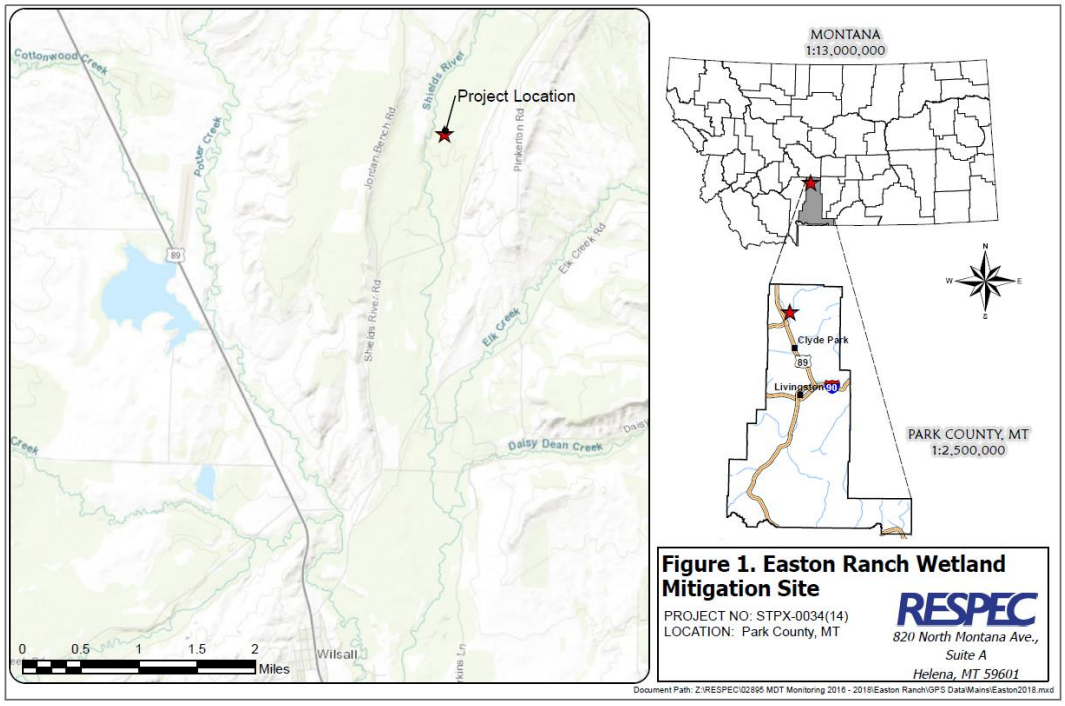
Credit Summary – Table 5 summarizes the estimated wetland credits based on the USACE-approved credit ratios and the wetland delineation completed in July 2019. Proposed mitigation included creating 24.95 acres of emergent and shrub/scrub wetlands, reestablishing a 1.56-acre flood channel, preserving 1.10 acres of preexisting wetland, and maintaining 6.43 acres of upland buffer. Proposed wetland credits for the project site totaled 27.41 credit acres, which accounted for 0.67 acre of impacts associated with constructing the mitigation wetland. The total mitigation credit estimated in 2019 totaled 13.1 credit acres, which is an increase of 0.7 acre since 2018. The site is still approximately 14.31 acres short of the original goal of 27.41 acres of credit.

Table 5. Wetland Mitigation Credits Estimated for the Easton Ranch Site (2016–2019)

Proposed Mitigation Features	Compensatory Mitigation Type	USACE Mitigation Ratios	Anticipated Final Credit Acreages	Proposed Final Wetland Credits (Acres)	2016 Wetland Acreages	2016 Credit Estimated (Acres)	2017 Wetland Acreages	2017 Credit Estimated (Acres)	2018 Wetland Acreages	2018 Credit Estimated (Acres)	2019 Wetland Acreages	2019 Credit Estimated (Acres)
Creation of palustrine emergent wetland via shallow excavation	Creation	1:1	24.95	24.95	9.34	9.34	9.79	9.79	8.93	8.93	9.63	9.63
Reestablishment of relic flood channel	Restoration (Reestablishment)	1:1	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56
Preservation of existing shrub/scrub and palustrine emergent wetland	Preservation	4:1	1.10	0.28	1.10	0.28	1.10	0.28	1.10	0.28	1.10	0.28
Establish a 50-foot-wide upland buffer	Upland Buffer	5:1	6.43	1.29	11.5	2.30	11.5	2.30	11.5	2.30	11.5	2.3
Project impacts			–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67
Total				**27.41**		**12.81**		**13.26**		**12.40**		**13.10**

Maps, Plans, Photos

Site Location Map



Project Area Maps/Figures: See Appendix A

Data Forms: See Appendix B (Site Monitoring form, Corps 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-Easton-Ranch.PDF

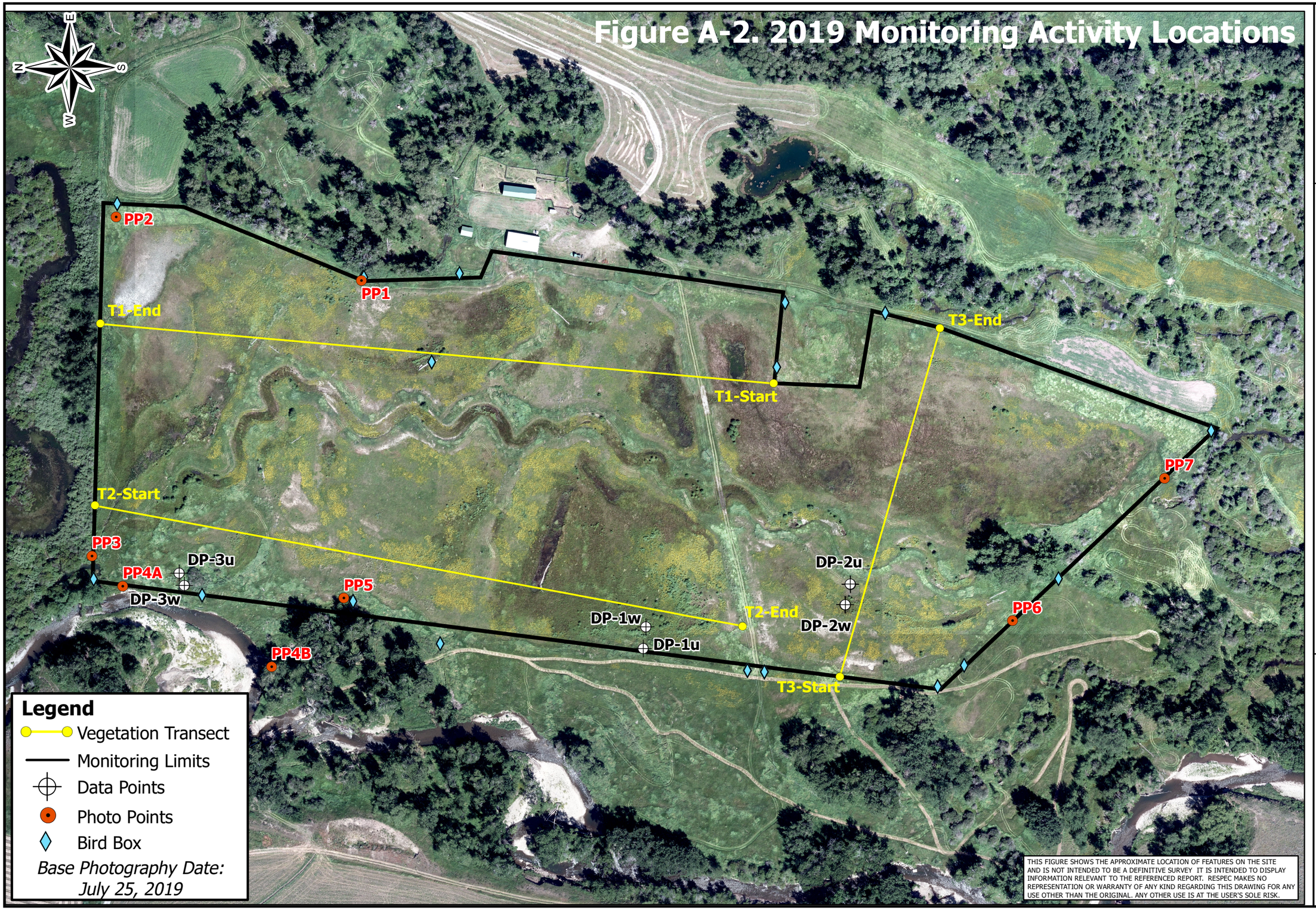
Conclusions

Based on the results of the tenth year of monitoring, the mitigation site is continuing an upward trend toward a diverse wetland ecosystem. The site is meeting all Performance Standards except for Wetland hydrology (groundwater wells), Wetland Acreage Development, Bank Stabilization (deep-rooting riparian vegetation establishment). Before the 2020 growing season, MDT will discuss the difficulties in meeting these performance standards and potential remedial actions to address the deficiencies. Depending on the outcome of this meeting, MDT may request amendments to these performance standards with the USACE.

APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Easton Ranch
Park County, Montana

Figure A-2. 2019 Monitoring Activity Locations



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

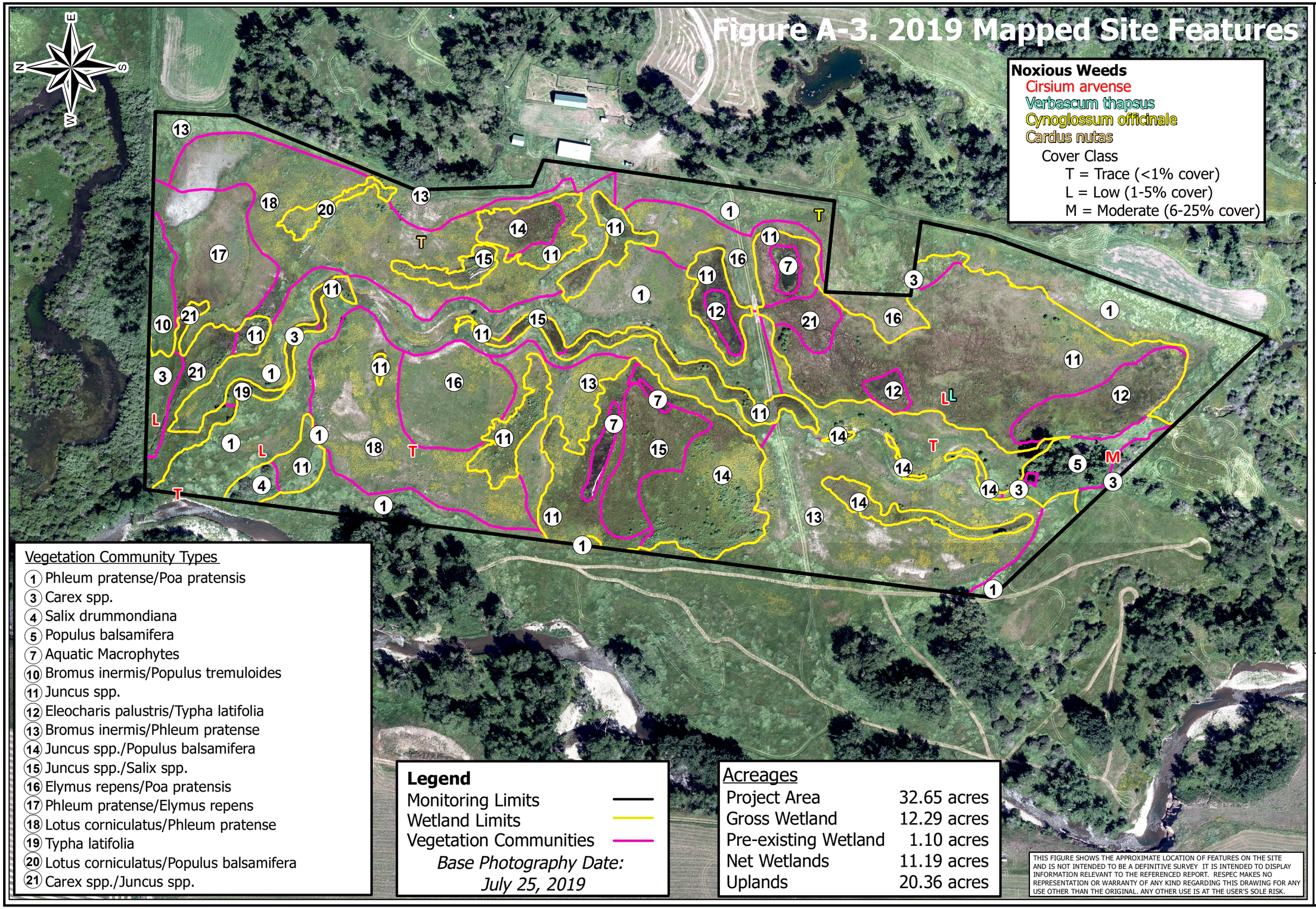
Easton Ranch Wetland Mitigation
2019 Monitoring Activity Locations

