# MONTANA DEPARTMENT OF TRANSPORTATION
# WETLAND MITIGATION MONITORING REPORT

## EASTON RANCH MITIGATION SITE
## PARK COUNTY, MONTANA

PROJECT CONSTRUCTED: 2009

MONITORING REPORT #8: DECEMBER 2017

*Prepared for:*

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

2701 Prospect Avenue
Helena, Montana 59620

*Prepared by:*

RESPEC

820 North Montana Ave, Suite A
Helena, Montana 59601

December 2017

# MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2017

## 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

*prepared for*

Montana Department of Transportation
2701 Prospect Avenue
Helena, Montana 59620

*prepared by*

RESPEC
820 North Montana Avenue, Suite A
Helena, Montana 59601

December 2017

# TABLE OF CONTENTS



# LIST OF TABLES

TABLE PAGE

# LIST OF TABLES (continued)

TABLE PAGE



# LIST OF CHARTS

CHART PAGE



# LIST OF FIGURES

FIGURE PAGE



# LIST OF APPENDICES



Cover: View looking north at vegetation community Types 12 and 11.

# 1.0 INTRODUCTION

The 2017 Easton Ranch Wetland Mitigation Monitoring Report presents the results of the eighth 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.

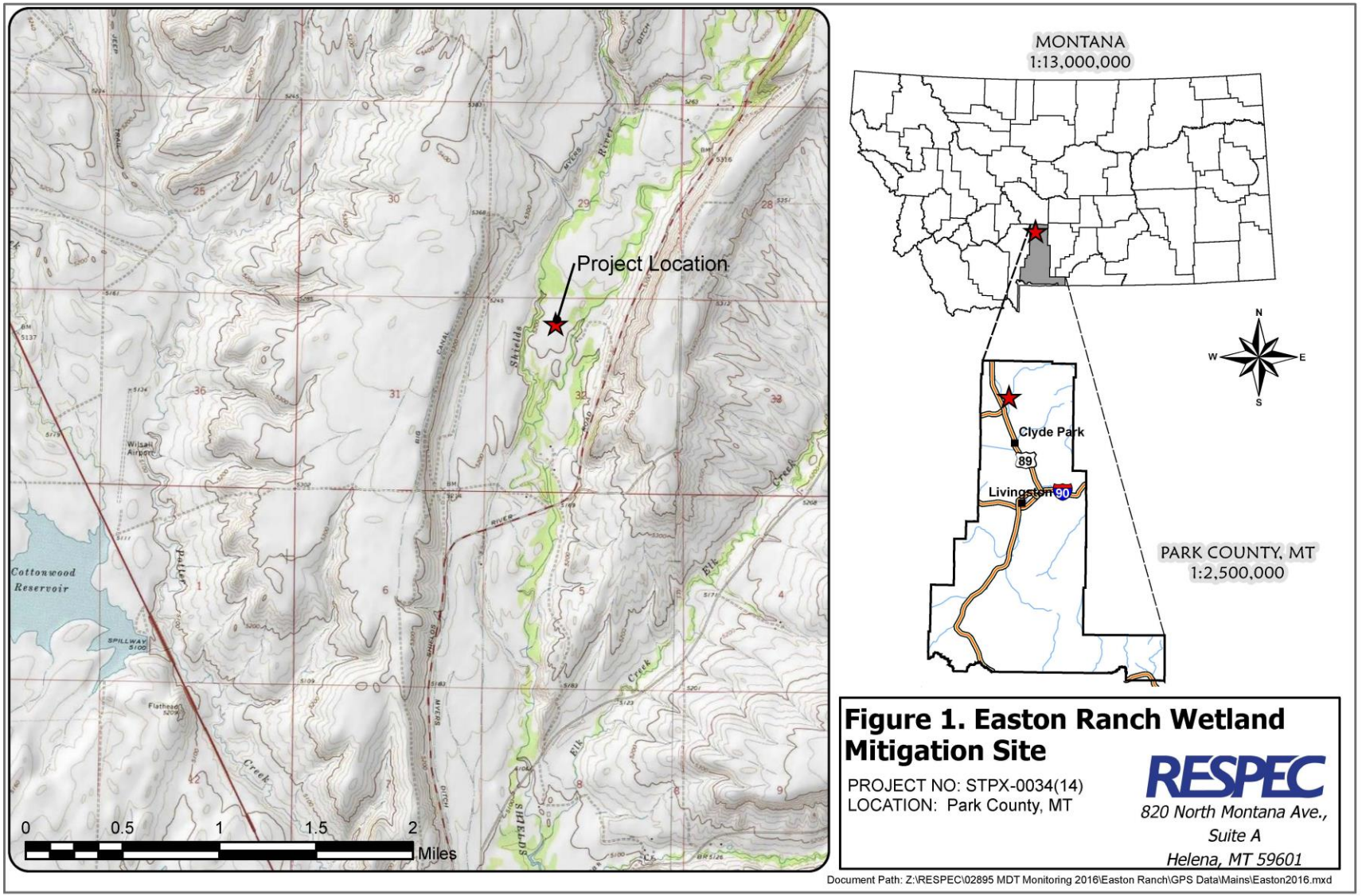



**Figure 1-1.** Project Location of the Easton Ranch Site.

**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 |
| Re-establishment 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 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 in Appendix A show the site monitoring activity locations and mapped site features, respectively. 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 eighth year of monitoring was completed on June 29, 2017. 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.

## 2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data forms was assessed at four data points that were established within the project area. The hydrologic indicators were evaluated according to features observed in situ during the site visit. The data were recorded on Wetland Determination Data forms (Appendix B). Hydrologic assessments allow evaluation of mitigation performance standards that address inundation and saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as “permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season” [USACE, 2010]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered wetlands. The growing season is defined for purposes of this report as the number of days when a 50 percent probability exists that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit [Environmental Laboratory, 1987]. Temperature data recorded for the meteorological station at Wilsall 8 ENE, Montana (249023), has a median (5 years in 10) growing season length of 120 days. Areas that are defined as wetlands require 15 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits that were excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded on the Wetland Determination Data forms (Appendix B). Precipitation data from the Wilsall 8 ENE, Montana (249023) meteorological station were also reviewed and compared to long-term averages for this site. No monitoring wells were installed at this site.

## 2.2 VEGETATION

The boundaries of the dominant vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2016 aerial photograph. Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure A-3, Appendix A). Percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (< 1 percent), 1 (1–5 percent), 2 (6–10 percent), 3 (11–20 percent), 4 (21–50 percent), and 5 (> 50 percent) (Appendix B). The survival of woody species planted on site were counted and recorded during monitoring. Survival rates are evaluated annually. Additionally, natural recruitment of woody species will be noted.

Temporal changes in vegetation were evaluated through annual assessments of static belt transects established in June 2010 (Figure A-2, Appendix A). Vegetation composition was assessed and recorded along three vegetation belt transects (T-1, T-2, and T-3) that are approximately 10 feet wide and 1,376, 1,333, and 732 feet long, respectively (Figure A-2, Appendix A). T-2 and T-3 traverse the floodplain channel corridor and banks to provide an assessment of root stability indices of the developing riparian and wetland plant species (Figure A-2, Appendix A).

The transect locations were recorded with a resource-grade GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the vegetation community polygon data. Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (February 2017), which was prepared by the Montana Department of Agriculture [2017], was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photograph with noxious weed species color-coded (Figure A-3, Appendix A). Cover classes are represented by a T, L, M, or H, which represent less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively. The total cover by noxious weeds overall across the site was estimated based on the noxious weed cover class and project acreage.

## 2.3 SOIL

Soil information was obtained from the *Web Soil Survey for Park County Area* [USDA, 2010] and in situ soil descriptions. Soil cores were excavated by using a hand auger and evaluated according to procedures outlined in the 1987 Wetland Manual and the 2010 WMVC Regional Supplement. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data form for each profile (Appendix B).

## 2.4 WETLAND DELINEATION

Waters of the US, including special aquatic sites and wetlands, were delineated throughout the project area according to criteria established in the 1987 Wetland Manual and the 2010 WMVC Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 2010 WMVC Regional Supplement must be satisfied to delineate a representative area as a wetland. The name and indicator status of plant species was derived from the 2016 National Wetland Plant List (NWPL) [Lichvar et al., 2016]. Following USACE guidance, the 2016 NWPL scientific and common plant names were used in this report. A routine level-2 on-site determination method [Environmental Laboratory, 1987] was used to delineate wetlands within the project boundaries. Paired wetland/upland data points were evaluated to aid in determining the wetland boundary. The information was recorded on the Wetland Determination Data forms (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology and changes in soil characteristics. Topographic relief boundaries within the project area

were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site (i.e., mudflat). The wetland boundaries were surveyed using a resource-grade GPS unit and imported into GIS format. The reported wetlands areas have been calculated using spatial quantification methodology.

## 2.5 WILDLIFE

Direct observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring form during the site visit. Indirect-use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list of animals that were observed from 2010 through 2017 was compiled for this report.

## 2.6 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM was used to evaluate functions and values on the site from 2010 through 2017. This method provides an objective means of assigning an overall rating to wetlands and provides regulators with a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values [Berglund and McEldowney, 2008]. Field data for this assessment were collected during the site visit. MWAM forms were completed for three separate assessment areas (AAs) within the mitigation site (Appendix B).

## 2.7 PHOTOGRAPHIC DOCUMENTATION

Monitoring at photo points provided supplemental information that documented wetland, upland, and transect conditions; site trends; and current land uses that surround the site. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo-point locations were recorded with a resource-grade GPS unit (Figure A-2, Appendix A).

## 2.8 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2017 monitoring season. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included wetland boundaries, fence boundaries, photo points, transect endpoints, and wetland data points.

## 2.9 MAINTENANCE NEEDS

Channels, engineered structures, irrigation structures, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. This examination was cursory and did not constitute an engineering-level structural inspection.

# 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 2017 [Western Region Climate Center, 2017]. 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), and 19.54 inches (2016). This data indicates that 2010 and 2013 received above-average precipitation with 2011, 2012, 2015, and 2016 exhibiting below-average precipitation. The historic precipitation average from January to August was 14.94 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), and 12.89 inches (2017). This dataset corroborates that 2010 and 2014 received above-average precipitation and precipitation before and during the growing season for 2011 through 2013 and 2015 through 2017 was below average. The extent of surface water across the site fluctuates seasonally and is moderately driven by direct precipitation and surface runoff. During the June monitoring, the Shields River flows remain high, flows were noted coming into the flood channel from the river. A total of 3.80 inches of rain was recorded for the month, which is the second-highest recorded June precipitation in the last 8 years. Precipitation contributes to hydrology within this site, elevated seasonal groundwater levels and overbank flows from the Shields River appear to be the principal contributors to wetland hydrology at this site. However, 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, 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 2017 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 June monitoring. Wetland soils were generally saturated to the surface across Community Types 11, 14 and 15 located in the western half of the property, Upland areas along the northern portion of the site were also saturated. Ponded water was noted within portions of the floodplain channel and most soils in the depressions were saturated except in the southern quarter of the channel. Approximately 35 percent of the site was inundated with surface water during the 2017 investigation at depths that ranged from 0 to 1.5 feet. The average depth was 0.2 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, 4, and 5.

Wetland Cells 1 and 3 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 2017 monitoring, these signs were not noted, but ponded water was observed in low areas within the flood channel, and soils were saturated primarily within the northern half of the channel.

Paired wetland/upland data points (DPs) were sampled in two locations to determine the wetland/upland boundaries. No hydrologic indicators were observed at DP-1U and DP-2U. DP-1W and DP-2W were located in areas that met the wetland criteria. Primary wetland hydrology indicators included soil saturation and the presence of ponded water in portions of the channel adjacent to wetland data point DP-2W. Secondary wetland hydrology indicators at this data point included the FAC-neutral test and geomorphic position. Primary hydrologic indicators included saturation at DP-1W, which is located in an excavated wetland cell in the south-central part of the site. Additional hydrological indicators that were observed in various wetland areas of the Easton Ranch site included shallow surface water, saturation, sediment deposits, and dry season water table. Shallow surface water was observed within most of the wetlands along the eastern portion of the mitigation site. Additionally, soils were also saturated across upland community Type 13 – *Bromus* spp./*Phleum pratense*, which is located in the northeastern corner of the site and was intended to be a created wetland area. The decrease in open water in 2016 and 2017 across the southern portion of the site may be the result of decreased regional precipitation rates before the site investigation.

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 since construction 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 the northern and central portion of the channel during the June 2017 site visit. A few small areas along the channel have exposed fabric, but overall the banks were secure and well vegetated with minimal erosion.

## 3.2 VEGETATION

Monitoring year 2017 marked the eighth year of monitoring on the Easton Ranch site. A total of 3 new plant species were observed across the site in 2017 for a total of 173 plant species since 2010; Table 3-1 lists all plant species observed at this site during the 8 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).

Four upland and eight wetland community types were observed on the site in 2017. The upland communities include the following:

- Type 1 – *Phleum pratense*/*Poa pratensis*
- Type 8 – *Bromus inermis/Trifolium* spp.
- Type 13 – *Bromus inermis/Phleum pratense*
- Type 10 – *Bromus inermis*/*Populus tremuloides*

**Table 3-1. Vegetation Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 1 of 5)**

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

**Table 3-1. Vegetation Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 2 of 5)**

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

**Table 3-1. Vegetation Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 3 of 5)**

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

**Table 3-1. Vegetation Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 4 of 5)**

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

**Table 3-1. Vegetation Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 5 of 5)**

| Scientific Names | Common Names | WMVC Indicator Status[(a)] |
|---|---|---|
| *Trifolium arvense* | Rabbit-foot Clover | NL |
| *Trifolium hybridum* | Alsike Clover | FAC |
| *Trifolium pratense* | Red Clover | FACU |
| *Trifolium repens* | White Clover | FAC |
| *Triglochin maritima* | Seaside Arrow-Grass | OBL |
| *Typha latifolia* | Broad-Leaf Cattail | OBL |
| *Urtica dioica* | Stinging Nettle | FAC |
| *Verbascum thapsus* | Great Mullein | FACU |
| *Vicia americana* | American Purple Vetch | FAC |
| *Xanthium strumarium* | Rough Cockleburr | FAC |

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2017 are **bolded.**

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).

Upland community Type 1 – *Phleum pratense/Poa pratensis* was identified on 8.20 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 community was dominated by herbaceous species including common Timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), caraway (*Carum carvi*), creeping wild rye (*Elymus repens*), orchard grass (*Dactylis glomerata*), and common dandelion (*Taraxacum officinale*).

