MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2015

Schrieber Meadows
Lincoln County, Montana

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

CONFLUENCE
PO Box 1133
Bozeman, MT 59771-1133

December 2015

MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND MITIGATION MONITORING REPORT:

YEAR 2015

Schrieber Meadows
Lincoln County, Montana
Pilot Project Constructed: 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:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

Confluence Consulting, Inc.
P.O. Box 1133
Bozeman, MT 59771

December 2015

CCI Project No: MDT.006

TABLE OF CONTENTS

1. INTRODUCTION....1

2. METHODS....7

2.1. Hydrology....7
2.2. Channel Cross-Sections....8
2.3. Vegetation....8
2.4. Soil....9
2.5. Wetland Delineation....9
2.6. Wildlife....10
2.7. Functional Assessment....10
2.8. Photo Documentation....10
2.9. GPS Data....10
2.10. Maintenance Needs....11

3. RESULTS....11

3.1. Hydrology....11
3.2. Channel Cross-Sections....12
3.3. Vegetation....13
3.4. Soil....25
3.5. Wetland Delineation....25
3.6. Wildlife....26
3.7. Functional Assessment....28
3.8. Photo Documentation....31
3.9. Maintenance Needs....31
3.10. Current Credit Summary....31

4. REFERENCES....38

TABLES

Table 1. USACE wetland credit ratios for the Schrieber Meadows Pilot Mitigation Site. 3
Table 2. Vegetation species identified in 2010 and 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site. 14
Table 3. Data summary for transect T-1 in 2010 and 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site. 19
Table 4. Data summary for transect T-2 from 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site. 21
Table 5. Data summary for transect T-3 from 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site. 23
Table 6. Total wetland acres delineated in 2010, 2012 thru 2015. 26
Table 7. Wildlife species observed at the Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015. 27
Table 8. Functions and Values of Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015. 30
Table 9. Summary of wetland mitigation credits at the Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015. 33
Table 10. Summary of Performance Standards and Success Criteria at Schrieber Meadows in 2015. 34
Table 11. Determination of Riparian Mitigation Credits for Schrieber Meadows. 36
Table 12. Determination of Stream Mitigation Credits for Schrieber Meadows. 36

CHARTS

Chart 1. Transect map showing community types on transect T-1 in 2010 and 2012 through 2015 from start (0 feet) to end (318 feet). 19
Chart 2. Length of habitat types within transect T-1 in 2010 and 2012 through 2015. 20
Chart 3. Transect map showing community types on transect T-2 from 2012 through 2015 from start (0 feet) to end (594 feet). 21
Chart 4. Length of habitat types within transect T-2 from 2012 through 2015. 22
Chart 5. Transect map showing community types on transect T-3 from 2012 through 2015 from start (0 feet) to end (440 feet). 23
Chart 6. Length of habitat types within transect T-3 from 2012 through 2015. 24

FIGURES

Figure 1. Project location for Schrieber Meadows Mitigation Site. 2
Figure 2. Monitoring Activity Locations……..Appendix A
Figure 3. Mapped Site Features……..Appendix A

APPENDICES

Appendix A Project Areas Maps – Figures 2 and 3
Appendix B 2015 MDT Wetland Mitigation Site Monitoring Form
2015 USACE Wetland Determination Data Forms
2015 MDT Wetland Assessment Forms
Appendix C Project Site Photographs
Appendix D Surveyed Stream Cross Sections (XS1-XS11)
Appendix E Project Plan Sheet

Cover: View of inundated excavated cell with emergent vegetation around margins.

1. INTRODUCTION

The Schrieber Meadows Wetland Mitigation 2015 Monitoring Report presents the results of the fifth year of post-construction monitoring at the Schrieber Meadows mitigation area for three pilot cells constructed in 2007 and of the fourth year of post-construction monitoring for the remaining cells and new stream channels constructed during fall 2011. Monitoring was not completed in 2011 due to 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 (Figure 1). The 57-acre site lies within the boundaries of Watershed #1 – Kootenai River Basin. The majority of the site is situated on an MDT-owned parcel of land that consisted of hay fields, pastures, and clear-cut forest slopes. The remainder of the 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 eventually drains into Schrieber Lake and the Fisher River. Schrieber Meadows is situated within a narrow valley corridor bordered on the west and north sides by the Kootenai National Forest. The US Highway 2 corridor bounds the area to the east. The south boundary of this site is bordered by a second MDT-owned property (Schrieber Lake parcel) and Plum Creek Timber lands.

Figures 2 and 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 Region (USACE 2010), 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 construction of 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 in an effort 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 using a variety of herbaceous wetland species.
- Restore (rehabilitate) 1.12 acres of degraded wetlands dominated by pasture grasses through the permanent restoration of hydrology, excavation of shallow depressions, and revegetation with wetland seed.
- Develop 2.96 acres of upland buffers around the created wetland areas.

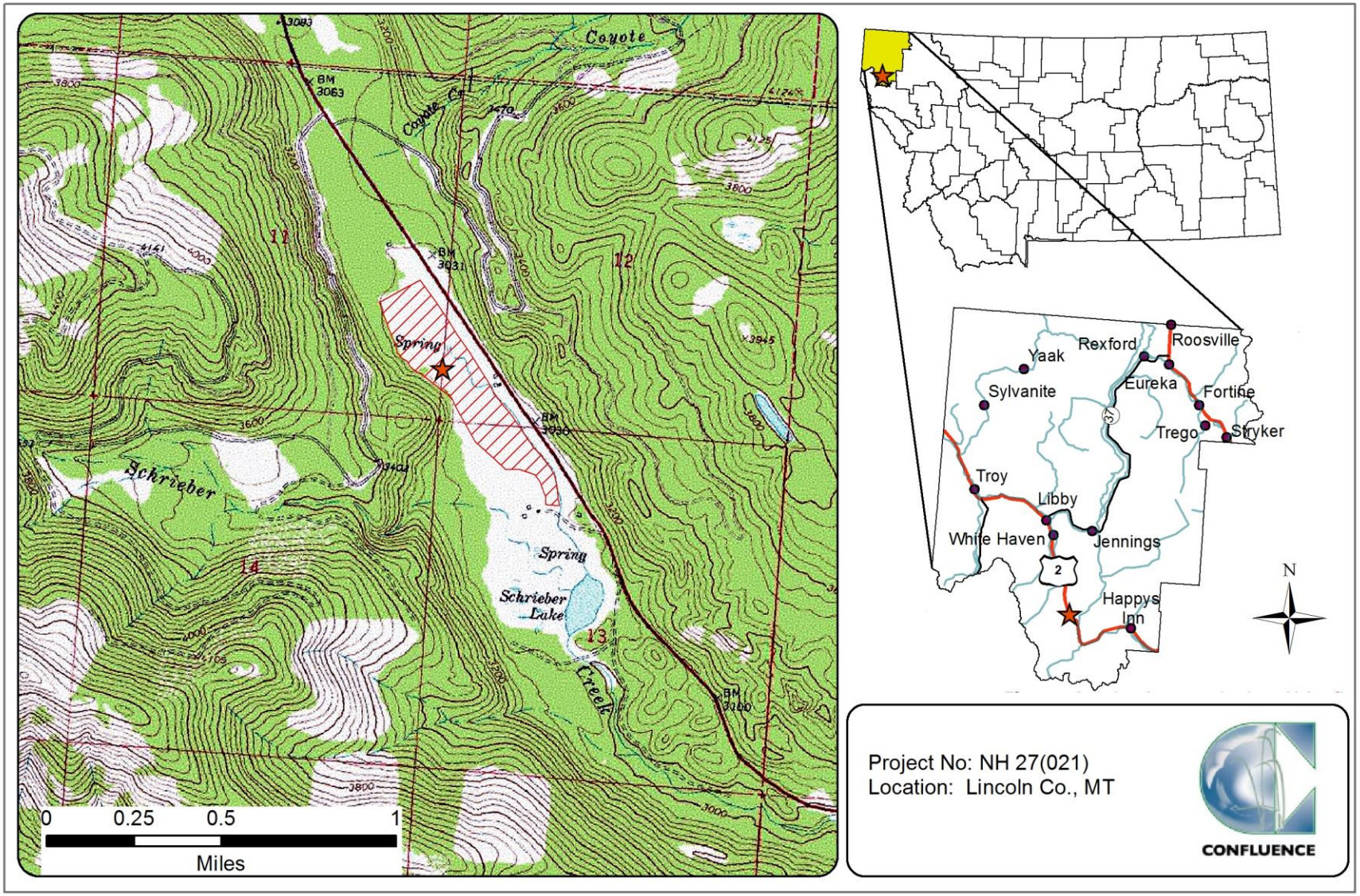


Figure 1. Project location for Schrieber Meadows Mitigation Site.

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

Table 1. USACE wetland credit ratios for the Schrieber Meadows Pilot Mitigation Site.

Wetland Mitigation	Acreage	Ratio	Credit Acres
Creation - Northwestern Cell	0.08	1:1	0.08
Creation - Central Cell	2.01	1:1	2.01
Creation - Southeast Cell	0.29	1:1	0.29
Restoration/Rehabilitation - Southeast Cell	1.12	1.5:1	0.75
Upland Buffer (50 feet)	2.96	5:1	0.59
Project Impacts	0.00	None	
Total Mitigation Acreage	**6.46**		**3.72**

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, limiting 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 in order to allow for natural channel migration and overbank flooding. The elevation of the restored channels 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 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 construction of the pilot project in 2007. The acreage included creation, restoration (rehabilitation), and upland buffer credits. The entire Schrieber Meadows mitigation project encompassed the creation of additional depression wetland cells and buffer areas within upland and degraded wetlands, enhancement of scrub/shrub palustrine wetlands, and reconstruction of the Coyote and Schrieber Creek channels. The MDT anticipates the development of 17.84 wetland credit acres 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 were to:

Wetland Mitigation

- 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 through the restoration (rehabilitation) of 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 through the permanent restoration of hydrology, land surface manipulation (excavating shallow depressions), and re-vegetation with wetland plant seed;
- Provide approximately 4.41 wetland credit acres through the enhancement of 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 through the development of upland buffers totaling 8.50 acres (at 5:1 ratio) around the created, restored and enhanced wetland areas and stream riparian corridors;
- Impact approximately 0.08 acres of wetlands through the installation of 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; and

Stream Mitigation

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

Prior to the construction of the Schrieber Mitigation 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. It is anticipated

that through these restoration efforts, the overall project will provide increased functional ratings to the existing wetlands and stream corridor by:

- 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 ground water and surface water hydrology to restore existing degraded wetland communities, and
- 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, and with a seasonal groundwater table within 0.5 to 3 feet of the pre-construction ground elevation during the spring. The seasonal groundwater is expected to provide the necessary hydrology for the majority of the created depression wetland systems. It is also anticipated that the raised bed elevation of the newly restored stream reaches will 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 (*Phalaris arundinacea*) were removed from the site as an intended consequence of wetland cell excavation and restoration actions. The constructed wetland cells and streambanks were reseeded following 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.

The approved performance standards for the mitigation activities are listed below (MDT 2009).

1. **Wetland Characteristics**: All 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* (Environmental Laboratory 1987) and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010).
    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. Since 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 ≥70 percent and Montana State-listed noxious weeds do not exceed 5 percent absolute cover.

The following concept of "dominance", as defined in the 1987 USACE Wetland Delineation 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 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.
    i. **Vegetation Success** will be achieved where combined aerial cover of riparian and stream bank vegetation communities is ≥70 percent and Montana State-listed noxious weeds do not exceed 10 percent cover, subject to the woody standards listed below.
    ii. **Woody Plants** – 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.
    i. 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.
    ii. The intent of the stream restoration is to allow for 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 banks are vegetated with a majority of deep-rooting riparian plant species having root stability indexes ≥6 (subject to 3.i and 3.ii above).
5. **Open Water:** It is the intent of the project to provide open water during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, it is anticipated that vegetation will 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 disturbed by project construction must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.
7. **Weed Control** will be based upon annual monitoring of the site to determine weed species and degree of infestation within the site. Based upon the monitoring results, control measures will be implemented by MDT to minimize and/or eliminate the intrusion of State Listed Noxious weed species within the site. The MDT managed the property to control known weed problems (knapweed and houndstongue) prior to the initiation of wetland construction activities within the site.

2. METHODS

The annual monitoring event was conducted on July 20th, 2015, and represented the fifth year of monitoring for the pilot project and fourth year of monitoring of the entire Schrieber Meadows mitigation site. Information contained on the Mitigation Monitoring Form and Wetland Determination Data Forms was recorded during the field investigation (Appendix B). Monitoring activity locations were mapped using a global positioning system (GPS) (Figure 2, Appendix A). Information collected included a wetland delineation; wetland/open water/aquatic habitat boundary mapping; vegetation community mapping; vegetation transect monitoring; soils, hydrology, bird and wildlife use documentation; photographs; stream cross-sections at 11 established stations; functional assessments; and a non-engineering examination of the infrastructure established within the mitigation project area. Monitoring of this MDT mitigation site has been based upon the MDT standard monitoring protocols for both stream and wetland areas utilized for all MDT mitigations 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

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 (usually 14 days or 12.5 percent or more during the growing season)" (USACE 2010). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered wetlands. The growing season is defined for purposes of this report

as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28.5 degrees Fahrenheit (Environmental Laboratory 1987). The growing season recorded for the meteorological station at Libby 32 SSE (245020), located approximately eight miles northwest of the project, extends from June 13 to September 1 for a total of 81 days (NRCS 2010). Areas 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.

The presence of hydrologic indicators as outlined on the USACE Routine Wetland Determination Data Forms (USACE 2010) were documented at two data points established within the project area. The hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on electronic field data sheets (Appendix B). Onsite hydrologic assessments allowed evaluation of mitigation criteria addressing inundation/saturation requirements.

Groundwater monitoring wells have been installed on the site. However, due to high groundwater table and persistent inundation of the area, these wells have not been monitored. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data was recorded electronically on the Wetland Determination data form (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 streambank vegetation development. Eleven permanent cross-sections were established across the constructed streams during the 2012 site visit (Figure 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 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 indexes. The survey cross-section data shown in Appendix D are used to evaluate temporal changes in stream stability.

2.3. Vegetation

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

3, Appendix A). The percent cover of identified species within a community type was estimated and recorded on the monitoring form using the following ranges: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to 10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Appendix B).

Temporal changes in vegetation were evaluated through annual assessments of three vegetation belt transects 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 State Noxious Weed List (July 2015), prepared by the Montana Department of Agriculture, was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photo (Figure 3, Appendix B). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■" representing 0 to 0.1 acre, 0.1 to 1.0 acre, or greater than 1 acre in extent, respectively. Cover classes are represented on Figure 3 (Appendix A) by T, L, M, or H, for less than 1 percent, 1 to 5 percent, 6 to 25 percent, and 26 to 100 percent, respectively.

2.4. Soil

Soil information was obtained from the *Lincoln County Soil Survey* and *in situ* soil descriptions accessed from the NRCS official soil description website (USDA 2010). Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 wetland manual and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010). 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 (WUS), including jurisdictional wetlands and special aquatic sites, were delineated throughout the project area in accordance with criteria established in the 1987 Wetland Manual and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010).

In order to delineate a representative area as wetland, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology, as described in the 1987 Wetland Manual and 2010 Regional Supplement, must be satisfied. The name and indicator status of plant species were derived from the 2014 National Wetland Plant List (NWPL) (Lichvar *et al*., 2014). A Routine Level-2 On-site Determination Method (USACE 2010) was used to delineate wetland areas

within the project boundaries. The information was recorded electronically on the Wetland Determination Data form (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 a special aquatic site, an atypical situation, or a problem area. The wetland boundary was GPS surveyed and identified on 2015 aerial photography. Wetland areas were estimated using geographic information system (GIS) methods.

2.6. Wildlife

Observations of use by mammal, reptile, amphibian, and bird species were recorded on the wetland monitoring form during the site visit. Indirect use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list for the entire site is maintained and reported each year.

2.7. Functional Assessment

The 2008 MDT MWAM has been used to evaluate functions and values on the site since post-construction monitoring began. This method provides an objective means of assigning wetlands an overall rating and provides regulators 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. A Functional Assessment Form was completed for each wetland or group of wetlands (Assessment Areas [AAs]) (Appendix B).

2.8. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland conditions, trends, current land uses surrounding the site, upland buffer and monitored area conditions, and vegetation transect composition. Photographs were taken at established photo points throughout the mitigation site, at the transect end points, at each wetland determination data point, and at each surveyed cross-section during the site visit (Appendix C). Photo point locations were recorded with a resource-grade GPS unit (Figure 2, Appendix A).

2.9. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit and a Trimble GeoHX GPS unit during the 2015 monitoring

season. The collected data were then transferred to a personal computer, imported into GIS, and presented in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included photographic points, transect endpoints, wetland boundary, and wetland data points.

2.10. Maintenance Needs

Channels, engineered structures, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. The examination was cursory rather than an engineering-level inspection.

3. RESULTS

3.1. Hydrology

Climate data from the Libby 30 SSE, Montana (245020) weather station recorded an average total annual precipitation rate of 24.44 inches from 1949 to 2015 (WRCC 2015). Annual precipitation for 2010, 2011, 2012, 2013 and 2014 was 22.01, 22.64, 27.19, 19.18 and 25.75 inches, respectively. Average monthly precipitation totals from January to August for the period of record was 14.99 inches. Precipitation totals recorded from January to August were 15.05 inches (2011), 16.2 inches (2012), 10.01 inches (2013), 15.06 inches (2014), and 11.14 inches (2015). In general, the region surrounding the project area exhibited above-average precipitation in 2011, 2012, and 2014 and below-average precipitation in 2013 and 2015 prior to and during the growing season.

During the 2015 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 assessment area 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 due to 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 Schrieber Creek was dry in July 2015 north of the spring, located 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 driving 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 visible on aerial photographs, geomorphic positions, positive FAC-neutral test, and a seasonal high groundwater table.

Two data points were sampled in 2015 to determine the wetland/upland boundaries. Data point SP-1 was located near an excavated wetland cell within wetland community Type 3 (Figure 2, Appendix A). The wetland data point exhibited a high water table, geomorphic position, and a positive FAC-Neutral test. Upland data point SP-2 was located upslope (west) from SP-1 within upland community Type 9. There were no hydrologic indicators observed data point SP-2.

3.2. Channel Cross-Sections

The survey results for eleven permanent cross-sections (XS) established along the constructed Coyote and Schrieber Creeks (Figure 2, Appendix A) are shown in Appendix D. The 2015 data was compared to the previous surveys to assess stream channel stability.

In general, the banks of the constructed channels were well vegetated and exhibited stable conditions. In the upper reaches of the site, including XS-1 through XS-3, streambank vegetation was dominated by a combination of creeping meadow-foxtail (*Alopecurus arundinaceus*), field meadow-foxtail (*Alopecurus pratensis*), American slough grass (*Beckmannia syzigachne*), and various sedges (*Carex* spp.). Sedges identified on site generally have a root stability index of six or greater with American slough grass supporting a stability rating of 8. No stability ratings are available for creeping or field meadow-foxtail. Below the site access road across the stream, streambank vegetation is dominated by nearly 100 percent reed canary grass (*Phalaris arundinacea*), which has a root stability rating of nine.

With the exception of XS-3, XS-9 and XS-10, there were minimal changes within the surveyed cross section geometry between 2012 and 2015. Cross-section 3 was located directly below a spring in the reach of 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 and 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 over the 2012 to 2015 period. Photographs of XS-3, shown on page C-25 of Appendix C, display well-vegetated streambanks and abundant in-stream vegetation. The survey at XS-9 from 2013 to 2014 was intentionally mislocated upstream or downstream of the 2012 survey location, to avoid disturbance of channel morphology and large woody debris that had been installed after the 2012 survey. The 2013 and 2014 survey data, taken outside the zone of influence of the installed woody debris, document that the channel is stable in the vicinity of XS-9, 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 of the channel. The permanent bank pins could not be located at XS-10 during the 2013 and 2014 surveys as a result of a robust stand of reed canary grass obscuring the ground surface. A cross-section survey was completed at the

approximate location; however, post-processing of the GPS survey data indicated 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 photos document that the site is well vegetated and stable, and the apparent minor adjustment in channel morphology is as likely the result of survey error and marshy substrate conditions as to actual movement. Photographs on page C-32 of Appendix C show well-established reed canary grass stands at this cross section with no erosion identified during the field survey. All cross section locations thus demonstrate stable banks that are well vegetated with species that possess high root-stability indices.

