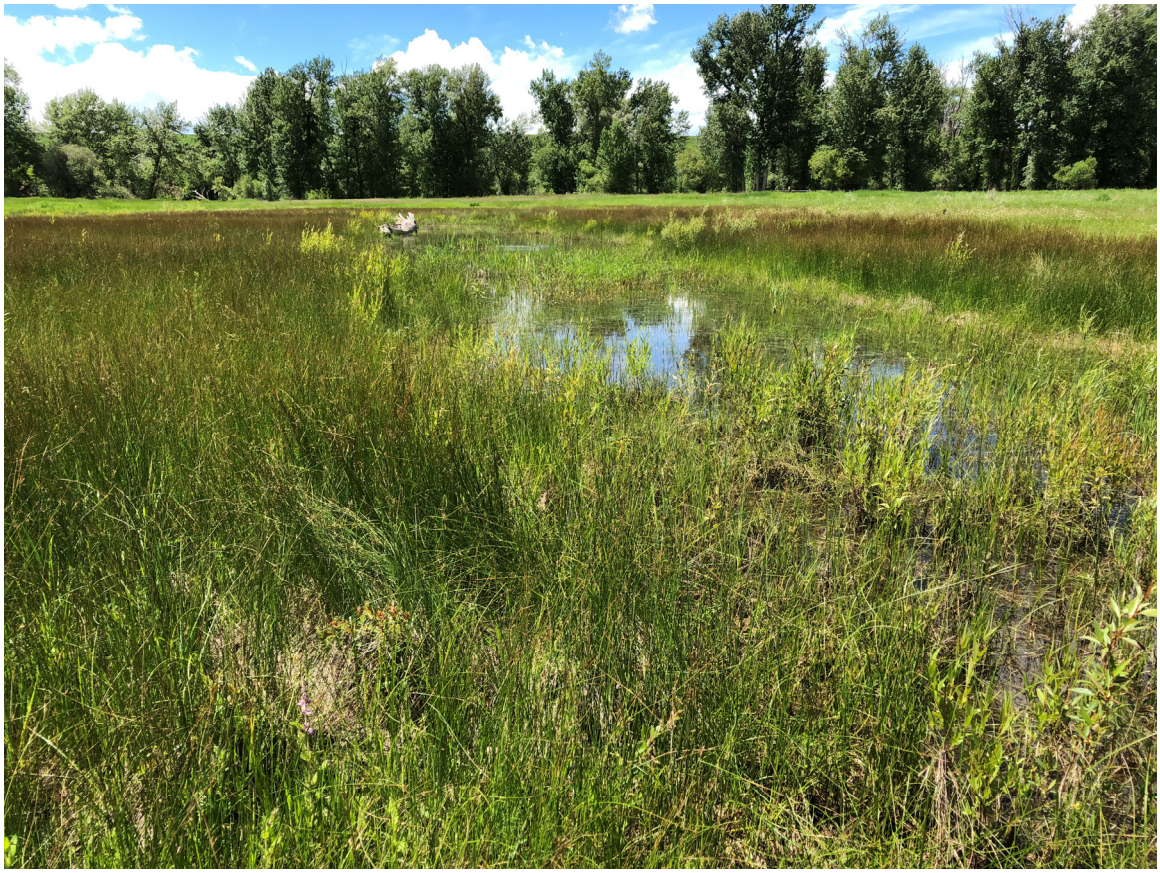
MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT

EASTON RANCH MITIGATION SITE
PARK COUNTY, MONTANA

PROJECT CONSTRUCTED: 2009

MONITORING REPORT #9: DECEMBER 2018



Prepared for:

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MONTANA DEPARTMENT OF TRANSPORTATION

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MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2018

EASTON RANCH
PARK COUNTY, MONTANA
CONSTRUCTED: 2009

MDT Project Number STPX-0034(14)
Control Number 4866

MFWP: SPA MDT R3-56-2008
USACE: NWO-2006-90370-MTB

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December 2018

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Cover: View looking north across community Types 7, 11, and 1.

1.0 INTRODUCTION

The 2018 Easton Ranch Wetland Mitigation Monitoring Report presents the results of the ninth year of post-construction monitoring at the Easton Ranch mitigation area. This Montana Department of Transportation (MDT) wetland mitigation site is located within Watershed #13 – Upper Yellowstone River Basin. Wetlands were developed at this location to provide compensatory mitigation for wetland impacts associated with transportation projects in the Butte District. The Easton Ranch site was selected after an extensive search of potential wetland and stream restoration sites by MDT within the Shields River Valley in cooperation with personnel from the Park Conservation District and the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Center in Livingston, Montana.

The Easton Ranch site is located within a 34.31-acre MDT Wetland Conservation Easement east of the Shields River within the boundaries of the larger Easton Family Ranch (the previous landowner). The wetland mitigation project at the Easton Ranch is located in the northwestern quarter of Section 32, Township 4 North, Range 9 East, Park County, Montana. The site is located approximately 3 miles east of US Highway 89 and 4 miles northeast of Wilsall, Montana, as illustrated in Figure 1-1.

Construction entailed excavating a series of wetland cells and a flood channel that bisects the 32.65-acre mitigation area. The primary source of wetland hydrology is groundwater supplemented by surface water from high flows associated with the Shields River. An existing irrigation diversion and delivery system was maintained to provide supplemental water to the eastern portion of the site in a flow-through system. Revegetation tasks included planting cuttings and containerized shrubs, seeding wetland herbaceous species within the excavated wetland areas, and transplanting wetland plants and soils from existing wetlands to excavated areas. 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 objectives include the following:

- Re-establish a previously existing, relic floodplain channel and associated riparian and floodplain wetland areas that total 1.56 acres
- Create approximately 25 acres of emergent, scrub/shrub, and riparian wetlands by replacing existing hay fields with a variety of wetland communities that mimic habitats found in bio-referenced wetland areas located north and south of the project
- Preserve 1.1 acres of existing scrub/shrub, forested, and palustrine emergent communities at several locations within the project area
- Mimic old meander scars and relic flood channels within the site
- Improve water-storage capacity and increase the amount of floodplain area across the site
- Increase the amount of wildlife habitat in this reach of the Shields River.

The project credit ratios approved by the USACE are shown in Table 1-1.

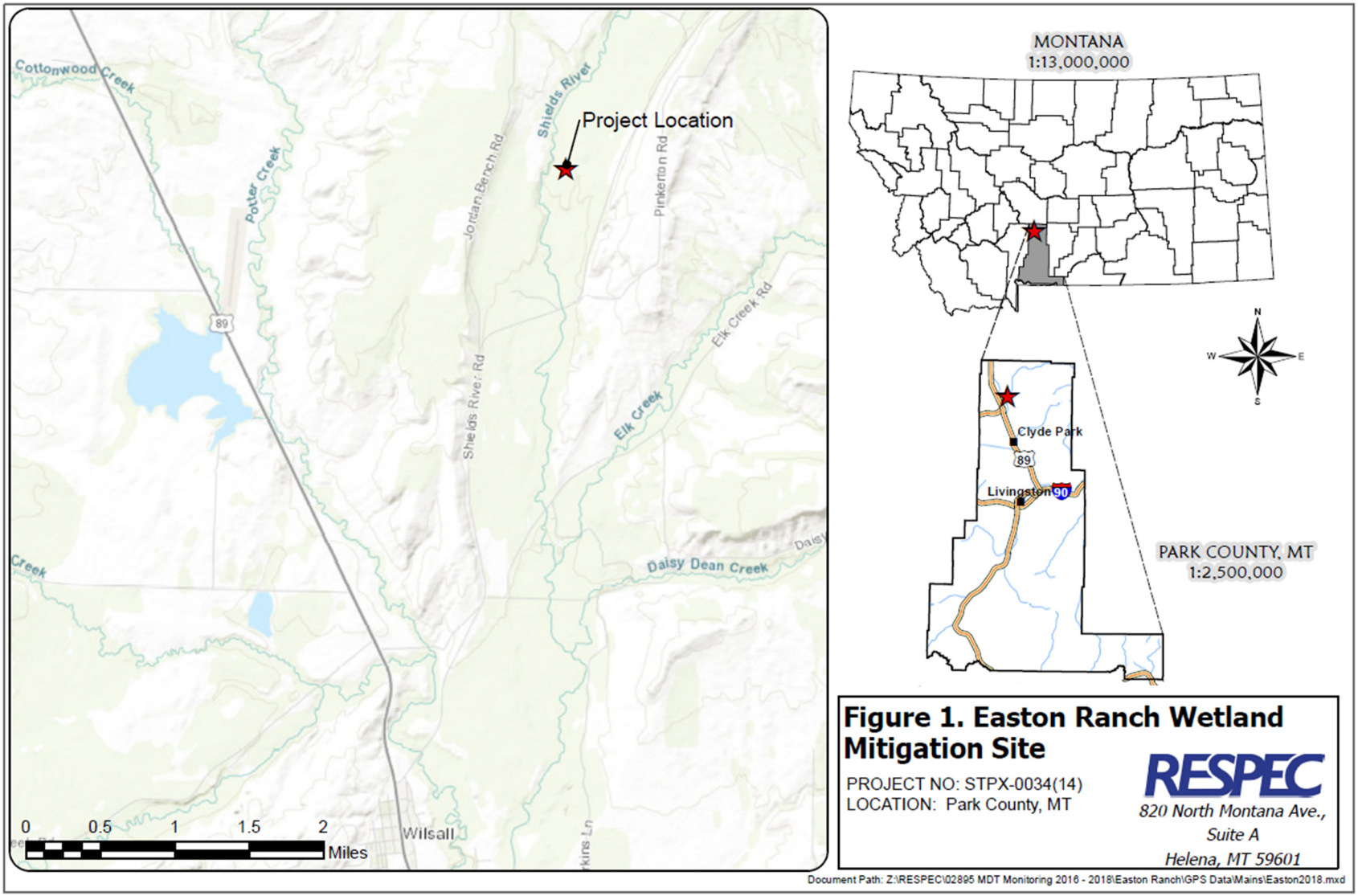

Figure 1-1. Project Location of the Easton Ranch Site.

Table 1-1. Wetland Credit Determination for the Easton Ranch Site

Proposed Mitigation Features	Compensatory Mitigation Type	USACE Mitigation Ratios	Acres	Final Credit Estimate (Acres)
Creation of palustrine emergent wetland via shallow excavation	Creation	1:1	24.95	24.95
Reestablishment of relic flood channel	Restoration (Reestablishment)	1:1	1.56	1.56
Preservation of existing shrub/scrub and palustrine emergent wetland	Preservation	4:1	1.10	0.28
Establish a 50-foot wide upland buffer	Upland Buffer	5:1	6.43	1.29
Project Impacts	Debit	—	—	(0.67)
Total				27.41

The USACE-approved performance standards are listed below.

1. **Wetland Characteristics** for all of the restored, created, enhanced, and preserved wetlands within the project limits will meet the three-parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and the 2010 *Regional Supplement to the Corps of Engineers Manual: Western Mountains, Valleys, and Coast Region* (2010 Regional Supplement; WMVC) [USACE, 2010].
    a. **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Wetland Manual and the 2010 Regional Supplement.
        i. Soil saturation will be present for at least 12.5 percent of the growing season.
        ii. Groundwater wells will be left undisturbed within the site to monitor groundwater elevations during the growing season.
        iii. Depressional wetlands that were excavated into the upland areas will be monitored to determine if groundwater hydrology is filling the sites and establishing vegetation communities.
        iv. Hydrologic success will also require that the constructed stream channel be stable in the wetlands.
    b. **Hydric Soil Success** will be achieved where hydric soil conditions are present (per the most recent NRCS definitions for hydric soil [USDA, 2014]) or appear to be forming, the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Soil sampling will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Wetland Manual and the WMVC 2010 Regional Supplement. Because typical hydric soil indicators may require long periods to form in created wetland areas, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.
    c. **Hydrophytic Vegetation Success** will be achieved by delineating developing wetlands by using the technical guidelines established in the 1987 Wetland Manual and the

2010 Regional Supplement. The following concept of "dominance," as defined in the 1987 Wetland Manual, will be applied during future routine wetland determinations in created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines).*"

i. **Woody Plants –** Trees and shrubs are to be installed at various locations to provide structural diversity within the site at the direction of the MDT Reclamation Specialist. Survival of woody plant species planted within the site will be evaluated to determine survival rates and success of the planting each year of the monitoring period. Success of these planted species will be determined by stem counts each year to determine survival rates of the various planted woody species and will also include evaluating naturally recruited woody plant species within the site. *"Scrub/shrub wetland habitat will be achieved where 30 percent absolute cover by cuttings, planted and volunteer woody plants is reached within the defined monitoring period or the site is showing signs of progression (e.g., by approximating stem densities and estimating future canopy coverage, or using other appropriate methods) toward that goal at the end of the defined monitoring period."*

ii. **Herbaceous Plants –** At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation (wetland plants listed as OBL, FACW, and FAC) will be at least 80 percent. A wetland seed mix was prepared for this site that included tufted hairgrass (*Deschampsia caespitosa*), Northwest Territory sedge (*Carex utriculata*), Baltic rush (*Juncus balticus*), American sloughgrass (*Beckmannia syzigachne*), American mannagrass (*Glyceria grandis*), and bluejoint reedgrass (*Calamagrostis canadensis*).

2. **Wetland Acreage Development** will provide 27.41 net credit acres for the project site (Appendix D).
   a. Emergent wetlands will compose approximately 70–75 percent of the site.
   b. Scrub/shrub wetland and riparian areas will compose 15–20 percent of the site primarily along the proposed stream corridor and between created wetlands.
   c. Open water will compose approximately less than 5 percent of the total wetland area within the site after final monitoring.
3. **Floodplain Channel Restoration Success** will be evaluated in terms of revegetation and bank stability success.
   a. The floodplain channel corridor will be considered stable when banks are vegetated with a majority of deep-rooting riparian and wetland plant species.
   b. Bank pins will be established at appropriate locations along the new relic floodplain channel to monitor channel stability and to measure channel movement.
   c. Bank stability success will be evaluated by using the bio-reference reaches to the north and south of the project area as comparisons because of their relatively undisturbed and vegetated mixture of woody and herbaceous riparian and wetland plant species.

   d. Vegetation transects will be monitored along the relic floodplain channel corridor to determine root stability indices of the riparian and wetland plant species as it develops.

4. **Bank Stabilization Success** along the Shields River in the northwestern corner of the site will be evaluated in terms of revegetation and bank stability success.
   a. Bank stability will be achieved when the banks are vegetated with a majority of deep-rooting riparian and wetland plant species.
   b. This area will be visually inspected and photo-documented for incorporation into the annual monitoring reports to outline the success of the bank stabilization.
   c. If annual monitoring determines that the banks are eroding, the USACE and Montana Department of Fish, Wildlife, and Parks (FWP) will be contacted to coordinate a field meeting for joint evaluation and consultation on remediation.
5. **Upland Buffer Success** will be achieved when noxious weeds do not exceed 10 percent of cover within the buffer areas on site. Any area within the creditable buffer zone that is disturbed by project construction must have at least 50 percent aerial cover of nonweed species by the end of the monitoring period.
6. **Weed Control** will be based on annual monitoring of the site to determine weed species and degree of infestation within the site, and control measures based on the monitoring results will be implemented by MDT to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site. MDT will manage the wetland conservation easement area to meet a goal of having less than 5 percent absolute cover of state-listed noxious weed species across the site.
7. **Fencing** of the proposed mitigation site has been installed along the easement boundaries to protect the integrity of the wetland from disturbance that may be detrimental to the site. Fencing installed along the perimeter of the site has been designed to be wildlife-friendly and to allow for wildlife movement into and out of the wetland complex.
8. **Monitoring** of this site will be based on the MDT standard monitoring protocols that are used for all of the MDT wetland mitigation sites for a minimum period of 5 years or longer as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and whether or not the site has met the wetland success criteria.

Figures A-2 and A-3 (Appendix A) of this report show the site monitoring activity locations and mapped site features, respectively, and Figure A-4 (Appendix A) shows the 2018 wetland delineation boundaries compared to the pre-project wetland boundaries. The MDT Mitigation Site Monitoring form, US Army Corps of Engineers (USACE) Wetland Determination Data forms [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] are included in Appendix B. Project area photographs are included in Appendix C, and the project plan sheet is included in Appendix D.

2.0 METHODS

The ninth year of monitoring was completed on July 1, 2018. Information for the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and are illustrated in Figure A-2 (Appendix A). The information collected included a wetland delineation, vegetation community mapping, vegetation transect data, soil and hydrology data, bird- and wildlife-use documentation, photographic documentation, and a nonengineering examination of the infrastructure established within the mitigation project area. The monitoring methods have remained relatively consistent at this site since the onset of monitoring. The initial 2010 Easton Ranch monitoring report [Confluence Consulting, Inc., 2010] provides a detailed description of monitoring methods at this site. The 2010 monitoring report for this MDT mitigation sites can be found online (*https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2010/easton_final.pdf*).

3.0 RESULTS

3.1 HYDROLOGY

Climate data from the meteorological station at Wilsall 8 ENE, Montana (249023), recorded an average annual precipitation rate of 20.2 inches from April 1957 to August 2018 [Western Region Climate Center, 2018]. The annual precipitation rate recorded during the monitoring period was 24.15 inches (2010), 18.03 inches (2011), 16.34 inches (2012), 21.43 inches (2013), 20.09 inches (2014), 17.49 inches (2015), 19.54 inches (2016), and 17.68 inches (2017). This data indicates that 2010 and 2013 received above-average precipitation with 2011, 2012, 2015, 2016, and 2017 exhibiting below-average precipitation. The historic precipitation average from January to August was 15.2 inches. The precipitation totals for this same period were 17.56 inches (2010), 13.36 inches (2011), 12.41 inches (2012), 13.41 inches (2013), 18.14 inches (2014), 13.71 inches (2015), 11.32 inches (2016), 13.3 inches (2017), and 15.3 inches (2018). This dataset corroborates that 2010 and 2014 received above-average precipitation, precipitation before and during the growing season for 2011 through 2013 and 2015 through 2017 was below average, and precipitation in 2018 was right at the long-term average for this period.

The extent of surface water across the site fluctuates seasonally and is moderately driven by direct precipitation and surface runoff. During the July monitoring, the Shields River flows remained high and flows were noted coming into the flood channel from the river. A total of 3.5 inches of rain was recorded for the month, which is the third highest recorded June precipitation in the last 9 years. Precipitation contributes to hydrology within this site and elevated seasonal groundwater levels and overbank flows from the Shields River appear to be the principal contributors to the site's wetland hydrology. Although precipitation was above average this year, the lower-than-average precipitation levels over the past several years have undoubtedly decreased groundwater levels in the mitigation site and the entire Shields Valley.

The irrigation diversion system located upgradient of the wetland cells, in the northeastern corner of the site, was closed during the 2010–2015 investigations. Per communication with Ranch Manager

Mr. Josh Huttinger in 2016, the eastern area was flood irrigated in June and July of 2016. In 2017 and 2018, irrigation water, designed to flow through the eastern half of the site from north to south, was flowing in the ditch and was released onto the eastern portion of the site several times during the spring and summer months. During the 2018 monitoring, wetland soils were either saturated to the surface or inundated. Generally, depressions or low contours across the eastern and northern portions of Community Type 11 were inundated during the July monitoring. Wetland soils were generally saturated to the surface across Community Types 11, 14, and 15 north of the two-track road that bisects the property. Upland soils areas along the northern portion of the site were moist but not saturated. Ponded water was noted within portions of the floodplain channel and most soils in the depressions were saturated, including portions of the southern channel.

