MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2016

SCHRIEBER MEADOWS MITIGATION SITE
LINCOLN COUNTY, MONTANA



Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

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Helena, Montana 59620

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December 2016

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SCHRIEBER MEADOWS MITIGATION SITE
LINCOLN COUNTY, MONTANA
PILOT PROJECT CONSTRUCTION: 2007
SITE-WIDE CONSTRUCTION: 2011

MDT Project Number NH 27(021)
Control Number 1027

Corps #: NWO-2004-90280-MTH
SPA MDT-R1-88-2010

prepared for

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Cover: View looking west along Transect 3.

1.0 INTRODUCTION

The Schrieber Meadows Wetland Mitigation 2016 Monitoring Report presents the results of the sixth year of postconstruction monitoring at the Schrieber Meadows site for three pilot cells that were constructed in 2007. This report also presents the fifth year of postconstruction monitoring for the remaining cells and new stream channels that were constructed during fall 2011. Monitoring was not completed in 2011 because of the construction of the expanded mitigation area. The Montana Department of Transportation (MDT) Schrieber Meadows mitigation project is located adjacent to the US Highway 2 corridor in Sections 11, 12, and 13, of Township 27 North, Range 30 West, MPM, Lincoln County, as shown in Figure 1-1. The 57-acre mitigation site lies within the boundaries of Watershed #1 – Kootenai River Basin. The majority of the mitigation site is situated on a 147-acre MDT-owned parcel of land that consisted of hay fields, pastures, and clear-cut forest slopes. The remainder of the mitigation site is a 16-acre easement area in the Kootenai National Forest, adjacent to the MDT parcel. The property is bisected by Coyote Creek, which drains into Schrieber Lake and the Fisher River. Schrieber Meadows is situated within a narrow valley corridor bordered on the western and northern sides by the Kootenai National Forest. The US Highway 2 corridor bounds the area to the east. The southern boundary of this site is bordered by a second MDT-owned property (the Schrieber Lake parcel) and land owned by Weyerhaeuser corporation.

Figures A-2 and A-3 in Appendix A of this report show the monitoring activity locations and mapped site features, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring form, the US Army Corps of Engineers (USACE) Wetland Determination Data forms for the Western Mountains, Valleys, and Coast (WMVC) Region [USACE, 2010a], and the 2008 MDT Montana Wetland Assessment (MWAM) forms. Appendix C contains photographs of the project area, Appendix D includes the surveyed stream cross-sections, and Appendix E includes project plan sheets.

Based on the nature of the peat and lacustrine soils identified within the project area, the MDT Geotechnical Section indicated that constructing a new stream channel and wetlands within Schrieber Meadows could potentially affect the stability of US Highway 2. In 2007, a pilot wetland project to excavate several shallow depressional wetland cells was completed to determine constructability within these soil types. Three shallow wetland cells were created in 2007 and initially monitored in 2010. The pilot project objectives for the cells are listed below [MDT, 2009]:

- Create 2.38 acres of emergent depression wetlands within portions of existing upland hay fields by using a variety of herbaceous wetland species
- Restore (rehabilitate) 1.12 acres of degraded wetlands that are dominated by pasture grasses by permanently restoring hydrology, excavating shallow depressions, and revegetating with wetland seed
- Develop 2.96 acres of upland buffers around the created wetland areas.

The project credit ratios for the initial pilot project are shown in Table 1-1. The 3.72 acres of proposed wetland mitigation credits generated by this project have been approved by the USACE.

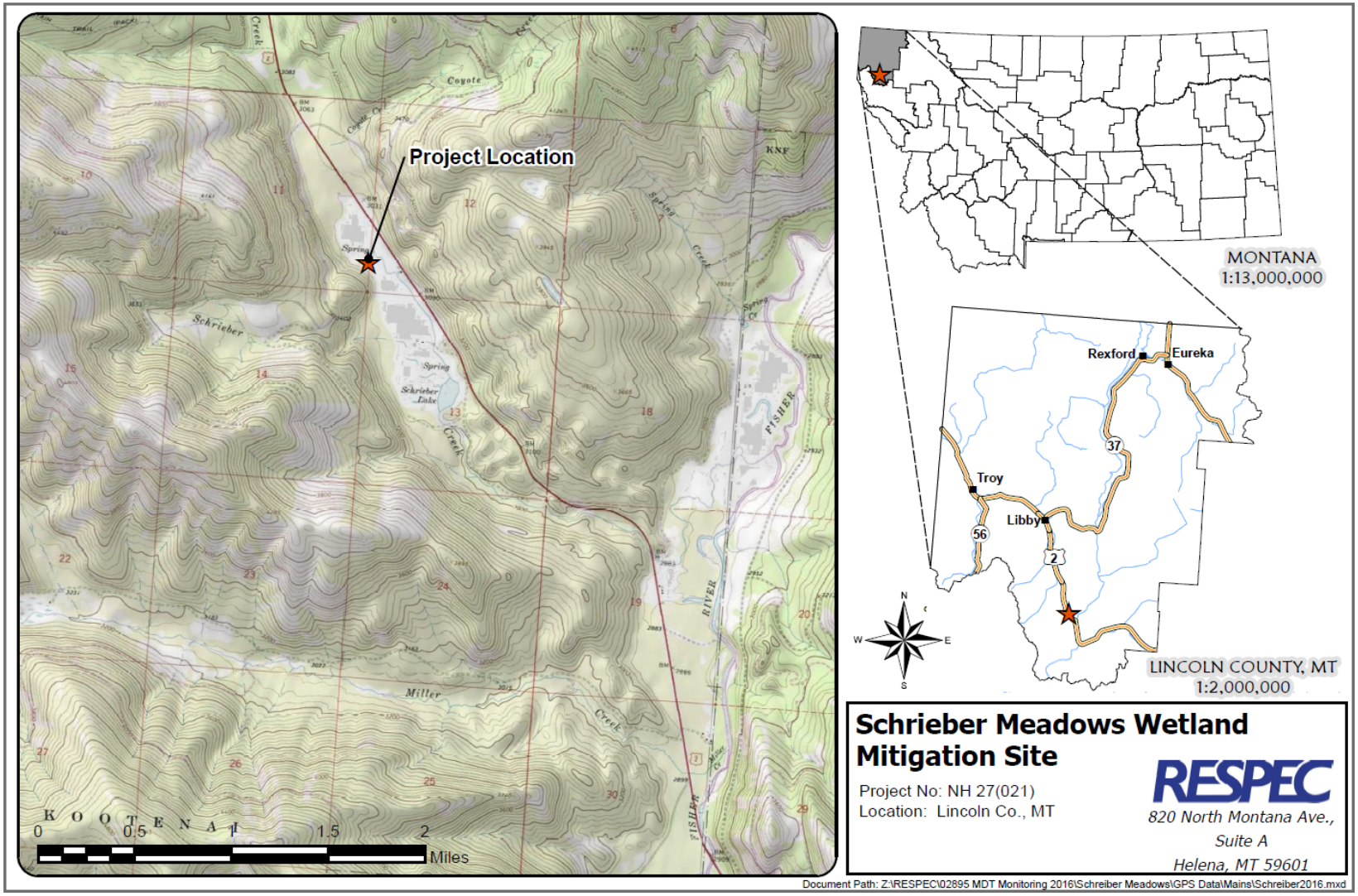


Figure 1-1. Project Location of the Schrieber Meadows Site.

Table 1-1. US Army Corps of Engineers Wetland Credit Ratios for the Schrieber Meadows Pilot Mitigation Site

Wetland Mitigation	Proposed Pilot Project Acreage	USACE-Approved Credit Ratios	Proposed Pilot Project Credit Acres	2010 Wetland Acreage	2010 Credit Acres
Creation – Northwestern Cell	0.08	1:1	0.08	0.08	0.08
Creation – Central Cell	2.01	1:1	2.01	2.01	2.01
Creation – Southeast Cell	0.29	1:1	0.29	1.63	1.63
Restoration/Rehabilitation – Southeast Cell	1.12	1.5:1	0.75	1.12	0.75
Upland Buffer (50 feet)	2.96	5:1	0.59	2.96	0.59
Total Mitigation Acreage	**6.46**		**3.72**		**5.06**

The Schrieber Meadows wetland and stream restoration project was scaled back from the original design based on the results of the pilot project. A 300-foot buffer was established by the MDT Geotechnical Section from the edge of the roadway, which limited potential areas of development for the new stream channel and depressional wetland areas within the project area. The existing Coyote and Schrieber Creek channels were relocated toward the west side of the property away from the highway corridor to allow for natural channel migration and overbank flooding. The restored channels' elevation was raised to promote access to the floodplain and increase the localized water table throughout this meadow. A series of wetland cells (depressions) were excavated throughout the floodplain to increase flood storage and provide for a diversity of wetland habitat. The existing Coyote/Schrieber Creek channel that is located along the east boundary was plugged at various locations to prevent the abandoned channel from serving as a drainage ditch and to create small pothole-like wetland areas to increase wetland diversity within the site. The overall objective for mitigation was to create and restore wetlands and to restore the natural stream sinuosity and associated riparian and floodplain corridor to Coyote and Schrieber Creeks within the US Forest Service (USFS) and MDT properties.

The construction of the Schrieber Meadows mitigation project was authorized under the authority of Section 404 of the Clean Water Act via permit NWO-2004-90280-MTH and certification through Montana's Stream Protection Act (SPA) #MDT-R1-88-2010. A total of 3.72 mitigation credit acres were developed by pilot project construction in 2007. The acreage included creation, restoration (rehabilitation), and upland buffer credits. The entire Schrieber Meadows mitigation project encompassed creating additional depressional wetland cells and upland buffer areas around the wetlands, restoring degraded wetlands, enhancing scrub/shrub palustrine wetlands, and reconstructing portions of Coyote and Schrieber Creek channels. MDT anticipates that 17.84 wetland credit acres will be developed from the Schrieber Meadows wetland and stream restoration project, including credits that have been approved from the previous 2007 pilot project. The objectives of the full Schrieber Meadows stream and wetland restoration project are described in the following sections.

1.1 WETLAND MITIGATION OBJECTIVES

- Create 8.91 wetland credit acres of seasonally inundated, emergent depressional wetlands within portions of the existing upland hay fields on both the USFS and MDT properties with a variety of herbaceous wetland communities.
- Provide approximately 2.31 wetland credit acres by restoring (rehabilitating) 3.46 acres of degraded wetlands (at 1.5:1 ratio) that are dominated by pasture grasses such as meadow-foxtail (*Alopecurus* sp.), reed canary grass (*Phalaris arundinacea*), timothy (*Phleum pratense*), and other hay species by permanently restoring hydrology, manipulating land surface (excavating shallow depressions), and revegetating with wetland plant seed.
- Provide approximately 4.41 wetland credit acres by enhancing 13.22 acres of existing wetlands (at 3:1 ratio) located between the proposed stream mitigation portion of the project area and the US Highway 2 corridor.
- Provide approximately 1.70 wetland credit acres by developing upland buffers that total 8.50 acres (at 5:1 ratio) around the created, restored, and enhanced wetland areas and stream riparian corridors.
- Impact approximately 0.08 acre of wetlands by installing ditch plugs along the channelized perennial reaches of Coyote and Schrieber Creeks to divert the flows into the new stream channel.
- Establish an overall total of 17.24 acres of wetland mitigation credits to mitigate wetland impacts associated with MDT projects within Watershed #1 – Kootenai River Basin.

1.2 STREAM MITIGATION OBJECTIVES

- Restore approximately 7,756 linear feet of new stream channel of both Coyote and Schrieber Creeks, which will result in an overall increase of 3,327 linear feet of stream length to both creek corridors by restoring sinuosity, floodplains, and natural stream migration within the project site.
- Develop approximately 35,551 stream mitigation credits by restoring Coyote and Schrieber Creeks for use within Watershed #1 – Kootenai River Basin.

Before the construction of the Schrieber Meadows project, the area consisted of hay grounds and historic wetlands that had been filled, graded, leveled, and drained. The stream channel had been channelized to promote and maximize hay production and grazing opportunities for livestock, as well as to flood irrigate the adjacent hay pastures. Historically, the project site was likely a large floodplain and beaver pond complex of mixed riparian scrub/shrub and emergent wetlands associated with both Coyote and Schrieber Creeks. Through these restoration efforts, the overall project is expected to provide increased functional ratings to the existing wetlands and stream corridor through the following:

- Improving fisheries habitat within both streams
- Relocating the streams away from the US Highway 2 corridor
- Increasing the frequency of inundation for floodplain storage across the site during high-water events

- Improving the diversity of riparian, emergent, and scrub/shrub vegetation communities through topographic and hydrologic manipulation and planting
- Restoring and raising groundwater and surface-water hydrology to restore existing degraded wetland communities
- Improving wildlife habitat across the entire project area.

Coyote and Schrieber Creeks provide the project area with a source of seasonal and perennial surface water, along with a seasonal groundwater table within 0.5 to 3 feet of the preconstruction ground elevation during the spring. The seasonal groundwater is expected to provide the necessary hydrology for the majority of the created depression wetland systems. The raised bed elevation of the newly restored stream reaches is expected to promote higher groundwater elevations for a longer duration during the growing season and allow for an increased frequency of flood events to occupy newly created wetlands and riparian floodplain areas adjacent to these channels.

Stands of creeping meadow-foxtail (*Alopecurus arundinacea*) and reed canary grass were removed from the site as an intended consequence of wetland cell excavation and restoration actions. The constructed wetland cells and stream banks were reseeded after the disturbance with a wetland mix and replanted with existing shrubs, trees, and plants salvaged from wetlands adjacent to the project site. Additional revegetation measures included supplemental planting of trees and shrubs with anticipation of some level of natural recruitment.

1.3 APPROVED PERFORMANCE STANDARDS

The approved performance standards for the mitigation activities are listed below [MDT, 2009].

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 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (2010 Regional Supplement) [USACE, 2010a].
    a. **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Wetland Manual. Soil saturation will be present for at least 12.5 percent of the growing season.
    b. **Hydric Soil Success** will be achieved where hydric soil conditions are present (per the most recent Natural Resource Conservation Service [NRCS] definitions for hydric soil) 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. Because typical hydric soil indicators may require long periods to form, 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 where combined absolute cover of facultative or wetter species is greater than or equal to 70 percent and state-listed noxious

weeds do not exceed 5 percent absolute cover. 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).*"

2. **Riparian Buffer Success** will be achieved when woody and riparian vegetation becomes established and noxious weeds do not exceed 10 percent cover within the riparian buffer areas. Any areas within the creditable buffer area that are disturbed by the project construction must have at least 50 percent aerial cover of non-noxious weed species by the end of the monitoring period.
    a. **Vegetation Success** will be achieved where combined aerial cover of riparian and stream bank vegetation communities is greater than or equal to 70 percent and state-listed noxious weeds do not exceed 10 percent cover, subject to the woody standards listed below.
    b. **Woody Plants,** including planted trees and shrubs, will be considered successful where they exhibit 50 percent survival after 5 years.
3. **Channel-Restoration Success** will be evaluated in terms of revegetation success.
    a. Revegetation along the new Coyote and Schrieber Creek channel corridors will be considered successful when banks are vegetated with a majority of deep-rooting riparian and wetland herbaceous and woody plant species.
    b. The intent of the stream restoration is to allow the stream to naturally migrate within the floodplain and to give it enough room to move and stabilize itself within the site.
4. **Vegetation Along the Stream Banks** will be considered successful when the banks are vegetated with a majority of deep-rooting riparian plant species having root-stability indexes greater than or equal to 6 (subject to 3a and 3b above).
5. **Open Water** is expected to be provided by the project during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, vegetation is expected to germinate within the majority of the depressions. Open water with submerged and/or floating vegetation will, therefore, be considered successful and creditable.
6. **Upland Buffer Success** will be achieved when the noxious weeds do not exceed 5 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.
7. **Weed Control** will be based on annual site monitoring to determine weed species and degree of infestation within the site. Control measures will be implemented by MDT based on the monitoring results to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site. MDT managed the property to control known weed problems (knapweed and houndstongue) before the wetland construction activities were initiated within the site.

2.0 METHODS

The annual monitoring event was conducted on July 27, 2016, and represented the sixth year of monitoring for the pilot project and fifth year of monitoring of the entire Schrieber Meadows site. Information contained on the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded during the field investigation (Appendix B). Monitoring activity locations were mapped by using a global positioning system (GPS) (Figure A-2, Appendix A). Data-collection activities included a wetland delineation; wetland/open water/aquatic habitat boundary mapping; vegetation community mapping; vegetation transect monitoring; soils, hydrology, and bird- and wildlife-use documentation; photographs; stream cross-sections at 11 established stations; functional assessments; and a nonengineering examination of the infrastructure established within the mitigation project area. Monitoring of this MDT mitigation site has been based on the MDT standard monitoring protocols for both stream and wetland areas that are used for all of the MDT 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 wetland and stream mitigation success criteria).

2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data form was assessed at two 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 the Wetland Determination Data forms (Appendix B). Hydrologic assessments allow mitigation goals that address inundation and saturation requirements to be evaluated.

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, 2010a]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional 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 28.5 degrees Fahrenheit [USACE, 2010a]. The growing season recorded for the meteorological station at Libby 32 SSE (245020), which is located approximately 8 miles northwest of the project, extends from June 13 to September 1 for a total of 81 days [NRCS, 2010]. Areas that are defined as wetlands would require 10 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria and performance standards.

Groundwater monitoring wells have been installed on the site. However, because of high groundwater table and persistent inundation of the area, these wells have not been monitored. 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). Areas of surface inundation were delineated on an aerial photograph during the growing season. The extent of soil saturation was determined through core sampling.

2.2 CHANNEL CROSS-SECTIONS

In accordance with the approved mitigation plan, a minimum of one stream cross-section per 1,000 feet of assessed stream reach was established to monitor channel form and function, natural channel migration, vertical stability (down-cutting), sediment deposition, and stream bank vegetation development. Eleven permanent cross-sections were established across the constructed streams during the 2012 site visit (Figure A-2, Appendix A). Rebar was driven into the ground at both ends of each cross-section, marked with pink paint and flagging, and covered with a wildlife-friendly cap. These cross-sections were surveyed annually by using a survey-grade GPS with a base station established on site to improve accuracy. Photographs were taken of each cross-section and are shown in Appendix C. Additionally, general vegetation development was documented at each cross-section and used to evaluate root-stability indices. The survey cross-section data shown in Appendix D are used to evaluate temporal changes in-stream stability.

2.3 VEGETATION

The boundaries of general dominant-species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2016 aerial photographs. The 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). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure A-3, Appendix A).

Temporal changes in vegetation were evaluated through annual assessments of three vegetation belt transects that are approximately 10 feet wide and 318, 594, and 440 feet long, respectively. The transect endpoints were recorded with a GPS unit. Spatial changes in the 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 cover ranges listed above (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (July 2015), prepared by the Montana Department of Agriculture [2015], was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field during the investigation and mapped on the 2016 aerial photographs (Appendix A). The noxious weed species that were identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■," which represent 0.0–0.1 acre, 0.1–1.0 acre, or greater than 1.0 acre in extent, respectively. The letters T, L, M, and H represent the cover classes and stand for less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively.

2.4 SOIL

Soil information was obtained from the *Web Soil Survey for Lincoln County Soil Area* and in situ soil descriptions accessed from the NRCS official soil description website [USDA, 2016]. Soil cores were excavated using a sharpshooter shovel and evaluated according to procedures outlined in the 1987 Wetland Manual and 2010 Regional Supplement [USACE, 2010a]. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Determination Data form for each profile (Appendix B).

2.5 WETLAND DELINEATION

Waters of the US, including special aquatic sites and jurisdictional wetlands, were delineated throughout the project area according to criteria established in the 1987 Wetland Manual and the 2010 Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology that were described in the 2010 Regional Supplement must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2016 national wetland plant list (NWPL) [Lichvar et al., 2016]. A routine level-2 on-site determination method [Environmental Laboratory, 1987] was used to delineate jurisdictional areas within the project boundaries. The information was recorded onto 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 boundary was surveyed in the field using GPS technology and identified on the 2016 aerial photographs. Wetland areas were calculated using GIS methods.

2.6 WILDLIFE

Observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring forms during each of the site visits. 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 observed from 2010 through 2016 was compiled for this report.

2.7 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate functions and values of wetlands delineated on the site from 2013 through 2016. This method provides an objective means of assigning wetlands an overall rating 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 assessment areas (AA), included created wetlands, enhanced wetlands, and restored wetlands within the mitigation site (Appendix B).

2.8 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 site during the site visit (Appendix C). Photo-point locations were recorded with a resource-grade GPS unit (Figure A-2, Appendix A).

2.9 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected by using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2016 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, stream cross-sections, noxious weed infestations, and wetland data points.

2.10 MAINTENANCE NEEDS

Channels, engineered structures, fencing, bird boxes, and other man-made 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 Libby 32 SSE, Montana (245020), weather station recorded an average total annual precipitation rate of 24.44 inches from 1949 to 2016 [Western Regional Climate Center, 2016]. Annual precipitation at this site was 21.93 inches (2010), 22.64 inches (2011), 27.20 inches (2012), 19.18 inches (2013), 25.75 inches (2014), and 21.26 inches (2015). In general, the region surrounding the project area exhibited below-average precipitation before and during the growing season in 2010, 2011, 2013, and 2015 and above-average precipitation in 2012 and 2014. Based on data recorded from the Libby 32 SSE, Montana station from January through August, precipitation totals for this region were 14.94 inches (long-term average), 11.14 in 2015, and 11.82 inches in 2016. which is more than 3 inches below the long-term average in each of the last 2 years. Based on field observations of hydrology within the site over the 6-year monitoring period, water levels within the excavated basins appear to be largely influenced by groundwater and stream discharge with moderate influence from direct precipitation. The percent of open water observed during 2016 remained similar to 2015 water levels, which is likely caused by below-average precipitation in June and drought conditions across the region.

During the 2016 investigation, the average depth of surface water across the site was estimated at 1.8 feet with a range of depths from 0 to 3.5 feet. Approximately 65 percent of the AA was inundated. The surface-water depth at the emergent vegetation and open-water boundary was estimated at 1.1 feet. The southern two-thirds of the site was inundated and/or saturated as a result of the newly constructed channel of Coyote Creek and abundant surface and ground water flowing through the

valley. The high groundwater elevations found on the site are caused by a combination of restoration efforts to plug existing drain ditches and channels as well as the subsidence of the histosol soil elevations over time. The north portion of the site was drier. Many of the excavated ponds contained surface water, with water levels the lowest or absent near the northern boundary. The intermittent Coyote Creek was dry in July 2016 north of the spring, just upstream of the site's access road. This spring appears to provide a perennial source of hydrology to the site. Direct precipitation also contributes to wetland hydrology, but the high seasonal groundwater table provides the majority of water that drives wetland hydrology within this site. Above-average precipitation rates, such as those observed in 2011, 2012, and 2014, likely flow off the site as excess surface water. Other site-wide indicators of wetland hydrology included saturation and inundation that is visible on aerial photographs, geomorphic positions, positive FAC-neutral test, and a seasonal high groundwater table.

Two data points were sampled in 2016 to determine the wetland/upland boundaries. DP-1W is located near an excavated wetland cell near the center of the site (Figure A-2, Appendix A). This wetland data point exhibited a high water table, geomorphic position (valley bottom at toe of slope), and a positive FAC-neutral test. DP-2U is located upslope (west) from DP-1W. No hydrologic indicators were observed at DP-2U.

3.2 CHANNEL CROSS-SECTIONS

The survey results for 11 permanent cross-sections established along the constructed Coyote and Schrieber Creeks (Figure A-2, Appendix A) are shown in Appendix D. The 2016 data was compared to the previous surveys and discussions to assess stream channel stability. In general, the banks of the constructed channels were well vegetated and exhibited stable conditions. Consequently, no major channel morphological changes have been observed throughout all monitoring years.

As stated in the 2015 monitoring report [Confluence Consulting, Inc., 2015], with the exception of Cross-Sections 3, 9, and 10, minimal changes were observed within the surveyed cross-section geometry between 2012 and 2015. The 2015 monitoring report provided the following discussion with respect to Cross-Section 3:

"XS 3 was located directly below a spring in the reach of a channel that remained undisturbed during mitigation construction in 2011. In 2014, a review of the XS 3 survey data indicated a discrepancy related to an inability to find the bank pins in 2013 and 2014; the difference in the surveys for those years do not reflect an actual change in channel morphology at this location. The 2015 survey was accurately located at XS 3 and demonstrates no effective change in-stream channel morphology from 2012 through 2015."

The 2016 survey was also accurately located for Cross-Section 3. Between 2015 and 2016 surveys, the plots provided in Appendix C show no significant changes.

The 2015 monitoring report provided the following discussion with respect to Cross-Section 9:

"The survey at XS 9 from 2013 to 2014 was intentionally mislocated upstream or downstream of the 2012 survey location to avoid disturbing channel morphology and large woody debris that had been

installed after the 2012 survey. The 2013 and 2014 survey data was taken outside the zone of influence of the installed woody debris; these data document that the channel is stable near XS 9, which is a circumstance that continues to the present. In 2015, the survey data were collected at the original 2012 XS 9 location to document the effect of the woody debris: a general widening without deepening the channel.

The 2016 survey was also performed at the original 2012 Cross-Section 9 location. As observed in the cross-sectional plots in Appendix C, the widening that was observed in 2015 appears to have narrowed to approximately the same width upstream and downstream shown in the 2013 and 2014 surveys.

The 2015 monitoring report provided the following discussion with respect to Cross-Section 10:

The permanent bank pins could not be located at XS 10 during the 2013 and 2014 surveys because of a robust stand of reed canary grass that obscured the ground surface. A XS survey was completed at the approximate location; however, postprocessing of the GPS survey data indicated that the survey was approximately 10 feet from the established pins. In 2015, the bank pins were located, and the original alignment of XS 10 was surveyed. Survey data and site photographs document that the site is well vegetated and stable and that the apparent minor adjustment in channel morphology is as likely caused by survey error and marshy substrate conditions as by actual movement. Photographs in Appendix C show well-established reed canary grass stands at this XS with no erosion identified during the field survey.