3.3. Vegetation

A comprehensive list of 131 plant species identified on the site from 2010 to 2015 is presented in Table 2. There were six wetland and two upland community types identified and mapped at the mitigation site in 2015 (Figure 3, Appendix A). Individual plant species observed within each community are listed on the Monitoring Form (Appendix B). Open water below the ordinary high water mark (OHWM) of the constructed stream channel is identified on Figure 3 (Appendix A) by polygon 10. The vegetation community types identified on the site in 2015 are discussed below.

Wetland community Type 3 – *Phalaris arundinacea* was the largest vegetation community on the site in 2015, covering 20.44 acres of the project area. Reed canary grass dominated the community. The reed canary grass on-site was over six feet tall in some areas. Open water accounted for 11 to 20 percent of the community. Speckled alder (*Alnus incana*), stalk-grain sedge (*Carex stipata*), fringed willowherb (*Epilobium ciliatum*), water smartweed (*Persicaria amphibia*), and green algae were present at one to five percent cover. Six additional species were identified in this community at less than one percent cover.

Wetland community Type 5 – Aquatic Macrophytes/Open Water encompassed 10.3 acres of the excavated cells throughout the site. The cells constructed in 2011 exhibited a large variability of aquatic plant development which appeared dependent upon whether the water regime within the cell was intermittent or perennial. In general, the cells located toward the north boundary (up-gradient) 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 down-gradient 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, broad-leaf cat-tail (*Typha latifolia*) and other unidentified aquatic macrophytes that were common within the deeper water. A total of 15 species, including Nebraska sedge (*Carex nebrascensis*), and common spike-rush (*Eleocharis palustris*), were identified within this community in 2015. Open water and bare ground each accounted for 21 to 50 percent of the community.

Table 2. Vegetation species identified in 2010 and 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
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
Alnus incana	Speckled Alder	FACW
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
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

[1] 2014 NWPL (Lichvar *et al* ., 2014)

New species identified in 2015 are **bolded**.

Table 2. (continued). Vegetation species identified in 2010 and 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
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
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

[1] 2014 NWPL (Lichvar *et al* ., 2014)

New species identified in 2015 are **bolded**.

Table 2. (continued). Vegetation species identified in 2010 and 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
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 sceleratus	Cursed Buttercup	OBL
***Rosa* sp.**	**Rose**	**NL**
Rumex acetosella	Common Sheep Sorrel	FACU
Rumex crispus	Curly Dock	FAC
Salix candida	**Sage Willow**	**OBL**
Salix drummondiana	Drummond's Willow	FACW
***Scirpus* sp.**	**Bulrush**	**NL**
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**
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

[1] 2014 NWPL (Lichvar *et al* ., 2014)

New species identified in 2015 are **bolded**.

Wetland community Type 6 – *Alopecurus pratensis/Agrostis capillaris* was located across 13.12 acres surrounding 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*), and nineteen other species.

Wetland community Type 7 – *Juncus bufonius*/Bare Ground was located on 0.25 acres in 2015, a considerable decrease from 1.70 acres identified in 2013. This community was generally mapped around the perimeter of the constructed cells in 2012. Community Type 7 was mapped in 2015 in the lower contours of an excavated wetland cell in the 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*), and paiuteweed (*Suaeda calceoliformis*), and 11 other species were observed in 2015. Approximately 21 to 50 percent of the community was bare ground, 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 the cells and stream channels. This area has been re-seeded several times following construction in 2011 due to continued use of the spoil pile to provide topsoil to other MDT construction projects. 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, tall hedge-mustard (*Sisymbrium altissimum*), and Canadian thistle (*Cirsium arvense*).

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*), great plantain (*Plantago major*), common dandelion (*Taraxacum officinale*), and 10 additional species.

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 to 50 percent of the cover within the community due to 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, replacing 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 2015, with lesser cover from 10 additional species. This community contained a trace amount of Priority 2A noxious weed, orange hawkweed (*Hieracium aurantiacum*), and a low amount of Priority 2B noxious weed, ox-eye daisy (*Leucanthemum vulgare*).

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 to 2015 were primarily the result of 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 in accord with fluctuating seasonal water levels.

Trends in plant species composition were measured along three belt transects (T-1, T-2, and T-3) in 2015. Photographs of the transect end points are shown on pages C-35 to C-40 of Appendix C. One 318-foot transect, T-1, was established during initial monitoring at the site in 2010. Table 3 and Charts 1 and 2 summarize the data for T-1 (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 2015, a decrease of nearly five percent since 2014. Open water accounted for 80.2 percent of the transect, an increase of nearly five percent since 2014. This transect has not intersected any upland vegetation communities from 2012 through 2015.

Table 3. Data summary for transect T-1 in 2010 and 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site.

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

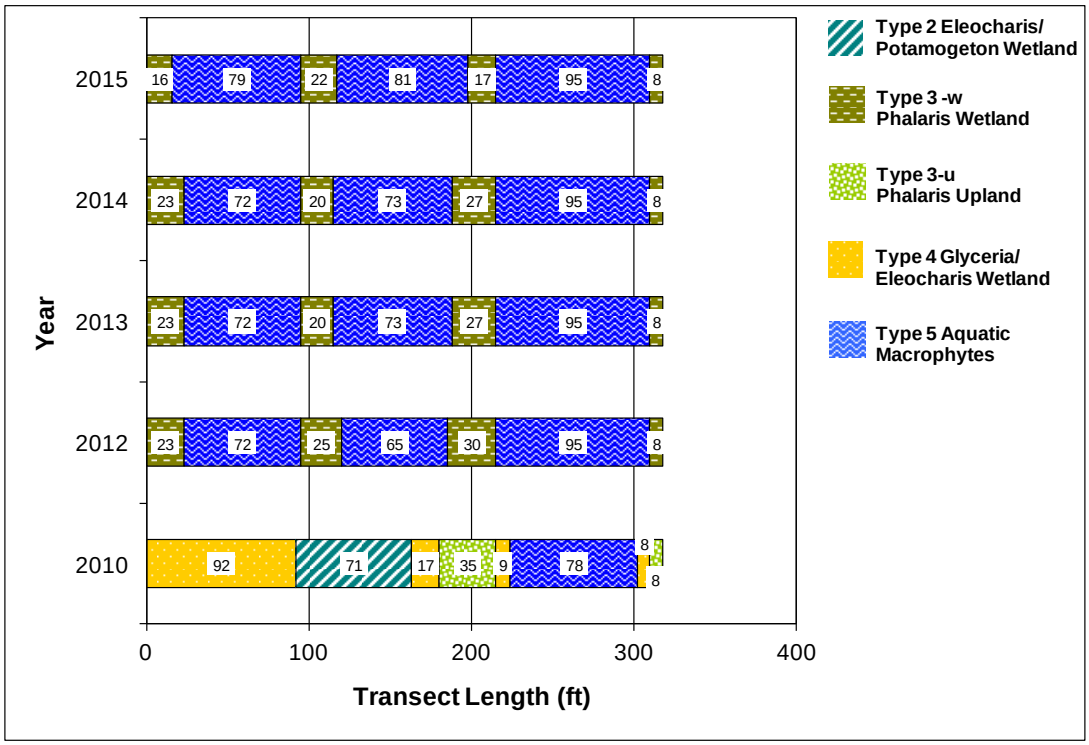


Chart 1. Transect map showing community types on transect T-1 in 2010 and 2012 through 2015 from start (0 feet) to end (318 feet).

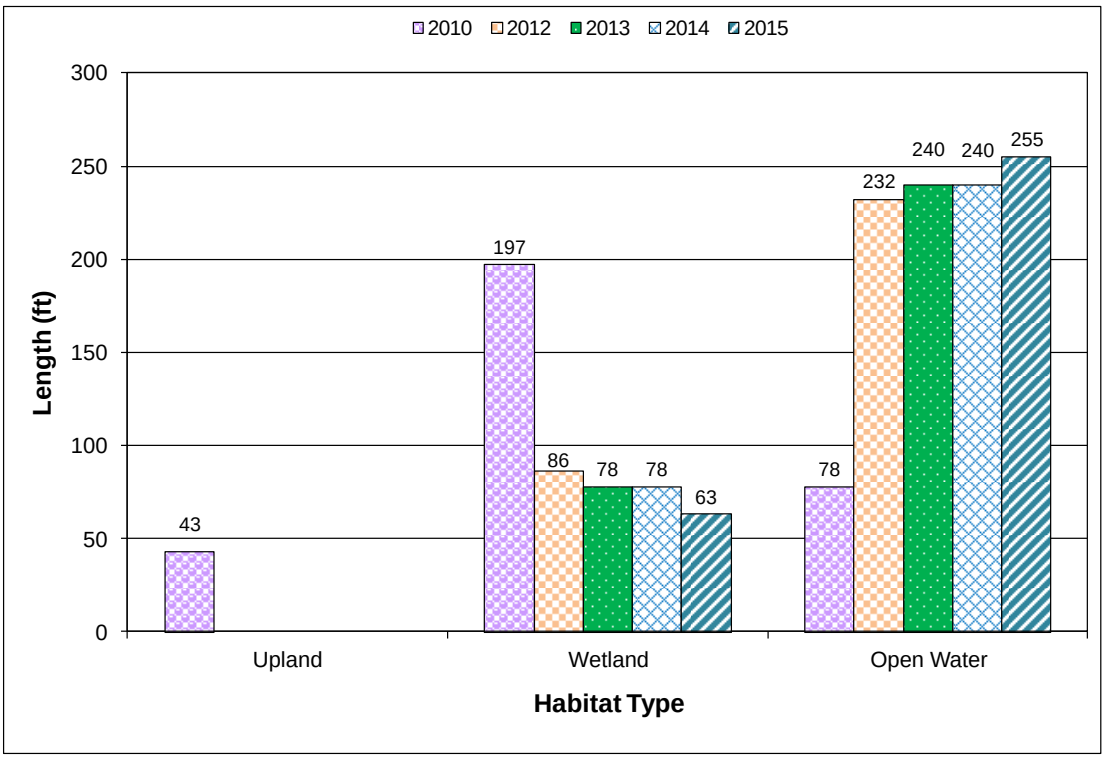


Chart 2. Length of habitat types within transect T-1 in 2010 and 2012 through 2015.

Transect T-2 was established in 2011 across three constructed cells within the northwestern section of the project site (Figure 2, Appendix A). The data recorded on Transect T-2 (Monitoring Form, Appendix B) are summarized in tabular and graphical formats in Table 4 and Charts 3 and 4, respectively. Transect T-2 extends 594 feet from west to east across wetland cells 2A, 3A, and 4A. The transect intervals alternated between 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 comprised approximately 58.1 percent of the transect during the 2015 survey. A total of 43 species were identified, including 30 hydrophytes and 13 upland species. Open water and mudflat represented 7.7 and 34.2 percent of the transect intervals, respectively. Less open water was observed along the transect in 2015, likely a result of below-average precipitation in June and drought conditions across the region.

Table 4. Data summary for transect T-2 from 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site.

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

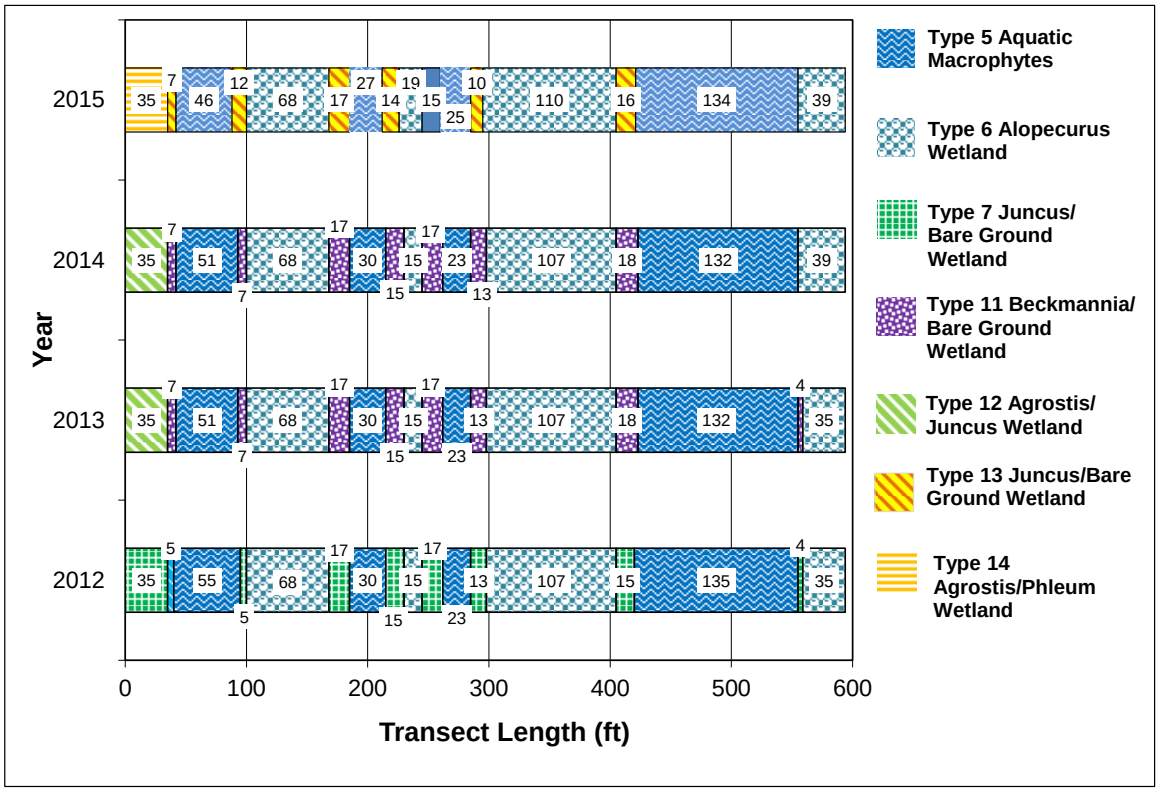


Chart 3. Transect map showing community types on transect T-2 from 2012 through 2015 from start (0 feet) to end (594 feet).

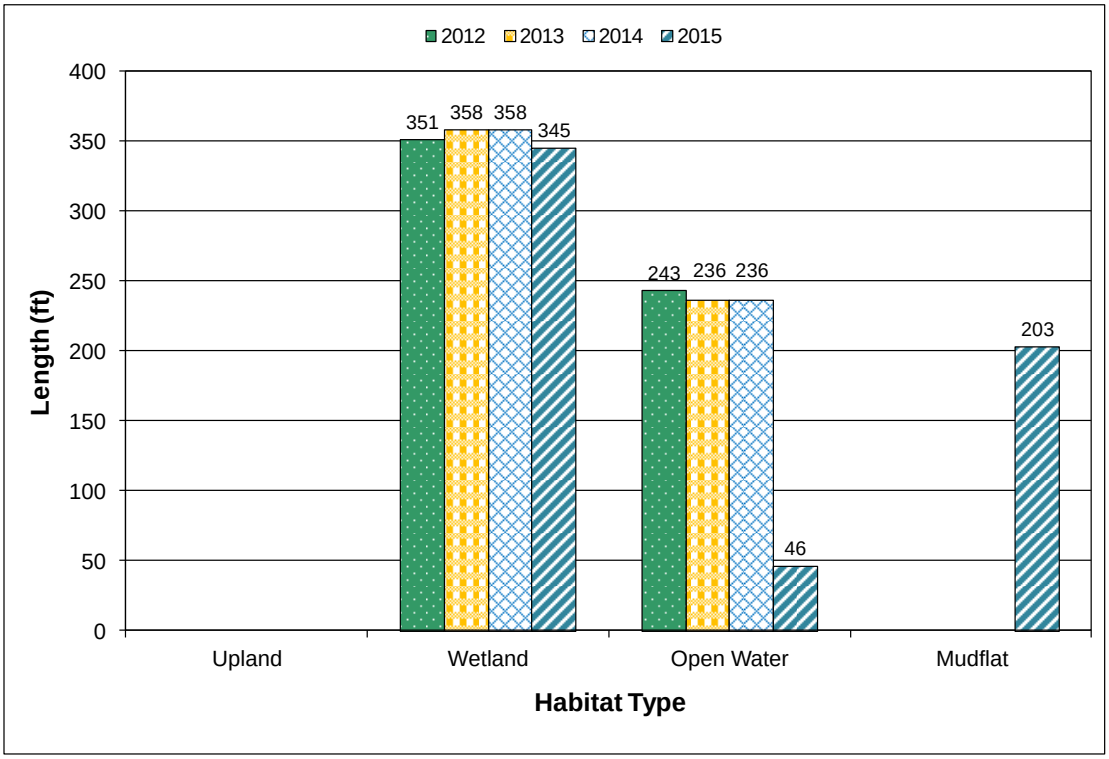


Chart 4. Length of habitat types within transect T-2 from 2012 through 2015.

Transect 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 Transect T-3 (Monitoring Form, Appendix B) are summarized in tabular and graphical formats in Table 5 and Charts 5 and 6, respectively. The transect intervals alternated between wetland community Types 3 – *Phalaris arundinacea* and 5 – Aquatic macrophytes/Open Water. Hydrophytic vegetation comprised approximately 46 percent of the transect during the 2015 survey. Only eleven 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, an increase of seven percent since 2014.

Table 5. Data summary for transect T-3 from 2012 through 2015 at the Schrieber Meadows Wetland Mitigation Site.

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

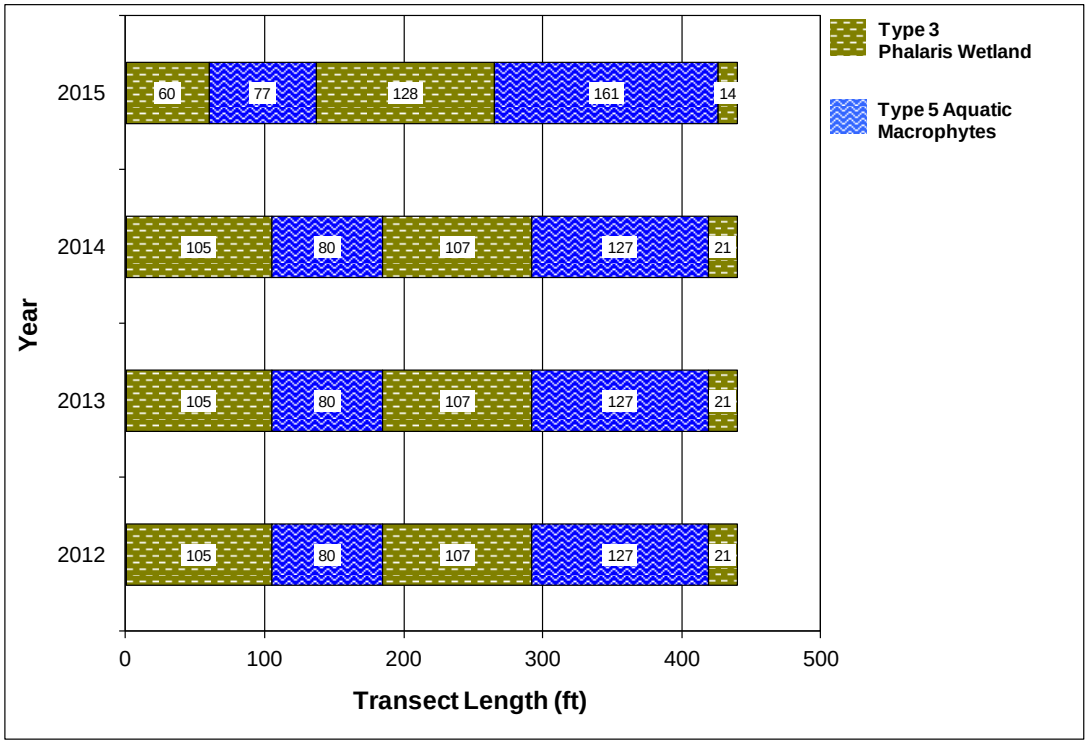


Chart 5. Transect map showing community types on transect T-3 from 2012 through 2015 from start (0 feet) to end (440 feet).