Approximately 35 percent of the site was inundated with surface water during the 2018 investigation at depths that ranged from 0 to 1.5 feet. The average depth was 0.3 foot, and the depth at the emergent vegetation/open-water boundary was 0.5 feet. Inundated areas were located within the low contours of the excavated depressions within wetland Cells 2 and 3. Portions of wetland Cells 1 and 5 were saturated to the surface. The 2011 monitoring event at this site revealed recent scour holes, sediment deposits, drift lines, watermarks, and other signs of contemporary inundation caused by overbank flooding from the Shields River and activation of the flood channel. During the 2018 monitoring, these signs were also noted from recent high-water flows and included ponded water that was observed in low areas within the flood channel, recent scour, sand/sediment deposition, debris left on trees and shrub stems, and watermarks. Soils were saturated primarily within the northern half of the channel. Signs of overland flow from the Shields River were observed across the western portion of the site with debris that was deposited approximately 1 foot tall along the stems and trunks of young trees and shrubs in Community Types 14 and 15 and fine sediment deposits that were noted across upland Community Type 13 in the southwestern portion of the site.

Paired wetland/upland data points (DPs) were sampled in three locations to determine the wetland/upland boundaries. Hydrologic indicators were not recorded at DP-1U, DP-2U, or DP-3U; however, signs of the river flood events (sediment deposits and water marks) were noted in the surrounding area. DP-1W, DP-2W, and DP-3W were located in areas that met the wetland criteria. Primary wetland hydrology indicators included soil saturation, oxidized rhizospheres, sediment deposits, high groundwater, and water marks. Secondary wetland hydrology indicators included a positive FAC-neutral test and geomorphic position. Additional hydrological indicators that were observed in various wetland areas of the Easton Ranch site included shallow surface water, saturation, sediment deposits, ponded water in portions of the channel and water marks. Shallow surface water was observed within community Types 11 and 12 along the eastern portion of the mitigation site. Additionally, soils were also moist across portions of upland community Type 18 – *Lotus corniculatus/ Phleum pratense* , which is located in the northeastern corner of the site and was intended to be a created wetland area. In 2018, an increase in open water occurred within several small depressions, primarily north of the access road, because of higher groundwater, overland flows, and increased regional precipitation.

The 2011 spring runoff levels and duration were high because of an above-average snowpack in the mountains and above-average spring precipitation. The constructed flood channel through the

mitigation site was activated for the first time during the early part of the 2011 growing season. Fluvial geomorphic processes resulted in the initial development of scour holes, riffles, and point bars. Surface water was present in portions of the northern, central, and southern portion of the channel during the July 2018 site visit. New areas with sediment deposition, channel scour, new point bars, and water marks were observed within the channel in 2018; however, the banks were secure and well-vegetated with minimal erosion. Cottonwood *(Populus* spp.) saplings were abundant within the southern quarter of the channel.

3.2 VEGETATION

Monitoring Year 2018 marked the ninth year of monitoring on the Easton Ranch site. A total of 3 new plant species were observed across the site in 2018 for a total of 176 plant species since 2010. The three new species observed in 2018 are nodding burr-marigold (*Bidens cernua*), an obligate wetland species, and two upland species, proso millet (*Panicum miliaceum*), and common snowberry (*Symphoricarpos albus*). Table 3-1 lists all plant species observed at this site during the 9 years of monitoring, with new species shown in bold text. Vegetation plant communities were mapped and named by plant composition and dominance. The composition of each community is listed on the Wetland Mitigation Site Monitoring form (Appendix B). The community boundaries are shown on Figure A-3 (Appendix A).

Six upland and eight wetland community types were observed on the site in 2018. The upland communities include the following:

- Type 1 – *Phleum pratense*/*Poa pratensis*
- Type 10 – *Bromus inermis*/*Populus tremuloides*
- Type 13 – *Bromus inermis/Phleum pratense*
- Type 16 – *Elymus repens/Poa pratensis*
- Type 17 – *Phleum pratense/Elymus repens*
- Type 18 – *Lotus corniculatus/Phleum pratense*

The wetland communities include the following:

- Type 3 – *Carex* spp.
- Type 4 – *Salix drummondiana*
- Type 5 – *Populus balsamifera*
- Type 7 – Aquatic Macrophytes
- Type 11 – *Juncus* spp.
- Type 12 – *Eleocharis palustris*/*Typha latifolia*
- Type 14 – *Juncus* spp./*Populus balsamifera*
- Type 15 – *Juncus* spp./*Salix spp.*

These communities are discussed in this section and are shown on Figure A-3 (Appendix A).

Table 3-1. Vegetation Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 1 of 5)

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

Table 3-1. Vegetation Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 2 of 5)

Common Name	Scientific Name	WMVC Indicator Status[a]
Clustered Field Sedge	*Carex praegracilis*	FACW
Swollen Beaked Sedge	*Carex rostrate*	OBL
Pointed Broom Sedge	*Carex scoparia*	FACW
Sedge	*Carex sp.*	NL
Stalk-Grain Sedge	*Carex stipata*	OBL
Northwest Territory Sedge	*Carex utriculata*	OBL
Lesser Bladder Sedge	*Carex vesicaria*	OBL
Caraway	*Carum carvi*	FACU
Western Moss-Heather	*Cassiope mertensiana*	FACU
Lamb's-Quarters	*Chenopodium album*	FACU
Narrow-Leaf Goosefoot	*Chenopodium leptophyllum*	FACU
Western Water-Hemlock	*Cicuta douglasii*	OBL
Canadian Thistle	*Cirsium arvense*	FAC
Douglas' Thistle	*Cirsium douglasii*	OBL
Bull Thistle	*Cirsium vulgare*	FACU
Poison-Hemlock	*Conium maculatum*	FAC
Field Bindweed	*Convolvulus arvensis*	UPL
Red Osier	*Cornus alba*	FACW
Gypsy-Flower	*Cynoglossum officinale*	FACU
Orchard Grass	*Dactylis glomerata*	FACU
Golden-Hardhack	*Dasiphora fruticosa*	FAC
Tufted Hair Grass	*Deschampsia caespitosa*	FACW
Herb Sophia	*Descurainia sophia*	UPL
Dragonhead	*Dracocephalum sp.*	UPL
Common Spike-Rush	*Eleocharis palustris*	OBL
Waterweed	*Elodea sp.*	UPL
Creeping Wild Rye	*Elymus repens*	FAC
Wild Rye	*Elymus sp.*	NL
Slender Wild Rye	*Elymus trachycaulus*	FAC
Fringed Willowherb	*Epilobium ciliatum*	FACW
Field Horsetail	*Equisetum arvense*	FAC
Tall Scouring-Rush	*Equisetum hyemale*	FACW
Smooth Scouring-Rush	*Equisetum laevigatum*	FACW
Virginia Strawberry	*Fragaria virginiana*	FACU
Common Marsh Bedstraw	*Galium palustre*	OBL
Large-Leaf Avens	*Geum macrophyllum*	FAC
Tall Mannagrass	*Glyceria elata*	FACW
American Mannagrass	*Glyceria grandis*	OBL

Table 3-1. Vegetation Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 3 of 5)

Common Name	Scientific Name	WMVC Indicator Status[a]
Fowl Mannagrass	*Glyceria striata*	OBL
American Licorice	*Glycyrrhiza lepidota*	FAC
Common Sunflower	*Helianthus annuus*	FACU
Fox-Tail Barley	*Hordeum jubatum*	FAC
Baltic Rush	*Juncus balticus*	FACW
Toad Rush	*Juncus bufonius*	FACW
Lamp Rush	*Juncus effusus*	FACW
Dagger-Leaf Rush	*Juncus ensifolius*	FACW
Long-Style Rush	*Juncus longistylis*	FACW
Sierran Rush	*Juncus nevadensis*	FACW
Lesser Poverty Rush	*Juncus tenuis*	FAC
Torrey's Rush	*Juncus torreyi*	FACW
Flatspine Stickseed	*Lappula occidentalis*	UPL
Western Larch	*Larix occidentalis*	FACU
Field Pepperweed	*Lepidium campestre*	UPL
Clasping Pepperwort	*Lepidium perfoliatum*	FACU
Great Basin Lyme Grass	*Leymus cinereus*	FAC
Garden Bird's-Foot-Trefoil	*Lotus corniculatus*	FAC
Silvery Lupine	*Lupinus argenteus*	UPL
Rough Water-Horehound	*Lycopus asper*	OBL
Black Medick	*Medicago lupulina*	FACU
Alfalfa	*Medicago sativa*	UPL
Yellow Sweet-Clover	*Melilotus officinalis*	FACU
American Wild Mint	*Mentha arvensis*	FACW
Seep Monkey-Flower	*Mimulus guttatus*	OBL
Water-Milfoil	*Myriophyllum sp.*	NL
Proso Millet	***Panicum miliaceum***	**UPL**
Western-Wheat Grass	*Pascopyrum smithii*	FACU
Dock-Leaf Smartweed	*Persicaria lapathifolia*	FACW
Spotted Lady's-Thumb	*Persicaria maculosa*	FACW
Reed Canary Grass	*Phalaris arundinacea*	FACW
Common Timothy	*Phleum pratense*	FAC
Great Plantain	*Plantago major*	FAC
Flat-Stem Bluegrass	*Poa compressa*	FACU
Fowl Bluegrass	*Poa palustris*	FAC
Kentucky Bluegrass	*Poa pretensis*	FAC
Annual Rabbit's-Foot Grass	*Polypogon monspeliensis*	FACW
Narrow-Leaf Cottonwood	*Populus angustifolia*	FACW

Table 3-1. Vegetation Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 4 of 5)

Common Name	Scientific Name	WMVC Indicator Status[(a)]
Balsam Poplar	*Populus balsamifera*	FAC
Quaking Aspen	*Populus tremuloides*	FACU
Grassy Pondweed	*Potamogeton gramineus*	OBL
White-Stem Pondweed	*Potamogeton praelongus*	OBL
Silverweed	*Potentilla anserina*	OBL
Graceful Cinquefoil	*Potentilla gracilis*	FAC
Choke Cherry	*Prunus virginiana*	FACU
Bluebunch Wheatgrass	*Pseudoroegneria spicata*	UPL
White Water-Crowfoot	*Ranunculus aquatilis*	OBL
Macoun's Buttercup	*Ranunculus macounii*	OBL
Alder-Leaf Buckthorn	*Rhamnus alnifolia*	FACW
Bristly Black Gooseberry	*Ribes lacustre*	FAC
Woods' Rose	*Rosa woodsii*	FACU
Curly Dock	*Rumex crispus*	FAC
Willow Dock	*Rumex salicifolius*	FACW
Beaked Ditch-Grass	*Ruppia maritima*	OBL
Peach-Leaf Willow	*Salix amygdaloides*	FACW
Gray Willow	*Salix bebbiana*	FACW
Drummond's Willow	*Salix drummondiana*	FACW
Narrow-Leaf Willow	*Salix exigua*	FACW
Pacific Willow	*Salix lasiandra*	FACW
Yellow Willow	*Salix lutea*	OBL
Tall False Rye Grass	*Schedonorus arundinaceus*	FAC
Meadow False Rye Grass	*Schedonorus pratensis*	FACU
Red-Tinge Bulrush	*Scirpus microcarpus*	OBL
Pale Bulrush	*Scirpus pallidus*	OBL
Hooded Skullcap	*Scutellaria galericulata*	OBL
Mad Dog Skullcap	*Scutellaria lateriflora*	FACW
White Cockle or Campion	*Silene latifolia*	UPL
Corn Mustard	*Sinapis arvensis*	UPL
Tall Hedge-Mustard	*Sisymbrium altissimum*	FACU
Small Hedge-Mustard	*Sisymbrium loeselii*	UPL
Idaho Blue-eyed-Grass	*Sisyrinchium idahoense*	FACW
Strict Blue-eyed-Grass	*Sisyrinchium montanum*	FAC
Canadian Goldenrod	*Solidago canadensis*	FACU
Late Goldenrod	*Solidago gigantea*	FACW
Field Sow-Thistle	*Sonchus arvensis*	FACU
Hairy Hedge-Nettle	*Stachys palustris*	FACW

Table 3-1. Vegetation Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 5 of 5)

Common Name	Scientific Name	WMVC Indicator Status[(a)]
Grass-Leaf Starwort	*Stellaria graminea*	FACU
Common Snowberry	***Symphoricarpos albus***	**FACU**
Aster	*Symphyotrichum sp.*	NL
Common Dandelion	*Taraxacum officinale*	FACU
Field Pennycress	*Thlaspi arvense*	UPL
Meadow Goat's-beard	*Tragopogon dubius*	UPL
Rabbit-foot Clover	*Trifolium arvense*	UPL
Alsike Clover	*Trifolium hybridum*	FAC
Red Clover	*Trifolium pratense*	FACU
White Clover	*Trifolium repens*	FAC
Seaside Arrow-Grass	*Triglochin maritima*	OBL
Broad-Leaf Cattail	*Typha latifolia*	OBL
Stinging Nettle	*Urtica dioica*	FAC
Great Mullein	*Verbascum thapsus*	FACU
American Purple Vetch	*Vicia americana*	FAC
Rough Cockleburr	*Xanthium strumarium*	FAC

(a) Lichvar et al., 2016.

New species identified in 2018 are bolded.

Upland Community Type 1 – *Phleum pratense/Poa pratensis* was identified on 8.53 acres of higher elevation areas that surround the constructed wetland cells and channel (Figure A-3, Appendix A). The 0.5-acre decrease in 2015 was a result of updating the project boundary to correspond with the most recent rectified aerial imagery. The 0.33-acre increase in 2018 represents the refinement of the wetland boundaries around community Type 11 in the central portion of the project site. This community is dominated by herbaceous species including common Timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*), birds-foot trefoil (*Lotus corniculatus*), smooth brome (*Bromus inermis*), creeping wild rye (*Elymus repens*), orchard grass (*Dactylis glomerata*), and common dandelion (*Taraxacum officinale*). During the 2018 monitoring year, several willow (*Salix* spp.) and cottonwood seedlings were observed within portions of community Type 1, primarily along the eastern project boundary.

Wetland Community Type 3 – *Carex* spp. encompassed 0.43 acre in the pre-existing emergent wetlands located at the northern and southwestern boundaries of the site. In 2018, this acreage increased slightly to 0.50 acre from the existing wetland expansion and addition of a new polygon in the eastern central portion of the project area. The community includes a diverse mix of wetland species and consists of Northwest Territory sedge, wheat sedge *(Carex atherodes),* woolly-fruit sedge (*Carex pellita),* leafy tussock sedge (*Carex aquatilis*), Nebraska sedge (*Carex nebrascensis*), lamp rush (*Juncus effusus*), Baltic rush, and red-tinged bulrush (*Scirpus microcarpus*).

Wetland Community Type 4 – *Salix drummondiana* was identified in a 0.14-acre area in the northwestern corner of the site near the bank of the Shields River. The area encompassed a pre-existing scrub/shrub wetland associated with an old flood-channel meander scar of the Shields River. Dominant species included Drummond's willow (*Salix drummondiana*), western-wheatgrass (*Pascopyrum smithii*), and Nebraska sedge. Other wetland species identified in this community include white-stem gooseberry (*Ribes inerme)*), red-tinge bulrush, American mannagrass, stinging nettle (*Urtica dioica*), reed canary grass (*Phalaris arundinacea*), creeping wild rye, American wild mint (*Mentha arvensis)*, and common Timothy.

Wetland Community Type 5 – *Populus balsamifera* was a pre-existing, undisturbed, forested, scrub/shrub wetland located on 0.57 acre that is south of the construction area. The vegetation community was dominated by balsam poplar (*Populus balsamifera*), narrow-leaf cottonwood (*Populus angustifolia*), smooth brome, fowl mannagrass (*Glyceria striata)*, gray willow (*Salix bebbiana*), red-tinge bulrush, Pacific willow (*Salix lasiandra*), and blue skullcap (*Scutellaria lateriflora*).

Wetland Community Type 7 – Aquatic Macrophytes was observed in excavated depressions exhibiting the longest duration of surface water that support semi-permanent open water. Three depressions were identified as Community Type 7 across the site with the largest area located within the eastern portion of the site (south of the access road) where a higher seasonal groundwater table is sustained. In 2017, this community characterized approximately 0.10 acre of the site. In 2018, two small additional areas supporting permanent to semi-permanent open water were added and increased the acreage to 0.25 acres. They are located north of the access road within the western portion of the site. This wetland type has been classified as an aquatic bed community since 2011 and is generally defined as a wetland vegetation class dominated by plants "that grow principally on or below the surface of the water for most of the growing season in almost all years" [Cowardin *et al*., 1979]. The dominant species in 2018 were green algae (protist), Northwest Territory sedge, common spike-rush (*Eleocharis palustris*), and Baltic rush, with lower cover levels of spreading bent grass (*Agrostis stolonifera),* American wild mint, lamp rush, American mannagrass, and beaked ditch-grass (*Ruppia maritima*). An additional depression (approximately 0.68 acre) that existed in 2015 was replaced with community Type 12 – *Eleocharis palustris*/*Typha latifolia* in 2016.

Upland Community Type 10 – *Bromus inermis*/*Populus tremuloides* was identified on 0.27 acre of upland located along the northern boundary. This community differentiated from upland community Type 1 – *Phleum pratense/Poa pratensis* in 2016 because of an observed increase in smooth brome and regeneration of quaking aspen (*Populus tremuloides*). Other species present in this community are red clover (*Trifolium pratense),* creeping wild rye, common Timothy, and orchard grass.

Wetland Community Type 11 – *Juncus* spp. was identified on 6.76 acres of the constructed depressions and floodplain channel in 2018. Between 2013 and 2014, this community replaced community Type 6 – *Beckmannia syzigachne* as primary colonizing species decreased in abundance and more persistent, perennial plants increased in cover to become dominant. The base elevation of most of the depressions in this community contained shallow surface water in 2018. This diverse community type is dominated by rush species (*Juncus* spp.), including Baltic rush, lamp rush, lesser poverty rush (*Juncus tenuis*), Nebraska sedge, and common spike-rush. Changes in the vegetation

within this community type between 2016 and 2018 have primarily occurred within the south-central portion of the project or wetland Cell 3 and include an increased dominance of woody species (primarily young balsam cottonwood and young willows) which represent 2.38 acres of two new community types: wetland community Type 14 – *Juncus spp./Populus balsamifera* (1.52 acres) and wetland community Type 15 – *Juncus spp./Salix* spp.(0.86 acre).

Wetland Community Type 12 – *Eleocharis palustris/Typha latifolia* was identified in 2015 in one 0.11-acre excavated depression within community Type 11 – *Juncus* spp., which replaced a small area of community Type 7 – Aquatic Macrophytes as species dominance transitioned from aquatic macrophytes to common spike-rush and broad-leaf cattail (*Typha latifolia*). In 2016, community Type 12 was identified as replacing another community Type 7 – Aquatic Macrophytes (0.68 acre), which occurred within community Type 11 – *Juncus* spp., located in a depression near the southern site boundary. This community was dominated by common spike-rush, broad-leaf cattail, American sloughgrass, and Northwest Territory sedge and in 2018 represents 0.99 acre.

Upland Community Type 13 – *Bromus inermis*/*Phleum pratense* was identified on 3.61 acres of upland located within the excavated footprint. In 2017, this community was reduced in size by 0.4 acre as a result of community Type 11 replacing portions of Type 13 in the northern and central portions of the project area. This community has been reduced in size by 7.49 acres as a result of Type 16 – *Elymus repens/Poa pratensis* and Type 18 – *Lotus corniculatus/Phleum pratense* replacing portions of Type 13 in the northern and central portions of the project area. The reduction is primarily because of irrigation, which is influencing the lower elevation areas in the northern half of the project area and resulting in a combination of inundation and vegetation transitioning to hydrophytic species following drought conditions. Community Type 13 replaced most of community Type 8 in 2015 as primary colonizing species decreased in dominance and more persistent, perennial plants increased in cover. The vegetation cover increased notably within this community between 2013 and 2015. Community Type 13 is dominated by smooth brome, common Timothy, Kentucky bluegrass, and creeping wild rye.