The 2016 survey of Cross-Section 10 was also complicated by the robust stand of reed canary grass that obscured the ground surface. The left bank monument was located and surveyed as the same location in 2015. However, the right bank monument was not located, which resulted in a different cross-section orientation than collected in 2015.

The robust vegetation establishment with species that possess high root-stability indices observed at all cross-sections are likely the source of the overall (in general) stable banks observed throughout all monitoring years.

3.3 VEGETATION

A comprehensive list of 136 plant species identified on the site from 2010 through 2016 is presented in Table 3-1. Six wetland and two upland community types were identified and mapped at the mitigation site in 2016 (Figure A-3, Appendix A). Individual plant species that were observed within each community are listed on the Wetland Mitigation Site Monitoring form (Appendix B). Open water below the ordinary high water mark (OHWM) of the constructed stream channel is identified on Figure A-3 (Appendix A) by Polygon 10. The vegetation community types identified on the site in 2016 are discussed below.

Table 3-1. Vegetation Species Identified in 2010 and From 2012 Through 2016 at the Schrieber Meadows Site (Page 1 of 4)

Scientific Names	Common Names	WMVC Indicator Status[a]
Achillea millefolium	Common Yarrow	FACU
Achnatherum nelsonii	Nelson's Rice Grass	UPL
Agastache urticifolia	Nettle-Leaf Giant-Hyssop	FACU
Agropyron cristatum	Crested Wheatgrass	NL
Agropyron sp.	Wheatgrass	NL
Agrostis capillaris	Colonial Bent	FAC
Agrostis gigantea	Black Bent	FAC
Agrostis scabra	Rough Bent	FAC
Agrostis stolonifera	Spreading Bent	FAC
Algae, brown	Algae, brown	NL
Algae, green	Algae, green	NL
Alisma triviale	**Northern Water-Plantain**	**OBL**
Alnus incana	Speckled Alder	FACW
Alopecurus aequalis	**Short-Awn Meadow-Foxtail**	**OBL**
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FAC
Alopecurus pratensis	Field Meadow-Foxtail	FAC
Aquatic macrophytes	Aquatic macrophytes	NL
Arctium minus	Lesser Burrdock	UPL
Arnica chamissonis	Leafy Leopardbane	FACW
Aster sp.	Aster	NL
Beckmannia syzigachne	American Slough Grass	OBL
Bromus carinatus	California Brome	NL
Bromus inermis	Smooth Brome	FAC
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex athrostachya	Slender-Beak Sedge	FACW
Carex bebbii	Bebb's Sedge	OBL
Carex lasiocarpa	Woolly-Fruit Sedge	OBL
Carex microptera	Small-Wing Sedge	FACU
Carex nebrascensis	Nebraska Sedge	OBL
Carex pachystachya	Thick-Head Sedge	FAC
Carex pellita	Woolly Sedge	OBL
Carex scoparia	Pointed Broom Sedge	FACW
Carex sp.	Sedge	NL
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Centaurea stoebe	Spotted Knapweed	NL
Cerastium arvense	Field Mouse-Ear Chickweed	FACU
Cerastium fontanum	Common Mouse-Ear Chickweed	FACU
Ceratophyllum demersum	Coon's-Tail	OBL
Chara sp.	Muskgrass	NL
Cirsium arvense	Canadian Thistle	FAC

Table 3-1. Vegetation Species Identified in 2010 and From 2012 Through 2016 at the Schrieber Meadows Site (Page 2 of 4)

Scientific Names	Common Names	WMVC Indicator Status[a]
Cirsium vulgare	Bull Thistle	FACU
Collomia linearis	Narrow-Leaf Mountain-Trumpet	FACU
Cynoglossum officinale	Gypsy-Flower	FACU
Deschampsia cespitosa	Tufted Hairgrass	FACW
Eleocharis flavescens	Yellow Spike-Rush	OBL
Eleocharis palustris	Common Spike-Rush	OBL
Eleocharis quinqueflora	Few-Flower Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Epilobium sp.	Willowherb	NL
Equisetum arvense	Field Horsetail	FAC
Equisetum hyemale	Tall Scouring-Rush	FACW
Erysimum cheiranthoides	Worm-Seed Wallflower	FACU
Festuca sp.	Fescue	NL
Fragaria virginiana	Virginia Strawberry	FACU
Galium mexicanum	Mexican Bedstraw	FAC
Galium trifidum	Three-Petal Bedstraw	FACW
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria elata	Tall Manna Grass	FACW
Glyceria grandis	American Manna Grass	OBL
Glyceria sp.	Manna Grass	NL
Glyceria striata	Fowl Manna Grass	OBL
Gnaphalium palustre	Western Marsh Cudweed	FACW
Hieracium aurantiacum	Orange Hawkweed	NL
Hippuris vulgaris	Common Mare's-Tail	OBL
Juncus articulatus	Joint-Leaf Rush	OBL
Juncus bufonius	Toad Rush	FACW
Juncus confusus	Colorado Rush	FAC
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus nodosus	Knotted Rush	OBL
Juncus tenuis	Lesser Poverty Rush	FAC
Lemna minor	Common Duckweed	OBL
Lepidium sp.	Pepperwort	NL
Leucanthemum vulgare	Ox-Eye Daisy	FACU
Marsilea vestita	Hairy Water-Clover	OBL
Matricaria discoidea	Pineapple-Weed	FACU
Medicago lupulina	Black Medick	FACU
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Pascopyrum smithii	Western-Wheat Grass	FACU

Table 3-1. Vegetation Species Identified in 2010 and From 2012 Through 2016 at the Schrieber Meadows Site (Page 3 of 4)

Scientific Names	Common Names	WMVC Indicator Status[a]
Pedicularis groenlandica	**Bull Elephant-Head**	**OBL**
Persicaria amphibia	Water Smartweed	OBL
Persicaria lapathifolia	Dock-Leaf Smartweed	FACW
Persicaria maculosa	Spotted Lady's-Thumb	FACW
Peritoma serrulata	Rocky Mountain Bee Plant	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Pinus contorta	Lodgepole Pine	FAC
Pinus ponderosa	Ponderosa Pine	FACU
Plantago major	Great Plantain	FAC
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa sp.	Blue Grass	NL
Polygonum douglasii	Douglas' Knotweed	FACU
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus balsamifera	Balsam Poplar	FAC
Potamogeton foliosus	Leafy Pondweed	OBL
Potamogeton natans	Broad-Leaf Pondweed	OBL
Potentilla gracilis	Graceful Cinquefoil	FAC
Potentilla norvegica	Norwegian Cinquefoil	FAC
Prunella vulgaris	Common Selfheal	FACU
Pseudotsuga menziesii	Douglas-Fir	FACU
Ranunculus aquatilis	**Whitewater Crowfoot**	**OBL**
Ranunculus sceleratus	Cursed Buttercup	OBL
Rosa woodsii	Woods' Rose	FACU
Rumex acetosella	Common Sheep Sorrel	FACU
Rumex crispus	Curly Dock	FAC
Salix bebbiana	**Gray Willow**	**FACW**
Salix candida	Sage Willow	OBL
Salix drummondiana	Drummond's Willow	FACW
Scirpus cyperinus	**Cottongrass Bulrush**	**OBL**
Scirpus microcarpus	**Red-Tinge Bulrush**	**OBL**
Senecio hydrophiloides	Stout Meadow Ragwort	FACW
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solidago canadensis	Canadian Goldenrod	FACU
Sparganium emersum	European Burr-Reed	OBL
Spiranthes romanzoffiana	Hooded Ladies'-Tresses	FACW
Stuckenia pectinata	Sago False Pondweed	OBL
Suaeda calceoliformis	Paiuteweed	FACW
Symphoricarpos albus	Common Snowberry	FACU
Symphyotrichum spathulatum	Mountain American-Aster	FAC

Table 3-1. Vegetation Species Identified in 2010 and From 2012 Through 2016 at the Schrieber Meadows Site (Page 4 of 4)

Scientific Names	Common Names	WMVC Indicator Status[(a)]
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	UPL
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 Cat-Tail	OBL
Verbascum thapsus	Great Mullein	FACU
Veronica americana	American-Brooklime	OBL
Veronica anagallis-aquatica	Blue Water Speedwell	OBL
Veronica peregrina	Neckweed	OBL
Veronica serpyllifolia	Thyme-Leaf Speedwell	FAC

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

Wetland community Type 3 – *Phalaris arundinacea* was the largest vegetation community on the site in 2016 and covered 20.44 acres of the project area. Reed canary grass dominated the community. The reed canary grass on this site was over 6 feet tall in some areas. Open water accounted for 11–20 percent of the community. Speckled alder (*Alnus incana*), stalk-grain sedge (*Carex stipata*), and water smartweed (*Persicaria amphibia*) were present at 1–5 percent cover. Portions of this community type are seeing a shift in species dominance from reed canary grass to sedge because of prolonged saturation and standing water on the site. Portions of this community type are expected to shift as the wetland continues to develop after construction. Changes in wetland community type will be documented in future monitoring events.

Wetland community Type 5 – Aquatic Macrophytes/Open Water encompassed 10.3 acres of the excavated cells throughout the site. The cells that were constructed in 2011 exhibited a large variability of aquatic plant development, which appeared to depend on whether the water regime within the cell was intermittent or perennial. In general, the cells located toward the north boundary (upgradient) were susceptible to a higher level of groundwater fluctuation and displayed intermittent conditions. Vegetation within these cells was composed of algae and sparse emergent vegetation. Inundation levels within the constructed cells increased at the downgradient end of the site near the south boundary where the water regime is perennial. Aquatic plant cover was much higher in these wetter cells and included brown and green algae, muskgrass (*Chara* sp.), water smartweed, Nebraska sedge (*Carex nebrascensis*), common spike-rush (*Eleocharis palustris*), and reed canary grass. Other species that were observed at less than 1 percent include broad-leaf cat-tail (*Typha latifolia*), American manna grass (*Glyceria grandis*), and common duckweed (*Lemna minor*). A total of 11 dominant species were identified within this community in 2016. Open water and bare ground each accounted for 21–50 percent of the community.

Wetland community Type 6 – *Alopecurus pratensis/Agrostis capillaris* was located across 13.12 acres that surround the constructed cells along the upper Coyote Creek reach. The area appeared to be exposed to periodic flooding during peak spring runoff with seasonal drawdown and drier conditions present throughout the latter part of the growing season. The community was dominated by field meadow-foxtail and colonial bent (*Agrostis capillaris*), with lesser cover provided by reed canary grass, smooth brome (*Bromus inermis*), Kentucky blue grass (*Poa pratensis*), slender-beak sedge (*Carex athrostachya*), fringed willowherb (*Epilobium ciliatum*), and two other sedge species.

Wetland community Type 7 – *Juncus bufonius*/Bare Ground was located on 0.25 acre in 2016. This community was generally mapped around the perimeter of the constructed cells in 2012. Community Type 7 was mapped in 2016 in the lower contours of an excavated wetland cell in the far northwest corner of the mitigation area. Toad rush (*Juncus bufonius*) dominated this vegetation community. American slough grass, common spike-rush, seep monkey-flower (*Mimulus guttatus*), paiuteweed (*Suaeda calceoliformis*), and three other species were observed in 2016. Approximately 21–50 percent of the community was bare ground, which is a result of fluctuating water levels in the excavated ponds.

Upland community Type 8 – *Elymus repens/Pascopyrum smithii* was mapped across 2.68 acres within the spoil pile from both the Schrieber Meadows and Schrieber Lake mitigation projects. MDT continues to use topsoil from this location to revegetate highway reconstruction projects along US Highway 2 in the vicinity of Schrieber Meadows. Creeping wild rye (*Elymus repens*), western-wheat grass (*Pascopyrum smithii*), and black medic (*Medicago lupulina*) dominated the community. Other species included field meadow-foxtail, smooth brome, and tall hedge-mustard (*Sisymbrium altissimum*).

Upland community Type 9 – *Alopecurus* spp./*Bromus inermis* was located across 6.32 acres within uplands around the periphery of the site. Community Type 9 consisted of field meadow-foxtail, creeping meadow-foxtail, and smooth brome, with lesser cover provided by common yarrow (*Achillea millefolium*), western-wheat grass, Kentucky blue grass, stout meadow ragwort (*Senecio hydrophiloides*), leafy leopardbane (*Arnica chamissonis*), and common dandelion (*Taraxacum officinale*).

Wetland community Type 13 – *Eleocharis palustris*/Bare Ground characterized 1.6 acres of wetland within the perimeter of the ponds in the north section of the site. This community replaced community Type 11 – *Beckmannia syzigachne*/Bare Ground in 2015 as species composition and their associated cover classes had changed during the 2015 survey. Bare ground represented 21–50 percent of the cover within the community because of fluctuating water levels. This community occurs primarily within the bottom of wetland cells. Open water was not observed in this community in 2015. Common spike-rush, field meadow-foxtail, and American slough grass dominated this community, with lesser cover provided by woolly sedge (*Carex pellita*), bulrush (*Scripus* sp.), and 30 other species.

Wetland community Type 14 – *Agrostis capillaris/Phleum pratense* was observed for the first time in 2015 and replaced community Type 12 – *Agrostis stolonifera/Juncus bufonius* on 1.9 acres located in USFS property that is in the northwest corner of the site. Colonial bent and common timothy (*Phleum*

pratense) dominated the vegetation cover in 2016, with lesser cover from 10 additional species. This community contained a trace amount of orange hawkweed (*Hieracium aurantiacum*), which is a Priority 2A noxious weed, and a low amount of ox-eye daisy (*Leucanthemum vulgare*), which is a Priority 2B noxious weed.

Five vegetation communities were identified during the initial monitoring of the Schrieber Meadows pilot project in 2010. Three of these communities did not persist into 2012. Changes in vegetation communities from 2012 through 2016 were primarily caused by continued wetland vegetation development within and around the excavated cells, vegetation response to the increased groundwater table, and mapping refinement of community boundaries. Overall, the vegetation communities at this site have remained relatively stable with the principal changes occurring around the constructed cells in the northern part of the site as hydrophytic vegetation continues to develop with fluctuating seasonal water levels.

Trends in plant species composition were measured along three belt transects (T-1, T-2, and T-3) in 2016. Photographs of the transect end points are provided in Appendix C. One 318-foot transect (T-1) was established during initial monitoring at the site in 2010. Table 3-2 and Charts 3-1 and 3-2 summarize the data for T-1 (Wetland Mitigation Site Monitoring form, Appendix B). T-1 intersected vegetation community Types 3 – *Phalaris arundinacea* and 5 – Aquatic Macrophytes/Open Water. Hydrophytic vegetation accounted for 19.8 percent of the transect in 2016. Open water accounted for 80.2 percent of the transect. This transect has not intersected any upland vegetation communities from 2012 through 2016.

Table 3-2. Data Summary for T-1 in 2010 and From 2012 Through 2016 at the Schrieber Meadows Site

Monitoring Year	2010	2012	2013	2014	2015	2016
Transect Length (feet)	**318**	**318**	**318**	**318**	**318**	**318**
Vegetation Community Transitions Along Transect	7	6	6	6	6	6
Vegetation Communities Along Transect	3	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	32	15	13	10	8	8
Total Hydrophytic Species	22	12	8	6	4	4
Total Upland Species	10	3	5	4	4	0
Estimated % Total Vegetative Cover	75	80	85	90	75	77
Estimated % Unvegetated	25	20	15	10	25	23
% Transect Length Comprising Hydrophytic Vegetation Communities	62	27	24.5	24.5	19.8	19.8
% Transect Length Comprising Upland Vegetation Communities	13	0	0	0	0	0
% Transect Length Comprising Open Water	25	73	75.5	75.5	80.19	80.2
% Transect Length Comprising Mudflat	0	0	0	0	0	0

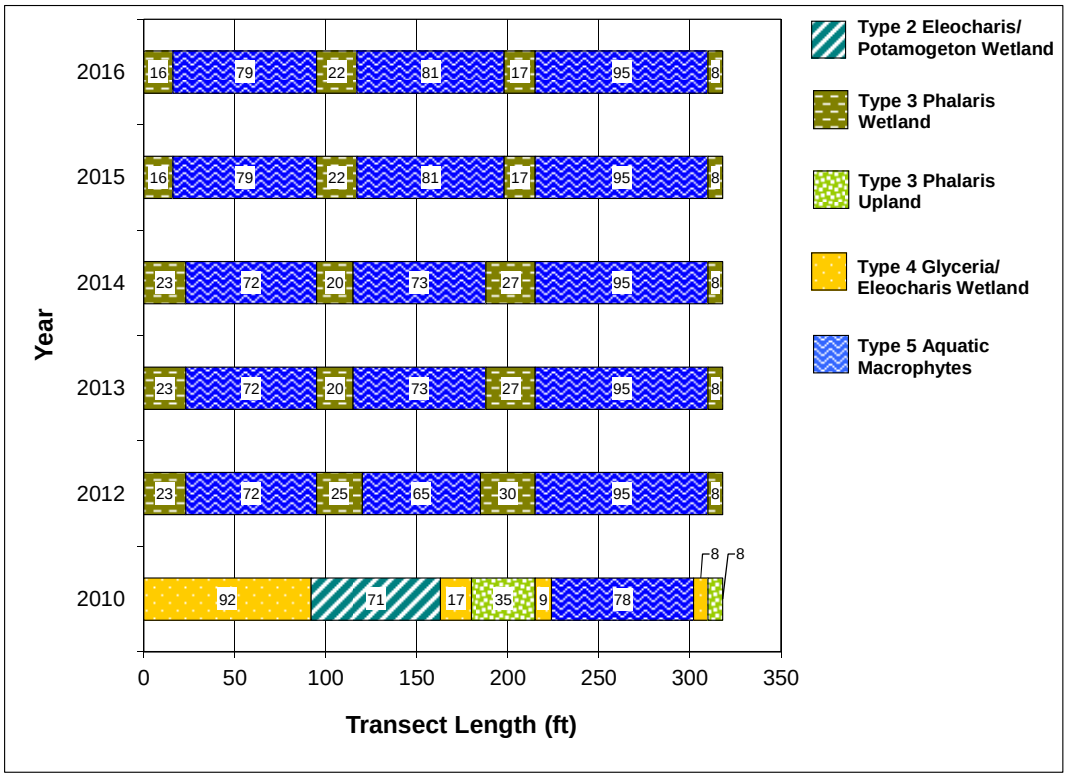


Chart 3-1. Transect Map Showing Community Types on T-1 in 2010 and From 2012 Through 2016 From Start (0 Foot) to End (318 Feet).

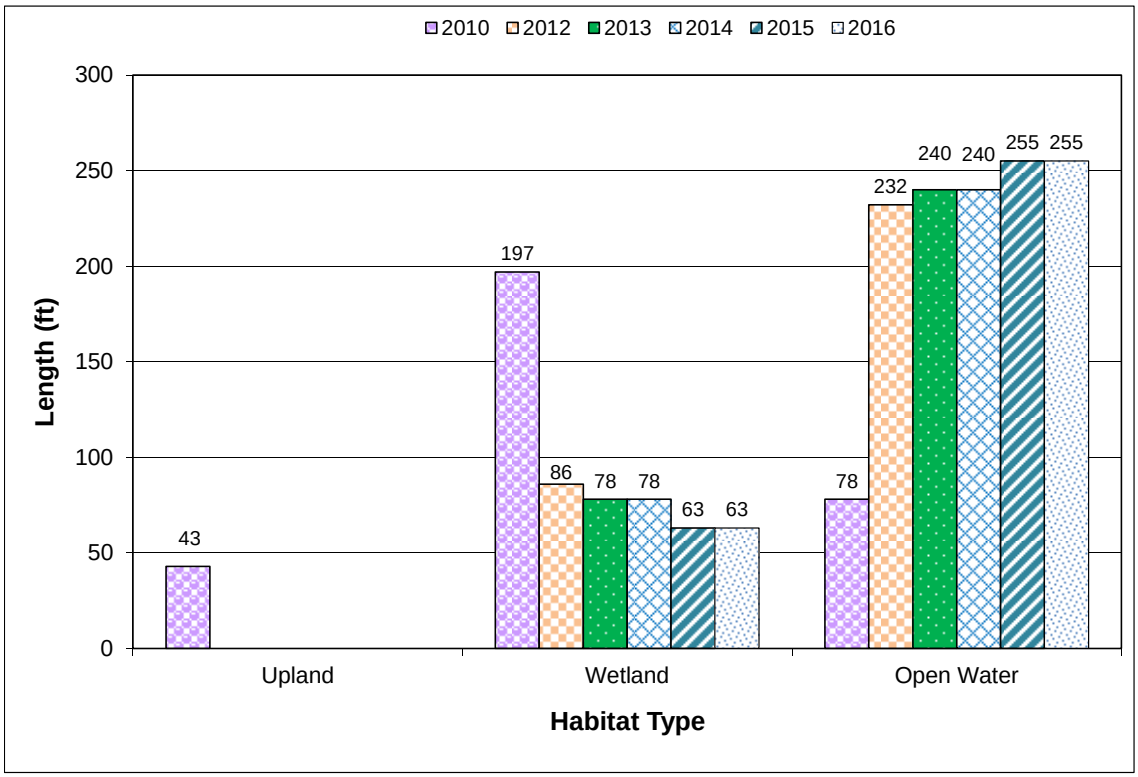


Chart 3-2. Length of Habitat Types Within T-1 in 2010 and From 2012 Through 2016.

T-2 was established in 2011 across three constructed cells within the northwestern section of the project site (Figure A-2, Appendix A). The data recorded on T-2 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-3 and Charts 3-3 and 3-4, respectively. T-2 extends 594 feet from west to east across wetland Cells 2A, 3A, and 4A. The transect intervals alternated between wetland community Types 5 – Aquatic macrophytes/Open Water, 6 – *Alopecurus pratensis/Agrostis capillaris*, 13 – *Eleocharis palustris/*Bare Ground, and 14 – *Agrostis capillaris/Phleum pratense*. Hydrophytic vegetation composed approximately 58.1 percent of the transect during the 2016 survey. A total of 36 species were identified, including 30 hydrophytes and 6 upland species. Open water and mudflat represented 7.7 and 34.2 percent of the transect intervals, respectively. The percent of open water observed during 2016 remained similar to 2015 water levels, which is likely caused by below-average precipitation in June and drought conditions across the region.

Table 3-3. Data Summary for T-2 From 2012 Through 2016 at the Schrieber Meadows Site

Monitoring Year	2012	2013	2014	2015	2016
Transect Length (feet)	**594**	**594**	**594**	**594**	**594**
Vegetation Community Transitions Along Transect	16	16	15	15	15
Vegetation Communities Along Transect	3	4	4	4	4
Hydrophytic Vegetation Communities Along Transect	3	3	3	3	3
Total Vegetative Species	26	38	38	43	36
Total Hydrophytic Species	17	28	27	30	30
Total Upland Species	9	10	11	13	6
Estimated % Total Vegetative Cover	60	75	95	80	65
Estimated % Unvegetated	40	25	5	20	45
% Transect Length Comprising Hydrophytic Vegetation Communities	59.1	60.3	60.3	58.1	58.1
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	40.9	39.7	39.7	7.7	7.7
% Transect Length Comprising Mudflat	0	0	0	34.2	34.2

T-3 began near constructed Wetland Cell 8 along the Middle Coyote Creek reach and extends east 440 feet to the edge of the former Coyote Creek channel along the eastern site boundary. The data recorded on T-3 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-4 and Charts 3-5 and 3-6, respectively. The transect intervals alternated between wetland community Types 3 – *Phalaris arundinacea* and 5 – Aquatic macrophytes/Open Water. Hydrophytic vegetation composed approximately 46 percent of the transect during the 2016 survey. Only 11 plant species were identified on the transect as a result of the dominance by reed canary grass within this area. Open water represented 54 percent of T-3, which is similar to the percent in 2015.

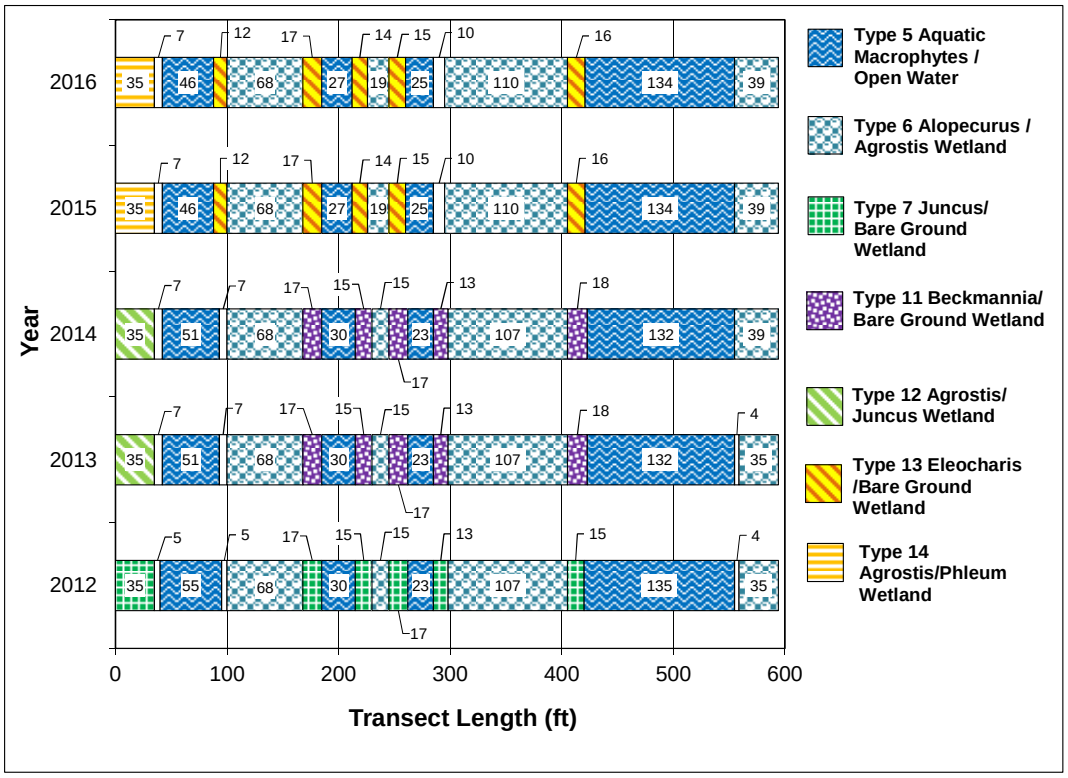


Chart 3-3. Transect Map Showing Community Types on T-2 From 2012 Through 2016 From Start (0 Foot) to Finish (594 Feet).