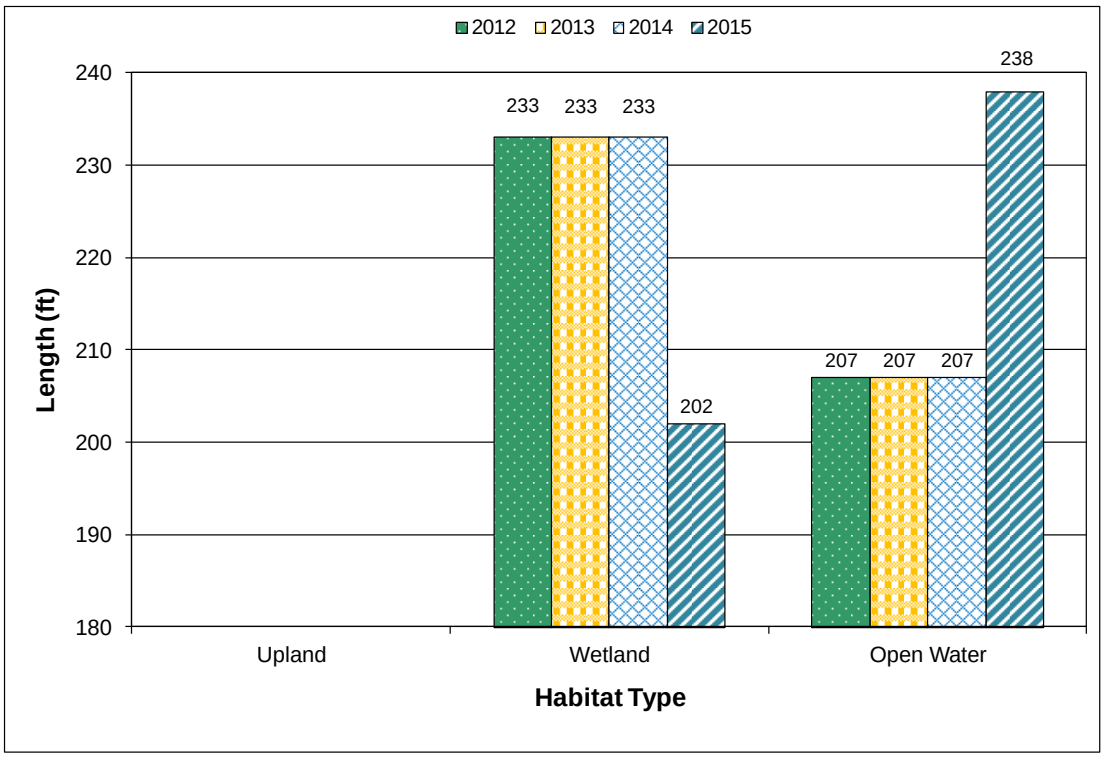


Chart 6. Length of habitat types within transect T-3 from 2012 through 2015.

Eleven infestations of Montana Listed Priority 2B noxious weeds, Canadian thistle and ox-eye daisy, and one infestation of Montana Listed Priority 2A noxious weed, orange hawkweed, were mapped across the Schrieber Meadows mitigation site in 2015 (Figure 3, Appendix A). Nine infestations of Canadian thistle, two infestations of ox-eye daisy, and one infestation of orange hawkweed were identified in areas less than 1.0 acre in size with cover classes ranging from trace (less than 1 percent) to moderate (6 to 25 percent). A weed contractor with MDT treated nearly four acres of the site in July 2015, with treatment concentrated in areas of infestation by the three noxious weed species observed on site. The 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.

One thousand speckled alders (*Alnus incana*) were planted along the newly constructed stream channel and pond in the northern third of the site. Fifty-six live plants were observed throughout the mitigation site in 2015, indicating 5 percent survival. Several of the alder trees were re-sprouting from the roots, while the above-ground portion of the plants were dead. The remaining alders appeared to be doing well and are expected to persist. Eight willows (*Salix* spp.) were observed near the spring north of the access road. The prevalence of reed canary grass and high water table will likely inhibit shrub development within this site.

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 2010).

Soil test pits were excavated at two locations to evaluate the extent of hydric soil development. Data point SP-1 was located in wetland community Type 3 in the center of the site and data point SP-2 was located up-slope of SP-1 in upland community Type 9. The soil profile in SP-1 revealed an eight inch upper layer of fibric peat above a dark grayish brown (10YR 4/2) silty clay loam with 1 percent dark yellowish brown (10YR 4/4) redoximorphic concentrations in the matrix. The soil met the criteria for histic epipedon and classification as a hydric soil. The soil profile at SP-2 revealed a very dark grayish brown (10 YR 3/2) silt loam, with no hydric soil indicators observed.

3.5. Wetland Delineation

The wetland delineation conducted in 2004 and 2005 prior to project initiation identified four different wetland areas totaling approximately 15.56 acres within the mitigation project area. The pilot project constructed in 2007 resulted in the development of an additional 2.38 acres of wetland habitat within the project boundary. The delineation conducted in 2012 following completion of the second construction phase mapped a total of 47.58 acres of wetlands across the 56.95-acre site. The total wetland acreage delineated in 2013 through 2015 was 47.61 acres, which represented a slight increase of 0.03 acre. 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 south 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 resulting from the seasonally intermittent Upper Coyote Creek reach were observed in the upgradient, northern region of the mitigation area. The creek flow is perennial 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 acres of the site. A total of 47.95 acres of jurisdictional wetland were delineated at the Schrieber Meadows mitigation site in 2015 (Table 6).

Table 6. Total wetland acres delineated in 2010, 2012 thru 2015.

Wetland Habitat Type	2010 Acres	2012 Acres	2013 Acres	2014 Acres	2015 Acres
Pre-existing Wetland Area inside geotechnical limits adjacent to US 2 (MDT & USFS)	1.12	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
Open Water Riverine Habitat	0.00	0.34	0.34	0.34	0.34
TOTAL WETLAND HABITAT	**4.84**	**47.92**	**47.95**	**47.95**	**47.95**

3.6. Wildlife

A list of animal species observed directly or indirectly in 2010 and 2012 through 2015 is presented in Table 7. Fourteen bird species were identified onsite in 2015. Birds observed using open water areas included Canada geese (*Branta canadensis*) and Cinnamon teal (*Anus cyanoptera*). Goose scat and grazed grasses were observed west of the ponds in the southern portion of the site. Other wildlife observed directly included one ground squirrel, three meadow voles (*Microtus pennsylvanicus*), two Columbia spotted frogs (*Rana luteiventris*) and one rubber boa (*Charina bottae*). The tracks of deer (*Odocoileus* sp.) and elk (*Cervus canadensis*) were also noted in 2015.

Table 7. Wildlife species observed at the Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015.

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***
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*
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***

Species identified in 2015 are **bolded**.

Table 7. (continued). Wildlife species observed at the Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015.

FISH	
Pumpkinseed	*Lepomis gibbosus*
REPTILE	
Common Gartersnake	*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 identified in 2015 are **bolded**.

3.7. Functional Assessment

The 2008 MDT MWAM was used to evaluate the site in 2010 and 2012 through 2015. The functional assessment 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 wetlands cells, restored wetlands, and enhanced wetlands. These additions resulted in the assessment of three separate AAs from 2012 to 2015 (Table 8). The score for Listed/Proposed T&E Species Habitat function was increased to high due to the presence of grizzly bears in the area as reported by MFWP and USFWS biologists in 2015.

The 2012 to 2015 **restoration AA** included 3.46 acres of pre-existing wetlands within the footprint of the excavated cells. The AA includes both aquatic bed and emergent wetland habitats. The assessment score increased by eight percentage points to 82 percent and the functional units totaled 28.37. The AA was rated as a Category I wetland, scoring excellent for General Wildlife Habitat and Production Export/Food Chain Support, and high for Listed/Proposed T&E species habitat, 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 as a result of the observation of an unrestricted water surface outlet to Coyote Creek. General Wildlife Habitat shifted from a high to excellent rating for this AA in 2015 as a result of the change in disturbance rating from moderate to low.

The 13.22-acre **enhancement AA** included existing wetlands located between the stream mitigation portion of the project area and the US Hwy 2 corridor. The AA achieved 87 percent of the possible score in 2015, up from 80 percent in 2014. Due to a confirmed sighting of a grizzly bear in the project area the score for Listed/Proposed T&E Species Habitat was increased to a high rating. The AA received a Category I rating and 115 functional units. High ratings were assessed for Listed/Proposed T&E Species Habitat, General Wildlife Habitat, MTNHP Species Habitat, Short and Long Term Surface Water Storage, Sediment/Nutrient/Toxicant Removal, Sediment/Shoreline Stabilization, Groundwater/Discharge/Recharge, and Recreation/Education Potential. Production Export/Food Chain Support shifted from a high to excellent rating in 2015 as a result of the observation of a restricted water surface outlet.

The 2012 to 2015 **creation AA** included all wetland areas within the site that were not identified as wetland habitat during the baseline delineation and that were located outside of the riparian buffer area along the constructed channels. An increase of wetlands, above the anticipated target of 6.53 acres, has developed onsite as a result of the substantially increased water table elevation observed site wide. This 22.43-acre AA was rated as a Category I wetland in 2015 with 85 percent of the possible points, an increase of 5 percent since 2014, and 208.6 functional units. This AA received high ratings in Listed/Proposed T&E Species Habitat, MTNHP Species Habitat, General Wildlife Habitat, Short and Long Term Surface Water Storage, Sediment/Nutrient/Toxicant Removal, Sediment/Shoreline Stabilization, Groundwater/Discharge/Recharge, and Recreation/Education Potential. General Fish/Aquatic Habitat shifted from a high to moderate rating as a result of no fish species observed during the 2015 survey. Production Export/Food Chain Support shifted from a high to excellent rating in 2015 as a result of the observation of restricted surface and subsurface water outlets.

Table 8. Functions and Values of Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015.

		ENHANCEMENT AA				CREATION AA				RESTORATION AA			
Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method[1]	**2010 Creation/ Enhancement AA**	**2012**	**2013**	**2014**	**2015**	**2012**	**2013**	**2014**	**2015**	**2012**	**2013**	**2014**	**2015**
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	High (0.8)	Low (0.3)	Low (0.3)	Low (0.3)	High (0.8)	Low (0.3)	Low (0.3)	Low (0.3)	High (0.8)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	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)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	Exc (1.0)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	Mod (0.6)	High (0.8)	High (0.8)	Mod (0.6)	NA	NA	NA	NA
Flood Attenuation	NA	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.5)
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)	High (1.0)	High (1.0)	High (1.0)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.6)
Sediment/Shoreline Stabilization	Mod (0.6)	NA	NA	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)	Low (0.3)	Low (0.3)	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)	High (0.8)	High (0.8)	High (0.8)	Excel (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Excel (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	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)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.4)
Recreation/Education Potential	Low (0.5)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	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**	**8.3/11**	**8.5/11**	**8.8/11**	**9.3/11**	**6.7/10**	**6.7/10**	**7.4/10**	**8.2/10**
% of Possible Score Achieved	**68%**	**79%**	**80%**	**80%**	**87%**	**75%**	**77%**	**80%**	**85%**	**67%**	**67%**	**74%**	**82%**
Overall Category	**II**	**II**	**II**	**I**	**I**	**II**	**II**	**II**	**I**	**II**	**II**	**II**	**I**
Acreage of Assessed Aquatic Habitats within Easement (ac)	**4.84**	**13.22**	**13.22**	**13.22**	**13.22**	**22.40**	**22.43**	**22.43**	**22.43**	**3.46**	**3.46**	**3.46**	**3.46**
Functional Units (acreage x actual points)	**26.38**	**93.86**	**95.18**	**105.76**	**115.01**	**185.92**	**190.66**	**197.38**	**208.60**	**23.18**	**23.18**	**25.60**	**28.37**

[1] Berglund and McEldowney 2008.

3.8. Photo Documentation

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 re-establishment of PP-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 2 in Appendix A, and photographs in Appendix C.

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. Eleven infestations of Montana Listed Priority 2B noxious weeds, Canadian thistle and ox-eye daisy, and one infestation of Montana Listed Priority 2A noxious weed, orange hawkweed, were mapped across the Schrieber Meadows mitigation site in 2015 (Figure 3, Appendix A). Nine infestations of Canadian thistle, two infestations of ox-eye daisy, and one infestation of orange hawkweed were identified in areas less than 1.0 acre in size with cover classes ranging from trace (less than 1 percent) to moderate (6 to 25 percent). Weed spraying has been conducted annually within the site to eliminate Canadian thistle infestations, with documented weed control activities completed on June 22 and August 5, 2013 and June 20 and August 20, 2014. A weed contractor with MDT treated nearly four acres of the site in July 2015, with treatment concentrated in areas of infestation by the three noxious weed species observed on site. The 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

Wetland Mitigation Credit

The pilot project constructed in 2007 generated approximately 3.72 mitigation credit acres including 2.38 credit acres of wetland creation, 0.75 credit acres of restoration (rehabilitation) of existing wetlands (1.12 acres restored), and 0.59 credit acres 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 9 provides the credits generated at the Schrieber Meadows mitigation site for the approximate 57-acre full-scale project with no differentiation between the pilot project and full build-out of the Schrieber Meadows project.

It was anticipated that a total of approximately 17.24 wetland credit acres would 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 shown on Table 9 are described below. It was predicted that approximately 8.91 acres of wetlands would be created through the excavation of cells 1 to 11 (Project Plan sheet, Appendix E). The 2013 through 2015 delineated acreages indicated that 22.43 acres of wetland habitat have been created within this mitigation site. It should be noted that water levels have substantially increase 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 due to 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 wetlands within the 25-foot riparian buffer (8.30 acres) used to calculate stream mitigation credits were subtracted from total wetland habitat to avoid double calculation of total mitigation credits at this site.

A total of 2.31 acres of wetland credit was to be generated from the restoration of 3.46 acres of wetlands located 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 has been generated through the hydrologic enhancement of 13.22 acres of existing wetlands located 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 giving to areas located on MDT and USFS property and outside of the 25-foot riparian buffer. The development of this mitigation site resulted in impacts to 0.08 acres of wetland through the installation of the ditch plugs. The 0.08 acres was debited from the estimated credit acreages. Overall, the proposed credit acres of 17.24 have been surpassed by the development of 31.54 acres, creating a surplus of 14.30 credit acres.

The 2015 estimated credit acres for this site have exceeded the proposed credit acres as a result of the rise in the water table following 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 following mitigation construction.

The current site conditions documented in 2015 are compared to the approved performance standards and success criteria in Table 10. The wetlands delineated in 2015 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 as these areas have at least 50 percent aerial cover of non-weed species and noxious weeds do not exceed 5 percent cover.

Table 9. Summary of wetland mitigation credits at the Schrieber Meadows Mitigation Site in 2010 and 2012 through 2015.

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
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
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
Enhancement of wetlands inside geotechnical limits adjacent to US 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
Riparian Buffer*	-	-	-	8.30	**	8.30	**	8.30	**	8.30	**
Upland Buffer	8.50	5:1	1.70	8.50	1.70	12.39***	2.48	12.39***	2.48	12.39***	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
Total Mitigation Acreage	**34.01**		**17.24**	**55.80**	**30.73**	**59.72**	**31.54**	**59.72**	**31.54**	**59.72**	**31.54**

*Riparian buffer areas used to calculate stream and riparian credits.

**Wetland acreages within riparian buffer subracted from wetland credit total; riparian buffer does not include upland buffer acreage.

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

Table 10. Summary of Performance Standards and Success Criteria at Schrieber Meadows in 2015.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	Meet the three parameter criteria for hydrology, vegetation, and soils as outlined in the 1987 Wetland Delineation Manual and 2010 Mountains, Valleys, Coast Region.	Y	Areas identified as wetland habitat within the mitigation site meet the three parameter criteria.
Wetland Hydrology	Soil saturation present for at least 12.5 percent of the growing season.	Y	Areas identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of growing season.
Hydric Soil	Hydric soil conditions 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	Achieved where combined absolute cover of facultative or wetter species is ≥70 percent	Y	Areas identified as wetland habitat within the mitigation site support a prevalence of hydrophytic vegetation (OBL, FACW, and FAC).
	Montana State-listed noxious weeds do not exceed 5 percent absolute cover.	Y	Montana State-listed noxious weeds is estimated well below 5 percent absolute cover within wetland areas.
Riparian Buffer Success	Achieved when woody and riparian vegetation becomes established	N	No woody-dominated communities have formed along the established riparian buffer; riparian vegetation (primarily reed canarygrass) has established.
	Noxious weeds do not exceed 10 percent cover within the riparian buffer areas.	Y	Montana State-listed noxious weeds is estimated at 1 to 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.
	Achieved where combined aerial cover of riparian and stream bank vegetation communities is ≥70 percent.	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	Following plantings, the majority of the site supported standing water and likely drowned out 90% of the plantings by the end of the 2nd growing season. Approximatley 3 percent survival was noted in 2014. No replanting efforts have been completed.
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 canarygrass, which has a stability rating of 9.
	The intent of the stream restoration is to allow for 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 stable with no lateral adjustment observed following construction.
Stream Bank Vegetation	Considered successful when banks are vegetated with a majority of deep-rooting riparian plant species having root stability indexes ≥6 .	Y	Reed canarygrass and foxtail (*Alopecurus* sp.) dominate the stream banks. Reed canarygrass has a root stability index of 9; no index value is provided for foxtail, assume this value is 6 or greater.
Open Water	It is the intent of the project to provide open water during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, it is anticipated that vegetation will germinate within the majority of the depressions. Open water with submerged and/or floating vegetation will therefore be considered successful and creditable.	Y	Excavated depression 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 creditable buffer zone must have at least 50 percent aerial cover of non-weed species by end of monitoring period.	Y	Disturbed areas have established greater than 50 percent cover by non-weed species.
Weed Control	Will be based upon annual monitoring of the site to determine weed species and degree of infestation within the site, and control measures based upon 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 post-construction monitoring event. MDT administers an on-going weed-control program.

Stream Mitigation Credit

As discussed in the introduction of this report, the goal of the stream mitigation component of the Schrieber Meadows project was the restoration of approximately **7,756 linear feet** of new stream channel in both Coyote and Schrieber Creeks, resulting 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 five distinct segments, including:

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. It 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 the area between the USFS restored segment of stream and the access road into the MDT site. There is a large spring emanating from this location and 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 due to groundwater flows emanating from the spring area.
4. **Perennial Spring Channel Ditch** was originally a drainage ditch constructed to relocate flows from a natural spring emanating 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.

The completed restoration of 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, 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 (2010), the calculation of stream mitigation credits includes the summation of both riparian (Table 11) and stream credits (Table 12).

Table 11. Determination of Riparian Mitigation Credits for Schrieber Meadows.

Riparian						
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 x L x RM=	**2,409**	**332**	**4,371**	**550**	**3,334**
TOTAL RIPARIAN CREDITS = 10,996						

Table 12. Determination of Stream Mitigation Credits for Schrieber Meadows.

Stream					
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 x 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					

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 utilized 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 utilized 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 prior to 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. For determining the comparative stream order factor for each segment, a same order factor of 0.20 was used. As the developed mitigation

credits will likely be used to offset impacts within the watershed >0.5 mile away, the off-site factor of 0.10 was used.

In determining stream credits for the Coyote and Schrieber Creek corridors, many of the same factors 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, as this area was not constructively changed.

Stream credits reported here are based upon the designed stream lengths, as presented in the Mitigation Plan (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 Montana 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 pertaining to woody plant survival of greater than 50 percent after five years has not been achieved. An approximate 5 percent survival rate for the planted woody species was estimated in 2015. The 35,551 stream credits calculated for this site following construction achieves the goals for the stream mitigation component of the Schrieber Meadows project.

Table 10 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 the development of greater than 70 percent vegetation cover while supporting less than 10 percent cover by noxious weeds. However, the success criteria indicating 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 2015 and approximately 60 plants were observed during the field survey. Robust reed canary grass made it difficult to see small shrubs located throughout much of the site.