Wetland Community Type 14 – *Juncus spp./Populus balsamifera* was identified in 2016 in one 0.80-acre excavated depression within community Type 11. Natural recruitment of young balsam cottonwood seedlings and saplings, as well as other woody species, represent approximately 30 percent of the vegetation cover across this portion of the wetland cell. Other woody species include narrow-leaf cottonwood, yellow willow (*Salix lutea*), narrow-leaf willow, and speckled alder (*Alnus incana*). A mix of Baltic rush and lamp rush are the dominant herbaceous species with lesser amounts of Kentucky bluegrass, American wild mint , silverweed (*Potentilla anserina*), Nebraska sedge, and spreading bent grass. In 2018, the acreage for community Type 14 increased to 1.52-acres when the cottonwood seedlings expanded because of previous overland flows and improved soil moisture over the last 2 years. Type 14 occupies portions the southern overflow channel and excavated depressions north of the access road. Future shifts in acreage are likely to occur between Types 14 and 15 – *Juncus* spp./*Salix* spp. as woody species continue to expand and develop.

Wetland Community Type 15 – *Juncus spp./Salix* spp*.* was identified in 2017 in the excavated depression within community Type 11. This community type has increased since 2017, which

represents 0.86 acre in 2018 and includes rush and willow species that were formerly part of community Types 11 and 14. Within the last 2 years, vegetation cover by willow species including yellow willow, gray willow, Drummond willow and narrow-leaf willow (*Salix exigua*) have increased to represent greater than 30 percent cover across this portion of the wetland cell. A mix of Baltic rush, lamp rush, and lesser poverty rush are the dominant herbaceous species with lesser amounts of narrow-leaf willow, bird's-foot-trefoil, silverweed, Nebraska sedge, and western water-hemlock (*Circuta douglasii*).

Upland Community Type 16 – *Elymus repens/Poa pratensis* is a new community type in 2018 that is primarily located in the northwestern portion of the project site. Community Type 16 represents a 4.16-acre shift from smooth brome (community Type 13) to more facultative species with a dominance of creeping wild rye and Kentucky bluegrass and includes a diverse mix of other less abundant species such as common Timothy, caraway, birds-foot trefoil, smooth brome, Great Basin wildrye, fringed brome (*Bromus ciliatus*), and red clover.

Upland Community Type 17 – *Phleum pratense/Elymus repens* is a small (0.17 acre) well-defined community along the northern end of Transect 1. This area was previously mapped as community Type 1 – *Phleum pratense/Poa pratensis*, but a significant increase in cover by creeping wild rye was noted in 2018; creeping wild rye in this area was waist high with a cover value of 4 or 21 to 50 percent. Kentucky bluegrass, smooth brome, caraway, field horsetail, and other forbs were also present but represented a smaller percent of the overall cover.

Upland Community Type 18 – *Lotus corniculatus/Phleum pratense* was identified in 2018 primarily in the northeastern corner of the project site. This new community type dominated by birds-foot trefoil and common timothy represents 4.33 acres that were previously part of Community Types 8 and 13. The cover and density of birds-foot trefoil has been increasing over the last 2 years. Other species noted within this community type included creeping meadow-foxtail (*Alopecurus arundinaceus*), Kentucky bluegrass, narrow-leaf willow, creeping wildrye, red clover, caraway, Great Basin wildrye, speckled alder, balsam cottonwood, alsike clover and black medick (*Medicago lupulina*). The future parts of this community will likely shift to vegetation that exhibits a codominance of woody species as the willow, alder, and cottonwood continue to expand across the excavated footprint of Wetland Cell 5.

In general, the site has increased slightly in wetland acreage since initial monitoring in 2010 from 10.43 created acres to 10.49 acres in 2018. The northern portion of the project has experienced increased hydrology and transitions from upland community Type 13 to wetland community Type 11 and upland community Type 18 – *Lotus corniculatus/Phleum pratense.* Community Type 18*,* which is located in the northeastern section of the project site, have a dominance of hydrophytic vegetation but lack primary or secondary hydrology indicators. Both bird's-foot-trefoil and common timothy have an indicator status of FAC, followed by a creeping meadow-foxtail, which is also FAC. Soils were generally moist within the upper few inches in this area likely caused by precipitation that occurred on June 29, 2018, which delayed the annual monitoring a few days. The southwestern portion of the project area has remained relatively unchanged from 2016 to 2018 and may be slower to experience increased hydrology and shifts from upland communities to wetland community types. Community Type 11 – *Juncus* spp. (previously Type 6 – *Beckmannia syzigachne)* decreased in size from 10.43 acres (2014) to 9.9 acres (2015), 9.10 acres (2016), 8.94 acres (2017) and 6.76 acres (2018).

This decrease in Type 11 is the result of the development into different kinds of wetland communities. Wetland community Type 14 – *Juncus* spp./*Populus balsamifera* and community Type 15 – *Juncus* spp./*Salix* spp. occur within portions of community Type 11, which indicates a shift from a dominance of emergent vegetation to a dominance of woody hydrophytic species in areas closer to the Shields River because of overland flows that occurred in 2011. Based on observations from 2018, a dominance of woody hydrophytic species is likely to develop in other areas across the northern half of the project site. Several of the wetland boundaries have changed since the 2016 delineation including changes in wetland lengths along the transects where the wetland lines were surveyed in 2018.

The below-average natural precipitation cycles that have occurred in most years have affected the rate of wetland development. The floodplain channel was designed to receive water from the Shields River flood events, and the northern channel is the source of this hydrology; both depend on snow and rain events. The below-average precipitation levels noted during most of the past several years have resulted in lower creek levels, lower groundwater levels, and reduced surface water across the site. However, in 2018, portions of the site were flooded from overland flow events from the Shields River and resulted in high groundwater levels and increased surface water across the site. Signs of overland flow included new scour in the channel, deposition, and debris deposits along the base of young trees and shrubs in the channel. Surface water was present in portions of the overflow channel as noted on July 1, 2018, and in other low areas across the site. Signs of overland flow were noted along Transect 2 with debris from high flows deposited approximately 1 foot tall along the stems and trunks of young trees and shrubs One upland community near the southwestern end of Transect 2 also had lower vegetation cover values in 2018 because of overland flows that caused fine sediment deposits.

The overall percent cover of hydrophytic vegetation in the constructed floodplain channel has improved/recovered in the last year, and the channel is stable but active with new signs of sediment deposition, point bars and debris deposition. Young cottonwood seedlings are establishing in the channel near the mature cottonwood grove to the south; planted trees and shrubs are thriving along the channel, particularly speckled alder.

Vegetation cover was measured along three transects at the Easton Ranch site in 2018 (Figure A-2, Appendix A). The data recorded on T-1 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-2 and Charts 3-1 and 3-2, respectively. The transect ends were photographed (Appendix C). T-1 extends 1,376 feet (1,072 feet in 2010 because of field error during the survey) from south to north across several constructed cells east of the constructed channel. The transect intervals alternated between upland communities Type 16 – *Elymus repens/Poa pratensis* , Type 1 – *Phleum pratense/Poa pratensis,* Type 18 – *Lotus corniculatus/Phleum pretense,* Type 17 – *Phleum pratense/Elymus repens,* and Type 10 – *Bromus inermis/Populus tremuloides* and wetland communities Type 11 – *Juncus* spp., Type 7 – Aquatic Macrophytes, Type 14 – *Juncus* spp./*Populus balsamifera,* and Type 15 – *Juncus spp./Salix spp*. Wetland community Type 11 replaced wetland community Type 6 in 2014 because of continued development of wetland vegetation within the excavated depressions. Hydrophytic vegetation communities composed 19.1 percent of T-1 in 2018 , which represents a slight decrease of 3.6 percent since 2017. In 2018, a reduction in wetland community Type 11 occurred along T-1, and an increase in the overall cover and density of bird's-foot-trefoil and common timothy occurred near the constructed depressions

and continued to the north where bird's-foot-trefoil and common timothy replaced community Type 13 – *Bromus inermis/Phleum pratense*. Slight changes in ground surface elevation influence the hydrology and subsequent species composition over time. In 2018, a shift from community Type 13 and Type 11 to upland community Type 18 occurred and wetland community Types 3, 14 and 15 were added. Although this area is located within the footprint of an excavated depression, the hydrology and vegetation did not meet the wetland criteria in 2018, which was confirmed by the recorded data on T-1 and during the wetland delineation survey.

Table 3-2. Data Summary for T-1 From 2010 Through 2018 at the Easton Ranch Site

Monitoring Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**1,072**	**1,376**	**1,376**	**1,376**	**1,376**	**1,376**	**1,376**	**1,376**	**1,376**
Vegetation Community Transitions Along Transect	11	11	12	12	14	14	14	14	12
Vegetation Communities Along Transect	3	4	4	4	5	5	6	6	8
Hydrophytic Vegetation Communities Along Transect	1	2	2	2	2	2	2	2	4
Total Vegetative Species	33	18	34	44	53	57	54	58	50
Total Hydrophytic Species	15	19	20	29	33	37	34	41	32
Total Upland Species	18	19	14	15	20	20	20	17	18
Estimated % Total Vegetative Cover	65	70	80	85	85	85	85	85	89
Estimate % Unvegetated	35	30	20	15	15	15	15	15	11
% Transect Length Comprising Hydrophytic Vegetation Communities	28.0	17.0	14.7	17.0	23.5	22.2	22.7	22.7	19.1
% Transect Length Comprising Upland Vegetation Communities	70.0	83.0	82.5	83.0	76.5	77.8	77.3	77.3	80.9
% Transect Length Comprising Unvegetated Open Water	2.5	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0
% Transect Length Comprising Mudflat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

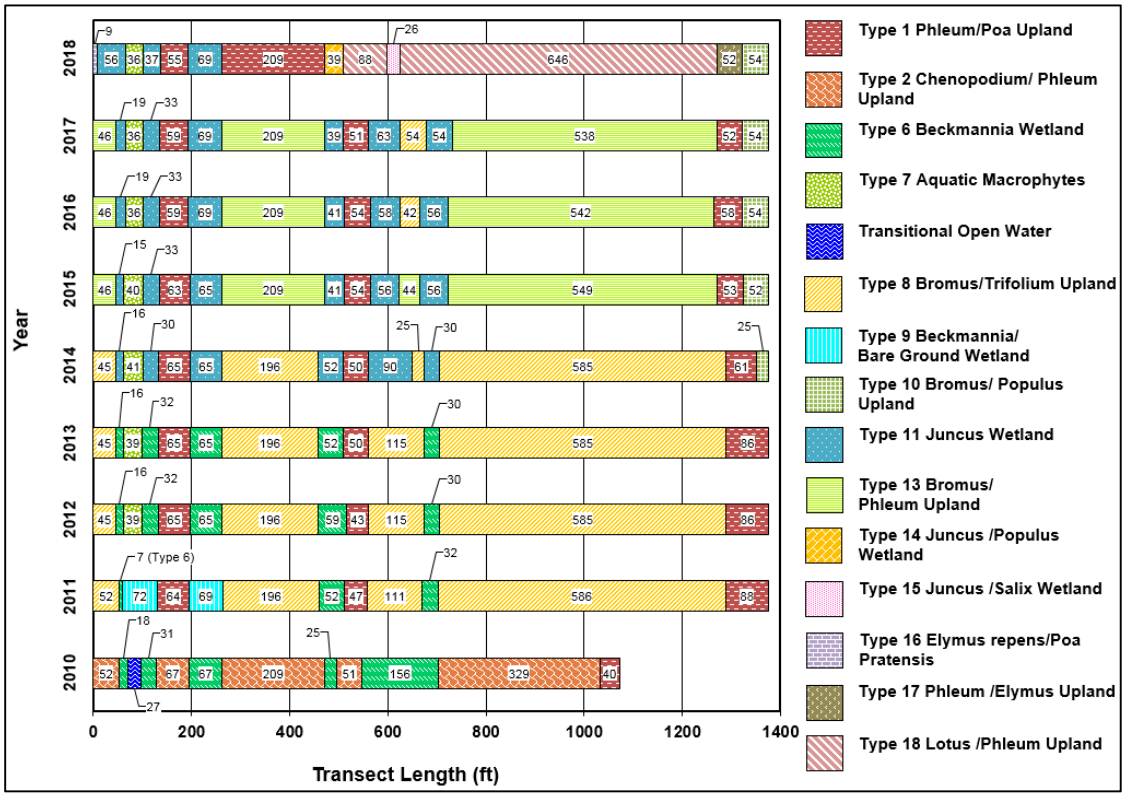

Chart 3-1. Transect Maps Showing Community Types on T-1 From Start/South (0 Foot) to Finish/North (1,072 Feet in 2010 and 1,376 Feet From 2011 Through 2018) at the Easton Ranch Site.

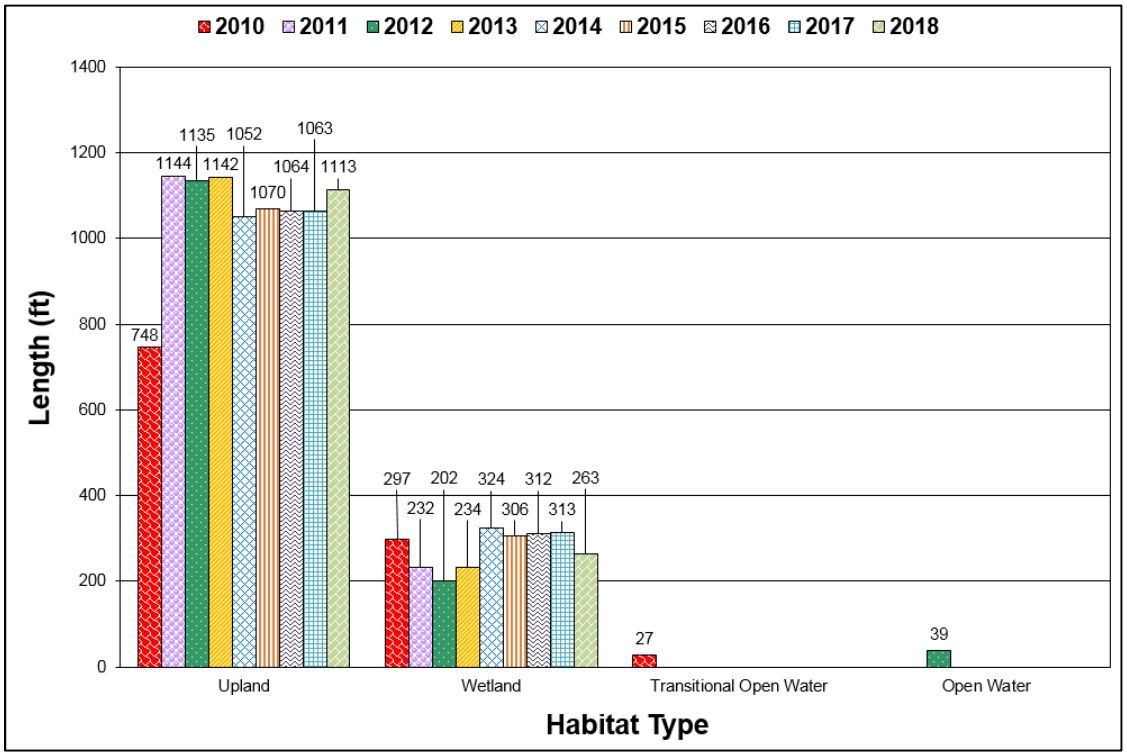

Chart 3-2. Length of Habitat Types Within T-1 From 2010 Through 2018 at the Easton Ranch Site.

Data collected on T-2 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphic formats in Table 3-3 and Charts 3-3 and 3-4, respectively. The endpoints of T-2 were photographed (Appendix C). Wetland Type 3 – *Carex* spp., Type 7 – Aquatic Macrophytes, Type 11 – *Juncus* spp., Type 14 – *Juncus* spp./*Populus balsamifera,* and Type 15 – *Juncus* spp./*Salix* spp. Upland Type 1 – *Phleum pratense*/*Poa pratensis,* Type 13 – *Bromus inermis*/*Phleum pratense,* and Type 16 – *Elymus repens*/*Poa pratensis* were identified along this transect. Community Type 14 was identified in 2016 as a result of a dominance of balsam cottonwood saplings mixed with rush species within a portion of wetland Cell 3. Balsam cottonwood plants ranged in height from 18 to 43 inches tall and represented over 30 percent of the total cover. Other woody plants included narrow-leaf cottonwood, yellow willow, specked alder, and narrow-leaf willow. Community Type 15 was added in 2017 to a portion of wetland Cell 3 where a variety of young willows surpassed the cover by young cottonwoods. Willows included yellow willow, Drummond willow and gray willow. Hydrophytic vegetation communities made up 40.9 percent of T-2 in 2018 and represents a slight increase since 2014. Along T-2 in 2018, 54 species were documented, including 44 hydrophytic and 10 upland species.

Table 3-3. Data Summary for T-2 From 2010 Through 2018 at the Easton Ranch Site

Monitoring Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**1,333**	**1,333**	**1,333**	**1,333**	**1,333**	**1,333**	**1,333**	**1,333**	**1,333**
Vegetation Community Transitions Along Transect	11	8	7	7	7	8	10	11	14
Vegetation Communities Along Transect	4	4	4	4	4	4	5	6	8
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2	3	4	5
Total Vegetative Species	35	38	42	45	52	54	61	58	54
Total Hydrophytic Species	17	22	29	32	35	36	41	45	44
Total Upland Species	18	16	13	13	17	18	20	13	10
Estimated % Total Vegetative Cover	65	75	80	85	85	85	85	85	87
Estimate % Unvegetated	35	25	20	15	15	15	15	15	13
% Transect Length Comprising Hydrophytic Vegetation Communities	38.7	41.0	39.5	38.9	41.9	40.0	40.4	40.4	40.9
% Transect Length Comprising Upland Vegetation Communities	61.3	59.0	60.5	61.1	58.1	60.0	59.6	59.6	59.1
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Transect Length Comprising Mudflat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

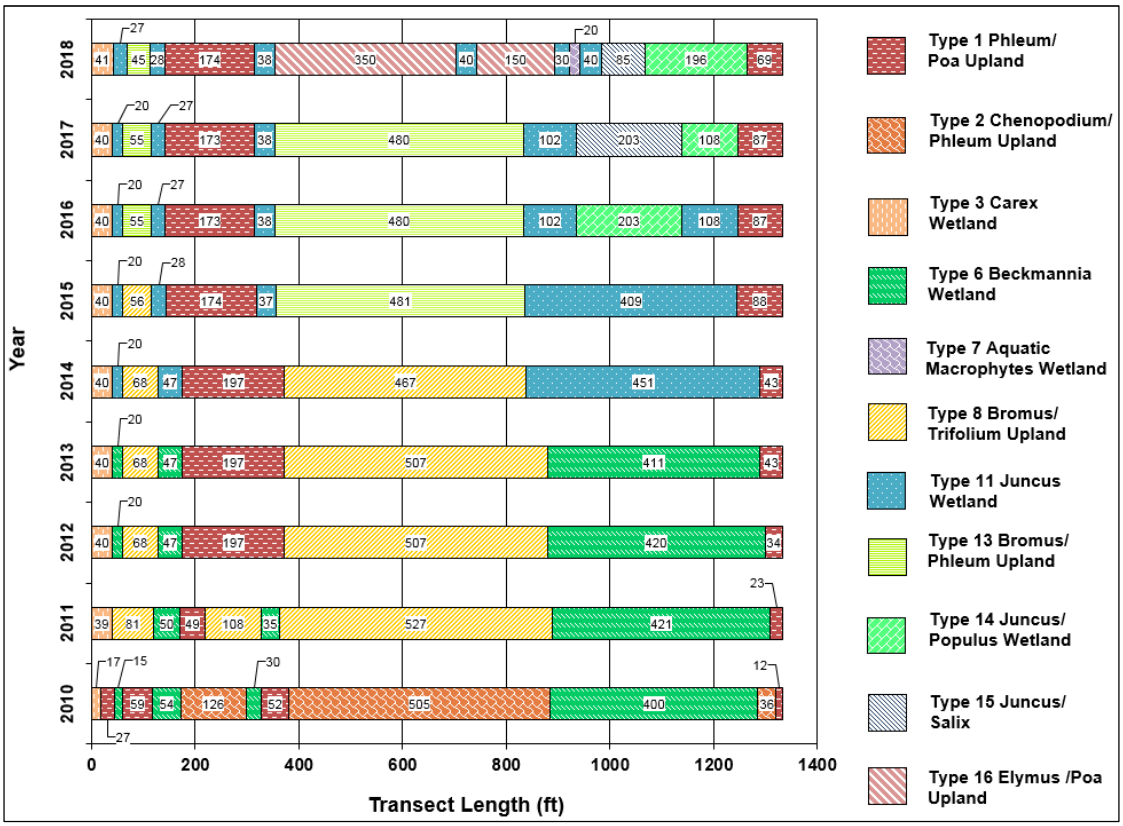

Chart 3-3. Transect Maps Showing Community Types on T-2 From 2010 Through 2018 From Start/North (0 Foot) to Finish/South (1,333 Feet) at the Easton Ranch Site.