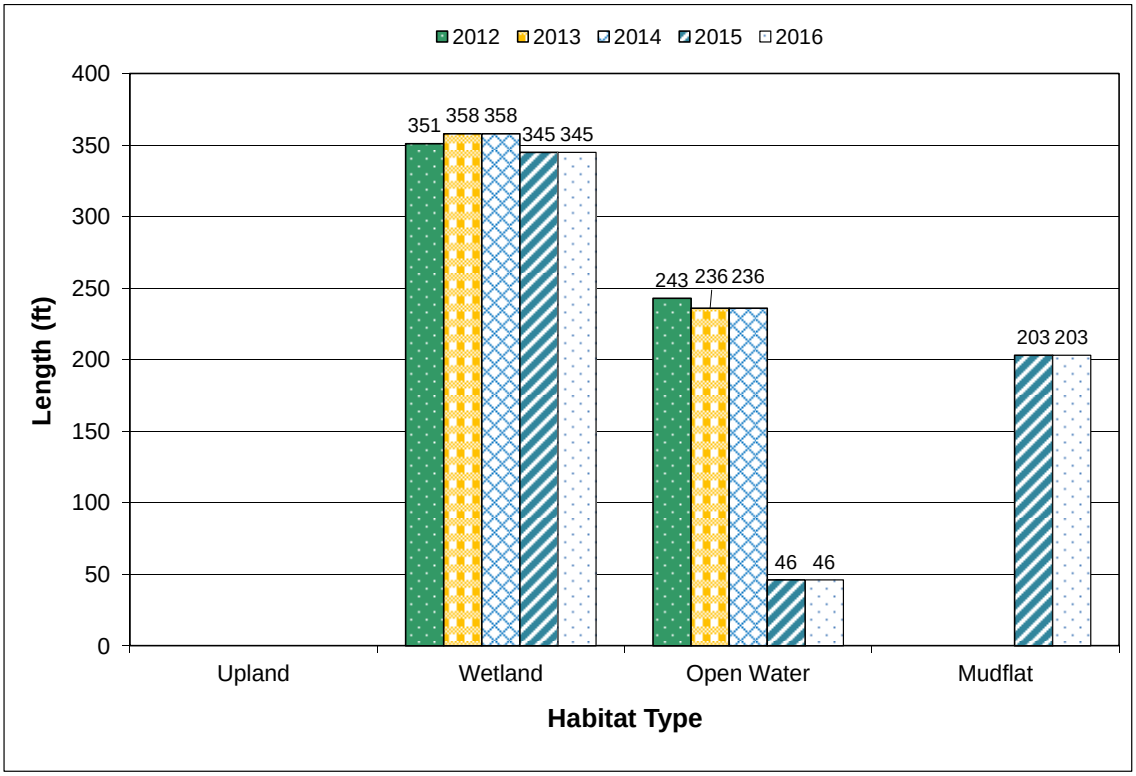


Chart 3-4. Length of Habitat Types Within T-2 From 2012 Through 2016.

Fifteen infestations of state-listed Priority 2B noxious weeds were recorded at the site, including Canadian thistle, ox-eye daisy, hounds tongue, and spotted knapweed. In addition, one infestation of a state-listed Priority 2A noxious weed (orange hawkweed) was mapped across the Schrieber Meadows site in 2016 (Figure A-3, Appendix A). Infestations of noxious weeds included 11 Canada thistle, 2 of ox-eye daisy, 1 of hound's tongue, 1 of spotted knapweed, and 1 of orange hawkweed. These infestations were identified in areas less than 1.0 acre in size with cover classes that ranged from trace (< 1 percent) to moderate (6–25 percent). A weed contractor with MDT treated these areas during July 2016. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds identified at each location and treatment to contain and control identified populations.

Table 3-4. Data Summary for T-3 From 2012 Through 2016 at the Schrieber Meadows Site

Monitoring Year	2012	2013	2014	2015	2016
Transect Length (feet)	**440**	**440**	**440**	**440**	**440**
Vegetation Community Transitions Along Transect	4	4	4	4	4
Vegetation Communities Along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2
Total Vegetative Species	9	5	8	11	11
Total Hydrophytic Species	7	3	6	7	7
Total Upland Species	2	2	2	4	0
Estimated % Total Vegetative Cover	50	75	100	70	70
Estimated % Unvegetated	50	25	0	30	30
% Transect Length Comprising Hydrophytic Vegetation Communities	53	53	53	46	46
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	47	47	47	54	54
% Transect Length Comprising Mudflat	0	0	0	0	0

A total of 1,000 speckled alders (*Alnus incana*) were planted along the newly constructed stream channel and pond in the northern third of the site. Less than 50 live plants were observed throughout the mitigation site in 2016, which indicates 5 percent survival. Less than ten willows (*Salix* spp.) were observed near the spring north of the access road. Several of the alder trees were resprouting from the roots, while the aboveground portions of the plants were dead. The remaining alders and willows appeared to be doing well in 2016 and are expected to persist. The prevalence of reed canary grass and a high water table will likely inhibit shrub development within this site.

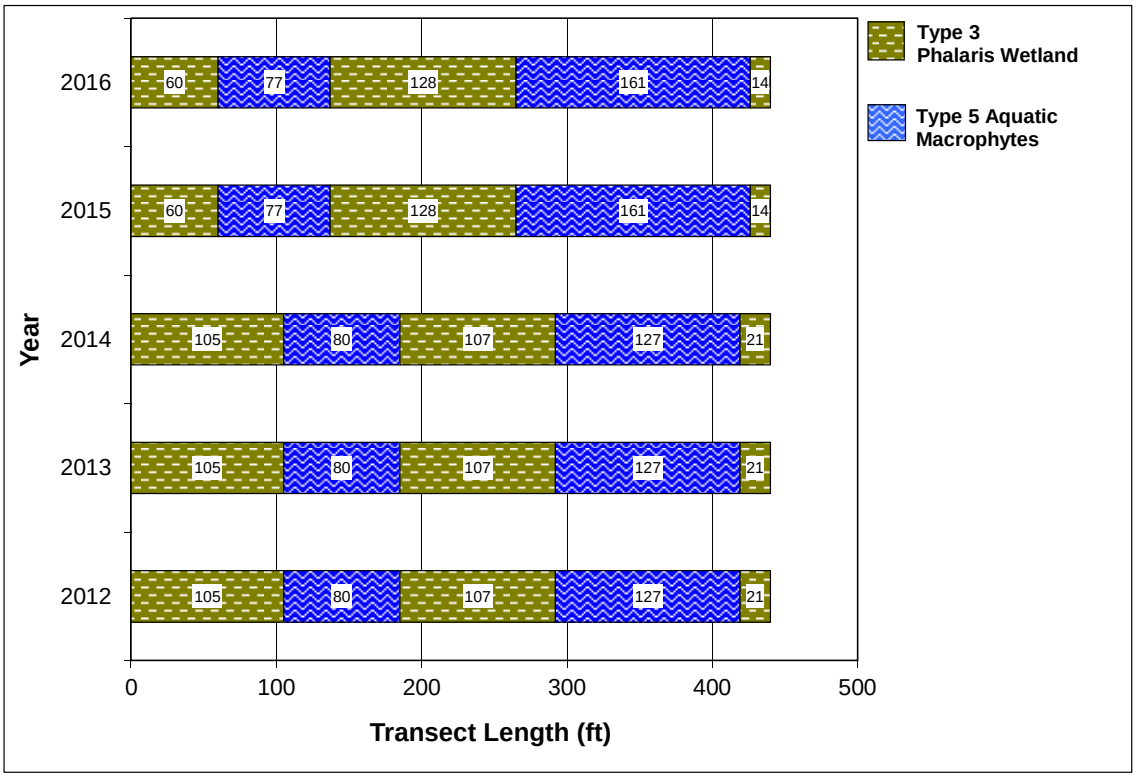


Chart 3-5. Transect Map Showing Community Types on T-3 From 2012 Through 2016 From Start (0 Foot) to Finish (440 Feet).

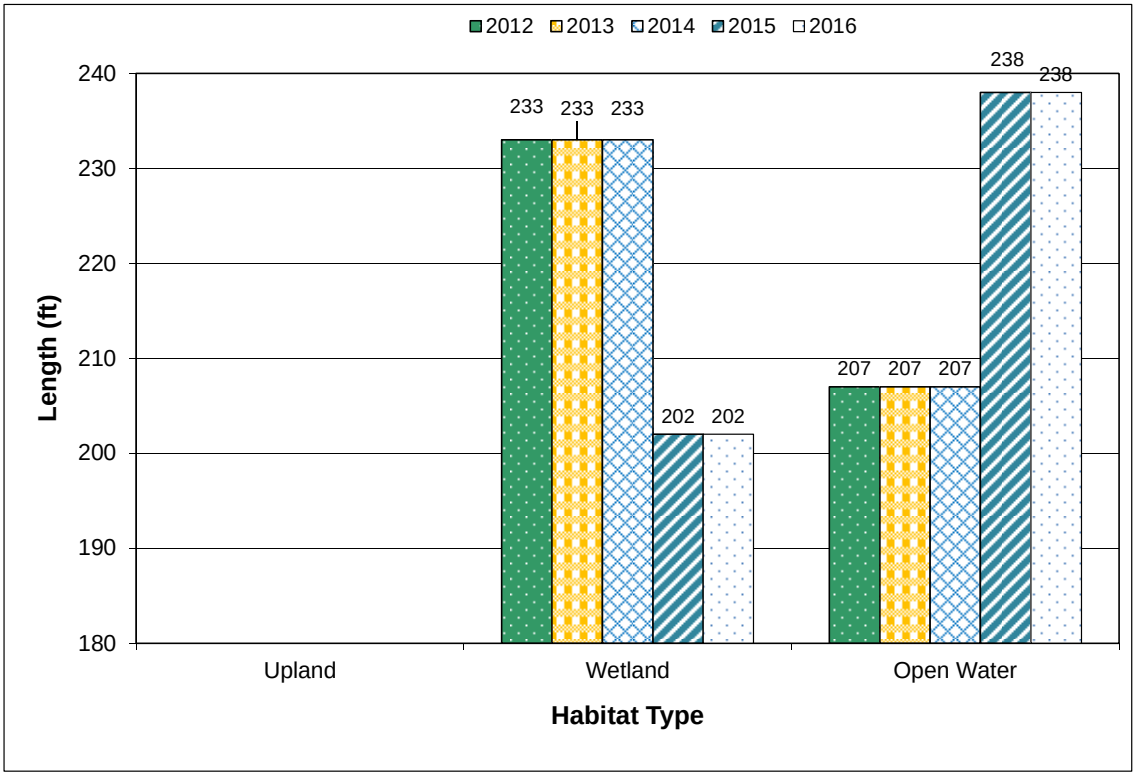


Chart 3-6. Length of Habitat Types Within T-3 From 2012 Through 2016.

3.4 SOIL

The primary map unit on the site (approximately 70 percent) was identified as a poorly drained Aquic Udifluvent. The soil is found in intermontane basins and is classified as hydric. The NRCS soil unit Andic Dystric Eutrochrepts was mapped in the lower portions of the site and included silty glaciolacustrine deposits common on lacustrine terraces and glacial outwash terraces [USDA, 2016].

Soil test pits were excavated at two locations to evaluate the extent of hydric soil development. DP-1W was located in wetland community Type 3 in the center of the site and data point DP-1U was located upslope of DP-1W in upland community Type 9. At DP-1W, the upper layers of soil profile revealed a 14-inch layer of black (10YR 2/1) loam above a layer of light brownish-gray (10YR 6/2) silty clay. DP-1W revealed 16 inches of black (10YR 2/1) loam and silty clay loam. Below the upper surface of loam soil is dark gray (10YR 4/1) layer of silty clay with 15 percent dark yellowish-brown (10YR 4/6) redoximorphic concentrations in the matrix. The soil met the criteria for *Thick Dark Surface (A12)* and classification as a hydric soil.

3.5 WETLAND DELINEATION

The wetland delineation conducted in 2004 and 2005 before project initiation identified four different wetland areas that totaled approximately 15.56 acres within the mitigation project area. The pilot project that was constructed in 2007 resulted in an additional 2.38 acres of wetland habitat being developed within the project boundary. After the second construction phase was complete, the delineation that was conducted in 2012 mapped a total of 47.58 acres of wetlands across the 56.95-acre site. The total wetland acreage that was delineated from 2013 through 2016 has remained constant at 47.61 acres. The extensive development of wetlands at this site was the product of excavating the wetland cells, plugging the former channel, and raising the bed elevation of the restored creek channel. Widespread inundation was present throughout the southern two-thirds of the site as a result of the earthen ditch plugs and the impedance of surface drainage out of the site. Increased water-table elevations and saturated soil that resulted from the seasonally intermittent upper Coyote Creek reach were downgradient of the large spring that originates within the project area near the access drive that separates the upper and lower sections of the site. The site was inundated extensively below the access drive. Open-water riverine habitat associated with the restored stream channel was defined on approximately 0.34 acre of the site. Note that the restored stream channels are not creditable under wetland credits because they are being credited as stream mitigation credits. A total of 47.95 acres of jurisdictional wetland were delineated at the Schrieber Meadows site in 2016, as shown in Table 3-5.

Table 3-5. Total Wetland Acres Delineated in 2010 and From 2012 Through 2016 at the Schrieber Meadows Site

Wetland Habitat Type	2010 (acres)	2012 (acres)	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)
Preexisting wetland area inside geotechnical limits adjacent to US Highway 2 (MDT & USFS)	1.12	15.56	15.56	15.56	15.56	15.56
Created wetland depressions and additional wetland development	3.72	32.02	32.05	32.05	32.05	32.05
Open-water riverine habitat	0.00	0.34	0.34	0.34	0.34	0.34
Total Wetland Habitat	**4.84**	**47.92**	**47.95**	**47.95**	**47.95**	**47.95**

3.6 WILDLIFE

A list of animal species that were directly or indirectly observed in 2010 and 2012 through 2016 is presented in Table 3-6. Eight bird species were identified on-site in 2016. Birds that were observed using open-water areas included blue-winged teal (*Anas discors*), gadwell (*Anas strepera*), and great blue heron (Ardea Herodias). Reptiles that were observed included six Columbia spotted frogs (*Rana luteiventris*), and observed fish included one pumpkinseed. Deer (*Odocoileus* sp.) and elk (*Cervus canadensis*) tracks were also noted in 2016.

3.7 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM was used to evaluate the site in 2010 and 2012 through 2016. The functional assessment that was completed in 2010 incorporated the three constructed wetland cells and enhanced wetlands into one AA. These wetlands received a Category II rating with 68 percent of the total possible points in 2010. In 2012, the acreage of the project area increased to include the additional constructed wetland cells, restored wetlands, and enhanced wetlands. These additions resulted in the assessment of three separate AAs from 2012 to 2016; these assessments are summarized in Table 3-7. The score for listed/proposed threatened and endangered (T&E) species habitat function was increased to high because of the presence of grizzly bears in the area as reported by Montana Fish, Wildlife, and Parks Department (MFWP) and US Fish and Wildlife Service (USFWS) biologists in 2015 and 2016.

The 2012 through 2016 restoration AA included 3.46 acres of preexisting wetlands within the footprint of the excavated cells. The AA includes both aquatic bed and emergent wetland habitats. During 2015, the assessment score increased by 8 percent to 82 percent, and the functional units totaled 28.37. The scores remained similar in 2016. The AA is rated as a Category I wetland and scored excellent for general wildlife habitat and production export/food chain support, and high for listed/proposed T&E species habitat, Montana Natural Heritage Program (MTNHP) species habitat, short- and long-term surface-water storage, sediment/shoreline stabilization, groundwater/discharge/recharge, and recreation/education potential. Production export/food chain Support shifted from a moderate to excellent rating in 2015 because of the observation of an unrestricted water surface outlet to Coyote Creek. General wildlife habitat shifted from a high to an excellent rating for this AA in 2015 because of the change in disturbance rating from moderate to low.

3.8 PHOTOGRAPHIC DOCUMENATION

Ten photo points were initially established within the three constructed cells monitored in 2010. A total of 20 photo points were established in 2012 in response to the increased project area size, including the reestablishment of Photo Point 7 from its original 2010 location. In addition to established photo points, photographs were taken at each surveyed stream cross-section, sampled data points, and vegetation transect endpoints. The locations of these photographs are illustrated on Figure A-2 (Appendix A) and the photographs in Appendix C.

Table 3-6. Wildlife Species Observed at the Schrieber Meadows Site in 2010 and From 2012 Through 2016 (Page 1 of 2)

Common Name	Scientific Name
Amphibian	
Columbia Spotted Frog	***Rana luteiventris***
Frog sp.	
Pacific Treefrog	*Pseudacris regilla*
Western Toad	*Bufo boreas*
Bird	
American Robin	*Turdus migratorius*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Belted Kingfisher	*Megaceryle alcyon*
Black-capped Chickadee	***Poecile atricapillus***
Blue-winged Teal	***Anas discors***
Brewer's Blackbird	*Euphagus cyanocephalus*
Canada Goose	*Branta canadensis*
Cedar Waxwing	*Bombycilla cedrorum*
Cinnamon Teal	*Anas cyanoptera*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Raven	*Corvus corax*
Common Yellowthroat	*Geothlypis trichas*
Eared Grebe	*Podiceps nigricollis*
Eastern Kingbird	*Tyrannus tyrannus*
Gadwall	***Anas strepera***
Great Blue Heron	***Ardea herodias***
Greater Yellowlegs	*Tringa melanoleuca*
Green-winged Teal	*Anas crecca*
Killdeer	***Charadrius vociferus***
Lesser Yellowlegs	*Tringa flavipes*
Mallard	*Anas platyrhynchos*
Osprey	*Pandion haliaetus*
Redhead	*Aythya americana*
Red-winged Blackbird	***Agelaius phoeniceus***
Rufous Hummingbird	*Selasphorus rufus*
Sandpiper sp.	
Spotted Sandpiper	*Actitis macularius*
Sparrow sp.	
Tree Swallow	***Tachycineta bicolor***
Turkey Vulture	*Cathartes aura*
Vaux's Swift	*Chaetura vauxi*
Vesper Sparrow	*Pooecetes gramineus*
Virginia Rail	*Rallus limicola*
Wilson's Snipe	***Gallinago delicata***

Table 3-6. Wildlife Species Observed at the Schrieber Meadows Site in 2010 and From 2012 Through 2016 (Page 2 of 2)

Common Name	Scientific Name
Fish	
Pumpkinseed	***Lepomis gibbosus***
Reptile	
Common Garter Snake	*Thamnophis sirtalis*
Rubber Boa	*Charina bottae*
Painted Turtle	*Chrysemys picta*
Mammal	
Coyote	*Canis latrans*
Deer sp.	***Odocoileus sp.***
Elk or Wapiti	***Cervus canadensis***
Gray Wolf	*Canis lupus*
Ground Squirrel	
Meadow Vole	*Microtus pennsylvanicus*
Moose	*Alces americanus*
Muskrat	*Ondatra zibethicus*
White-tailed Deer	*Odocoileus virginianus*

Species that were identified in 2016 are **bolded**.

3.9 MAINTENANCE NEEDS

No man-made water-control structures were installed on the property. Two nest boxes were in place on the fence posts at the site entrance gate. The boxes were in good condition with signs of continued use. Fifteen infestations of state-listed Priority 2A and 2B noxious weeds were treated. Weed-control activities were conducted on July 5, 2016. Weed spraying has been conducted annually within the site to eliminate the predominant Canadian thistle infestations. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds identified at each location and treatment to contain and control identified populations.

3.10 CURRENT CREDIT SUMMARY

3.10.1 Wetland Mitigation Credit

The pilot project was constructed in 2007 and generated approximately 3.72 mitigation credit acres, including 2.38 credit acres of wetland creation, 0.75 credit acre for restoring (rehabilitating) of existing wetlands (1.12 acres restored), and 0.59 credit acre of upland (2.96 acres maintained) buffer around the wetlands. The pilot project was engulfed by the larger project constructed by MDT in 2011. Table 3-8 provides the credits generated at the Schrieber Meadows site for the approximate 57-acre full-scale project and does not differentiate between the pilot project and full build-out of the Schrieber Meadows project.

Table 3-7. Functions and Values at the Schrieber Meadows Site From 2010 and From 2012 Through 2016 (Page 1 of 3)

Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method[(a)]	2010 Creation/ Enhancement AA	Enhancement AA				
		2012	2013	2014	2015	2016
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	High (0.8)	High (0.8)
Montana Natural Montana Natural Heritage Program (MTNHP) Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.7)	High (0.9)	Exc (1.0)	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
Flood Attenuation	N/A	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)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	N/A	N/A	High (1.0)	High (1.0)	High (1.0)
Production Export/ Food Chain Support	Mod (0.5)	High (0.8)	High (0.8)	High (0.8)	Exc. (1.0)	Exc. (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Mod (0.4)	Mod (0.4)	Low (0.3)	Low (0.3)	Low (0.3)
Recreation/Education Potential	Low (0.5)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	**5.45/8**	**7.1/9**	**7.2/9**	**8.0/10**	**8.7/10**	**8.7/10**
% of Possible Score Achieved	**68%**	**79%**	**80%**	**80%**	**87%**	**87%**
Overall Category	**II**	**II**	**II**	**I**	**I**	**I**
Acreage of Assessed Aquatic Habitats Within Easement (acres)	**4.84**	**13.22**	**13.22**	**13.22**	**13.22**	**13.22**
Functional Units (acreage × actual points)	**26.38**	**93.86**	**95.18**	**105.76**	**115.01**	**115.01**

Table 3-7. Functions and Values at the Schrieber Meadows Site From 2010 and From 2012 Through 2016 (Page 2 of 3)

Function and ValueParameters From the 2008 MDT Montana Wetland Assessment Method[a]	2010 Creation/ Enhancement AA	Creation AA				
		2012	2013	2014	2015	2016
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	High (0.8)	High (0.8)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.7)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	N/A	Mod (0.6)	High (0.8)	High (0.8)	Mod (0.6)	Mod (0.6)
Flood Attenuation	N/A	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)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)
Production Export/ Food Chain Support	Mod (0.5)	High (0.8)	High (0.8)	High (0.8)	Excel (1.0)	Excel (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Recreation/Education Potential	Low (0.5)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	**5.4 /8**	**8.3/11**	**8.5/11**	**8.8/11**	**9.3/11**	**9.3/11**
% of Possible Score Achieved	**68%**	**75%**	**77%**	**80%**	**85%**	**85%**
Overall Category	**II**	**II**	**II**	**II**	**I**	**I**
Acreage of Assessed Aquatic Habitats Within Easement (acres)	**4.84**	**22.40**	**22.43**	**22.43**	**22.43**	**22.43**
Functional Units (acreage × actual points)	**26.38**	**185.92**	**190.66**	**197.38**	**208.60**	**208.60**

Table 3-7. Functions and Values at the Schrieber Meadows Site From 2010 and From 2012 Through 2016 (Page 3 of 3)

Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method[(a)]	2010 Creation/ Enhancement AA	Restoration AA				
		2012	2013	2014	2015	2016
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	High (0.8)	High (0.8)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.7)	High (0.9)	High (0.9)	High (0.9)	Exc. (1.0)	Exc. (1.0)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	N/A	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.5)	Mod (0.5)
Short- and Long-Term Surface-Water Storage	Mod (0.6)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.6)	Mod (0.6)
Sediment/Shoreline Stabilization	Mod (0.6)	Low (0.3)	Low (0.3)	High (1.0)	High (1.0)	High (1.0)
Production Export/ Food Chain Support	Mod (0.5)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Exc. (1.0)	Exc. (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	Low (0.5)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	**5.4 /8**	**6.7/10**	**6.7/10**	**7.4/10**	**8.2/10**	**8.2/10**
% of Possible Score Achieved	**68%**	**67%**	**67%**	**74%**	**82%**	**82%**
Overall Category	**II**	**II**	**II**	**II**	**I**	**I**
Acreage of Assessed Aquatic Habitats Within Easement (acres)	**4.84**	**3.46**	**3.46**	**3.46**	**3.46**	**3.46**
Functional Units (acreage × actual points)	**26.38**	**23.18**	**23.18**	**25.60**	**28.37**	**28.37**

(a) Berglund and McEldowney, 2008.