4. REFERENCES

Berglund, J. and R. McEldowney. 2008. *MDT Montana Wetland Assessment Method.* Prepared for Montana Department of Transportation, Helena, Montana. Post, Buckley, Schuh, & Jernigan, Helena, Montana. 42pp.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. U.S. Army Corps of Engineers. Washington, DC.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. *The National Wetland Plant List. 2014 Update of Wetland Ratings*. Phytoneuron 2014-41:1-42.

Montana Department of Transportation, June 29, 2009, Schrieber Meadows Wetland Mitigation Plan, NH 27(021) CN 1027, Watershed #1 – Kootenai River Basin, Lincoln County, Montana

US Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ed. J. S.Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3.Vicksburg, MS: US Army Engineer Research and Development Center.

US Army Corps of Engineers – Helena Regulatory Program 2010. Montana Stream Mitigation Procedure. May 2010. Helena, Montana.

Websites:

Montana Department of Agriculture. Montana Noxious Weed List. July 2015. Accessed in October 2015 http://agr.mt.gov/agr/Programs/Weeds/PDF/2015WeedList.pdf

NRCS. Natural Resource Conservation Service. US Department of Agriculture, WETS Station data accessed from the world wide web at http://www.wcc.nrcs.usda.gov/climate/wetlands.html .

USDA. US Department of Agriculture, Natural Resource Conservation Service, Official Soil Descriptions accessed from the World Wide Web at http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

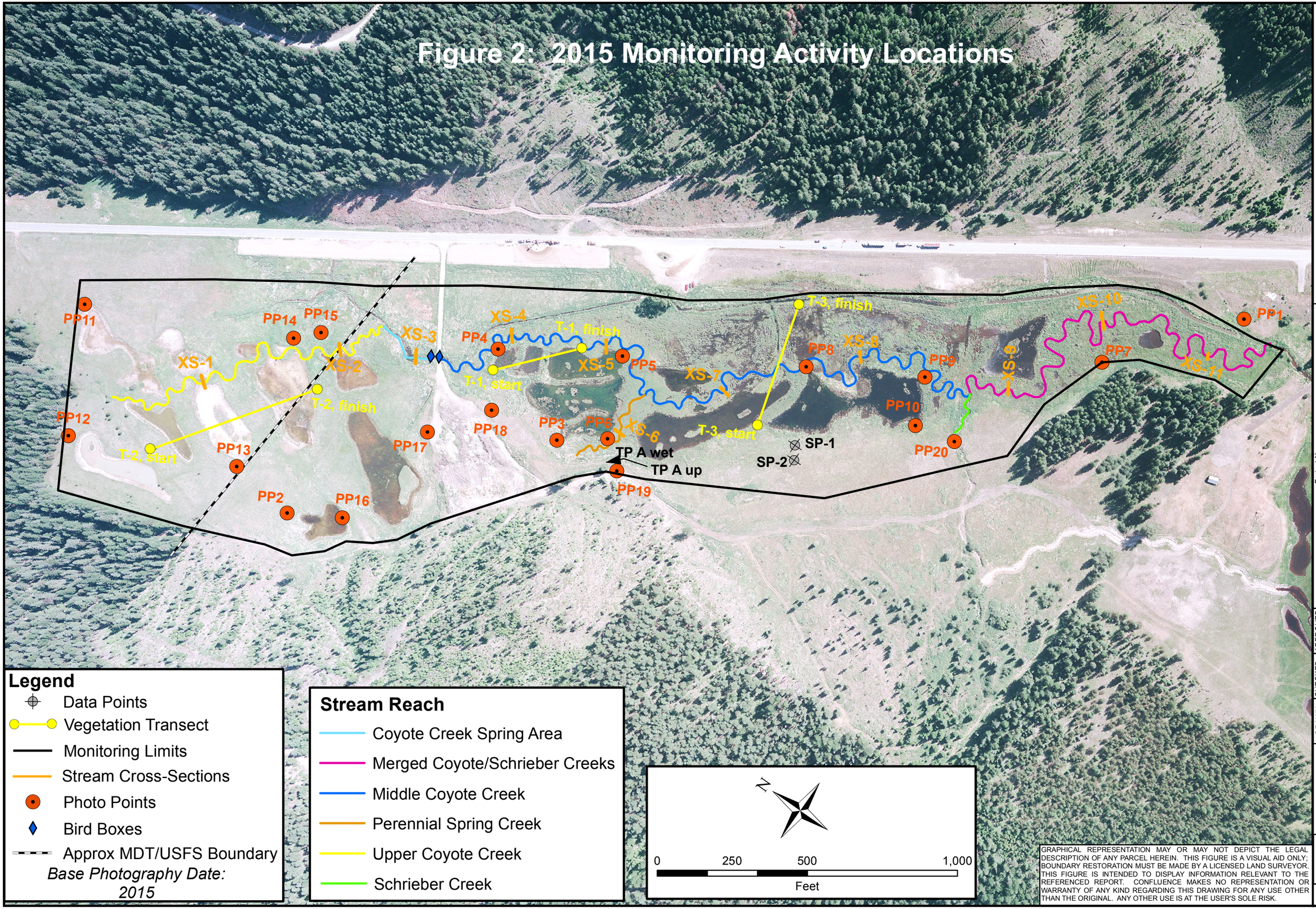
Western Regional Climate Center (WRCC). Precipitation data accessed October 2015 from http://www.wrcc.dri.edu/CLIMATEDATA.html.

Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

Figure 2: 2015 Monitoring Activity Locations



GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Lincoln Co., MT

PROJECT NO: NH 27(021)

FILE: Schrieber/Monitor2015.mxd

Project Name
Schrieber Meadows Mitigation Site

Drawing Title
2015 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

Drawn: October 16, 2015

PROJ MGR: J Johnson

CONFLUENCE
consulting incorporated

Figure 2

REV -

Figure 3: 2015 Mapped Site Features

Acreages

Project Area	56.95 acres
Total Wetlands and WUS	47.95 acres
Wetlands*	47.61 acres
WUS (Stream Channel) (10)	0.34 acres
Uplands	9.00 acres

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

N

0 250 500 1,000
Feet

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities
- Stream Channel

Base Photography Date: 2015

Vegetation Community Types

(3) Phalaris arundinacea
(5) Aquatic Macrophytes/Open Water
(6) Alopecurus pratensis/Agrostis capillaris
(7) Juncus bufonius/Bare Ground
(8) Elymus repens/Pascopyrum smithii
(9) Alopecurus spp./Bromus inermis
(13) Eleocharis palustris/Bare Ground
(14) Agrostis capillaris/Phleum pratense

Noxious Weeds

Cirsium arvense
Hieracium aurantiacum
Leucanthemum vulgare

Infestation Size
X = <0.1 acre
▲ = 0.1 to 1 acre
■ = 1 to 5 acre

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

LOCATION: Lincoln Co., MT
PROJECT NO: NH 27(021)
FILE: Schreiber/Veg2015.mxd

Project Name: Schrieber Meadows Mitigation Site
Drawing Title: 2015 Mapped Site Features

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown
Drawn: October 16, 2015
PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2015 MDT Wetland Mitigation Site Monitoring Form
2015 USACE Wetland Determination Data Forms
2015 MDT Wetland Assessment Forms

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Schrieber Meadows Assessment Date/Time 7/20/2015

Person(s) conducting the assessment: S. Wall, R. McEldowney

Weather: partly cloudy, calm, 57 degrees at Location: Highway 2, Swamp Creek East

MDT District: Missoula Milepost: 53.5

Legal Description: T 27N R 30W Section(s) 11,12,13

Initial Evaluation Date: 8/29/2010 Monitoring Year: 5 #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: ☑ Average Depth: 1.8 **(ft)** Range of Depths: 0-3.5 **(ft)**

Percent of assessment area under inundation: 65 %

Depth at emergent vegetation-open water boundary: 1.1 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc**:**

Saturation/inundation on aerial photos and in field, FAC-neutral test, seasonal high water table

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

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.

Hydrology Notes:

Site was inundated/saturated throughout the southern 2/3, and drier toward the north end. Some ponds at the north end were drier than in 2014. Schrieber Creek was dry above the spring.

VEGETATION COMMUNITIES

Site Schrieber Meadows

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 3 **Community Type:** Phalaris arundinacea / **Acres** 20.44

Species	Cover class	Species	Cover class
Algae, green	1	Alnus incana	1
Carex scoparia	0	Carex stipata	1
Eleocharis palustris	0	Epilobium ciliatum	1
Glyceria grandis	0	Lemna minor	0
Mimulus guttatus	0	Open Water	3
Persicaria amphibia	1	Phalaris arundinacea	5
Rumex crispus	0		

Comments:

Community # 5 **Community Type:** Aquatic macrophytes / Open Water **Acres** 10.3

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	2
Aquatic macrophytes	2	Bare Ground	4
Beckmannia syzigachne	0	Carex nebrascensis	1
Carex sp.	0	Chara sp.	0
Eleocharis palustris	1	Epilobium ciliatum	0
Glyceria elata	0	Glyceria grandis	0
Lemna minor	0	Open Water	4
Persicaria amphibia	0	Phalaris arundinacea	0
Typha latifolia	1		

Comments:

Open water/bare ground percentage depends on water year.

Community # 6 Community Type: Alopecurus pratensis / Agrostis capillaris **Acres** 13.12

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron sp.	1
Agrostis capillaris	4	Alopecurus pratensis	4
Bromus inermis	2	Carex athrostachya	1
Carex lasiocarpa	0	Carex stipata	0
Carex utriculata	0	Cirsium arvense	0
Epilobium ciliatum	1	Fragaria virginiana	0
Juncus tenuis	0	Phalaris arundinacea	2
Pinus contorta	0	Pinus ponderosa	0
Poa pratensis	1	Rumex crispus	0
Salix candida	0	Senecio hydrophiloides	0
Solidago canadensis	0	Symphyotrichum spathulatum	0
Taraxacum officinale	0	Trifolium arvense	0

Comments:

Community # 7 Community Type: Juncus bufonius / Bare Ground **Acres** 0.25

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Alnus incana	0
Bare Ground	4	Beckmannia syzigachne	2
Bromus carinatus	0	Carex pachystachya	0
Eleocharis palustris	1	Eleocharis quinqueflora	0
Epilobium ciliatum	0	Juncus bufonius	3
Juncus ensifolius	0	Juncus tenuis	0
Mimulus guttatus	1	Rumex crispus	0
Suaeda calceoliformis	1	Taraxacum officinale	0
Trifolium pratense	0	Verbascum thapsus	0

Comments:

Community # 8 Community Type: Elymus repens / Pascopyrum smithii **Acres** 2.68

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Bare Ground	1
Bromus inermis	1	Cirsium arvense	0
Elymus repens	3	Medicago lupulina	3
Pascopyrum smithii	3	Sisymbrium altissimum	1

Comments:

Community # 9 **Community Type:** Alopecurus spp. / Bromus inermis **Acres** 6.32

Species	Cover class	Species	Cover class
Achillea millefolium	1	Alopecurus arundinaceus	2
Alopecurus pratensis	5	Arnica chamissonis	1
Bromus inermis	3	Carex athrostachya	0
Cirsium arvense	0	Pascopyrum smithii	1
Persicaria lapathifolia	0	Phalaris arundinacea	0
Pinus contorta	0	Plantago major	1
Poa pratensis	1	Potentilla gracilis	0
Rumex acetosella	0	Senecio hydrophiloides	1
Symphoricarpos albus	0	Taraxacum officinale	1
Trifolium pratense	0	Verbascum thapsus	0

Comments:

Community # 13 **Community Type:** Eleocharis palustris / Bare Ground **Acres** 1.6

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron sp.	0
Agrostis capillaris	0	Alopecurus pratensis	3
Bare Ground	4	Beckmannia syzigachne	3
Carex athrostachya	0	Carex lasiocarpa	0
Carex nebrascensis	0	Carex pellita	2
Carex scoparia	0	Carex sp.	0
Carex stipata	0	Carex utriculata	0
Cirsium vulgare	0	Eleocharis palustris	3
Elymus trachycaulus	1	Epilobium ciliatum	1
Festuca sp.	0	Fragaria virginiana	0
Geum macrophyllum	0	Glyceria elata	1
Glyceria grandis	1	Gnaphalium palustre	1
Juncus bufonius	0	Juncus ensifolius	0
Juncus tenuis	1	Leucanthemum vulgare	0
Mentha arvensis	0	Phalaris arundinacea	1
Poa palustris	0	Polypogon monspeliensis	0
Potentilla norvegica	1	Salix candida	0
Scirpus sp.	2	Suaeda calceoliformis	0
Trifolium pratense	0		

Comments:

Formerly veg community type 11 in 2014.

Community # 14 **Community Type:** Agrostis capillaris / Phleum pratense **Acres** 1.9

Species	Cover class	Species	Cover class
Agrostis capillaris	4	Bromus inermis	1
Cirsium arvense	0	Fragaria virginiana	0
Hieracium aurantiacum	0	Leucanthemum vulgare	1
Phleum pratense	2	Pinus contorta	0
Pinus ponderosa	0	Pseudotsuga menziesii	0
Rosa sp.	0	Symphyotrichum spathulatum	0

Comments:

Formerly community type 12 in 2014. Name change from Agrostis stolonifera to Agrostis capillaris. Note Hieraceum aurantiacum (orange hawkweed) Cat 2 noxious weed and Leucanthemum vulgare, Cat 1 noxious weed.

Total Vegetation Community Acreage **56.61**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Schrieber Meadows Date: 7/20/2015

Transect Number: 1 **Compass Direction from Start:** 112

Interval Data:

Ending Station 16 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Phalaris arundinacea	5		

Ending Station 95 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, green	3	Aquatic macrophytes	2
Open Water	5	Phalaris arundinacea	2

Ending Station 117 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Phalaris arundinacea	5		

Ending Station 198 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, green	1	Aquatic macrophytes	5
Epilobium ciliatum	0	Open Water	5
Persicaria amphibia	0		

Ending Station 215 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Alnus incana	2	Persicaria amphibia	1
Phalaris arundinacea	5		

Ending Station 310 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	1
Aquatic macrophytes	5	Open Water	5
Persicaria amphibia	0	Phalaris arundinacea	0

Ending Station 318 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Open Water	0	Phalaris arundinacea	5

Transect Notes:

Less open water than in 2014.

Transect Number: 2 **Compass Direction from Start:** 100

Interval Data:

Ending Station 35 **Community Type:** Agrostis capillaris / Phleum pratense

Species	Cover class	Species	Cover class
Agrostis capillaris	4	Bromus inermis	2
Hieracium aurantiacum	0	Leucanthemum vulgare	1
Phleum pratense	2	Symphyotrichum spathulat	0

Ending Station 42 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Bare Ground	2
Beckmannia syzigachne	4	Carex lasiocarpa	0
Glyceria elata	0	Gnaphalium palustre	1
Juncus bufonius	3	Juncus tenuis	4
Phalaris arundinacea	1		

Ending Station 88 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, brown	1	Open Water	5
Typha latifolia	1		

Ending Station 100 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Bare Ground	2	Beckmannia syzigachne	2
Carex pellita	4	Carex stipata	0
Glyceria elata	1	Juncus tenuis	0
Scirpus sp.	3		

Ending Station 168 **Community Type:** Alopecurus pratensis / Agrostis capillaris

Species	Cover class	Species	Cover class
Agrostis capillaris	4	Alopecurus pratensis	4
Bromus inermis	0	Carex lasiocarpa	0
Epilobium ciliatum	1	Juncus tenuis	0
Phalaris arundinacea	1	Salix candida	0

Ending Station 185 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Bare Ground	5
Beckmannia syzigachne	0	Epilobium ciliatum	2
Juncus tenuis	2	Phalaris arundinacea	0
Poa palustris	0	Suaeda calceoliformis	1
Trifolium pratense	0		

Ending Station 212 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Bare Ground	5		

Ending Station 226 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Agropyron sp.	0	Agrostis capillaris	0
Bare Ground	3	Beckmannia syzigachne	0
Epilobium ciliatum	0	Festuca sp.	0
Juncus tenuis	3	Suaeda calceoliformis	1
Trifolium pratense	2		

Ending Station 245 **Community Type:** Alopecurus pratensis / Agrostis capillaris

Species	Cover class	Species	Cover class
Achillea millefolium	0	Alopecurus pratensis	3
Bromus inermis	5	Solidago canadensis	0
Symphyotrichum spathulat	0		

Ending Station 260 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Agropyron sp.	0	Bare Ground	3
Carex sp.	0	Cirsium vulgare	0
Epilobium ciliatum	2	Juncus tenuis	4
Leucanthemum vulgare	0	Polypogon monspeliensis	0
Suaeda calceoliformis	0	Trifolium pratense	3

Ending Station 285 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Bare Ground	5	Beckmannia syzigachne	0
Glyceria sp.	0	Open Water	0
Typha latifolia	0		

Ending Station 295 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Agrostis capillaris	0	Alopecurus pratensis	0
Bare Ground	3	Beckmannia syzigachne	0
Epilobium ciliatum	0	Juncus tenuis	4
Suaeda calceoliformis	0	Trifolium pratense	2

Ending Station 405 **Community Type:** Alopecurus pratensis / Agrostis capillaris

Species	Cover class	Species	Cover class
Alopecurus pratensis	4	Bromus inermis	4

Ending Station 421 **Community Type:** Eleocharis palustris / Bare Ground

Species	Cover class	Species	Cover class
Achillea millefolium	0	Alopecurus pratensis	1
Bare Ground	2	Beckmannia syzigachne	1
Carex athrostachya	1	Carex nebrascensis	0
Carex utriculata	0	Eleocharis palustris	0
Elymus trachycaulus	1	Fragaria virginiana	0
Glyceria grandis	2	Mentha arvensis	1
Potentilla norvegica	0	Suaeda calceoliformis	0
Trifolium pratense	0		

Ending Station 555 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Bare Ground	5	Beckmannia syzigachne	0
Carex sp.	0	Eleocharis palustris	2
Persicaria amphibia	0	Phalaris arundinacea	0
Typha latifolia	0		

Ending Station 594 **Community Type:** Alopecurus pratensis / Agrostis capillaris

Species	Cover class	Species	Cover class
Agropyron sp.	0	Alopecurus pratensis	5
Carex athrostachya	1	Carex stipata	0
Phalaris arundinacea	2	Poa pratensis	1

Transect Notes:

The west pond at the start of the transect had open water, the other two ponds on the transect were mostly dry. There were pockets of water in the east pond. The percentage of open water vs. bare ground depends on the water year.

Transect Number: 3 **Compass Direction from Start:** 45

Interval Data:

Ending Station 60 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Algae, green	1	Lemna minor	0
Open Water	0	Persicaria amphibia	0
Phalaris arundinacea	5		

Ending Station 137 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, green	1	Aquatic macrophytes	3
Chara sp.	4	Lemna minor	0
Open Water	5	Persicaria amphibia	0

Ending Station 265 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Eleocharis palustris	0	Epilobium ciliatum	1
Glyceria grandis	0	Lemna minor	0
Open Water	4	Persicaria amphibia	0
Phalaris arundinacea	5		

Ending Station 426 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, brown	2	Carex nebrascensis	2
Eleocharis palustris	0	Lemna minor	2
Open Water	5	Persicaria amphibia	2
Phalaris arundinacea	2		

Ending Station 437 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Lemna minor	0	Open Water	3
Phalaris arundinacea	5		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Schrieber Meadows

Planting Type	#Planted	#Alive	Notes
Alnus incana	1000	56	5 alders resprouting from the roots near PP 15, and 13 alders along T-1, 1 alder near the beginning of T-3.
Salix spp.	750	8	Look like Bebb's willow.

Comments

The majority of plantings were along the newly constructed channel and ponds in the north 1/3 of the site.

Schrieber Meadows

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: blue bird boxes

How many? 2

Are the nesting structures being used? Yes

Do the nesting structures need repairs? No

Nesting Structure Comments:

Two bird boxes are mounted on the fence posts at the entrance gate. The bird box on the eas side had been moved. GPSd new location.