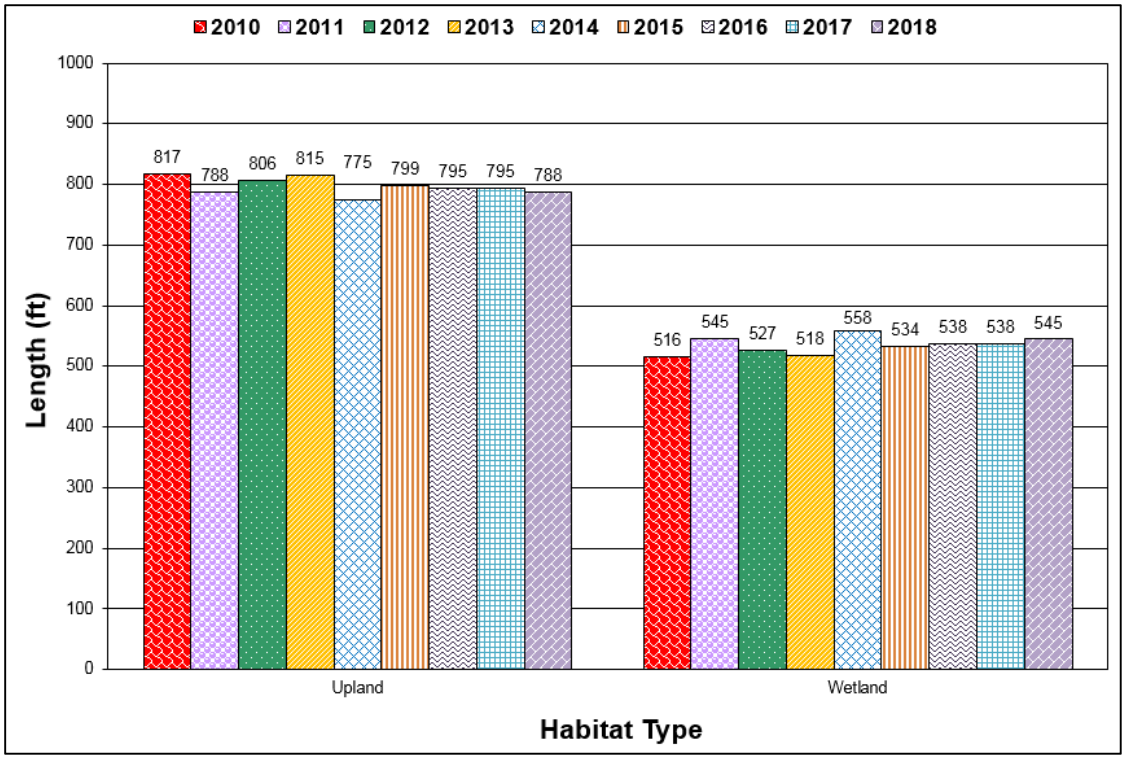

Chart 3-4. Length of Habitat Types Within T-2 From 2010 Through 2018 at the Easton Ranch Site.

T-3 was established west to east across the constructed cells and channel in the southern half of the site (Figure A-2, Appendix A). During the 2015 field survey, an error in the starting point of T-3 was identified and later confirmed using GIS. The length of T-3 was corrected to 732 feet to correspond with field observations and the most recent rectified aerial imagery and the new project boundary. T-3 data (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphic formats in Table 3-4 and Charts 3-5 and 3-6, respectively. Photographs of the endpoints of T-3 are located in Appendix C. The transect intervals intercepted upland community Types 1 – *Phleum pratense/Poa pratensis* and 13 – *Bromus inermis*/*Phleum pratense* and wetland community Types 11 – *Juncus* spp and 14 – *Juncus spp./Populus balsamifera*. Hydrophytic vegetation accounted for 51.1 percent of T-3 in 2018, which is a 3.8 percent increase since 2017. Hydrophytic vegetation (rushes and cottonwoods) was observed in portions of the restored stream channel. Soils were saturated and ponded water was noted in portions of the channel with segments within the channel with new silt/sand deposition or areas void of vegetation. Multiple cottonwood seedlings were also noted expanding within the channel from community Type 5 - *Populus balsamifera* located at the southern end of the channel.

Table 3-4. Data Summary for T-3 From 2010 Through 2018 at the Easton Ranch Site

Monitoring Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**751**	**751**	**751**	**751**	**751**	**732**	**732**	**732**	**732**
Vegetation Community Transitions Along Transect	11	9	9	8	8	4	4	4	6
Vegetation Communities Along Transect	3	3	3	3	3	3	3	3	4
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1	1	1	1	2
Total Vegetative Species	24	35	33	34	39	39	45	42	42
Total Hydrophytic Species	11	17	20	20	24	23	28	29	30
Total Upland Species	13	18	13	14	15	16	17	13	12
Estimated % Total Vegetative Cover	65	70	80	85	85	85	85	85	90
Estimate % Unvegetated	35	30	20	15	15	15	15	15	10
% Transect Length Comprising Hydrophytic Vegetation Communities	45.0	50.0	49.1	48.9	48.9	43.3	44.4	47.3	51.1
% Transect Length Comprising Upland Vegetation Communities	55.0	50.0	50.9	51.1	51.1	56.7	55.5	52.7	48.9
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Transect Length Comprising Mudflat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

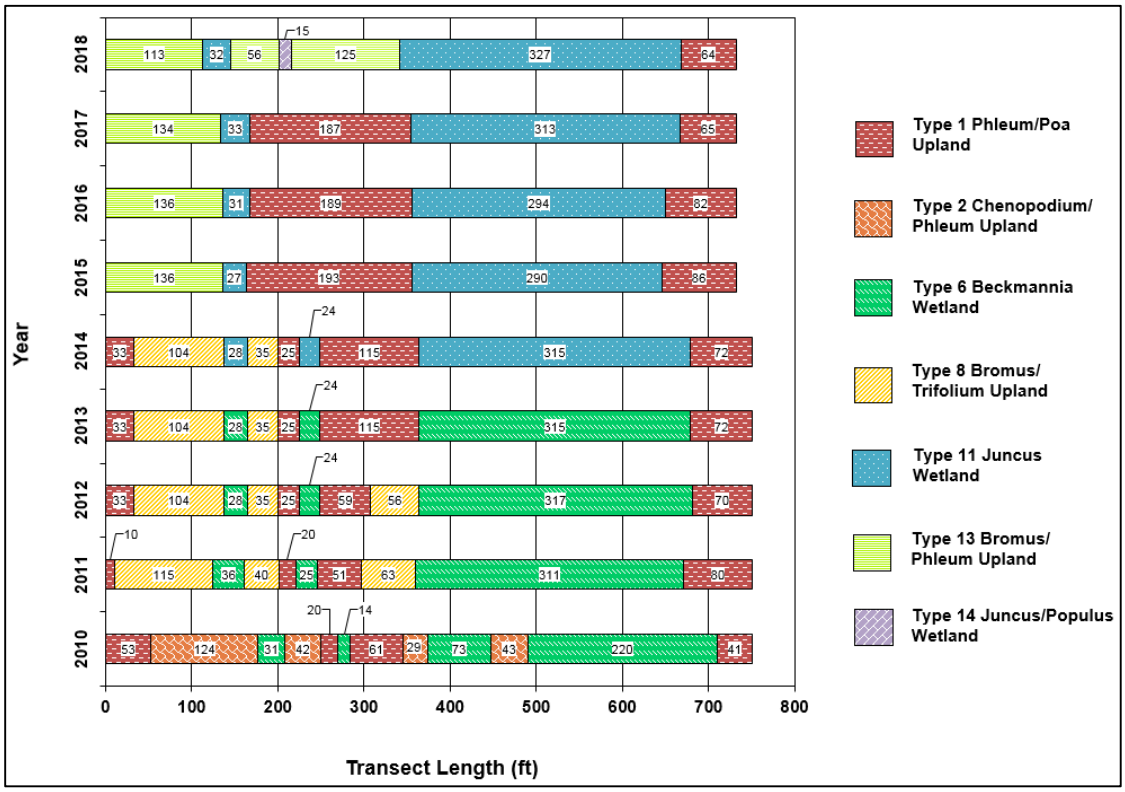

Chart 3-5. Transect Maps Showing Community Types on T-3 From 2010 Through 2018 From Start/West (0 Foot) to Finish/East (751 Feet in 2010 Through 2014 and 732 Feet in 2015 and 2018) at the Easton Ranch Site.

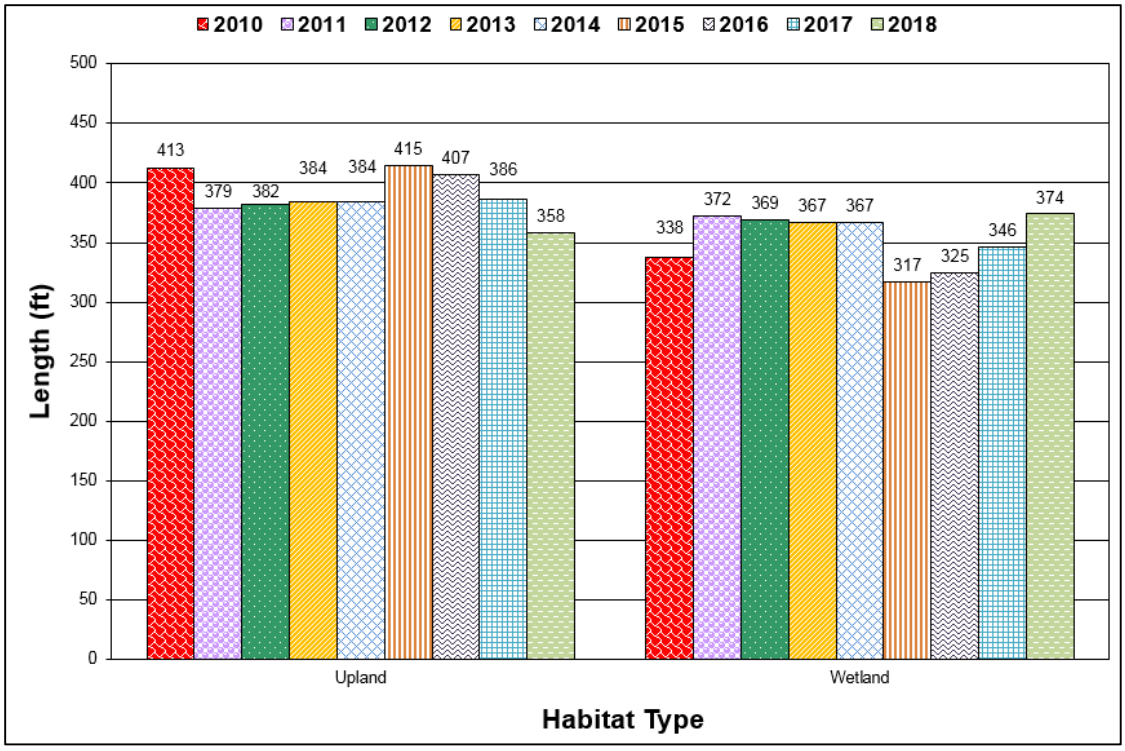

Chart 3-6. Length of Habitat Types Within T-3 From 2010 Through 2018 at the Easton Ranch Site.

During the July 2018 monitoring, four small infestations of Canada thistle (*Cirsium arvense*), which is a Priority 2B noxious weed, were identified on site, 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 5 – *Populus balsamifera*, and Type 18 – *Lotus corniculatus/Phleum pratense* . Three infestations of gypsy-flower (*Cynoglossum officinale*) were observed on site in community Types 1 and 18. Ongoing weed control/spraying has been very effective in reducing overall infestation size and density across the site. MDT has an ongoing weed-control program and contractors sprayed weeds on July 5, 2018.

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 2018 to locate and identify surviving cuttings and containerized saplings. Approximately 12 red osier dogwood (*Cornus alba*), 48 sandbar willow, 49 speckled alder, and 65 willow cuttings were identified as surviving in 2018 The amount of woody volunteer species continues to increase, especially quaking aspen saplings along the northern and northeastern project boundaries in 2018. Young narrow-leaf willow, yellow willow, gray willow and narrow-leaf cottonwood were observed within the constructed cells. Balsam cottonwood and a variety of willows were abundant in a portion of the constructed wetland Cell 3 near the Shields River. In 2018, several young willow and cottonwood seedlings were observed in community Type 18, which is located in the excavated depression west of the large cottonwood grove near the eastern project boundary. Most of the woody volunteer plants noted within the constructed wetland cells are likely the result of seeds deposited in sediment from the 2011 flood that occurred across the site, especially in wetland Cells 1 and 3 near the Shields River. Many cottonwood seedlings/ saplings were noted in 2018 within the southern portion of the floodplain channel and along the western side of community Type 5 – *Populus balsamifera*.

3.3 SOIL

Meadowcreek and Nesda soil complexes have been identified within the project area by the Web Soil Survey for Park County [USDA, 2010]. The Meadowcreek (155A) series is a somewhat poorly drained, clay loam soil that is located on floodplains within valleys. The map unit is listed on the *Montana Hydric Soils List* [USDA, 2014] and is classified as a frigid Fluvaquentic Haplustoll. The Nesda loam (600B) is mapped in a small area at the southern end of the project. The loam is a well-drained, frigid Fluventic Haplustoll and is also listed on the *Montana Hydric Soil List*. Soils at each representative wetland and upland data point were typically inspected to a depth of 20 inches (where possible) to determine the presence or absence of hydric soil indicators based on the *Version 8.1 2017 Field Indicators of Hydric Soils* [NRCS, 2017]. The mitigation site was previously a hayfield that was subject to plowing with the potential for a plow-zone profile to a depth of 18 inches.

Soil test pits were excavated at six locations, all within what was originally mapped as the Meadowcreek soil series (DP-1W, DP-1U, DP-2W, DP-2U, DP-3W, and DP3U; Figure A-2, Appendix A). DP-1W was located within wetland community Type 14 – *Juncus* spp./*Populus balsamifera,*DP-2W was located within wetland community Type 11 – *Juncus* spp., and DP-3W was located within wetland community Type 4 – *Salix drummondiana*. Upland data points DP-1U and DP-3U were located within

community Type 1 – *Phleum pratense/Poa pratensis* and DP-2U was located within upland community Type 13 – *Bromus inermis/Phleum pratense.* The soil profile for DP-1W included a very dark gray (10YR 3/1) silt loam and a very dark grayish brown gravelly silt loam. 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 revealed a very dark grayish brown (10YR 3/2) silt 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 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.

3.4 WETLAND DELINEATION

The six DPs previously described were used to support the wetland boundary (Figure A-2, Appendix A; Wetland Determination Data forms, Appendix B). DP-1W and DP-2W were located within wetland community Type 14 – *Juncus spp./Populus balsamifera* and Type 11 – *Juncus* spp.*,* respectively, with DP-1U and DP-3U located in upland community Type 1 – *Phleum pratense/Poa pratensis* and DP-2U in upland community Type 13 – *Bromus inermis/Phleum pratensis*, respectively. The total wetland acreage, including pre-existing wetland, was 11.59 acres in 2018, which is a decrease of 0.86 acres from 2017, as shown in Table 3-5. The reduction occurred primarily within wetland community Type 11 in the northeastern portion of the site, which was previously dominated by the *Juncus* species. In 2018, a significant increase in the cover and density of bird's-foot's-trefoil, which is a facultative species (FAC) near constructed depressions, occurred and continued to the north where bird's-foot's-trefoil replaced community Type 13 – *Bromus inermis* (UPL)/*Phleum pretense* (FAC). However, slight changes in the ground surface elevation, species composition, and hydrology were also evidenced a shift from wetland to upland community types in this area, including dry soils within areas that were previously delineated as Type 11 and moist surface soils in portions of Type 18 further to the north.

Water from the irrigation system at the northeastern boundary had been diverted to the site during the spring and summer of 2018. The frequency and duration of surface and groundwater appears to support a dominance of hydrophytic vegetation in most of the excavated and pre-existing wetland areas. The delineation mapped 1.1 acres of pre-existing emergent and shrub/scrub wetland within the mitigation boundaries in 2018 (Figure A-3, Appendix A). The pre-existing wetlands were originally defined during the baseline investigation completed in August 2001 [MDT, 2008]. The 2018 delineated wetland includes 1.56 acres of the reestablished flood channel (Type 11 and Type 14; Figure A-3, Appendix A) and 8.93 acres of created wetland. Uplands account for 21.06 acres of the mitigation site. In 2017, the vegetation cover in the depressions characterized by wetland community Type 11 had increased along the north side and northwestern quarter of the project area and were replacing portions of community Type 13. In 2018, the vegetation cover in the depressions continues to shift within community Type 11 and a codominance of willows or cottonwoods was noted in the

northeastern portion of the project site. Additionally, new upland communities identified in 2018 demonstrate a transition from Facultative Upland (FACU) (smooth brome) to more facultative (FAC) species, such as birds-foot trefoil and indicates a positive response from surface water and groundwater within the last year.

Table 3-5. Total Wetland Acres Delineated From 2010 Through 2018 at the Easton Ranch Site

Habitat	2010 (acres)	2011 (acres)	2012 (acres)	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)	2018 (acres)
Pre-Existing Wetland Area	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Created Wetland Area	10.43	10.54	10.54	11.30	11.54	10.91	10.91	11.35	10.49
Total Wetland Habitat	**11.53**	**11.64**	**11.64**	**12.40**	**12.64**	**12.01**	**12.01**	**12.45**	**11.59**

3.5 WILDLIFE

A comprehensive list of bird and other wildlife species observed directly or indirectly from 2010 through 2018 is presented in Table 3-6. Nine bird species were identified in 2018. The behaviors and habitats of all of the birds observed in 2018 are listed on the Wetland Mitigation Site Monitoring form (Appendix B). A Savannah sparrow nest with five eggs was observed on the ground and house wrens and tree swallows were noted using the bird boxes during the July (2018) monitoring. Two white-tailed deer (*Odocoileus virginianus*) were observed on site in 2018. In addition, a young bald eagle (*Haliaeetus leucocephalus*) was observed in the nest located directly southwest of the site on the western side of the Shields River; although the project site is located within a primary habitat zone for bald eagles, mature eagles were not heard or observed during the 2018 site visit.