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. The community included a diverse mix of wetland species, including Northwest Territory sedge (*Carex utriculata*), leafy tussock sedge (*Carex aquatilis*), Nebraska sedge (*Carex nebrascensis*), lamp rush (*Juncus effusus*), narrow-leaf willow (*Salix exigua*), 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 American sloughgrass (*Beckmannia syzigachne*), bristly black gooseberry (*Ribes lacustre*), red-tinge bulrush, American mannagrass (*Glyceria grandis*), stinging nettle (*Urtica dioica*), orchard grass, and common Timothy.

Wetland community Type 5 – *Populus balsamifera* was a pre-existing, undisturbed, forested, scrub/shrub wetland located on 0.63 acre 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 found in an excavated depression with the longest duration of surface water and supports semi-permanent open water. One depression was identified as community Type 7 across the site and was located within the eastern portion of the site (south of the access road) where a higher seasonal groundwater table is sustained. The community characterized approximately 0.10 acre of the site. The wetland has been classified as an aquatic bed community since 2011, which 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 were green algae (protist) and sedges (*Carex* sp.), with lower covers of American sloughgrass, water-milfoil (*Myriophyllum sp*.), broad-leaf cattails (*Typha latifolia*), American mannagrass, creeping spike-rush *(Eleocharis palustris*), and beaked ditch-grass (*Ruppia maritima*). A second depression (approximately 0.68 acre) that existed in 2015 was replaced with community Type 12 – *Eleocharis palustris*/*Typha latifolia* in 2016.

Upland community Type 8 – *Bromus inermis*/*Trifolium* spp. was identified in an area that was previously mapped as upland community Type 13 - *Bromus inermis*/*Phleum pratense*. The vegetation cover included a dominance of smooth brome and several clover species, specifically red clover (*Trifolium pratense*) and alsike clover (*Trifolium hydridum*). This community type was identified in only one area and represented 0.28 acre of upland located within the excavated footprint of wetland Cell 5.

Upland community Type 13 – *Bromus inermis*/*Phleum pratense* was identified on 11.50 acres of upland located within the excavated footprint. This community has been reduced in size by 0.4 acre in 2017 as a result of community Type 11 replacing portions of Type 13 in the northern and central portions of the project area. This 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 hydrophyic species after 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 was dominated by smooth brome, common timothy, Kentucky bluegrass, and creeping wild rye.

Upland community Type 10 – *Bromus inermis*/*Populus tremuloides* was identified on 0.22 acre of upland located along the northern boundary. This community was distinguished from upland Type 1 – *Phleum pratense/Poa pratensis* by an increase in smooth brome and regeneration of quaking aspen (*Populus tremuloides*) species observed in 2016. Other species observed were caraway, red clover, creeping wild rye, common Timothy, and Kentucky bluegrass.

Wetland community Type 11 – *Juncus* spp. was identified on 8.94 acres of the constructed depressions and floodplain channel in 2017. Between 2013 and 2014, this community replaced community Type 6 – *Beckmannia syzigachne* as primary colonizing species decreased in dominance and more persistent, perennial plants increased in cover. The base elevation of a majority of the depressions in this community contained surface water in 2017. This diverse community type was dominated by rush species, including Baltic rush (*Juncus balticus*), lamp rush, lesser poverty rush (*Juncus tenuis*), sedge species (*Carex* spp.) and in some areas American mannagrass. Changes in the vegetation within this community type since 2016 are primarily within the south-central portion of the project or wetland Cell 3, include a dominance of woody species, primarily young balsam cottonwood and young willows, which represent 1.42 acres of two new community types: wetland community Type 14 – *Juncus spp./Populus balsamifera* (0.70 acres) and wetland community Type 15 – *Juncus spp./Salix* spp.

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 cat-tail. In 2016, community Type 12 was identified as replacing another community Type 7 – Aquatic Macrophytes (0.68 acre), which was also within community Type 11, which was located in a depression near the southern site boundary. This newly characterized community was observed in 2015, 2016, and 2017 and was dominated by common spike-rush, broad-leaf cat-tail, American sloughgrass, and Northwest Territory sedge.

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 root suckers as well as other woody species represent approximately 30 percent of the vegetation cover across this portion of the wetland cell. Other woody species included narrow-leaf cottonwood, yellow willow (*Salix lutea*), narrow-leaf willow, and speckled alder (*Alnus incana*). A mix of Baltic rush and lamp rush were the dominant herbaceous species with lesser amounts of Kentucky bluegrass, American wild mint (*Mentha arvensis*), silverweed (*Potentilla anserina*), Nebraska sedge, and spread bent grass (*Agrostis stolonifera*). In 2017, the acreage for community Type 14 was reduced slightly to 0.70-acre because of a shift in dominance from *Populus balsamifera* to *Salix (*community Type 15*)* within the northern quarter of this wetland cell.

Wetland community Type 15 – *Juncus spp./Salix* spp*.* was identified in 2017 in the excavated depression within community Type 11. This new community type represents 0.72 acre of rush and willow species that were formerly part of community Types 11 and 14. Within the last year, cover by willow species including yellow willow, gray willow, Drummond willow and narrow-leaf willow 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 were the dominant herbaceous species with lesser amounts of narrow-leaf bird's-foot-trefoil (*Lotus corniculatus*), silverweed, Nebraska sedge, and western water hemlock (*Circuta douglasii*).

In general, the site has slowly increased in wetland acreage since initial monitoring in 2010 from 10.43 created acres to 11.35 created acres in 2017. The northern portion of the project has experienced increased hydrology and transitions from upland community Type 13 to wetland community Type 11. The southern portion of the project area has remained relatively unchanged from 2016 to 2017 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), and then 8.94 acres (2017). 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 the observations from 2017, a dominance of woody hydrophytic species is likely 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 2017.

The below-average natural precipitation cycles 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 the past years have resulted in lower creek levels, lower groundwater levels, and reduced surface water across the site.

The overall percent cover of hydrophytic vegetation in the constructed floodplain channel has declined in the last few years, which reduced soil stability and protection from erosion when the channel is activated during high flows in the Shields River.

Vegetation cover was measured along three transects at the Easton Ranch site in 2017 (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 community Types 1 – *Phleum pratense/Poa pratensis*, 13 – *Bromus inermis*/*Phleum pratense,* 8 – *Bromus inermis*/*Trifolium* spp., and 10 – *Bromus inermis/Populus tremuloides* and wetland community Types 7 – Aquatic Macrophytes and 11 – *Juncus* spp. Wetland community Type 11 replaced wetland community Type 6 in 2014 because of the continued development of wetland vegetation within these excavated depressions. Hydrophytic vegetation communities composed 22.7 percent of T-1 in 2017 (and 2016), which is a slight increase of 0.4 percent since 2015.

**Table 3-2. Data Summary for T-1 From 2010 Through 2017 at the Easton Ranch Site**

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

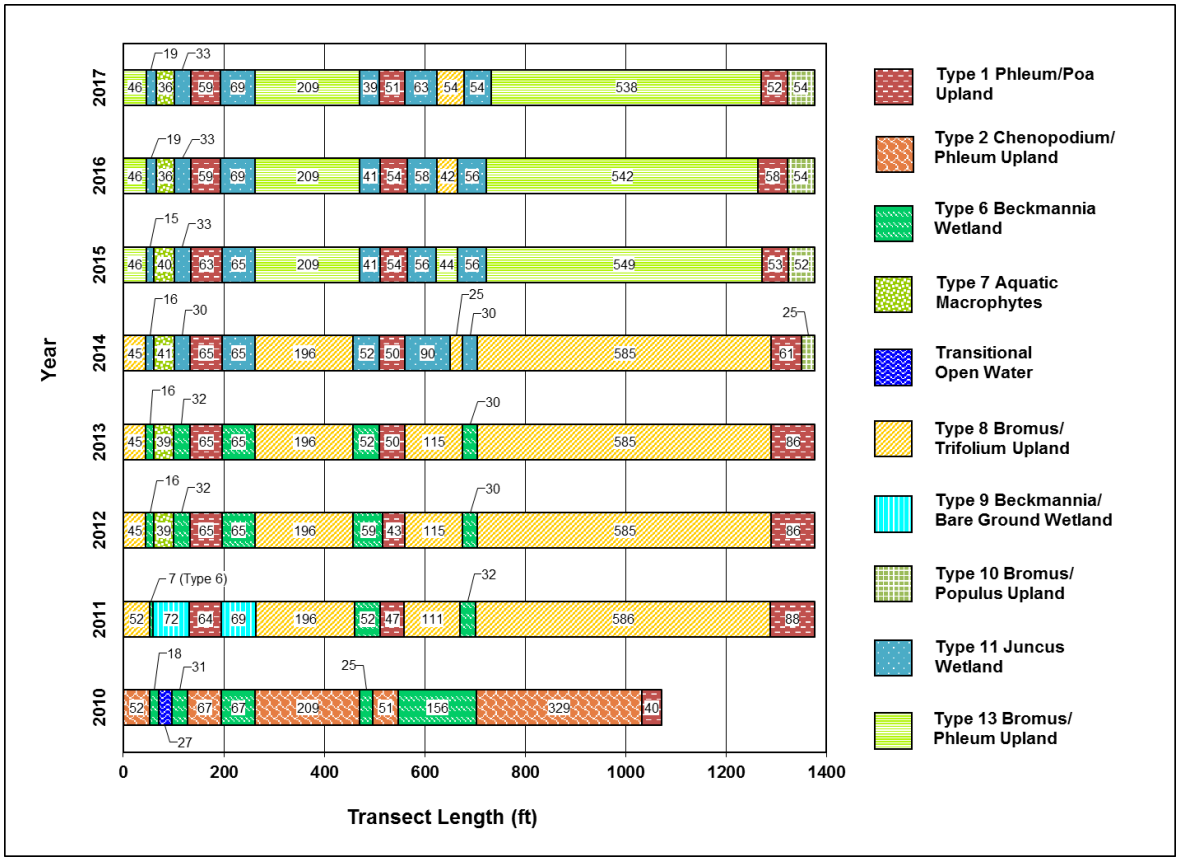



**Chart 3-1.** Transect Maps Showing Community Types on T-1 From Start/South (0 Foot) to Finish/North (1,072 Feet in 2010 and 1,376 Feet From 2011 Through 2017) at the Easton Ranch Site.

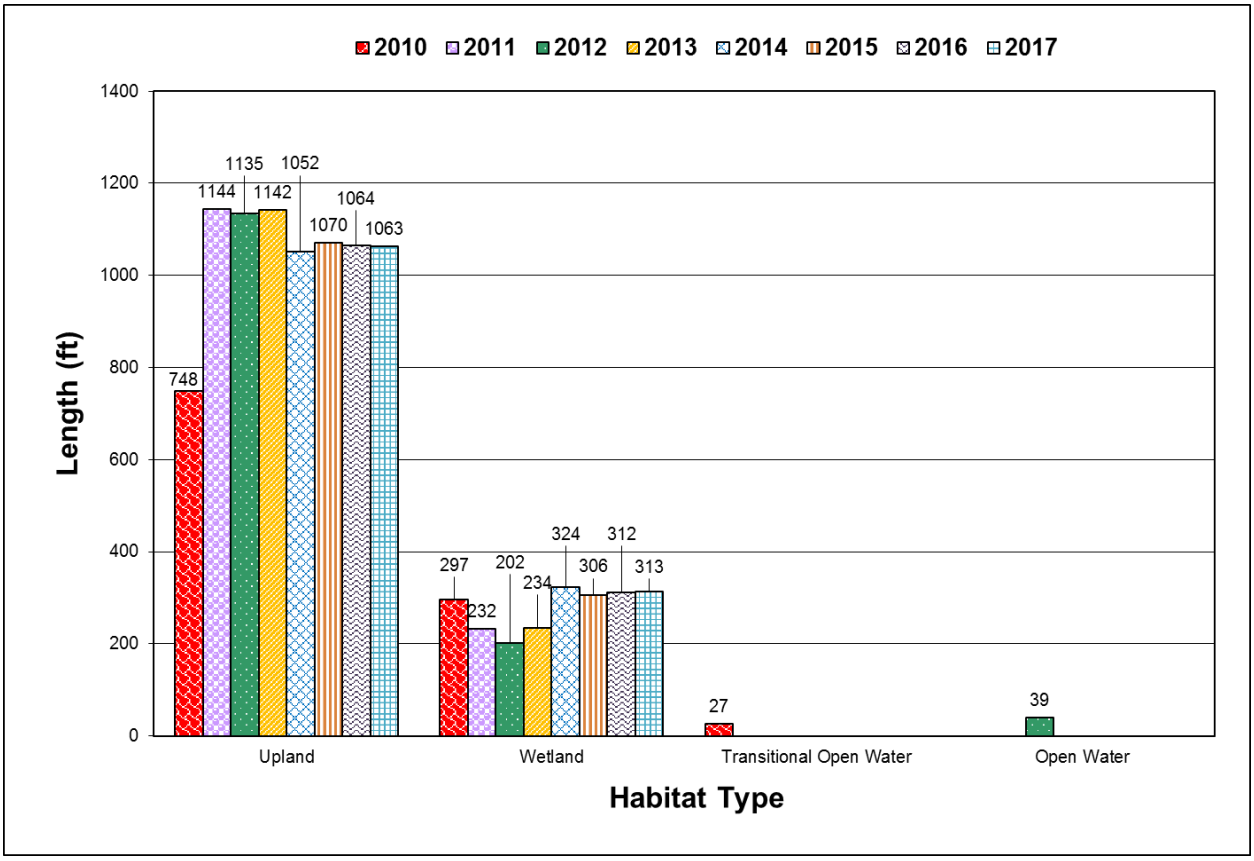



**Chart 3-2.** Length of Habitat Types Within T-1 From 2010 Through 2017 at the Easton Ranch Site.

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 Types 3 – *Carex* spp., 11 – *Juncus* spp., 14 – *Juncus* spp./ *Populus balsamifera* and Type 15 – *Juncus* spp./*Salix* spp. Upland Types 1 – *Phleum pratense*/*Poa pratensis* and 13 – *Bromus inermis*/*Phleum pratense* were identified along this transect. Community Type 14 was identified in 2016 as a result of a dominance of balsam cottonwood root suckers mixed with rush species (*Juncus* spp.) within a portion of wetland Cell 3. Balsam cottonwood plants ranged in height from 18 to 32 inches tall and represented approximately 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 composed 40.4 percent of T-2 in 2017, which is the same as 2016. An increase of four hydrophytic species, for a total of 45 species, was documented along T-2 in 2017.