Species	#Observed	Behavior	Habitat
American Robin	2		UP, WM,
Belted Kingfisher	1		OW, SS, UP,
Canada Goose			OW, UP, WM,
Cinnamon Teal	22		AB, AB, I, OW, UP,
Greater Yellowlegs	1		US, OW, US,
Green-winged Teal	1		I, OW, UP, WM,
Killdeer	1		US, UP, WM, US,
Mallard	2		I, OW, WM,
Redhead	5		I, OW, UP, WM,
Red-winged Blackbird	3		WM,
Sandpiper Sp.	1		US, MF, OW, US,
Sparrow Sp.	1		SS, UP,
Tree Swallow	5		OW, SS,
Wilson's Snipe	2		WM,

Bird Comments

Goose scat and browsed grasses observed west of the ponds in the south part of the site, near Photo Point 10.

BEHAVIOR CODES

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

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Columbia Spotted Frog	2	No	No	No	at pond near Transect 2
Deer Sp.		Yes	No	No	
Elk or Wapiti		Yes	No	No	
Ground squirrel	1	No	No	No	
Meadow Vole	3	No	No	No	
Muskrat		No	No	Yes	
Rubber Boa	1	No	No	No	

Wildlife Comments:

Schrieber Meadows

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.

Photo #	Latitude	Longitude	Bearing	Description
1786	48.115204	-115.421013	100	veg tran 2, start
1787	48.114197	-115.418991	280	veg tran 2, end
1789	48.113403	-115.420128	290	PP-16
1790	48.113735	-115.420509	150	PP-2
1791 stitch	48.11422	-115.420403	280	PP-13
1793 stitch	48.115673	-115.421562	180	PP-12
1796 stitch	48.116409	-115.420021	190	PP-11
1798 stitch	48.114655	-115.41893	230	PP-14
1801 stitch	48.114323	-115.418449	180	PP-15
1804 stitch	48.112938	-115.418388	270	PP-17
1807	48.1129	-115.417618	90	PP-18
1808	48.115204	-115.417503	115	veg tran 1, start
1809	48.112663	-115.41642	245	veg tran 1, end
1810 stitch	48.113213	-115.416832	180	PP-4
1813 stitch	48.112614	-115.415977	300	PP-5
1816	48.111134	-115.415642	45	veg tran 3, start
1817 stitch	48.109737	-115.414024	0	PP-10
1820	48.109493	-115.413918	100	PP-20
1822 stitch	48.109997	-115.413765	280	PP-9
1824 stitch	48.108813	115.411923	0	PP-7
8512 stitch	48.112183	-115.417503	90	PP-3
8514 stitch	48.11904	-115.417023	0	PP-6
8517	48.111553	-115.417084	10	PP-19 photo 1
8518	48.111553	-115.417084	100	PP-19 photo 2
8524	48.111187	-115.413849	225	veg tran 3, end

8525	48.11121	-115.414238	190	PP-8
8532	48.110452	-115.41545	22	SP-01
8534	48.110423	-115.415619	22	SP-02
8536 stitch	48.10804	-115.410172	270	PP-1

Comments:

Schrieber Meadows

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

☑ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Functional Assessment Comments:

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? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:
No hydric soil indicators 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 along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☑ 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, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators present.

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

Project/Site: Schrieber Meadows | City/County: Lincoln | Sampling Date: 7/20/2015

Applicant/Owner: MDT | State: Montana | Sampling Point: SP-1

Investigator(s): R. McEldowney, S. Wall | Section, Township, Range: S 11 T 27N R 30W

Landform (hillslope, terrace, etc.): Valley bottom | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): LRR E | Lat: 48.110452 | Long: -115.41545 | 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:
PEM, slope wetland. Monoculture of reed canarygrass with a seasonal high water table and a histic epipedon.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (30 Foot Radius)

Herbaceous Stratum Plot size (3 Foot Radius)

Phalaris arundinacea	100	☑	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

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	% (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

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:
Monoculture of reed canarygrass.

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8		100					fibric peat	
8-16	10YR 4/2	99	10YR 4/4	1	C	M	Silty Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

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 along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☑ 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, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil is moist. Site has high water table, particularly in the spring and early summer. This area of the state is currently in a drought.

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

Project/Site: Schrieber Meadows | City/County: Lincoln | Sampling Date: 7/20/2015

Applicant/Owner: MDT | State: Montana | Sampling Point: SP-2

Investigator(s): R. McEldowney, S. Wall | Section, Township, Range: S 11 T 27N R 30W

Landform (hillslope, terrace, etc.): Valley bottom | Local relief (concave, convex, none): none | Slope (%): 1

Subregion (LRR): LRR E | Lat: 48.110423 | Long: -115.415619 | 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:
Hydrophytic vegetation present, but hydric soils and wetland hydrology are lacking. This sample point is located upslope from SP-1 and so does not have the same hydrology.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius) — Absolute % Cover: | Domiant Species? | Indicator Status

Sapling/Shrub Stratum Plot size (30 Foot Radius)

Herbaceous Stratum Plot size (3 Foot Radius)

Alopecurus pratensis	90	☑	FAC
Phalaris arundinacea	10	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	10	X 2	20
FAC species	90	X 3	270
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	100 (A)		290 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4		100					fibric peat	
10-14	10YR 3/2	100					Silt Loam	
4-9	10YR 2/1	100					Silt Loam	
9-10	10YR 5/1	100					Silt Loam	**elluvium**

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No hydric soil indicators observed.

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 along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☑ 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, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No evidence of wetland hydrology present.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Schrieber Meadows **2. MDT project#** NH 27(021) **Control#** 1027

3. Evaluation Date 7/20/2015 **4. Evaluators** R. McEldowney, S.Wall **5. Wetland/Site# (s)** Creation

6. Wetland Location(s): T 27N **R** 30W **Sec1** 11, 12, 13 **T** **R** **Sec2**

Approx Stationing or Mileposts Approximately Milepost 53.5

Watershed Kootenai-1 17010101 **Watershed/County** Kootenai, Lincoln County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 22.43

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 22.43

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	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%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

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, other exotic 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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent and aquatic bed classes are present

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMEN

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use 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 plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use 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

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
- ☐ interviews with local biologists 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
- ☐ interviews with local biologists with knowledge of the 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
- ☐ interviews with local biologists 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 instructions 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 ñ 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Observed waterfowl (ducks, canada geese) and numerous wildlife tracks and scat (deer and elk)

14D. General Fish Habitat Rating: (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, etc.]. 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 ☐ **NA** here and proceed to 14E.) Cold Water

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 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?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** .5M

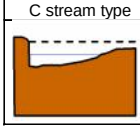
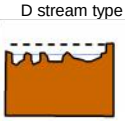
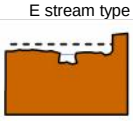
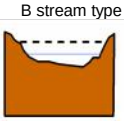
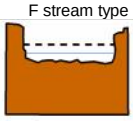
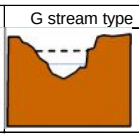
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◉ **Y** ○ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .6M

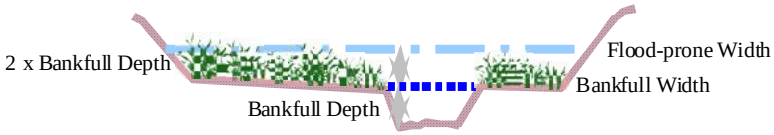
iii. Final Score and Rating: .6 M **Comments:** An upwelling area is located adjacent to Coyote Creek in the north 1/3 of the site. Pumpkinseed and sunfish observed in open water in previous years.

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width 35 **/ Bankfull width** 5 **= Entrenchment ratio** 7

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 (check)? **Y** ○ **N** ◉

Comments: Highway adjacent to the site.

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions 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 ñ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

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

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands 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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: Wetlands adjacent to excavated cells are 100% vegetated with reed canarygrass and sedges. Depressions with no outlet.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☐ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% 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
ñ **65%**	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

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 ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions 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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: 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).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** 1 E

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 & 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 arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	NA			

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

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: Structural diversity may increase if shrubs expand.

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☑ Educational/scientific study; ☑ Consumptive rec.; ☑ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

Known recreation site

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR 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	H	.8	1	17.944	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	20.187	☐
C. General Wildlife Habitat	H	.9	1	20.187	☑
D. General Fish Habitat	M	.6	1	13.458	☐
E. Flood Attenuation	M	.6	1	13.458	☐
F. Short and Long Term Surface Water Storage	H	1	1	22.43	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	22.43	☑
H. Sediment/Shoreline Stabilization	H	1	1	22.43	☐
I. Production Export/Food Chain Support	E	1	1	22.43	☐
J. Groundwater Discharge/Recharge	H	1	1	22.43	☑
K. Uniqueness	L	.3	1	6.729	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	4.486	☐
Totals:		9.3	11	208.599	
Percent of Possible Score			**84.55** %		

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 #).

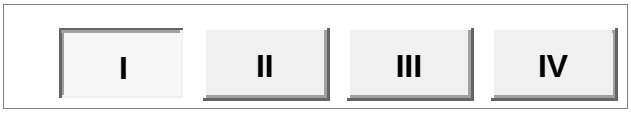
Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ 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; otherwise 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 RATING:
(check appropriate category based on the criteria outlined above)



MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Schrieber Meadows **2. MDT project#** NH 27(021) **Control#** 1027

3. Evaluation Date 7/20/2015 **4. Evaluators** R. McEldowney, S.Wall **5. Wetland/Site# (s)** Enhancement

6. Wetland Location(s): T 27N **R** 30W **Sec1** 11, 12, 13 **T** **R** **Sec2**

Approx Stationing or Mileposts Approximately Milepost 53.5

Watershed Kootenai-1 17010101 **Watershed/County** Kootenai, Lincoln County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 13.22

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 13.22

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	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%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Disturbance due to recent road fill between the AA and Hwy 2

ii. Prominent noxious, aquatic nuisance, other exotic 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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent wetland, very close to a monoculture of reed canarygrass

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMEN

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use 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 plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use MNHP and documented breeding on site by MDT and USFS personel

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Substantial

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
- ☐ interviews with local biologists 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
- ☐ interviews with local biologists with knowledge of the 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
- ☐ interviews with local biologists 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 instructions 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 ñ 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

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

14D. General Fish Habitat Rating: (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, etc.]. 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 ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 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?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

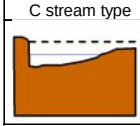
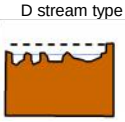
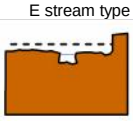
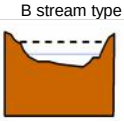
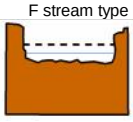
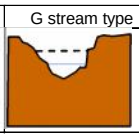
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

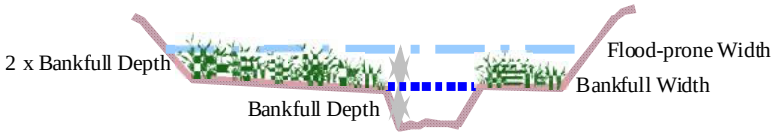
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within the enhancement AA.

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width 35 **/** **Bankfull width** 5 **=** **Entrenchment ratio** 7

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 (check)? **Y** ○ **N** ◉

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

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions 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 ñ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

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: (Applies to wetlands 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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA nearly 100% vegetated with reed canarygrass, presence of flooding/ponding, restricted outlet.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☐ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% 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
ñ **65%**	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

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 ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions 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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: 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).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** 1 E

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 & 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 arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	NA			

Comments: AA with shallow water table and surface water

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

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

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☑ Educational/scientific study; ☑ Consumptive rec.; ☑ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

Known recreation at site.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR 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	H	.8	1	10.576	☑
B. MT Natural Heritage Program Species Habitat	H	.9	1	11.898	☐
C. General Wildlife Habitat	H	.9	1	11.898	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.6	1	7.932	☐
F. Short and Long Term Surface Water Storage	H	1	1	13.22	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	13.22	☑
H. Sediment/Shoreline Stabilization	H	1	1	13.22	☐
I. Production Export/Food Chain Support	E	1	1	13.22	☑
J. Groundwater Discharge/Recharge	H	1	1	13.22	☐
K. Uniqueness	L	.3	1	3.966	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	2.644	☐
Totals:		8.7	10	115.014	
Percent of Possible Score			**87** %		

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; otherwise 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 RATING:
(check 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) **Control#** 1027

3. Evaluation Date 7/20/2015 **4. Evaluators** R. McEldowney, S.Wall **5. Wetland/Site# (s)** Restoration

6. Wetland Location(s): T 27N **R** 30W **Sec1** 11,12,13 **T** **R** **Sec2**

Approx Stationing or Mileposts Approximately Milepost 53.5

Watershed Kootenai-1 17010101 **Watershed/County** Kootenai, Lincoln County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 3.46

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 3.46

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	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%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

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, other exotic 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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent and aquatic bed

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMEN

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USFWS database, MNHP database shows site is within year-round range of grizzly bear; reports from FS, FWP, and USFWS

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use MNHP and documented breeding on site by MDT and USFS personel

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Substantial

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
- ☐ interviews with local biologists 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
- ☐ interviews with local biologists with knowledge of the 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
- ☐ interviews with local biologists 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 instructions 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 ñ 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Good habitat diversity with substantial wildlife evidence.

14D. General Fish Habitat Rating: (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, etc.]. 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 ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 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?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

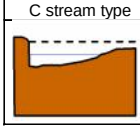
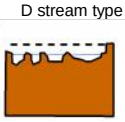
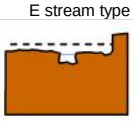
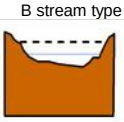
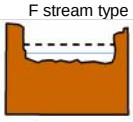
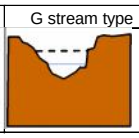
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

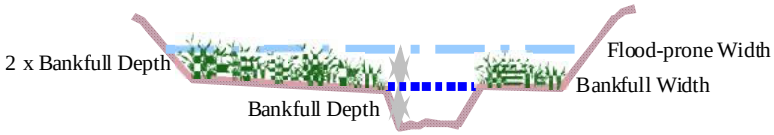
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat identified within restoration AA

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width 35 **/** **Bankfull width** 5 **=** **Entrenchment ratio** 7

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 (check)? **Y** ○ **N** ◉

Comments: All wetland cells subject to flooding from Coyote Creek

---

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions 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 ñ **5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: AA with evidence of frequent flooding.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands 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, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA receives periodic overflow from Coyote Creek

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☐ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% 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
ñ **65%**	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

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 ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions 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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: 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).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** 1 E

Comments: No fish habitat, high biological activity, well-vegetated buffer, unrestricted outlet to creek.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & 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 arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	NA			

Comments: Perennial spring located near AA

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☑ Educational/scientific study; ☐ Consumptive rec.; ☑ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

Known recreation site.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR 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	H	.8	1	2.768	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	3.114	☑
C. General Wildlife Habitat	E	1	1	3.46	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.5	1	1.73	☐
F. Short and Long Term Surface Water Storage	H	.8	1	2.768	☐
G. Sediment/Nutrient/Toxicant Removal	M	.6	1	2.076	☐
H. Sediment/Shoreline Stabilization	H	1	1	3.46	☑
I. Production Export/Food Chain Support	E	1	1	3.46	☐
J. Groundwater Discharge/Recharge	H	1	1	3.46	☑
K. Uniqueness	M	.4	1	1.384	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	0.692	☐
Totals:		8.2	10	28.372	
Percent of Possible Score			**82** %		

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; otherwise 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 RATING:
(check 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 **Taken in 2012**

Photo Point 1 – *Panorama* **Location:** SW corner of site

Bearing: 270 degrees **Taken in 2013**

Photo Point 1 – *Panorama* **Location:** SW corner of site

Bearing: 270 degrees **Taken in 2014**

Photo Point 1 – *Panorama* **Location:** SW corner of site

Bearing: 270 degrees **Taken in 2015**

Photo Point 2 **Location:** Cell 7 (Created 2007)

Bearing: 190 degrees **Taken in 2010**

Photo Point 2 **Location:** Cell 7 (Enhanced in 2011)

Bearing: 150 degrees **Taken in 2012**

Photo Point 2 **Location:** Cell 7 (Enhanced in 2011)

Bearing: 150 degrees **Taken in 2013**

Photo Point 2 **Location:** Cell 7 (Enhanced in 2011)

Bearing: 150 degrees **Taken in 2014**

Photo Point 2 **Location:** Cell 7 (Enhanced in 2011)

Bearing: 150 degrees **Taken in 2015**

Photo Point 3 **Location:** Cell 2 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2010**

Photo Point 3 **Location:** Cell 2 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2013**

Photo Point 3 **Location:** Cell 2 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2014**

Photo Point 3 **Location:** Cell 2 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2015**

Photo Point 4 **Location:** Cell 2 (Constructed in 2007)

Bearing: 180 degrees **Taken in 2010**

Photo Point 4 **Location:** Cell 2 (Constructed in 2007)

Bearing: 180 degrees **Taken in 2013**

Photo Point 4 **Location:** Cell 2 (Constructed in 2007)

Bearing: 180 degrees **Taken in 2014**

Photo Point 4 **Location:** Cell 2 (Constructed in 2007)

Bearing: 180 degrees **Taken in 2015**

Photo Point 5 **Location:** Cell 2 (Constructed in 2007)

Bearing: 270 degrees **Taken in 2010**

Photo Point 5 **Location:** Cell 2 (Constructed in 2007)

Bearing: 300 degrees **Taken in 2013**

Photo Point 5 **Location:** Cell 2 (Constructed in 2007)

Bearing: 300 degrees **Taken in 2014**

Photo Point 5 **Location:** Cell 2 (Constructed in 2007)

Bearing: 300 degrees **Taken in 2015**

Photo Point 6 **Location:** Cell 2 (Constructed in 2007)

Bearing: 40 degrees **Taken in 2010**

Photo Point 6 **Location:** Cell 2 (Constructed in 2007)

Bearing: 0 degrees **Taken in 2013**

Photo Point 6 **Location:** Cell 2 (Constructed in 2007)

Bearing: 0 degrees **Taken in 2014**

Photo Point 6 **Location:** Cell 2 (Constructed in 2007)

Bearing: 0 degrees **Taken in 2015**

2010 PHOTO POINT 7 MOVED IN 2012

Photo Point 7 **Location:** Cell 3

Bearing: 110 degrees **Taken in 2010**

Photo Point 7 **Location:** Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris

Bearing: 0 degrees **Taken in 2012**

Photo Point 7 **Location:** Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris

Bearing: 0 degrees **Taken in 2013**

Photo Point 7 **Location:** Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris

Bearing: 0 degrees **Taken in 2014**

Photo Point 7 **Location:** Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris

Bearing: 0 degrees **Taken in 2015**

Photo Point 8 **Location:** Cell 3 (Constructed in 2007)

Bearing: 200 degrees **Taken in 2010**

Photo Point 8 **Location:** Cell 3 (Constructed in 2007)

Bearing: 190 degrees **Taken in 2013**

Photo Point 8 **Location:** Cell 3 (Constructed in 2007)

Bearing: 190 degrees **Taken in 2014**

Photo Point 8 **Location:** Cell 3 (Constructed in 2007)

Bearing: 190 degrees **Taken in 2015**

Photo Point 9 **Location:** Cell 3 (Constructed in 2007)

Bearing: 330 degrees **Taken in 2010**

Photo Point 9 **Location:** Cell 3 (Constructed in 2007)

Bearing: 280 degrees **Taken in 2013**

Photo Point 9 **Location:** Cell 3 (Constructed in 2007)

Bearing: 280 degrees **Taken in 2014**

Photo Point 9 **Location:** Cell 3 (Constructed in 2007)

Bearing: 280 degrees **Taken in 2015**

Photo Point 10 **Location:** Cell 3 (Constructed in 2007)

Bearing: 30 degrees **Taken in 2010**

Photo Point 10 **Location:** Cell 3 (Constructed in 2007)

Bearing: 0 degrees **Taken in 2013**

Photo Point 10 **Location:** Cell 3 (Constructed in 2007)

Bearing: 30 degrees **Taken in 2014**

Photo Point 10 **Location:** Cell 3 (Constructed in 2007)

Bearing: 0 degrees **Taken in 2015**

Photo Point 11 **Location:** Cell 2B (Constructed in 2011)