Table 3-6. Wildlife Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 1 of 2)

Common Name	Scientific Name
Amphibians	
Columbia Spotted Frog	*Rana luteiventris*
Western Toad	*Anaxyrus boreas*
Mammals	
Coyote	*Canis latrans*
Deer Mouse	*Peromyscus maniculatus*
Deer sp.	*Odocoileus* sp.
Long-tailed Vole	*Microtus longicaudus*
Meadow Vole	*Microtus pennsylvanicus*
Moose	*Alces americanus*
Mountain Cottontail	*Sylvilagus nuttallii*
Northern Pocket Gopher	*Thomomys talpoides*
Porcupine	*Erethizon dorsatum*
Pronghorn	*Antilocapra americana*
Raccoon	*Procyon lotor*
Richardson's Ground Squirrel	*Spermophilus richardsonii*
Striped Skunk	*Mephitis*
White-footed Mouse	*Peromyscus leucopus*
White-tailed Deer	***Odocoileus virginianus***
Reptiles	
Plains Gartersnake	*Thamnophis radix*
Birds	
American Coot	*Fulica americana*
American Crow	*Corvus brachyrhynchos*
American Goldfinch	***Spinus tristus***
American Kestrel	*Falco sparverius*
American Robin	***Turdus migratorius***
American White Pelican	*Pelecanus erythrorhynchos*
American Widgeon	*Anas americana*
Bald Eagle	*Haliaeetus leucocephalus*
Band-tailed Pigeon	*Patagioenas fasciata*
Bank Swallow	*Riparia*
Barn Swallow	*Hirundo rustica*
Belted Kingfisher	*Megaceryle alcyon*
Black-billed Magpie	*Pica hudsonia*
Brown-headed Cowbird	*Molothrus ater*
Black-capped Chickadee	*Poecile atricapillus*
Bullock's Oriole	***Icterus bullockii***
Canada Goose	*Branta canadensis*

Table3-6. Wildlife Species Observed From 2010 Through 2018 at the Easton Ranch Site (Page 2 of 2)

Common Name	Scientific Name
Birds (continued)	
Cedar Waxwing	*Bombycilla cedrorum*
Common Grackle	*Quiscalus quiscula*
Common Nighthawk	***Chordeiles minor***
Eastern Kingbird	***Tyrannus tyrannus***
Golden Eagle	*Aquila chrysaetos*
Gray Catbird	*Dumetella carolinensis*
Gray Partridge	*Perdix perdix*
Great Blue Heron	*Ardea herodias*
Great Horned Owl	*Bubo virginianus*
House Wren	***Troglodytes aedon***
Killdeer	*Charadrius vociferus*
Lesser Yellowlegs	*Tringa flavipes*
Mallard	*Anas platyrhynchos*
Marsh Wren	*Cistothorus palustris*
Mountain Bluebird	***Sialia currucoides***
Mourning Dove	*Zenaida macroura*
Northern Flicker	*Colaptes auratus*
Northern Harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Pacific Wren	*Troglodytes pacificus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-necked Pheasant	*Phasianus colchicus*
Sandhill Crane	*Grus canadensis*
Savannah Sparrow	***Passerculus sandwichensis***
Song Sparrow	*Melospiza melodia*
Spotted Sandpiper	*Actitis macularius*
Tree Swallow	***Tachycineta bicolor***
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*
Western Bluebird	*Sialia mexicana*
Western Meadowlark	*Sturnella neglecta*
Wild Turkey	*Meleagris gallopavo*
Willet	*Tringa semipalmata*
Wilson's Snipe	*Gallinago delicata*
Yellow Warbler	*Dendroica petechia*
Yellow-rumped Warbler	*Dendroica coronate*

Species identified in 2018 are in bold.

3.6 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM [Berglund and McEldowney, 2008] has been used to evaluate three AAs (Assessment Areas) (Appendix B). The AAs were separated by Creation, Restoration, and Preservation areas of the mitigation site and are discussed below. Tables 3-7, 3-8, and 3-9 display the functions and values of the Creation, Restoration, and Preservation areas, respectively.

The Creation AA encompassed 8.93 acres of constructed palustrine, emergent, and scrub/shrub wetland cells that generate 54.98 functional units, which represents a decrease from 2017 (57.27 function units) because of wetland boundary shifts and the associated, changes in 2018 that occurred primarily in the northeastern and northwestern portions of the project boundary. The overall rating for the Creation AA remained at a Category III wetland characterized by low disturbance in 2018. The ratings were high for general wildlife habitat, flood attenuation, short- and long-term surface-water storage, sediment/nutrient/toxicant removal, and production export/food chain support. The number of units and acreage are expected to increase as some areas of upland in the excavated areas (community Type 18 – *Lotus corniculatus/Phleum pratense*) transition to wetland habitat, provided sufficient wetland hydrology continues within the site. In 2018, the site's wetland acreage decreased from wetland acreage mapped in 2016 and 2017. The release of irrigation water during the spring and summer has greatly improved vegetation cover in the northern portion of the site and provided increased soil moisture to support an increase in woody vegetation cover and growth across portions of the site; however, continued irrigation will likely be needed for wetland acreage to expand. Sustained higher stream flows and precipitation levels through June 2018 also contributed to improve cover values and wetland diversity, especially across the western portion of the site.

The Restoration AA consisted of 1.56 acres of reestablished flood channel. This AA (flood channel) received a Category III rating with 58.5 percent of the total possible points, which was an increase from moderate to high rating for sediment/shoreline stabilization between 2012 and 2013. Ratings were high for sediment/nutrient/toxicant removal and moderate for general wildlife habitat, flood attenuation, short- and long-term surface-water storage, production export/food chain support, groundwater discharge/recharge, and uniqueness. The Restoration AA achieved 9.13 functional units in 2018.

The 1.1-acres Preservation AA encompassed the existing forested, shrub/scrub, and palustrine emergent wetlands. The existing wetland within the Preservation AA was rated as Category II with 65 percent of the possible points. The presence of emergent, scrub/shrub, and forested wetland types increased the structural diversity and flood attenuation ratings. Ratings were high for general wildlife habitat, flood attenuation, and sediment/nutrient/toxicant removal. This AA was reevaluated in 2014 as supporting a seasonal/intermittent water regime, which was a decrease from a perennial water regime that was recognized on previous evaluations and resulted in a decrease of actual points and functional units. The Preservation AA scored a total of 6.44 functional units in 2018.

Table 3-7. Functions and Values of the Easton Ranch Site From 2011 Through 2018 for the Creation Area

Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method	2011 Creation	2012 Creation	2013 Creation	2014 Creation	2015 Creation	2016 Creation	2017 Creation	2018 Creation
Listed/Proposed Threatened and Endangered (T&E) Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
Montana Natural Heritage Program (MTNHP) Species Habitat	Mod (0.6)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
General Wildlife Habitat	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (0.9)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	High (0.8)
Short- and Long-Term Surface-Water Storage	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	Low (0.2)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Production Export/Food Chain Support	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential (bonus points)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points/Possible Points	**5.75/10**	**5.75/10**	**5.75/10**	**5.65/10**	**5.65/10**	**5.85/10**	**5.85/10**	**6.15/10**
% of Possible Score Achieved	**57.5**	**57.5**	**57.5**	**56.5**	**56.5**	**58.5**	**58.5**	**61.5**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**
Acreage of Assessed Aquatic Habitats Within Easement	**9.09**	**9.09**	**9.74**	**9.98**	**9.34**	**9.34**	**9.79**	**8.93**
Functional Units (acreage × actual points)	**52.27**	**52.27**	**56.01**	**56.39**	**52.77**	**54.64**	**57.27**	**54.98**

Table 3-8. Functions and Values of the Easton Ranch Site From 2011 Through 2018 for the Restoration Area

Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method	2011 Restoration	2012 Restoration	2013 Restoration	2014 Restoration	2015 Restoration	2016 Restoration	2017 Restoration	2018 Restoration
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.6)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
General Wildlife Habitat	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Short- and Long-Term Surface-Water Storage	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Production Export/Food Chain Support	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential (bonus points)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points/Possible Points	**5.95/10**	**5.65/10**	**5.95/10**	**5.85/10**	**5.85/10**	**5.85/10**	**5.85/10**	**5.85/10**
% of Possible Score Achieved	**59.5**	**56.5**	**59.5**	**58.5**	**58.5**	**58.5**	**58.5**	**58.5**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**
Acreage of Assessed Aquatic Habitats Within Easement	**1.45**	**1.45**	**1.56**	**1.56**	**1.56**	**1.56**	**1.56**	**1.56**
Functional Units (acreage × actual points)	**8.63**	**8.19**	**9.28**	**9.13**	**9.13**	**9.13**	**9.13**	**9.13**

Table 3-9. Functions and Values of the Easton Ranch Site From 2011 Through 2018 for the Preservation Area

Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method	2011 Preservation	2012 Preservation	2013 Preservation	2014 Preservation	2015 Preservation	2016 Preservation	2017 Preservation	2018 Preservation
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.6)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
General Wildlife Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	High (0.9)	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Short- and Long-Term Surface-Water Storage	High (0.8)	High (0.8)	High (0.8)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Production Export/Food Chain Support	Exc (1.0)	Exc (1.0)	Exc (1.0)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Recreation/Education Potential (bonus points)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points/ Possible Points	**6.95/9**	**6.25/9**	**6.55/9**	**5.85/9**	**5.85/9**	**5.85/9**	**5.85/9**	**5.85/9**
% of Possible Score Achieved	**77.2**	**69.4**	**72.8**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**
Overall Category	**II**	**II**	**II**	**III**	**II**	**II**	**II**	**II**
Acreage of Assessed Aquatic Habitats Within Easement	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**
Functional Units (acreage × actual points)	**7.65**	**6.88**	**7.21**	**6.44**	**6.44**	**6.44**	**6.44**	**6.44**

3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken from seven photo points (PP1 to PP7) of the transect end points and of the four DPs are provided in Appendix C. PP4A and PP4B show the Shields River just outside the northwestern corner of the project area. Photo point PP4B, which is located on the south side of the river, was relocated further south in 2018 because of bank erosion and woody debris accumulation.

3.8 MAINTENANCE NEEDS

Irrigation water was diverted onto the site several times during the spring and summer growing season. MDT is working with the landowner to establish a water management plan for diverting irrigation flows into the site on a more consistent basis to meet water right requirements for monitoring usage. A total of 17 bird boxes are present around the perimeter of the site: 9 were installed between 2010 and 2016, and 8 new boxes were installed before the 2017 monitoring. Five of the bird boxes were occupied. In 2016, the southern and western fences were removed at the request of the landowner to improve wildlife movement from the river corridor across the wetland. Remaining fences were intact. No maintenance was required for the man-made structures.

The site supports two state-listed noxious weeds (Canada thistle and gypsy-flower) primarily within the uplands or along the site perimeter (Figure A-3, Appendix A). The cover classes ranged from a trace (< 1 percent) to low (1-5 percent) and moderate (6–25 percent) cover. Canada thistle was observed in community Type 1 – *Phleum pratense/Poa pratensis*, Type 5 – *Populus balsamifera*, and Type 18 – *Lotus corniculatus/Phleum pratense*. The gypsy-flower infestations represent a trace (< 1.0 percent) cover. MDT has an ongoing weed-control program, and contractors sprayed the site on July 5, 2018.

The eastern bank of the Shields River along the northwestern corner of the Easton Ranch mitigation site remained relatively stable from project completion through the 2011 runoff event. The structural integrity of the coir-wrapped soil lifts was intact after high flows. Fine-grain deposits accumulated on the lifts as floodwaters receded. The 2011 flood flows caused a wider base-flow channel to form because of a slight westward shift of the western bank, away from the site.

In early 2012, a woody debris jam was removed from the outer bend of the Shield River channel (eastern bank) downstream from PP4A, and several downed trees were removed from the cottonwood forest in the adjacent riparian zone. Removing these stabilizing elements increased the vulnerability of the river to lateral migration. During the next high-flow event (spring 2013), significant bank erosion occurred immediately upstream of PP4B. This erosion exposed the riprap that protects the reconstructed streambank, undermined the riprap along an approximately 85-foot-long section on that bank, and undermined the coir-wrapped soil lifts on that section, which caused significant loss of soil and willow cuttings. Photographs from PP4A and PP4B document these changes.

Some re-accumulation of woody debris in the former log jam location was noted in 2018,. Stacked piles of wood debris were noted previously in the floodplain were burned or hauled away. Photo point PP4B, which is located on the south side of the river, needed to be relocated further to the south in 2018 because of the bank erosion and woody debris accumulation. Although additional bank erosion

has been noted since the dramatic lateral cutting event of 2013, this section of bank remains exposed and vulnerable. The 2018 runoff period was supported by above-average precipitation in June.

3.9 CURRENT CREDIT SUMMARY

Table 3-10 summarizes the current estimated wetland credits based on the USACE-approved credit ratios [MDT, 2008] and the wetland delineation completed in July 2018. 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 pre-existing 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 2018 delineation identified a total of 11.59 acres of wetlands within the project boundary. Approximately 8.93 acres of emergent and scrub/shrub wetlands have developed to date within the constructed cells. The restored channel encompassed 1.56 acres of riverine emergent wetland. The pre-existing wetlands, which included portions of community Types 3 – *Carex* spp., 4 – *Salix drummondiana*, and 5 – *Populus balsamifera*, encompassed 1.1 acres. Uplands accounted for 21.06 acres of the 32.65-acre site. The current 50-foot upland buffer calculated for this site totals 11.5 acres. The expected value of 2.6 acres of upland buffer was replaced in 2015 with the GIS-calculated, 50-foot upland buffer of 11.5 acres based on the existing extent of wetland development within the site, which resulted in a slight increase of credits between 2014 and 2015. However, the overall extent of wetland habitat in 2018 has decreased slightly because of wetland/upland boundary shifts that are occurring primarily in the northeastern portion of the project site. Portions of community Type 11, in the northeastern portion of the project site, have transitioned to community Type 18. Although dry soils were evident in an area previously delineated as Type 11, the overall hydrology appears to be improving to the north, as noted by an increase in FAC species within the area. Applying USACE-approved mitigation ratios to each mitigation feature, a total of 12.40 acres of credit were estimated in 2018 (Table 3-10), which is approximately 15.01 acres short of the proposed final credit acreage.

This site has not developed wetland habitat acreage as expected. In 2018, most of the excavated depression soils were either saturated or inundated, which was likely caused by irrigation water release, flooding from the Shields River, and/or groundwater levels during the spring and summer. The river flows were above average during the July 1, 2018, monitoring. Surface water was present in portions of the overflow channel and other low areas across the site. Signs of overland flow were noted along the western portion of the site, and debris from high flows was deposited along the base of young trees and shrubs. Sediment deposits were observed in the uplands along the southwestern portion of the project. New scour, deposition, and debris were also noted in the southern portion the channel. This additional water supported wetland hydrology, hydrophytic vegetation, and hydric soil development as well as improving vegetation cover and supported the expansion of facultative species across the northern portion of the project site. The decrease in wetland acreage delineated in 2018 was primarily associated with shifts in wetland /upland boundaries in the northeastern portion where the increase in hydrology was evident further to the north.

Table 3-10. Credit Summary From 2011 Through 2018 for the Easton Ranch Site

Proposed Mitigation Features	Compensatory Mitigation Type	USACE Mitigation Ratios	Anticipated Final Credit Acreages	Proposed Final Wetland Credits (Acres)	2011 Wetland Acreages	2011 Credit Estimated (Acres)	2012 Wetland Acreages	2012 Credit Estimated (Acres)	2013 Wetland Acreages	2013 Credit Estimated (Acres)	2014 Wetland Acreages	2014 Credit Estimated (Acres)	2015 Wetland Acreages	2015 Estimated Credit (Acres)	2016 Wetland Acreages	2016 Credit Estimated (Acres)	2017 Wetland Acreages	2017 Credit Estimated (Acres)	2018 Wetland Acreages	2018 Credit Estimated (Acres)
Creation of palustrine emergent wetland via shallow excavation	Creation	1:1	24.95	24.95	9.09	9.09	9.09	9.09	9.74	9.74	9.98	9.98	9.34	9.34	9.34	9.34	9.79	9.79	8.93	8.93
Reestablishment of relic flood channel	Restoration (Reestablishment)	1:1	1.56	1.56	1.45	1.45	1.45	1.45	1.56	1.56	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	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	6.43[a]	1.29	6.43[a]	1.29	6.43[a]	1.29	2.60[b]	0.52	11.5[b]	2.30	11.5	2.30	11.5	2.30	11.5	2.30
Project impacts			–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	–0.67	-0.67	-0.67
Total				**27.41**		**11.44**		**11.44**		**12.19**		**11.67**		**12.81**		**12.81**		**13.26**		**12.40**

(a) The upland buffer was expected to decrease as wetland areas expand within the mitigation boundary. The values presented in this table before 2014 (6.43 acres) represented the expected extent of upland buffer after maximum wetland acreage has been achieved.
(b) A 50-foot buffer was calculated with GIS in 2015.

In 2018, precipitation was 0.7 percent or slightly above the long-term average from January to August. Precipitation contributes to hydrology within this site, and elevated seasonal groundwater levels and high flows from the Shields River appear to be the principal contributors to wetland hydrology. Irrigation water should continue to be added to the site, especially in the northeastern portion of the project site, the southern portion of the restored channel, and the created wetland Cell 1 (located directly west of the channel) to maintain/improve wetland status in these areas. Community Type 18 – *Lotus corniculatus/Phleum pratense* has a dominance of facultative species but lacks the primary and/or secondary hydrology indicators. This northeastern portion of the project, with continued and consistent irrigation, represents an area where increases in wetland acreage could be anticipated based on the vegetation shifts from FACU to FAC and the increase in willow and cottonwood seedlings noted in 2018. A portion of this community type is located within an excavated depression where soils were moist in the upper few inches during the July 1, 2018, monitoring but were dry in the lower few inches. Irrigation water from an existing water right that is dedicated to the Easton wetland is being diverted into the site to improve and maintain wetlands. MDT is working with the landowner and his ranch manager to develop a water management plan for consistent and measurable water delivery to the site that will improve overall wetland development.

Table 3-11 summarizes the mitigation goals for the Easton Ranch site. The site has generally shown continued progress toward achieving goals; although the targeted credit acreage was not been achieved in 2018, the wetland acreage is anticipated to continue to increase with consistent annual precipitation and managed delivery of supplemental irrigation flows to improve hydrology within the site. The site has achieved five of its six goals. Although the site has developed nearly 9 acres of created wetland habitat or 11 acres including wetland creation and restoration, this value is more than 50 percent short of the 25 acres that were originally identified as a target for wetland creation. The current wetland acreage is likely to expand with the continued release of irrigation water during the spring and summer to supplement hydrology and to restore/maintain hydrology across the north and northeastern portion of the site, but continued normal or above-average precipitation is also needed to aid in and restore wetland development across the remaining portion of the site.