0 75 150 300 450 600 750 Feet

Project:	STPX-0034(14)
Location:	Park Co., Montana
Date:	December 2019
Project Manager:	M. Traxler
Drawn By:	JR/MP

File: R:\Projects\02895 MDT Monitoring 2016-2019\Easton Ranch\GPS Data\Mains\Monitor2019.mxd

Figure A-3. 2019 Mapped Site Features



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

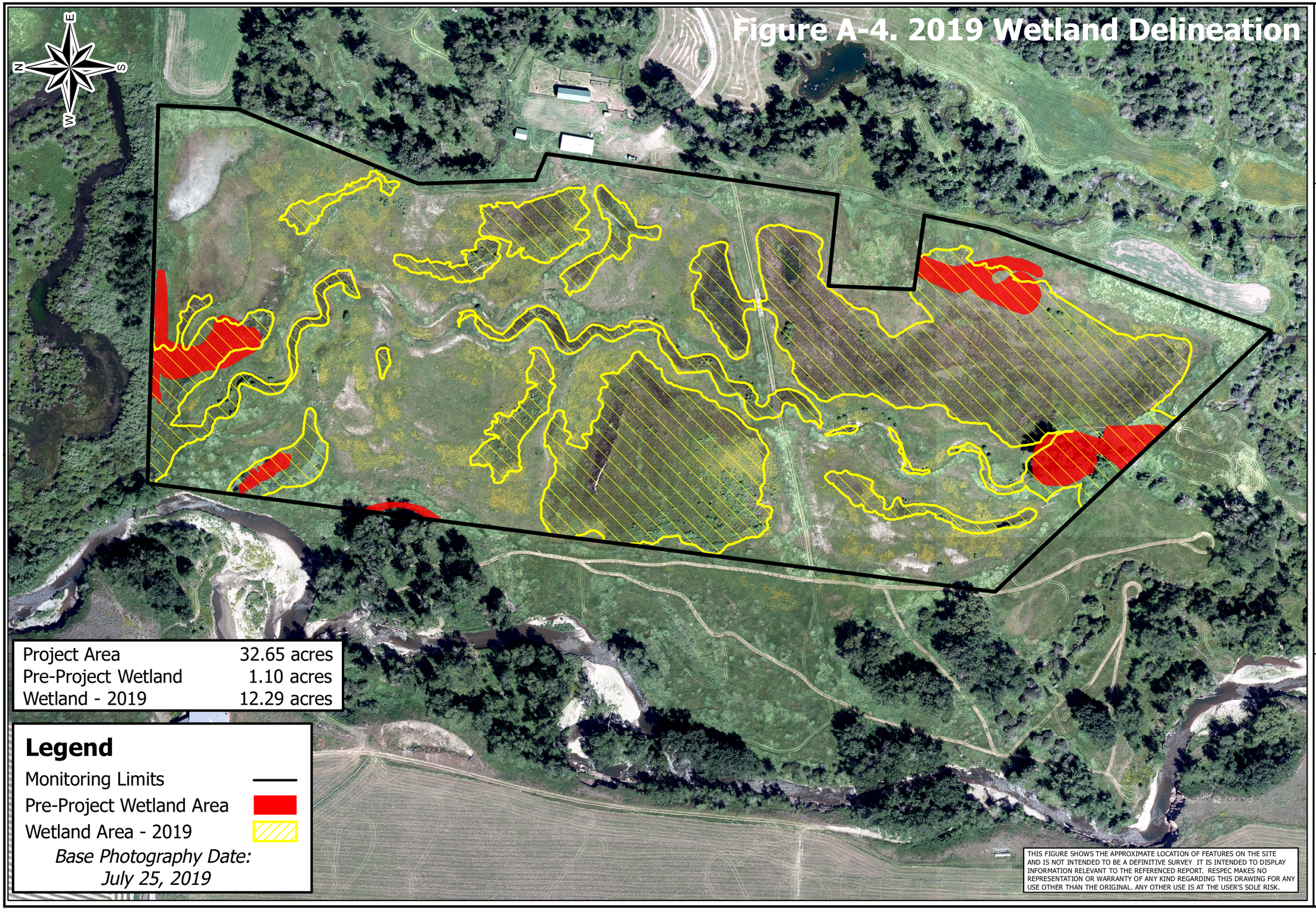
Easton Ranch Wetland Mitigation
2019 Mapped Site Features

0 75 150 300 450 600 750 Feet

Project:	STPX-0034(14)
Location:	Park Co., Montana
Date:	December 2019
Project Manager:	M. Traxler
Drawn By:	JR/MP

File: C:\Projects\02895 MDT Monitoring 2016-2019\Easton Ranch\GPS Data\Mains\Veg2019.mxd

Figure A-4. 2019 Wetland Delineation



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

Easton Ranch Wetland Mitigation
2019 Wetland Delineation

0 75 150 300 450 600 750 Feet

Project:	STPX-0034(14)
Location:	Park Co., Montana
Date:	December 2019
Project Manager:	M. Traxler
Drawn By:	JR/MP

File: R:\Projects\02895 MDT Monitoring 2016-2019\Easton Ranch\GPS Data\Mains\Delin2019.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Easton Ranch
Park County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Easton Ranch** Project Number: _____
Assessment Date: **July 26, 2019** Person(s) conducting the assessment: **T. Traxler, C. Hoschouer, C. Seibert**
Location: **Northeast of Wilsall** MDT District: **Butte** Milepost: **NA**
Legal Description: T **4N** R **9E** Section **32 NW 1/4** **0**
Weather Conditions: **Calm, Clear 60 F** Time of Day: **9 AM**
Initial Evaluation Date: **August 25, 2010** Monitoring Year: **9** # Visits in Year: **1**
Size of evaluation area: **32.65 acres** Land use surrounding wetland: **Agriculture, riparian corridor**

HYDROLOGY

Surface Water Source: **High groundwater, periodic overbank flow from the Shields River.**
Inundation: **Present** Average Depth: **0.2 feet** Range of Depths: **0 to 1.5 ft**
Percent of assessment area under inundation: **25%**
Depth at emergent vegetation-open water boundary: **0.5 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.):
Sediment deposits, channel scour and deposition, debris left around the base of young trees and shrubs, geomorphic position, FAC-neutral test, surface water, saturation, and dry season water table.

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
A few of the wetland cells were saturated or inundated with shallow surface water during the July monitoring. Surface water was present in portions of the overflow channel and in a few other low areas across the site. However surface water levels were lower compared to 2018 as noted in depressions along Transect 1 and 2. Some signs of overland flow were noted along portions of Transect 2 with debris from high flows deposited along the stems/trunks of young trees and shrubs. Along Transect 3, signs of high flows were noted in the channel and included deposition and scour holes but banks were generally well -vegetated and the channel bottom stable and in places rocky.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Phleum pratense/Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Phleum pratense	3 = 11-20%	Trifolium hybridum	1 = 1-5%
Poa pratensis	3 = 11-20%	Leymus cinereus	1 = 1-5%
Bromus inermis	3 = 11-20%	Carum carvi	1 = 1-5%
Poa palustris	2 = 6-10%	Salix spp.	1 = 1-5%
Elymus repens	2 = 6-10%	Agrostis stolonifera	1 = 1-5%
Trifolium pratense	2 = 6-10%	Populus balsamifera	1 = 1-5%

Comments / Problems: **In 2017, there is an increase in the cover by Lotus corniculatus and Trifolium species within this community. In 2018, starting to see more willow and cottonwood seedlings. In 2019, CT13 replaced CT1 along portions of the eastern boundary and along the road.**

Community Number:**3** Community Title (main spp): **Carex spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Carex utriculata	3 = 11-20%	Equisetum arvense	1 = 1-5%
Carex nebrascensis	2 = 6-10%	Poa palustris	1 = 1-5%
Carex atherodes	4 = 21-50%	Stachys palustris	1 = 1-5%
Carex pellita	2 = 6-10%	Juncus longstylis	1 = 1-5%
Juncus balticus	2 = 6-10%	Calamagrostis canadensis	1 = 1-5%
Scirpus microcarpus	2 = 6-10%	Mentha arvensis	1 = 1-5%

Comments / Problems: **This community type is diverse with a variety of species.**

Community Number: **4** Community Title (main spp): **Salix drummondiana**

Dominant Species	% Cover	Dominant Species	% Cover
Salix drummondiana	4 = 21-50%	Elymus repens	2 = 6-10%
Salix lutea	1 = 1-5%	Phleum pratense	2 = 6-10%
Scirpus microcarpus	2 = 6-10%	Ribes lucustre	2 = 6-10%
Phalaris arundinacea	2 = 6-10%	Ribes inerme	2 = 6-10%
Carex nebrascensis	2 = 6-10%	Salix bebbiana	1 = 1-5%
Urtica dioica	2 = 6-10%	Mentha arvensis	1 = 1-5%

Comments / Problems: **Scrub-shrub community along the banks of the Shield River.**

Community Number: **5** Community Title (main spp): **Populus balsamifera**

Dominant Species	% Cover	Dominant Species	% Cover
Populus balsamifera	4 = 21-50%	Cirsium arvense	2 = 6-10%
Populus angustifolia	4 = 21-50%	Salix bebbiana	2 = 6-10%
Bromus inermis	2 = 6-10%	Scirpus microcarpus	2 = 6-10%
Glyceria striata	2 = 6-10%		
Salix lasiandra	2 = 6-10%		
Scutellaria lateriflora	2 = 6-10%		

Comments / Problems: **Small forested area along the southern project boundary.**

VEGETATION COMMUNITIES (continued)

Community Number: **7** Community Title (main spp): **Aquatic macrophytes**

Dominant Species	% Cover	Dominant Species	% Cover
Open water: Aquatic Macrophyte	5 = > 50%	Mentha arvensis	1 = 1-5%
Carex utriculata	2 = 6-10%	Carex pellita	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Glyceria grandis	1 = 1-5%
Juncus balticus, Juncus effusus	2 = 6-10%	Ruppia maritima	1 = 1-5%
Algae, green	3 = 11-20%	Salix lutea	1 = 1-5%
Typha latifolia	2 = 6-10%	Beckmannia syzigachne	1 = 1-5%

Comments / Problems: **This community type is stable with shallow open water with aquatic macrophytes and a diverse border of hydrophytic vegetation similar to 2016. Several new areas were mapped in 2018.**