**Table 3-3. Data Summary for T-2 From 2010 Through 2017 at the Easton Ranch Site**

| Monitoring Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| **Transect Length (feet)** | **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 |
| Vegetation Communities Along Transect | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 6 |
| Hydrophytic Vegetation Communities Along Transect | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 4 |
| Total Vegetative Species | 35 | 38 | 42 | 45 | 52 | 54 | 61 | 58 |
| Total Hydrophytic Species | 17 | 22 | 29 | 32 | 35 | 36 | 41 | 45 |
| Total Upland Species | 18 | 16 | 13 | 13 | 17 | 18 | 20 | 13 |
| Estimated % Total Vegetative Cover | 65 | 75 | 80 | 85 | 85 | 85 | 85 | 85 |
| Estimate % Unvegetated | 35 | 25 | 20 | 15 | 15 | 15 | 15 | 15 |
| % Transect Length Comprising Hydrophytic Vegetation Communities | 38.7 | 41.0 | 39.5 | 38.9 | 41.9 | 40.0 | 40.4 | 40.4 |
| % Transect Length Comprising Upland Vegetation Communities | 61.3 | 59.0 | 60.5 | 61.1 | 58.1 | 60.0 | 59.6 | 59.6 |
| % Transect Length Comprising Unvegetated Open Water | 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 |

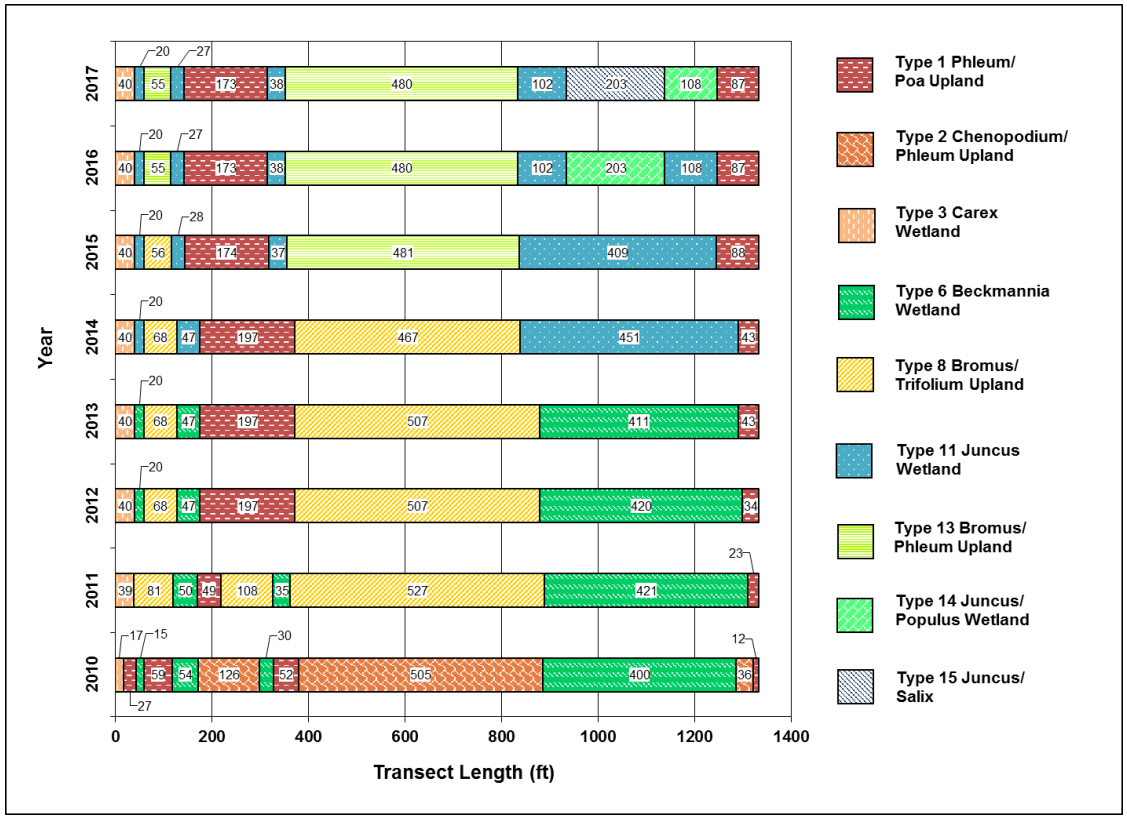



**Chart 3-3.** Transect Maps Showing Community Types on T-2 From 2010 Through 2017 From Start/North (0 Foot) to Finish/South (1,333 Feet) at the Easton Ranch Site.

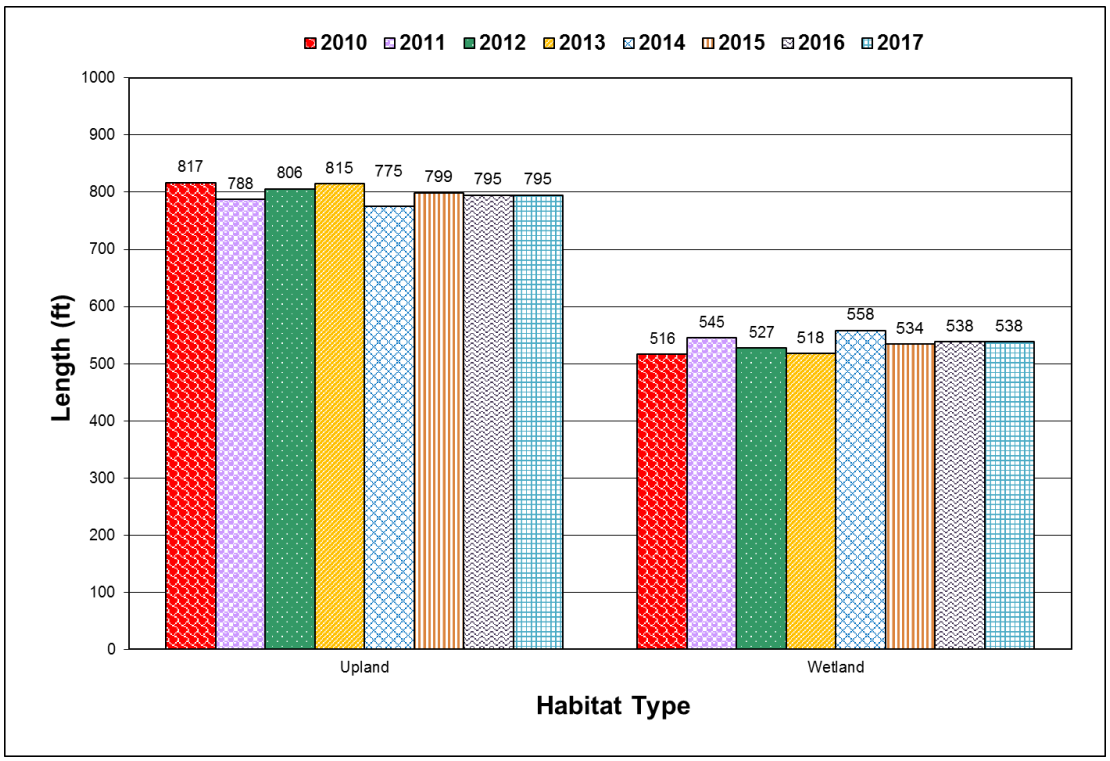



**Chart 3-4.** Length of Habitat Types Within T-2 From 2010 Through 2017 at the Easton Ranch Site.

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 Type 11 – *Juncus* spp. Hydrophytic vegetation composed 47.3 percent of T-3 in 2017, which was a slight increase from 44.4 percent in 2016. Hydrophytic vegetation was observed in the restored stream channel at the point that T-3 transected the channel; DP-2W is located along the channel, and soils were saturated with a dominance of hydrophytic vegetation. Water was noted in portions of the channel, but vegetation and hydrology were drier to the south of the T-3 crossing. The lower precipitation over the past several years for the area and the continuing drying trend has likely resulted in a transition to an upland vegetation community within portions of the channel.

**Table 3-4. Data Summary for T-3 From 2010 Through 2017 at the Easton Ranch Site**

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

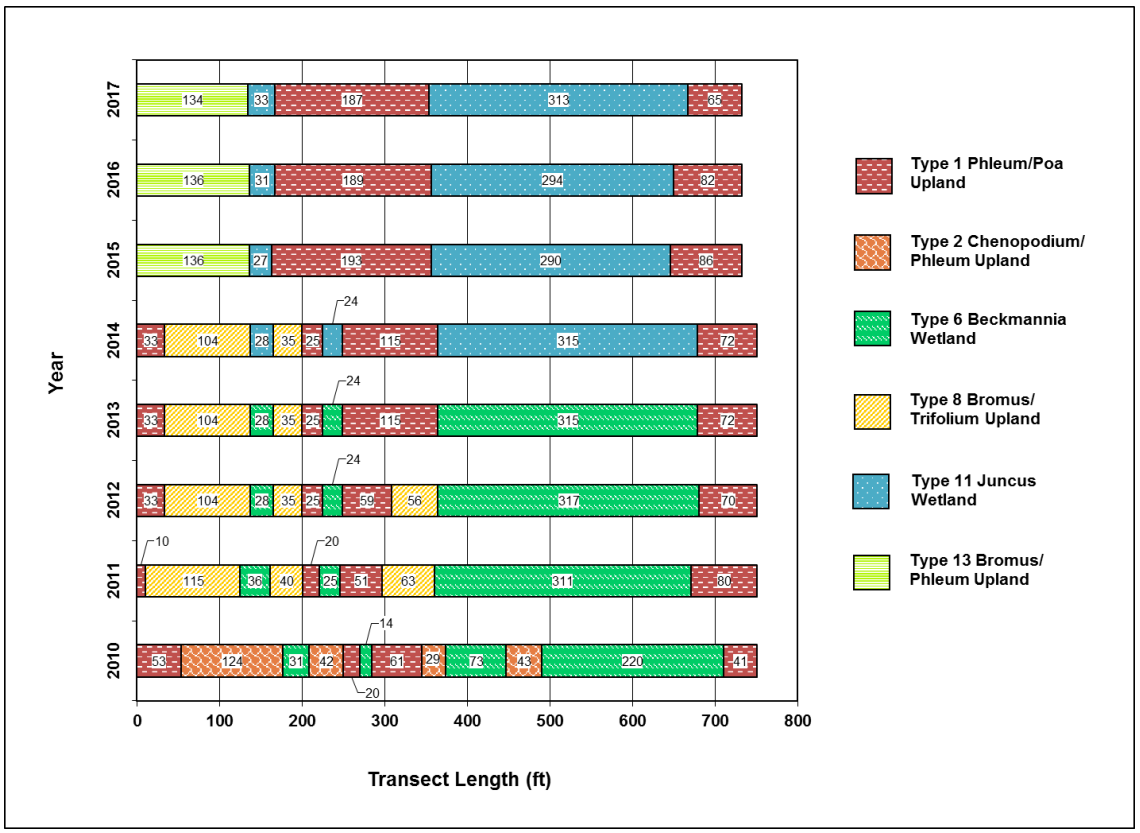



**Chart 3-5.** Transect Maps Showing Community Types on T-3 From 2010 Through 2017 From Start/West (0 Foot) to Finish/East (751 Feet in 2010 Through 2014 and 732 Feet in 2015 and 2017) at the Easton Ranch Site.

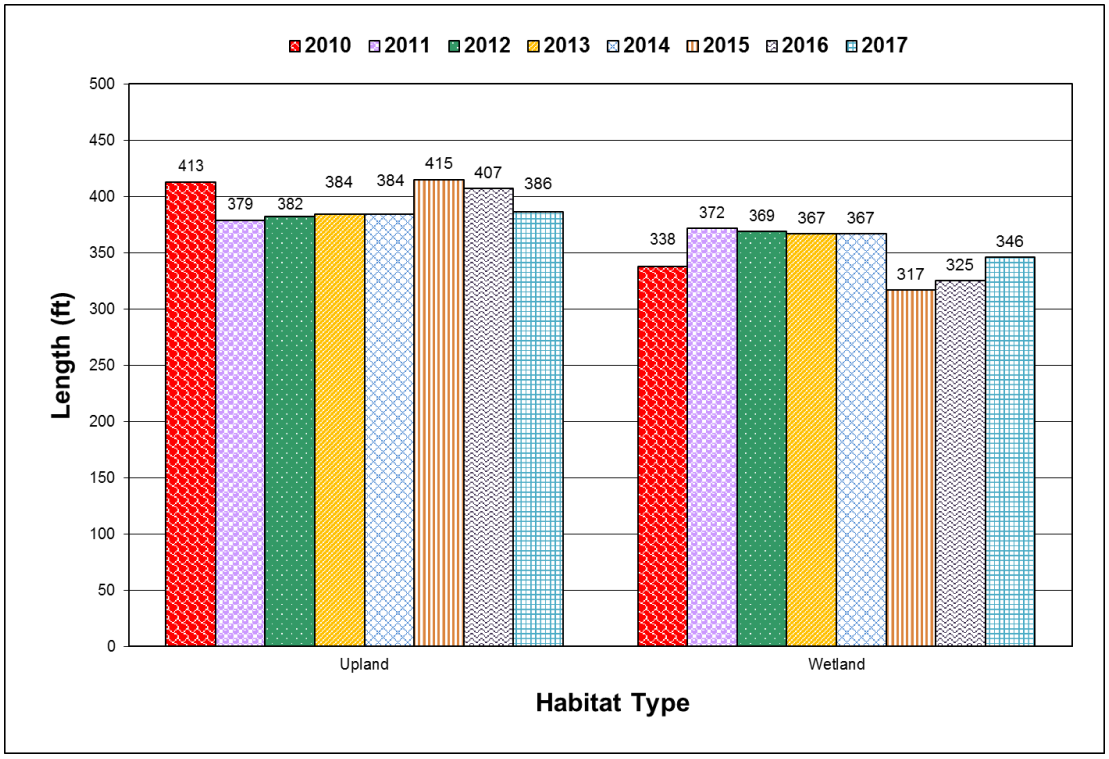



**Chart 3-6.** Length of Habitat Types Within T-3 From 2010 Through 2017 at the Easton Ranch Site.

During the June 2017 monitoring, 6 infestations of Canada thistle (*Cirsium arvense*), which is a Priority 2B noxious weed, were identified on site, primarily in uplands and 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 Types 1 – *Phleum pratense/Poa pratensis*, 3 – *Carex* spp., 5 – *Populus balsamifera*, 13 – *Bromus inermis*/*Phleum pratense*, 10 – *Bromus inermis/Populus tremuloides*, and 11 – *Juncus* spp. One infestation of gypsy-flower (*Cynoglossum officinale*) was observed on site also in community Type 13. Ongoing weed control/spraying has been effective in reducing overall infestation size and density across the site. MDT has an ongoing weed-control program, and contractors sprayed weeds on July 26, 2017.