Five of the mitigation goals have been achieved at this site. The constructed floodplain channel was activated during the 2011 spring runoff and caused scour holes, riffles, and point bars to develop through natural fluvial geomorphic processes. Hydrophytic vegetation has established within the footprint of this channel. No bank erosion has been identified along the constructed channel through the course of yearly monitoring. Existing wetlands within the site have been preserved and grazing eliminated from these areas. The excavated depressions throughout the floodplain function as relic meander scars and store surface water during periods of high flow within the Shields River. These depressional wetlands have improved the water-storage capacity of the floodplain. Establishing hydrophytic vegetation communities; preserving existing scrub/shrub, forested, and emergent wetlands; and constructing wildlife-friendly fencing around the site have improved wildlife habitat within the Easton Ranch site.

The summary of performance standards listed in Table 3-12 indicates that this site has not achieved the full suite of success criteria established in the mitigation plan for the site. All of the wetlands that were delineated within this site in 2018 met the USACE's three-parameter criteria for hydrology,

vegetation, and soils. Groundwater has been documented filling the depressional wetlands excavated across the site. Groundwater wells established within the site during baseline evaluation were inadvertently removed by the contractor during construction. Redoximorphic concentrations and other hydric characteristics have developed within the wetland soils across the site. Sustained high stream flows and irrigation in 2018 have improved hydrology across the northern and western portion of the project area. Soils that were disturbed during construction have developed vegetation communities and are stable with no signs of active erosion. Areas that were identified as wetland habitat support a prevalence of hydrophytic vegetation. Trees and shrubs that were planted throughout the mitigation site continue to develop and natural recruitment of aspen, willows, and cottonwoods has been documented. Approximately 1174 live, planted woody stems were observed in 2018, approximately 9 more than noted in 2017. Although the number of speckled alder and sandbar willows increased in 2018, the number of live willow cuttings was reduced. The woody plants are increasing in height and coverage, with a positive trend toward achieving scrub/shrub communities. Speckled alder plants were especially robust and thriving as noted during the 2017 and 2018 monitoring. The improvement in woody plant growth is likely attributed to releasing irrigation water and improved hydrology observed across portions of the site.

Table 3-11. Summary of Mitigation Goals and Monitoring Results

Mitigation Goal for Easton Ranch	Goal Achieved Y/N	Discussion
Create approximately 25 acres of new emergent, scrub/shrub and riparian wetlands by replacing existing hay fields with various wetland communities that mimic habitats found in bio-reference wetland areas located north and south of the project.	N	A total of 8.93 acres of wetland habitat has been created at this site to date. The beginning of a dominance of hydrophytic trees and shrubs within created wetlands can be seen as well as the occurrence of young willow and cottonwood seedlings in uplands east of the channel in the northern portion of the project.
Re-establish a previously existing, relic floodplain channel and associated riparian and floodplain wetland areas totaling 1.56 acres.	Y	A 1.56-acre floodplain channel was excavated through the site. This channel was activated during peak spring runoff in 2011 with fluvial geomorphic processes resulting in scour holes, riffles, and point bars. Wetland vegetation has established within the footprint of the channel as well as young cottonwood seedlings/saplings, planted alder, and willows.
Preserve 1.1 acres of existing scrub/shrub, forested, and palustrine emergent communities at several locations within the project area.	Y	The 1.1 acres of existing scrub/shrub, forested, and palustrine emergent wetland communities have been preserved, livestock grazing has been eliminated, and the areas continue to exhibit wetland hydrology.
Mimic old meander scars and relic flood channels within the wetland mitigation site.	Y	Several depressional wetland areas have been constructed across the mitigation site and function as relic meander scars.
Improve water-storage capacity and increase the amount of floodplain area across the site.	Y	Several depressional wetland areas have been constructed across the mitigation site and have increased the water-storage capacity of the floodplain.
Increase the amount of wildlife habitat in this reach of the Shields River.	Y	Wildlife habitat has been improved by the diversification of the site including various community types, the establishment of wetland vegetation, and increased woody vegetation that will continue to support wildlife usage.

The anticipated 27.41 acres of credit development has not occurred to date; anticipated credits and 2018 calculated credits have been discussed above. To satisfy this performance standard, an additional 15.01 acres of wetland habitat would need to be created within the site. Irrigation water from an existing water right that is dedicated to the Easton wetland is being diverted into the site as a means of improving and maintaining wetlands. MDT is working with the landowner and his ranch manager to develop a water management plan for consistent and measurable water delivery to the site that will improve overall wetland development. In general, the percentage of emergent wetland habitat types (71 percent) are within the identified success criteria of 70 to 75 percent and scrub/shrub wetland habitat types (27 percent) slightly exceeds the target range of 15 to 20 percent as described in Table 3-10. The 2017 and 2018 monitoring has shown a trend toward increasing woody/shrub habitat within the site that could potentially reduce emergent coverage over time. The criterion for open water to occupy less than 5 percent of wetland area has been achieved.

The floodplain channel is considered stable and successfully restored. The floodplain channel was designed to inundate during a Q2 event and was not intended to flow annually. Because of the lack of Q2 flood events to inundate the system more frequently, portions of the southern flood channel have reverted to non-wetland status as would be anticipated under these natural conditions. However, cottonwood seedlings/saplings are being established within portions of the channel because of the previous channel flows and the proximity of the channel to an existing cottonwood grove (CT 5).

The bank stability of the Shields River in the northwestern corner of the site has been considered marginal because the established vegetation along the banks primarily consists of upland pasture grasses that lack deep-binding roots. The stream bank exhibits significant erosion and the underlying riprap is exposed at the downstream end of the bank, which has resulted in the formation of an eddy pool. Within the last 3 years, scrub-shrub communities have begun to develop within portions of the site near the Shields River. The disturbed upland buffer has developed more than 50 percent cover by nonweed species and noxious weed cover is less than 10 percent. Additionally, the percent cover of bare ground has decreased notably across the site from 2010 to 2018. Absolute cover of state-listed noxious weed species across the site is less than 5 percent, and weed management by MDT is ongoing. The remaining fencing around the site was intact and in good condition; grazing has been excluded from the mitigation area.

Table 3-12. Summary of Performance Standards and Success Criteria for the Easton Ranch Site (Page 1 of 3)

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 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 29 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.

Table 3-12. Summary of Performance Standards and Success Criteria for the Easton Ranch Site (Page 2 of 3)

Performance Standards	Success Criteria	Criteria Achieved (Y/N)	Discussion
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.
Wetland Acreage Development	Provide 27.41 net credit acres for the project area.	N	A total of 12.40 acres of wetland credit has been generated for the mitigation site. This total includes 8.93 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.	Y	Emergent wetland habitat comprises approximately 71% of total wetland areas delineated in 2018.
	Scrub/shrub wetland habitat will be 15–20% of wetland area.	Y	Scrub/shrub wetland habitat comprises approximately 27% of total wetland areas delineated in 2018.
	Open water will be < 5% of wetland area.	Y	Aquatic macrophytes habitat comprises approximately 2% of total wetland areas delineated in 2018 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 NW corner of the site. Installed willow cuttings did not establish along this bank.

Table 3-12. Summary of Performance Standards and Success Criteria for the Easton Ranch Site (Page 3 of 3)

Performance Standards	Success Criteria	Criteria Achieved (Y/N)	Discussion
Upland Buffer	'Noxious weeds do not exceed 10 percent cover within upland buffer area.	Y	'Noxious weed cover is less than 10 percent within the upland buffer.
	'Any area disturbed within creditable buffer zone must have at least 50 percent aerial cover of nonweed species by end of monitoring period.	Y	'Disturbed areas have established greater than 50 percent cover by nonweed 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 less than 5 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 US Army Corps.	Y	Comprehensive site monitoring has been ongoing for approximately 8 years, since the completion of construction activities in 2009.

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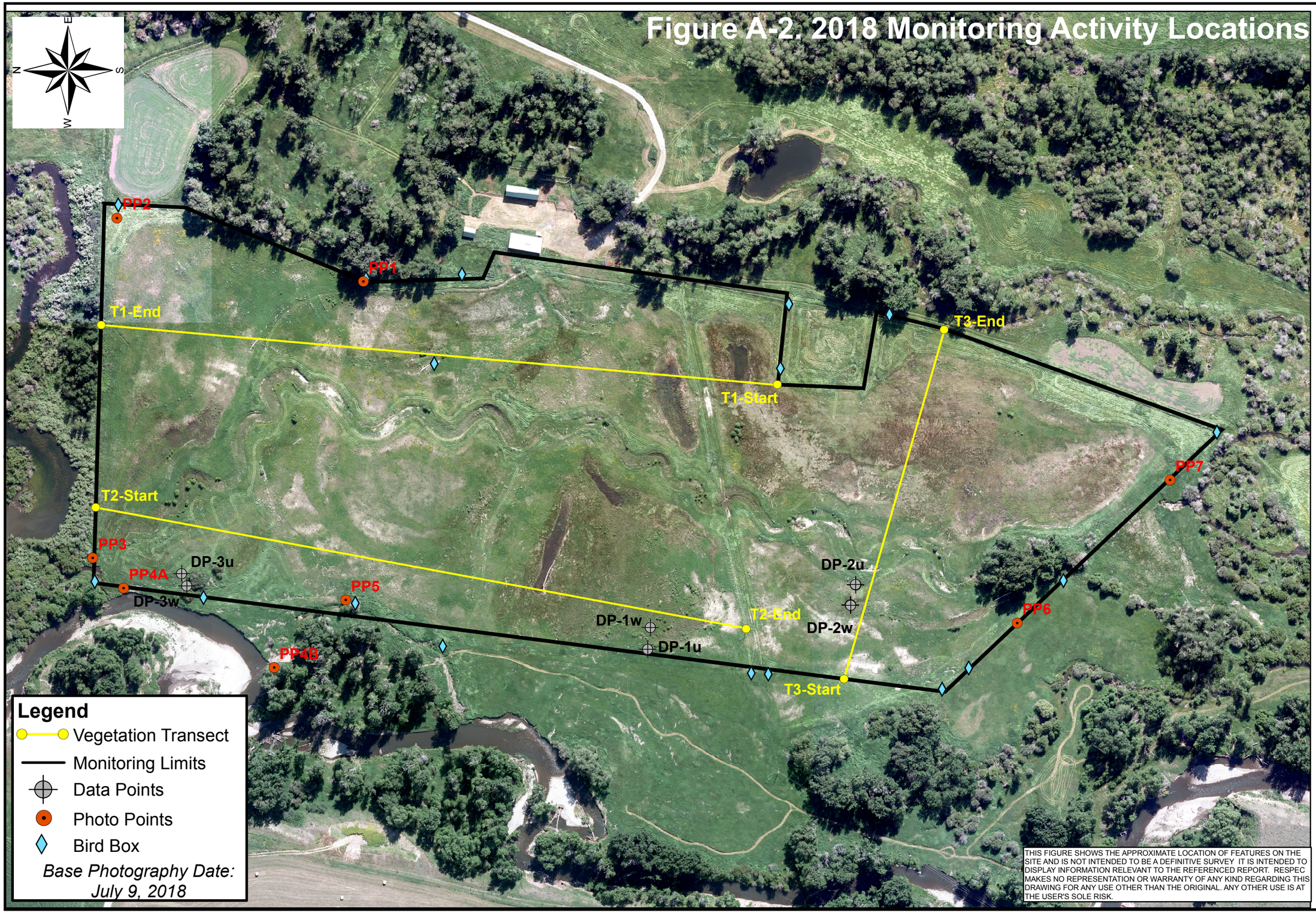
APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Easton Ranch
Park County, Montana

Figure A-2. 2018 Monitoring Activity Locations



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

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

Easton Ranch Wetland Mitigation
2018 Monitoring Activity Locations

0 75 150 300 450 600 750 Feet

Project:	STPX-0034(14)
Location:	Park Co., Montana
Date:	December 2018
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Easton Ranch\GPS Data\Mainst\Monitor2018.mxd

Figure A-3. 2018 Mapped Site Features

Noxious Weeds
- Cirsium arvense
- Cynoglossum officinale

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

Vegetation Community Types

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

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 9, 2018

Acreages

Project Area	32.65 acres
Gross Wetland	11.59 acres
Pre-existing Wetland	1.10 acres
Net Wetlands	10.49 acres
Uplands	21.06 acres

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

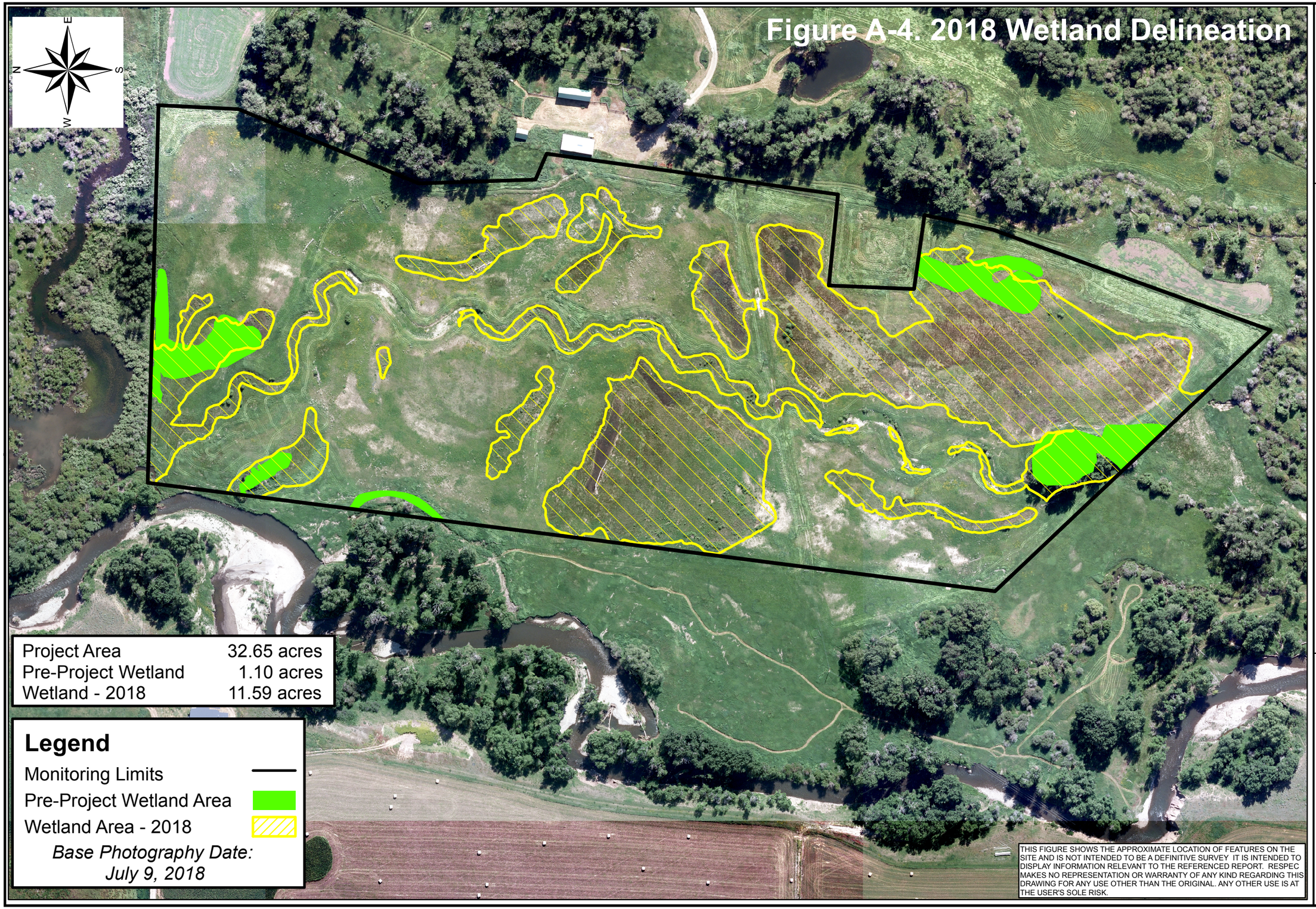
Easton Ranch Wetland Mitigation
2018 Mapped Site Features

0 75 150 300 450 600 750 Feet

Project: STPX-0034(14)
Location: Park Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Easton Ranch\GPS Data\Mains\Veg2018.mxd

Figure A-4. 2018 Wetland Delineation



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

Easton Ranch Wetland Mitigation
2018 Wetland Delineation

0 75 150 300 450 600 750 Feet

Project: STPX-0034(14)
Location: Park Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Easton Ranch\GPS Data\Mains\Delin2018.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 1, 2018** Person(s) conducting the assessment: **C. Hoschouer, L. Bacon**
Location: **Northeast of Wilsall** MDT District: **Butte** Milepost: **NA**
Legal Description: T **4N** R **9E** Section **32 NW 1/4** **0**
Weather Conditions: **Cloudy, calm 70F** Time of Day: **7 AM**
Initial Evaluation Date: **August 25, 2010** Monitoring Year: **8** # 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: **0.3 feet** Range of Depths: **0 to 1.5 ft**
Percent of assessment area under inundation: **35%**
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:
The majority 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 other low areas across the site. Signs of overland flow were noted along Transect 2 with debris from high flows deposited approximately 1 foot in height along the stems/trunks of young trees and shrubs Also one upland community near the southwestern end of Transect 2 had lower vegetation cover values in 2018 due to overland flows resulting in fine sediment deposits. Along Transect 3, signs of overland flow included new scour in the channel, deposition and debris deposits along the base of young trees and shrubs in the channel.