Table 3-8. Summary of Wetland Mitigation Credits at the Schrieber Meadows Site in 2010 and From 2012 Through 2016

Mitigation Type	Total Proposed Acreage	Ratio	Proposed Credit Acres	2012 Delineated Acreage	2012 Credit Acres	2013 Delineated Acreage	2013 Credit Acres	2014 Delineated Acreage	2014 Credit Acres	2015 Delineated Acreage	2015 Credit Acres	2016 Delineated Acreage	2016 Credit Acres
Creation – USFS/MDT Property	8.91	1:1	8.91	22.40	22.40	22.43	22.43	22.43	22.43	22.43	22.43	22.43	22.43
Restoration on USFS/MDT Property	3.46	1.5:1	2.31	3.46	2.31	3.46	2.31	3.46	2.31	3.46	2.31	3.46	2.31
Enhancement of Wetlands Inside Geotechnical Limits Adjacent to US Highway 2 (MDT/USFS)	13.22	3:1	4.41	13.22	4.41	13.22	4.41	13.22	4.41	13.22	4.41	13.22	4.41
Riparian Buffer[(a)]		–		8.30	(b)	8.30	(b)	8.30	(b)	8.30	(b)	8.30	(b)
Upland Buffer	8.50	5:1	1.70	8.50	1.70	12.39[(c)]	2.48	12.39[(c)]	2.48	12.39[(c)]	2.48	12.39[(c)]	2.48
Project Impacts	–0.08	None	-0.08	–0.08	–0.08	–0.08	–0.08	–0.08	–0.08	–0.08	–0.08	–0.08	–0.08
Total Mitigation Acreage	34.01		17.24	55.80	30.73	59.72	31.54	59.72	31.54	59.72	31.54	59.72	31.54

(a) Riparian buffer areas were used to calculate stream and riparian credits.

(b) Wetland acreages within riparian buffer were subtracted from wetland credit total; riparian buffer does not include upland buffer acreage.

(c) Acreage includes 50-foot buffer around wetlands within MDT and USFS property and outside of the riparian buffer.

Approximately 17.24 wetland credit acres were anticipated to be generated from the full build-out of the Schrieber Meadows project, including the approved credits from the 2007 pilot project. The proposed wetland credits that are shown on Table 3-8 are described below. Approximately 8.91 acres of wetlands were predicted to be created by excavating Cells 1 through 11 (Appendix E). The acreages that were delineated form 2013 through 2016 indicated that 22.43 acres of wetland habitat have been created within this site. Note that water levels have substantially increase because of the newly constructed channel of Coyote Creek and abundant surface and ground water that flows through the valley. The high groundwater elevations found on the site are caused by a combination of restoration efforts to plug existing drain ditches and channels as well as the subsidence of the histosol soil elevations over time. All of the wetlands within the 25-foot riparian buffer (8.30 acres) that were used to calculate stream mitigation credits were subtracted from total wetland habitat to avoid doubly calculating the total mitigation credits at this site.

A total of 2.31 acres of wetland credit was to be generated from restoring 3.46 acres of wetlands within a small portion of the USFS property and a portion of MDT property in wetland Cells 4, 5, 8, 9, 10, and 11 (Appendix E). A total of 4.41 acres of wetland credit have been generated by hydrologically enhancing 13.22 acres of existing wetlands between the stream mitigation portion of the project area and the US Highway 2 corridor.

Approximately 2.48 acres of mitigation credit have been generated by preserving 50-foot upland buffers around the perimeter of the wetland boundary. Upland buffer credit was given to areas on MDT and USFS property and outside of the 25-foot riparian buffer. Developing this mitigation site resulted in impacts to 0.08 acre of wetland because of ditch plug installation. The 0.08 acre was debited from the estimated credit acreages. Overall, the 17.24 proposed credit acres have been surpassed by developing 31.54 acres, which created a surplus of 14.30 credit acres.

The 2016 estimated credit acres for this site have exceeded the proposed credit acres as a result of the rise in the water table over time after the abandonment of the former Coyote Creek channel and of the subsequent increase in site-wide wetland hydrology. A total of 31.54 credit acres have developed at this site after mitigation construction.

The current site conditions that were documented in 2016 are compared to the approved performance standards and success criteria in Table 3-9. The wetlands delineated in 2016 met the performance standards approved for this site, which included meeting the three parameter criteria for hydrology, vegetation, and soils. Hydrophytic vegetation success has been achieved based on the absolute cover of facultative or wetter species being greater than or equal to 70 percent. Open-water areas were given full credit based on the stated goal of the project to provide open water within the excavated depressions during the spring and early summer. Weed cover site-wide and within the upland buffers did not exceed 5 percent and met the success criteria. Isolated weed infestations were mapped throughout the mitigation site and are controlled by MDT as mandated by the performance standards. The upland buffer success criteria have been achieved because these areas have at least 50 percent aerial cover of nonweed species and noxious weeds do not exceed 5 percent cover.

Table 3-9. Summary of Performance Standards and Success Criteria at Schrieber Meadows in 2016 (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 growing season.
Hydric Soil	Hydric soil conditions are present or appear to be forming.	Y	Hydric soil characteristics 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 is well established across disturbed soils.
Hydrophytic Vegetation	Combined absolute cover of facultative or wetter species is 70 percent or greater.	Y	Areas that were identified as wetland habitat within the mitigation site support a prevalence of hydrophytic vegetation (OBL, FACW, and FAC).
	State-listed noxious weeds do not exceed 5 percent absolute cover.	Y	State-listed noxious weeds are estimated well below 5 percent absolute cover within wetland areas.
Riparian Buffer Success	Woody and riparian vegetation is established.	N	No woody-dominated communities have formed along the established riparian buffer; riparian vegetation (primarily reed canary grass) has established.
	Noxious weeds do not exceed 10 percent cover within the riparian buffer areas.	Y	State-listed noxious weeds are estimated at 1–3 percent absolute cover within riparian buffer.
	Creditable buffer areas must have at least 50 percent aerial cover of non-noxious weed species by the end of the monitoring period.	Y	Non-noxious vegetation consist of nearly 100 percent of total vegetation cover within riparian buffer.
	Combined aerial cover of riparian and stream bank vegetation communities is 70 percent or greater.	Y	Riparian and stream bank vegetation communities support nearly 100 percent cover.
	Planted trees and shrubs will be considered successful where they exhibit 50 percent survival after 5 years.	N	After plantings, the majority of the site supported standing water and likely drowned out 90 percent of the plantings by the end of the second growing season. Approximately 3 percent survival was noted in 2016. MDT is currently working with the USFS Kootenai National Forest to coordinate a replanting plan in appropriate riparian buffer areas within the site that are not inundated by high water levels.

Table 3-9. Summary of Performance Standards and Success Criteria at Schrieber Meadows in 2016 (Page 2 of 2)

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Channel Restoration Success	Revegetation along the new Coyote and Schrieber Creek channel corridors will be considered successful when banks are vegetated with a majority of deep-rooting riparian and wetland herbaceous and woody plant species.	Y	The majority of stream bank vegetation along the constructed Coyote and Schrieber Creek channel corridors is dominated by reed canary grass, which has a stability rating of 9.
	The intent of the stream restoration is to allow the stream to naturally migrate within the floodplain and to give it enough room to move and stabilize itself within the site.	Y	The stream has plenty of space within the floodplain for natural migration. The stream currently appears to be stable with no lateral adjustment observed following construction.
Stream Bank Vegetation	Banks are vegetated with a majority of deep-rooting riparian plant species that have root-stability indices of 6 or greater.	Y	Reed canary grass and foxtail (*Alopecurus* sp.) dominate the stream banks. Reed canary grass has a root-stability index of 9. Alopecurus species found at the site have root stability index values of 3 for short-awned foxtail and 4 for Garrison creeping foxtail.
Open Water	The project will provide open water during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, vegetation is anticipated to germinate within the majority of the depressions. Open water with submerged and/or floating vegetation will, therefore, be considered successful and creditable.	Y	Excavated depressions within the upper reach of the site site experience seasonal drawdown, and rooted hydrophytic vegetation development has been observed. The lower depressions appear to support perennial inundation with established aquatic macrophyte community.
Upland Buffer	Noxious weeds do not exceed 5 percent cover within upland buffer area.	Y	Noxious weed cover is less than 5 percent within the upland buffer.
	Any area 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	Weed control will be based on annual site monitoring to determine weed species and degree of infestation within the site. 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.	Y	State-listed noxious weed species across the site have been monitored and mapped during each postconstruction monitoring event. MDT administers an ongoing weed-control program.

3.10.2 Stream Mitigation Credit

As discussed in this report's introduction, the goal of the stream mitigation component of the Schrieber Meadows project was to restore approximately 7,756 linear feet of new stream channel in both Coyote and Schrieber Creeks to result in an overall increase of 3,327 linear feet of stream length with the

development of approximately 35,551 stream mitigation credits. The stream mitigation project has been separated into the following five distinct segments:

1. **Upper Coyote Creek** is the segment from the edge of the forested areas on and through the USFS parcel onto the MDT-owned parcel and is considered a seasonally intermittent stream. This segment of stream does not become perennial again until it reaches the spring area on the MDT property.
2. **Coyote Creek Spring Area** is located between the USFS restored segment of stream and the access road into the MDT site. A large spring emanates from this location; MDT did not manipulate this area except to plant the adjacent riparian zones with woody shrubs and trees.
3. **Middle Coyote Creek** begins at the culverts under the access road and extends to its connection with Schrieber Creek. The stream is perennial because of groundwater flows that emanate from the spring area.
4. **Perennial Spring Channel Ditch** was originally a drainage ditch constructed to relocate flows from a natural spring that emanates from the hillside in the south central portion of the site. At the suggestion of the MFWP fisheries biologist for this region, the ditch was reconstructed into a natural channel and connected to Coyote Creek to contribute perennial flow to Coyote Creek.
5. **Merged Coyote/Schrieber Creeks** is the segment of stream at the southeast portion of the MDT property where Schrieber Creek merges with Coyote Creek to form Schrieber Creek and then continues beyond the property boundary. The stream flow is perennial through this segment.

Completely restoring sinuosity and stream length to both Coyote Creek and Schrieber Creek was intended to create a new channel length of approximately 7,756 linear feet, which is an overall increase of 3,327 linear feet from the previously channelized length of 4,429 linear feet. As part of the Montana Stream Mitigation Procedure [USACE, 2010b], calculating stream mitigation credits includes summing both riparian, which are provided in Table 3-10, and stream credits, which are provided in Table 3-11.

With the exception of the Coyote Creek spring area, which was undisturbed during construction activities, a net improvement factor of 0.25 for each side of the stream for the entire site was used for the riparian credit calculation. This value was based on the minimum creditable riparian width of 25 feet on either side of the new stream channel (50 feet total) to minimize conflict with proposed wetland credit areas. A protection factor of 0.20 was used based on the federal and state agency ownership of the site and executed conservation easement. A mitigation timing factor of 0.10 was used based on the development of the stream credits before any impact debits. Both Coyote and Schrieber Creeks are considered 1st Order streams by the approved mitigation plan. These streams become 2nd Order when they merge at the lower end of the project area. To determine the comparative stream order factor for each segment, a same order factor of 0.20 was used. Because the developed mitigation credits will likely be used to offset impacts within the watershed more than 0.5 mile away, the off-site factor of 0.10 was used.

Table 3-10. Determination of Riparian Mitigation Credits for Schrieber Meadows

Factors	Upper Coyote Creek (USFS)	Coyote Creek Spring Area	Middle Coyote Creek (MDT)	Perennial Spring Channel	Merged Coyote/ Schrieber Creeks
Net Improvement – Stream Side A	0.25	0.40	0.25	0.25	0.25
Net Improvement – Stream Side B	0.25	0.40	0.25	0.25	0.25
Type of Protection	0.20	0.20	0.20	0.20	0.20
Mitigation Timing	0.10	0.10	0.10	0.10	0.10
Comparative Stream Order	0.20	0.20	0.20	0.20	0.20
Location	0.10	0.10	0.10	0.10	0.10
Sum of Factors (M)	1.10	1.40	1.10	1.10	1.10
Linear Feet (L)	1,725	190	3,179	400	2,425
Reach Multiplier (RM)	1.25	1.25	1.25	1.25	1.25
Total Riparian Credits (M × L × RM)	**2,409**	**332**	**4,371**	**550**	**3,334**
Total Riparian Credits = 10,996					

Table 3-11. Determination of Stream Mitigation Credits for Schrieber Meadows

Factors	Upper Coyote Creek (USFS)	Coyote Creek Spring Area	Middle Coyote Creek (MDT)	Perennial Spring Channel	Merged Coyote/ Schrieber Creeks
Net Improvement	2.50	0.00	2.50	2.50	2.50
Stream Status	0.05	0.05	0.05	0.05	0.05
Type of Protection	0.20	0.20	0.20	0.20	0.20
Mitigation Timing	0.10	0.10	0.10	0.10	0.10
Comparative Stream Order	0.20	0.20	0.20	0.20	0.20
Location	0.10	0.10	0.10	0.10	0.10
Sum of Factors (M)	3.15	0.65	3.15	3.15	3.15
Linear Feet (L)	1,752	190	3,179	400	2,425
Total Stream Credits (M × L)	**5,519**	**123**	**10,014**	**1,260**	**7,639**
Total Stream Credits = 24,555					
Total Mitigation Credits (Riparian + Stream) = 10,996 + 24,555 = 35,551					

To determine the stream credits for the Coyote and Schrieber Creek corridors, many of the same factors that were used in the riparian credit calculations were repeated. The only exception was the net improvement factor for stream credits, where a factor of 2.5 for substantial improvement was assigned. No net improvement factor for the Coyote Creek spring area was included because this area was not constructively changed.

The stream credits that are reported here are based on the designed stream lengths, as presented in the project plan sheets (Appendix E). With the exception of woody plant survival criteria, the site has achieved the riparian buffer success and channel-restoration success criteria to date. Both the stream channel and creditable buffer areas have greater than 70 percent aerial cover by deep-rooting vegetation and less than 10 percent cover by state-listed noxious weeds. The construction technique employed for creating the new channels did not disturb the stream banks, which are predominantly covered by reed canary grass (plant stability rating of 9). The riparian success criteria that pertain to woody plant survival of greater than 50 percent after 5 years has not been achieved. An approximate 5 percent survival rate for the planted woody species was estimated based on ocular review of the site in 2016. The 35,551 stream credits that were calculated for this site after construction achieves the goals for the stream mitigation component of the Schrieber Meadows project.

Table 3-9 provides a summary of performance standards and success criteria for the constructed streams and riparian buffers. The restored channel has met the defined success criteria by supporting deep-rooted vegetation along the stream banks and a floodplain capable of supporting lateral migration within the site. The riparian buffer has achieved the success criteria associated with developing greater than 70 percent vegetation cover while supporting less than 10 percent cover by noxious weeds. However, the success criteria that indicate 50 percent survival of planted trees and shrubs after 5 years has not been achieved. Higher-than-expected water levels across the site and perennial inundation appear to inhibit the survival and development of woody species within the site. No woody communities were identified within the site in 2016. Viewing the small shrubs throughout much of the site was made difficult by the robust reed canary grass.

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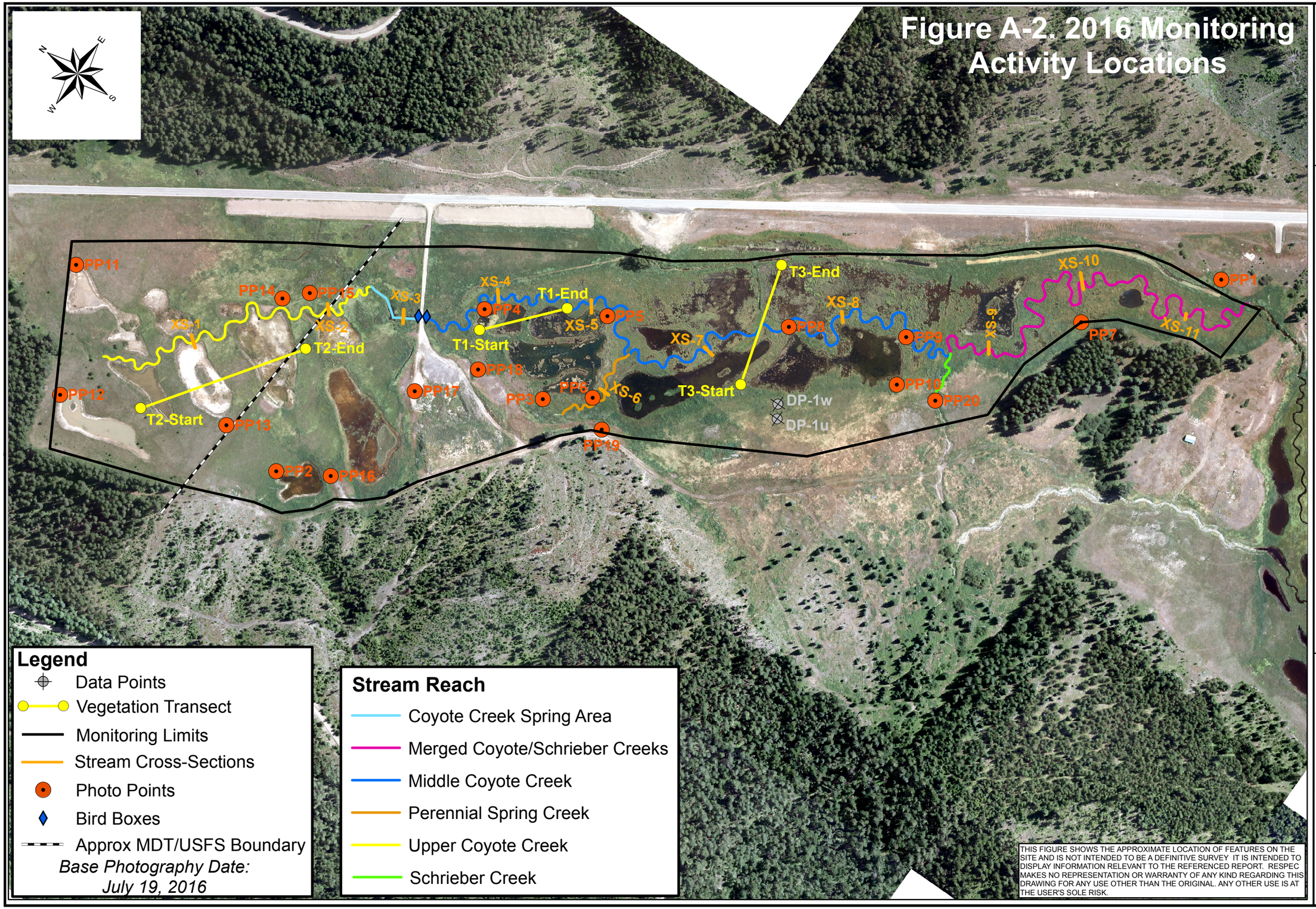
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APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

Figure A-2. 2016 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.

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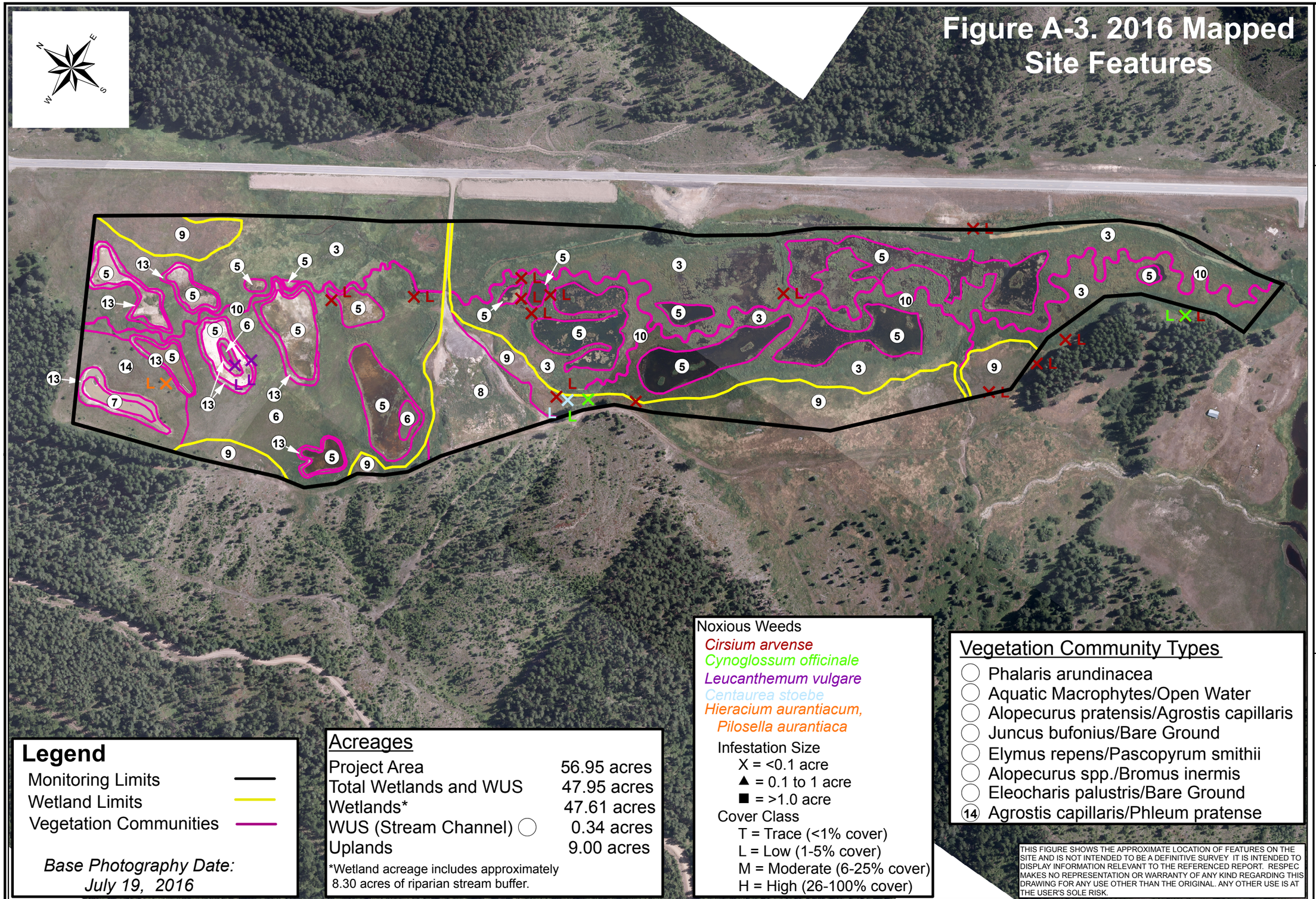
Schrieber Meadows Mitigation Site
2016 Monitoring Activity Locations

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

Project:	NH 27(021)
Location:	Lincoln Co., Montana
Date:	December 2016
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016\Schrieber Meadows\GPS Data\Mains\Monitor2016.mxd

Figure A-3. 2016 Mapped Site Features



Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 19, 2016

Acreages

Project Area	56.95 acres
Total Wetlands and WUS	47.95 acres
Wetlands*	47.61 acres
WUS (Stream Channel) ◯	0.34 acres
Uplands	9.00 acres

*Wetland acreage includes approximately 8.30 acres of riparian stream buffer.