Several hundred cuttings and containerized vegetative materials were planted along the constructed flood channel to increase channel stability. A thorough survey of the project area was conducted in 2017 to locate and identify surviving cuttings and containerized saplings. Approximately 12 red osier dogwood (*Cornus alba*), 35 sandbar willow, 43 thinleaf alder, and 75 willow cuttings were identified as surviving in 2017. The amount of woody volunteer species is increasing, especially quaking aspen root suckers along the northern and southern project boundaries in 2017. Young narrow-leaf willow, yellow willow, gray willow and narrow-leaf cottonwood (*Populus angustifolia*) 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. The majority of the woody volunteers noted within the constructed wetland cells are likely the result of seeds deposited in sediment from the 2011 flood across the site, especially in wetland Cells 1 and 3 near the Shields River.

## 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*.

Soil test pits were excavated at four locations, all within what was originally mapped as the Meadowcreek soil series (DP-1W, DP-1U, DP-2W, and DP-2U; Figure A-2, Appendix A). DP-1W was located within wetland community Type 11 – *Juncus* spp. DP-2W was located within wetland community Type 14 – *Juncus* spp./*Populus balsamifera*. DP-1U and DP-2U were located within upland community Type 1 – *Phleum pratense/Poa pratensis* and Type 13 – *Bromus inermis/Phleum pratense,* respectfully. The soil profile for DP-1W included a dark grayish brown (10YR 4/2) clay loam with 5 percent strong brown (7.5YR 4/6) redox concentrations at 6 inches. This soil met the criteria for depleted matrix (F3) and classification as a hydric soil. The paired upland soil test pit DP-1U revealed a dark brown (10YR 3/3), gravelly loam. The soil observed at this upland data point had no hydric soil indicators. The profile at DP-2W revealed a very dark brown (10 YR 2/2) silt loam soil to a depth of 6 inches, and a very dark grayish brown (10YR 3/2) silt loam with redox concentrations at 6 inches. This soil did meet the criteria for redox dark surface (F6). The soils at DP-2W were saturated throughout, and shallow ponded water was noted within portions of the constructed overflow channel during the June 2017 monitoring. The soil profile for DP-2U was a dark brown (10YR 3/3) silt loam and rocky from 8 to 16 inches.

## 3.4 WETLAND DELINEATION

The four data points 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 11 – *Juncus spp*. and Type 14 – *Juncus* spp./*Populus balsamifera* with data points DP-1U and DP-2U in upland community Type 1 – *Phleum pratense/Poa pratensis* and 13 – *Bromus inermis/Phleum pratensis*, respectively. The total wetland acreage, including pre-existing wetland, was 12.45 acres in 2017, which is an increase of 0.44 acre since 2015, as shown in Table 3-5. Water from the irrigation system at the northeastern boundary had been diverted to the site during the spring and summer of 2017. The frequency and duration of surface and ground water 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 2017 (Figure A-3, Appendix A). The pre-existing wetlands were originally defined during the baseline investigation completed in August 2001 [MDT, 2008]. The 2017 delineated wetland acres include 1.56 acres of the reestablished flood channel (Type 11; Figure A-3, Appendix A) and 9.79 acres of created wetland. Uplands account for 20.20 acres of the mitigation site. The vegetation cover in the depressions characterized by wetland community Type 11 has increased along the north side and northwestern quarter of the project area replacing portions of community Type 13. Additionally, a new community is present because of an increase in hydrophytic woody species within constructed wetland Cell 3.

**Table 3-5. Total Wetland Acres Delineated From 2010 Through 2017 at the Easton Ranch Site**

| Habitat | 2010 (acres) | 2011 (acres) | 2012 (acres) | 2013 (acres) | 2014 (acres) | 2015 (acres) | 2016 (acres) | 2017 (acres) |
|---|---|---|---|---|---|---|---|---|
| Pre-Existing Wetland Area | 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 |
| **Total Wetland Habitat** | **11.53** | **11.64** | **11.64** | **12.40** | **12.64** | **12.01** | **12.01** | **12.45** |

## 3.5 WILDLIFE

A comprehensive list of bird and other wildlife species observed directly or indirectly from 2010 through 2017 is presented in Table 3-6. Nine bird species were identified in 2017. The behaviors and habitats of all of the birds observed in 2017 are listed on the Wetland Mitigation Site Monitoring form (Appendix B). One white-tailed deer (*Odocoileus virginianus*) was observed on site in 2017. Because a bald eagle (*Haliaeetus leucocephalus*) nest is located directly southwest of the site on the western side of the Shields River, the project site is within the primary habitat zone for bald eagles. Eagles were not heard or observed during the 2017 site visit.

**Table 3-6. Wildlife Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 1 of 3)**

| Common Name | Scientific Name |
|---|---|
| *Amphibian* | |
| Columbia Spotted Frog | *Rana luteiventris* |
| Western Toad | *Anaxyrus boreas* |
| *Mammal* | |
| 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 mephitis* |
| White-footed Mouse | *Peromyscus leucopus* |
| **White-tailed Deer** | ***Odocoileus virginianus*** |
| *Reptile* | |
| Plains Gartersnake | *Thamnophis radix* |

**Table 3-6. Wildlife Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 2 of 3)**

| Common Name | Scientific Name |
|---|---|
| | *Bird* |
| 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 Wigeon | *Anas americana* |
| Bald Eagle | *Haliaeetus leucocephalus* |
| Band-tailed Pigeon | *Patagioenas fasciata* |
| Bank Swallow | *Riparia 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* |
| 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*** |

**Table 3-6. Wildlife Species Observed From 2010 Through 2017 at the Easton Ranch Site (Page 3 of 3)**

| Common Name | Scientific Name |
|---|---|
| *Bird* | |
| **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 coronata* |

Species that were identified in 2017 are listed in **bold** type.

## 3.6 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM [Berglund and McEldowney, 2008] has been used to evaluate three AAs (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 9.79 acres of constructed palustrine, emergent, and scrub/shrub wetland cells that generate 57.27 functional units, which is an increase from 2016 (54.64 function units) to account for the scrub/shrub community development. The overall rating for the Creation AA remained at a Category III wetland characterized by low disturbance in 2017. The ratings were high for general wildlife habitat, 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 13 – *Bromus* spp./*Phleum pratense*) transition to wetland habitat, provided sufficient wetland hydrology continues within the site. In 2017, the site's wetland acreage increased from wetland acreage mapped in 2015 and 2016. The release of irrigation water during the spring and summer increased wetland acreage with improvements in woody vegetation cover and growth across portions of the site, but continued irrigation will likely be needed for wetland acreage to expand. Sustained higher stream flows and precipitation levels through June 2017 also contributed to wetland acreage expansion, especially across the western portion of the site.

**Table 3-7. Functions and Values of the Easton Ranch Site From 2011 Through 2017 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 |
|---|---|---|---|---|---|---|---|
| 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) |
| 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) |
| General Wildlife Habitat | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) | Mod (0.7) | High (0.9) | High (0.9) |
| General Fish/Aquatic Habitat | 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) |
| 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) |
| 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) |
| Sediment/Shoreline Stabilization | Low (0.2) | 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) |
| Groundwater Discharge/Recharge | High (1.0) | 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) |
| 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) |
| **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** |
| **% of Possible Score Achieved** | **57.5** | **57.5** | **57.5** | **56.5** | **56.5** | **58.5** | **58.5** |
| **Overall Category** | **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** |
| **Functional Units (acreage × actual points)** | **52.27** | **52.27** | **56.01** | **56.39** | **52.77** | **54.64** | **57.27** |

**Table 3-8. Functions and Values of the Easton Ranch Site From 2011 Through 2017 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 |
|---|---|---|---|---|---|---|---|
| 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) |
| MTNHP Species Habitat | Mod (0.6) | 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) |
| General Fish/Aquatic Habitat | 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) |
| 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) |
| 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) |
| Sediment/Shoreline Stabilization | Mod (0.6) | Mod (0.6) | 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) |
| Groundwater Discharge/Recharge | 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) |
| 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) |
| **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** |
| **% of Possible Score Achieved** | **59.5** | **56.5** | **59.5** | **58.5** | **58.5** | **58.5** | **58.5** |
| **Overall Category** | **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** |
| **Functional Units (acreage × actual points)** | **8.63** | **8.19** | **9.28** | **9.13** | **9.13** | **9.13** | **9.13** |

**Table 3-9. Functions and Values of the Easton Ranch Site From 2011 Through 2017 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 |
|---|---|---|---|---|---|---|---|
| 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) |
| MTNHP Species Habitat | Mod (0.6) | 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) |
| General Fish/Aquatic Habitat | 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) |
| 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) |
| 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) |
| Sediment/Shoreline Stabilization | 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) |
| Groundwater Discharge/ Recharge | High (1.0) | High (1.0) | High (1.0) | 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) |
| 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) |
| **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** |
| **% of Possible Score Achieved** | **77.2** | **69.4** | **72.8** | **65.0** | **65.0** | **65.0** | **65.0** |
| **Overall Category** | **II** | **II** | **II** | **III** | **II** | **II** | **II** |
| **Acreage of Assessed Aquatic Habitats Within Easement** | **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** |

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 2017.

The 1.1-acre 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 2017.

## 3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken from seven photo points (PP1 to PP7) of the transect end points and of the four data points are provided in Appendix C. PP4A and PP4B show the Shields River just outside the northwestern corner of the project area.

## 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. Four 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 and 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 Types 1 – *Phleum pratense/Poa pratensis*, 3 – *Carex* spp., 5 – *Populus balsamifera*, 13 – *Bromus inermis*/*Phleum pratense*, 10 – *Bromus inermis/Populus tremuloides*, and 11 – *Juncus* spp. 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 27, 2017.

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 reaccumulation of woody debris in the former log jam location was noted in 2014, but 2017 showed little additional accumulation. Stacked piles of wood debris were noted previously in the floodplain were burned or hauled away. Although additional bank erosion has been noted since the dramatic lateral cutting event of 2013, this section of bank remains exposed and vulnerable. The 2017 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 June 2017. 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 2017 delineation identified a total of 12.45 acres of wetlands within the project boundary. Approximately 9.79 acres of emergent wetland has 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 20.20 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 2017 has increased. Applying the USACE-approved mitigation ratios to each mitigation feature, a total of 13.26 acres of credit were estimated in 2017 (Table 3-10), which is approximately 14.15 acres short of the proposed final credit acreage.

This site has not developed wetland habitat as expected. Several of the excavated depressions that contained surface water in 2011 and 2014 were dry in 2012, 2013, and 2015 because of lower-than-normal groundwater levels and the lack of supplemental irrigation water, which limited potential expansion of wetland acreage within the site. In 2017, the excavated depression soils were either saturated or inundated, which was likely caused by irrigation water release and/or groundwater levels during the spring and summer. This additional water supported wetland hydrology, hydrophytic vegetation, and hydric soil development and expanded the wetland acreage as determined during the June 2017 monitoring. The increase of wetland acreage delineated in 2017 was primarily associated with the lower topographical swales and basins supported by seasonal groundwater, June precipitation, and irrigation. Decreased water levels within some of the open-water depressions observed on site during the 2012, 2013, 2015, 2016, and 2017 field surveys were likely the result of a decrease in precipitation during those years. In 2012, 2013, 2015, 2016, and 2017, the precipitation was 18 percent, 11 percent, 8 percent, 25 percent and 14 percent, respectively, below the long-term average for January to August. In 2014, precipitation was 22 percent above the January-to-August, long-term average. Precipitation contributes to hydrology within this site, and elevated seasonal

**Table 3-10. Credit Summary From 2010 Through 2017 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| **Total** | | | **27.41** | | **11.44** | | **11.44** | | **12.19** | | **11.67** | | **12.81** | | **12.81** | | **13.26** | |

(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.

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 for 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 this area. 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 shown continued progress toward achieving goals; however, the targeted credit acreage has not been achieved in 2017 but 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 10 acres of created wetland habitat or 12 acres including wetland creation and restoration, this value falls over 50 percent short of the 25 acres that were originally identified as a target for wetland creation. Expanding the current wetland acreage is likely with the continued release of irrigation water during the spring and summer to supplement hydrology in years with below-average precipitation and snowpack to restore/maintain hydrology across the eastern portion of the site, but normal or above-average precipitation is also needed to aid in and restore wetland development across the remaining portion 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 a variety of wetland communities that mimic habitats found in bio-reference wetland areas located north and south of the project. | N | A total of 9.79 acres of wetland habitat have been created at this site to date. The beginnings of a dominance of hydrophytic trees and shrubs within created wetlands can be seen. |
| Reestablish a previously existing, relic floodplain channel and associated riparian and floodplain wetland areas that totals 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 that result in scour holes, riffles, and point bars. The fabric was exposed in minor areas, but bank erosion along this channel is minor and appears to be functioning as designed. Wetland vegetation has established within the footprint of the channel. |
| 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 and protected by excluding livestock grazing, promoting the establishment of wetland vegetation, and restoring woody species in the vegetation community to create habitat diversity. |

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 2017 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 2017 have improved hydrology across the northern 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 165 live, planted woody stems were observed in 2017, the same as noted in 2016. The woody plants are increasing in height and coverage, with a positive trend toward achieving scrub/shrub communities. Thinleaf alder were especially robust and thriving as noted during the 2017 monitoring. The improvement in woody plant growth is likely attributed to releasing irrigation water and improved hydrology observed across portions of the site.

The anticipated 27.41 acres of credit development has not occurred to date; anticipated credits and 2017 calculated credits have been discussed above. To satisfy this performance standard, an additional 14.15 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 percentages of emergent and scrub/shrub wetland habitat types fall outside the identified success criteria, as described in Table 3-10. However, 2017 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.