Bearing: 190 degrees **Taken in 2012**

Photo Point 11 **Location:** Cell 2B (Constructed in 2011)

Bearing: 190 degrees **Taken in 2013**

Photo Point 11 **Location:** Cell 2B (Constructed in 2011)

Bearing: 190 degrees **Taken in 2014**

Photo Point 11 **Location:** Cell 2B (Constructed in 2011)

Bearing: 190 degrees **Taken in 2015**

Photo Point 12 **Location:** Cell 1 (Constructed in 2011)

Bearing: 180 degrees **Taken in 2012**

Photo Point 12 **Location:** Cell 1 (Constructed in 2011)

Bearing: 180 degrees **Taken in 2013**

Photo Point 12 **Location:** Cell 1 (Constructed in 2011)

Bearing: 180 degrees **Taken in 2014**

Photo Point 12 **Location:** Cell 1 (Constructed in 2011)

Bearing: 180 degrees **Taken in 2015**

Photo Point 13 **Location:** Cell 3A (Constructed in 2011)

Bearing: 280 degrees **Taken in 2012**

Photo Point 13 **Location:** Cell 3A (Constructed in 2011)

Bearing: 280 degrees **Taken in 2013**

Photo Point 13 **Location:** Cell 3A (Constructed in 2011)

Bearing: 280 degrees **Taken in 2014**

Photo Point 13 **Location:** Cell 3A (Constructed in 2011)

Bearing: 280 degrees **Taken in 2015**

Photo Point 14 **Location:** Cell 4C (Constructed in 2011)

Bearing: 230 degrees **Taken in 2012**

Photo Point 14 **Location:** Cell 4C (Constructed in 2011)

Bearing: 230 degrees **Taken in 2013**

Photo Point 14 **Location:** Cell 4C (Constructed in 2011)

Bearing: 230 degrees **Taken in 2014**

Photo Point 14 **Location:** Cell 4C (Constructed in 2011)

Bearing: 230 degrees **Taken in 2014**

Photo Point 15 **Location:** Cell 5A (Constructed in 2011)

Bearing: 180 degrees **Taken in 2012**

Photo Point 15 **Location:** Cell 5A (Constructed in 2011)

Bearing: 180 degrees **Taken in 2013**

Photo Point 15 **Location:** Cell 5A (Constructed in 2011)

Bearing: 180 degrees **Taken in 2014**

Photo Point 15 **Location:** Cell 5A (Constructed in 2011)

Bearing: 180 degrees **Taken in 2015**

Photo Point 16 – *Photo 1* **Location:** Cell 6 (Constructed in 2011)

Bearing: 70 degrees **Taken in 2012**

Photo Point 16 – *Photo 1* **Location:** Cell 6 (Constructed in 2011)

Bearing: 70 degrees **Taken in 2013**

Photo Point 16 – *Photo 1* **Location:** Cell 6 (Constructed in 2011)

Bearing: 70 degrees **Taken in 2014**

NO PHOTO

Photo Point 16 – *Photo 1* **Location:** Cell 6 (Constructed in 2011)

Bearing: 70 degrees **Taken in 2015**

Photo Point 16 – *Photo 2* **Location:** Cell 5A (Constructed in 2011)

Bearing: 290 degrees **Taken in 2012**

Photo Point 16 – *Photo 2* **Location:** Cell 5A (Constructed in 2011)

Bearing: 290 degrees **Taken in 2013**

Photo Point 16 – *Photo 2* **Location:** Cell 5A (Constructed in 2011)

Bearing: 290 degrees **Taken in 2014**

Photo Point 16 – *Photo 2* **Location:** Cell 5A (Constructed in 2011)

Bearing: 290 degrees **Taken in 2015**

Photo Point 17 **Location:** Cell 6 (Constructed in 2011)

Bearing: 270 degrees **Taken in 2012**

Photo Point 17 **Location:** Cell 6 (Constructed in 2011)

Bearing: 270 degrees **Taken in 2013**

Photo Point 17 **Location:** Cell 6 (Constructed in 2011)

Bearing: 270 degrees **Taken in 2014**

Photo Point 17 **Location:** Cell 6 (Constructed in 2011)

Bearing: 270 degrees **Taken in 2015**

Photo Point 18 **Location:** Cell 3 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2012**

Photo Point 18 **Location:** Cell 3 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2013**

Photo Point 18 **Location:** Cell 3 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2014**

Photo Point 18 **Location:** Cell 3 (Constructed in 2007)

Bearing: 90 degrees **Taken in 2015**

Photo Point 19 – *Photo 1* **Location:** West boundary

Bearing: 10 degrees **Taken in 2012**

Photo Point 19 – *Photo 2* **Location:** West boundary

Bearing: 100 degrees **Taken in 2012**

Photo Point 19 – *Photo 1* **Location:** West boundary

Bearing: 10 degrees **Taken in 2013**

Photo Point 19 – *Photo 2* **Location:** West boundary

Bearing: 100 degrees **Taken in 2013**

Photo Point 19 – *Photo 1* **Location:** West boundary

Bearing: 10 degrees **Taken in 2014**

Photo Point 19 – *Photo 2* **Location:** West boundary

Bearing: 100 degrees **Taken in 2014**

Photo Point 19 – *Photo 1* **Location:** West boundary

Bearing: 10 degrees **Taken in 2015**

Photo Point 19 – *Photo 2* **Location:** West boundary

Bearing: 100 degrees **Taken in 2015**

Photo Point 20 **Location:** Schrieber Creek

Bearing: 100 degrees **Taken in 2012**

Photo Point 20 **Location:** Schrieber Creek

Bearing: 100 degrees **Taken in 2013**

Photo Point 20 **Location:** Schrieber Creek

Bearing: 100 degrees **Taken in 2014**

Photo Point 20 **Location:** Schrieber Creek

Bearing: 100 degrees **Taken in 2015**

XS – 1 **Location:** Upper Coyote Creek

Bearing: 130 degrees **Taken in 2012**

XS – 1 **Location:** Upper Coyote Creek

Bearing: 280 degrees **Taken in 2013**

XS – 1 **Location:** Upper Coyote Creek

Bearing: 280 degrees **Taken in 2014**

XS – 1 **Location:** Upper Coyote Creek

Bearing: 280 degrees **Taken in 2015**

XS – 2 **Location:** Upper Coyote Creek

Bearing: 320 degrees **Taken in 2012**

XS – 2 **Location:** Upper Coyote Creek

Bearing: 320 degrees **Taken in 2013**

XS – 2 **Location:** Upper Coyote Creek

Bearing: 320 degrees **Taken in 2014**

XS – 2 **Location:** Upper Coyote Creek

Bearing: 320 degrees **Taken in 2015**

XS – 3 **Location:** Coyote Creek Spring Area

Bearing: 320 degrees **Taken in 2012**

XS – 3 **Location:** Coyote Creek Spring Area

Bearing: 320 degrees **Taken in 2013**

XS – 3 **Location:** Coyote Creek Spring Area

Bearing: 320 degrees **Taken in 2014**

XS – 3 **Location:** Coyote Creek Spring Area

Bearing: 340 degrees **Taken in 2015**

XS – 4 **Location:** Middle Coyote Creek

Bearing: 125 degrees **Taken in 2012**

XS – 4 **Location:** Middle Coyote Creek

Bearing: 290 degrees **Taken in 2013**

XS – 4 **Location:** Middle Coyote Creek

Bearing: 290 degrees **Taken in 2014**

XS – 4 **Location:** Middle Coyote Creek

Bearing: 290 degrees **Taken in 2015**

XS – 5 **Location:** Middle Coyote Creek

Bearing: 150 degrees **Taken in 2012**

XS – 5 **Location:** Middle Coyote Creek

Bearing: 300 degrees **Taken in 2013**

XS – 5 **Location:** Middle Coyote Creek

Bearing: 300 degrees **Taken in 2014**

XS – 5 **Location:** Middle Coyote Creek

Bearing: NA **Taken in 2015**

XS – 6 **Location:** Perennial Spring Creek

Bearing: 90 degrees **Taken in 2012**

XS – 6 **Location:** Perennial Spring Creek

Bearing: 230 degrees **Taken in 2013**

XS – 6 **Location:** Perennial Spring Creek

Bearing: 230 degrees **Taken in 2014**

XS – 6 **Location:** Perennial Spring Creek

Bearing: 90 degrees **Taken in 2015**

XS – 7 **Location:** Middle Coyote Creek

Bearing: 90 degrees **Taken in 2012**

XS – 7 **Location:** Middle Coyote Creek

Bearing: 220 degrees **Taken in 2013**

XS – 7 **Location:** Middle Coyote Creek

Bearing: 220 degrees **Taken in 2014**

XS – 7 **Location:** Middle Coyote Creek

Bearing: 220 degrees **Taken in 2015**

XS – 8 **Location:** Middle Coyote Creek

Bearing: : 170 degrees **Taken in 2012**

XS – 8 **Location:** Middle Coyote Creek

Bearing: : 270 degrees **Taken in 2013**

XS – 8 **Location:** Middle Coyote Creek

Bearing: : 270 degrees **Taken in 2014**

XS – 8 **Location:** Middle Coyote Creek

Bearing: : 270 degrees **Taken in 2015**

XS – 9 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 130 degrees **Taken in 2012**

XS – 9 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 90 degrees **Taken in 2013**

XS – 9 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 90 degrees **Taken in 2014**

XS – 9 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 90 degrees **Taken in 2015**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 140 degrees **Taken in 2012**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 270 degrees **Taken in 2013**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 270 degrees **Taken in 2014**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 270 degrees **Taken in 2015**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks

Description: Submerged Right Bank **Taken in 2015**

XS – 11 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 100 degrees **Taken in 2012**

XS – 11 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 90 degrees **Taken in 2013**

XS – 11 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 90 degrees **Taken in 2014**

XS – 11 **Location:** Merged Coyote/Schrieber Creeks

Bearing: 90 degrees **Taken in 2015**

Veg Tran 1 **Location:** T-1 start

Bearing: 115 degrees **Taken in 2010**

Veg Tran 1 **Location:** T-1 end

Bearing: 245 degrees **Taken in 2010**

Veg Tran 1 **Location:** T-1 start

Bearing: 115 degrees **Taken in 2013**

Veg Tran 1 **Location:** T-1 end

Bearing: 245 degrees **Taken in 2013**

Veg Tran 1 **Location:** T-1 start

Bearing: 115 degrees **Taken in** 2014

Veg Tran 1 **Location:** T-1 end

Bearing: 245 degrees **Taken in 2014**

Veg Tran 1 **Location:** T-1 start

Bearing: 115 degrees **Taken in** 2015

Veg Tran 1 **Location:** T-1 end

Bearing: 245 degrees **Taken in 2015**

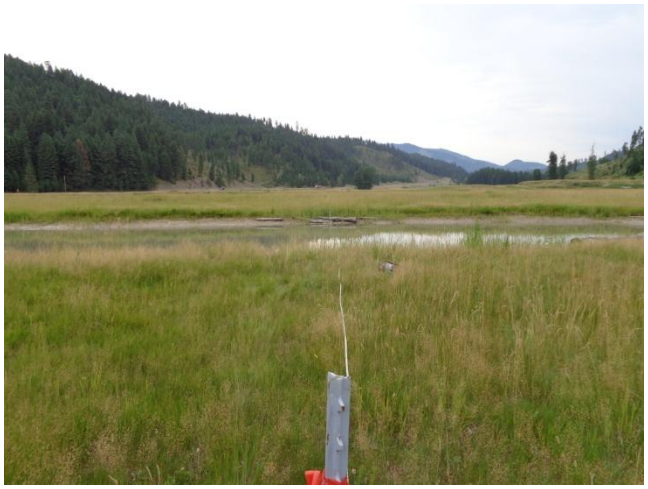
No Photo

Veg Tran 2 **Location:** T-2 start

Bearing: 100 degrees **Taken in 2012**

Veg Tran 2 **Location:** T-2 end

Bearing: 280 degrees **Taken in 2012**



Veg Tran 2 **Location:** T-2 start

Bearing: 100 degrees **Taken in 2013**

Veg Tran 2 **Location:** T-2 end

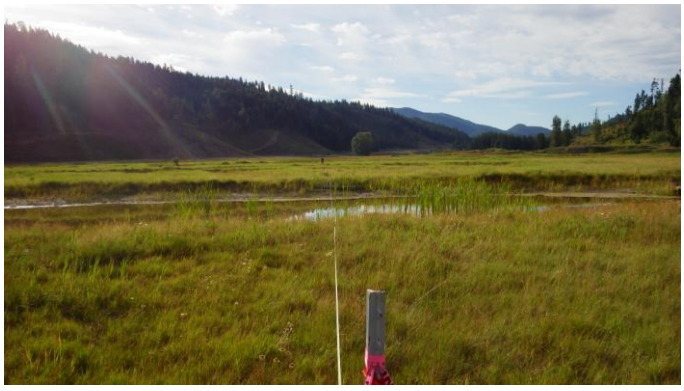
Bearing: 280 degrees **Taken in 2013**

Veg Tran 2 **Location:** T-2 start

Bearing: 100 degrees **Taken in 2014**

Veg Tran 2 **Location:** T-2 end

Bearing: 280 degrees **Taken in 2014**



Veg Tran 2 **Location:** T-2 start

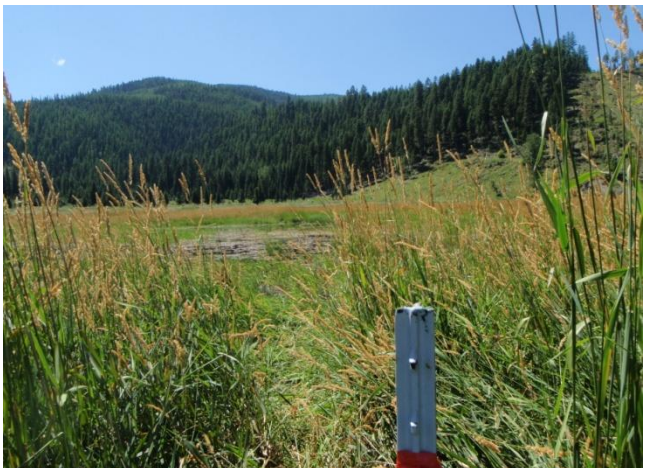
Bearing: 100 degrees **Taken in 2015**

Veg Tran 2 **Location:** T-2 end

Bearing: 280 degrees **Taken in 2015**

Veg Tran 3 **Location:** T-3 start

Bearing: 50 degrees **Taken in 2012**



Veg Tran 3 **Location:** T-3 end

Bearing: 200 degrees **Taken in 2012**

Veg Tran 3 **Location:** T-3 start

Bearing: 45 degrees **Taken in 2013**

Veg Tran 3 **Location:** T-3 end

Bearing: 225 degrees **Taken in 2013**

Veg Tran 3 **Location:** T-3 start

Bearing: 45 degrees **Taken in 2014**

Veg Tran 3 **Location:** T-3 end

Bearing: 225 degrees **Taken in 2014**

Veg Tran 3 **Location:** T-3 start

Bearing: 45 degrees **Taken in 2015**

Veg Tran 3 **Location:** T-3 end

Bearing: 225 degrees **Taken in 2015**

Data Point: TP A Wet **Location:** Veg Com 3

Bearing: NA **Taken in 2014**

Data Point: TP A UP **Location:** Veg Com 9

Bearing: NA **Taken in 2014**

Data Point: SP-1 WET **Location:** Veg Com 3

Bearing: 22 **Taken in 2015**

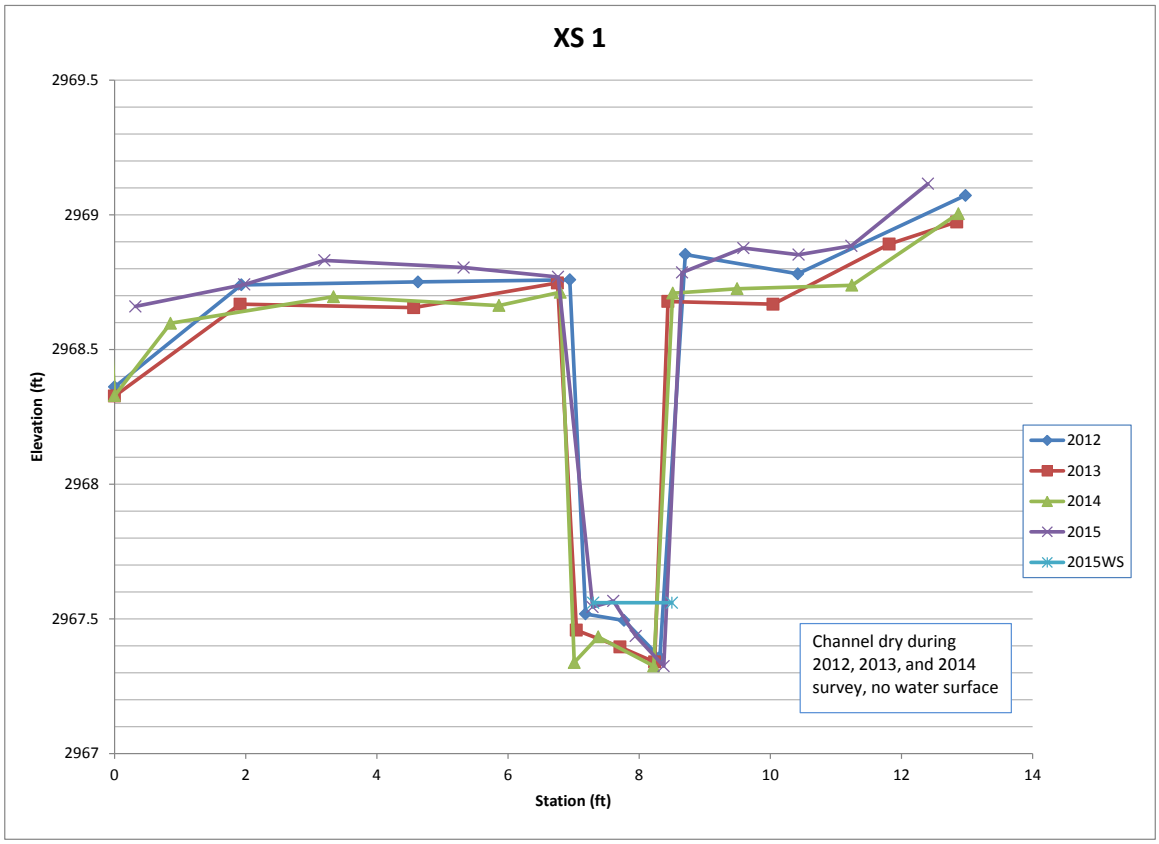
Data Point: SP-2 UP **Location:** Veg Com 9