Noxious Weeds

Cirsium arvense
Cynoglossum officinale
Leucanthemum vulgare
Centaurea stoebe
Hieracium aurantiacum, Pilosella aurantiaca

Infestation Size
- X = <0.1 acre
- ▲ = 0.1 to 1 acre
- ■ = >1.0 acre

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

Vegetation Community Types

- ◯ Phalaris arundinacea
- ◯ Aquatic Macrophytes/Open Water
- ◯ Alopecurus pratensis/Agrostis capillaris
- ◯ Juncus bufonius/Bare Ground
- ◯ Elymus repens/Pascopyrum smithii
- ◯ Alopecurus spp./Bromus inermis
- ◯ Eleocharis palustris/Bare Ground
- (14) Agrostis capillaris/Phleum pratense

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

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Helena, MT 59601

Schrieber Meadows Mitigation Site
2016 Mapped Site Features

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

Project: NH 27(021)
Location: Lincoln Co., Montana
Date: December 2016
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016\Schreiber Meadows\GPS Data\Wains\Veg2016.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Schrieber Meadows** Project Number: **NH 27(021)**
Assessment Date: **July 26, 2016** Person(s) conducting the assessment: **G. Howard, T. Traxler**
Location: **Highway 2, Swamp Creek East** MDT District: **Missoula**
Milepost: **53.5**
Legal Description: T **27N** R **30W** Section **11, 12, 13**
Weather Conditions: **Sunny, calm, 85 degrees** Time of Day: **Afternoon**
Initial Evaluation Date: **August 29, 2010** Monitoring Year: **7** # Visits in Year: **1**
Size of evaluation area: **56.9 acres** Land use surrounding wetland: **US Highway 2, US Forest Service, forested watershed**

HYDROLOGY

Surface Water Source: **Coyote Creek spring, Schrieber Creek, Precipitation, Groundwater**
Inundation: **Present** Average Depth: **1.5 feet** Range of Depths: **0-3**
Percent of assessment area under inundation: **%**
Depth at emergent vegetation-open water boundary: **1.5 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface:
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

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:

VEGETATION COMMUNITIES

Community Number: **3** Community Title (main spp): **Phalaris arundinacea**

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	5 = > 50%		
Alnus incana	1 = 1-5%		
Carex stipata	1 = 1-5%		
Persicaria amphibia	1 = 1-5%		
Eleocharis palustris	+ = < 1%		
Glyceria grandis	+ = < 1%		

Comments / Problems: _____

Community Number: **5** Community Title (main spp): **Aquatic macrophytes / Open Water**

Dominant Species	% Cover	Dominant Species	% Cover
Algae - Green	2 = 6-10%	Eleocharis palustris	1 = 1-5%
Algae - Brown	2 = 6-10%	Phalaris arundinacea	1 = 1-5%
Aquatic macrophytes	2 = 6-10%	Typhia latifolia	+ = < 1%
Chara sp.	2 = 6-10%	Glyceria grandis	+ = < 1%
Persicaria amphibia	2 = 6-10%	Lemna minor	+ = < 1%
Carex nebrascensis	1 = 1-5%	Open water	4 = 21-50%

Comments / Problems: _____

Community Number: **6** Community Title (main spp): **Alopecurus pratensis / Agrostis capillaris**

Dominant Species	% Cover	Dominant Species	% Cover
Agrostis capillaris	4 = 21-50%	Poa pratensis	1 = 1-5%
Alopecurus pratensis	4 = 21-50%	Carex lasiocarpa	+ = < 1%
Bromus inermis	2 = 6-10%	Carex utriculata	+ = < 1%
Phalaris arundinacea	2 = 6-10%		
Carex athrostachya	1 = 1-5%		
Epilobium ciliatum	1 = 1-5%		

Comments / Problems: _____

Community Number: **7** Community Title (main spp): **Juncus bufonius / Bare Ground**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	4 = 21-50%	Agrostis stolonifera	+ = < 1%
Juncus bufonius	3 = 11-20%	Eleocharis quinqueflora	+ = < 1%
Beckmannia syzigachne	2 = 6-10%	Juncus tenuis	+ = < 1%
Eleocharis palustris	1 = 1-5%		
Mimulus guttatus	1 = 1-5%		
Suaeda calceoliformis	1 = 1-5%		

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

Community Number: **8** Community Title (main spp): **Elymus repens / Pascopyrum smithii**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	3 = 11-20%		
Medicago lupulina	3 = 11-20%		
Pascopyrum smithii	3 = 11-20%		
Alopecurus pratensis	1 = 1-5%		
Bromus inermis	1 = 1-5%		
Sisymbrium altissimum	1 = 1-5%		

Comments / Problems: **Upland Community**

Community Number: **9** Community Title (main spp): **Alopecurus spp. / Bromus inermis**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus pratensis	5 = > 50%	Poa pratensis	1 = 1-5%
Bromus inermis	3 = 11-20%	Senecio hydrophiloides	1 = 1-5%
Alopecurus arundinaceus	2 = 6-10%	Taraxacum officinale	1 = 1-5%
Achillea millefolium	1 = 1-5%		
Arnica chamissonis	1 = 1-5%		
Pascopyrum smithii	1 = 1-5%		

Comments / Problems: **Upland Community**

Community Number: **13** Community Title (main spp): **Eleocharis palustris / Bare Ground**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	4 = 21-50%	Epilobium cilatum	1 = 1-5%
Alopecurus arundinaceus	3 = 11-20%	Glyceria elata	1 = 1-5%
Beckmannia syzigachne	3 = 11-20%	Juncus bufonius	+ = < 1%
Eleocharis palustris	3 = 11-20%	Juncus tenuis	+ = < 1%
Scirpus microcarpus	2 = 6-10%	Salix bebbiana	+ = < 1%
Carex pellita	2 = 6-10%	Suaeda calceoliformis	+ = < 1%

Comments / Problems: _____

Community Number: **14** Community Title (main spp): **Agrostis capillaris / Phleum pratense**

Dominant Species	% Cover	Dominant Species	% Cover
Agrostis capillaris	4 = 21-50%	Hieracium aurantiacum	+ = < 1%
Phleum pratense	2 = 6-10%	Pinus contorta	+ = < 1%
Bromus inermis	1 = 1-5%	Pinus ponderosa	+ = < 1%
Leucanthemum vulgare	1 = 1-5%	Pseudotsuga menziesii	+ = < 1%
Cirsium arvense	+ = < 1%	Rosa woodsii	+ = < 1%
Fragaria virginiana	+ = < 1%	Symphyotrichum spathulatum	+ = < 1%

Comments / Problems: **Two noxious weeds: Priority 2A - orange hawkweed (Hieracium aurantiacum), and Priority 2B - Ox-eye Daisy (Leucanthemum vulgare).**

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
Alnus incana	1000	50	too wet and out-competed by reed canary grass
Salix spp.	750	10	too wet and out-competed by reed canary grass

Comments / Problems: **Planted shrubs are difficult to see at the sight due to tall reed canary grass. It is thought that most woody plantings have died because of very wet conditions and being out compteted by reed canary grass.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadows** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **318 feet** Compass Direction from Start: **112˚** Note: _____

Transect Interval Length: **16 feet (Station 0-16)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Total Vegetative Cover:	98%

Transect Interval Length: **79 feet (Station 16-95)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Open Water	5 = > 50%
Algae - Green	3 = 11-20%
Chara sp.	2 = 6-10%
Lemna minor	2 = 6-10%
Persicaria amphibia	1 = 1-5%
Phalaris arundinacea	1 = 1-5%
Total Vegetative Cover:	50%

Transect Interval Length: **22 feet (Station 95-117)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Total Vegetative Cover:	98%

Transect Interval Length: **81 feet (Station 117-198)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Aquatic macrophytes	5 = > 50%
Open Water	5 = > 50%
Algae - Green	1 = 1-5%
Persicaria amphibia	1 = 1-5%
Lemna minor	1 = 1-5%
Epilobium ciliatum	+ = < 1%
Total Vegetative Cover:	55%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **318 feet** Compass Direction from Start: **112˚** Note: _____

Transect Interval Length: **17 feet (Station 198-215)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Alnus incana	2 = 6-10%
Persicaria amphibia	1 = 1-5%
Total Vegetative Cover:	98%

Transect Interval Length: **95 feet (Station 215-310)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Open water	5 = > 50%
Aquatic macrophytes	3 = 11-20%
Persicaria amphibia	2 = 6-10%
Algae (green)	1 = 1-5%
Algae (brown)	1 = 1-5%
Phalaris arundinacea	+ = < 1%
Total Vegetative Cover:	45%

Transect Interval Length: **8 feet (Station 310-318)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Total Vegetative Cover:	98%

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

%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **594 feet** Compass Direction from Start: **100˚** Note: _____

Transect Interval Length: **35 feet (Station 0-35)**	
Vegetation Community Type: Alopecurus pratensis / Agrostis capillaris	
Plant Species	**Cover**
Agrostis capillaris	4 = 21-50%
Bromus inermis	2 = 6-10%
Phleum pratense	2 = 6-10%
Achillea millefolium	1 = 1-5%
Hieracium aurantiacum	1 = 1-5%
Leucanthemum vulgare	1 = 1-5%
Total Vegetative Cover:	98%

Transect Interval Length: **7 feet (Station 35-42)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Beckmannia syzigachne	4 = 21-50%
Juncus tenuis	4 = 21-50%
Phalaris arundinacea	2 = 6-10%
Gnaphalium palustre	1 = 1-5%
Juncus bufonius	1 = 1-5%
Bare Ground	1 = 1-5%
Total Vegetative Cover:	98%

Transect Interval Length: **46 feet (Station 42-88)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Open Water	5 = > 50%
Typha latifolia	1 = 1-5%
Algae (brown)	+ = < 1%
Total Vegetative Cover:	5%

Transect Interval Length: **12 feet (Station 88-100)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Carex pellita	4 = 21-50%
Bare Ground	2 = 6-10%
Beckmannia syzigachne	2 = 6-10%
Eleocharis palustris	2 = 6-10%
Glyceria elata	1 = 1-5%
Scirpus microcarpus	1 = 1-5%
Carex stipata	+ = < 1%
Juncus tenius	+ = < 1%
Total Vegetative Cover:	80%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **594 feet** Compass Direction from Start: **100˚** Note: _____

Transect Interval Length: **68 feet (Station 100-168)**	
Vegetation Community Type: Alopecurus pratensis / Agrostis capillaris	
Plant Species	**Cover**
Agrostis capillaris	4 = 21-50%
Alopecurus pratensis	4 = 21-50%
Epilobium ciliatum	1 = 1-5%
Phalaris arundinacea	1 = 1-5%
Bromus inermis	+ = < 1%
Carex lasiocarpa	+ = < 1%
Juncus tenius	+ = < 1%
Salix bebbiana	+ = < 1%
Total Vegetative Cover:	98%

Transect Interval Length: **17 feet (Station 168-185)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Bare Ground	5 = > 50%
Alopecurus pratensis	2 = 6-10%
Epilobium ciliatum	1 = 1-5%
Juncus tenius	1 = 1-5%
Juncus bufonius	1 = 1-5%
Typha latifolia	1 = 1-5%
Suaeda calceoliformis	1 = 1-5%
Phalaris arundinacea	+ = < 1%
Populus balsamifera	+ = < 1%
Total Vegetative Cover:	50%

Transect Interval Length: **27 feet (Station 185-212)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Bare Ground	5 = > 50%
Total Vegetative Cover:	0%

Transect Interval Length: **14 feet (Station 212-226)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Bare Ground	3 = 11-20%
Juncus tenius	3 = 11-20%
Trifolium pratense	2 = 6-10%
Agrostis capillaris	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%
Epilobium ciliatum	+ = < 1%
Phalaris arundinacea	+ = < 1%
Total Vegetative Cover:	45%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **594 feet** Compass Direction from Start: **100˚** Note: _____

Transect Interval Length: **19 feet (Station 226-245)**	
Vegetation Community Type: Alopecurus pratensis / Agrostis capillaris	
Plant Species	**Cover**
Bromus inermis	5 = > 50%
Alopecurus pratensis	3 = 11-20%
Achillea millefolium	+ = < 1%
Symphyotrichum spathulat	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **15 feet (Station 245-260)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Bare Ground	4 = 21-50%
Trifolium pratense	3 = 11-20%
Juncus tenuis	2 = 6-10%
Epilobium ciliatum	+ = < 1%
Leucanthemum vulgare	+ = < 1%
Total Vegetative Cover:	35%

Transect Interval Length: **25 feet (Station 260-285)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Bare Ground	5 = > 50%
Typha latifolia	1 = 1-5%
Beckmannia syzigachne	+ = < 1%
Glyceria sp.	+ = < 1%
Total Vegetative Cover:	10%

Transect Interval Length: **10 feet (Station 285-295)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Bare Ground	4 = 21-50%
Juncus tenuis	3 = 11-20%
Trifolium pratense	2 = 6-10%
Epilobium ciliatum	1 = 1-5%
Leucanthemum vulgare	1 = 1-5%
Agrostis capillaris	+ = < 1%
Beckmannia syzigachne	+ = < 1%
Total Vegetative Cover:	50%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **594 feet** Compass Direction from Start: **100˚** Note: _____

Transect Interval Length: **110 feet (Station 295-405)**	
Vegetation Community Type: Alopecurus pratensis / Agrostis capillaris	
Plant Species	**Cover**
Alopecurus pratensis	4 = 21-50%
Bromus inermis	4 = 21-50%
Leucanthemum vulgare	+ = < 1%
Pedicularis groenlandica	+ = < 1%
Total Vegetative Cover:	98%

Transect Interval Length: **16 feet (Station 405-421)**	
Vegetation Community Type: Eleocharis palustris / Bare Ground	
Plant Species	**Cover**
Bare Ground	2 = 6-10%
Glyceria grandis	2 = 6-10%
Alopecurus pratensis	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%
Carex athrostachya	1 = 1-5%
Eleocharis palustris	1 = 1-5%
Geum macrophyllum	1 = 1-5%
Mentha arvensis	1 = 1-5%
Scirpus microcarpus	1 = 1-5%
Trifolium pratense	1 = 1-5%
Total Vegetative Cover:	60%

Transect Interval Length: **134 feet (Station 421-555)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Bare Ground	5 = > 50%
Eleocharis palustris	3 = 11-20%
Chara sp.	2 = 6-10%
Beckmannia syzigachne	1 = 1-5%
Phalaris arundinacea	1 = 1-5%
Typha latifolia	1 = 1-5%
Alopecurus aequalis	+ = < 1%
Carex sp.	+ = < 1%
Alopecurus aequalis	+ = < 1%
Persicaria amphibia	+ = < 1%
Scirpus microcarpus	+ = < 1%
Total Vegetative Cover:	50%

Transect Interval Length: **39 feet (Station 555-594)**	
Vegetation Community Type: Alopecurus pratensis / Agrostis capillaris	
Plant Species	**Cover**
Alopecurus pratensis	4 = 21-50%
Phalaris arundinacea	4 = 21-50%
Agropyron sp.	1 = 1-5%
Carex athrostachya	1 = 1-5%
Carex utriculata	+ = < 1%
Poa pratensis	+ = < 1%
Total Vegetative Cover:	98%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **3** Approximate Transect Length: **440 feet** Compass Direction from Start: **45˚** Note: _____

Transect Interval Length: **60 feet (Station 0-60)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Persicaria amphibia	+ = < 1%
Total Vegetative Cover:	98%

Transect Interval Length: **77 feet (Station 60-137)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Open Water	5 = > 50%
Chara sp.	4 = 21-50%
Aquatic macrophytes	3 = 11-20%
Algae (green)	1 = 1-5%
Lemna minor	+ = < 1%
Persicaria amphibia	+ = < 1%
Total Vegetative Cover:	50%

Transect Interval Length: **128 feet (Station 137-265)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Open Water	4 = 21-50%
Epilobium ciliatum	1 = 1-5%
Carex sp.	1 = 1-5%
Eleocharis palustris	1 = 1-5%
Lemna minor	+ = < 1%
Persicaria amphibia	+ = < 1%
Total Vegetative Cover:	70%

Transect Interval Length: **161 feet (Station 265-426)**	
Vegetation Community Type: Aquatic macrophytes / Open Water	
Plant Species	**Cover**
Open Water	4 = 21-50%
Algae (brown)	3 = 11-20%
Persicaria amphibia	3 = 11-20%
Carex nebrascensis	2 = 6-10%
Chara sp.	2 = 6-10%
Lemna minor	2 = 6-10%
Carex utriculata	1 = 1-5%
Eleocharis palustris	1 = 1-5%
Phalaris arundinacea	1 = 1-5%
Total Vegetative Cover:	50%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Schrieber Meadow** Date: **July 26, 2016** Examiner: **G. Howard**
Transect Number: **3** Approximate Transect Length: **440 feet** Compass Direction from Start: **45˚** Note: _____

Transect Interval Length: **14 feet (Station 426-440)**	
Vegetation Community Type: Phalaris arundinacea	
Plant Species	**Cover**
Phalaris arundinacea	5 = > 50%
Open Water	2 = 6-10%
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: _____

PHOTOGRAPHS

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

Photograph Checklist:

- ☐ One photograph for each of the four cardinal directions surrounding the wetland.
- ☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☐ At least one photograph showing the buffer surrounding the wetland.
- ☐ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1 (Pano): 48.10804 / -115.410172	270
PP-2		Photo Point 2: 48.113735 / -115.420509	150
PP-3		Photo Point 3 (Pano): 48.112183 / -115.417503	90
PP-4		Photo Point 4 (Pano): 48.113213 / -115.416832	180
PP-5		Photo Point 5 (Pano): 48.112614 / -115.415977	300
PP-6		Photo Point 6 (Pano): 48.11904 / -115.417023	0
PP-7		Photo Point 7 (Pano): 48.108813 / 115.411923	0
PP-8		Photo Point 8 (Pano): 48.11121 / -115.414238	190
PP-9		Photo Point 9 (Pano): 48.109997 / -115.413765	280
PP-10		Photo Point 10 (Pano): 48.109737 / -115.414024	0
PP-11		Photo Point 11 (Pano): 48.116409 / -115.420021	190
PP-12		Photo Point 12 (Pano): 48.115673 / -115.421562	180
PP-13		Photo Point 13 (Pano): 48.11422 / -115.420403	280
PP-14		Photo Point 14 (Pano): 48.114655 / -115.41893	230
PP-15		Photo Point 15 (Pano): 48.114323 / -115.418449	180
PP-16		Photo Point 16 (Pano): 48.113403 / -115.420128	70
PP-17		Photo Point 17 (Pano): 48.112938 / -115.418388	270
PP-18		Photo Point 18: 48.1129 / -115.417618	90
PP-19		Photo Point 19, Photo 1: 48.111553 / -115.417084	10
PP-19		Photo Point 19, Photo 2: 48.111553 / -115.417084	100
PP-20		Photo Point 20: 48.109493 / -115.413918	100
T-1 start		Transect 1 start: 48.115204 / -115.417503	115
T-1 end		Transect 1 end: 48.112663 / -115.41642	295
T-2 start		Transect 2 start: 48.115204 / -115.421013	100
T-2 end		Transect 2 end: 48.114197 / -115.418991	280
T-3 start		Transect 3 start: 48.111134 / -115.415642	45
T-3 end		Transect 3 end: 48.111187 / -115.413849	225
DP-1W		Wetland soil pit: 48.110452 / -115.41545	
DP-1U		Upland soil pit: 48.110423 / -115.415619	

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: **box** How many? **2**
Are the nesting structures being used? **No**
Do the nesting structures need repairs? _____

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
Columbia Spotted Frog	6	☐	☐	☐	
Deer sp.		☒	☐	☐	
Elk		☒	☐	☐	
Pumpkinseed		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Schrieber Meadows** Date: **7/26/16**
Survey Time: _____ to _____

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Gadwall	4	FO	OW				
Red-winged Blackbird	4	L FO	WM				
Wilson's Snipe	2	F	MF				
Blue-winged Teal	7	F	OW				
Black-capped Chickadee	4	FO	UP				
Tree Swallow	2	FO	UP				
Killdeer	1	F	MF				
Great Blue Heron	1	L	OW 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: Schrieber Meadows **City/County:** Lincoln **Sampling Date:** 27-Jul-16

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

Investigator(s): RESPEC - G. Howard **Section, Township, Range:** **S** 11 **T** 27 N **R** 30 W

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

Subregion (LRR): LRR E **Lat.:** 48.11042332 **Long.:** -115.4156209 **Datum:** NAD 83

Soil Map Unit Name: aquic adfluvents, poorly drained **NWI classification:** Upland

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

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

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

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

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

Remarks:

Sampling points considered with an upland area. Hydrophytic vegetation present, but hydric soils and wetland hydrology lacking. The sampling point is located upslope from DP-1w and does not receive the same hydrologic input.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 Ft.)			
1. Alopecurus pratensis	50	☑ 50.0%	FAC
2. Phalaris arundinacea	30	☑ 30.0%	FACW
3. Elymus repens	20	☑ 20.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 1

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	30	**x 2 =**	60
FAC species	70	**x 3 =**	210
FACU species	0	**x 4 =**	0
UPL species	0	**x 5 =**	0
Column Totals:	100	**(A)**	270 **(B)**

Prevalence Index = B/A = 2.700

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Hydrophytic vegetation present with marginal wetland species dominating a portion of the site.

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

Soil

Sampling Point: DP-1u

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR	2/2	100						Organics / duff	
2-14	10YR	2/1	100						Silt Loam	
14+	10YR	6/2	100						Silt Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators present.

Hydrology

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No hydrology indicators present. Soil pit dry and crumbly.

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

Project/Site: Schrieber Meadows **City/County:** Lincoln **Sampling Date:** 27-Jul-16

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

Investigator(s): RESPEC - G. Howard **Section, Township, Range:** **S** 11 **T** 27 N **R** 30 W

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

Subregion (LRR): LRR E **Lat.:** 48.11050375 **Long.:** -115.4154566 **Datum:** NAD 83

Soil Map Unit Name: aquic adfluvents, poorly drained **NWI classification:** Upland

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

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

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

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

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

Remarks:

Sampling points considered with a wetland area dominated emergent vegetation type. Monoculture of reed canarygrass with a seasonal high water table and histic epipedon.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 Ft.)			
1. Phalaris arundinacea	100	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 1

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	100	**x 2 =**	200
FAC species	0	**x 3 =**	0
FACU species	0	**x 4 =**	0
UPL species	0	**x 5 =**	0
Column Totals:	100	**(A)**	200 **(B)**

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Hydrophytic vegetation present with a monoculture of reed canarygrass.

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

Soil

Sampling Point: DP-1w

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR	2/1	100						Loam	
12-16	10YR	2/1	100						Silty Clay Loam	
16+	10YR	4/1	80	10YR	4/6	15	C	M	Silty Clay	
				10YR	6/1	5	D	M		

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydric soil indicator present with thick dark surface layer above depleted matrix.

Hydrology

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Hydrology indicators present with oxidized rhizospheres. The site has a high water table in spring and earlier summer.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Schrieber Meadows **2. MDT Project #:** NH 27(021) **3. Control #:** 1027

3. Evaluation Date: 7/27/2016 **4. Evaluator(s):** G. Howard, T. Traxler **5. Wetland/Site #(s):** Creation

6. Wetland Location(s): Township 27 N, Range 30 W, Section 11, 12, 13; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: Approximately Milepost 53.5

Watershed: 1 - Kootenai **County:** _ Lincoln _ _____

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)
22.43 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 22.43 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	35
Depressional	Aquatic Bed	Excavated	Permanent / Perennial	10
Slope	Emergent Wetland		Seasonal / Intermittent	55

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%.	---	---	moderate 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 includes excavated depressions and adjacent undisturbed wetland habitat created as a result of higher water table. Highway 2 is adjacent to the AA.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes constructed wetland depressions and adjacent wetland habitat that has been created by the plugging of existing ditches and channels, creation of a new stream channel and subsidence of the histosol soil elevations over time. The surrounding land is currently managed in a natural state. USFS land surrounds the majority of the site.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises 90% of total cover)	---	NA	NA	NA

Comments: Emergent and aquatic bed classes are present

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 Grizzly bear
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	---	---	.8M	---	---	---	---

Sources for documented use (e.g. observations, records): USFWS database, MNHP database shows site is within year-round range of grizzly bear, reports from FWP, USFWS, and FS on use.

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 Western toad (S2)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

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

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

Sources for documented use (e.g. observations, records): MNHP and documented breeding on site by MDT and USFS personnel. Great Blue Heron (S3) observed on site.

14C. GENERAL WILDLIFE HABITAT RATING

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

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

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

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

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

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

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

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
☒ **Substantial**	---	.9H	---	---
☐ **Moderate**	---	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Observed waterfowl and numerous wildlife tracks and scat (ungulates)

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	---	---	.5M	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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 = .6 or ☐ **N0**

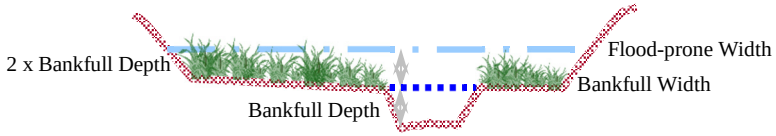
iii. Final Score and Rating: .6M **Comments:** An upwelling area is located adjacent to Coyote Creek in the north 1/3 of the site. Pumpkinseed and sunfish observed in open water in previous years.

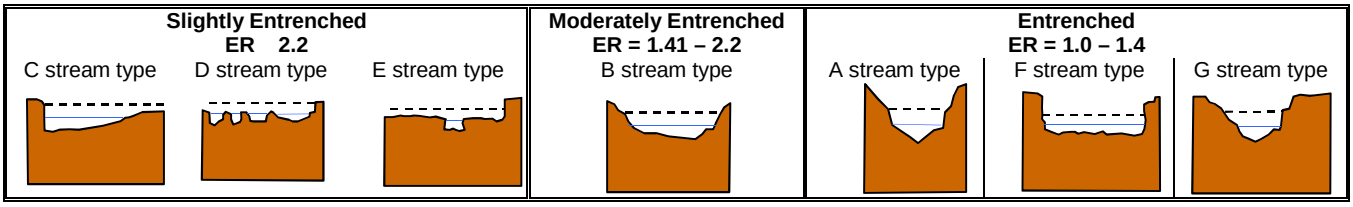
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

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.

35 / 5 = 7
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:** Highway adjacent to the site.

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**	1H	---	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Extensive areas of inundation were observed in 2013, 2014, 2015, and 2016.

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: Wetlands adjacent to excavated cells are 100% vegetated with reed canarygrass and sedges. Depressions with no 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%	1H	---	---
☐ 35-64%	---	---	---
☐ < 35%	---	---	---

Comments: Perennial hydrologic regime in at least 10% of the AA. Species with high stability ratings are established on the perimiters of excavated areas.

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	H	---	---
☐ L	---	---	---
☐ NA	---	---	---

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

A	**☒ Vegetated Component >5 acres**						**☐ Vegetated Component 1-5 acres**						**☐ Vegetated Component <1 acre**					
B	**☒ High**		**☐ Moderate**		**☐ Low**		**☐ High**		**☐ Moderate**		**☐ Low**		**☐ High**		**☐ Moderate**		**☐ Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	1H	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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** = 1E ☐ **NO**

iv. Final Score and Rating: 1H **Comments:** High level of biological activity, veg component > 5 ac, perennial, has surface and subsurface outlets

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: large spring located near the middle of the AA

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**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: AA with perennial inundation/saturation to the surface.

14K. UNIQUENESS

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

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Structural diversity may increase if shrubs expand.

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

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

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

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

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Known recreation 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	mod 0.80	1.00	17.944	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	20.187	
C. General Wildlife Habitat	high 0.90	1.00	20.187	*
D. General Fish Habitat	mod 0.60	1.00	13.458	
E. Flood Attenuation	mod 0.60	1.00	13.458	
F. Short and Long Term Surface Water Storage	high 1.00	1.00	22.43	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	22.43	*
H. Sediment / Shoreline Stabilization	high 1.00	1.00	22.43	
I. Production Export / Food Chain Support	high 1.00	1.00	22.43	
J. Groundwater Discharge / Recharge	high 1.00	1.00	22.43	*
K. Uniqueness	low 0.30	1.00	6.729	
L. Recreation / Education Potential (bonus point)	high 0.20		4.486	
Total Points	**9.3**	**11**	**208.599 Total Functional Units**	
Percent of Possible Score 85% (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: Schrieber Meadows **2. MDT Project #:** NH 27(021) **3. Control #:** 1027

3. Evaluation Date: 7/27/2016 **4. Evaluator(s):** G. Howard, T. Traxler **5. Wetland/Site #(s):** Enhancement

6. Wetland Location(s): Township 27 N, Range 30 W, Section 11, 12, 13; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: Approximately Milepost 53.5

Watershed: 1 - Kootenai **County:** _ Lincoln _ _____

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)
13.22 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 13.22 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Slope	Emergent Wetland		Permanent / Perennial	10
Slope	Emergent Wetland		Seasonal / Intermittent	90

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%.	---	---	moderate 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.)**:** Disturbance due to recent road fill between the AA and Hwy 2

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes existing wetlands located between stream mitigation area and US Hwy 2. The wetland is dominated by reed canarygrass and meadow foxtail. Restoration efforts have resulted in increased inundation. Adjacent land use is forest and the highway.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises 90% of total cover)	---	NA	NA	NA

Comments: Emergent wetland dominated by reed canary grass and meadow foxtail with Carex spp. beginning to establish.