**Table 3-12. Summary of Performance Standards and Success Criteria for the Easton Ranch Site (Page 1 of 2)**

| Performance Standards | Success Criteria | Criteria Achieved Y/N | Discussion |
|---|---|---|---|
| Wetland Characteristics | The three parameter criteria for hydrology, vegetation, and soils are met as outlined in the 1987 Wetland Manual and the 2010 Regional Supplement. | Y | Areas that were identified as wetland habitat within the mitigation site meet the three parameter criteria. |
| Wetland Hydrology | Soil saturation is present for at least 12.5 percent of the growing season. | Y | Areas that were identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of the growing season. |
| | Groundwater wells will be left undisturbed within the site to monitor 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. |
| | The constructed 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 are present or appear to be forming. | Y | Hydric soil characteristics, including redoximorphic concentrations and depleted matrix, have developed throughout a majority 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 | Wetlands are delineated as hydrophytic by using technical guidelines. | Y | Areas that were 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 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 the site shows signs of progression toward that goal at the end of the defined monitoring period. | Y | Approximately 18 percent of the wetland areas identified within the site are dominated by woody vegetation. Planted woody species continue to survive and develop along the constructed flood channel. Natural recruitment of aspen, willows, and cottonwoods within the site continue to establish. The site appears to exhibit progress toward these success criteria. |
| Herbaceous Plants | At least 80 percent ocular vegetation coverage by desirable hydrophytic vegetation. | Y | Desirable hydrophytic vegetation consist of greater than 80 percent of total vegetation cover within delineated wetlands. |
| Wetland Acreage Development | 27.41 net credit acres are provided for the project area. | N | A total of 13.26 acres of wetland credit has been generated for the site. This total includes 9.79 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 percent of mitigation wetland. | N | Emergent wetland habitat comprises approximately 81 percent of total wetland areas delineated in 2017. |

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

| Performance Standards | Success Criteria | Criteria Achieved Y/N | Discussion |
|---|---|---|---|
| *Wetland Acreage Development* | Scrub/shrub wetland habitat will be 15–20 percent of wetland area. | Y | Scrub/shrub wetland habitat comprises approximately 18 percent of total wetland areas delineated in 2017. The increase in woody plants is caused by the increased size/height and is more visible above the herbaceous vegetation. |
| | Open water will be less than 5 percent of wetland area. | Y | Aquatic macrophytes habitat composes approximately 1 percent of total wetland areas delineated in 2017, which is an 8.1 percent reduction compared to 2015 and was likely caused by lower stream flows and lower seasonal precipitation. These inundated areas (< 3 feet deep) seasonally fluctuate throughout the growing season and support diverse 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 | Stability is achieved 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) | The area is visually inspected and photo-documented. | Y | The results of annual inspection and photographic documentation along the Shields River in the northwestern corner of the site are presented in the mitigation monitoring reports. |
| | Stability is 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 riprap installed along the bank are eroding near the northwestern corner of the site. Installed willow cuttings did not establish along this bank. |
| Upland Buffer | Noxious weeds do not exceed 10 percent cover within upland buffer area. | Y | Noxious weed cover is less than 10 percent within the upland buffer. |
| | Any area that was disturbed within the creditable buffer zone must have at least 50 percent aerial cover of nonweed species by the end of the 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 exists across the site. | Y | State-listed noxious weed species across the site is less than 5 percent absolute cover. |
| Fencing | Wildlife-friendly fencing is installed along the easement boundaries. | Y | Wildlife-friendly fencing has been removed from the western and southern portions of the easement boundaries to promote wildlife movement across the wetland and the Shield River riparian corridor. The remaining fences are in good condition. |
| Monitoring | Monitor the site for a minimum period of 5 years or longer as determined by the USACE. | Y | Comprehensive site monitoring has been ongoing for approximately 8 years, since construction activities were completed in 2009. |

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, the southern portion of the flood channel is beginning to revert to non-wetland status as would be anticipated under these natural conditions.

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 now exposed at the downstream end of the bank, which has resulted in the formation of an eddy pool. Within the last 2 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 non-weed 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 2017. Absolute cover of state-listed noxious weed species across the site is less than 5 percent, and weed management by MDT is ongoing. The fencing around the site was intact and in good condition; grazing has been excluded from the mitigation area.

# 4.0 REFERENCES

**Berglund, J. and R. McEldowney, 2008.** *MDT Montana Wetland Assessment Method,* PBS&J Project B43075.00, prepared by Post, Buckley, Schuh, & Jernigan, Helena, MT, for the Montana Department of Transportation, Helena, MT.

**Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe, 1979.** *Classification of Wetlands and Deepwater Habitats of the United States*, FWS/OBS-79/31, prepared by the US Department of the Interior, Fish and Wildlife Service, Washington, DC.

**Environmental Laboratory, 1987.** *Corps of Engineers Wetlands Delineation Manual*, Program Technical Report Y-87-1, prepared by Environmental Laboratory, Department of the Army, Waterways Experiment Station, Corps of Engineers, Vicksburg, MS, for the Department of the Army, US Army Corps of Engineers, Washington, DC.

**Lichvar, R. W., D. L. Banks, W. N. Kirchner, and N.C. Melvin, 2016. "**The National Wetland Plant List: 2016 Wetland Ratings," *Phytoneuron,* Vol. 2016-30, No. 1–17.

**Montana Department of Transportation, 2008**. *Easton Family Ranch Wetland Mitigation Plan, Watershed #13 – Upper Yellowstone River Basin, Park County, Montana*, prepared by the Montana Department of Transportation, Helena, MT.

**Montana Department of Agriculture, 2017.** "Montana Noxious Weed List," *mt.gov,* retrieved November 7, 2017, from *http://agr.mt.gov/Portals/168/Documents/Weeds/2017%20Noxious%20Weed%20List.pdf*

**US Army Corps of Engineers, 2010.** *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ERDC/EL TR-10-3, prepared by the US Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, MS.

**US Department of Agriculture, 2010.** "Web Soil Survey for Park County, Montana," *usda.gov*, retrieved August 5, 2015, from *http://websoilsurvey.nrcs.usda.gov/app/*

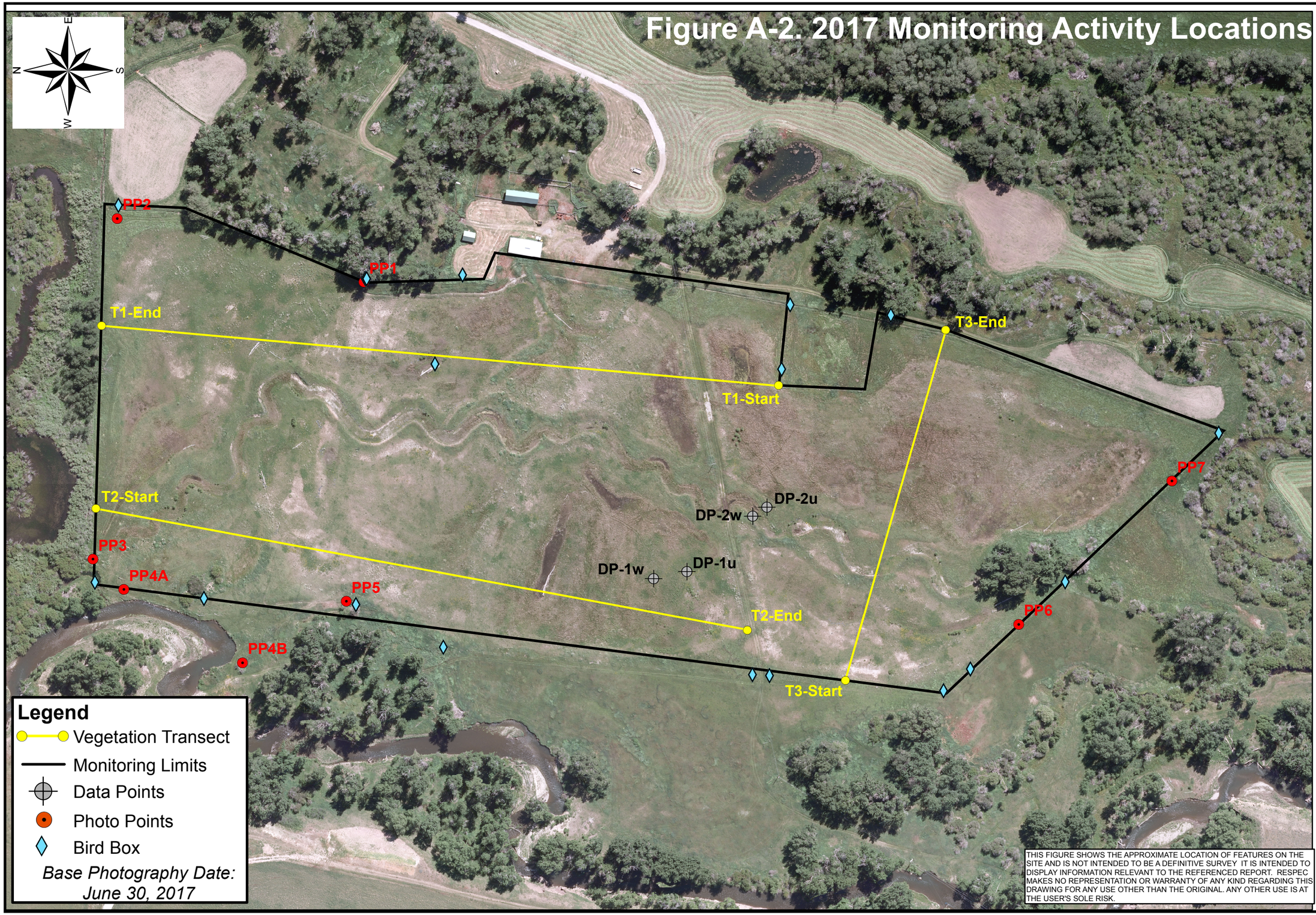
**US Department of Agriculture, 2014.** "Montana Hydric Soil List," *usda.gov,* retrieved October 10, 2016, from *http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric*

**Western Regional Climate Center, 2017.** "Monthly Sum of Precipitation at the Wilsall 8 ENE, Montana (249023)" *dri.edu,* Western Regional Climate Center, United States Historical Climatology Network, Reno, NV, retrieved September 14, 2017, from *http://www.wrcc.dri.edu/CLIMATEDATA.html*

# APPENDIX A
# PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Easton Ranch
Park County, Montana

# Figure A-2. 2017 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**
**2017 Monitoring Activity Locations**

0 75 150 300 450 600 750 Feet

| | |
|---|---|
| Project: | STPX-0034(14) |
| Location: | Park Co., Montana |
| Date: | December 2017 |
| Project Manager: | M. Traxler |
| Drawn By: | J. Rosenbaum |

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Easton Ranch\GPS Data\Mains\Monitor2017.mxd

# Figure A-3. 2017 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*
8. *Bromus inermis/Trifolium spp.*
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.*

## Legend

Monitoring Limits
Wetland Limits
Vegetation Communities
*Base Photography Date: June 30, 2017*

## Acreages

| | |
|---|---|
| Project Area | 32.65 acres |
| Gross Wetland | 12.45 acres |
| Pre-existing Wetland | 1.10 acres |
| Net Wetlands | 11.35 acres |
| Uplands | 20.20 acres |



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

## Easton Ranch Wetland Mitigation
## 2017 Mapped Site Features

0 75 150 300 450 600 750 Feet

Project: STPX-0034(14)
Location: Park Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Easton Ranch\GPS Data\Wains\Veg2017.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: **June 29, 2017** Person(s) conducting the assessment: **C. Hoschouer, C. Seibert**
Location: **Northeast of Wilsall** MDT District: **Butte** Milepost: **NA**
Legal Description: T **4N** R **9E** Section **32 NW 1/4** **0**
Weather Conditions: **Cloudy, calm 75F** Time of Day: **8 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: **0.2 feet** Range of Depths: **0 to 1.5ft**
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, 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 June monitoring. Shallow surface water was also present in portions of the overflow channel and in other low areas across the site.**

**Food plots have been established adjacent/outside to the mitigation site near northeastern and southeastern corners, which will likely attract and provide a food source for wildlife throughout the year.**

## VEGETATION COMMUNITIES

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

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Phleum pratense | 4 = 21-50% | Trifolium hybridum | 1 = 1-5% |
| Poa pratensis | 4 = 21-50% | Elymus cinerus | 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% | Medicago lupulina | 1 = 1-5% |

Comments / Problems: **In 2017 there is an increase in the cover by Lotus corniculatus and Trifolium species within this community.**

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

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Carex utriculata | 4 = 21-50% | Juncus balticus | 2 = 6-10% |
| Carex nebrascensis | 3 = 11-20% | Poa pratensis | 2 = 6-10% |
| Carex aquatilis | 2 = 6-10% | Stachys palustris | 1 = 1-5% |
| Carex lanuginosa | 1 = 1-5% | Agrostis stolonifera | 1 = 1-5% |
| Equisetum arvense | 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% | Dactylis glomerata | 2 = 6-10% |
| Carex nebrascensis | 3 = 11-20% | Phleum pratense | 2 = 6-10% |
| Pascopyrum smithii | 3 = 11-20% | Ribes lacustre | 2 = 6-10% |
| Beckmannia syzigachne | 2 = 6-10% | Scirpus microcarpus | 2 = 6-10% |
| Glyceria grandis | 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% | Ruppa 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.**

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.**

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

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Bromus inermis | 4 = 21-50% | Elymus cinerus | 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.**

## 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% | Ruppa maritina | 1 = 1-5% |
| Carex utriculate | 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: ____

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

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| Juncus balticus | 4 = 21-50% | Mentha arvense | 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 root suckers and seedlings were common across a portion of this cell, other woody species 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 cornculatus | 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 root suckers and seedlings representing greater than 30 percent of the total cover.**