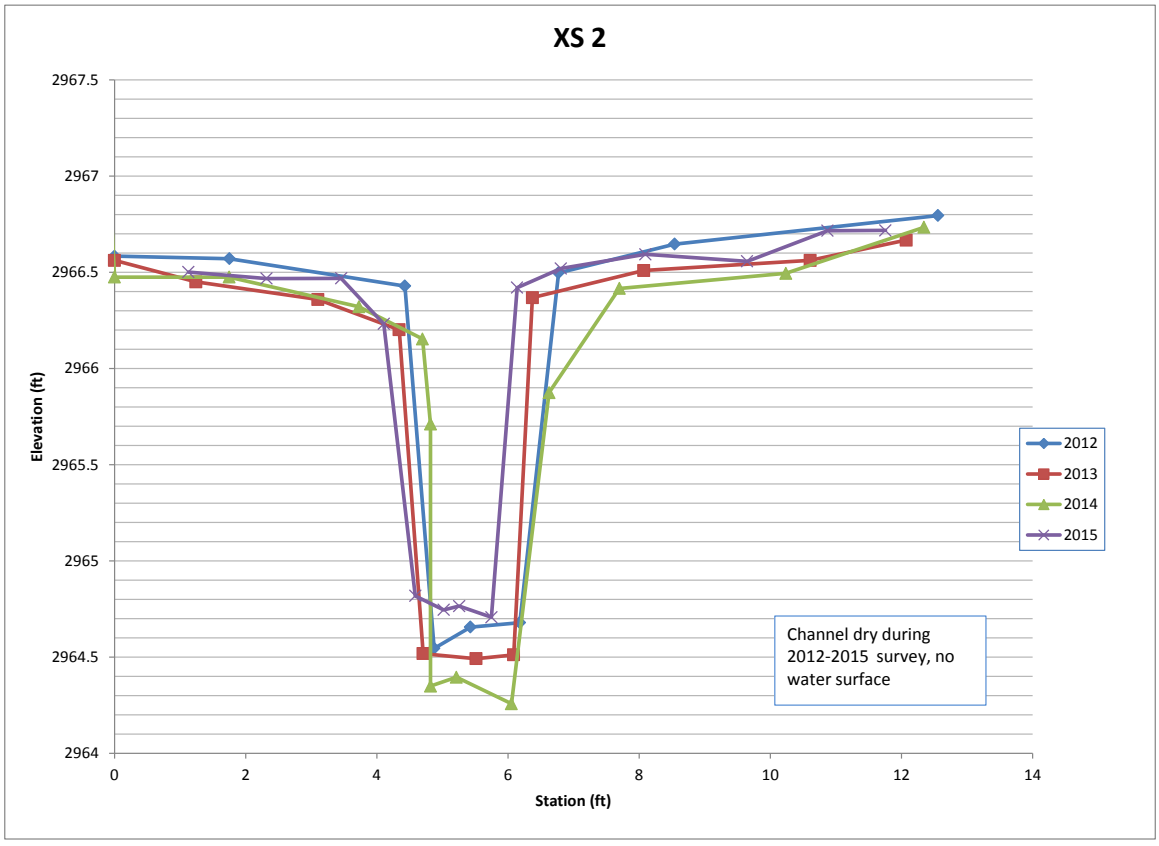
Bearing: 22 **Taken in 2015**

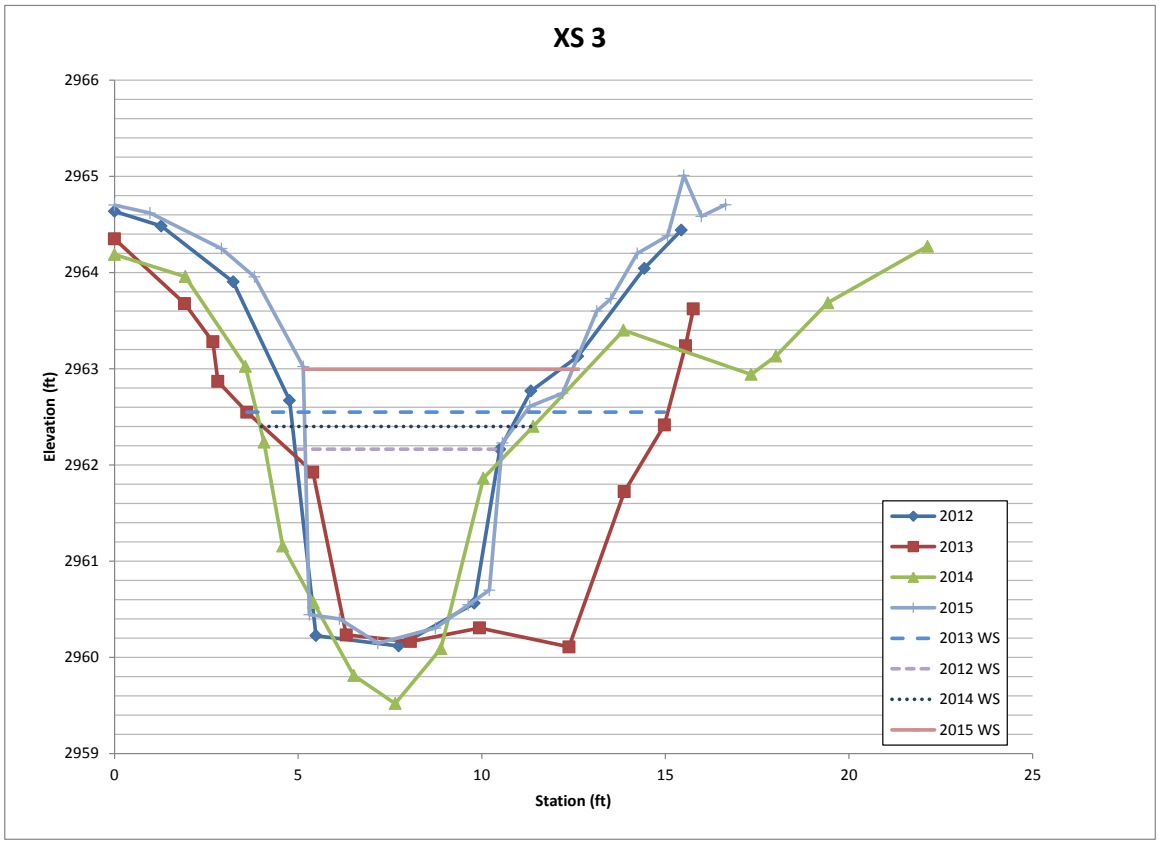
Appendix D

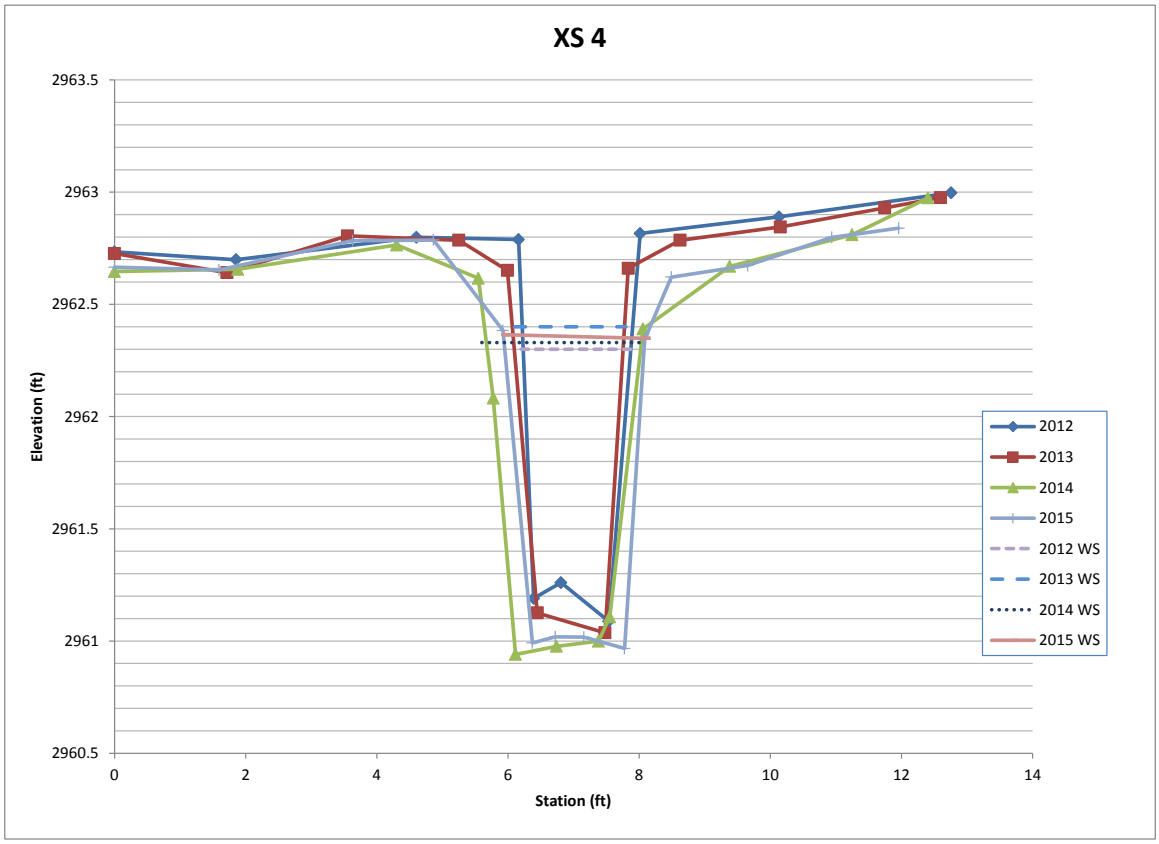
Surveyed Stream Cross Sections

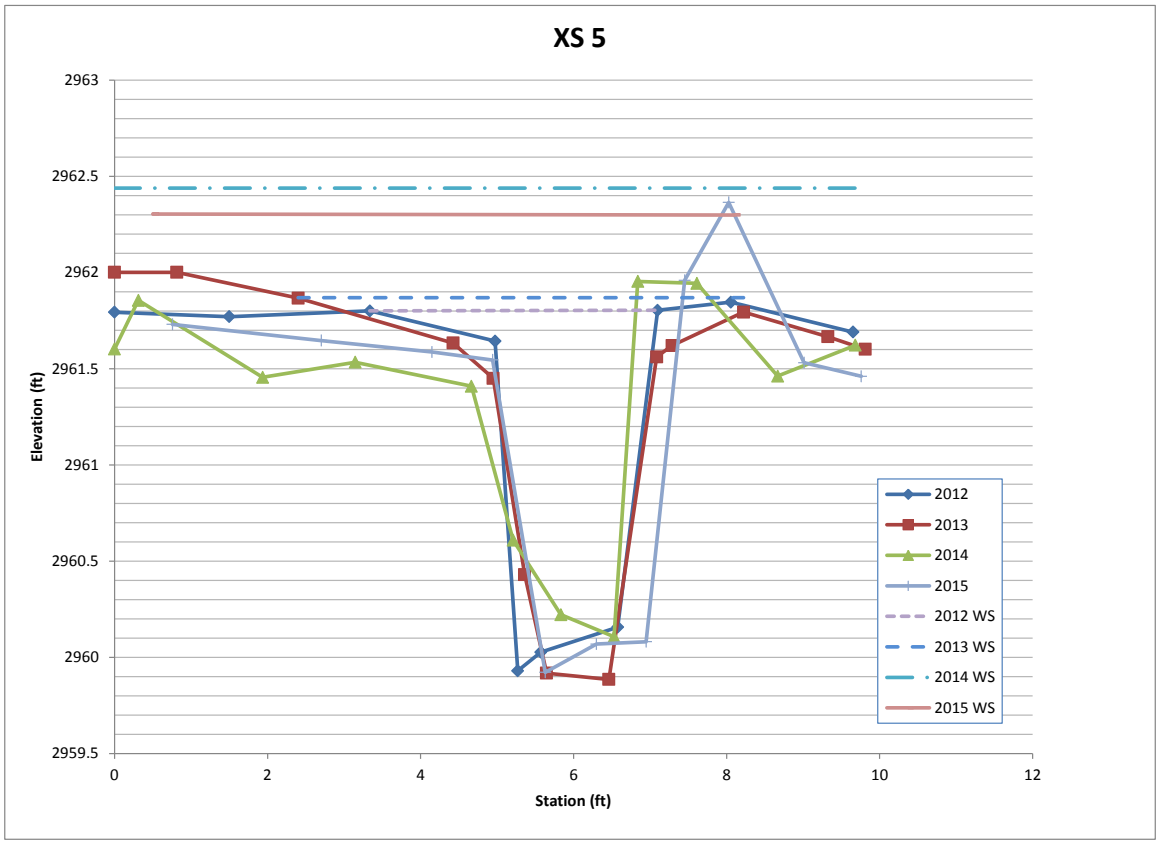
MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

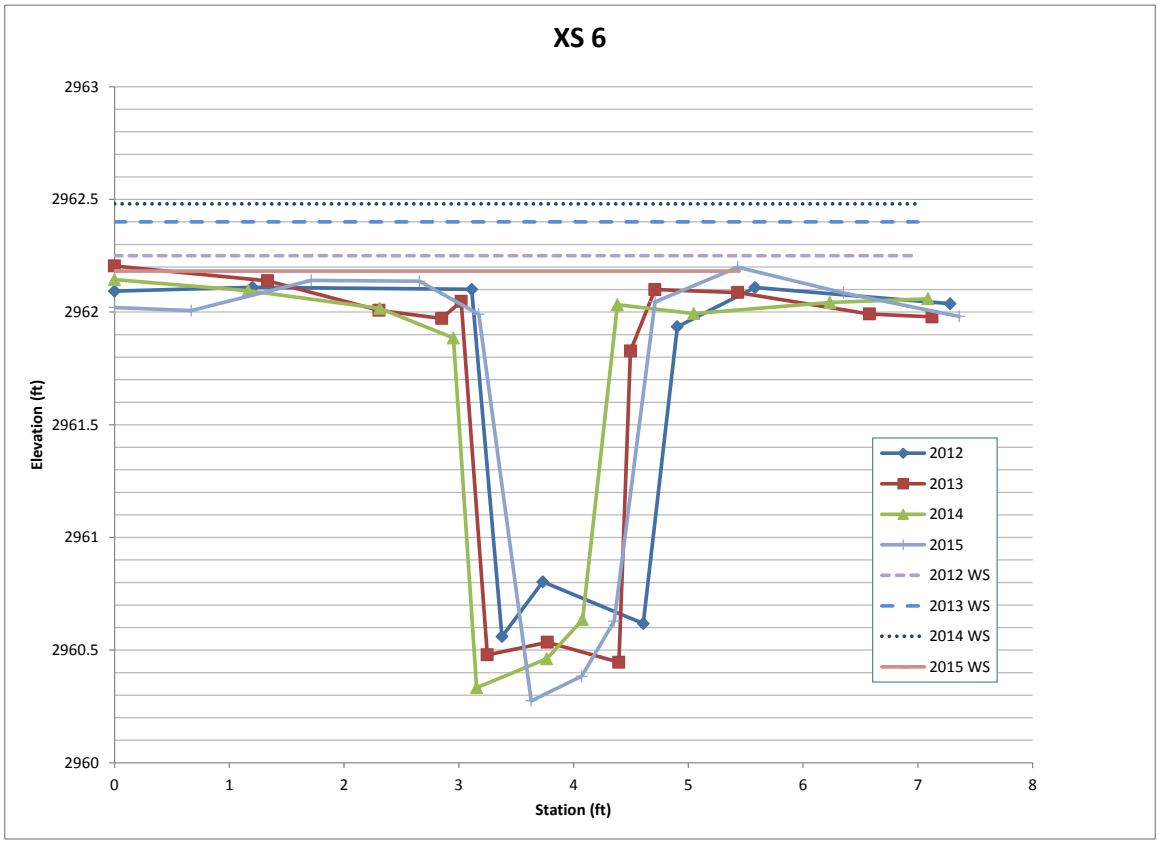

XS 1
2969.5
2969
2968.5
2968
2967.5
2967
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2015
2015WS
Channel dry during 2012, 2013, and 2014 survey, no water surface

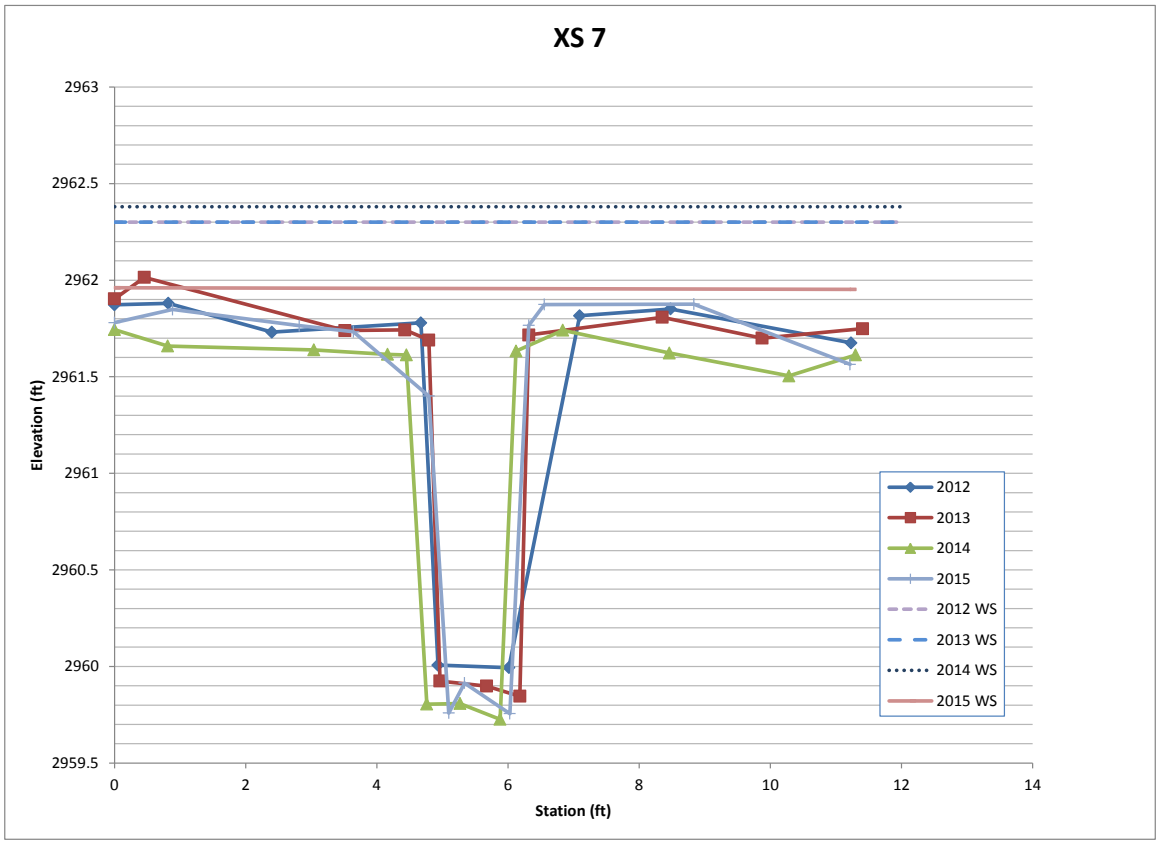

XS 2
2967.5
2967
2966.5
2966
2965.5
2965
2964.5
2964
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2015
Channel dry during 2012-2015 survey, no water surface

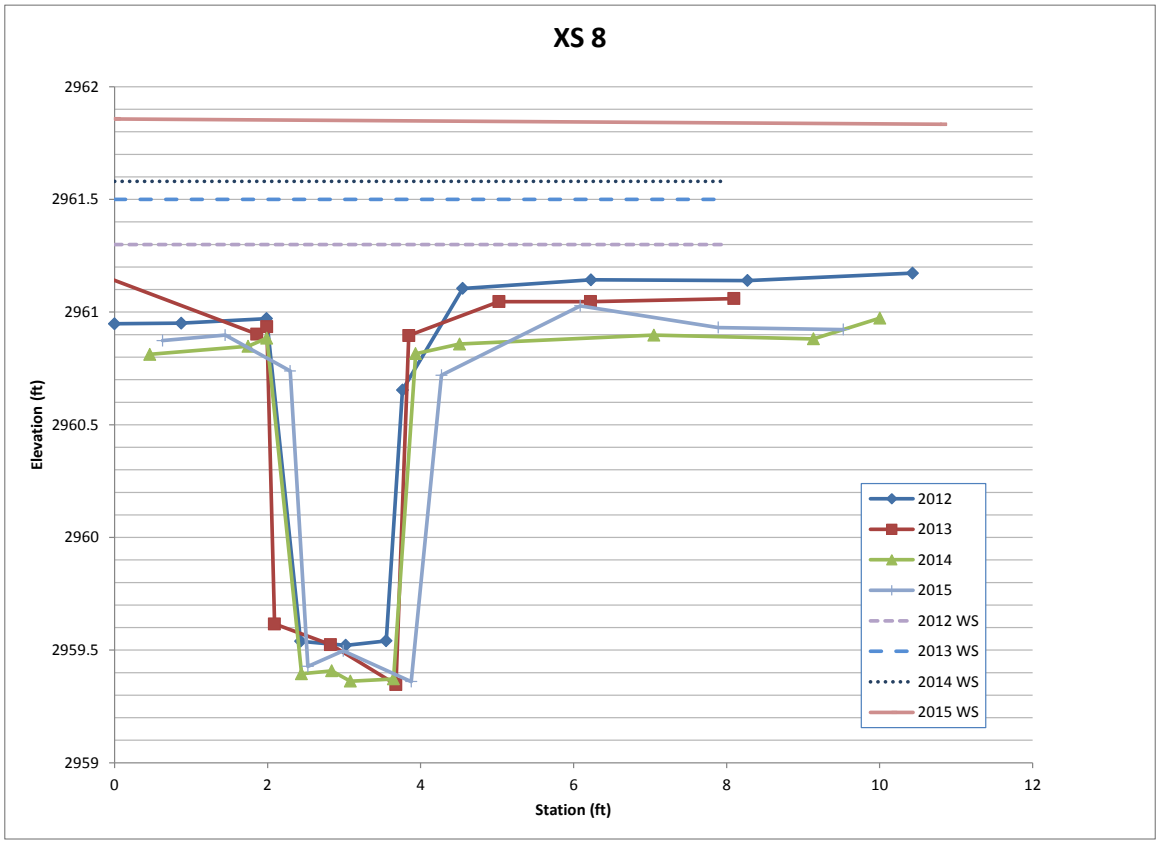

XS 3
Elevation (ft)
Station (ft)
2966
2965
2964
2963
2962
2961
2960
2959
0
5
10
15
20
25
2012
2013
2014
2015
2013 WS
2012 WS
2014 WS
2015 WS

