MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2014

Schrieber Meadows
Lincoln County, Montana

Prepared for:

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December 2014

MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND MITIGATION MONITORING REPORT:

YEAR 2014

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

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CCI Project No: MDT.006

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

1. INTRODUCTION

The Schrieber Meadows Wetland Mitigation 2014 Monitoring Report presents the results of the fourth year of post-construction monitoring at the Schrieber Meadows mitigation area for three pilot cells constructed in 2007 and of the third 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 USACE Wetland Determination Data Forms for the Western Mountains, Valleys, and Coast Region (USACE 2010), and the 2008 MDT Montana Wetland Assessment Forms. Appendix C contains photographs of the project area and Appendix D includes the project plan sheet.

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.

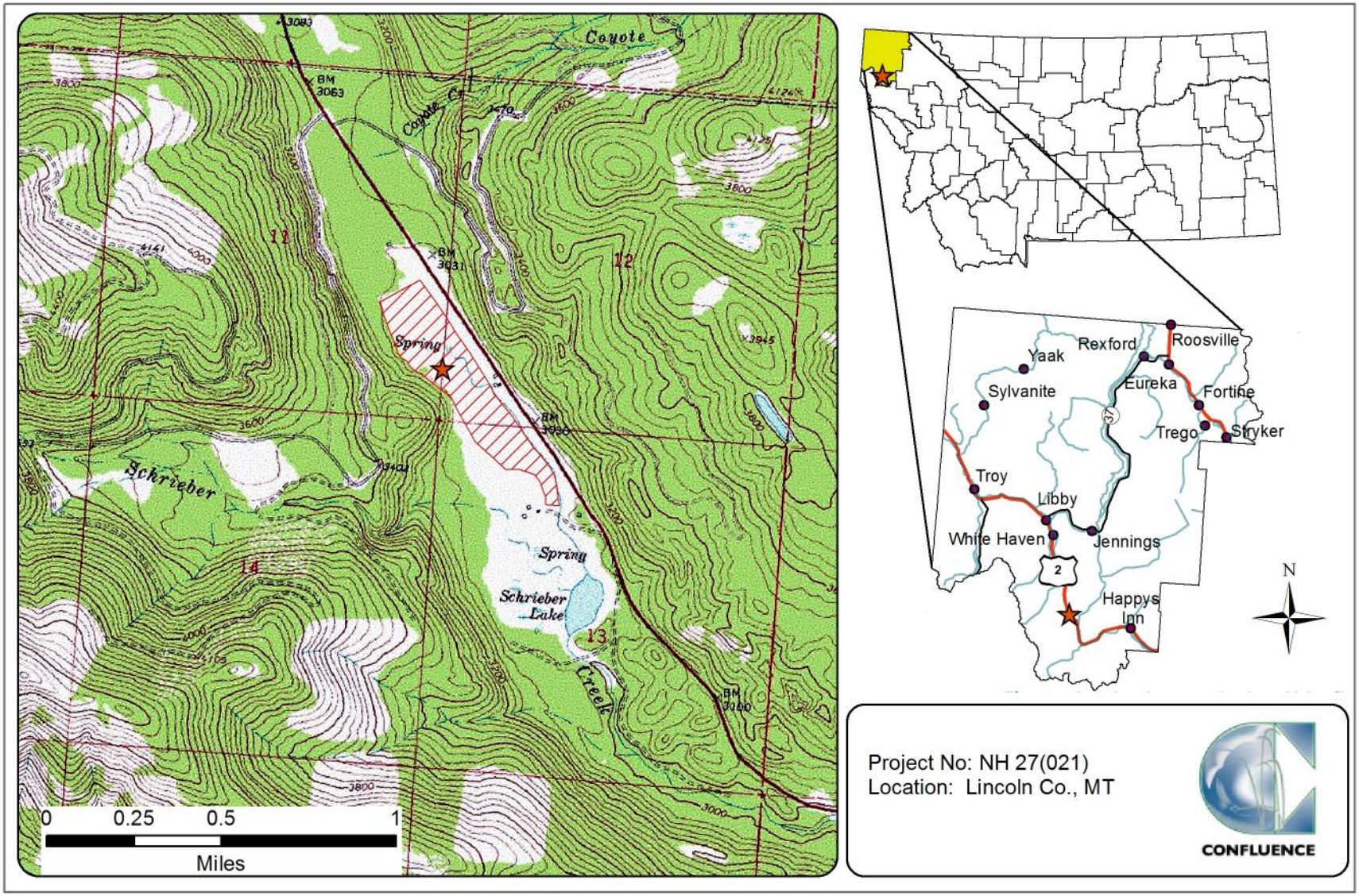

Figure 1. Project location for Schrieber Meadows Mitigation Site.

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.

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 under Section 401 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 meadow foxtail (*Alopecurus pratensis*) were removed from the site as a consequence of wetland cell excavation. 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 hounds tongue) prior to the initiation of wetland construction activities within the site.

2. METHODS

The annual monitoring event was conducted on July 29th, 2014, and represented the fourth year of monitoring for the pilot project and third year of monitoring of the entire Schrieber Meadows mitigation site. Information contained on the Mitigation Monitoring Form and Wetland Determination Data Forms was entered in the field on an electronic tablet computer 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.