**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 | 35 | |
| Thinleaf alder | 500 | 43 | |
| Willow cuttings | 200 | 75 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Comments / Problems:** **During the 2017 monitoring there were no changes in the number of live species. All of the plants are 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: **June 29, 2017** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

| Transect Interval Length: **46 ft (station 0 to 46)** | |
|---|---|
| Vegetation Community Type: Bromus inermis/Phleum pratense | |
| **Plant Species** | **Cover** |
| Bromus inermis | 3 = 11-20% |
| Phleum pratense | 3 = 11-20% |
| Elymus repens | 2 = 6-10% |
| Agrostis stolonifera | 2 = 6-10% |
| Carum carvi | 2 = 6-10% |
| Carex nebrascensis | 1 = 1-5% |
| Juncus balticus | 1 = 1-5% |
| Deschampsia caespitosa | 1 = 1-5% |
| Poa pratensis | 1 = 1-5% |
| Trifolium hybridum | 1 = 1-5% |
| Carex pachystachya, Juncus longistylis, J. tenuis | + = < 1% |
| Total Vegetative Cover: | 80% |

| Transect Interval Length: **19 ft (station 46 to 65)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 4 = 21-50% |
| Juncus effusus | 3 = 11-20% |
| Juncus ensifolius | 1 = 1-5% |
| Juncus longistylis | 1 = 1-5% |
| Poa palustris | 1 = 1-5% |
| Carex nebrascensis | 1 = 1-5% |
| Agrostis stolonifera | 1 = 1-5% |
| Mentha arvensis | 1 = 1-5% |
| Deschampsia caespitosa | 1 = 1-5% |
| Salix lutea | + = < 1% |
| Carum carvi | + = < 1% |
| 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% |
| Agrostis stolonifera | 1 = 1-5% |
| Typha latifolia | 1 = 1-5% |
| Mentha arvensis | 1 = 1-5% |
| Algae, green | 2 = 6-10% |
| Juncus effusus | 1 = 1-5% |
| Glyceria grandis | 1 = 1-5% |
| Juncus ensifolius | 1 = 1-5% |
| Juncus tenuis | 1 = 1-5% |
| Total Vegetative Cover: | 45% |

| Transect Interval Length: **33 ft (station 101 to 134)** | |
|---|---|
| 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 = 1-5% |
| Poa palustris | 1 = 1-5% |
| Mentha arvensis | 1 = 1-5% |
| Juncus ensifolius | 1 = 1-5% |
| Carex aquatilis | + = < 1% |
| Total Vegetative Cover: | 100% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 29, 2017** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

| Transect Interval Length: **59 ft (station 134 to 193)** | |
|---|---|
| Vegetation Community Type: Phleum pratense/Poa pratensis | |
| **Plant Species** | **Cover** |
| Poa pratensis | 4 = 21-50% |
| Phleum pratense | 4 = 21-50% |
| Elymus repens | 3 = 11-20% |
| Carum carvi | 2 = 6-10% |
| Bromus inermis | 1 = 1-5% |
| Cirsium arvense | 1 = 1-5% |
| Cynoglossum officinale | 1 = 1-5% |
| Stachys palustris | 1 = 1-5% |
| Trifolium pratense | + = < 1% |
| Taraxcum officinale | + = < 1% |
| | |
| Total Vegetative Cover: | 95% |

| Transect Interval Length: **69 ft (station 193 to 262)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus effusus | 3 = 11-20% |
| Juncus balticus | 3 = 11-20% |
| Alopecurus arundinaceus | 3 = 11-20% |
| Open water | 2 = 6-10% |
| Juncus ensifolius | 2 = 6-10% |
| Eleocharis palustris | 2 = 6-10% |
| Salix lutea | 2 = 6-10% |
| Scirpus microcarpus | 2 = 6-10% |
| Typha latifolia | 2 = 6-10% |
| Potentilla anserina | 1 = 1-5% |
| Juncus longistylis, Carex utriculata, | 1 = 1-5% |
| Total Vegetative Cover: | 85% |

| Transect Interval Length: **209 ft (station 262 to 471)** | |
|---|---|
| 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% |
| Leymus cinereus | 2 = 6-10% |
| Elymus repens | 2 = 6-10% |
| Schedonorus pratensis | 2 = 6-10% |
| Trifolium pratense | 2 = 6-10% |
| Carum carvi | 2 = 6-10% |
| Alopecurus arundinaceus | 1 = 1-5% |
| Trifolium hybridum | 1 = 1-5% |
| Cirsium arvense | 1 = 1-5% |
| Medicago lupulina, Lotus corniculatus | 1 = 1-5% |
| Total Vegetative Cover: | 80% |

| Transect Interval Length: **39 ft (station 471 to 510)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 4 = 21-50% |
| Poa pratensis | 3 = 11-20% |
| Juncus effusus | 1 = 1-5% |
| Juncus tenuis | 1 = 1-5% |
| Mentha arvensis | 1 = 1-5% |
| Trifolium pratense | 1 = 1-5% |
| Stachys palustris | 1 = 1-5% |
| Carex pachystachya | 1 = 1-5% |
| Alopecurus arundinaceus | 1 = 1-5% |
| Agrostis stolonifera | 1 = 1-5% |
| Poa palustris | + = < 1% |
| Glyceria striata | + = < 1% |
| Total Vegetative Cover: | 95% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 29, 2017** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

| Transect Interval Length: **51 ft (station 510 to 561)** | |
|---|---|
| Vegetation Community Type: Phleum pratense/Poa pratensis | |
| **Plant Species** | **Cover** |
| Poa pratensis | 3 = 11-20% |
| Phleum pratense | 2 = 6-10% |
| Alopecurus arundinaceus | 4 = 21-50% |
| Lotus corniculatus | 2 = 6-10% |
| Salix lutea | 1 = 1-5% |
| Elymus repens | 1 = 1-5% |
| Rumex salicifolius | 1 = 1-5% |
| Cirsium arvense | 1 = 1-5% |
| Carex pachystachya | 1 = 1-5% |
| Agrostis stolonifera | 1 = 1-5% |
| Cynoglossum officinale, Rumex salicifolius | + = < 1% |
| Total Vegetative Cover: | 85% |

| Transect Interval Length: **63 ft (station 561 to 624)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus tenuis | 3 = 11-20% |
| Juncus effusus | 1 = 1-5% |
| Juncus balticus | 2 = 6-10% |
| Lotus corniculatus | 3 = 11-20% |
| Trifolium hybridum | 2 = 6-10% |
| Carum carvi | 1 = 1-5% |
| Agrostis stolonifera | 1 = 1-5% |
| Poa pratensis | 1 = 1-5% |
| Medicago sativa | 1 = 1-5% |
| Carex pachystachya | 1 = 1-5% |
| Poa pratensis, Deschampsia caespitosa | 1 = 1-5% |
| Total Vegetative Cover: | 85% |

| Transect Interval Length: **54 ft (station 624 to 678)** | |
|---|---|
| Vegetation Community Type: Bromus inermis/Trifolium spp. | |
| **Plant Species** | **Cover** |
| Bromus inermis | 3 = 11-20% |
| Trifolium hybridum | 3 = 11-20% |
| Trifolium pratense | 3 = 11-20% |
| Poa pratensis | 3 = 11-20% |
| Phleum pratensis | 2 = 6-10% |
| Lotus corniculatus | 2 = 6-10% |
| Juncus balticus | 2 = 6-10% |
| Carum carvi | 2 = 6-10% |
| Carex pachystachya | 1 = 1-5% |
| Medicago lupulina | 1 = 1-5% |
| Potentilla gracilis | 1 = 1-5% |
| Salix lutea | + = < 1% |
| Total Vegetative Cover: | 80% |

| Transect Interval Length: **54 ft (station 678 to 732)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 5 = > 50% |
| Juncus longistylis | 2 = 6-10% |
| Lotus corniculatus | 2 = 6-10% |
| Salix exigua | 2 = 6-10% |
| Trifolium pratense | 2 = 6-10% |
| Medicago lupulina | 1 = 1-5% |
| Salix lutea | 1 = 1-5% |
| Deschampsia caespitosa | 1 = 1-5% |
| Poa palustris | 1 = 1-5% |
| Eleocharis palustris | + = < 1% |
| Cirsium arvense | + = < 1% |
| Potentilla gracilis | + = < 1% |
| Total Vegetative Cover: | 100% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 24, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **1** Approximate Transect Length: **1376 feet** Compass Direction from Start: **5˚** Note: _____

| Transect Interval Length: **538 ft (station 732 to 1270)** | |
|---|---|
| Vegetation Community Type: Bromus inermis/Phleum pratense | |
| **Plant Species** | **Cover** |
| Bromus inermis | 3 = 11-20% |
| Phleum pratense | 3 = 11-20% |
| Trifolium pratense | 3 = 11-20% |
| Carum carvi | 2 = 6-10% |
| Lotus corniculatus | 2 = 6-10% |
| Taraxacum officinale | 2 = 6-10% |
| Schedonorus pratensis | 1 = 1-5% |
| Equisetum arvense | 1 = 1-5% |
| Agrostis stolonifera | 1 = 1-5% |
| Elymus repens | 1 = 1-5% |
| Elymis cinerus | 1 = 1-5% |
| Total Vegetative Cover: | 80% |

| Transect Interval Length: **52 ft (station 1270 to 1322)** | |
|---|---|
| Vegetation Community Type: Phleum pratense/Poa pratensis | |
| **Plant Species** | **Cover** |
| Phleum pratense | 2 = 6-10% |
| Poa pratensis | 2 = 6-10% |
| Bromus inermis | 2 = 6-10% |
| Elymus repens | 3 = 11-20% |
| Trifolium pratense | 2 = 6-10% |
| Carum carvi | 2 = 6-10% |
| Taraxacum officinale | 2 = 6-10% |
| Cirsium arvense | + = < 1% |
| Equistem arvense | + = < 1% |
| Medicago lupulina | + = < 1% |
| Elymus cinerus | + = < 1% |
| Total Vegetative Cover: | 90% |

| 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% |
| Elymus repens | 2 = 6-10% |
| Dactylis glomerata | 2 = 6-10% |
| Cirsium arvense | 1 = 1-5% |
| Leymus cinereus | 1 = 1-5% |
| Poa pratensis | 1 = 1-5% |
| Taraxacum officinale | 1 = 1-5% |
| Medicago lupulina | + = < 1% |
| | |
| Total Vegetative Cover: | 95% |

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

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 29, 2017** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

| Transect Interval Length: **40 ft (station 0 to 40)** | |
|---|---|
| Vegetation Community Type: Carex spp. | |
| **Plant Species** | **Cover** |
| Carex nebrascensis | 4 = 21-50% |
| Carex atherodes | 2 = 6-10% |
| Carex utriculata | 1 = 1-5% |
| Poa pratensis | 3 = 11-20% |
| 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: **20 ft (station 40 to 60)** | |
|---|---|
| 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 | 3 = 11-20% |
| 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: **55 ft (station 60 to 115)** | |
|---|---|
| Vegetation Community Type: Bromus inermis/Phleum pratense | |
| **Plant Species** | **Cover** |
| Phleum pratense | 2 = 6-10% |
| Bromus inermis | 2 = 6-10% |
| Poa pratensis | 3 = 11-20% |
| Equisetum arvense | 2 = 6-10% |
| Trifolium pratense | 1 = 1-5% |
| Carex nebrascensis | 1 = 1-5% |
| Lotus corniculatus | 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: | 85% |

| Transect Interval Length: **27 ft (station 115 to 142)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 3 = 11-20% |
| Juncus effusus | 2 = 6-10% |
| Carex utriculata | 3 = 11-20% |
| Agrostis stolonifera | 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 | 1 = 1-5% |
| Total Vegetative Cover: | 95% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 29, 2019** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

| Transect Interval Length: **173 ft (station 142 to 315)** | |
|---|---|
| Vegetation Community Type: Phleum pratense/Poa pratensis | |
| **Plant Species** | **Cover** |
| Phleum pratense | 2 = 6-10% |
| Poa pratensis | 2 = 6-10% |
| Elymus repens | 3 = 11-20% |
| Ranunculus macounii | 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 | 1 = 1-5% |
| | 1 = 1-5% |
| Total Vegetative Cover: | 80% |

| 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 | 3 = 11-20% |
| Salix lutea | 2 = 6-10% |
| Lotus corniculatus | 2 = 6-10% |
| Agrostis stolonifera | 1 = 1-5% |
| Poa palustris | 1 = 1-5% |
| Salix bebbiana, Equisetum arvense | 1 = 1-5% |
| Potentilla anservina, Trifolium pratense | 1 = 1-5% |
| Total Vegetative Cover: | 90% |

| Transect Interval Length: **480 ft (station 353 to 833)** | |
|---|---|
| Vegetation Community Type: Bromus inermis/Phleum pratense | |
| **Plant Species** | **Cover** |
| Bromus inermis | 2 = 6-10% |
| Phleum pratense | 3 = 11-20% |
| Elymus repens | 3 = 11-20% |
| Lotus corniculatus | 3 = 11-20% |
| Bromus carinatus | 1 = 1-5% |
| Trifolium pratense | 1 = 1-5% |
| Leymus cinereus | 1 = 1-5% |
| Lepidium campestre | 1 = 1-5% |
| Poa pratensis | 1 = 1-5% |
| Medicago lupulina | 1 = 1-5% |
| Carum carvi | 1 = 1-5% |
| Schedonorus pratensis, Equisetum arvense | 1 = 1-5% |
| Total Vegetative Cover: | 75% |

| Transect Interval Length: **102 ft (station 833 to 935)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 4 = 21-50% |
| Juncus effusus | 2 = 6-10% |
| Juncus tenuis | 1 = 1-5% |
| Carex nebrascensis | 2 = 6-10% |
| Lotus corniculatus | 2 = 6-10% |
| Salix lutea | 1 = 1-5% |
| Poa pratensis | 2 = 6-10% |
| Salix exigua | 1 = 1-5% |
| Equisetum arvense | 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: | 90% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 29, 2017** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **2** Approximate Transect Length: **1333 feet** Compass Direction from Start: **185˚** Note: _____

| Transect Interval Length: **203 ft (station 935 to 1138)** | |
|---|---|
| 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 | 2 = 6-10% |
| Salix drummondiana | 1 = 1-5% |
| Populus balsamifera | 2 = 6-10% |
| Carex nebrascensis | 2 = 6-10% |
| Lotus cornculatus | 2 = 6-10% |
| Agrostis stolonifera | 1 = 1-5% |
| Salix exigua, Potentilla anserina, Cicuta douglasii | 1 = 1-5% |
| Total Vegetative Cover: | 90% |

| Transect Interval Length: **108 ft (station 1138 to 1246)** | |
|---|---|
| Vegetation Community Type: Juncus spp./Populus balsamifera | |
| **Plant Species** | **Cover** |
| Juncus balticus | 4 = 21-50% |
| Juncus effusus | 2 = 6-10% |
| Populus balsamifera | 3 = 11-20% |
| Salix lutea | 3 = 11-20% |
| Poa pratensis | 2 = 6-10% |
| Equisetum arvense | 2 = 6-10% |
| Salix lutea | 2 = 6-10% |
| Salix bebbiana | 2 = 6-10% |
| Lotus cornculatus | 2 = 6-10% |
| Mentha arvensis | 1 = 1-5% |
| Carex utriculata | 1 = 1-5% |
| Total Vegetative Cover: | 90% |

| Transect Interval Length: **87 ft (station 1246 to 1333)** | |
|---|---|
| Vegetation Community Type: Phleum pratense/Poa pratensis | |
| **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% |
| Solidago gigantea | 1 = 1-5% |
| Poa compressa | 1 = 1-5% |
| Trifolium hybridum | 1 = 1-5% |
| Schedonorus pratensis | 1 = 1-5% |
| Trifolium pratense | 1 = 1-5% |
| Total Vegetative Cover: | 85% |