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	4 = 21-50%	Leymus cinereus	1 = 1-5%
Lotus corniculatus	3 = 11-20%	Carum carvi	1 = 1-5%
Bromus inermis	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.**

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

Dominant Species	% Cover	Dominant Species	% Cover
Carex utriculata	4 = 21-50%	Equisetum arvense	1 = 1-5%
Carex nebrascensis	3 = 11-20%	Poa pratensis	1 = 1-5%
Carex atherodes	2 = 6-10%	Stachys palustris	1 = 1-5%
Carex lasiocarpa	+ = < 1%	Juncus effusus	1 = 1-5%
Juncus balticus	2 = 6-10%	Poa palustris	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	5 = > 50%	Mentha arvensis	1 = 1-5%
Carex utriculata	2 = 6-10%	Juncus effusus	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Glyceria grandis	1 = 1-5%
Juncus balticus	2 = 6-10%	Ruppia maritima	1 = 1-5%
Algae, green	2 = 6-10%	Juncus ensifolius	1 = 1-5%
Agrostis stolonifera	1 = 1-5%	Juncus tenuis	1 = 1-5%

Comments / Problems: **This community type is stable with open water 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%	Elymus cinereus	1 = 1-5%
Populus tremuloides	3 = 11-20%	Poa pratensis	1 = 1-5%
Phleum pratense	3 = 11-20%	Sisyrinchium montanum	1 = 1-5%
Trifolium pratense	2 = 6-10%	Taraxacum officinale	1 = 1-5%
Elymus repens	2 = 6-10%	Medicago lupulina	+ = < 1%
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 pratensis	2 = 6-10%
Juncus effusus	2 = 6-10%	Eleocharis palustris	1 = 1-5%
Juncus ensifolius	1 = 1-5%	Carex nebrascensis	1 = 1-5%
Juncus longistylis	1 = 1-5%	Lotus corniculatus	1 = 1-5%
Juncus tenius	1 = 1-5%	Potentilla gracilis	1 = 1-5%
Agrostis stolonifera	2 = 6-10%	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, 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	4 = 21-50%	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	2 = 6-10%	Lotus corniculatus	1 = 1-5%
Trifolium pratense	2 = 6-10%	Medicago lupulina	1 = 1-5%
Trifolium hybridum	2 = 6-10%	Agrostis stolonifera	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.**

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%	Potentilla anserina	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 pratensis	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%	Lotus corniculatus	2 = 6-10%
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	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
Bromus inermis	1 = 1-5%	Lotus corniculatus	1 = 1-5%
Phleum pratense	4 = 21-50%	Taraxacum officinale	1 = 1-5%
Poa pratensis	3 = 11-20%	Trifolium pratense	+ = < 1%
Elymus repens	4 = 21-50%	Bare Ground	1 = 1-5%
Carum carvi	2 = 6-10%		
Equisetum arvense	2 = 6-10%		

Comments / Problems: **A small, well-defined community along the northern end of Transect 1 formerly CT 1.**

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%
Alopecurus arundinaceus	2 = 6-10%	Medicago lupulina	1 = 1-5%
Trifolium pratense	2 = 6-10%	Leymus cinereus	1 = 1-5%
Elymus repens	1 = 1-5%	Alnus incana	1 = 1-5%
Poa pratensis	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 type 8 and CT 13.**

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	12	
Sandbar willow	250	48	
Thinleaf alder	500	49	
Willow cuttings	200	65	

Comments / Problems: **During the 2018 monitoring there were changes in the number of live species. Thinleaf alder increased from 43 plants to 49 plants and Sandbar willow increased from 35 to 48. Several volunteer thinleaf alder and young sandbar willows were noted along the channel. All of the plants observed were well established and growing. The thinleaf alder were especially robust and thriving in areas where planted.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **L. Bacon, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **9 ft (station 0 to 9)**	
Vegetation Community Type: Elymus repens/Poa pratensis	
Plant Species	**Cover**
Elymus repens	4 = 21-50%
Poa pratensis	3 = 11-20%
Alopecurus arundinaceus	3 = 11-20%
Bromus inermis	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Carex nebrascensis	1 = 1-5%
Equisetum arvense	1 = 1-5%
Juncus longistylis	1 = 1-5%
Juncus tenuis	1 = 1-5%
Trifolium hybridum	1 = 1-5%
Carex pachystachya	+ = < 1%
Total Vegetative Cover:	85%

Transect Interval Length: **56 ft (station 9 to 65)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	2 = 6-10%
Juncus longistylis	1 = 1-5%
Carex pellita	3 = 11-20%
Poa palustris	1 = 1-5%
Carex nebrascensis	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Mentha arvensis	1 = 1-5%
Carex pachystachya	1 = 1-5%
Salix lutea	+ = < 1%
Carum carvi, Elymus repens, Equisetum arvense	2 = 6-10%
Total Vegetative Cover:	95%

Transect Interval Length: **36 ft (station 65 to 101)**	
Vegetation Community Type: Aquatic macrophytes	
Plant Species	**Cover**
Open water	5 = > 50%
Carex utriculata	2 = 6-10%
Eleocharis palustris	2 = 6-10%
Juncus balticus	2 = 6-10%
Carex pellita	1 = 1-5%
Typha latifolia	1 = 1-5%
Alopecurus geniculatus	1 = 1-5%
Algae, green	2 = 6-10%
Juncus effusus	1 = 1-5%
Juncus tenuis	1 = 1-5%
Juncus ensifolius	1 = 1-5%
Total Vegetative Cover:	50%

Transect Interval Length: **37 ft (station 101 to 138)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	5 = > 50%
Juncus longistylis	1 = 1-5%
Juncus tenuis	1 = 1-5%
Carex nebrascensis	1 = 1-5%
Salix lutea	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Poa pratensis	1 = 1-5%
Eleocharis palustris	+ = < 1%
Poa palustris	+ = < 1%
Mentha arvensis	+ = < 1%
Juncus ensifolius	+ = < 1%
Carex aquatilis, Equisetum arvense	+ = < 1%
Total Vegetative Cover:	100%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **55 ft (station 138 to 193)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Poa pratensis	4 = 21-50%
Phleum pratense	3 = 11-20%
Elymus repens	3 = 11-20%
Carum carvi	3 = 11-20%
Bromus inermis	1 = 1-5%
Cirsium arvense	1 = 1-5%
Cynoglossum officinale	1 = 1-5%
Stachys palustris	+ = < 1%
Trifolium pratense	+ = < 1%
Taraxcum officinale	+ = < 1%
Carex nebrascensis, Leymus cinereus, Thlaspi arvense	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **69 ft (station 193 to 262)**	
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	3 = 11-20%
Eleocharis palustris	2 = 6-10%
Salix exigua	1 = 1-5%
Populus balsamifera	1 = 1-5%
Typha latifolia	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Carex utriculata	2 = 6-10%
Total Vegetative Cover:	85%

Transect Interval Length: **209 ft (station 262 to 471)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Poa pratensis	3 = 11-20%
Leymus cinereus	3 = 11-20%
Carum carvi	2 = 6-10%
Juncus balticus	2 = 6-10%
Taraxacum officinale	1 = 1-5%
Rumex crispus	1 = 1-5%
Elymus repens	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Trifolium hybridum, Populus angustifolia	1 = 1-5%
Cirsium arvense, Carex aquatilis	+ = < 1%
Medicago lupulina, Lotus corniculatus	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **39 ft (station 471 to 510)**	
Vegetation Community Type: Juncus spp./ Populus balsamifera	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Populus balsamifera	2 = 6-10%
Poa pratensis	2 = 6-10%
Juncus tenuis	1 = 1-5%
Carex pellita	1 = 1-5%
Carum carvi	1 = 1-5%
Stachys palustris	1 = 1-5%
Carex pachystachya	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Salix lutea	+ = < 1%
Populus angustifolia	+ = < 1%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **L. Bacon, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **88 ft (station 510 to 598)**	
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	2 = 6-10%
Salix lutea	1 = 1-5%
Elymus repens	1 = 1-5%
Rumex salicifolius	1 = 1-5%
Trifolium pratense	1 = 1-5%
Carex pachystachya	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Alnus incana, Populus angustifolia	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **26 ft (station 598 to 624)**	
Vegetation Community Type: Juncus spp./Salix spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	1 = 1-5%
Salix exigua	3 = 11-20%
Lotus corniculatus	3 = 11-20%
Populus angustifolia	2 = 6-10%
Carum carvi	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Poa pratensis, Salix lutea	1 = 1-5%
Carex nebrascensis, Eleocharis palustris	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Bare soil - signs of inundation	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **646 ft (station 624 to 1270)**	
Vegetation Community Type: Lotus corniculatus/Phleum pratense	
Plant Species	**Cover**
Lotus corniculatus	3 = 11-20%
Phleum pratense	2 = 6-10%
Trifolium pratense	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: **52 ft (station 1270 to 1322)**	
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%
Poa pratense	2 = 6-10%
Bromus inermis	1 = 1-5%
Medicago lupulina	1 = 1-5%
Leymus cinereus	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Cirsium arvense	+ = < 1%
Trifolium pratense	+ = < 1%
Equisetum arvense	+ = < 1%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **L. Bacon, C. Hoschouer**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

Transect Interval Length: **54 ft (station 1322 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%
Trifolium pratense	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 1, 2018** Examiner: **C. Hoschouer, L. Bacon**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

Transect Interval Length: **41 ft (station 0 to 41)**	
Vegetation Community Type: Carex spp.	
Plant Species	**Cover**
Carex nebrascensis	3 = 11-20%
Carex atherodes	3 = 11-20%
Carex utriculata	1 = 1-5%
Poa pratensis	2 = 6-10%
Juncus balticus	2 = 6-10%
Scirpus microcarpus	2 = 6-10%
Stachys palustris	1 = 1-5%
Juncus effusus	1 = 1-5%
Poa palustris	1 = 1-5%
Salix exigua	+ = < 1%
Equisetum arvense	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **27 ft (station 41 to 68)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	2 = 6-10%
Juncus effusus	2 = 6-10%
Juncus ensifolius	2 = 6-10%
Carex nebrascensis, Scirpus microcarpus	2 = 6-10%
Glyceria grandis	2 = 6-10%
Open water	3 = 11-20%
Typha latifolia	1 = 1-5%
Eleocharis palustris	1 = 1-5%
Equisetum arvense	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: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Bromus inermis	3 = 11-20%
Phleum pratense	3 = 11-20%
Poa pratensis	3 = 11-20%
Lotus corniculatus	2 = 6-10%
Taraxacum officinale	2 = 6-10%
Carex nebrascensis	1 = 1-5%
Equisetum arvense	1 = 1-5%
Scirpus microcarpus	1 = 1-5%
Cirsium arvense	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Juncus balticus	1 = 1-5%
Dactylis glomerata	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **28 ft (station 113 to 141)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	1 = 1-5%
Carex utriculata	3 = 11-20%
Carex atherodes	2 = 6-10%
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, Salix bebbiana	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **C. Hoschouer, L. Bacon**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

Transect Interval Length: **174 ft (station 141 to 315)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratense	2 = 6-10%
Poa pratensis	3 = 11-20%
Elymus repens	3 = 11-20%
Lotus corniculatus	2 = 6-10%
Equisetum arvense	2 = 6-10%
Trifolium pratense	2 = 6-10%
Taraxacum officinale	2 = 6-10%
Trifolium hybridum	1 = 1-5%
Salix lutea	1 = 1-5%
Leymus cinereus, Populus balsamifera	1 = 1-5%
Ranunculus macounii, Carum carvi	1 = 1-5%
Total Vegetative Cover:	85%

Transect Interval Length: **38 ft (station 315 to 353)**	
Vegetation Community Type: Juncus spp	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	1 = 1-5%
Juncus tenuis	1 = 1-5%
Juncus longistylis	1 = 1-5%
Poa pratensis	2 = 6-10%
Salix lutea	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Agrostis stolonifera, Populus balsamifera	1 = 1-5%
Poa palustris, Scirpus microcarpus	1 = 1-5%
Salix bebbiana, Equisetum arvense	1 = 1-5%
Potentilla anservina, Trifolium pratense	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **350 ft (station 353 to 703)**	
Vegetation Community Type: Elymus repens/Poa pratensis	
Plant Species	**Cover**
Elymus repens	3 = 11-20%
Poa pratensis	3 = 11-20%
Lotus corniculatus	3 = 11-20%
Carum carvi	2 = 6-10%
Bromus carinatus	1 = 1-5%
Trifolium pratense	1 = 1-5%
Leymus cinereus	1 = 1-5%
Lepidium campestre	1 = 1-5%
Camelina microcarpus	1 = 1-5%
Medicago lupulina	1 = 1-5%
Bromus inermis	1 = 1-5%
Schedonorus pratensis, Equisetum arvense	1 = 1-5%
Total Vegetative Cover:	85%

Transect Interval Length: **40 ft (station 703 to 743)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	1 = 1-5%
Juncus tenuis	1 = 1-5%
Juncus longistylis	1 = 1-5%
Poa pratensis	2 = 6-10%
Salix lutea	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	1 = 1-5%
Carex bebbii, Mentha arvensis, Populus balsamifera	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **C. Hoschouer, L. Bacon**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

Transect Interval Length: **150 ft (station 743 to 893)**	
Vegetation Community Type: Elymus repens/Poa pratensis	
Plant Species	**Cover**
Elymus repens	3 = 11-20%
Poa pratensis	3 = 11-20%
Phleum pratense	2 = 6-10%
Bromus inermis	2 = 6-10%
Trifolium pratense	2 = 6-10%
Carum carvi	1 = 1-5%
Populus balsamifera	1 = 1-5%
Taraxacum officinale	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Cirsium arvense	+ = < 1%
Salix exigua	+ = < 1%
Total Vegetative Cover:	85%

Transect Interval Length: **30 ft (station 893 to 923)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	2 = 6-10%
Populus balsamifera	1 = 1-5%
Salix lutea	1 = 1-5%
Poa pratensis	2 = 6-10%
Equisetum arvense	2 = 6-10%
Salix exigua	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:	90%

Transect Interval Length: **20 ft (station 923 to 943)**	
Vegetation Community Type: Aquatic Macrophytes	
Plant Species	**Cover**
Open water	4 = 21-50%
Carex utriculata	2 = 6-10%
Eleocharis palustris	2 = 6-10%
Carex pellita	1 = 1-5%
Alopecurus geniculatus	1 = 1-5%
Juncus balticus	1 = 1-5%
Juncus ensifolius	+ = < 1%
Typha latifolia	+ = < 1%
Schoenoplectus pungens	+ = < 1%
Scirpus microcarpus	+ = < 1%
Total Vegetative Cover:	50%

Transect Interval Length: **40 ft (station 943 to 983)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	4 = 21-50%
Juncus effusus	2 = 6-10%
Juncus tenuis	1 = 1-5%
Agrostis stolonifera	2 = 6-10%
Alopecurus geniculatus	1 = 1-5%
Scirpus microcarpus	1 = 1-5%
Schoenoplectus pungens	1 = 1-5%
Mentha arvensis	+ = < 1%
Cicuta douglasii	1 = 1-5%
Total Vegetative Cover:	90%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **C. Hoschouer, L. Bacon**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

Transect Interval Length: **85 ft (station 983 to 1068)**	
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	3 = 11-20%
Salix bebbiana	3 = 11-20%
Salix drummondiana	1 = 1-5%
Populus balsamifera	2 = 6-10%
Carex nebrascensis	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Agrostis stolonifera	1 = 1-5%
Salix exigua, Potentilla anserina, Cicuta douglasii	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **196 ft (station 1068 to 1264)**	
Vegetation Community Type: Juncus spp./ Populus balsamifera	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	2 = 6-10%
Populus balsamifera	3 = 11-20%
Salix lutea	3 = 11-20%
Poa pratensis	2 = 6-10%
Salix drummondiana	2 = 6-10%
Agrostis stolonifera	2 = 6-10%
Salix bebbiana	2 = 6-10%
Lotus corniculatus	1 = 1-5%
Mentha arvensis	1 = 1-5%
Carex utriculata	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **69 ft (station 1264 to 1333)**	
Vegetation Community Type: Phleum pratense	
Plant Species	**Cover**
Phleum pratense	2 = 6-10%
Poa pratensis	2 = 6-10%
Bromus inermis	3 = 11-20%
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%
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 1, 2018** Examiner: **C. Hoschouer, L. Bacon**
Transect Number: **3** Approximate Transect Length: **732 feet** Compass Direction from Start: **95˚** Note: _____

Transect Interval Length: **113 ft (station 0 to 113)**	
Vegetation Community Type: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Bromus inermis	3 = 11-20%
Phleum pratense	2 = 6-10%
Carum carvi	3 = 11-20%
Trifolium pratense	3 = 11-20%
Dactylis glomerata	2 = 6-10%
Lotus corniculatus	2 = 6-10%
Elymus repens	1 = 1-5%
Taraxacum officinale	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: **32 ft (station 113 to 145)**	
Vegetation Community Type: Juncus spp.	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Lotus corniculatus	3 = 11-20%
Poa pratensis	2 = 6-10%
Salix lutea	2 = 6-10%
Populus balsamifera	2 = 6-10%
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	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **56 ft (station 145 to 201)**	
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	2 = 6-10%
Taraxacum officinale	1 = 1-5%
Elymus repens	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Equisetum arvense	1 = 1-5%
Leymus cinerus	1 = 1-5%
Dactylis glomerata	1 = 1-5%
Camelina microcarpa	1 = 1-5%
Bromus carinatus	+ = < 1%
Total Vegetative Cover:	85%

Transect Interval Length: **15 ft (station 201 to 216)**	
Vegetation Community Type: Juncus spp./Populus balsamifera	
Plant Species	**Cover**
Juncus balticus	3 = 11-20%
Juncus effusus	1 = 1-5%
Populus balsamifera	4 = 21-50%
Phleum pratense	1 = 1-5%
Poa pratensis	1 = 1-5%
Salix lutea	1 = 1-5%
Sinapis arvensis	1 = 1-5%
Glyceria striata	1 = 1-5%
Salix lutea	1 = 1-5%
Mentha arvensis	1 = 1-5%
Carex nebrascensis, Carex pachystachya	+ = < 1%
Water	2 = 6-10%
Total Vegetative Cover:	90%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **July 1, 2018** Examiner: **C. Hoschouer, L. Bacon**
Transect Number: **3** Approximate Transect Length: **732 feet** Compass Direction from Start: **95˚** Note: _____

Transect Interval Length: **125 ft (station 216 to 341)**	
Vegetation Community Type: Bromus inermis/Phleum pratense	
Plant Species	**Cover**
Phleum pratense	4 = 21-50%
Bromus inermis	3 = 11-20%
Carum carvi	3 = 11-20%
Lotus corniculatus	2 = 6-10%
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%
Melilotus officinalis	+ = < 1%
Cirsium arvense	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **327 ft (station 341 to 668)**	
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	1 = 1-5%
Carex utriculata	1 = 1-5%
Populus balsamifera	1 = 1-5%
Ranunculus aquatilis	+ = < 1%
Solidago gigantea	+ = < 1%
Carex nebrascensis	+ = < 1%
Carex spp.	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **64 (station to 668 to 732)**	
Vegetation Community Type: Phleum pratense/Poa pratensis	
Plant Species	**Cover**
Phleum pratense	3 = 11-20%
Poa pratensis	3 = 11-20%
Bromus inermis	2 = 6-10%
Taraxacum officinale	1 = 1-5%
Carum carvi	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Dactylis glomerata	1 = 1-5%
Lotus corniculatus	1 = 1-5%
Trifolium pratense	1 = 1-5%
Melilotus officinalis	+ = < 1%
Juncus balticus	+ = < 1%
Juncus effusus, Juncus tenuis	+ = < 1%
Total Vegetative Cover:	90%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

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

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

Comments: **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	2	☒	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: Several new bird boxes were installed and surveyed in 2017. Boxes were checked in 2018.

BIRD SURVEY – FIELD DATA SHEET

Site: **Easton Ranch** Date: **7/1/18**
Survey Time: **7 AM** to **5 PM**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Goldfinch	2	F	WM UP				
American Robin	2	BD	WM				
Bullock's Oriole	1	FO	WM				
Common Nighthawk	1	FO	UP WM				
Eastern Kingbird	2	FO	WM				
House Wren	1	BP	UP				
Mountain Bluebird	1	F	FO				
Savannah Sparrow	3	BP N	UP				
Tree Swallow	20	BD N F	WM UP				

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

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

Weather: _____

Notes: **Savannah sparrow had a nest on the ground with 5 eggs, House wrens and tree swallows were using bird boxes. Also noted young bald eagle in the nest within the Shield River corridor just outside the project boundary to the southwest.**

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

Project/Site: Easton **City/County:** Park **Sampling Date:** 01-Jul-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **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	30	☑ 33.3%	FAC
2. Poa pratensis	20	☑ 22.2%	FAC
3. Phleum pratense	25	☑ 27.8%	FAC
4. Alopecurus pratensis	5	☐ 5.6%	FAC
5. Taraxacum officinale	5	☐ 5.6%	FACU
6. Carum carvi	5	☐ 5.6%	FACU
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
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	80	x 3 =	240
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	90 (A)		280 (B)

Prevalence Index = B/A = 3.111

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
0-14	10YR	3/2	100						Silt Loam	
14-18	10YR	3/3	100						Silt Loam	with increasing gravels at depth

[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 once a hay field that was subject to plowing although a plow zone profile for DP-1U was not observed.

Hydrology

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ 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 dry.

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

Project/Site: Easton **City/County:** Park **Sampling Date:** 01-Jul-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **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.:** -110.382480 **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 2018.