Community Number: **8** Community Title (main spp): **Bromus inermis/Trifolium spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	3 = 11-20%	Lotus corniculatus	2 = 6-10%
Trifolium pratense	3 = 11-20%	Juncus balticus	2 = 6-10%
Trifolium hybridum	3 = 11-20%	Carex pachystachya	1 = 1-5%
Poa pratensis	3 = 11-20%	Potentilla gracilis	1 = 1-5%
Carum carvi	2 = 6-10%	Medicago lupulina	1 = 1-5%
Phleum pratense	2 = 6-10%	Salix lutea	+ = < 1%

Comments / Problems: **Small community type dominated by Bromus inermis and Trifolium but starting to see a shift toward more Poa pratensis and wetter species. In 2018, this CT was replaced by CT 18 due to the dominance of Lotus corniculatus and Phleum pratense.**

Community Number: **10** Community Title (main spp): **Bromus inermis/Populus tremuloides**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	4 = 21-50%	Leymus cinereus	1 = 1-5%
Populus tremuloides	3 = 11-20%	Poa pratensis	1 = 1-5%
Phleum pratense	3 = 11-20%	Lotus corniculatus	1 = 1-5%
Trifolium pratense	1 = 1-5%	Taraxacum officinale	1 = 1-5%
Elymus repens	1 = 1-5%	Agrostis stolonifera	1 = 1-5%
Dactylis glomerata	2 = 6-10%	Cirsium arvense	+ = < 1%

Comments / Problems: **Small community type along the northern project boundary.**

Community Number: **11** Community Title (main spp): **Juncus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	4 = 21-50%	Poa palustris	2 = 6-10%
Juncus effusus, J. ensifolius	2 = 6-10%	Mentha arvensis	1 = 1-5%
Juncus longistylis	1 = 1-5%	Carex nebrascensis	1 = 1-5%
Carex utriculata	2 = 6-10%	Lotus corniculatus	1 = 1-5%
Carex aquatilis	1 = 1-5%	Salix spp.	1 = 1-5%
Agrostis stolonifera	1 = 1-5%	Deschampsia caespitosa	1 = 1-5%

Comments / Problems: **Diverse wetland community type with many more species recorded with a cover value of less than 1 percent. In 2017, Glyceria spp. was removed as a codominant, Glyceria grandis and Glyceria striata are still present but represent a low percent cover. In 2018 and 2019, noted Salix spp. , Alnus incana and Populus balsamifera seedlings across portions of CT 11.**

VEGETATION COMMUNITIES (continued)

Community Number: **12** Community Title (main spp): **Eleocharis palustris/Typha latifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	3 = 11-20%	Carex aquatilis	1 = 1-5%
Typha latifolia	4 = 21-50%	Ruppia maritina	1 = 1-5%
Carex utriculata	2 = 6-10%	Glyceria elata	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%	Juncus ensifolius	1 = 1-5%
Agrostis stolonifera	1 = 1-5%	Alopecurus pratensis	1 = 1-5%
Mentha arvensis	1 = 1-5%	Phalaris arundinacea	1 = 1-5%

Comments / Problems: **This community type was found in areas where surface water previously persisted for longer periods through the summer.**

Community Number: **13** Community Title (main spp): **Bromus inermis/Phleum pratense**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	3 = 11-20%	Leymus cinereus	1 = 1-5%
Phleum pratense	3 = 11-20%	Carum carvi	1 = 1-5%
Poa pratensis	2 = 6-10%	Juncus balticus	1 = 1-5%
Elymus repens	1 = 1-5%	Lotus corniculatus	2 = 6-10%
Trifolium pratense	2 = 6-10%	Agrostis stolonifera	1 = 1-5%
Salix exigua	1 = 1-5%	Populus balsamifera	1 = 1-5%

Comments / Problems: **In 2018, several areas previously mapped as CT 13 have transitioned to community types 16 or 18 due to the increase of Elymus repens or Lotus corniculatus and the reduction of Bromus inermis. In 2019, CT13 replaced a small portion of CT1 in the eastern portion of the property and along portions of the road.**

Community Number: **14** Community Title (main spp): **Juncus spp./Populus balsamifera**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	4 = 21-50%	Mentha arvensis	1 = 1-5%
Juncus effusus	2 = 6-10%	Salix bebbiana	1 = 1-5%
Populus balsamifera	4 = 21-50%	Agrostis stolonifera	1 = 1-5%
Populus angustifolia	2 = 6-10%	Carex nebrascensis	1 = 1-5%
Salix lutea	2 = 6-10%	Alnus incana	1 = 1-5%
Poa palustris	2 = 6-10%	Salix exigua	1 = 1-5%

Comments / Problems: **New community type mapped in 2016 found mainly within portions of constructed wetland cell 3. Populus balsamifera seedlings were common across a portion of this cell, other young woody seedlings included Salix lutea, Salix exigua and Alnus incana.**

Community Number: **15** Community Title (main spp): **Juncus spp./Salix spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	4 = 21-50%	Salix exigua	1 = 1-5%
Juncus effusus	1 = 1-5%	Populus balsamifera	2 = 6-10%
Juncus tenuis	1 = 1-5%	Carex utriculata	1 = 1-5%
Salix lutea	3 = 11-20%	Carex nebrascensis	2 = 6-10%
Salix bebbiana	2 = 6-10%	Potentilla anserina	1 = 1-5%
Salix drummondiana	1 = 1-5%	Cicuta douglasii, Alnus incana	1 = 1-5%

Comments / Problems: **In 2017, portions of community types 11 and 14 have transitioned into a dominance of young willow seedlings representing greater than 30 percent of the total cover.**

VEGETATION COMMUNITIES (continued)

Community Number: **16** Community Title (main spp): **Elymus repens/Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	3 = 11-20%	Bromus inermis	2 = 6-10%
Poa pratensis	3 = 11-20%	Taraxacum officinale	2 = 6-10%
Phleum pratense	2 = 6-10%	Elymus cinereus	1 = 1-5%
Carum carvi	2 = 6-10%	Ranunculus macounii	+ = < 1%
Lotus corniculatus	2 = 6-10%	Bromus ciliatus	+ = < 1%
Trifolium pratense	1 = 1-5%	Populus balsamifera	+ = < 1%

Comments / Problems: **A new community type in 2018, primarily along the northwestern portion of the project. Noting a shift from Bromus inermis to more facultative species.**

Community Number: **17** Community Title (main spp): **Phleum pratense/Elymus repens**

Dominant Species	% Cover	Dominant Species	% Cover
Phleum pratense	4 = 21-50%	Lotus corniculatus	1 = 1-5%
Elymus repens	3 = 11-20%	Taraxacum officinale	1 = 1-5%
Poa pratensis	2 = 6-10%	Trifolium pratense	1 = 1-5%
Schedonorus pratensis	2 = 6-10%	Leymus cinereus	1 = 1-5%
Carum carvi	2 = 6-10%	Equisetum arvense	1 = 1-5%
Bromus inermis	1 = 1-5%		

Comments / Problems: **A small, well-defined community along the northern end of Transect 1 formerly CT 1. In 2019 this community expanded to the south.**

Community Number: **18** Community Title (main spp): **Lotus corniculatus/Phleum pratense**

Dominant Species	% Cover	Dominant Species	% Cover
Lotus corniculatus	4 = 21-50%	Juncus balticus	1 = 1-5%
Phleum pratense	3 = 11-20%	Populus balsamifera	1 = 1-5%
Poa pratensis, Carum carvi	2 = 6-10%	Medicago lupulina	1 = 1-5%
Trifolium hybridum	2 = 6-10%	Leymus cinereus	1 = 1-5%
Elymus repens	1 = 1-5%	Alnus incana	1 = 1-5%
Agrostis stolonifera	1 = 1-5%	Salix exigua	1 = 1-5%

Comments / Problems: **New community type mapped in 2018 found mainly across the northeastern portion of project site indicating an increase in soil moisture. Cover and density by Lotus corniculatus has been increasing over the past couple of years across CT 8, CT 13 and CT16.**

Community Number: **19** Community Title (main spp): **Typha latifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	5 = > 50%		
Carex utriculata	1 = 1-5%		
Water	4 = 21-50%		

Comments / Problems: **New community type mapped in 2019 generally noted in low areas across the northwestern corner along portions of the overflow channel. Usually noted in shallow surface water**.

VEGETATION COMMUNITIES (continued)

Community Number**: 20** Community Title (main spp): **Lotus corniculatus/Populus balsamifera**

Dominant Species	% Cover	Dominant Species	% Cover
Lotus corniculatus	4 = 21-50%	Agrostis stolonifera	1 = 1-5%
Populus balsamifera	3 = 11-20%		
Phleum pratense	3 = 11-20%		
Elymus repens	2 = 6-10%		
Equisetum arvense	1 = 1-5%		
Salix exigua	1 = 1-5%		

Comments / Problems: **A new community type mapped in 2019 in the northeastern corner of the project area replacing a small area within CT18. This new community type is anticipated to expand in the future based on the number of young cottonwoods noticed in this general area.**

Community Number: **21** Community Title (main spp): **Carex spp./Juncus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Carex pellita	3 = 11-20%	Agrostis stolonifera	2 = 6-10%
Carex pachystachya	3 = 11-20%	Equisetum arvense	1 = 1-5%
Carex nebrascensis	1 = 1-5%	Elymus repens	1 = 1-5%
Juncus balticus	4 = 21-50%	Poa pratensis	1 = 1-5%
Juncus longistylis	1 = 1-5%	Juncus effusus	1 = 1-5%
Juncus tenuis	1 = 1-5%	Bare ground/litter	3 = 11-20%

Comments / Problems: **A new community type mapped in 2019, within transects 1 and 2. Noting a shift or increase in Carex species within CT 11.**

Community Number: Community Title (main spp):

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems:

Community Number: Community Title (main spp):

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems:

Additional Activities Checklist:

☒ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
Red-osier dogwood	250	22	
Sandbar willow	250	48	
Thinleaf alder	500	64	
Willow cuttings	200	65	

Comments / Problems: **During the 2019 monitoring there were increases in the number of live species noted. The number of thinleaf alder continued to increase from 49 plants to 64 plants. Many of the larger thinleaf alder were 8 to 10 ft tall, robust and thriving where planted. The number of red-osier dogwoods observed also increased from 12 to 22. The dogwood were primarily along the channel with additional volunteer plants noted along Transect 2.**

Volunteer thinleaf alder, sandbar willows and cottonwoods were noted along the channel. All of the plants observed were well established. In addition, young cottonwoods were observed along CT7, CT11, and CT18 (Transect 1). Thinleaf alder and red-osier dogwood were observed primarily along or within the channel. Additional volunteer cottonwoods were observed around the perimeter of CT5 located in the southern portion of the project.