Wetland/Site #(s): Enhancement

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	Grizzly bear
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	---	---	.8M	---	---	---	---

Sources for documented use (e.g. observations, records): USFWS database, MNHP database shows site is within year-round range of grizzly bear, reports of use from FWP, FS, and USFWS.

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	Western toad (S2)
Secondary habitat (**list species**)	☐ D	☐ S	_____
Incidental habitat (**list species**)	☐ D	☐ S	_____
No usable habitat		☐ S	

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

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

Sources for documented use (e.g. observations, records): MNHP and documented breeding on site by MDT and USFS personnel. Great Blue Heron (S3) observed on site.

14C. GENERAL WILDLIFE HABITAT RATING

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

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

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

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

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

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

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

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
☒ **Substantial**	---	.9H	---	---
☐ **Moderate**	---	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Substantial wildlife use within the AA; however there is moderate traffic use during the day adjacent to the site on the northeast side.

Wetland/Site #(s): Enhancement

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

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

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

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

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

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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

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

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

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

iii. Final Score and Rating: _ **Comments:** No fish habitat within the enhancement AA.

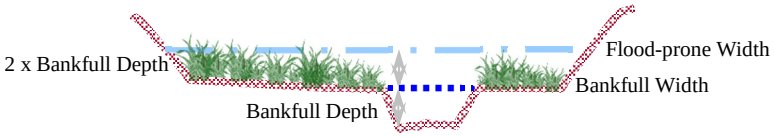
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

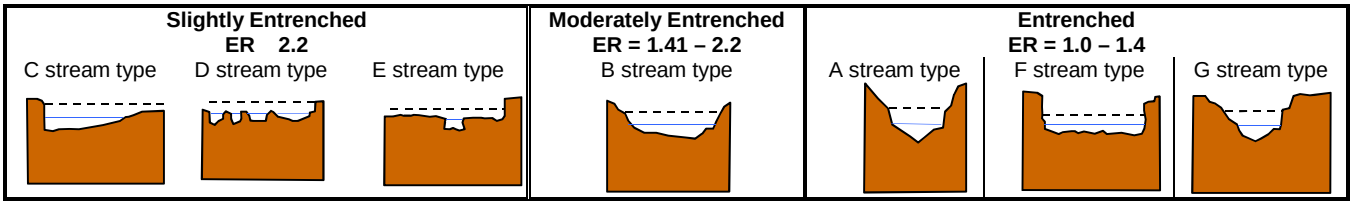
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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.

35 / 5 = 7

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:** AA inundated from restricted outlet, minimal trees or shrubs present.

Wetland/Site #(s): Enhancement

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**	1H	---	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: A includes constructed wetland depressions and adjacent wetland habitat that has been created by the Inundation due to restoration efforts including: plugging of existing ditches and channels, creation of a new stream channel and subsidence of

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

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

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

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	**☒ ≥ 70%**		**☐ < 70%**		**☐ ≥ 70%**		**☐ < 70%**	
Evidence of Flooding / Ponding in AA	**☒ Yes**	**☐ No**	**☐ Yes**	**☐ No**	**☐ Yes**	**☐ No**	**☐ Yes**	**☐ No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: AA nearly 100% vegetated with reed canarygrass, presence of flooding/ponding, 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%	1H	---	---
☐ 35-64%	---	---	---
☐ < 35%	---	---	---

Comments: Open water areas subject to wave action, well vegetated with reed canarygrass

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	1H	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Enhancement

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** = 1E ☐ **NO**

iv. Final Score and Rating: 1H **Comments:** No fish habitat, vegetation component >5 ac, high biological activity, perennial hydrology with restricted outlet.

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**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: AA with shallow water table and surface water

14K. UNIQUENESS

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

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: AA with common relative abundance and moderate disturbance due to adjacent road.

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

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

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

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

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Known recreation at site.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Enhancement

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	mod 0.80	1.00	10.576	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	11.898	*
C. General Wildlife Habitat	high 0.90	1.00	11.898	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.60	1.00	7.932	
F. Short and Long Term Surface Water Storage	high 1.00	1.00	13.22	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	13.22	*
H. Sediment / Shoreline Stabilization	high 1.00	1.00	13.22	*
I. Production Export / Food Chain Support	high 1.00	1.00	13.22	*
J. Groundwater Discharge / Recharge	high 1.00	1.00	13.22	
K. Uniqueness	low 0.30	1.00	3.966	
L. Recreation / Education Potential (bonus point)	high 0.20		2.644	
Total Points	**8.7**	**10**	**115.014 Total Functional Units**	
Percent of Possible Score 87% (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: Schrieber Meadows **2. MDT Project #:** NH 27(021) **3. Control #:** 1027

3. Evaluation Date: 7/27/2016 **4. Evaluator(s):** G. Howard, T. Traxler **5. Wetland/Site #(s):** Restoration

6. Wetland Location(s): Township 27 N, Range 30 W, Section 11, 12, 13; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: Approximately Milepost 53.5

Watershed: 1 - Kootenai **County:** _ Lincoln _ _____

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)
3.46 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 3.46 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Aquatic Bed	Excavated	Permanent / Perennial	35
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	65

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.)**:** The adjacent Creation AA encompasses the excavated depressions constructed in 2007 and 2011. Highway 2 is close to the AA.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Leucanthemum vulgare, Hieracium aurantiacum

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA includes pre-existing wetlands identified within the project area that were modified by excavation to increase the groundwater availability and provide a greater diversity of wetland habitat and hydrophytes.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises 90% of total cover)	---	NA	NA	NA

Comments: Emergent and aquatic bed

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 Grizzly bear
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	---	---	.8M	---	---	---	---

Sources for documented use (e.g. observations, records): USFWS database, MNHP database shows site is within year-round range of grizzly bear, reports of use from FWP, FS, and USFWS.

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 Western toad (S2)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

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

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

Sources for documented use (e.g. observations, records): MNHP and documented breeding on site by MDT and USFS personnel

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**	1E	---	---	---
☐ **Moderate**	---	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Good habitat diversity with substantial wildlife evidence.

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:** No fish habitat identified within restoration AA

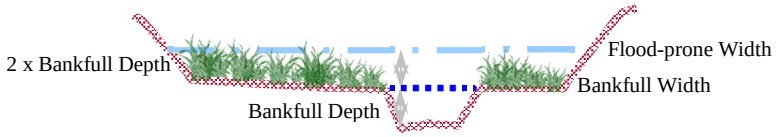
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

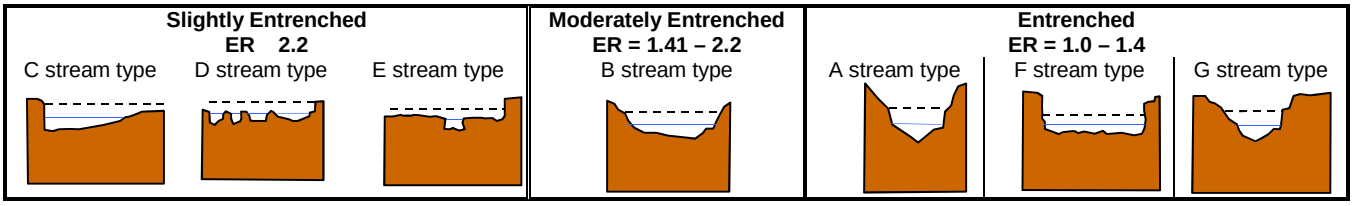
Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

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.

35 / 5 = 7

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:** All wetland cells subject to flooding from Coyote Creek

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

Comments: AA with evidence of frequent flooding.

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**	---	---	.6M	---	---	---	---	---

Comments: AA receives periodic overflow from Coyote Creek

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%**	1H	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: Vegetation has filled in around excavated areas

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	---	---	---	---	---	---	.9H	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
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** = 1E ☐ **NO**

iv. Final Score and Rating: 1H **Comments:** No fish habitat, high biological activity, well-vegetated buffer, unrestricted outlet to creek.

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**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: Perennial spring located near AA

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: _____

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

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

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

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

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Known recreation site.

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	mod 0.80	1.00	2.768	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	3.114	*
C. General Wildlife Habitat	exc 1.00	1.00	3.46	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.50	1.00	1.73	
F. Short and Long Term Surface Water Storage	high 0.80	1.00	2.768	
G. Sediment / Nutrient / Toxicant Removal	mod 0.60	1.00	2.076	
H. Sediment / Shoreline Stabilization	high 1.00	1.00	3.46	*
I. Production Export / Food Chain Support	high 1.00	1.00	3.46	
J. Groundwater Discharge / Recharge	high 1.00	1.00	3.46	*
K. Uniqueness	mod 0.40	1.00	1.384	
L. Recreation / Education Potential (bonus point)	high 0.20		0.692	
Total Points	**8.2**	**10**	**28.372 Total Functional Units**	
Percent of Possible Score 82% (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
Schrieber Meadows
Lincoln County, Montana



Photo Point 1 – Panorama; Location: SW Corner of site; Bearing 270 degrees; Year 2012



Photo Point 1 – Panorama; Location: SW Corner of site; Bearing 270 degrees; Year 2014



Photo Point 1 – Panorama; Location: SW Corner of site; Bearing 270 degrees; Year 2015



Photo Point 1 – Panorama; Location: SW Corner of site; Bearing 270 degrees; Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 2 Location: Cell 7 (Created in 2007)
Bearing 150 degrees Year 2010



Photo Point 2 Location: Cell 7 (Enhanced in 2011)
Bearing 150 degrees Year 2012



Photo Point 2 Location: Cell 7 (Enhanced in 2011)
Bearing 150 degrees Year 2013



Photo Point 2 Location: Cell 7 (Enhanced in 2011)
Bearing 150 degrees Year 2014



Photo Point 2 Location: Cell 7 (Enhanced in 2011)
Bearing 150 degrees Year 2015



Photo Point 2 Location: Cell 7 (Enhanced in 2011)
Bearing 150 degrees Year 2016



Photo Point 3; Location: Cell 2 (Constructed in 2007); Bearing 90 degrees; Year 2010



Photo Point 3; Location: Cell 2 (Constructed in 2007); Bearing 90 degrees; Year 2013



Photo Point 3; Location: Cell 2 (Constructed in 2007); Bearing 90 degrees; Year 2015



Photo Point 3; Location: Cell 2 (Constructed in 2007); Bearing 90 degrees; Year 2016



Photo Point 4; Location: Cell 2 (Constructed in 2007); Bearing 180 degrees; Year 2010



Photo Point 4; Location: Cell 2 (Constructed in 2007); Bearing 180 degrees; Year 2013



Photo Point 4; Location: Cell 2 (Constructed in 2007); Bearing 180 degrees; Year 2015



Photo Point 4; Location: Cell 2 (Constructed in 2007); Bearing 180 degrees; Year 2016



Photo Point 5; Location: Cell 2 (Constructed in 2007); Bearing 300 degrees; Year 2010



Photo Point 5; Location: Cell 2 (Constructed in 2007); Bearing 300 degrees; Year 2014



Photo Point 5; Location: Cell 2 (Constructed in 2007); Bearing 300 degrees; Year 2015



Photo Point 5; Location: Cell 2 (Constructed in 2007); Bearing 300 degrees; Year 2016



Photo Point 6; Location: Cell 2 (Constructed in 2007); Bearing 40 degrees; Year 2010



Photo Point 6; Location: Cell 2 (Constructed in 2007); Bearing 40 degrees; Year 2013



Photo Point 6; Location: Cell 2 (Constructed in 2007); Bearing 40 degrees; Year 2014



Photo Point 6; Location: Cell 2 (Constructed in 2007); Bearing 40 degrees; Year 2016



Photo Point 7; Location: Lower Reach of merged Coyote/Schrieber Creek; Bearing 0 degrees; Year 2012



Photo Point 7; Location: Lower Reach of merged Coyote/Schrieber Creek; Bearing 0 degrees; Year 2013



Photo Point 7; Location: Lower Reach of merged Coyote/Schrieber Creek; Bearing 0 degrees; Year 2015



Photo Point 7; Location: Lower Reach of merged Coyote/Schrieber Creek; Bearing 0 degrees; Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 8 Location: Cell 3 (Constructed in 2007)
Bearing 190 degrees Year 2010



Photo Point 8 Location: Cell 3 (Constructed in 2007)
Bearing 190 degrees Year 2013



Photo Point 8 Location: Cell 3 (Constructed in 2007)
Bearing 190 degrees Year 2014



Photo Point 8 Location: Cell 3 (Constructed in 2007)
Bearing 190 degrees Year 2015



Photo Point 8 Location: Cell 3 (Constructed in 2007)
Bearing 190 degrees Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 9 Location: Cell 3
Bearing 280 degrees Year 2010



Photo Point 9 Location: Cell 3
Bearing 280 degrees Year 2013



Photo Point 9 Location: Cell 3
Bearing 280 degrees Year 2014



Photo Point 9 Location: Cell 3
Bearing 280 degrees Year 2015



Photo Point 9 Location: Cell 3
Bearing 280 degrees Year 2016



Photo Point 10; Location: Cell 3; Bearing 0 degrees; Year 2010



Photo Point 10; Location: Cell 3; Bearing 0 degrees; Year 2014



Photo Point 10; Location: Cell 3; Bearing 0 degrees; Year 2015



Photo Point 10; Location: Cell 3; Bearing 0 degrees; Year 2016



Photo Point 11; Location: Cell 2B; Bearing 190 degrees; Year 2012



Photo Point 11; Location: Cell 2B; Bearing 190 degrees; Year 2014



Photo Point 11; Location: Cell 2B; Bearing 190 degrees; Year 2015



Photo Point 11; Location: Cell 2B; Bearing 190 degrees; Year 2016



Photo Point 12; Location: Cell 1 (Constructed in 2011); Bearing 180 degrees; Year 2012



Photo Point 12; Location: Cell 1 (Constructed in 2011); Bearing 180 degrees; Year 2014



Photo Point 12; Location: Cell 1 (Constructed in 2011); Bearing 180 degrees; Year 2015



Photo Point 12; Location: Cell 1 (Constructed in 2011); Bearing 180 degrees; Year 2016



Photo Point 13; Cell 3A (Constructed in 2011); Bearing 280 degrees; Year 2012



Photo Point 13; Cell 3A (Constructed in 2011); Bearing 280 degrees; Year 2014



Photo Point 13; Cell 3A (Constructed in 2011); Bearing 280 degrees; Year 2015



Photo Point 13; Cell 3A (Constructed in 2011); Bearing 280 degrees; Year 2016



Photo Point 14; Location: Cell 4C (Constructed in 2011); Bearing 230 degrees; Year 2012



Photo Point 14; Location: Cell 4C (Constructed in 2011); Bearing 230 degrees; Year 2014



Photo Point 14; Location: Cell 4C (Constructed in 2011); Bearing 230 degrees; Year 2015



Photo Point 14; Location: Cell 4C (Constructed in 2011); Bearing 230 degrees; Year 2016



Photo Point 15; Location: Cell 5A (Constructed in2011); Bearing 180 degrees; Year 2012



Photo Point 15; Location: Cell 5A (Constructed in2011); Bearing 180 degrees; Year 2014



Photo Point 15; Location: Cell 5A (Constructed in2011); Bearing 180 degrees; Year 2015



Photo Point 15; Location: Cell 5A (Constructed in2011); Bearing 180 degrees; Year 2016



Photo Point 16; Cell 6 (Constructed in 2011); Bearing 70 degrees; Year 2012



Photo Point 16; Cell 6 (Constructed in 2011); Bearing 70 degrees; Year 2013



Photo Point 16; Cell 6 (Constructed in 2011); Bearing 70 degrees; Year 2014



Photo Point 16; Cell 6 (Constructed in 2011); Bearing 70 degrees; Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 16 Location: Cell 5A
Bearing: 290 degrees Year 2010



Photo Point 16 Location: Cell 5A
Bearing: 290 degrees Year 2013



Photo Point 16 Location: Cell 5A
Bearing: 290 degrees Year 2014



Photo Point 16 Location: Cell 5A
Bearing: 290 degrees Year 2015



Photo Point 17; Location: Cell 6 (Constructed in 2011); Bearing 270 degrees; Year 2012



Photo Point 17; Location: Cell 6 (Constructed in 2011); Bearing 270 degrees; Year 2014



Photo Point 17; Location: Cell 6 (Constructed in 2011); Bearing 270 degrees; Year 2015



Photo Point 17; Location: Cell 6 (Constructed in 2011); Bearing 270 degrees; Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 18 Location: Cell 3 (Constructed 2007)
Bearing: 90 degrees Year 2012



Photo Point 18 Location: Cell 3 (Constructed 2007)
Bearing: 90 degrees Year 2013



Photo Point 18 Location: Cell 3 (Constructed 2007)
Bearing: 90 degrees Year 2014



Photo Point 18 Location: Cell 3 (Constructed 2007)
Bearing: 90 degrees Year 2015



Photo Point 18 Location: Cell 3 (Constructed 2007)
Bearing: 90 degrees Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 19 Location: West Boundary
Bearing: 10 degrees Year 2012



Photo Point 19 Location: West Boundary
Bearing: 10 degrees Year 2013



Photo Point 19 Location: West Boundary
Bearing: 10 degrees Year 2014



Photo Point 19 Location: West Boundary
Bearing: 10 degrees Year 2015



Photo Point 19 Location: West Boundary
Bearing: 10 degrees Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 19 Location: West Boundary
Bearing: 100 degrees Year 2012



Photo Point 19 Location: West Boundary
Bearing: 100 degrees Year 2013



Photo Point 19 Location: West Boundary
Bearing: 100 degrees Year 2014



Photo Point 19 Location: West Boundary
Bearing: 100 degrees Year 2015



Photo Point 19 Location: West Boundary
Bearing: 100 degrees Year 2016

Schrieber Meadows: Photo Point Photos



Photo Point 20 Location: Schrieber Creek
Bearing: 100 degrees Year 2012



Photo Point 20 Location: Schrieber Creek
Bearing: 100 degrees Year 2013



Photo Point 20 Location: Schrieber Creek
Bearing: 100 degrees Year 2014



Photo Point 20 Location: Schrieber Creek
Bearing: 100 degrees Year 2015



Photo Point 20 Location: Schrieber Creek
Bearing: 100 degrees Year 2016

Schrieber Meadows: Vegetation Transect Photos



Transect 1: Start Location: T-1
Bearing: 115 degrees Year 2010



Transect 1: Start Location: T-1
Bearing: 115 degrees Year 2013



Transect 1: Start Location: T-1
Bearing: 115 degrees Year 2014



Transect 1: Start Location: T-1
Bearing: 115 degrees Year 2015



Transect 1: Start Location: T-1
Bearing: 115 degrees Year 2016

Schrieber Meadows: Vegetation Transect Photos



Transect 1: End Location: T-1
Bearing: 245 degrees Year 2010



Transect 1: End Location: T-1
Bearing: 245 degrees Year 2013



Transect 1: End Location: T-1
Bearing: 245 degrees Year 2014



Transect 1: End Location: T-1
Bearing: 245 degrees Year 2015

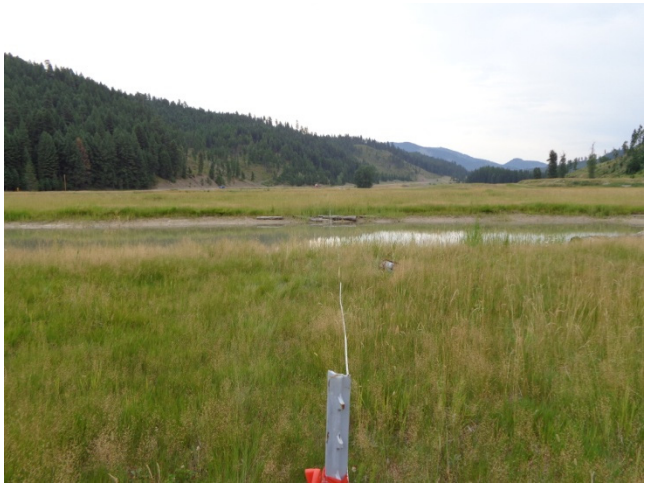


Transect 1: End Location: T-1
Bearing: 245 degrees Year 2016

Schrieber Meadows: Vegetation Transect Photos



Transect 2: Start Location: T-2
Bearing: 100 degrees Year 2012



Transect 2: Start Location: T-2
Bearing: 100 degrees Year 2013



Transect 2: Start Location: T-2
Bearing: 100 degrees Year 2014



Transect 2: Start Location: T-2
Bearing: 100 degrees Year 2015

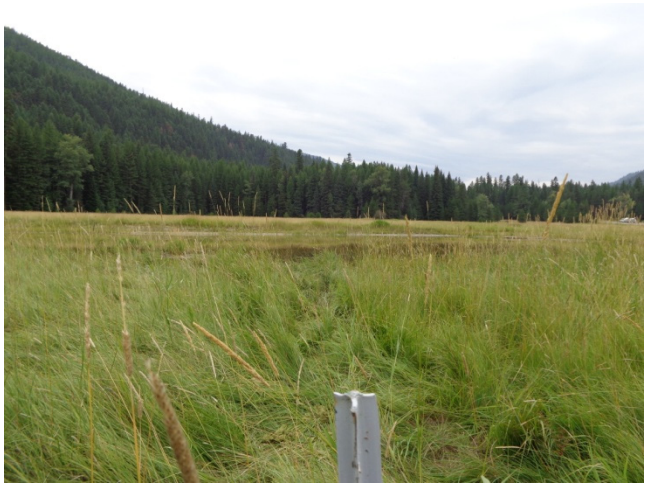


Transect 2: Start Location: T-2
Bearing: 100 degrees Year 2016

Schrieber Meadows: Vegetation Transect Photos

No Photo Available

Transect 2: End Location: T-2
Bearing 280: degrees Year 2012



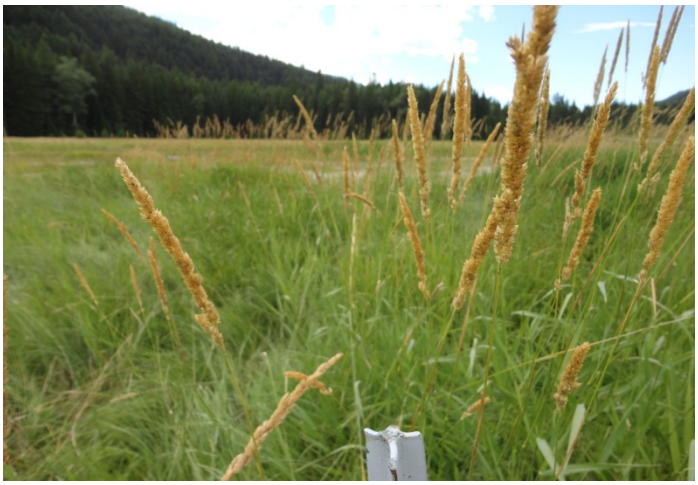
Transect 2: End Location: T-2
Bearing: 280 degrees Year 2013



Transect 2: End Location: T-2
Bearing: 280 degrees Year 2014



Transect 2: End Location: T-2
Bearing: 280 degrees Year 2015



Transect 2: End Location: T-2
Bearing: 280 degrees Year 2016

Schrieber Meadows: Vegetation Transect Photos



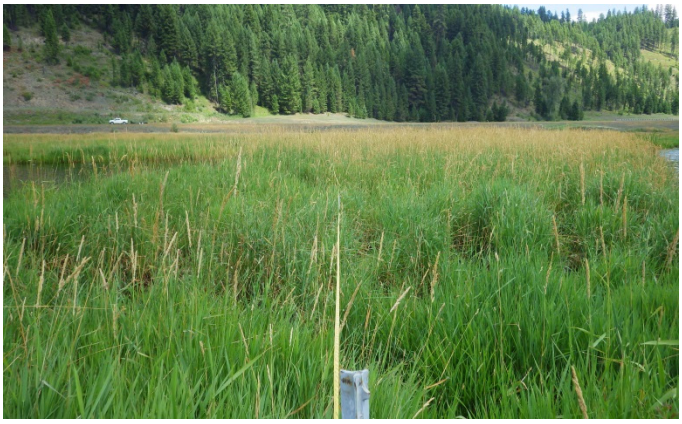
Transect 3: Start Location: T-3
Bearing: 45 degrees Year 2012



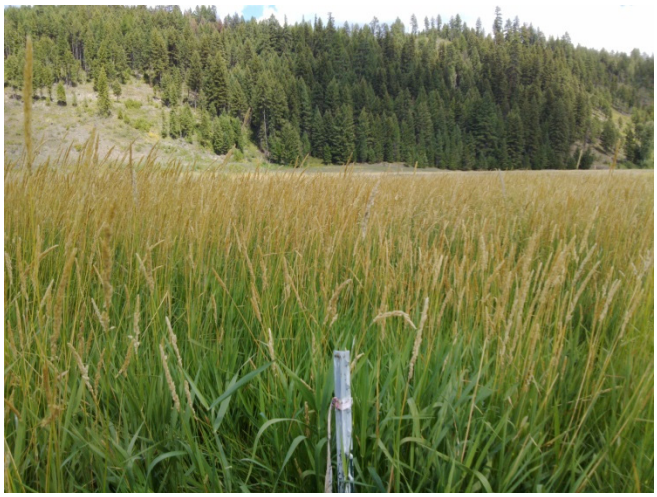
Transect 3: Start Location: T-3
Bearing: 45 degrees Year 2013