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

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 24, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **3** Approximate Transect Length: **732 feet** Compass Direction from Start: **95˚** Note: _____

| Transect Interval Length: **134 ft (station 0 to 134)** | |
|---|---|
| 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 pratensis | 3 = 11-20% |
| Medicago lupulina | 2 = 6-10% |
| Lotus corniculatus | 2 = 6-10% |
| Elymus repens | 1 = 1-5% |
| Taraxacum officinale | 1 = 1-5% |
| Leymus cinereus | 1 = 1-5% |
| Bare ground | 1 = 1-5% |
| | |
| Total Vegetative Cover: | 75% |

| Transect Interval Length: **33 ft (station 134 to 167)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 3 = 11-20% |
| Lotus corniculatus | 3 = 11-20% |
| Poa pratensis | 2 = 6-10% |
| Trifolium hybridum | 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% |
| Carum carvi | 1 = 1-5% |
| Taraxacum officinale | + = < 1% |
| Total Vegetative Cover: | 90% |

| Transect Interval Length: **187 ft (90station 167 to 354)** | |
|---|---|
| Vegetation Community Type: Phleum pratense/Poa pratensis | |
| **Plant Species** | **Cover** |
| Phleum pratense | 3 = 11-20% |
| Poa pratensis | 3 = 11-20% |
| Trifolium pratense | 3 = 11-20% |
| Carum carvi | 2 = 6-10% |
| Bromus inermis | 2 = 6-10% |
| Medicago lupulina | 1 = 1-5% |
| Lotus corniculatus | 1 = 1-5% |
| Equisetum arvense | 1 = 1-5% |
| Leymus cinerus | 1 = 1-5% |
| Dactylis glomerata | 1 = 1-5% |
| Schedonorus pratensis | 1 = 1-5% |
| Bromus carinatus | + = < 1% |
| Total Vegetative Cover: | 85% |

| Transect Interval Length: **313 ft (station 354 to 667)** | |
|---|---|
| Vegetation Community Type: Juncus spp./ | |
| **Plant Species** | **Cover** |
| Juncus balticus | 5 = > 50% |
| Juncus effusus | 2 = 6-10% |
| Juncus tenuis | 2 = 6-10% |
| Juncus ensifolius | 1 = 1-5% |
| Poa pratensis | 2 = 6-10% |
| Salix lutea | 2 = 6-10% |
| Sinapis arvense | 1 = 1-5% |
| Glyceria striata | 1 = 1-5% |
| Salix lutea | 1 = 1-5% |
| Mentha arvensis, Carex utriculata | 1 = 1-5% |
| Carex nebrascensis, Carex pachystachya | 1 = 1-5% |
| Typha latifolia, Scirpus microcarpus | + = < 1% |
| Total Vegetative Cover: | 90% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Easton Ranch** Date: **June 24, 2016** Examiner: **C. Hoschouer, C. Seibert**
Transect Number: **3** Approximate Transect Length: **732 feet** Compass Direction from Start: **95˚** Note: _____

| Transect Interval Length: **65 ft (station 667 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 | 2 = 6-10% |
| Carum carvi | 2 = 6-10% |
| Agrostis stolonifera | 1 = 1-5% |
| Dachylis glomerata | 1 = 1-5% |
| Lotus corniculatus | 1 = 1-5% |
| Trifolium pratense | 1 = 1-5% |
| Melilotus officinalis | + = < 1% |
| Juncus balticus, Juncus effusus, Juncus tenuis | + = < 1% |
| Total Vegetative Cover: | 90% |

| 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

| **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 or 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 /-100.637505 | 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 | Sheild bank 46.060414 /-110.640396 | 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 13 46.057281 /-110.638306 | 5 |
| T-1 End | 1 | View of CT 10 and 13 46.060627 /-110.637779 | 185 |
| | | | |
| T-2 Start | 1 | View of CT 13 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 | 46.432817 /-110.382411 | |
| DP-1W | 1 | 46.32918 /-110.38244 | |
| DP-2U | 1 | 46.05786 /-110.639433 | |
| DP-2W | 1 | 46.05780 /-110.639437 | |

**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 | 1 | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |
| | | ☐ | ☐ | ☐ | |

**Additional Activities Checklist:**
**NA** Macroinvertebrate Sampling (if required)

**Comments / Problems: Several new bird boxes were installed and surveyed in 2017.**

## BIRD SURVEY – FIELD DATA SHEET

Site: **Easton Ranch** Date: **6/29/17**
Survey Time: **8 AM** to **5 PM**

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|---|---|---|---|---|---|---|---|
| American Kestrel | 1 | L | FO | | | | |
| American White Pelican | 6 | FO | WM | | | | |
| Black-billed Magpie | 1 | L | FO | | | | |
| Red-winged Blackbird | 3 | L FO | WM | | | | |
| Ringed-necked Pheasant | 2 | F | UP | | | | |
| Sandhill Crane | 2 | F | UP WM | | | | |
| Song Sparrow | 1 | L | WM | | | | |
| Wild Turkeys with chicks | 5 | F | WM UP | | | | |
| Yellow Warbler | 1 | F | FO | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

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

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

Weather: _____

Notes: _____

## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Easton | City/County: Park | Sampling Date: 06/29/2017

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

Investigator(s): Cindy Hoschouer | Section, Township, Range: Section 32, Township 4N, Range 9E

Landform (hillside, terrace, etc.): Floodplain | Local relief (concave, convex, none): concave | Slope (%):

Subregion (LRR): LRR E | Lat: 46.432817 | Long: -110.382411 | 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 x No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X | **Is the Sampled Area within a Wetland?** **Yes** **No** X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks:
Upland sample point

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | =Total Cover | | |
| **Herb Stratum** (Plot size: 5 foot radius ) | | | |
| 1. *Lotus corniculatus* | 40 | Yes | FAC |
| 2. *Carum carvi* | 30 | Yes | FACU |
| 3. *Poa secunda* | 10 | No | FACU |
| 4. *Taraxacum officinale* | 10 | No | FACU |
| 5. *Rumex crispus* | 3 | No | FAC |
| 6. *Trifolium pratense* | 3 | No | FACU |
| 7. *Cirsium arvense* | 1 | No | FAC |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 97 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | =Total Cover | | |

% Bare Ground in Herb Stratum

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 44 | x 3 = | 132 |
| FACU species | 53 | x 4 = | 212 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 97 (A) | | 344 (B) |
| Prevalence Index = B/A = | | | 3.55 |

**Hydrophytic Vegetation Indicators:**

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

Remarks:
Sample plot lacks a dominance (>50%) of hydrophytic vegetation and a Prevalence Index less than or equal to 3.0.

## SOIL

Sampling Point: DP-1U

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

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-2 | 10YR 3/2 | 100 | | | | | | roots, organics |
| 2-18 | 10YR 3/3 | 100 | | | | | | loam soil 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 Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except 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 (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:
Hydric soil indicators were not observed within this data point.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is 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 (2 or more 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 x Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): ___

**Wetland Hydrology Present?** **Yes** ___ **No** X

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

Remarks:
No primary or secondary hydrology indicators were observed during the site visit.

## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Easton | City/County: Park | Sampling Date: 06/29/2017

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

Investigator(s): Cindy Hoschouer | Section, Township, Range: Section 32, Township 4N, Range 9E

Landform (hillside, terrace, etc.): Floodplain | Local relief (concave, convex, none): concave | Slope (%):

Subregion (LRR): LRR E | Lat: 46.32918 | Long: -110.38244 | Datum: NAD83

Soil Map Unit Name: Meadowcreek, rarely flooded-Nesda complex, 0 to 2% slopes | NWI classification: Not Mapped

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

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X | No |
| Hydric Soil Present? | Yes X | No |
| Wetland Hydrology Present? | Yes X | No |
| **Is the Sampled Area within a Wetland?** | **Yes** X | **No** |

Remarks:
A dominance of young cottonwoods

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15 ft radius)** | | | |
| 1. *Populus balsamifera* | 30 | Yes | FAC |
| 2. *Salix lutea* | 5 | No | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 35 | =Total Cover | |
| **Herb Stratum (Plot size: 5 foot radius)** | | | |
| 1. *Juncus balticus* | 35 | Yes | FACW |
| 2. *Poa pratensis* | 15 | Yes | FAC |
| 3. *Stachys palustris* | 10 | No | OBL |
| 4. *Lotus corniculatus* | 10 | No | FAC |
| 5. *Carum carvi* | 1 | No | FACU |
| 6. *Equisetum arvense* | 1 | No | FAC |
| 7. *Sisymbrium idahoensis* | 1 | No | FACW |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 73 | =Total Cover | |
| **Woody Vine Stratum (Plot size: )** | | | |
| 1. | | | |
| 2. | | | |
| | | =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 | 36 | x 2 = | 72 |
| FAC species | 56 | x 3 = | 168 |
| FACU species | 1 | x 4 = | 4 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 108 (A) | | 259 (B) |

Prevalence Index = B/A = 2.40

**Hydrophytic Vegetation Indicators:**

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vacular 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** X **No**

Remarks:
Diverse wetland which will likely develop into a palustrine scrub-shrub based on the number of young Populus balsamifera and increasing cover by Salix.

## SOIL

Sampling Point: DP-1W

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

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-6 | 10YR 3/1 | 100 | | | | | Loamy/Clayey | roots, organics |
| 6-17 | 10YR 4/2 | 95 | 7.5YR 4/6 | 5 | RM | M | Loamy/Clayey | clay 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 Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- X 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 (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:
Hydric soil indicators were observed within this data point.

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X 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 (2 or more 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)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No x | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No x | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes X | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ___

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

Remarks:
Primary indicators include saturation to the surface, secondary indicators include geomorphic position and FAC-neutral test.

## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Easton | City/County: Park | Sampling Date: 06/29/2017

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

Investigator(s): Cindy Hoschouer | Section, Township, Range: Section 32, Township 4N, Range 9E

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): flat | Slope (%): 0.0

Subregion (LRR): LRR E | Lat: 46.057586 | Long: -110.639433 | 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 x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** X |
| Hydric Soil Present? | Yes ____ | No X | |
| Wetland Hydrology Present? | Yes ____ | No X | |

Remarks:
New data point established in 2016 located on an upland bench or terrace between wetlands.

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | ____ | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | ____ | =Total Cover | |
| **Herb Stratum** (Plot size: 5 foot radius) | | | |
| 1. *Bromus inermis* | 30 | Yes | UPL |
| 2. *Poa pratensis* | 20 | Yes | FAC |
| 3. *Dactylis glomerata* | 20 | Yes | FACU |
| 4. *Elymus repens* | 10 | No | FAC |
| 5. *Taraxacum officinale* | 5 | No | FACU |
| 6. *Phleum pratense* | 5 | No | FAC |
| 7. *Agrostis stolonifera* | 5 | No | FAC |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 95 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| | ____ | =Total Cover | |

% Bare Ground in Herb Stratum 5

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 40 | x 3 = | 120 |
| FACU species | 25 | x 4 = | 100 |
| UPL species | 30 | x 5 = | 150 |
| Column Totals: | 95 (A) | | 370 (B) |

Prevalence Index = B/A = 3.89

**Hydrophytic Vegetation Indicators:**

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

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

____ 5 - Wetland Non-Vacular 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** X

Remarks:
Sample plot lacks a dominance (>50%) of hydrophytic vegetation and a Prevalence Index less than or equal to 3.0.

## SOIL

Sampling Point: DP-2U

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

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-8 | 10YR 3/2 | 100 | | | | | | silt loam |
| 8-16 | 7.5YR 3/3 | 100 | | | | | | silt loam with 10 percent 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 Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except 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 (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:
Hydric soil indicators were not observed within this data point.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is 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 (2 or more 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 x Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): ___

**Wetland Hydrology Present?** **Yes** ___ **No** X

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

Remarks:
Soils were moist in the upper few inches but not saturated. No primary or secondary indicators present.

## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Easton | City/County: Park | Sampling Date: 06/29/2017

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

Investigator(s): Cindy Hoschouer | Section, Township, Range: Section 32, Township 4N, Range 9E

Landform (hillside, terrace, etc.): Terrace | Local relief (concave, convex, none): concave | Slope (%): 0.0

Subregion (LRR): LRR E | Lat: 46.057580 | Long: -110.639437 | 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 x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X | No ____ | **Is the Sampled Area within a Wetland?** **Yes** X **No** ____ |
| Hydric Soil Present? | Yes X | No ____ | |
| Wetland Hydrology Present? | Yes X | No ____ | |

Remarks:
Wetland data point within the channel. Formerly SP-3

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | ____ | =Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 15 ft radius)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | ____ | =Total Cover | |
| **Herb Stratum (Plot size: 5 foot radius)** | | | |
| 1. *Carex nebrascensis* | 30 | Yes | OBL |
| 2. *Juncus balticus* | 20 | Yes | FACW |
| 3. *Scripus microcarpus* | 20 | Yes | OBL |
| 4. *Lotus corniculatus* | 10 | No | FAC |
| 5. *Carex utriculata* | 10 | No | OBL |
| 6. *Equisetum arvense* | 3 | No | FAC |
| 7. *Glyceria grandis* | 3 | No | FACW |
| 8. *Poa pratensis* | 2 | No | FAC |
| 9. *Carex aquatilis* | 2 | No | OBL |
| 10. | | | |
| 11. | | | |
| | 100 | =Total Cover | |
| **Woody Vine Stratum (Plot size: ____)** | | | |
| 1. | | | |
| 2. | | | |
| | ____ | =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 | 62 | x 1 = | 62 |
| FACW species | 23 | x 2 = | 46 |
| FAC species | 15 | x 3 = | 45 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 100 (A) | | 153 (B) |
| Prevalence Index = B/A = | | | 1.53 |

**Hydrophytic Vegetation Indicators:**

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

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

____ 5 - Wetland Non-Vacular 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** X **No** ____

Remarks:
Diverse, well vegetated area with small areas of ponded water north of the data point.

## SOIL

Sampling Point: DP-2W

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

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-6 | 10YR 2/2 | 100 | | | | | | silt loam |
| 6-12 | 10YR 3/2 | 95 | 10YR 4/6 | 5 | RM | M | | silt loam |
| 12-14 | | | | | | | | 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 Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:
Hydric soil indicators were observed within this data point.

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X 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 (2 or more 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)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ___ | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No x | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes X | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ___

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

Remarks:
Primary indicators include saturation to the surface and adjacent areas with ponded surface water, 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:** 6/29/2017 **4. Evaluator(s):** C. Hoschouer, C. Seibert **5. Wetland/Site #(s):** Creation

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

**Approximate Stationing or Roadposts:** NA

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

**7. Evaluating Agency:** RESPEC for MDT

**Purpose of Evaluation:**

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

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

**9. Assessment Area (AA) Size (acre):** _____ (visually estimated)
(see manual for determining AA) 9.79 (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 | 87 |
| Depressional | Aquatic Bed | Excavated | Seasonal / Intermittent | 3 |
| Riverine | Scrub-Shrub Wetland | Excavated | Seasonal / Intermittent | 10 |
| | | | | |
| | | | | |
| | | | | |

**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 an aquatic bed 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. Also noted wild turkeys with chicks and numerous 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.