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **42 ft (station 0 to 42)**	
Vegetation Community Type: Carex spp./Juncus spp.	
Plant Species	**Cover**
Carex pellita	3 = 11-20%
Carex pachystachya	3 = 11-20%
Carex nebrascensis	1 = 1-5%
Juncus balticus	4 = 21-50%
Juncus longistylis	2 = 6-10%
Juncus tenuis	2 = 6-10%
Juncus effusus	1 = 1-5%
Agrostis stolonifera	2 = 6-10%
Equisetum arvense	1 = 1-5%
Elymus repens	1 = 1-5%
Poa pratensis	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **22 ft (station 42 to 64)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus, Juncus effusus	5 = > 50%
Juncus ensifolius	1 = 1-5%
Salix bebbiana	1 = 1-5%
Carex nebrascensis	1 = 1-5%
Carex utriculata	1 = 1-5%
Carex pellita	1 = 1-5%
Equisetum arvense	1 = 1-5%
Phleum pratense	1 = 1-5%
Litter	2 = 6-10%
Ponded water	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **36 ft (station 64 to 100)**	
Vegetation Community Type: Aquatic macrophytes	
Plant Species	**Cover**
Open water	5 = > 50%
Carex utriculata	2 = 6-10%
Eleocharis palustris	2 = 6-10%
Juncus balticus, Juncus effusus	2 = 6-10%
Carex pellita	1 = 1-5%
Typha latifolia	2 = 6-10%
Juncus ensifolius	1 = 1-5%
Algae, green	3 = 11-20%
Salix lutea	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%
Mentha arvensis	1 = 1-5%
Glyceria grandis	
Total Vegetative Cover:	50%

Transect Interval Length: **37 ft (station 100 to 137)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus, Juncus effusus	5 = > 50%
Carex utriculata, Carex aquatilis	2 = 6-10%
Salix bebbiana, Salix lutea	1 = 1-5%
Carex nebrascensis	1 = 1-5%
Epilobium ciliatum	1 = 1-5%
Agrostis stolonifera	+ = < 1%
Poa pratensis	+ = < 1%
Phleum pratensi	+ = < 1%
Poa palustris	+ = < 1%
Mentha arvensis	+ = < 1%
Juncus ensifolius	+ = < 1%
Ponded water	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **56 ft (station 137 to 193)**	
Vegetation Community Type: Elymus repens/Poa pratensis	
Plant Species	**Cover**
Elymus repens	4 = 21-50%
Poa pratensis	3 = 11-20%
Phleum pratensis	2 = 6-10%
Agrostis stolonifera	2 = 6-10%
Lotus corniculatus	1 = 1-5%
Cirsium arvense	+ = < 1%
Poa palustris	+ = < 1%
Stachys palustris	+ = < 1%
Leymus cinereus	+ = < 1%
Taraxcum officinale	+ = < 1%
Litter	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **70 ft (station 193 to 263)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	2 = 6-10%
Alopecurus arundinaceus	3 = 11-20%
Open water	4 = 21-50%
Salix lutea, Salix bebbiana, Salix exigua	3 = 11-20%
Scirpus microcarpus, Glyceria grandis	2 = 6-10%
Typha latifolia	2 = 6-10%
Populus balsamifera	1 = 1-5%
Carex utriculata, Carex aquatilis	2 = 6-10%
Lotus corniculatus, Poa pratensis, Agrostis stolonifera	1 = 1-5%
Total Vegetative Cover:	85%

Transect Interval Length: **209 ft (station 263 to 472)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Poa pratensis	3 = 11-20%
Agrostis stolonifera	2 = 6-10%
Carum carvi, Carex nebrascensis	2 = 6-10%
Juncus balticus	1 = 1-5%
Trifolium hybridum, Trifolium pratense	1 = 1-5%
Populus trichocarpa	1 = 1-5%
Elymus repens	1 = 1-5%
Alopecurus arundinaceus, Deschampsia caespitosa	1 = 1-5%
Leymus cinereus	1 = 1-5%
Cirsium arvense, Taracum officinale	+ = < 1%
Lotus corniculatus, Melilotus officinalis	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **44 ft (station 472 to 516)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus, Juncus effusus, Juncus tenuis	4 = 21-50%
Juncus effusus, Juncus tenuis	3 = 11-20%
Poa pratensis	2 = 6-10%
Phleum pratense	1 = 1-5%
Carex pachystachya	1 = 1-5%
Schedonorus pratensis	1 = 1-5%
Stachys palustris	1 = 1-5%
Carex pachystachya	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Poa palustris	1 = 1-5%
Alopecurus pratensis	1 = 1-5%
Cirsium arvense	+ = < 1%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **66 ft (station 516 to 582)**	
Vegetation Community Type: Lotus corniculatus/Phleum pratense	
Plant Species	**Cover**
Lotus corniculatus	4 = 21-50%
Phleum pratense	3 = 11-20%
Alopecurus arundinaceus	3 = 11-20%
Poa pratensis, Poa palustris	3 = 11-20%
Carum carvi, Stachys palustris	1 = 1-5%
Elymus repens	1 = 1-5%
Rumex salicifolius	1 = 1-5%
Trifolium hybridum	1 = 1-5%
Carex pachystachya	1 = 1-5%
Agrostis stolonifera, Equisetum arvense	1 = 1-5%
Alnus incana, Populus balsamifera	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **15 ft (station 582 to 597)**	
Vegetation Community Type: Juncus spp./Salix spp.	
Plant Species	**Cover**
Juncus balticus, Juncus effusus	3 = 11-20%
Salix lutea, Salix exigua	3 = 11-20%
Agrostis stolonifera	3 = 11-20%
Lotus corniculatus	3 = 11-20%
Populus angustifolia	2 = 6-10%
Poa palustris	2 = 6-10%
Carex pellita, Carex pachystachya	1 = 1-5%
Poa pratensis	1 = 1-5%
Phleum pratense	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Bare soil	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **550 ft (station 597 to 1147)**	
Vegetation Community Type: Lotus corniculatus/Phleum pratense	
Plant Species	**Cover**
Lotus corniculatus	4 = 21-50%
Phleum pratense	3 = 11-20%
Trifolium pratense, Trifolium hybridum	2 = 6-10%
Carum carvi	2 = 6-10%
Poa pratense	2 = 6-10%
Juncus balticus	2 = 6-10%
Alnus incana	1 = 1-5%
Leymus cinereus	1 = 1-5%
Populus balsamifera	1 = 1-5%
Medicago lupulina	1 = 1-5%
Rumex salicifolius	1 = 1-5%
Taraxacum officinale	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **188 ft (station 1147 to 1335)**	
Vegetation Community Type: Phleum pratense/Elymus repens	
Plant Species	**Cover**
Phleum pratense	4 = 21-50%
Elymus repens	3 = 11-20%
Carum carvi	3 = 11-20%
Schedonorus pratensis	2 = 6-10%
Lotus corniculatus	3 = 11-20%
Poa pratensis	1 = 1-5%
Leymus cinereus	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Bromus inermis	1 = 1-5%
Cirsium arvense	+ = < 1%
Trifolium pratense	1 = 1-5%
Equisetum arvense	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **41 ft (station 1335 to 1376)**	
Vegetation Community Type: Bromus inermis/Populus tremuloides	
Plant Species	**Cover**
Bromus inermis	4 = 21-50%
Populus tremuloides	3 = 11-20%
Phleum pratense	3 = 11-20%
Carum carvi	2 = 6-10%
Poa pratensis	2 = 6-10%
Taraxacum officinale	2 = 6-10%
Dactylis glomerata	2 = 6-10%
Leymus cinereus	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Elymus repens	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Total Vegetative Cover:	95%

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: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185**° Note: _____

Transect Interval Length: **46 ft (station 0 to 46)**	
Vegetation Community Type: Carex spp.	
Plant Species	**Cover**
Carex nebrascensis	2 = 6-10%
Carex atherodes	4 = 21-50%
Carex utriculata, Carex pellita	2 = 6-10%
Poa pratensis, Poa palustris	1 = 1-5%
Juncus balticus	1 = 1-5%
Scirpus microcarpus	2 = 6-10%
Stachys palustris	1 = 1-5%
Juncus longistylis	1 = 1-5%
Calamagrostis canadensis	1 = 1-5%
Salix exigua	+ = < 1%
Equisetum arvense	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **22 ft (station 46 to 68)**	
Vegetation Community Type: Carex spp./Juncus spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Carex pellita, Carex atherodes, Carex bebbii	4 = 21-50%
Carex aquatilis	2 = 6-10%
Scirpus microcarpus	2 = 6-10%
Glyceria grandis	2 = 6-10%
Open water	3 = 11-20%
Typha latifolia	1 = 1-5%
Ranunculus macounii,	1 = 1-5%
Equisetum arvense, Poa palustris	1 = 1-5%
Salix bebbiana	1 = 1-5%
Salix lutea	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **45 ft (station 68 to 113)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratensis	3 = 11-20%
Poa pratensis	3 = 11-20%
Elymus repens	3 = 11-20%
Lotus corniculatus	2 = 6-10%
Stachys palustris	2 = 6-10%
Carex nebrascensis, Carex pellita	1 = 1-5%
Equisetum arvense	1 = 1-5%
Juncus balticus	1 = 1-5%
Cirsium arvense	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Dactylis glomerata, Phalaris arundinacea	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **23 ft (station 113 to 136)**	
Vegetation Community Type: Carex spp./Juncus spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Carex utriculata, Carex nebrascensis	4 = 21-50%
Carex atherodes, Carex pellita	2 = 6-10%
Salix bebbiana	1 = 1-5%
Salix lutea	2 = 6-10%
Scirpus microcarpus	2 = 6-10%
Poa palustris	2 = 6-10%
Ranunculus macounii	1 = 1-5%
Deschampsia caespitosa	1 = 1-5%
Poa pratensis	1 = 1-5%
Equisetum arvense	1 = 1-5%
Stachys palustris, Lysimachia ciliata	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185**° Note: _____

Transect Interval Length: **183 ft (station 136 to 319)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Poa pratensis	3 = 11-20%
Elymus repens	2 = 6-10%
Lotus corniculatus, Medicago sativa	2 = 6-10%
Equisetum arvense	2 = 6-10%
Trifolium pratense	2 = 6-10%
Taraxacum officinale	2 = 6-10%
Carum carvi, Agrostis stolonifera	1 = 1-5%
Salix lutea, Populus balsamifera	1 = 1-5%
Leymus cinereus, Populus balsamifera	1 = 1-5%
Lysimacha ciliata, Stachys palustris	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **39 ft (station 319 to 358)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus tenuis	1 = 1-5%
Poa palustris	2 = 6-10%
Poa pratensis, Phleum, pratense	1 = 1-5%
Salix bebbiana	1 = 1-5%
Salix lutea	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Agrostis stolonifera, Populus balsamifera	2 = 6-10%
Scirpus microcarpus	1 = 1-5%
Carex microptera	1 = 1-5%
Lysimacha ciliata, Stachys palustris	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **350 ft (station 358 to 708)**	
Vegetation Community Type: Lotus corniculatus/Phleum pratense	
Plant Species	**Cover**
Lotus corniculatus	4 = 21-50%
Phleum pratense	3 = 11-20%
Elymus repens	2 = 6-10%
Carum carvi	2 = 6-10%
Bromus carinatus	1 = 1-5%
Trifolium hybridum	2 = 6-10%
Leymus cinereus	1 = 1-5%
Trifolium pratense	1 = 1-5%
Camelina microcarpus	1 = 1-5%
Medicago lupulina, Melilotus officinalis	1 = 1-5%
Bromus inermis	1 = 1-5%
Schedonorus pratensis, Equisetum arvense	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **75 ft (station 708 to 783)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	1 = 1-5%
Juncus tenuis	1 = 1-5%
Phleum pratense	1 = 1-5%
Poa pratensis	2 = 6-10%
Salix lutea, Populus balsamifera	2 = 6-10%
Typha latifolia	1 = 1-5%
Poa palustris	1 = 1-5%
Salix bebbiana	1 = 1-5%
Solidago gigantea	1 = 1-5%
Agrostis stolonifera, Lysimacha ciliata	1 = 1-5%
Carex bebbii, Mentha arvensis	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185**° Note: _____