No groundwater monitoring wells are present on the site. 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 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 E 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 (December 2013), 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 2014 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, burrow, 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 2014 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 32 SSE, Montana (245020) weather station recorded an average total annual precipitation rate of 24.59 inches from 1949 to 2013 (WRCC 2014). Annual precipitation for 2010, 2011, 2012, and 2013 was 22.01, 22.64, 27.19, and 19.18 inches, respectively. Average monthly precipitation totals from January to August for the period of record was 15.02 inches. Precipitation totals recorded from January to August were 15.05 inches (2011), 16.2 inches (2012), 10.01 inches (2013), and 15.06 (2014). In general, the region surrounding the project area exhibited above-average precipitation in 2011, 2012, and 2014 and below-average precipitation in 2013 prior to and during the growing season.

During the 2014 investigation, the average depth of surface water across the site was estimated at 1.8 feet with a range of depths from 0.0 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 south two-thirds of the site was inundated and/or saturated as a result of the plugged former channel of Coyote Creek and abundant surface and ground water flowing through the valley. The north portion of the site was drier. All of the excavated ponds contained surface water although the water levels were below the design elevation toward the north boundary. The intermittent Schrieber Creek was dry in July 2014 above 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 and 2012, likely flow off the site as excess surface water. Other site wide indicators of wetland hydrology included saturation and inundation visible on aerial photographs and a seasonal high groundwater table.

Two data points were sampled in 2014 to determine the wetland/upland boundaries. Data point TP A Wet was located between two excavated wetland cells within wetland community Type 3 (Figure 2, Appendix A). The wetland data point exhibited a high water table at 6 inches below the ground surface (bgs) and saturation to the ground surface. Upland data point TP A Up was located upslope from TP A Wet within upland community Type 9. There were no hydrologic indicators at data point TP A Up.

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 E. The 2014 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 have been provided for the meadow-foxtails. 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 and XS-10, there were minimal changes within the surveyed cross section geometry between 2012 and 2014. Cross-section 3 was located directly below the spring in a reach of channel that remained undisturbed during mitigation construction in 2011. A review of XS-3 indicated a discrepancy related to an inability to find the bank pins in 2013 and 2014 and does not reflect an actual change in channel morphology at this location. Photographs of XS-3, shown on page C-23 of Appendix C, display well-vegetated streambanks and abundant instream vegetation. There was no observable change to the stream channel through this reach between 2012 and 2014. The permanent bank pins could not be located at XS-10 during the 2013 survey 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 west of the established pins. Photographs on page C-26 of Appendix C show well-established reed canary grass stands at this cross section with no erosion identified during the field survey.

3.3. Vegetation

A comprehensive list of 114 plant species identified on the site from 2010 to 2014 is presented in Table 2. Six wetland and two upland community types were identified and mapped at the mitigation site in 2014 (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 2014 are discussed below.

Table 2. Vegetation species identified in 2010 and 2012 thru 2014 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 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
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 microptera	Small-Wing Sedge	FACU
Carex nebrascensis	Nebraska Sedge	OBL
Carex pachystachya	Thick-Head Sedge	FAC
Carex pellita	Woolly Sedge	OBL
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
Collomia linearis	Narrow-Leaf Mountain-Trumpet	FACU
Cynoglossum officinale	Gypsy-Flower	FACU

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

New species identified in 2014 are **bolded**.

Table 2. (continued). Vegetation species identified in 2010 and 2012 thru 2014 at the Schrieber Meadows Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
Deschampsia cespitosa	Tufted Hairgrass	FACW
Eleocharis flavescens	Yellow Spike-Rush	OBL
Eleocharis palustris	Common Spike-Rush	OBL
Eleocharis quinqueflora	Few-Flower Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Epilobium sp.	Willowherb	NL
Equisetum arvense	Field Horsetail	FAC
Equisetum hyemale	Tall Scouring-Rush	FACW
Erysimum cheiranthoides	Worm-Seed Wallflower	FACU
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 striata	Fowl Manna Grass	OBL
Gnaphalium palustre	Western Marsh Cudweed	FACW
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
Myriophyllum spicatum	Eurasian Water-Milfoil	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

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

New species identified in 2014 are **bolded**.

Table 2. (continued). Vegetation species identified in 2010 and 2012 thru 2014 at the Schrieber Meadows Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
Peritoma serrulata	Rocky Mountain Bee Plant	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC
Pinus contorta	Lodgepole Pine	FAC
Pinus ponderosa	Ponderosa Pine	FACU
Plantago major	Great Plantain	FAC
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa sp.	Blue Grass	NL
Polygonum douglasii	Douglas' Knotweed	FACU
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
Ranunculus sceleratus	Cursed Buttercup	OBL
Rumex acetosella	Common Sheep Sorrel	FACU
Rumex crispus	Curly Dock	FAC
Salix drummondiana	Drummond's Willow	FACW
Senecio hydrophiloides	Stout Meadow Ragwort	FACW
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sparganium emersum	European Burr-Reed	OBL
Spiranthes romanzoffiana	Hooded Ladies'-Tresses	FACW
Stuckenia pectinata	Sago False Pondweed	OBL
Suaeda calceoliformis	Paiuteweed	FACW
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 2014 are **bolded**.

Wetland community Type 3 – *Phalaris arundinacea* was the largest vegetation community on the site in 2014, covering 21.92 acres of the project area. Reed canary grass dominated the community. The reed canary grass was over six feet tall in some areas. Creeping meadow-foxtail, field meadow-foxtail, American slough grass, water smartweed (*Persicaria amphibia*), and thick-head sedge (*Carex pachystachya*) were present at one to five percent cover. Twenty-three additional species were identified in this community at less than one percent cover.