Transect 3: Start Location: T-3
Bearing: 45 degrees Year 2014

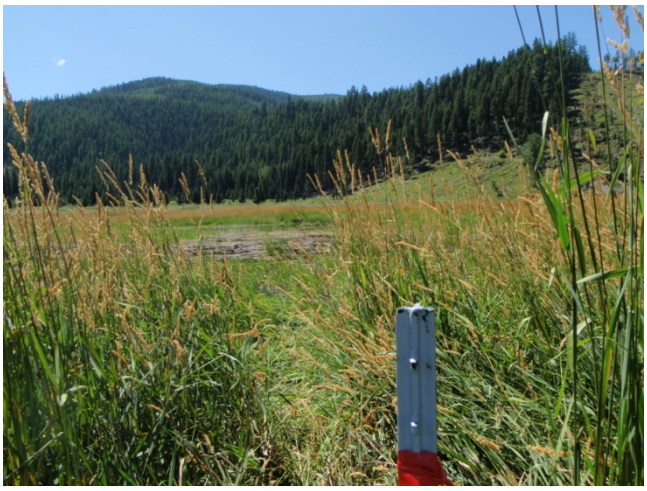


Transect 3: Start Location: T-3
Bearing: 45 degrees Year 2015



Transect 3: Start Location: T-3
Bearing: 45 degrees Year 2016

Schrieber Meadows: Vegetation Transect Photos



Transect 3: End Location: T-3
Bearing: 225 degrees Year 2012



Transect 3: End Location: T-3
Bearing: 225 degrees Year 2013



Transect 3: End Location: T-3
Bearing: 225 degrees Year 2014



Transect 3: End Location: T-3
Bearing: 225 degrees Year 2015



Transect 3: End Location: T-3
Bearing: 225 degrees Year 2016

Schrieber Meadows: Data Point Photos



Data Point: TP A Wet Location: Veg Com 3
Year 2014



Data Point: TP A UP Location: Veg Com 9
Year 2014



Data Point: SP-1Wet Location: Veg Com 3
Year 2015



Data Point: SP-1UP Location: Veg Com 9
Year 2015



Data Point: DP-1W Location: Veg Com 3
Year 2016



Data Point: DP-1U Location: Vg Com 9
Year 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-1 Location: Upper Coyote Creek
Bearing: 280 degrees Year 2012



Cross-Section: XS-1 Location: Upper Coyote Creek
Bearing: 280 degrees Year 2013



Cross-Section: XS-1 Location: Upper Coyote Creek
Bearing: 280 degrees Year 2014



Cross-Section: XS-1 Location: Upper Coyote Creek
Bearing: 280 degrees Year 2015



Cross-Section: XS-1 Location: Upper Coyote Creek
Bearing: 280 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-2 Location: Upper Coyote Creek
Bearing: 320 degrees Year: 2012



Cross-Section: XS-2 Location: Upper Coyote Creek
Bearing: 320 degrees Year: 2013



Cross-Section: XS-2 Location: Upper Coyote Creek
Bearing: 320 degrees Year: 2014



Cross-Section: XS-2 Location: Upper Coyote Creek
Bearing: 320 degrees Year: 2015



Cross-Section: XS-2 Location: Upper Coyote Creek
Bearing: 320 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-3 Location: Coyote Creek Spring Area
Bearing: 320 degrees Year: 2012



Cross-Section: XS-3 Location: Coyote Creek Spring Area
Bearing: 320 degrees Year: 2013



Cross-Section: XS-3 Location: Coyote Creek Spring Area
Bearing: 320 degrees Year: 2014



Cross-Section: XS-3 Location: Coyote Creek Spring Area
Bearing: 320 degrees Year: 2015



Cross-Section: XS-3 Location: Coyote Creek Spring Area
Bearing: 320 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-4 Location: Middle Coyote Creek
Bearing: 290 degrees Year: 2012



Cross-Section: XS-4 Location: Middle Coyote Creek
Bearing: 290 degrees Year: 2013



Cross-Section: XS-4 Location: Middle Coyote Creek
Bearing: 290 degrees Year: 2014



Cross-Section: XS-4 Location: Middle Coyote Creek
Bearing: 290 degrees Year: 2015



Cross-Section: XS-4 Location: Middle Coyote Creek
Bearing: 290 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-5 Location: Middle Coyote Creek
Bearing: 150 degrees Year: 2012



Cross-Section: XS-5 Location: Middle Coyote Creek
Bearing: 300 degrees Year: 2013



Cross-Section: XS-5 Location: Middle Coyote Creek
Bearing: 300 degrees Year: 2014



Cross-Section: XS-5 Location: Middle Coyote Creek
Bearing: 300 degrees Year: 2015



Cross-Section: XS-5 Location: Middle Coyote Creek
Bearing: 300 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-6 Location: Perennial Spring Creek
Bearing: 90 degrees Year: 2012



Cross-Section: XS-6 Location: Perennial Spring Creek
Bearing: 230 degrees Year: 2013



Cross-Section: XS-6 Location: Perennial Spring Creek
Bearing: 230 degrees Year: 2014



Cross-Section: XS-6 Location: Perennial Spring Creek
Bearing: 90 degrees Year: 2015



Cross-Section: XS-6 Location: Perennial Spring Creek
Bearing: 90 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-7 Location: Middle Coyote Creek
Bearing: 90 degrees Year: 2012



Cross-Section: XS-7 Location: Middle Coyote Creek
Bearing: 220 degrees Year: 2013



Cross-Section: XS-7 Location: Middle Coyote Creek
Bearing: 220 degrees Year: 2014



Cross-Section: XS-7 Location: Middle Coyote Creek
Bearing: 220 degrees Year: 2015



Cross-Section: XS-7 Location: Middle Coyote Creek
Bearing: 220 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-8 Location: Middle Coyote Creek
Bearing: 170 degrees Year: 2012



Cross-Section: XS-8 Location: Middle Coyote Creek
Bearing: 270 degrees Year: 2013



Cross-Section: XS-8 Location: Middle Coyote Creek
Bearing: 270 degrees Year: 2014



Cross-Section: XS-8 Location: Middle Coyote Creek
Bearing: 270 degrees Year: 2015



Cross-Section: XS-8 Location: Middle Coyote Creek
Bearing: 270 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-9 Location: Coyote/Schrieber Creeks
Bearing: 130 degrees Year: 2012



Cross-Section: XS-9 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2013



Cross-Section: XS-9 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2014



Cross-Section: XS-9 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2015



Cross-Section: XS-9 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-10 Location: Coyote/Schrieber Creeks
Bearing: 140 degrees Year: 2012



Cross-Section: XS-10 Location: Coyote/Schrieber Creeks
Bearing: 270 degrees Year: 2013



Cross-Section: XS-10 Location: Coyote/Schrieber Creeks
Bearing: 270 degrees Year: 2014



Cross-Section: XS-10 Location: Coyote/Schrieber Creeks
Bearing: 270 degrees Year: 2015



Cross-Section: XS-10 Location: Coyote/Schrieber Creeks
Bearing: 270 degrees Year: 2016

Schrieber Meadows: Cross-Section Photos



Cross-Section: XS-11 Location: Coyote/Schrieber Creeks
Bearing: 100 degrees Year: 2012



Cross-Section: XS-11 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2013



Cross-Section: XS-11 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2014



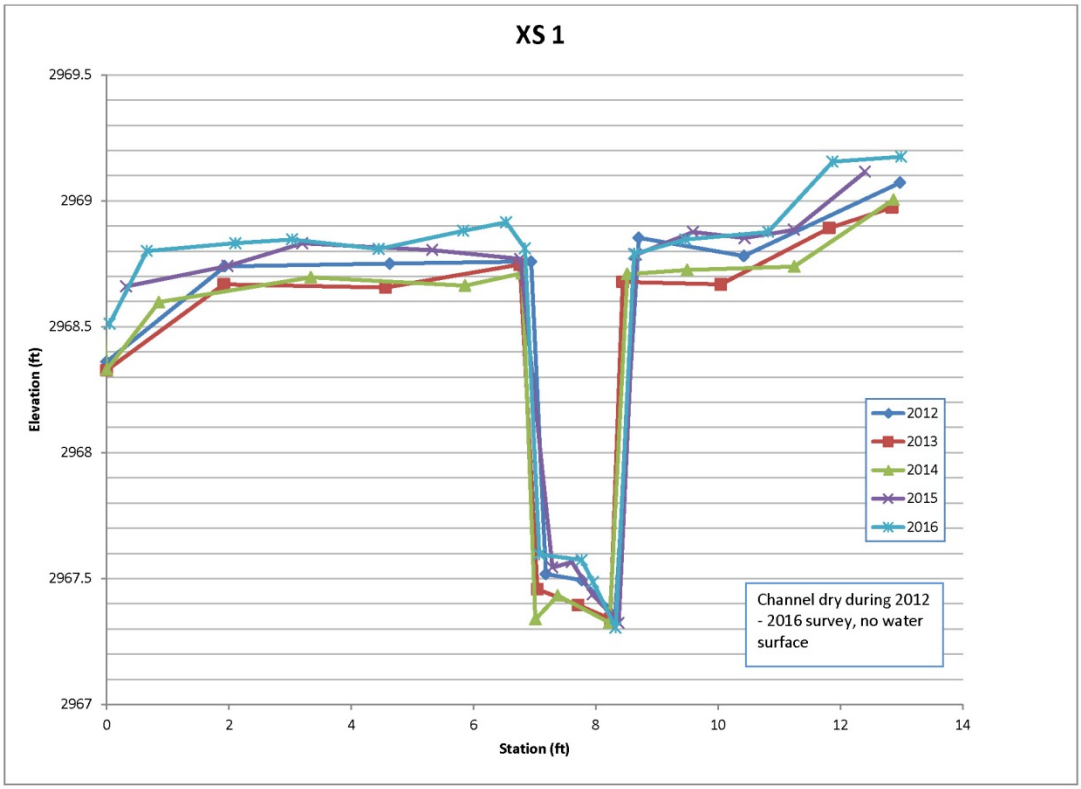
Cross-Section: XS-11 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2015

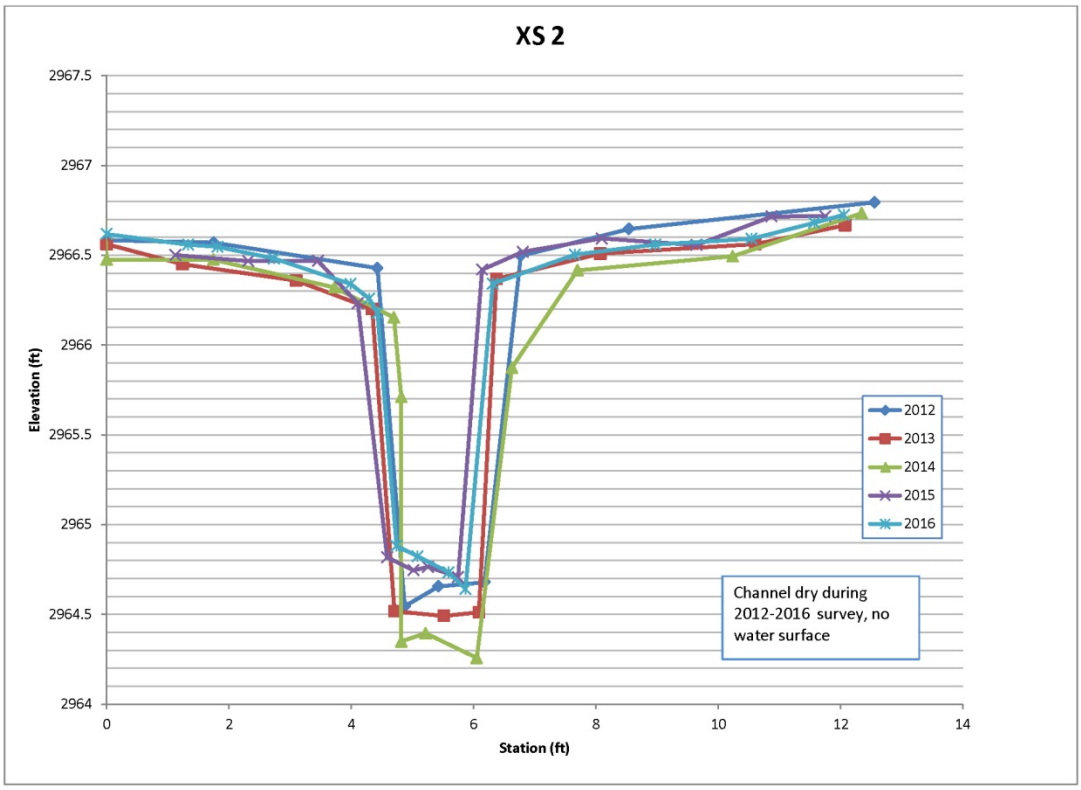


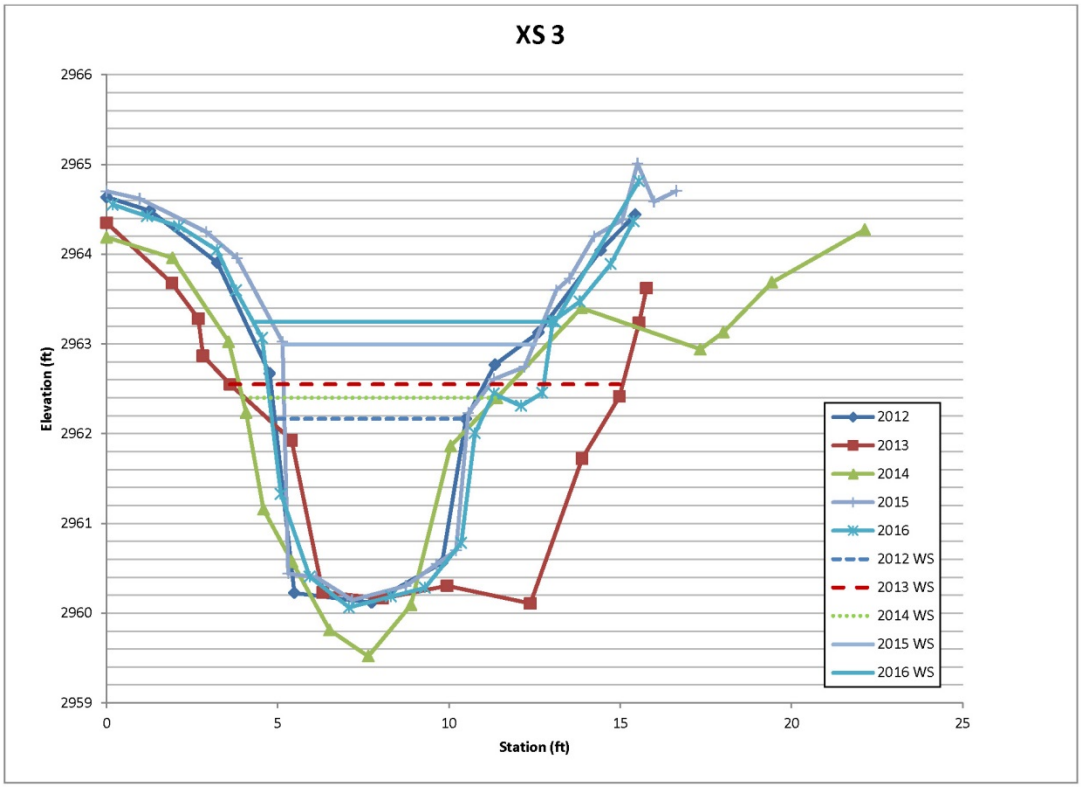
Cross-Section: XS-11 Location: Coyote/Schrieber Creeks
Bearing: 90 degrees Year: 2016

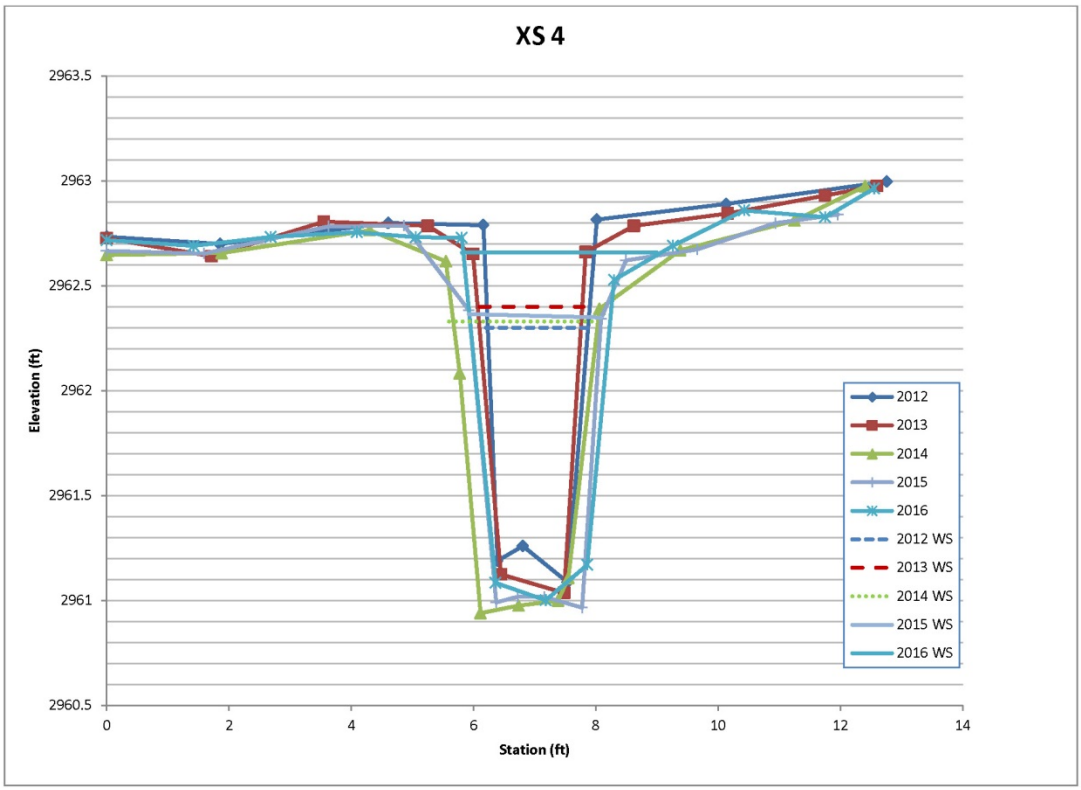
APPENDIX D
SURVEYED STREAM CROSS-SECTIONS

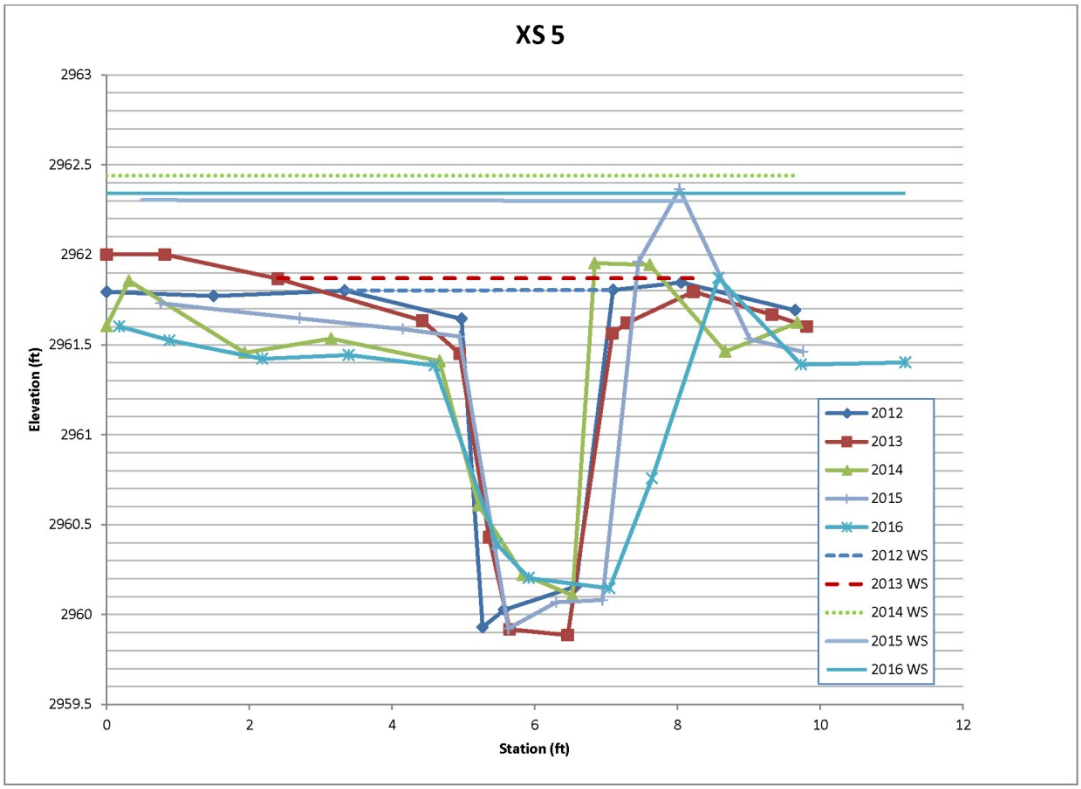
MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

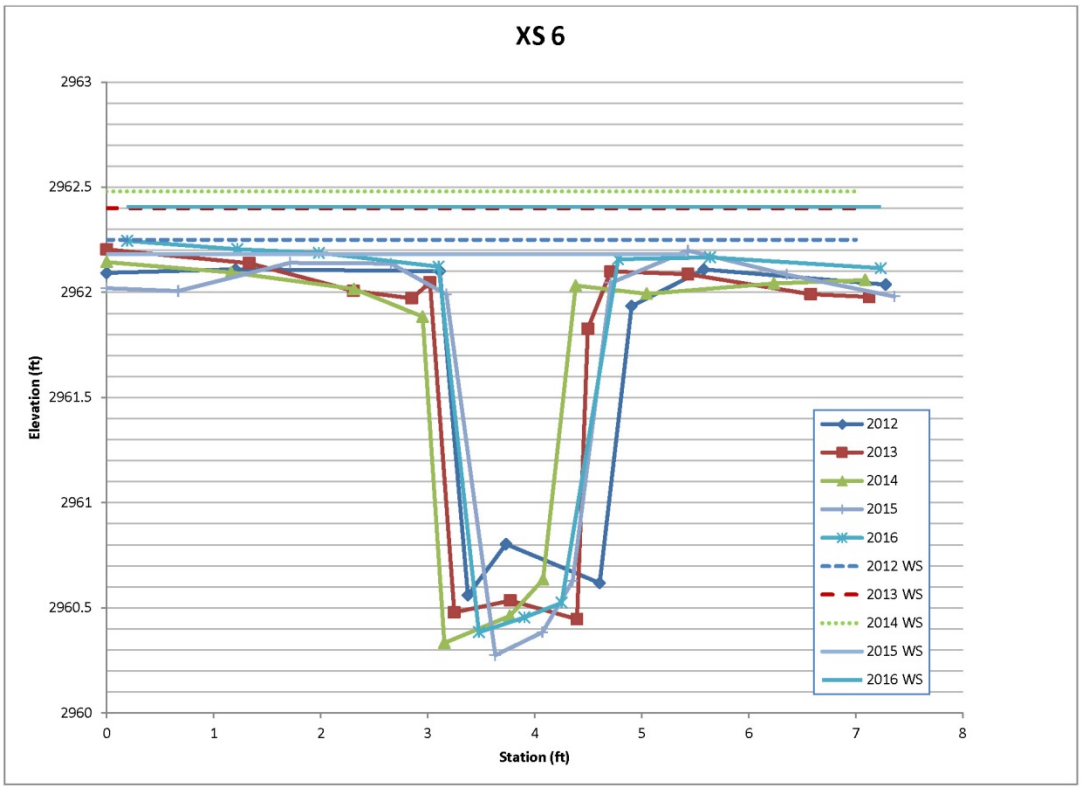

XS 1
2969.5
2969
2968.5
2968
2967.5
2967
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2015
2016
Channel dry during 2012 - 2016 survey, no water surface

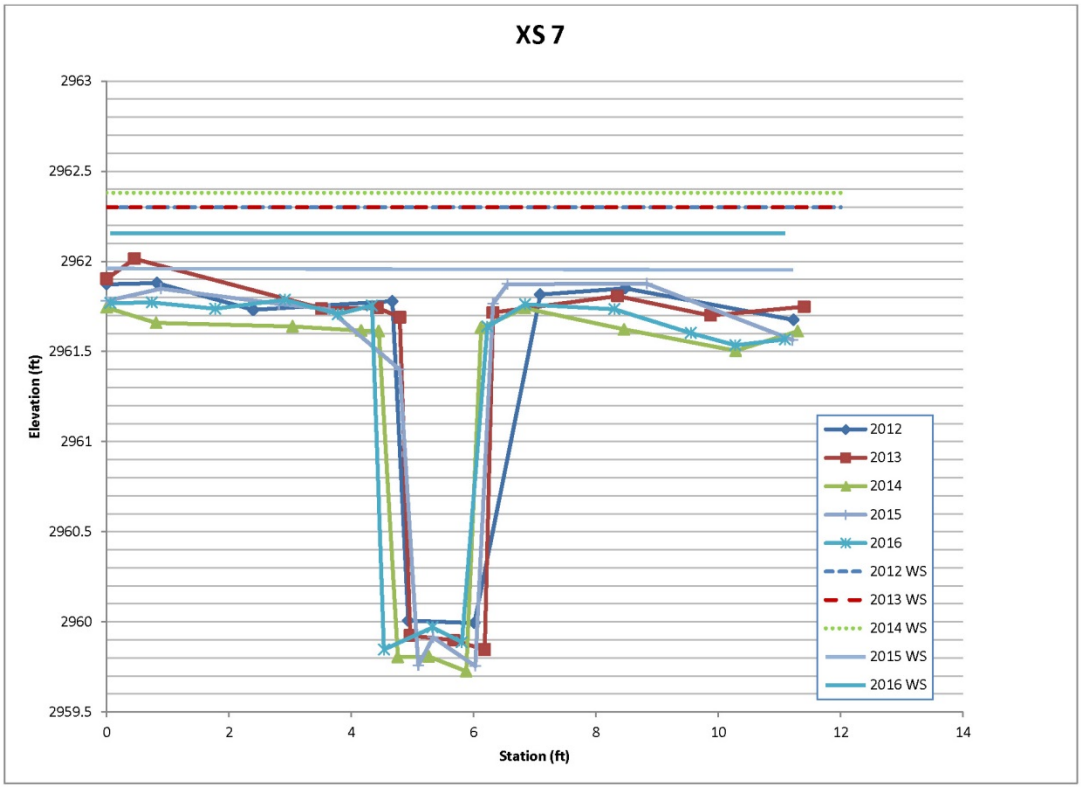

XS 2
2967.5
2967
2966.5
2966
2965.5
2965
2964.5
2964
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2015
2016
Channel dry during 2012-2016 survey, no water surface