Transect Interval Length: **72 ft (station 783 to 855)**	
Vegetation Community Type: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Bromus inermis	3 = 11-20%
Phleum pratense	3 = 11-20%
Trifolium pratense	2 = 6-10%
Elymus repens, Juncus balticus	1 = 1-5%
Poa pratensis	1 = 1-5%
Carum carvi	1 = 1-5%
Populus balsamifera	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Lotus corniculatus	2 = 6-10%
Cirsium arvense	+ = < 1%
Salix exigua	+ = < 1%
Total Vegetative Cover:	85%

Transect Interval Length: **75 ft (station 855 to 930)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	2 = 6-10%
Lotus corniculatis	2 = 6-10%
Salix lutea	1 = 1-5%
Poa pratensis	1 = 1-5%
Poa palustris	2 = 6-10%
Schedonorus arundinacea	1 = 1-5%
Carex aquatilis	2 = 6-10%
Carex utriculata	1 = 1-5%
Mentha arvensis	1 = 1-5%
Cornus stolonifera	+ = < 1%
Total Vegetative Cover:	100%

Transect Interval Length: **27 ft (station 930 to 957)**	
Vegetation Community Type: Aquatic Macrophytes	
Plant Species	**Cover**
Open water	4 = 21-50%
Glyceria grandis	3 = 11-20%
Carex utriculata	2 = 6-10%
Carex pellita	1 = 1-5%
Alopecurus geniculatus	1 = 1-5%
Juncus balticus	1 = 1-5%
Juncus ensifolius	1 = 1-5%
Eleocharis palustris	2 = 6-10%
Schoenoplectus pungens	2 = 6-10%
Scirpus microcarpus	+ = < 1%
Cornus stolonifera	1 = 1-5%
Total Vegetative Cover:	60%

Transect Interval Length: **21 ft (station 957 to 978)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	2 = 6-10%
Carex utriculata	2 = 6-10%
Carex aquatilis	2 = 6-10%
Deschampsia caespitosa	1 = 1-5%
Scirpus microcarpus	1 = 1-5%
Schoenoplectus pungens	1 = 1-5%
Mentha arvensis	+ = < 1%
Cicuta douglasii	1 = 1-5%
Agrostis stolonifera	2 = 6-10%
Salix lutea, Salix drummondiana	+ = < 1%
Phalaris arundinacea	+ = < 1%
Total Vegetative Cover:	100%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Seibert, T. Traxler, C. Hoschouer**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185**˚ Note: _____

Transect Interval Length: **85 ft (station 978 to 1063)**	
Vegetation Community Type: Juncus spp./Salix spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	1 = 1-5%
Juncus tenuis	1 = 1-5%
Salix lutea	4 = 21-50%
Salix bebbiana	3 = 11-20%
Salix drummondiana	2 = 6-10%
Populus balsamifera	2 = 6-10%
Carex nebrascensis, Carex utriculata	1 = 1-5%
Mentha arvensis, Poa palustris	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Salix exigua, Potentilla anserina, Alnus incana	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **201 ft (station 1063 to 1264)**	
Vegetation Community Type: Juncus spp./ Populus balsamifera	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	2 = 6-10%
Populus balsamifera	4 = 21-50%
Salix lutea	3 = 11-20%
Poa palustris	3 = 11-20%
Salix drummondiana	2 = 6-10%
Agrostis stolonifera	2 = 6-10%
Salix bebbiana	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Mentha arvensis	1 = 1-5%
Carex utriculata	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **69 ft (station 1264 to 1333)**	
Vegetation Community Type: Bromus inermis/Phleum pratensis	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Bromus inermis	4 = 21-50%
Poa pratensis	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Populus balsamifera	2 = 6-10%
Taraxacum officinale	2 = 6-10%
Elymus repens	1 = 1-5%
Schedonorus pratensis	1 = 1-5%
Trifolium pratense	1 = 1-5%
Leymus cinereus	1 = 1-5%
Total Vegetative Cover:	75%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Hoschouer, T. Traxler, S. Seibert**
Transect Number: **3** Approximate Transect Length: **732 feet** Compass Direction from Start: **95˚** Note: _____

Transect Interval Length: **114 ft (station 0 to 114)**	
Vegetation Community Type: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Bromus inermis	3 = 11-20%
Phleum pratense	3 = 11-20%
Carum carvi	3 = 11-20%
Trifolium pratense	3 = 11-20%
Poa pratensis	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Elymus repens	1 = 1-5%
Taraxacum officinale, Leymus cinerus	1 = 1-5%
Leymus cinereus, Populus balsamifera	1 = 1-5%
Trifolium hybridum, Camelina microcarpa	1 = 1-5%
Bare ground	1 = 1-5%
Total Vegetative Cover:	85%

Transect Interval Length: **35 ft (station 114 to 149)**	
Vegetation Community Type: Juncus spp./ Populus balsamifera	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Lotus corniculatus	3 = 11-20%
Populus balsamifera	4 = 21-50%
Salix lutea	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Salix bebbiana	1 = 1-5%
Trifolium pratense	1 = 1-5%
Deschampsia caespitosa	1 = 1-5%
Equisetum arvense	1 = 1-5%
Trifolium hydridum	1 = 1-5%
Taraxacum officinale, Phleum pratense	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **59 ft (station 149 to 208)**	
Vegetation Community Type: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Bromus inermis	3 = 11-20%
Poa pratensis	2 = 6-10%
Carum carvi	3 = 11-20%
Taraxacum officinale	1 = 1-5%
Elymus repens	1 = 1-5%
Lotus corniculatus	2 = 6-10%
Equisetum arvense	1 = 1-5%
Leymus cinerus	1 = 1-5%
Melilotus officinalis	1 = 1-5%
Camelina microcarpa	1 = 1-5%
Cirsium arvense	+ = < 1%
Total Vegetative Cover:	85%

Transect Interval Length: **15 ft (station 208 to 223)**	
Vegetation Community Type: Juncus spp./Populus balsamifera	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Populus balsamifera	4 = 21-50%
Salix lutea	1 = 1-5%
Phleum pratense	1 = 1-5%
Poa pratensis	1 = 1-5%
Phleum pratense	1 = 1-5%
Sinapis arvensis	1 = 1-5%
Glyceria striata	1 = 1-5%
Mentha arvensis	1 = 1-5%
Rock	3 = 11-20%
Total Vegetative Cover:	90%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 26, 2019** Examiner: **C. Hoschouer, T. Traxler, C. Seibert**
Transect Number: **3** Approximate Transect Length: **732 feet** Compass Direction from Start: **95˚** Note: _____

Transect Interval Length: **125 ft (station 223 to 348)**	
Vegetation Community Type: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Phleum pratense	4 = 21-50%
Bromus inermis	3 = 11-20%
Carum carvi	2 = 6-10%
Lotus corniculatus	1 = 1-5%
Dactylis glomerata	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Equisetum arvense	1 = 1-5%
Juncus balticus	1 = 1-5%
Trifolium pratense	1 = 1-5%
Poa pratensis, Elymus repens	1 = 1-5%
Alopecurus pratensis	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **327 ft (station 348 to 675)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus longistylis	1 = 1-5%
Salix drummondiana	2 = 6-10%
Salix bebbiana	1 = 1-5%
Salix lutea, Cornus stolonifera	1 = 1-5%
Carex utriculata	1 = 1-5%
Populus balsamifera	1 = 1-5%
Cirsium arvense	1 = 1-5%
Solidago gigantea	+ = < 1%
Carex nebrascensis	+ = < 1%
Carex spp.	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **57 (station to 675 to 732)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Poa pratensis	3 = 11-20%
Bromus inermis	3 = 11-20%
Taraxacum officinale	1 = 1-5%
Carum carvi	1 = 1-5%
Agrostis stolonifera	2 = 6-10%
Dactylis glomerata	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Trifolium pratense	1 = 1-5%
Elymus repens	1 = 1-5%
Juncus balticus	+ = < 1%
Total Vegetative Cover:	95%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

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

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

Comments: **During the transect monitoring, a comprehensive list of all species noted within the different community types were recorded (along with a cover estimate value). Species with a rating of 1 or greater were generally included on the previous transect forms, species with less than 1 percent were generally not listed on the previous transect forms.**

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 (°)
PP1	1	East boundary 46.059727 /-110.637505	250
PP2	1	Northeast corner 46.061028 /-110.637207	200
PP3	1	Northeast corner 46.061188 /-100.639848	100
PP4	1A	Shields bank 46.060993 /-110.640121	170
PP4	1B	Shields bank 46.050705 /-110.640434	20
PP5	1	West boundary 46.059883 /-110.640404	90
PP6	1	Southwest corner 46.056175 /-110.64048	0
PP7	1	Southeast corner 46.055286 /-110.639137	340
T-1 Start	1	View of CT 11 and 7 46.057281 /-110.638306	5
T-1 End	1	View of CT 10 and 18 46.060627 /-110.637779	185
T-2 Start	1	View of CT 3 46.060139 /-110.639229	185
T-2 End	1	View of CT 1 46.057594 /-110.640343	0
T-3 Start	1	View of CT 13 46.056984 /-110.640656	95
T-3 End	1	View of CT 1 and 11 46.056114 /-110.637924	265
DP-1U	1	46.329611 /-110.382625	
DP-1W	1	46.32942 /-110.382480	
DP-2U	1	46.324991 /-110.382425	
DP-2W	1	46.32600 /-110.382440	
DP-3U	1	46.338212 / -110.382360	
DP-3W	1	46.338024 / -110.382414	

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? **No**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **Yes**
If yes, type of structure: **Bird boxes** How many? **17**
Are the nesting structures being used? **Yes**
Do the nesting structures need repairs? **No**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
White-tailed Deer	3	☐	☐	☐	
Frog	1	☐	☐	☐	
Muskrat	1	☒	☐	☐	
Elk		☐	☒	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: Several new bird boxes were installed and surveyed in 2017. Boxes were checked in 2019 and all appeared to be in good condition. Some are full of nesting materials and could be cleaned out.

BIRD SURVEY – FIELD DATA SHEET

Site: **Easton Ranch** Date: **7/26/19**
Survey Time: **8:30 AM** to **5 PM**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Goldfinch	2	F	WM UP				
American Robin	2	BD	WM				
Bald Eagle	1	FO	WM				
Common Yellowthroat	1	F	SS				
Golden Eagle	1	FO	WM				
Great Blue Heron	1	FO	WM				
Red-Winged Blackbirds	14	L	WM SS				
Sandhill Crane	2	FO	UP				
Wilson's Snipe	6	F	WM MA				
Wild Turkey	2	F	UP				
Brewer's Blackbird	4	L	WM SS				
Yellow-headed Blackbird	4	L	WM SS				
Mallard	1	FO	WM				
Mourning Dove	1	FO	WM UP				
Northern Flicker	1	FO	WM UP				
Killdeer	1	FO	WM				

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: _____

Notes:

Easton Ranch Plant list (2010-2019)