Wetland community Type 5 – Aquatic macrophytes/Open Water encompassed 8.88 acres of the excavated cells throughout the site. The three cells constructed in 2007 exhibited a well-developed aquatic community with emergent, floating, and submergent plant species at densities generally greater than 15 percent cover. The cells constructed in 2011 exhibited a large variability of aquatic plant development which appeared dependent upon the 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 comprised of algae and spare emergent. Inundation levels within the constructed cells increased at the down-gradient end of the site near the south boundary and the water regime is most likely perennial. Aquatic plant density was much higher in these wetter cells and included brown and green algae, chara, water smartweed (*Persicaria amphibia*), broad-leaf cattail (*Typha latifolia*) and other unidentified aquatic macrophytes were common within the deeper water. Dominant vegetation at the open water margins included tall manna grass (*Glyceria elata*), common spike-rush (*Eleocharis palustris*), reed canary grass, and stalk-grain sedge (*Carex stipata*). A total of 18 species, including Northwest Territory sedge (*Carex utriculata*), Nebraska sedge (*Carex nebrascenis*), and leafy tussock sedge (*Carex aquatilis*), were identified within this community in 2014.

Wetland community Type 6 – *Alopecurus* spp. was located across 13.23 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 creeping meadow foxtail with lesser amounts of reed canary grass, Kentucky blue grass (*Poa pratensis*), great plantain (*Plantago major*), Drummond's willow (*Salix drummondiana*), rabbitfoot clover (*Trifolium arvense*), and common dandelion (*Taraxacum officinale*). A total of 34 plant species were identified within the community.

Wetland community Type 7 – *Juncus bufonius*/Bare Ground was located on 0.25 acre in 2014, a considerable decrease from 1.70 acres identified in 2013. This community was generally mapped around the perimeter of the constructed cells in 2012 and was replaced in 2013 by community Type 11 – *Beckmannia*

syzigachne/Bare Ground. Community Type 7 was mapped in 2014 in the lower contours of an excavated wetland cell in the northwest corner of the mitigation area. Toad rush (*Juncus bufonius*) was the dominant plant species in this community. American slough grass, common spike rush, seep monkey-flower (*Mimulus guttatus*), and paiuteweed (*Suaeda calceoliformis*) were identified at less than 10 percent cover. 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 was seeded following construction in 2011. 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 (*Bromus inermis*), and tall hedge-mustard (*Sisymbrium altissimum*).

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

Wetland community Type 11 – characterized 1.53 acres of wetland identified in 2013 and 2014 within the perimeter of the ponds in the north section of the site. Wetland community Type 11 – *Beckmannia syzigachne*/Bare Ground replaced wetland community 7 in 2013. Twenty-one to fifty percent of the cover within the community was recorded as bare ground. Open water covered from one to five percent of the community. American sloughgrass, creeping meadow-foxtail, toad rush, American wild mint (*Mentha arvensis*), and slender-beaked sedge (*Carex athrostachya*) dominated the vegetation species.

Wetland community Type 12 – *Agrostis stolonifera/Juncus bufonius* was a new vegetation community first identified in 2013 on 1.8 acres located in the northwest corner of the site that replaced an area mapped as the Type 6 – *Alopecurus* community in 2012. Black bent (grass) (*Agrostis stolonifera*), toad rush, and smooth brome dominated the plant cover in 2014. Bare ground was exposed on less than one percent of the community. This community type represented seasonal wetlands with dry conditions generally present throughout the second half of the growing season.

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 2014 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. Increased sedge establishment has been noted within the perennially inundated southern half of the site but have not progressed to the point of development to map as distinct vegetation communities.

Trends in plant species composition were measured on three transects (T-1, T-2, and T-3) in 2014. Photographs of the transect end points are shown on pages C-28 to C-30 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). Vegetation communities 3 (*Phalaris*) and 5 (Aquatic macrophytes/Open Water) were identified along this transect. Approximately seven inches of standing water was noted at the end of T-1. The cover of hydrophytic species on T-1 was 24.5 percent in 2013 and 2014, slightly lower than 2012. The increase of open water on T-1 from 2012 to 2013 reflected the rising level of inundation within the excavated cells, which was the result of plugging the former Coyote Creek channel along the east boundary. No portion of this transect crossed an upland community type from 2012 to 2014.

Table 3. Data summary for transect T-1 in 2010 and 2012 thru 2014 at the Schrieber Wetland Mitigation Site.

Monitoring Year	**2010**	**2012**	**2013**	**2014**
Transect Length (feet)	**318**	**318**	**318**	**318**
Vegetation Community Transitions along Transect	7	6	6	6
Vegetation Communities along Transect	3	2	2	2
Hydrophytic Vegetation Communities along Transect	2	2	2	1
Total Vegetative Species	32	15	13	10
Total Hydrophytic Species	22	12	8	6
Total Upland Species	10	3	5	4
Estimated % Total Vegetative Cover	75	80	85	90
Estiamte % Unvegetated	25	20	15	10
% Transect Length Comprising Hydrophytic Vegetation Communities	62	27	24.5	24.5
% Transect Length Comprising Upland Vegetation Communities	13	0	0	0
% Transect Length Comprising Open Water	25	73	75.5	75.5
% Transect Length Comprising Mudflat	0	0	0	0