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	15	☑ 42.9%	FAC
2. Salix lutea	5	☐ 14.3%	OBL
3. Salix drummondiana	15	☑ 42.9%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	35	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Juncus balticus	50	☑ 76.9%	FACW
2. Carex nebrascensis	5	☐ 7.7%	OBL
3. Carex utriculata	5	☐ 7.7%	OBL
4. Elymus repens	5	☐ 7.7%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	65	= 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:

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	15	x 1 =	15
FACW species	65	x 2 =	130
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		205 (B)

Prevalence Index = B/A = 2.050

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)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR	3/1	100						Silt Loam	
14-20	10YR	3/2	100						Silt Loam	with 5% gravels

[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):	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 and sediment deposits, 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:** 01-Jul-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **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. Bromus inermis	20	☑ 22.2%	UPL
2. Poa pratensis	20	☑ 22.2%	FAC
3. Elymus repens	40	☑ 44.4%	FAC
4. Phleum pratense	10	☐ 11.1%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
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: 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	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	20	x 5 =	100
Column Totals:	90 (A)		310 (B)

Prevalence Index = B/A = 3.444

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 vegetation.

*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 subject 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:** 01-Jul-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **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.:** -110.382440 **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 ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Wetland data point within a shallow depression hear 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. Salix lutea	5	☑	29.4%	OBL
2. Populus angustifolia	2	☐	11.8%	FACW
3. Alnus incana	5	☑	29.4%	FACW
4. Salix drummondiana	5	☑	29.4%	FACW
5.	0	☐	0.0%	
	17	**= Total Cover**		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Juncus balticus	35	☑	46.7%	FACW
2. Carex pellita	20	☑	26.7%	OBL
3. Elymus repens	10	☐	13.3%	FAC
4. Equisetum arvense	10	☐	13.3%	FAC
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
	75	**= 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: 8

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (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	47	x 2 =	94
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	92 (A)		179 (B)

Prevalence Index = B/A = 1.946

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 will likely develop into a palustrine scrub-shrub based on the number of young Populus and Salix.

*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	20	RM	M	Silt 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: Impeding rock layer

Depth (inches): below 12"

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydric soil indicators were observed within this data point. Used Version 8.1 2017 Field Indicators of Hydric Soils.

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):	8
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 and water in the pit at 8", 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:** 01-Jul-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **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:
New data point established in 2018 located on an upland terrace in the northwestern corner of the 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. Bromus inermis	30	☑ 31.6%	UPL
2. Poa pratensis	20	☑ 21.1%	FAC
3. Elymus repens	40	☑ 42.1%	FAC
4. Phleum pratense	5	☐ 5.3%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= 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: 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	0	x 4 =	0
UPL species	30	x 5 =	150
Column Totals:	95 (A)		345 (B)

Prevalence Index = B/A = 3.632

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
0-18	10YR	3/2	100						Silt Loam	
>18										Large rocks - impeding rock layer

[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: Impeding rock layer

Depth (inches): below 18"

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydric soil indicators were not observed within this data point. This data point is located outside the historic plow zone.

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 few inches 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:** 01-Jul-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **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:
New data point established in 2018 on the edge of Community type 4 - Salix drummondiana.

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	☑ 83.3%	FACW
2. Salix lutea	5	☐ 13.9%	OBL
3. Ribes inerme	1	☐ 2.8%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	36	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Phalaris arundinacea	15	☑ 27.8%	FACW
2. Scirpus microcarpus	9	☐ 16.7%	OBL
3. Elymus repens	30	☑ 55.6%	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%	
	54	= 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	14	x 1 =	14
FACW species	45	x 2 =	90
FAC species	31	x 3 =	93
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		197 (B)

Prevalence Index = B/A = 2.189

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. Used Version 8.1 2017 Field Indicators of Hydric Soils. This data point is located outside the historic plow zone.

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, water marks (scour), and sediment deposits. Secondary indicators include geomorphic position and FAC-neutral test.

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: 7/1/2018 **4. Evaluator(s):** C. Hoschouer, L. Bacon **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)
8.93 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 8.93 (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 _____
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	---	---	---	---	.2L	---	---

Sources for documented use (e.g. observations, records): MTNHP, 2013 field observations.

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 2018 noted wild turkeys near the eastern project boundary as well and ringed-neck pheasants. 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.

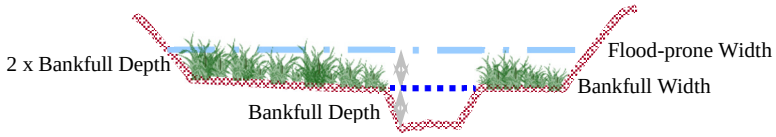
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

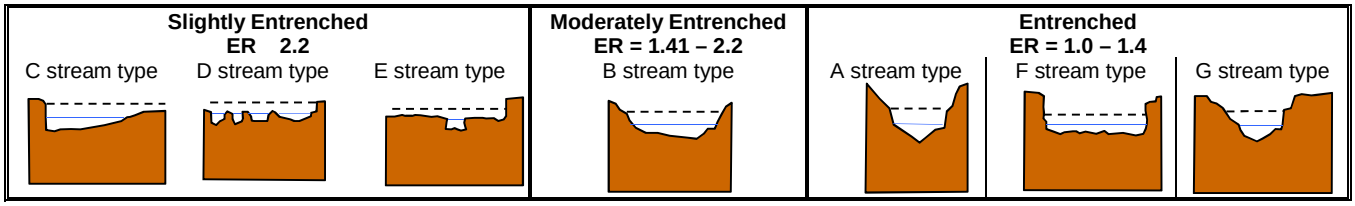
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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: (8.92 acre wetland) * (1 ft. max depth at highwater) = 8.92 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 and 2018. 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 2018 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 2018

14K. UNIQUENESS

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

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☒ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.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	low 0.20	1.00	1.788	
C. General Wildlife Habitat	high 0.90	1.00	8.046	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	high 0.80	1.00	7.152	
F. Short and Long Term Surface Water Storage	high 0.80	1.00	7.152	*
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	8.046	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	5.364	
I. Production Export / Food Chain Support	high 0.80	1.00	7.152	*
J. Groundwater Discharge / Recharge	mod 0.70	1.00	6.258	
K. Uniqueness	mod 0.40	1.00	3.576	
L. Recreation / Education Potential (bonus point)	low 0.05		0.447	
Total Points	**6.15**	**10**	**54.981 Total Functional Units**	
Percent of Possible Score 61.5% (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: 7/1/2018 **4. Evaluator(s):** C. Hoschouer, L. Bacon **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 _____
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	---	---	---	---	.2L	---	---

Sources for documented use (e.g. observations, records): MTNHP, 2013 field observations.

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.

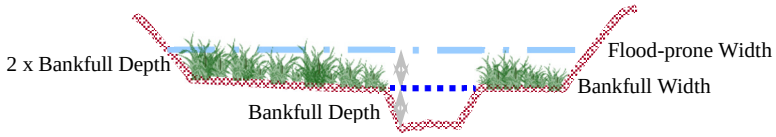
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

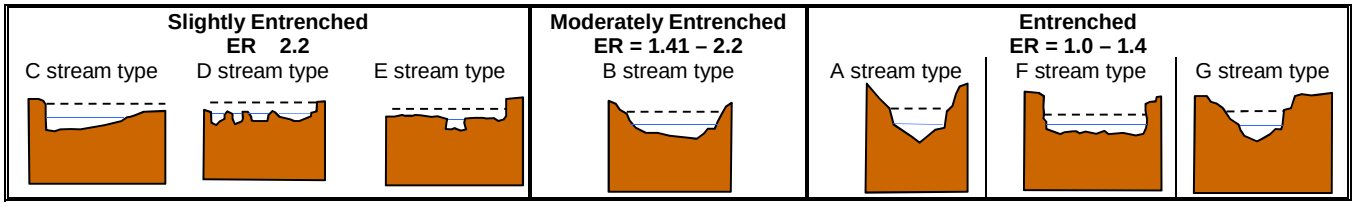
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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: _____

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	low 0.20	1.00	0.22	
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	**5.85**	**9**	**6.44 Total Functional Units**	
Percent of Possible Score 65% (round to nearest whole number)				

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

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

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

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

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

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: 7/1/2018 **4. Evaluator(s):** C. Hoschouer, L. Bacon **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 _____
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	---	---	---	---	.2L	---	---

Sources for documented use (e.g. observations, records): MTNHP;observed on site in 2013

14C. GENERAL WILDLIFE HABITAT RATING

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

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

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

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

Structural Diversity (see #13)	☐ **High**								☒ **Moderate**								☐ **Low**			
Class Cover Distribution (all vegetated classes)	☐ **Even**				☐ **Uneven**				☐ **Even**				☒ **Uneven**				☐ **Even**			
Duration of Surface Water in ≥ 10% of AA	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**
☒ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	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.

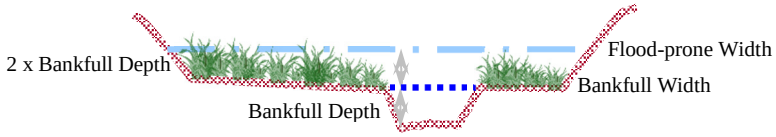
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

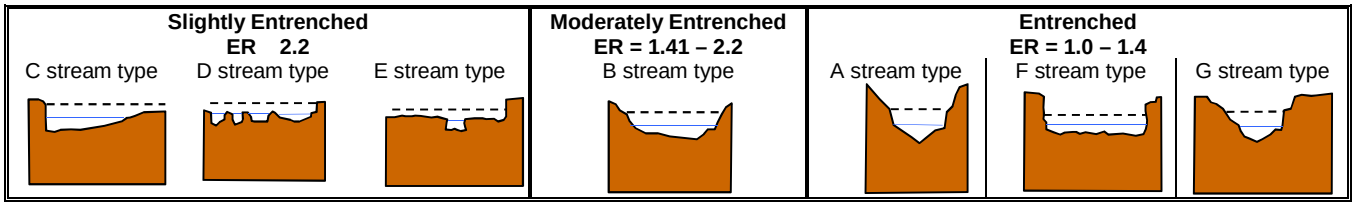
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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 2017 of species with high stability ratings including Salix, 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	low 0.20	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	**5.85**	**10**	**9.13 Total Functional Units**	
Percent of Possible Score 59% (round to nearest whole number)				

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

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

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

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

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

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: 2014

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2015

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2016

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2017

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2018

Easton Ranch: Photo Point Photos

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

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2014

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2015

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2016

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2017

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2018

Easton Ranch: Photo Point Photos

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

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2014

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2015

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2016

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2017

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2018

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: 2014

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2015

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2016

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2017

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2018

Easton Ranch: Photo Point Photos

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

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2014

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2015

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2016

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2017

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2018 – New location*

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

Easton Ranch: Photo Point Photos

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

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2014

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2015

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2016

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2017 (fence removed)

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 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: 2014

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2015

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2016

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2017

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2018

Easton Ranch: Photo Point Photos

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

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2014

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2015

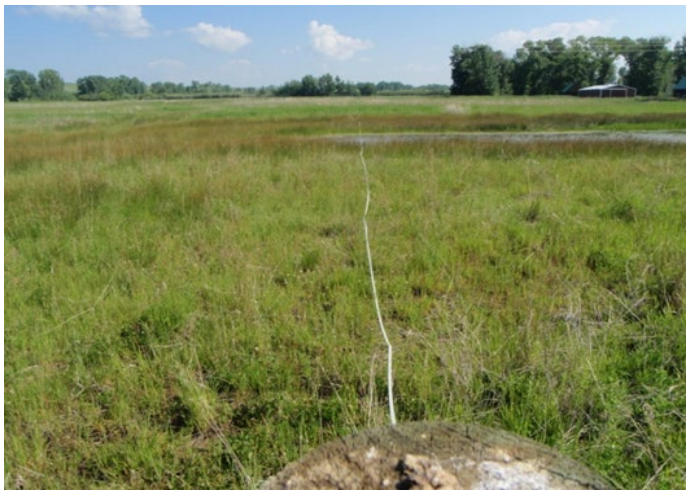
Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2016

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2017

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2018 (fence removed)

Easton Ranch: Transect Photos

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



Transect 1: Start Location: Veg Com 8 foreground
Bearing: 5 degrees Year: 2014

Transect 1: Start Location: Veg Com 8 foreground
Bearing: 5 degrees Year: 2015

Transect 1: Start Location: Veg Com 13 foreground
Bearing: 5 degrees Year: 2016

Transect 1: Start Location: Veg Com 13 foreground
Bearing: 5 degrees Year: 2017

Transect 1: Start Location: Veg Com 11 foreground
Bearing: 5 degrees Year: 2018

Easton Ranch: Transect Photos

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

Transect 1: End Location: Veg Com 8 foreground
Bearing: 185 degrees Year: 2014

Transect 1: End Location: Veg Com 8 foreground
Bearing: 185 degrees Year: 2015

Transect 1: End Location: Veg Com 13 foreground
Bearing: 185 degrees Year: 2016

Transect 1: End Location: Veg Com 13 foreground
Bearing: 185 degrees Year: 2017

Transect 1: End Location: Veg Com 17 foreground
Bearing: 185 degrees Year: 2018

Easton Ranch: Transect Photos

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

Transect 2: Start Location: Veg Com 1 foreground
Bearing: 185 degrees Year: 2014

Transect 2: Start Location: Veg Com 1 foreground
Bearing: 185 degrees Year: 2015

Transect 2: Start Location: Veg Com 1 foreground
Bearing: 185 degrees Year: 2016

Transect 2: Start Location: Veg Com 3 foreground
Bearing: 185 degrees Year: 2017

Transect 2: Start Location: Veg Com 3 foreground
Bearing: 185 degrees Year: 2018

Easton Ranch: Transect Photos

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

Transect 2: End Location: Veg Com 1 foreground
Bearing: 0 degrees Year: 2014

Transect 2: End Location: Veg Com 1 foreground
Bearing: 0 degrees Year: 2015

Transect 2: End Location: Veg Com 1 foreground
Bearing: 0 degrees Year: 2016

Transect 2: End Location: Veg Com 1 foreground
Bearing: 0 degrees Year: 2017

Transect 2: End Location: Veg Com 1 foreground
Bearing: 0 degrees Year: 2018

Easton Ranch: Transect Photos

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

Transect 3: Start Location: Veg Com 1 foreground
Bearing: 95 degrees Year: 2014

Transect 3: Start Location: Veg Com 1 foreground
Bearing: 95 degrees Year: 2015

Transect 3: Start Location: Veg Com 1 foreground
Bearing: 95 degrees Year: 2016

Transect 3: Start Location: Veg Com 13 foreground
Bearing: 95 degrees Year: 2017

Transect 3: Start Location: Veg Com 13 foreground
Bearing: 95 degrees Year: 2018

Easton Ranch: Transect Photos

Photo not available	Photo not available
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: 2014
Photo not available	
Transect 3: End Location: Veg Com 1 foreground Bearing: 265 degrees Year: 2015	Transect 3: End Location: Veg Com 1 foreground Bearing: 265 degrees Year: 2016
	
Transect 3: End Location: Veg Com 1 foreground Bearing: 265 degrees Year 2017	Transect 3: End Location: Veg Com 1 foreground Bearing: 265 degrees Year 2018

Easton Ranch: Data Point Photos

Data Point: DP1W Location: Veg Com 15
Year: 2018

Data Point: DP1U Location: Veg Com 1
Year: 2018

Data Point: DP2W Location: Veg Com 11
Year: 2018

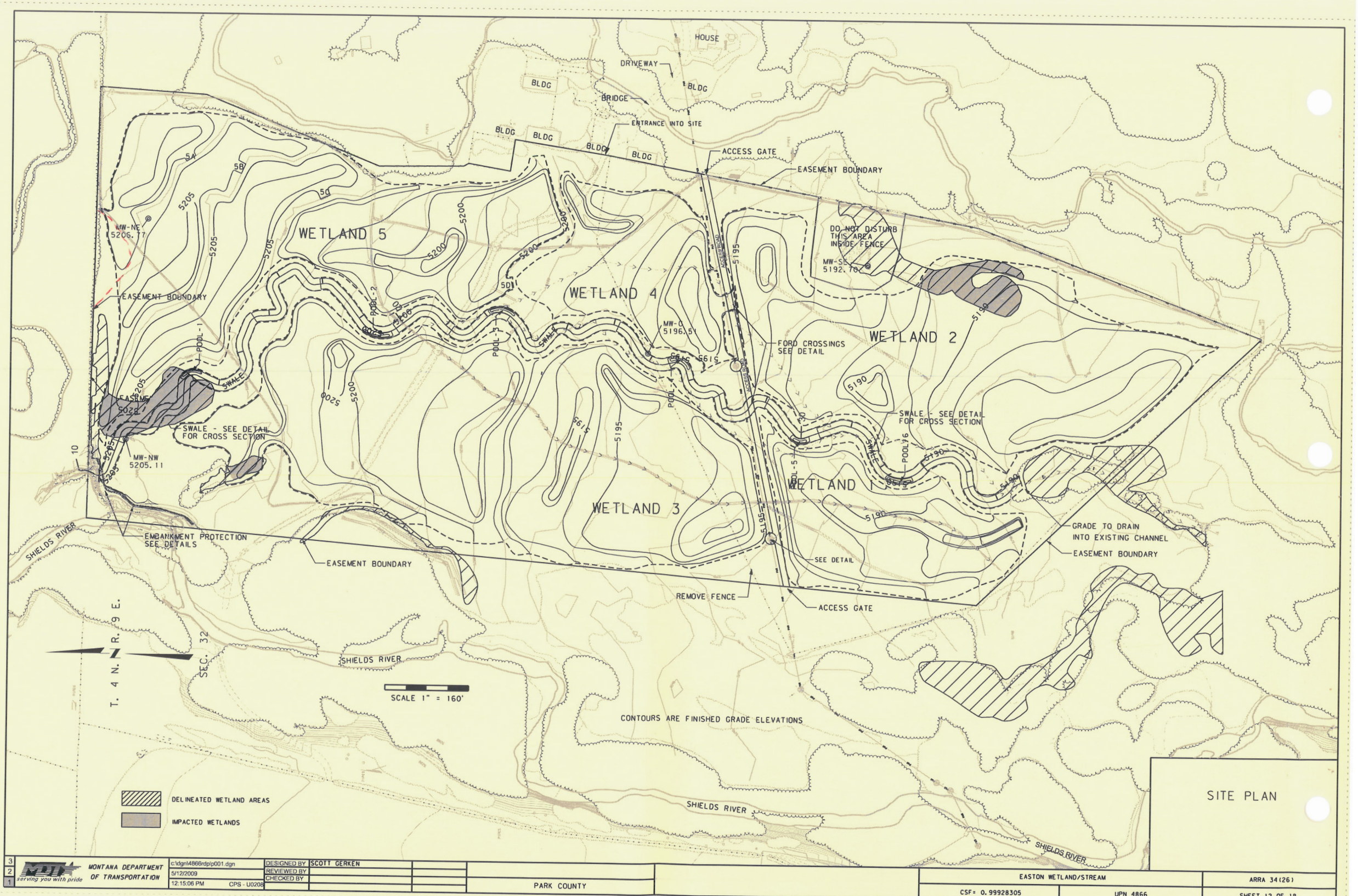
Data Point: DP2U Location: Veg Com 13
Year: 2018

Data Point: DP3W Location: Veg Com 4
Year: 2018

Data Point: DP3U Location: Veg Com 1
Year: 2018

APPENDIX D
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Easton Ranch
Park County, Montana



3	MDT serving you with pride	MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\4866rdp\p001.dgn	DESIGNED BY	SCOTT GERKEN			EASTON WETLAND/STREAM	ARRA 34(26)
2			5/12/2009	REVIEWED BY				CSF= 0.99928305	UPN 4866	SHEET 12 OF 18
1			12:15:06 PM CPS - U0208	CHECKED BY			PARK COUNTY		