Scientific Names	Common Names	WMVC Indicator Status[1]
Achillea millefolium	Common Yarrow	FACU
Agrostis gigantea	Black Bent	FAC
Agrostis stolonifera	Spreading Bent	FAC
Algae, green	Algae, green	NL
Alisma gramineum	Narrow-Leaf Water-Plantain	OBL
Alnus incana	Speckled Alder	FACW
Alopecurus geniculatus	Marsh Meadow-Foxtail	OBL
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FAC
Alopecurus pratensis	Field Meadow-Foxtail	FAC
Alyssum alyssoides	Pale Alyssum	UPL
Amaranthus retroflexus	Red-Root	FACU
Arctium sp.	Burrdock	UPL
Asclepias speciosa	Showy Milkweed	FAC
Astragalus cicer	Cicer Milkvetch	UPL
Avena fatua	Wild Oats	UPL
Bassia scoparia	Mexican-Fireweed	FAC
Beckmannia syzigachne	American Slough Grass	OBL
Berteroa incana	Hoary False Alyssum	UPL
Bidens cernua	Nodding Burr-Marigold	OBL
Brassica kaber	Brassica kaber	UPL
Brassica napus	Turnip	UPL
Bromus arvensis	Field Brome	UPL
Bromus carinatus	California Brome	UPL
Bromus ciliatus	Fringed Brome	FAC
Bromus inermis	Smooth Brome	FAC
Bromus tectorum	Cheatgrass	UPL
Calamagrostis canadensis	Bluejoint	FACW
Carduus nutans	Nodding Plumeless-Thistle	UPL
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex atherodes	Wheat Sedge	OBL
Carex aurea	Golden-Fruit Sedge	FACW
Carex bebbii	Bebb's Sedge	OBL
Carex limosa	Mud Sedge	OBL
Carex microptera	Small-winged Sedge	FACU
Carex nebrascensis	Nebraska Sedge	OBL
Carex pachystachya	Thick-Head Sedge	FAC
Carex parryana	Parry's Sedge	FACW
Carex pellita	Woolly Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex rostrata	Swollen Beaked Sedge	OBL
Carex scoparia	Pointed Broom Sedge	FACW
Carex sp.	Sedge	NA
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL

Scientific Names	Common Names	WMVC Indicator Status[1]
Carex vesicaria	Lesser Bladder Sedge	OBL
Carum carvi	Caraway	FACU
Cassiope mertensiana	Western Moss-Heather	FACU
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium leptophyllum	Narrow-Leaf Goosefoot	FACU
Cicuta douglasii	Western Water-Hemlock	OBL
Cirsium arvense	Canadian Thistle	FAC
Cirsium douglasii	Douglas' Thistle	OBL
Cirsium vulgare	Bull Thistle	FACU
Conium maculatum	Poison-Hemlock	FAC
Convolvulus arvensis	Field Bindweed	UPL
Cornus alba	Red Osier	FACW
Cynoglossum officinale	Gypsy-Flower	FACU
Dactylis glomerata	Orchard Grass	FACU
Dasiphora fruticosa	Golden-Hardhack	FAC
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Herb Sophia	UPL
Dracocephalum sp.	Dragonhead	UPL
Eleocharis palustris	Common Spike-Rush	OBL
Elodea sp.	Waterweed	NA
Elymus cinereus	Great Basin Wildrye	UPL
Elymus repens	Creeping Wild Rye	FAC
Elymus sp.	Wild Rye	NA
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum arvense	Field Horsetail	FAC
Equisetum hyemale	Tall Scouring-Rush	FACW
Equisetum laevigatum	Smooth Scouring-Rush	FACW
Fragaria virginiana	Virginia Strawberry	FACU
Galium palustre	Common Marsh Bedstraw	OBL
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria elata	Tall Manna Grass	FACW
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Glycyrrhiza lepidota	American Licorice	FAC
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FAC
Juncus balticus	Baltic Rush	FACW
Juncus bufonius	Toad Rush	FACW
Juncus effusus	Lamp Rush	FACW
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus longistylis	Long-Style Rush	FACW
Juncus nevadensis	Sierran Rush	FACW
Juncus tenuis	Lesser Poverty Rush	FAC
Juncus torreyi	Torrey's Rush	FACW
Lappula occidentalis	Flatspine Stickseed	UPL

Scientific Names	Common Names	WMVC Indicator Status[1]
Larix occidentalis	Western Larch	FACU
Lepidium campestre	Field Pepperweed	UPL
Lepidium perfoliatum	Clasping Pepperwort	FACU
Leymus cinereus	Great Basin Lyme Grass	FAC
Lotus corniculatus	Garden Bird's-Foot-Trefoil	FAC
Lupinus argenteus	Silvery Lupine	UPL
Lycopus asper	Rough Water-Horehound	OBL
Lysimachia ciliata	**Fringed Yellow-Loosestrife**	**FACW**
Medicago lupulina	Black Medick	FACU
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Myriophyllum sp.	Water-Milfoil	NA
Panicum miliaceum	Proso Millet	UPL
Pascopyrum smithii	Western-Wheat Grass	FACU
Persicaria amphibia	**Water Smartweed**	**OBL**
Persicaria lapathifolia	Dock-Leaf Smartweed	FACW
Persicaria maculosa	Spotted Lady's-Thumb	FACW
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Plantago major	Great Plantain	FAC
Poa compressa	Flat-Stem Blue Grass	FACU
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Polypogon viridis	Beardless Rabbit's-Foot Grass	FACW
Populus angustifolia	Narrow-Leaf Cottonwood	FACW
Populus balsamifera	Balsam Poplar	FAC
Populus tremuloides	Quaking Aspen	FACU
Potamogeton gramineus	Grassy Pondweed	OBL
Potamogeton praelongus	White-Stem Pondweed	OBL
Potentilla anserina	Silverweed	OBL
Potentilla gracilis	Graceful Cinquefoil	FAC
Prunus virginiana	Choke Cherry	FACU
Pseudoroegneria spicata	Bluebunch Wheatgrass	UPL
Ranunculus aquatilis	White Water-Crowfoot	OBL
Ranunculus macounii	Macoun's Buttercup	OBL
Rhamnus alnifolia	Alder-Leaf Buckthorn	FACW
Ribes lacustre	Bristly Black Gooseberry	FAC
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Rumex salicifolius	Willow Dock	FACW
Ruppia maritima	Beaked Ditch-Grass	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW

Scientific Names	Common Names	WMVC Indicator Status[1]
Salix bebbiana	Gray Willow	FACW
Salix boothii	**Booth's Willow**	**FACW**
Salix drummondiana	Drummond's Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Salix lasiandra	Pacific Willow	FACW
Salix lutea	Yellow Willow	OBL
Schedonorus arundinaceus	Tall False Rye Grass	FAC
Schedonorus pratensis	Meadow False Rye Grass	FACU
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Scirpus pallidus	Pale Bulrush	OBL
Scutellaria galericulata	Hooded Skullcap	OBL
Scutellaria lateriflora	Mad Dog Skullcap	FACW
Silene latifolia	White Cockle or Campion	UPL
Sinapis arvensis	Corn Mustard	UPL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sisymbrium loeselii	Small Hedge Mustard	UPL
Sisyrinchium idahoense	Idaho Blue-eyed-Grass	FACW
Sisyrinchium montanum	Strict Blue-eyed-Grass	FAC
Solidago canadensis	Canadian Goldenrod	FACU
Solidago gigantea	Late Goldenrod	FACW
Sonchus arvensis	Field Sow-Thistle	FACU
Stachys palustris	Hairy Hedge-Nettle	FACW
Stellaria graminea	Grass-Leaf Starwort	FACU
Symphoricarpos albus	Common Snowberry	FACU
Symphyotrichum subspicatum	**Leafy-Bract American-Aster**	**FACW**
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	UPL
Tragopogon dubius	Meadow Goat's-beard	UPL
Trifolium arvense	Rabbit-foot Clover	UPL
Trifolium hybridum	Alsike Clover	FAC
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FAC
Triglochin maritima	Seaside Arrow-Grass	OBL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Urtica dioica	Stinging Nettle	FAC
Verbascum thapsus	Great Mullein	FACU
Vicia americana	American Purple Vetch	FAC
Xanthium strumarium	Rough Cockleburr	FAC

[1] 2016 NWPL (Lichvar *et al.*)

New species identified in 2019 are bolded.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Easton **City/County:** Park **Sampling Date:** 26-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** **S** 32 **T** 4N **R** 9E

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

Subregion (LRR): LRR E **Lat.:** 46.329611 **Long.:** -110.382625 **Datum:** NAD83

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes **NWI classification:** Upland

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

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

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

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

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

Remarks:
Upland sample point located near the western project boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Elymus repens	20	☑ 22.2%	FAC
2. Poa pratensis	20	☑ 22.2%	FAC
3. Phleum pratense	20	☑ 22.2%	FAC
4. Bromus inermis	10	☐ 11.1%	UPL
5. Taraxacum officinale	5	☐ 5.6%	FACU
6. Carum carvi	5	☐ 5.6%	FACU
7. Agrostis stolonifera	5	☐ 5.6%	FAC
8. Lotus corniculatus	5	☐ 5.6%	FAC
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	**= Total Cover**	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 10

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	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	10	x 4 =	40
UPL species	10	x 5 =	50
Column Totals:	90 (A)		300 (B)

Prevalence Index = B/A = 3.333

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Sample plot has a dominance of FAC species.

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

Soil

Sampling Point: DP-1U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	3/2	100						Silt Loam	roots, litter
4-14	10YR	3/2	100						Silt Loam	
14-18	10YR	3/3	100						Silt Loam	5% small rocks

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 observed within this data point.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

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

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No primary or secondary hydrology indicators observed during the site visit. Soils were moist in the upper 10" and dry below.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Easton **City/County:** Park **Sampling Date:** 26-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** **S** 32 **T** 4N **R** 9E

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

Subregion (LRR): LRR E **Lat.:** 46.32942 **Long.:** -110.38248 **Datum:** NAD83

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes **NWI classification:** Upland

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

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

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

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

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

Remarks:
Sample point located in a shallow depression near the western project boundary. Signs of overland flooding were observed in 2019.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1. Populus balsamifera	30	☑ 83.3%	FAC
2. Salix lutea	5	☐ 13.9%	OBL
3. Salix drummondiana	1	☐ 2.8%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	36	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Juncus balticus	50	☑ 58.8%	FACW
2. Poa palustris	10	☐ 11.8%	FAC
3. Carex aquatilis	10	☐ 11.8%	OBL
4. Carex nebrascensis	5	☐ 5.9%	OBL
5. Carex utriculata	5	☐ 5.9%	OBL
6. Agrostis stolonifera	3	☐ 3.5%	FAC
7. Mentha arvensis	1	☐ 1.2%	FACW
8. Deschampsia cespitosa	1	☐ 1.2%	FACW
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	85	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 15

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	25	x 1 =	25
FACW species	53	x 2 =	106
FAC species	43	x 3 =	129
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	121 (A)		260 (B)

Prevalence Index = B/A = 2.149

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Juncus wetland with increasing cover by Populus balsamifera and Salix species.

*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)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-14	10YR 3/1	100					Clay Loam	small gravel at bottom of pit

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☑ 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 soil may develop in the future (Indicators for 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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):	12

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Primary indicators include saturation at 12". Secondary indicators include geomorphic position and FAC-neutral test.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Easton **City/County:** Park **Sampling Date:** 26-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 32 T 4N R 9E

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

Subregion (LRR): LRR E **Lat.:** 46.324991 **Long.:** -110.382425 **Datum:** WGS84

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes **NWI classification:** Upland

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

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

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

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

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

Remarks:
Sample point established west of the channel on an upland bench between wetlands.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Elymus repens	30	☑ 33.7%	FAC
2. Bromus inermis	25	☑ 28.1%	UPL
3. Poa pratensis	15	☐ 16.9%	FAC
4. Phleum pratense	15	☐ 16.9%	FAC
5. Leymus cinereus	2	☐ 2.2%	FAC
6. Equisetum arvense	1	☐ 1.1%	FAC
7. Agrostis stolonifera	1	☐ 1.1%	FAC
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	89	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 11

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	64	x 3 =	192
FACU species	0	x 4 =	0
UPL species	25	x 5 =	125
Column Totals:	89 (A)		317 (B)

Prevalence Index = B/A = 3.562

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Sample plot has a dominance of Elymus repens and Bromus inermis. Bare ground 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	3/2	100						Silt Loam	
14-18	10YR	3/2	100						Silt Loam	with 10% rocks

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 observed within this data point. This area was subjected to historic plowing with the potential for a plow zone profile.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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 present.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Easton **City/County:** Park **Sampling Date:** 26-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 32 T 4N R 9E

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

Subregion (LRR): LRR E **Lat.:** 46.32600 **Long.:** -110.38244 **Datum:** WGS84

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes **NWI classification:** Upland

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

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

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

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

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

Remarks:
Wetland data point within a shallow depression near the southwestern project boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1. Alnus incana	10	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	10	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Juncus balticus	35	☑ 38.9%	FACW
2. Carex pellita	20	☑ 22.2%	OBL
3. Populus angustifolia	5	☐ 5.6%	FACW
4. Equisetum arvense	5	☐ 5.6%	FAC
5. Salix lutea	5	☐ 5.6%	OBL
6. Phleum pratense	5	☐ 5.6%	FAC
7. Salix drummondiana	5	☐ 5.6%	FACW
8. Lotus corniculatus	5	☐ 5.6%	FAC
9. Deschampsia cespitosa	5	☐ 5.6%	FACW
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 10

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	25	x 1 =	25
FACW species	60	x 2 =	120
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		190 (B)

Prevalence Index = B/A = 1.900

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Juncus wetland which has developed into a palustrine scrub-shrub based on the number of young Populus and Salix. Data point located in Community Type 14 - Juncus/Populus.