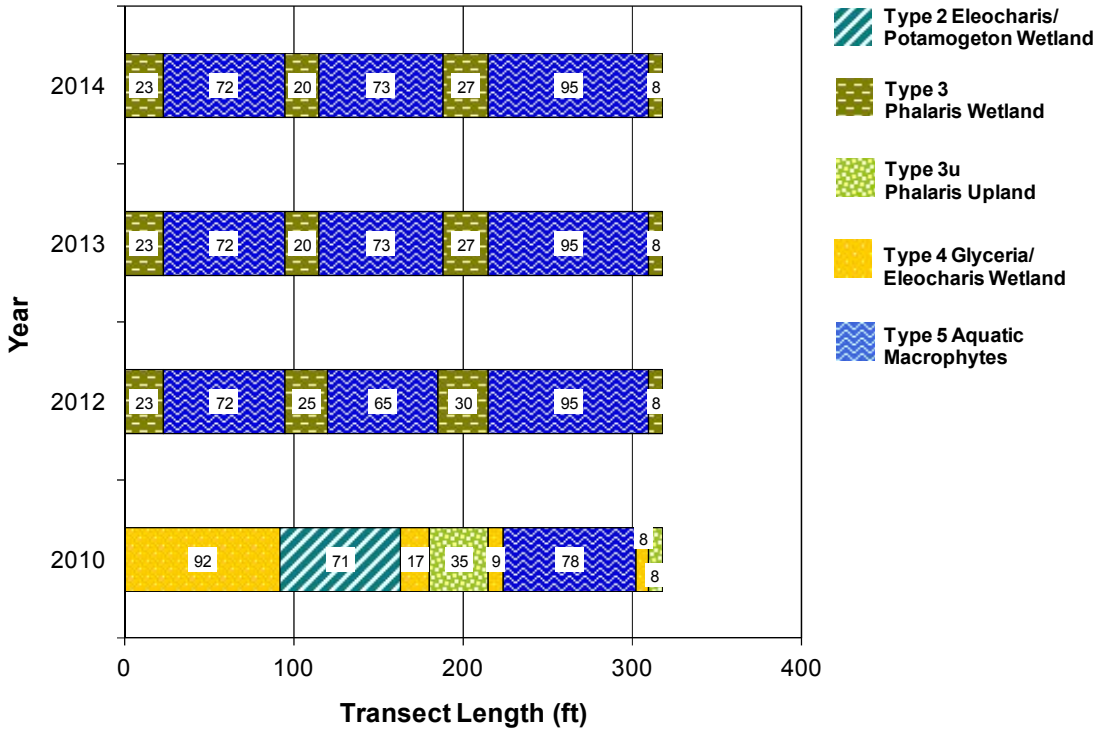

Chart 1. Transect map showing community types on transect T-1 in 2010 and 2012 thru 2014 from start (0 feet) to end (318 feet).

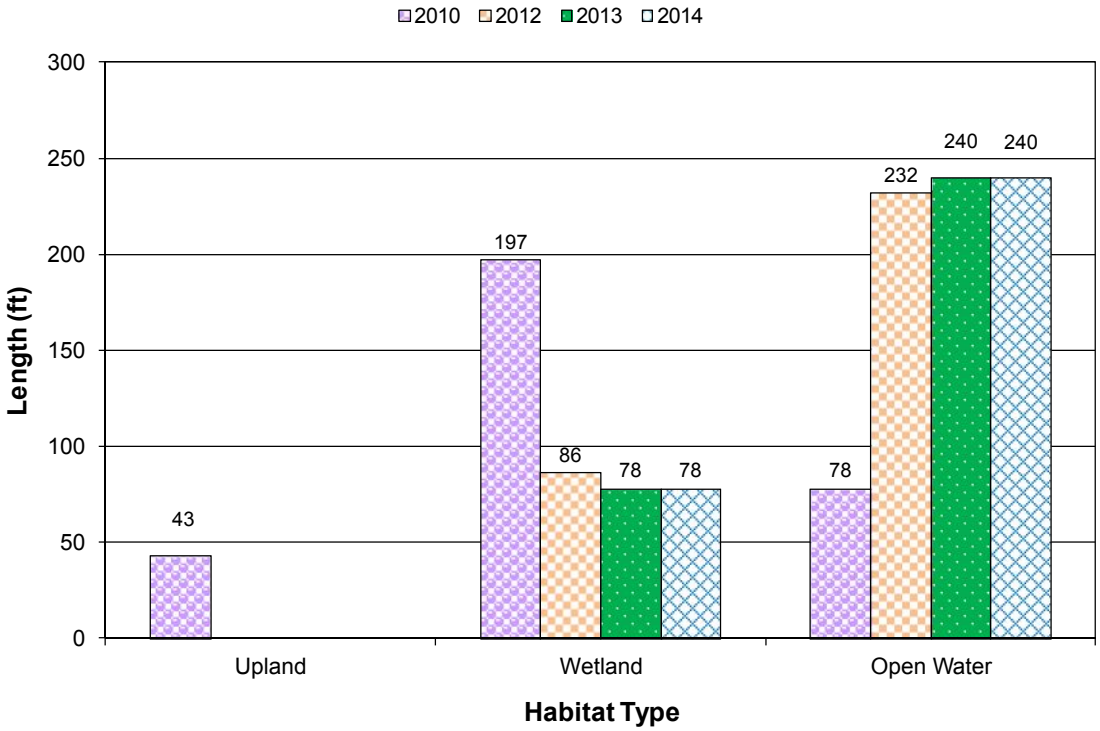

Chart 2. Length of habitat types within transect T-1 in 2010 and 2012 thru 2014.