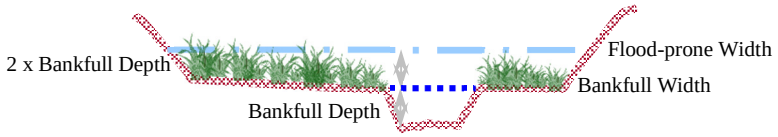
**14E. FLOOD ATTENUATION** ☐ **NA** (proceed to 14F)

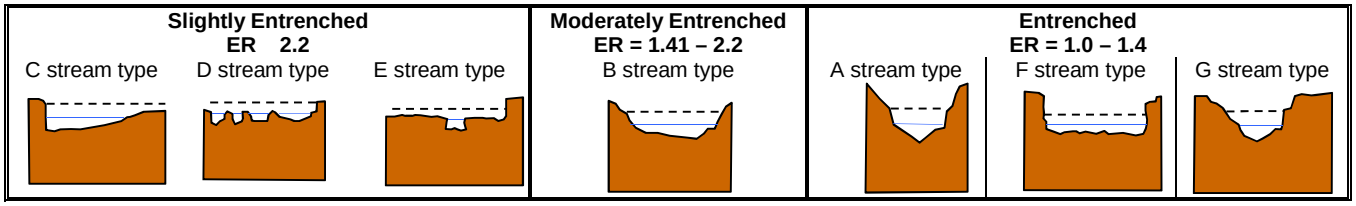
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

**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** | --- | --- | .5M | --- | --- | --- | --- | --- | --- |

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

Wetland/Site #(s): Creation

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

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

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

| **Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding** | ☒ **>5 acre feet** | | | ☐ **1.1 to 5 acre feet** | | | ☐ **≤1 acre foot** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Duration of Surface Water at Wetlands within the AA** | ☐ **P/P** | ☒ **S/I** | ☐ **T/E** | ☐ **P/P** | ☐ **S/I** | ☐ **T/E** | ☐ **P/P** | ☐ **S/I** | ☐ **T/E** |
| Wetlands in AA flood or pond **≥ 5 out of 10 years** | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wetlands in AA flood or pond **< 5 out of 10 years** | --- | .8H | --- | --- | --- | --- | --- | --- | --- |

**Comments:** (9.79 acre wetland) * (1 ft. max depth at highwater) = 9.79 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 and 2017. 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 2017 include 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 2017

**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 | 1.958 | |
| C. General Wildlife Habitat | high 0.90 | 1.00 | 8.811 | * |
| D. General Fish Habitat | NA | NA | 0 | |
| E. Flood Attenuation | mod 0.50 | 1.00 | 4.895 | |
| F. Short and Long Term Surface Water Storage | high 0.80 | 1.00 | 7.832 | * |
| G. Sediment / Nutrient / Toxicant Removal | high 0.90 | 1.00 | 8.811 | * |
| H. Sediment / Shoreline Stabilization | mod 0.60 | 1.00 | 5.874 | |
| I. Production Export / Food Chain Support | high 0.80 | 1.00 | 7.832 | * |
| J. Groundwater Discharge / Recharge | mod 0.70 | 1.00 | 6.853 | |
| K. Uniqueness | mod 0.40 | 1.00 | 3.916 | |
| L. Recreation / Education Potential (bonus point) | low 0.05 | | 0.489 | |
| **Total Points** | **5.85** | **10** | **57.271 Total Functional Units** | |
| **Percent of Possible Score 58%** (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:** 6/29/2017 **4. Evaluator(s):** C. Hoschouer, C. Seibert **5. Wetland/Site #(s):** Preservation

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

**Approximate Stationing or Roadposts:** NA

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

**7. Evaluating Agency:** RESPEC for MDT

**Purpose of Evaluation:**

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

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

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

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

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

**Comments:** _____

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

**12. GENERAL CONDITION OF AA**

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

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

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

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

**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.

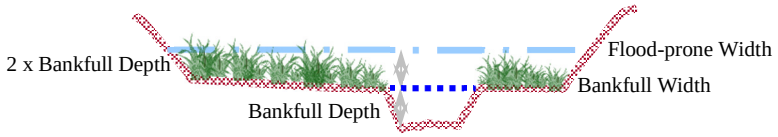
**14E. FLOOD ATTENUATION** ☐ **NA** (proceed to 14F)

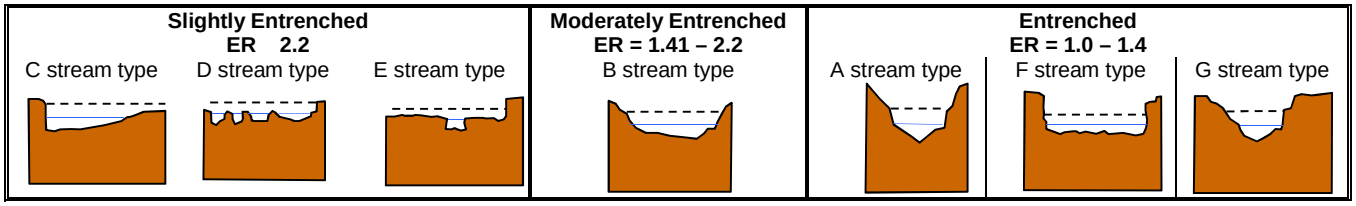
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

**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** | **6.435 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:** 6/29/2017 **4. Evaluator(s):** C. Hoschouer, C. Seibert **5. Wetland/Site #(s):** Restoration

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

**Approximate Stationing or Roadposts:** NA

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

**7. Evaluating Agency:** RESPEC for MDT

**Purpose of Evaluation:**

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

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

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

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

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

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

**Comments:** Planted shrubs along channel are surviving but have yet to develop a shrub community, emergent vegetation present.

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**

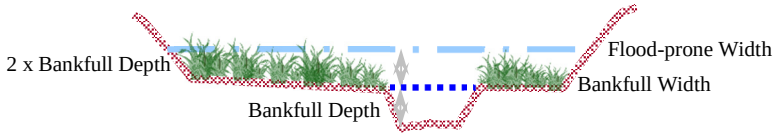
**iii. Final Score and Rating:** _ **Comments:** Although activated during high-flow events within the Shields River, no permanent fish habitat is present within AA.

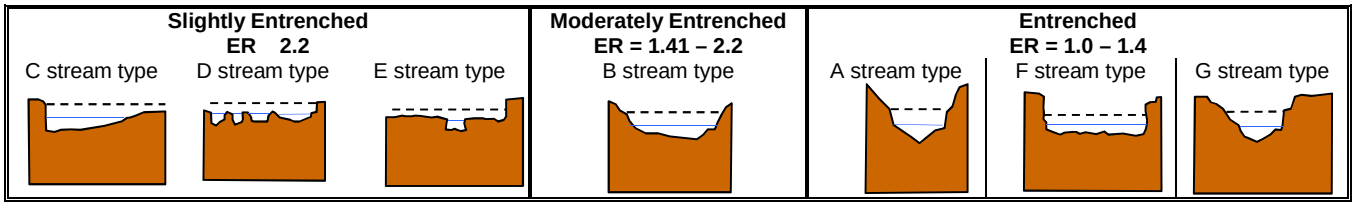
**14E. FLOOD ATTENUATION** ☐ **NA** (proceed to 14F)

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** | **9.126 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 Photographs

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

Photo Point: 1 Location: East Boundary
Bearing: 250 degrees Year: 2013

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

## Easton Ranch: Photo Point Photographs

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

Photo Point: 2 Location: Northeast Corner
Bearing: 200 degrees Year: 2013

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

## Easton Ranch: Photo Point Photographs

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

Photo Point: 3 Location: Northwest Corner
Bearing: 100 degrees Year: 2013

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

## Easton Ranch: Photo Point Photographs

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

Photo Point: 4A Location: Shields Bank DS
Bearing: 170 degrees Year: 2013

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

## Easton Ranch: Photo Point Photographs

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

Photo Point: 4B Location: Shields Bank US
Bearing: 20 degrees Year: 2013

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

## Easton Ranch: Photo Point Photographs

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

Photo Point: 5 Location: West Boundary
Bearing: 90 degrees Year: 2013

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)

## Easton Ranch: Photo Point Photographs

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

Photo Point: 6 Location: Southwest Corner
Bearing: 0 degrees Year: 2013

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

## Easton Ranch: Photo Point Photographs

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

Photo Point: 7 Location: Southeast Corner
Bearing: 340 degrees Year: 2013

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

## Easton Ranch: Transect Photographs

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: 2013

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

Transect 1: Start Location: Veg Com 13 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

## Easton Ranch: Transect Photographs

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: 2013

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

Transect 1: End Location: Veg Com 13 foreground

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

## Easton Ranch: Transect Photographs

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: 2013

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 3 foreground
Bearing: 185 degrees Year: 2016

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

## Easton Ranch: Transect Photographs

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

Transect 2: End
Bearing: 0 degrees
Location: Veg Com 1 foreground
Year: 2013

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

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

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

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

## Easton Ranch: Transect Photographs

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: 2013

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 13 foreground
Bearing: 95 degrees Year: 2016

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

## Easton Ranch: Transect Photographs

| | |
|---|---|
| Photo not available | Photo not available |
| Transect 3: End<br>Bearing: 265 degrees<br>Location: Veg Com 1 foreground<br>Year: 2010 | Transect 3: End<br>Bearing: 265 degrees<br>Location: Veg Com 1 foreground<br>Year: 2013 |
| Photo not available | Photo not available |
| Transect 3: End<br>Bearing: 265 degrees<br>Location: Veg Com 1 foreground<br>Year: 2014 | Transect 3: End<br>Bearing: 265 degrees<br>Location: Veg Com 1 foreground<br>Year: 2015 |
|  |  |
| Transect 3: End<br>Bearing: 265 degrees<br>Location: Veg Com 1 foreground<br>Year 2016 | Transect 3: End<br>Bearing: 265 degrees<br>Location: Veg Com 1 foreground<br>Year 2017 |

## Easton Ranch: Data Point Photographs

Data Point: DP-1W Location: Veg Com 15
Year: 2017

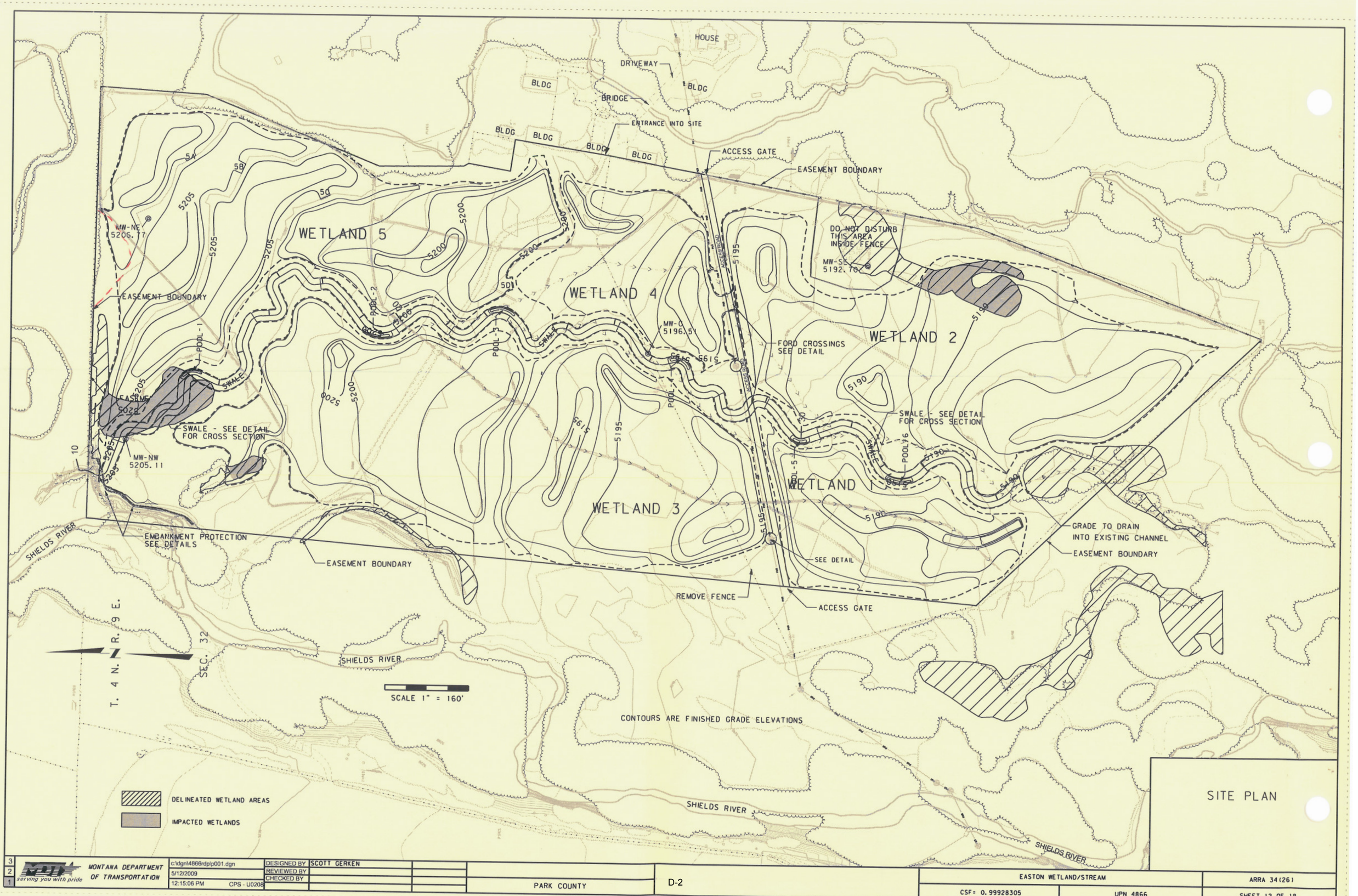
Data Point: DP-1U Location: Veg Com 1
Year: 2017

Data Point: DP-2W Location: Veg Com 11
Year: 2017

Data Point: DP-2U Location: Veg Com 1
Year: 2017

# APPENDIX D
# PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Easton Ranch
Park County, Montana




# SITE PLAN

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