*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
0-6	10YR	3/2	100						Silt Loam	
6-12	10YR	3/2	98	10YR	4/6	2	RM	M	Silty Clay Loam	
12+										60% gravels 3" or less

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 observed within this data point. Redox noted at 6".

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Primary indicators include saturation to the surface. Secondary indicators include geomorphic position and FAC-neutral test.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Easton **City/County:** Park **Sampling Date:** 26-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 32 T 4N R 9E

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

Subregion (LRR): LRR E **Lat.:** 46.338212 **Long.:** -110.382360 **Datum:** WGS84

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes **NWI classification:** Upland

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

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

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

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

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

Remarks:
Dense vegetation in 2019.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Elymus repens	40	☑ 40.0%	FAC
2. Bromus inermis	30	☑ 30.0%	UPL
3. Poa pratensis	20	☑ 20.0%	FAC
4. Phleum pratense	5	☐ 5.0%	FAC
5. Dactylis glomerata	5	☐ 5.0%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	5	x 4 =	20
UPL species	30	x 5 =	150
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.650

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic 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)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Sample plot has a dominance of FAC species.

*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
0-2	10YR	3/1	100						Silt Loam	dense roots, litter
2-18	10YR	3/2	100						Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 observed within this data point.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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 moist in the upper 6" and dry below. No primary or secondary indicators present.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Easton **City/County:** Park **Sampling Date:** 26-Jul-19

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

Investigator(s): Cindy Hoschouer, Tanner Traxler **Section, Township, Range:** S 32 T 4N R 9E

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

Subregion (LRR): LRR E **Lat.:** 46.338024 **Long.:** -110.382414 **Datum:** WGS84

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes **NWI classification:** Upland

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

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

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

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

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

Remarks:

Data point established on the edge of Community type 4 - Salix drummondiana. Signs of overland flooding, including water marks and sediment deposits, were observed in 2019.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1. Salix drummondiana	30	☑ 81.1%	FACW
2. Salix lutea	5	☐ 13.5%	OBL
3. Ribes inerme	1	☐ 2.7%	FAC
4. Rosa woodsii	1	☐ 2.7%	FACU
5.	0	☐ 0.0%	
	37	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Phalaris arundinacea	30	☑ 50.0%	FACW
2. Elymus repens	20	☑ 33.3%	FAC
3. Poa palustris	10	☐ 16.7%	FAC
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%	
11.	0	☐ 0.0%	
	60	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 5

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	5	x 1 =	5
FACW species	60	x 2 =	120
FAC species	31	x 3 =	93
FACU species	1	x 4 =	4
UPL species	0	x 5 =	0
Column Totals:	97 (A)		222 (B)

Prevalence Index = B/A = 2.289

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrologic 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)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Willow community near the Shields River. Some bare soil from high water flows and scour.

*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)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR	3/1	100						Silt Loam	
5-20	10YR	3/2	97	10YR	4/6	3	RM	M	Sandy Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ 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 observed within this data point. Redox noted at 5".

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

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):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Primary indicators include saturation within the upper 12", water marks (scour), and sediment deposits. Secondary indicators include geomorphic position and FAC-neutral test. Soils saturated in the upper 6", moist below.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Easton Ranch **2. MDT Project #:** STPX-0034(14) **3. Control #:** 4866

3. Evaluation Date: 7/26/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Creation

6. Wetland Location(s): Township 4 N, Range 9 E, Section 32; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: NA

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

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)
9.63 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 9.63 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland	Excavated	Seasonal / Intermittent	71
Depressional	Aquatic Bed	Excavated	Seasonal / Intermittent	4
Riverine	Scrub-Shrub Wetland	Excavated	Seasonal / Intermittent	25

Comments: _____

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%.	---	low disturbance	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** Limited agriculture (hay) and a few ranch structures to the east. Undeveloped riparian corridor and herbaceous uplands to north, south, and west. A new house was built west of the Shield River on an upland terrace. Two species of noxious weeds were present within the AA. The AA is managed in a natural state, as are most of the lands within 500 feet of the AA.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of five constructed wetland cells. The lowest contours of the wetland cells are seasonally inundated and have developed wetland characteristics. The higher elevations lack wetland characteristics and support upland plant communities. The cells are bordered by limited agriculture (hay and food plots) and an undeveloped riparian corridor.

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: The AA consists of palustrine emergent wetlands (PEM), scrub-shrub (young PSS) and aquatic beds in the deeper depression.

Wetland/Site #(s): Creation

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

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

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

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

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

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

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

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

Primary or critical habitat (**list species**) ☒ D ☐ S Sandhill Crane (S5B,S2N)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☒ D ☐ S Golden Eagle (S3)
No usable habitat ☐ S

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

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

Sources for documented use (e.g. observations, records): MTNHP, 2013 and 2019 field observations. Sandhill Crane nesting documented by MDT staff in 2019.

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)	---	---	---	---	---	E	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **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**	.9H	---	---	---
☐ **Minimal**	---	---	---	---

Comments: There is a bald eagle (Haliaeetus leucocephalus) nest directly southwest of the site on the west side of the Shields River, the project site is within the primary habitat zone for bald eagles. In 2019 noted wild turkeys near the eastern project boundary as well as several white-tailed deer. Food plots located along portions of the eastern property boundary provide a supplemental food source for wildlife throughout the year.

Wetland/Site #(s): Creation

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:** Wetland cells are isolated from Shields River with no fish habitat present.

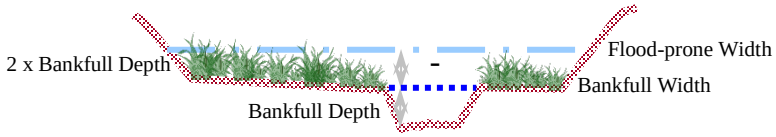
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

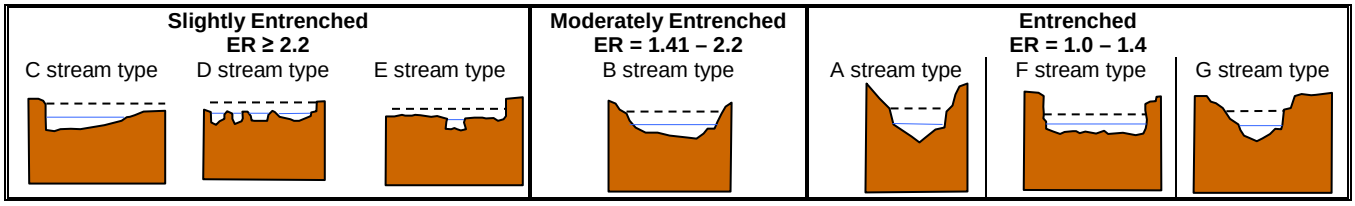
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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.

133 / 28 = 4.75

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**	---	.8H	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** AA receives overbank flow from Shields River during high flow events.

Wetland/Site #(s): Creation

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**	---	---	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	.8H	---	---	---	---	---	---	---

Comments: (9.63 acre wetland) * (1 ft. max depth at highwater) = 9.63 acre 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: There was evidence of ponding and flooding in 2011, 2012, 2014, 2015, 2016, 2017, 2018, and 2019. There was no evidence of ponding or flooding in 2013.

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

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

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

Comments: Deep-rooted species observed in 2019 include cattails, bulrush, spikerush, sedges and rushes.

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): Creation

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

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

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = .8H ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** Vegetated area greater than 5 acres with moderate level of biological activity and seasonal hydrology.

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: Shallow surface water or soil saturation across most of the constructed wetlands in 2019

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)	---	---	---	---	---	---	---	.4M	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Vegetation is becoming well established with tree and shrub seedlings colonizing the northern mitigation boundary and portions of wetland cell 3.

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

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

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

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

Known or Potential Recreational or Educational Area	**Known**	**Potential**
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	.05L

Comments: Permission is required for access to this site.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Creation

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	8.667	
C. General Wildlife Habitat	high 0.90	1.00	8.667	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	high 0.80	1.00	7.704	
F. Short and Long Term Surface Water Storage	high 0.80	1.00	7.704	*
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	8.667	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	5.778	
I. Production Export / Food Chain Support	high 0.80	1.00	7.704	*
J. Groundwater Discharge / Recharge	mod 0.70	1.00	6.741	
K. Uniqueness	mod 0.40	1.00	3.852	
L. Recreation / Education Potential (bonus point)	low 0.05		0.482	
Total Points	**6.85**	**10**	**65.966 Total Functional Units**	
Percent of Possible Score 68.5% (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: Easton Ranch **2. MDT Project #:** STPX-0034(14) **3. Control #:** 4866

3. Evaluation Date: 7/26/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Preservation

6. Wetland Location(s): Township 4 N, Range 9 E, Section 32; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: NA

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

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☐ **Mitigation wetlands; post-construction**
- ☒ **Other** Preserved PSS/PFO/PEM Habtiat

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

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 1.1 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Scrub-Shrub Wetland		Seasonal / Intermittent	10
Riverine	Forested Wetland		Seasonal / Intermittent	20
Riverine	Emergent Wetland		Seasonal / Intermittent	70

Comments: _____

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%.	---	low disturbance	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** AA consists of existing riverine PFO/PSS/PEM wetlands located adjacent to the created depressional wetlands and flood channel. AA and adjacent areas are managed in a natural state, disturbance is low.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA contains small areas of existing PFO/PSS/PEM wetlands located at the northwest (Shields River) and southcentral ends of the mitigation area. The existing PFO/PEM habitat located at the southern end of the AA receives direct hydrologic inputs from the created flood channel. Both wetland features are bordered by created wetlands and the Shields River riparian corridor.

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: PEM, PFO and PSS vegetated communties are present on site.

Wetland/Site #(s): Preservation

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

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

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

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

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

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

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

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

Primary or critical habitat (**list species**) ☒ D ☐ S Sandhill Crane (S5B,S2N)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☒ D ☐ S Golden Eagle (S3)
No usable habitat ☐ S

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

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

Sources for documented use (e.g. observations, records): MTNHP, 2013 field observations. Sandhill Crane nesting documented by MDT staff in 2019.

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)	---	---	---	---	---	E	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **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**	.9H	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Moderate use of site by moose, deer, golden eagle, and other avian species. There is a bald eagle (Haliaeetus leucocephalus) nest directly southwest of the site on the west side of the Shields River. The project site is within the primary habitat zone for bald eagles. Food plots east of the mitigation site will also encourage use by wildlife.