Transect T-2 was established in 2011 across three constructed cells within the north section of the project site (Figure 2, Appendix A). Details of the transect data are summarized and graphed on Table 4 and Charts 3 and 4. Photographs of the endpoints of transect T-2 are shown on page C-29 of Appendix C. Transect T-2 crossed wetland community types 5 – Aquatic macrophytes/Open Water, 6 – *Alopecurus spp.*, 11 – *Beckmannia syzigachne/*Bare Ground, and 12 – *Agrostis stolonifera/Juncus bufonius*. Wetland community 11 replaced wetland community 7 – *Juncus bufonius/*Bare Ground on several intervals of this transect in 2013. Hydrophytic species dominated 60.3 percent of the transect. Open water was observed on the remaining 39.7 percent of the transect intervals. There was a significant increase in the extent of inundation within the cells in 2013 that continued to 2014. The number of species identified on the transect increased from 26 in 2012 to 38 in 2013 and 2014.

Table 4. Data summary for transect T-2 in 2012 thru 2014 at the Schrieber Wetland Mitigation Site.

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

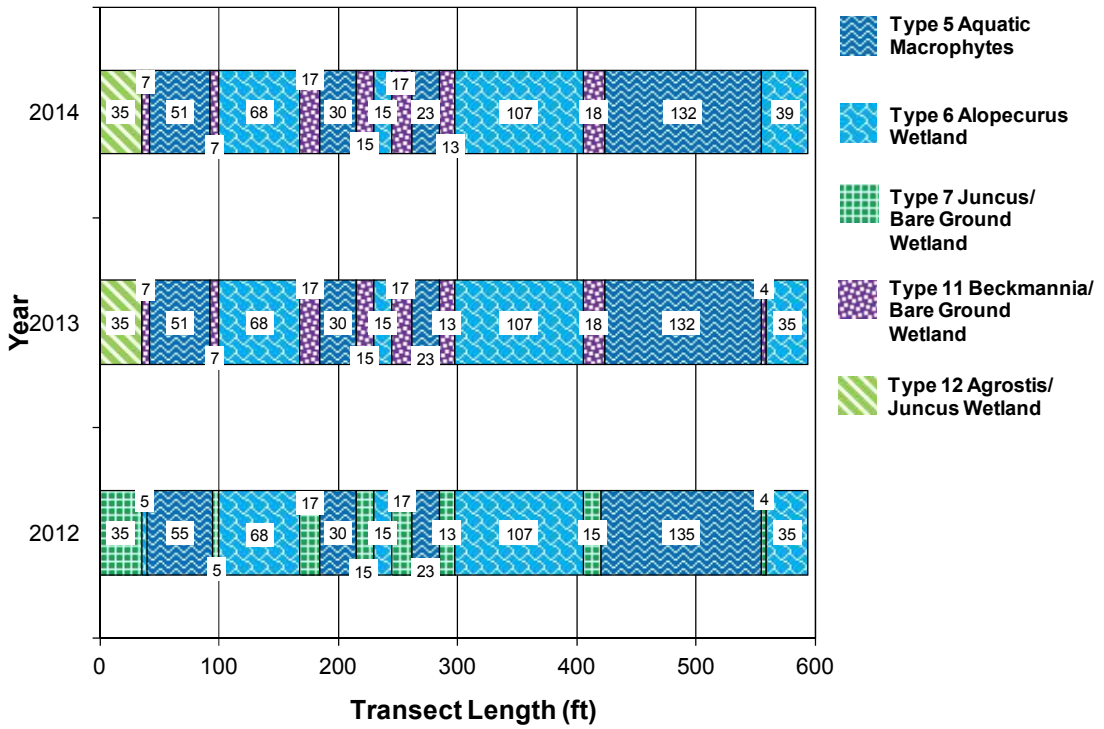

Chart 3. Transect map showing community types on transect T-2 in 2012 thru 2014 from start (0 feet) to end (594 feet).