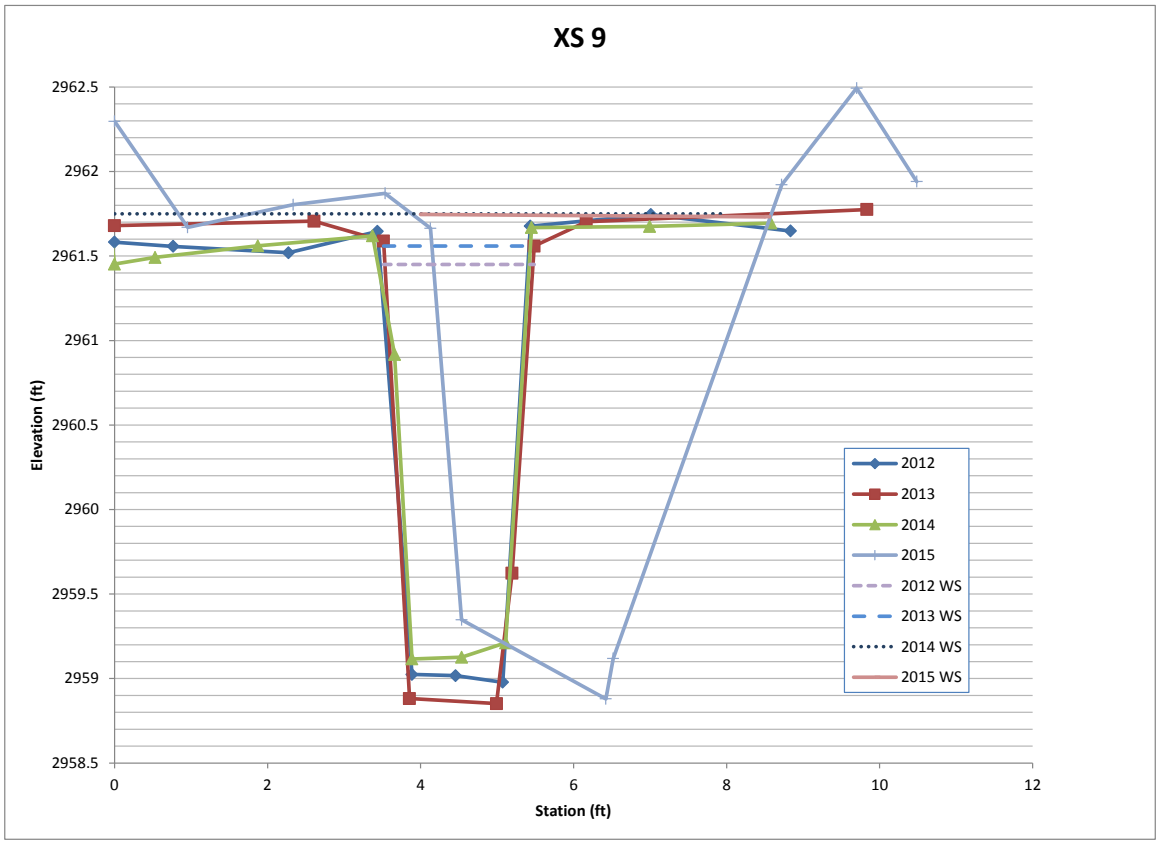

XS 4
Elevation (ft)
Station (ft)
2963.5
2963
2962.5
2962
2961.5
2961
2960.5
0
2
4
6
8
10
12
14
2012
2013
2014
2015
2012 WS
2013 WS
2014 WS
2015 WS

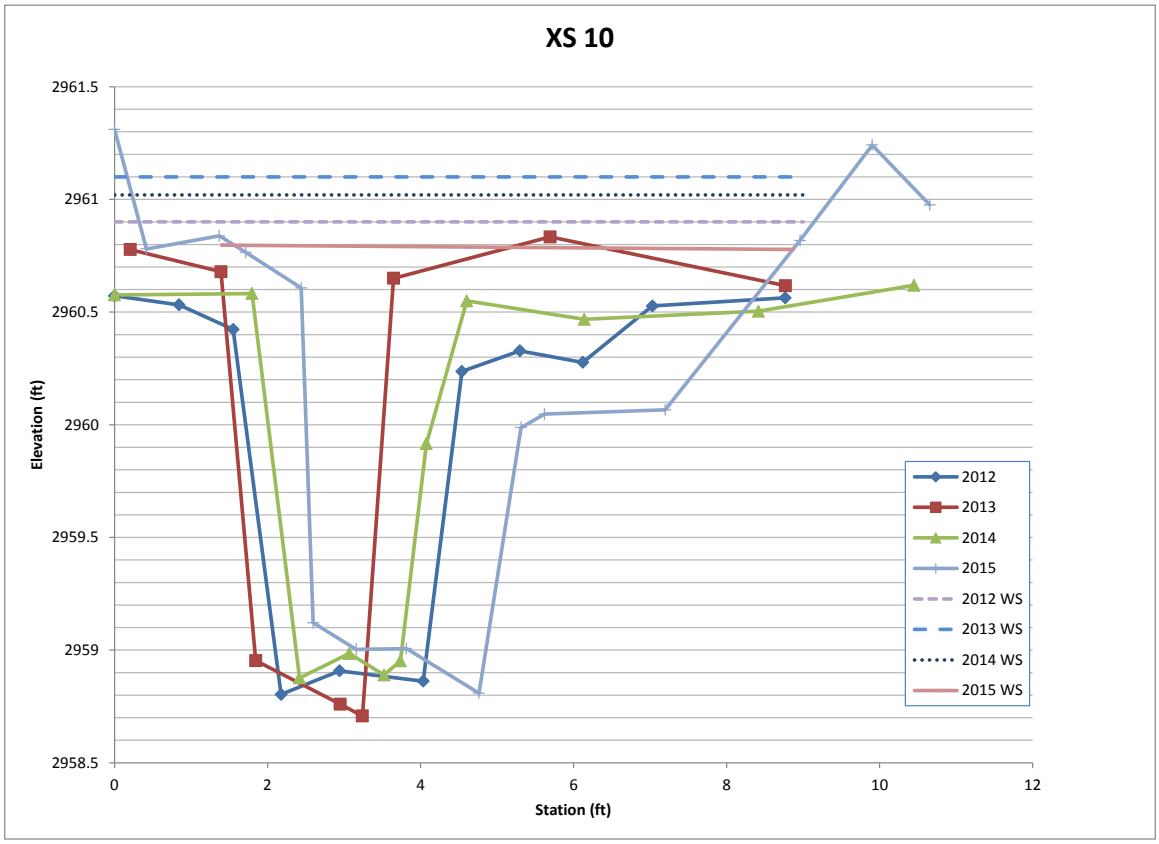

XS 5
2963
2962.5
2962
2961.5
2961
2960.5
2960
2959.5
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2015
2012 WS
2013 WS
2014 WS
2015 WS

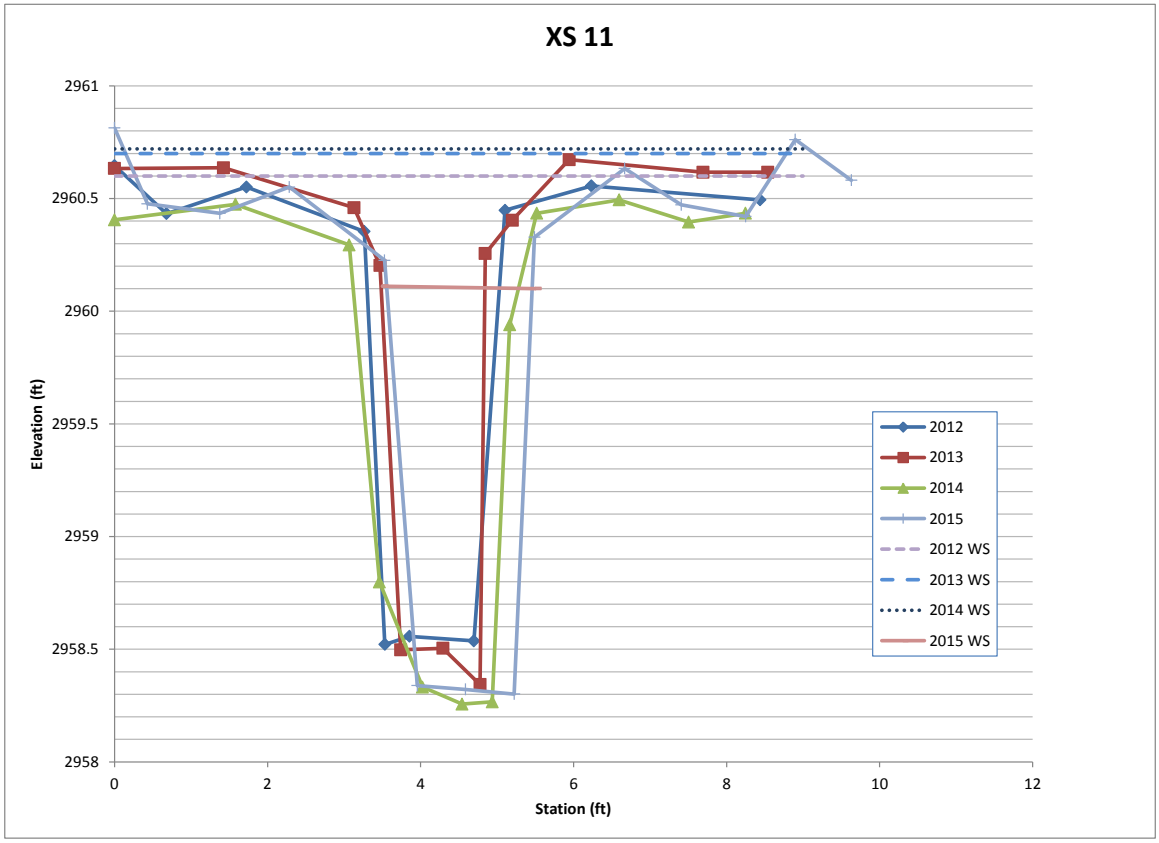

XS 6
2963
2962.5
2962
2961.5
2961
2960.5
2960
Elevation (ft)
0
1
2
3
4
5
6
7
8
Station (ft)
2012
2013
2014
2015
2012 WS
2013 WS
2014 WS
2015 WS


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
2012 WS
2013 WS
2014 WS
2015 WS


XS 8
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
2012 WS
2013 WS
2014 WS
2015 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
2012 WS
2013 WS
2014 WS
2015 WS


XS 10
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
2012 WS
2013 WS
2014 WS
2015 WS


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

Appendix E

Project Plan Sheet

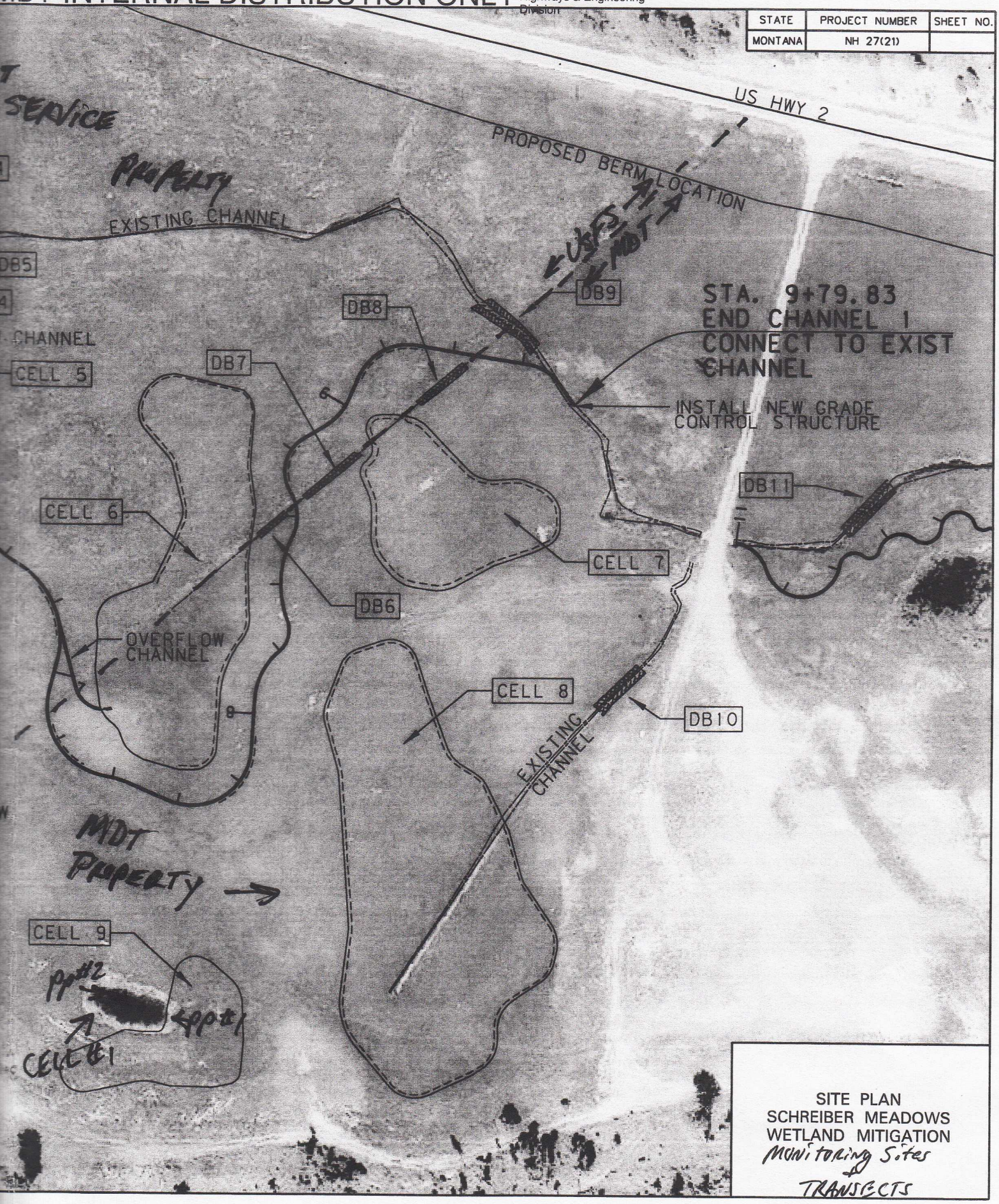
MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

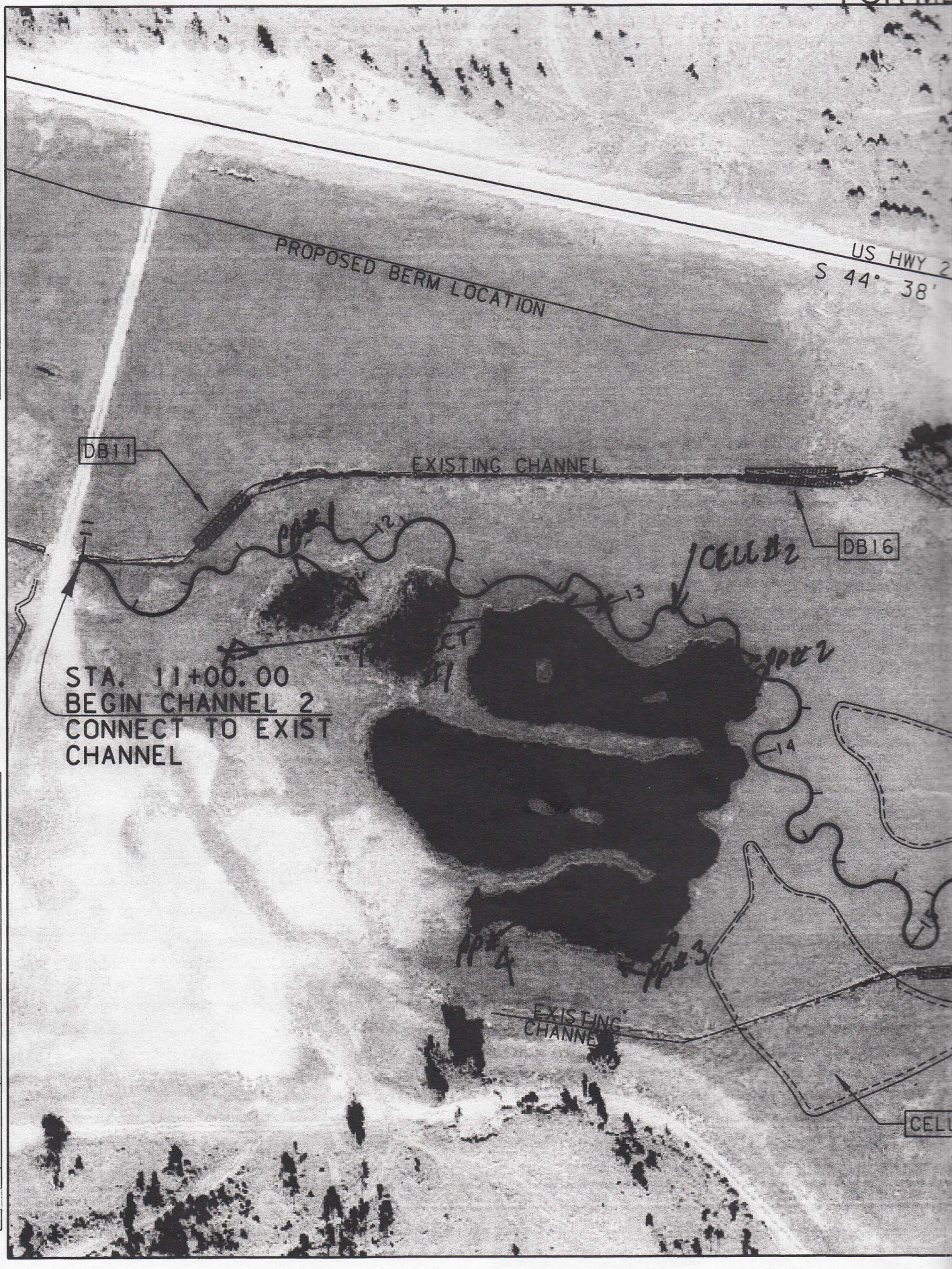
MONTANA CADD

MDT MONTANA DEPARTMENT OF TRANSPORTATION

DAVID EVANS AND ASSOCIATES INC.
908 N. Howard St., Suite 300
Spokane Washington 99201
Phone: 509.327.8697

c:\dgn\d027rdpln001.dgn	DESIGNED BY	
6/3/2010	REVIEWED BY	
6:58:07 AM	CHECKED BY	
EPS - U7713		





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

c:\dgn\d027rdpln001.dgn	DESIGNED BY		
6/3/2010	REVIEWED BY		
6:58:10 AM	CHECKED BY		
—	CPS - U77.13		

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

SITE PLAN
SCHREIBER MEADOWS
WETLAND MITIGATION
MONITORING POINTS
+
TRANSECTS