Wetland/Site #(s): Preservation

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

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

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

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

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

Duration of Surface 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 on site.

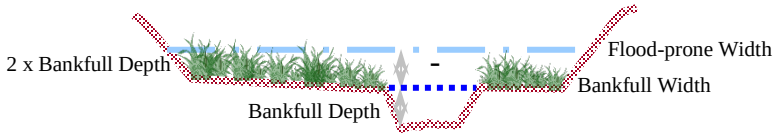
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

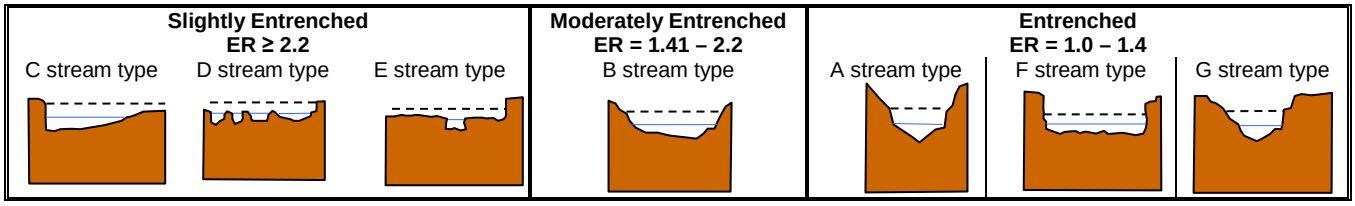
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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.

133 / 28 = 4.75

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**	---	.9H	---	---	---	---	---	---	---
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:** Approximately 30% of the preservation AA contains forested and/or scrub/shrub wetland with surface water outlet to the south into relic isolated channel. The Shields River is slightly entrenched at this location.

Wetland/Site #(s): Preservation

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: (1.10 acre of preserved wetland) x (approximate average of 1.0 ft. of inundation during high water) = 1.10 acre 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: Wetland vegetation cover exceeds 70%. AA contains restricted outlet.

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

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

% Cover of Wetland Streambank or Shoreline by Species with Stability 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: No shoreline in the project area.

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	---	---	---	---	---	---	.8H	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Preservation

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** = 0.90 ☐ **NO**

iv. Final Score and Rating: .9H **Comments:** There is a restricted surface water outlet to the south.

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: Shallow groundwater table documented during field investigations.

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)	---	---	---	---	.6M	---	---	---	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Site disturbance is low and structural diversity is high.

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

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

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

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

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	.05L

Comments: Permission is required for access to this site.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Preservation

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	0.99	
C. General Wildlife Habitat	high 0.90	1.00	0.99	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	high 0.90	1.00	0.99	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	0.66	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	1.1	*
H. Sediment / Shoreline Stabilization	NA	NA	0	
I. Production Export / Food Chain Support	high 0.90	1.00	0.99	*
J. Groundwater Discharge / Recharge	mod 0.70	1.00	0.77	*
K. Uniqueness	mod 0.60	1.00	0.66	
L. Recreation / Education Potential (bonus point)	low 0.05		0.055	
Total Points	**6.55**	**9**	**7.21 Total Functional Units**	
Percent of Possible Score 73% (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: Easton Ranch **2. MDT Project #:** STPX-0034(14) **3. Control #:** 4866

3. Evaluation Date: 7/26/2019 **4. Evaluator(s):** C. Hoschouer, T. Traxler, C. Seibert **5. Wetland/Site #(s):** Restoration

6. Wetland Location(s): Township 4 N, Range 9 E, Section 32; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: NA

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

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

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

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

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 1.56 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland	Excavated	Seasonal / Intermittent	97
Riverine	Scrub-Shrub Wetland	Excavated	Seasonal / Intermittent	3

Comments: _____

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%.	---	low disturbance	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** Limited agriculture (hay) and ranch structures to the east. Undeveloped riparian corridor and herbaceous uplands to north, south, and west. Two species of noxious weeds were present within the AA. The AA is managed in a natural state, as are most of the lands within 500 feet of the AA.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of one constructed secondary stream channel which bisects the mitigation area. The channel is active during high flow events, is seasonally inundated by shallow ground water early in the growing season and has developed wetland characteristics.

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: Planted shrubs along channel are surviving, cottonwood seedlings/root suckers were noted in the southern portion of the channel.

Wetland/Site #(s): Restoration

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

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

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

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

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

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

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

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

Primary or critical habitat (**list species**) ☐ D ☒ S Sandhill Crane (S5B,S2N)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☒ D ☐ S Golden Eagle (S3)
No usable habitat ☐ S

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

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

Sources for documented use (e.g. observations, records): MTNHP;observed on site in 2013. Sandhill Crane nesting documented by MDT staff in 2019.

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)	---	---	---	---	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **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: AA has frequent deer and moose sightings. Food plots located adjacent/east of the project boundary provide supplemental food for wildlife. There is a bald eagle (Haliaeetus leucocephalus) nest directly southwest of the site on the west side of the Shields River, the project site is within the primary habitat zone for bald eagles. .

Wetland/Site #(s): Restoration

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:** Although activated during high-flow events within the Shields River, no permanent fish habitat is present within AA.

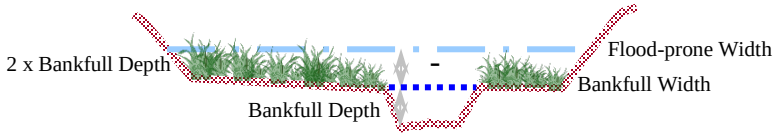
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

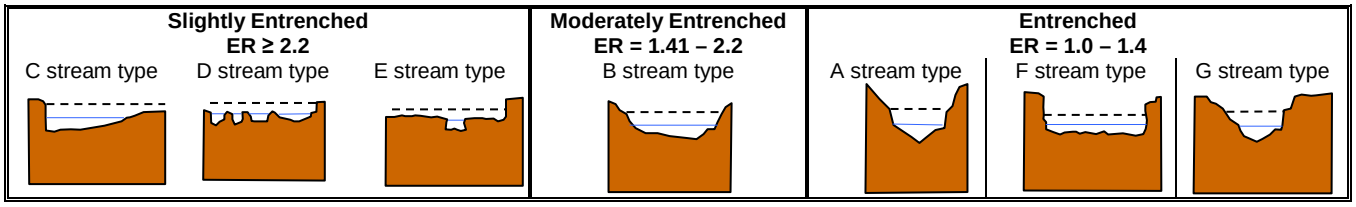
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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.

133 / 28 = 4.75

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**	---	---	.6M	---	---	---	---	---	---
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:** Outlet is restricted. AA subjet to overflow from Shields River and empties into old meanders of the Shields River at the south end of AA.

Wetland/Site #(s): Restoration

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: (1.56 acre of restoration) x (average 1 ft. ponding/flow at high water) = 1.56 acre 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: Cover in AA is greater than 70% and outlet is topographically restricted.

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%**	---	.9H	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: Increased vegetation development from 2013 to 2019 of species with high stability ratings including Salix, Betula, Carex, and Juncus species.

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	---	---	---	---	---	---	---	---	.6M	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Restoration

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** = 0.70 ☐ **NO**

iv. Final Score and Rating: .7M **Comments:** Channel is seasonally inundated and has a restricted outlet at the southern end of the mitigation 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: Channel is intermittently inundated by shallow groundwater and high flows from the Shields River.

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)	---	---	---	---	---	---	---	.4M	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Emergent wetland within seasonal flood channel. Common wetland type within basin with 10-50% of area wetlands similar to the constructed wetland vegetation.

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

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

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

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

Known or Potential Recreational or Educational Area	**Known**	**Potential**
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	.05L

Comments: Permission is required for site access.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Restoration

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	0.312	*
C. General Wildlife Habitat	mod 0.70	1.00	1.092	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.60	1.00	0.936	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	0.936	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	1.56	*
H. Sediment / Shoreline Stabilization	high 0.90	1.00	1.404	*
I. Production Export / Food Chain Support	mod 0.70	1.00	1.092	*
J. Groundwater Discharge / Recharge	mod 0.70	1.00	1.092	
K. Uniqueness	mod 0.40	1.00	0.624	
L. Recreation / Education Potential (bonus point)	low 0.05		0.078	
Total Points	**6.55**	**10**	**9.91 Total Functional Units**	
Percent of Possible Score 66% (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
Easton Ranch
Park County, Montana

Easton Ranch: Photo Point Photos

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2010

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2019

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2010

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2019

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2010

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2019

Easton Ranch: Photo Point Photos

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2010

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2019

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2010

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2019 – New location*

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2010

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2019

* new photo point location due to bank loss during high flows in 2018.

Easton Ranch: Photo Point Photos

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2010

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2019

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2010

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2019

Easton Ranch: Transect Photos

Transect 1: Start Location: Veg Com 8 foreground
Bearing: 5 degrees Year: 2010

Transect 1: Start Location: Veg Com 21 foreground
Bearing: 5 degrees Year: 2019

Transect 1: End Location: Veg Com 8 foreground
Bearing: 185 degrees Year: 2010

Transect 1: End Location: Veg Com 10 foreground
Bearing: 185 degrees Year: 2019

Transect 2: Start Location: Veg Com 1 foreground
Bearing: 185 degrees Year: 2010

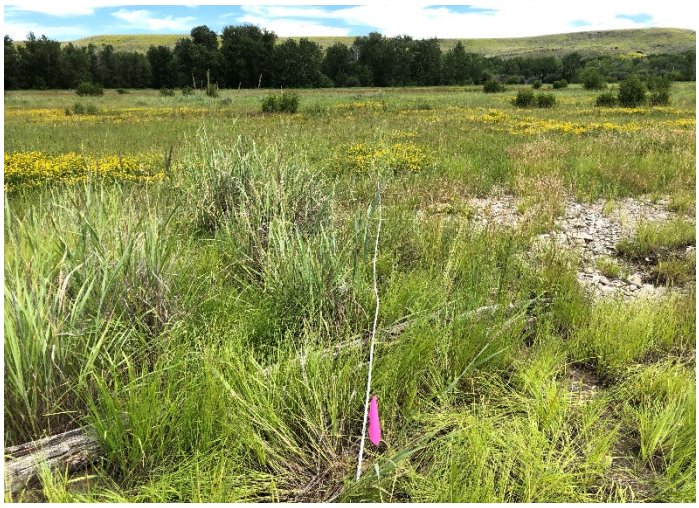
Transect 2: Start Location: Veg Com 3 foreground
Bearing: 185 degrees Year: 2019

Easton Ranch: Transect Photos

Transect 2: End Location: Veg Com 1 foreground
Bearing: 0 degrees Year: 2010

Transect 2: End Location: Veg Com 13 foreground
Bearing: 0 degrees Year: 2019

Transect 3: Start Location: Veg Com 1 foreground
Bearing: 95 degrees Year: 2010



Transect 3: Start Location: Veg Com 13 foreground
Bearing: 95 degrees Year: 2019

Transect 3: End Location: Veg Com 1 foreground
Bearing: 265 degrees Year: 2010

Transect 3: End Location: Veg Com 1 foreground
Bearing: 265 degrees Year: 2019

Easton Ranch: Data Point Photos

Data Point: DP1W Location: Veg Com 15
Year: 2019

Data Point: DP1U Location: Veg Com 1
Year: 2019

Data Point: DP2W Location: Veg Com 11
Year: 2019

Data Point: DP2U Location: Veg Com 13
Year: 2019

Data Point: DP3W Location: Veg Com 4
Year: 2019

Data Point: DP3U Location: Veg Com 1
Year: 2019