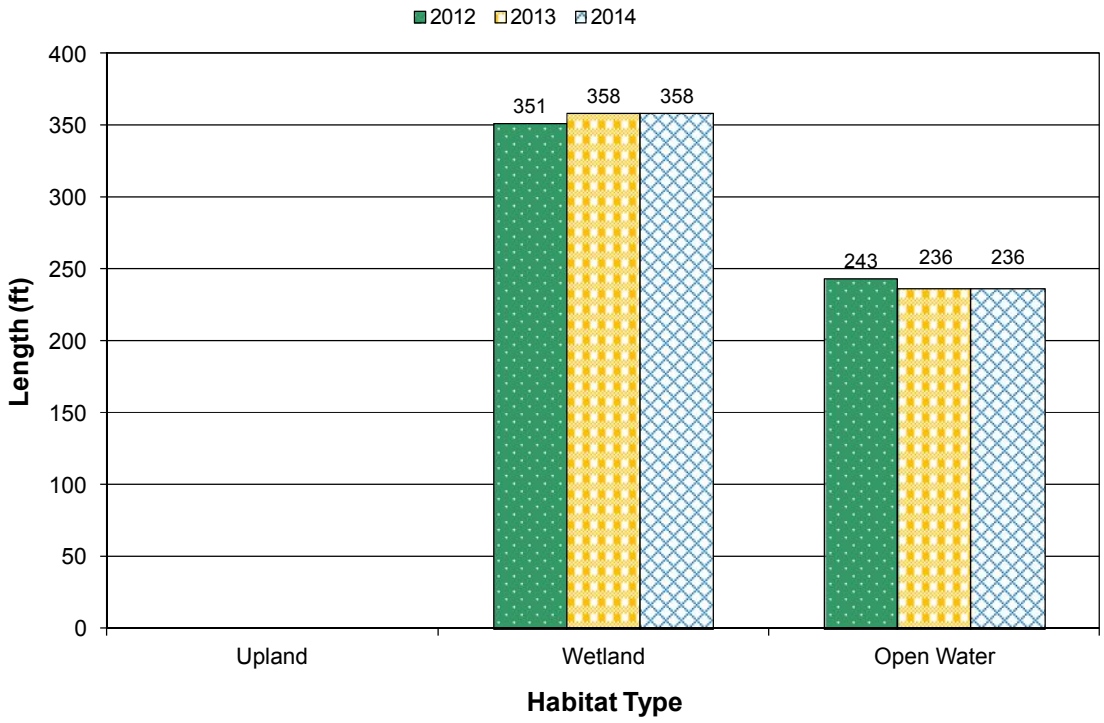

Chart 4. Length of habitat types within transect T-2 in 2012 thru 2014.

Transect T-3 began between two constructed cells along the Middle Coyote Creek reach and extended east 440 feet to the edge of the former Coyote Creek channel along the east boundary of the site. Transect details are shown on Table 5 and Charts 5 and 6 (Monitoring Forms, Appendix B). Photographs of the transect T-3 end points are shown on page C-30 of Appendix C. The transect crossed two wetland communities, Type 3 – *Phalaris arundinacea* and Type 5 – Aquatic macrophytes/Open Water. Only eight plant species were identified on the transect as a result of the dominance of reed canary grass within this area. However sedges (*Carex nebrascensis* and *Carex utriculata*) were documented for the first time on this transect, indicating a possible increase in native wetland vegetation in this community. Open water covered 47 percent of transect T-3.

Table 5. Data summary for transect T-3 in 2012 and 2013 to 2014 at the Schrieber Wetland Mitigation Site.

Monitoring Year	**2012**	**2013**	**2014**
Transect Length (feet)	**440**	**440**	**440**
Vegetation Community Transitions along Transect	4	4	4
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	9	5	8
Total Hydrophytic Species	7	3	6
Total Upland Species	2	2	2
Estimated % Total Vegetative Cover	50	75	100
Estiamte % Unvegetated	50	25	0
% Transect Length Comprising Hydrophytic Vegetation Communities	53	53	53
% Transect Length Comprising Upland Vegetation Communities	0	0	0
% Transect Length Comprising Unvegetated Open Water	47	47	47
% Transect Length Comprising Mudflat	0	0	0

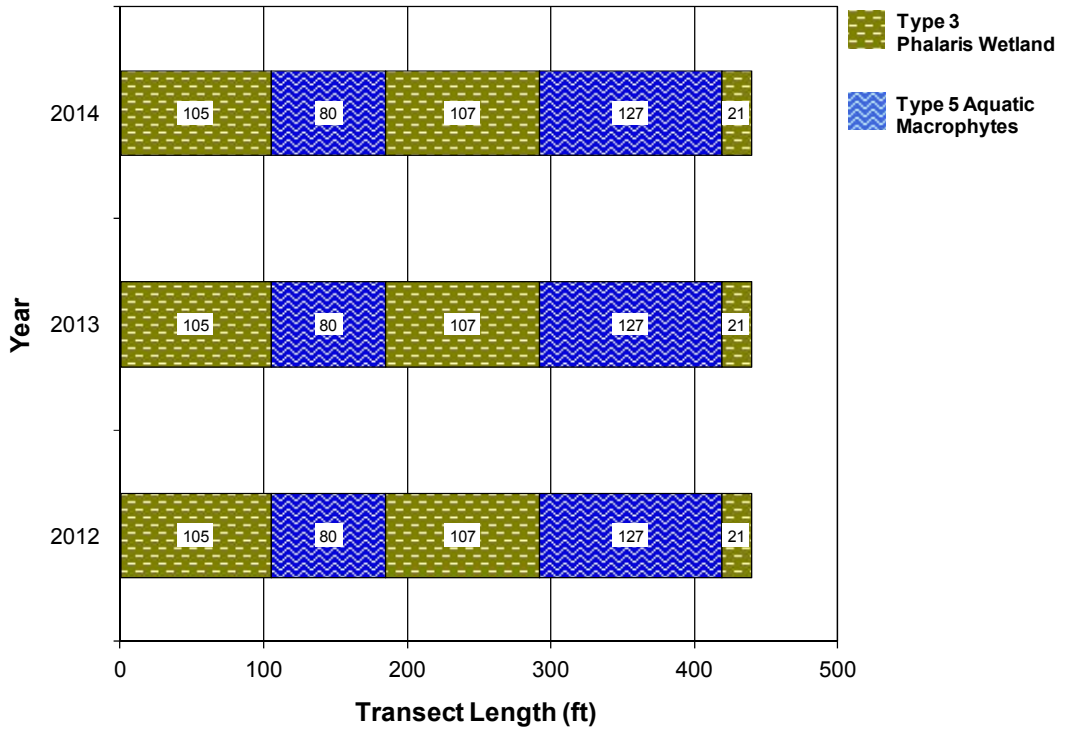

Chart 5. Transect map showing community types on transect T-3 in 2012 thru 2014 from start (0 feet) to end (440 feet).