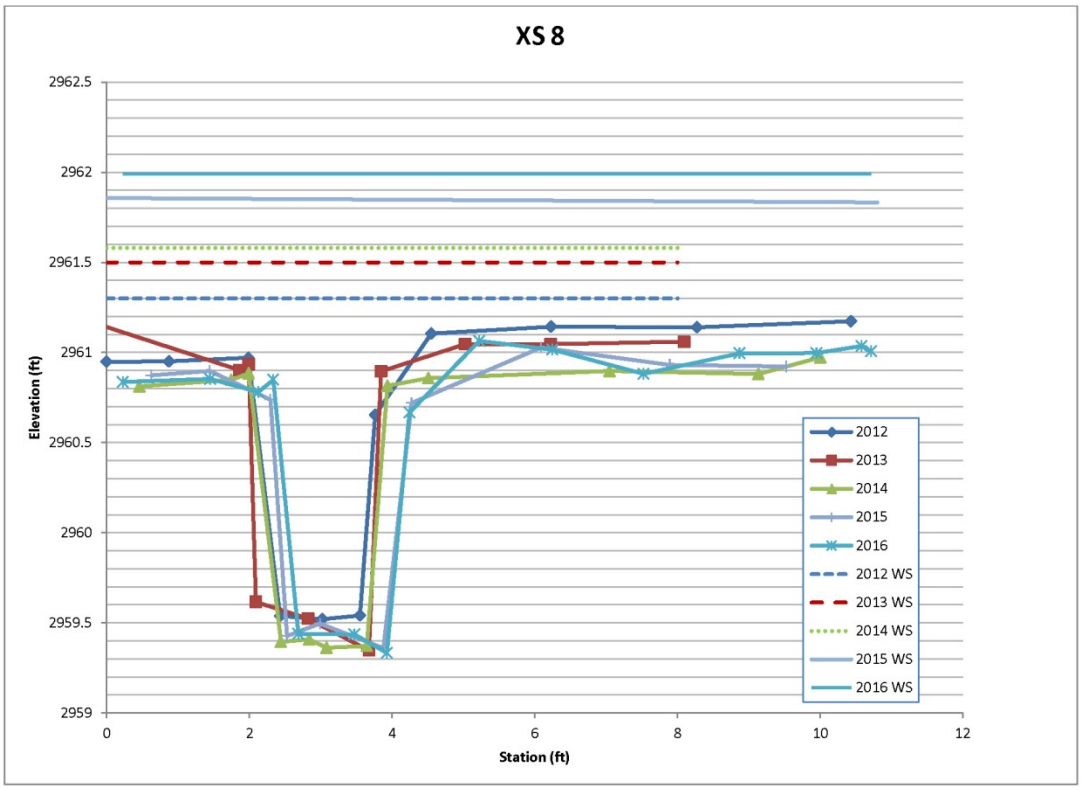

XS 3
2966
2965
2964
2963
2962
2961
2960
2959
Elevation (ft)
0
5
10
15
20
25
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS

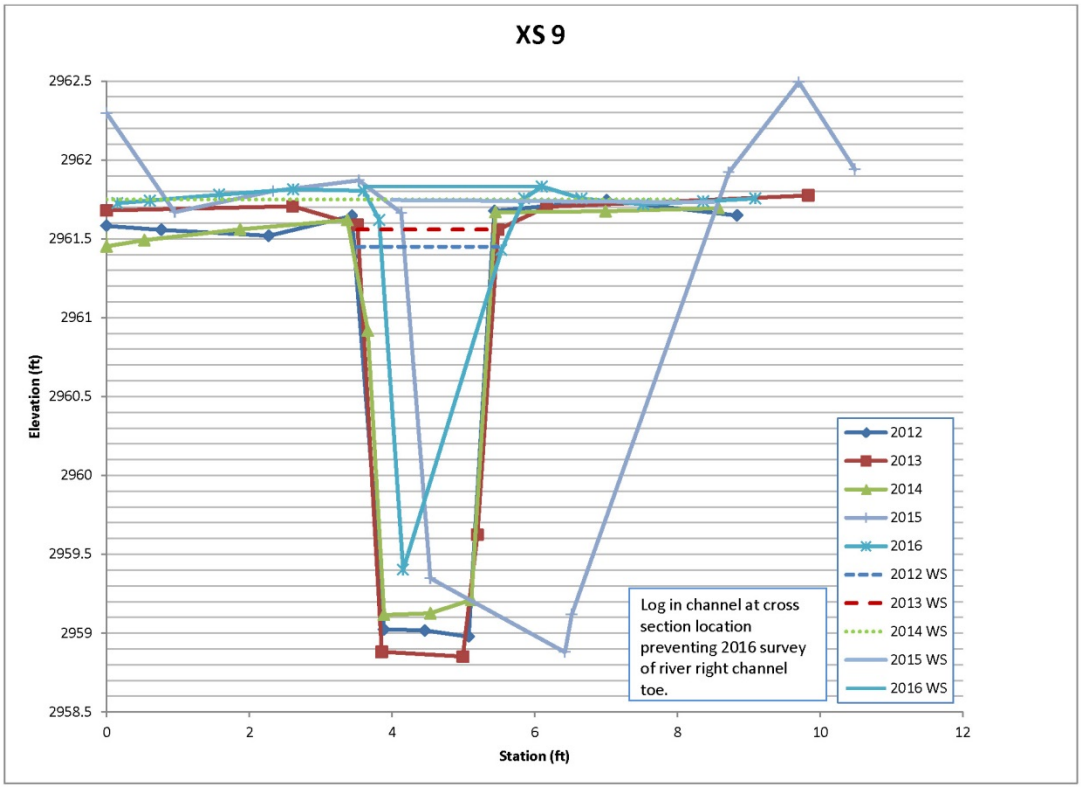

XS 4
2963.5
2963
2962.5
2962
2961.5
2961
2960.5
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS

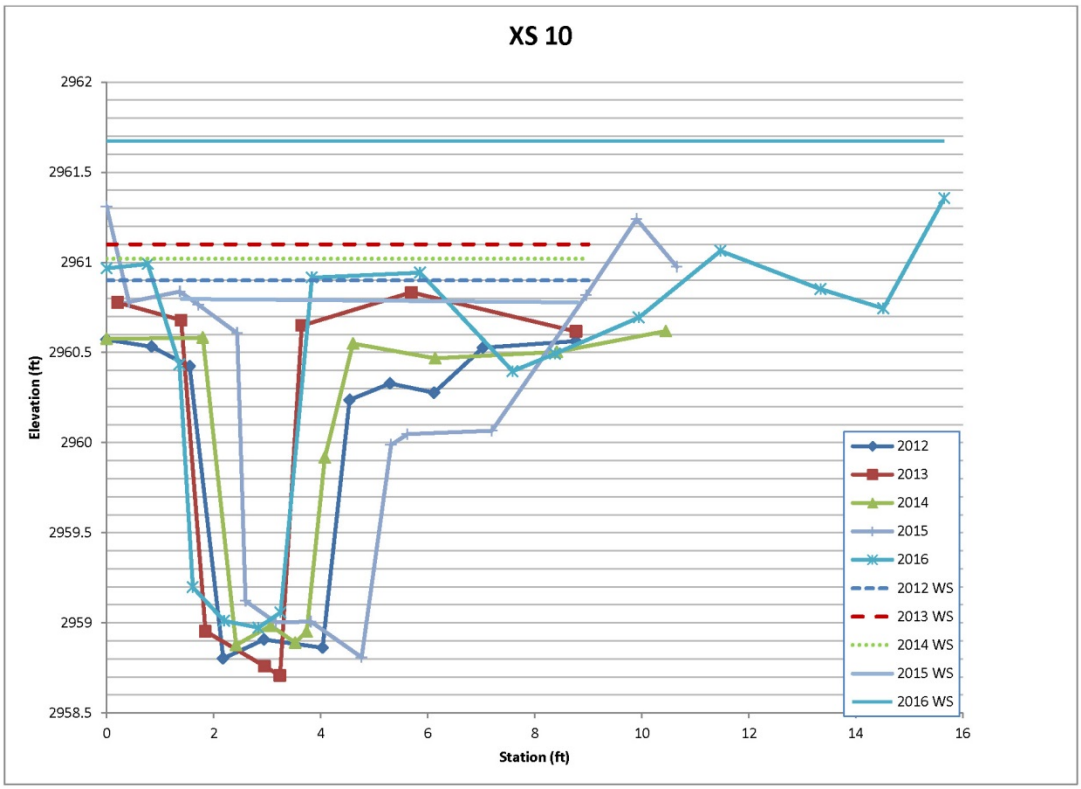

XS 5
2963
2962.5
2962
2961.5
2961
2960.5
2960
2959.5
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS

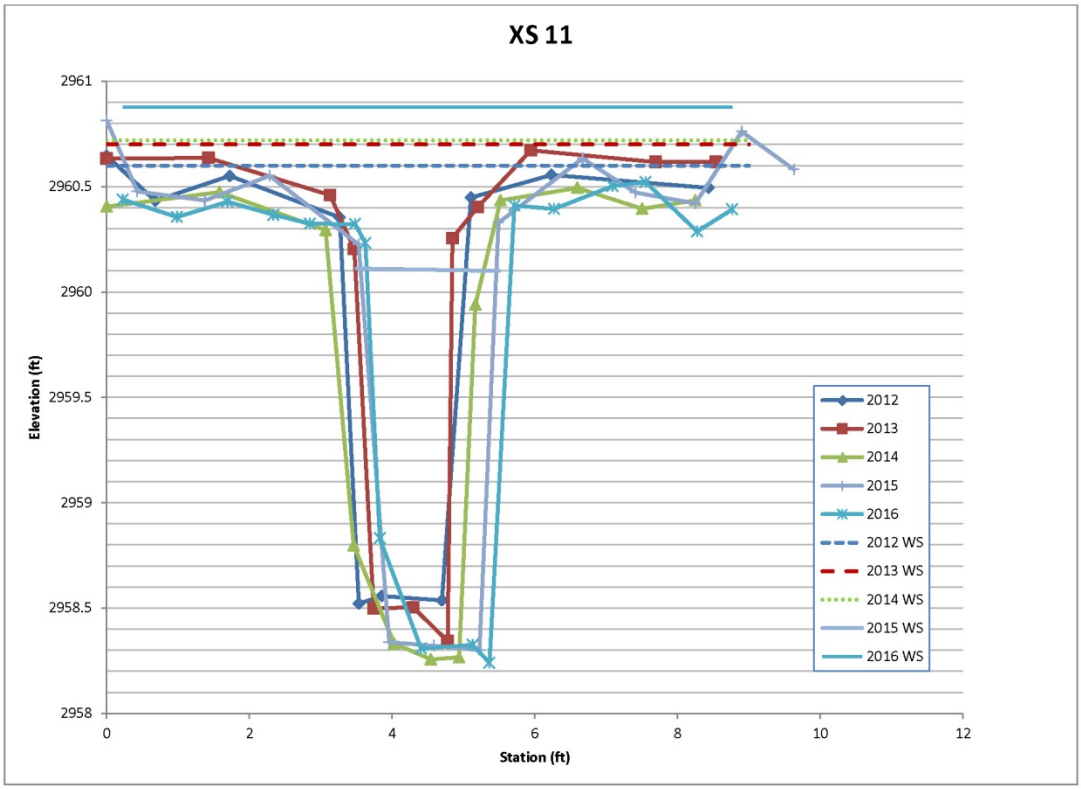

XS 6
2963
2962.5
2962
2961.5
2961
2960.5
2960
Elevation (ft)
0
1
2
3
4
5
6
7
8
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS


XS 7
2963
2962.5
2962
2961.5
2961
2960.5
2960
2959.5
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS


XS 8
2962.5
2962
2961.5
2961
2960.5
2960
2959.5
2959
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS


XS 9
2962.5
2962
2961.5
2961
2960.5
2960
2959.5
2959
2958.5
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS
Log in channel at cross section location preventing 2016 survey of river right channel toe.


XS 10
2962
2961.5
2961
2960.5
2960
2959.5
2959
2958.5
Elevation (ft)
0
2
4
6
8
10
12
14
16
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS


XS 11
2961
2960.5
2960
2959.5
2959
2958.5
2958
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2015
2016
2012 WS
2013 WS
2014 WS
2015 WS
2016 WS

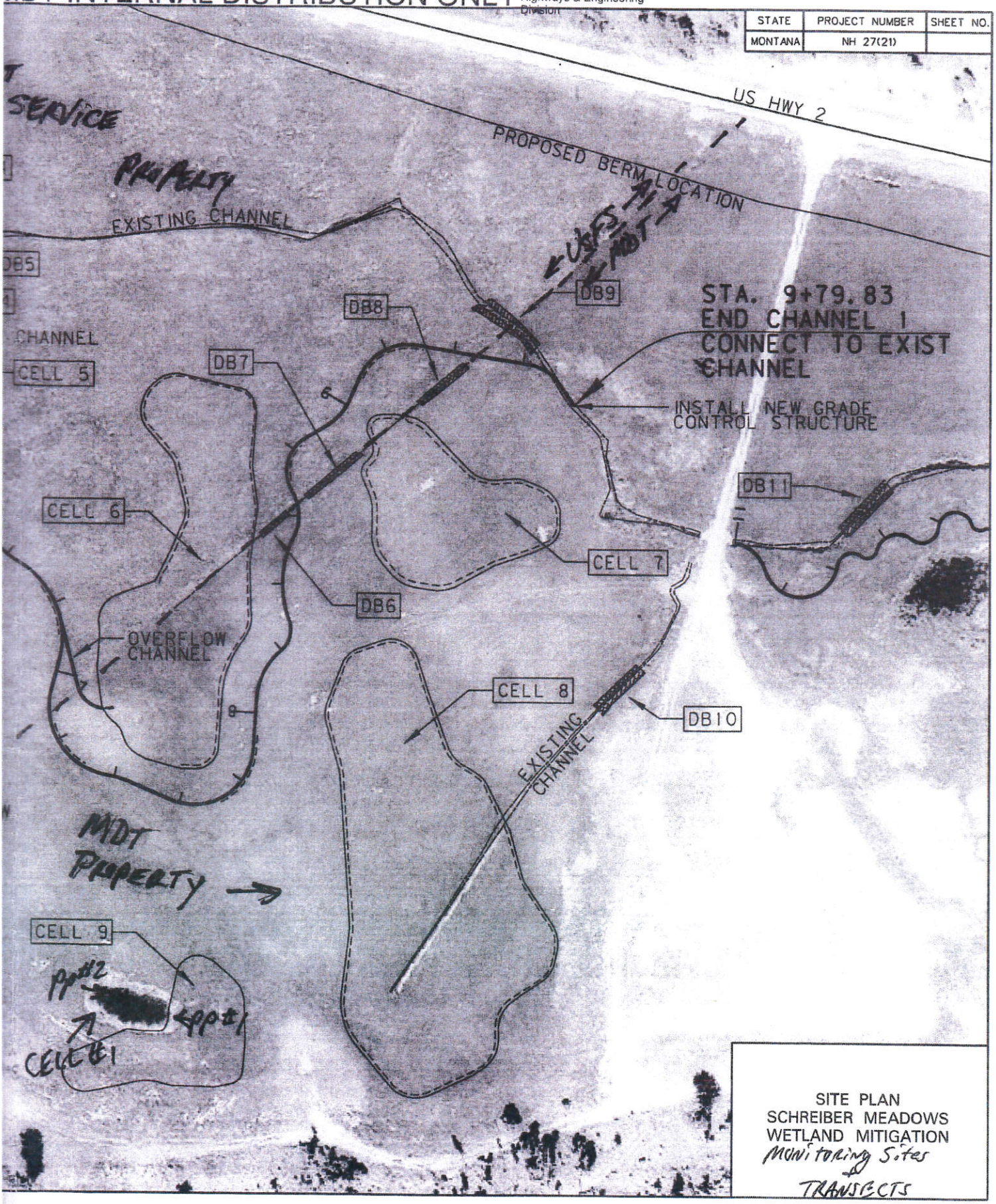
APPENDIX E
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

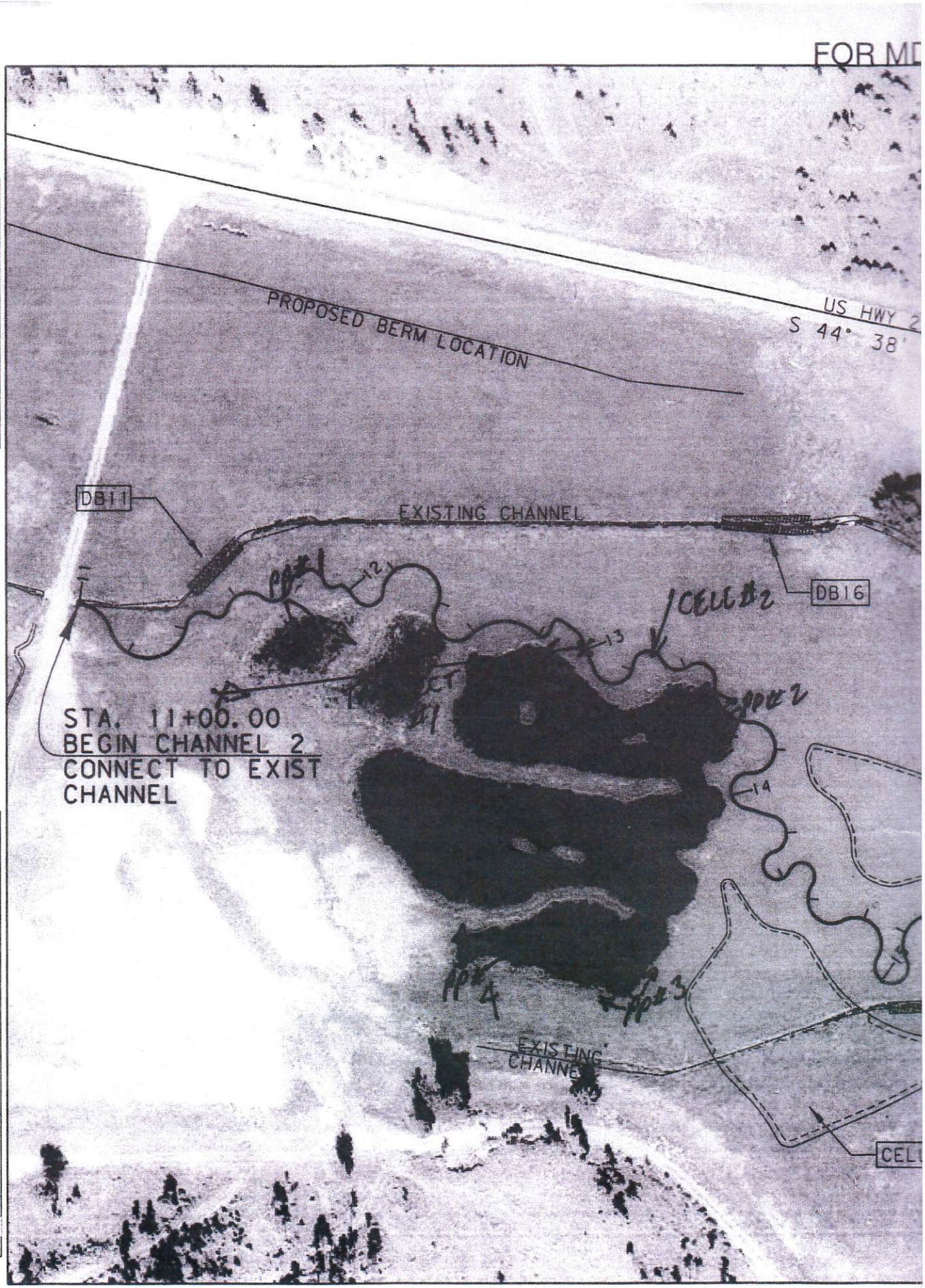
FOR M
FOREST
CELL 3
CELL 4
DB4
DB3
OVERFLOW
DB1
DB2
IST
CELL 2
CELL 1
OVERFLOW CHANNEL
USFS
MDT
MONTANA CADD
MDT MONTANA DEPARTMENT OF TRANSPORTATION
DAVID EVANS AND ASSOCIATES INC.
908 N. Howard St., Suite 300
Spokane Washington 99201
Phone: 509. 327. 8697
G:\dgn\d027rdpln001.dgn
6/3/2010
6:58:07 AM
CPS - U7713
DESIGNED BY
REVIEWED BY
CHECKED BY

MDT INTERNAL DISTRIBUTION ONLY 06/03/2010 Highways & Engineering Division

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 27(21)	

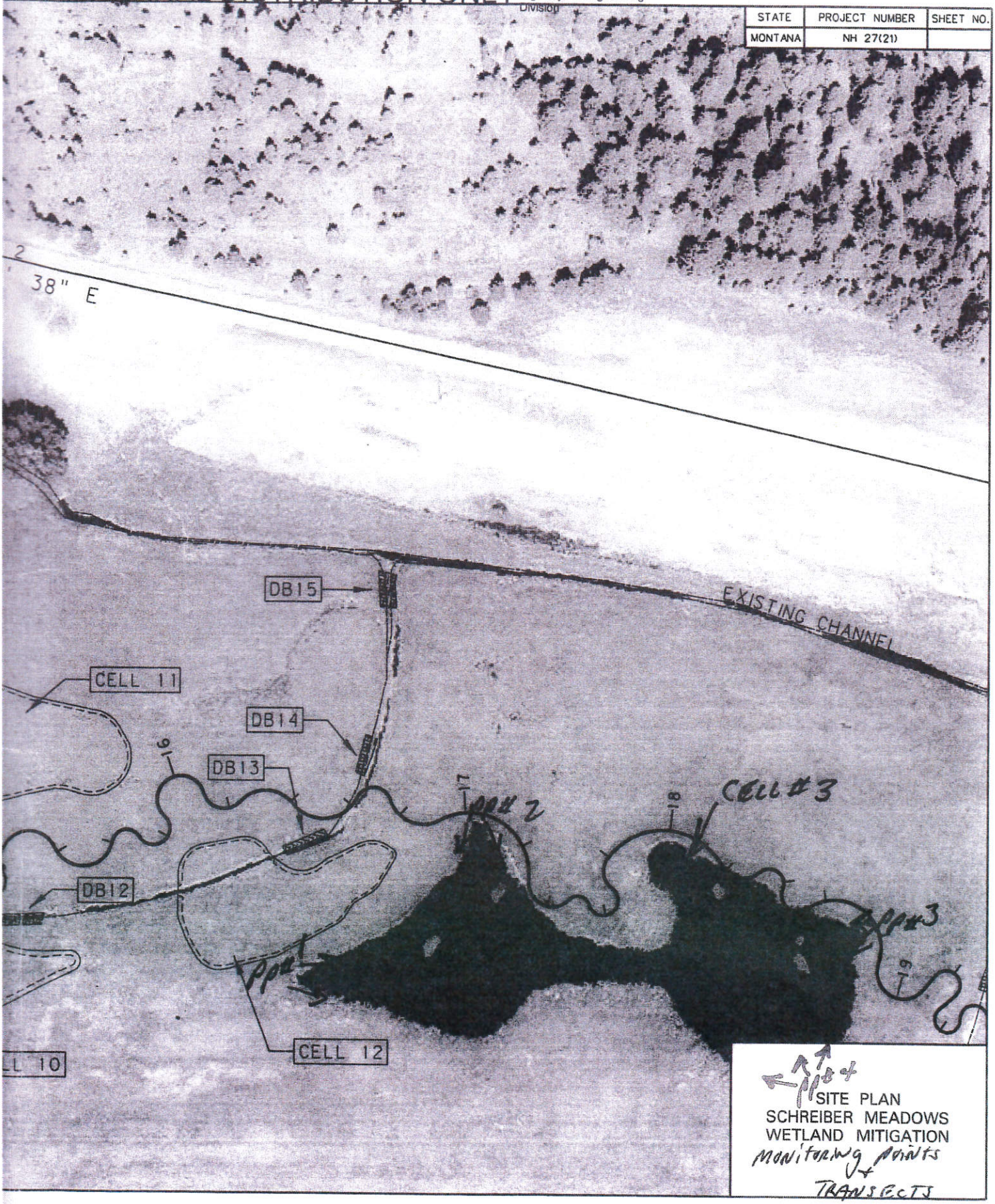


SITE PLAN
SCHREIBER MEADOWS
WETLAND MITIGATION
Monitoring Sites
TRANSECTS


FOR MD
PROPOSED BERM LOCATION
US HWY 2
S 44° 38'
DB11
EXISTING CHANNEL
DB16
CELL #2
STA. 11+00.00
BEGIN CHANNEL 2
CONNECT TO EXIST
CHANNEL
EXISTING CHANNEL
MONTANA CADD
MDT MONTANA DEPARTMENT OF TRANSPORTATION
DAVID EVANS AND ASSOCIATES INC.
508 N. Howard St., Suite 300
Spokane Washington 99201
Phone: 509. 327. 8697
c:\dgn\d02rdgn00 1. dgn
6/3/2010
6:58: 10 AM
CPS - 07713
DESIGNED BY
REVIEWED BY
CHECKED BY

MDT INTERNAL DISTRIBUTION ONLY 06/03/2010 Highways & Engineering Division

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 27(21)	



SITE PLAN
SCHREIBER MEADOWS
WETLAND MITIGATION
MONITORING POINTS
+
TRANSECTS