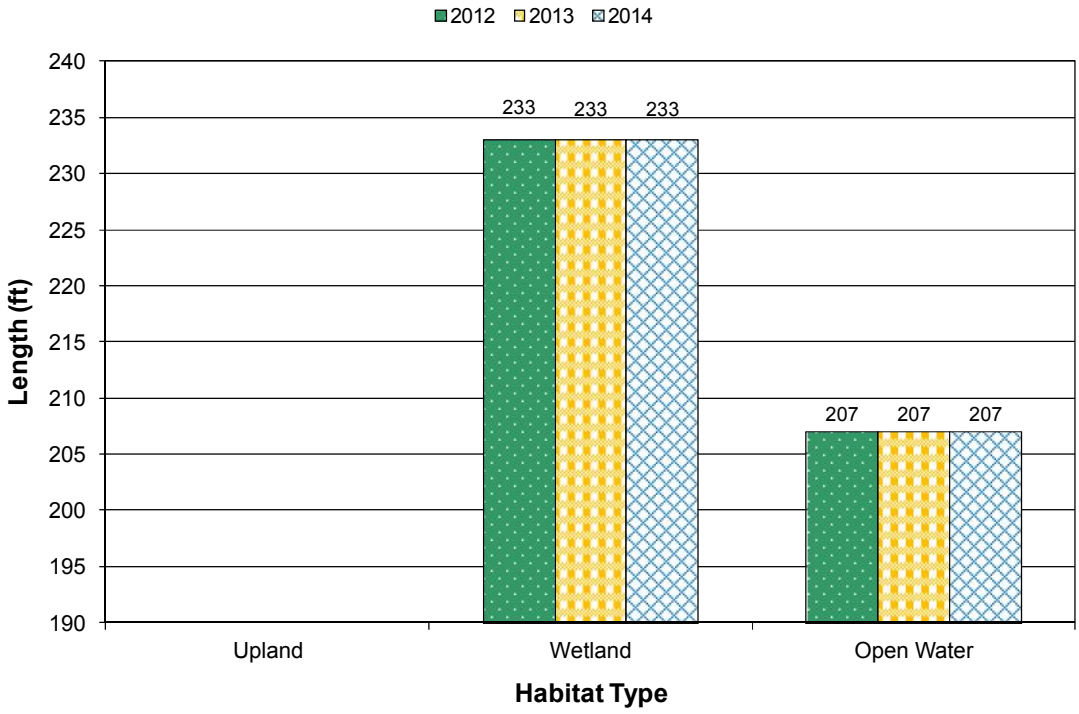

Chart 6. Length of habitat types within transect T-3 in 2012 thru 2014.

Four infestations of Canadian thistle (*Cirsium arvense*) were identified within wetland and upland community Types 6, 8, and 9. Infestation sizes ranged from less than 0.1 acre to 1.0 acre. Cover classes ranged from low (1 to 5 percent cover) to high (25 to 100 percent cover). The largest infestation was located along the west boundary in upland community Type 9 near the merged Coyote and Schrieber Creek reach in the south half of the site (Figure 3, Appendix A).

One thousand speckled alders (*Alnus incana*) were planted along the newly constructed stream channel and pond in the north third of the site. Fifty-two live plants were observed throughout the mitigation site in 2014, indicating 3 percent survival. Several of the alder trees were regrowing from the roots although they had dead tops. Seven willows (*Salix* sp.) were seen 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.

Two soil pits were evaluated to determine the extent of hydric soil development. One test pit, TP A wet, met the wetland criteria. The soil in TP A wet was a grayish brown (2.5Y 5/2) silt loam with 30 percent yellowish brown redoximorphic concentrations in the matrix. The depleted matrix was a positive indicator for hydric soil. The upland data point TP A Up revealed a very dark grayish brown (10 YR 3/2) sandy loam without redox features from 0 to 10 inches bgs. Gravel and cobbles were observed at greater than 10 inches bgs. No positive indicators of hydric soil were observed at the upland data point.

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 and 2014 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, north 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 2014 (Table 6).

Table 6. Total wetland acres delineated in 2010, 2012 thru 2014.

Wetland Habitat Type	2010 Acres	2012 Acres	2013 Acres	2014 Acres
Pre-existing Wetland Area inside geotechnical limits adjacent to US 2 (MDT & USFS)	1.12	15.56	15.56	15.56
Created Wetland Depressions and Additional Wetland Development	3.72	32.02	32.05	32.05
Open Water Riverine Habitat	0.00	0.34	0.34	0.34
TOTAL WETLAND HABITAT	**4.84**	**47.92**	**47.95**	**47.95**

3.6. Wildlife

A list of animal species observed directly or indirectly in 2010 and 2012 through 2014 is presented in Table 7. Twenty-eight individuals of eight bird species were identified onsite in 2014. Birds observed included Canada geese (*Branta canadensis*) and Cinnamon teal (*Anus cyanoptera*) noted on several of the ponds. Goose scat was observed near many of the ponds in the north third of the site. Other wildlife observed directly included two Columbia spotted frogs (*Rana luteiventris).* The tracks of a coyote (*Canas latrans*), moose (*Alces americanus*), deer (*Odocoileus* sp.), and elk (*Cervus canadensis*) were also noted in 2014.

Table 7. Wildlife observed at Schrieber Meadows Mitigation Site in 2010 and 2012 thru 2014.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog	***Rana luteiventris***
Frog sp.	
Pacific Treefrog	*Pseudacris regilla*
Western Toad	*Bufo boreas*
BIRD	
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*

Species identified in 2014 are **bolded**.

Table 7. (continued). Wildlife observed at Schrieber Meadows Mitigation Site in 2010 and 2012 thru 2014.

COMMON NAME	SCIENTIFIC NAME
BIRD	
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*
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*
Spotted Sandpiper	*Actitis macularius*
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***
FISH	
Pumpkinseed	*Lepomis gibbosus*
REPTILE	
Common Gartersnake	*Thamnophis sirtalis*
Painted Turtle	*Chrysemys picta*
MAMMAL	
Coyote	***Canis latrans***
Deer sp.	***Odocoileus sp.***
Elk or Wapiti	***Cervus canadensis***
Gray Wolf	*Canis lupus*
Moose	***Alces americanus***
Muskrat	*Ondatra zibethicus*
White-tailed Deer	*Odocoileus virginianus*

Species identified in 2014 are **bolded**.

3.7. Functional Assessment

The 2008 MDT MWAM was used to evaluate the site in 2010 and 2012 through 2014. The functional assessment completed in 2010 incorporated the three constructed wetland cells and enhanced wetlands into one AA. The 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 2014 (Table 8). In general, the disturbance ratings for the AAs were affected by the adjacent road construction in 2014 and was a key factor affecting the overall scores.

The 2012 to 2014 **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 score for the Sediment/Shoreline Stabilization function increased to high 2014 as a result of the increased development of streambank species. The assessment score increased 7 percentage points to 74 percent and the functional units totaled 25.60. The AA rated as a Category II wetland, scoring high for MTNHP Species Habitat, General Wildlife Habitat, Short and Long Term Surface Water Storage, Sediment/shoreline Stabilization, Groundwater/Discharge/Recharge, and Recreation/Education Potential.

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 89 percent of the possible score in 2014, up from 80 percent in 2013. Open water areas were identified within this AA in 2014, resulting in an increase rating for the Sediment/Shoreline Stabilization function. Recent construction by MDT increased the disturbance rating, which reduced the General Wildlife Habitat and Uniqueness functional points slightly. This construction along the US 2 corridor is anticipated to occur for the next 5 years (2019) as they build pre-loaded road grade berms on top of the organic soils in order to support the eventual construction of the new highway. The AA received a Category II rating and 105.76 functional units. High ratings were assessed for General Wildlife Habitat, MTNHP Species Habitat, Short and Long Term Surface Water Storage, Sediment/Nutrient/Toxicant Removal, Production Export/Food Chain Support, Groundwater/Discharge/Recharge, and Recreation/Education Potential.

The 2012 to 2014 **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 creeks. 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 II wetland in 2014 with 80 percent of the possible points, an increase of 3 percent since 2013, and 197.38 functional units. This AA received high ratings in MTNHP Species Habitat, General Wildlife Habitat, Short and Long Term Surface Water Storage, Sediment/Nutrient/Toxicant Removal, Production Export/Food Chain Support, Groundwater/Discharge/Recharge, and Recreation/Education Potential.

Table 8. Functions and Values of Schrieber Meadows wetlands in 2010, and 2012 thru 2014.

	RESTORATION AA		
Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method[1]	**2012**	**2013**	**2014**
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	High (0.9)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	Mod (0.6)	Mod (0.6)	Mod (0.6)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	Mod (0.7)
Sediment/Shoreline Stabilization	Low (0.3)	Low (0.3)	High (1.0)
Production Export/ Food Chain Support	Mod (0.7)	Mod (0.7)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)
Recreation/Education Potential	High (0.2)	High (0.2)	High (0.2)
Actual Points / Possible Points	**6.7/10**	**6.7/10**	**7.4/10**
% of Possible Score Achieved	**67%**	**67%**	**74%**
Overall Category	**II**	**II**	**II**
Acreage of Assessed Aquatic Habitats within Easement (ac)	**3.46**	**3.46**	**3.46**
Functional Units (acreage x actual points)	**23.18**	**23.18**	**25.60**

[1]Berglund and McEldowney 2008.

Table 8 (continued). Functions and Values of Schrieber Meadows wetlands in 2010 and 2012 thru 2014.

		ENHANCEMENT AA			CREATION AA		
Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method[1]	**2010 Creation/ Enhancement AA**	**2012**	**2013**	**2014**	**2012**	**2013**	**2014**
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	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)
General Fish/Aquatic Habitat	NA	NA	NA	NA	Mod (0.6)	High (0.8)	High (0.8)
Flood Attenuation	NA	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Short and Long Term Surface Water Storage	Mod (0.6)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	NA	NA	High (1.0)	Mod (0.7)	Mod (0.7)	High (1.0)
Production Export/ Food Chain Support	Mod (0.5)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	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)
Recreation/Education Potential	Low (0.5)	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**	**8.0/9**	**8.3/11**	**8.5/11**	**8.8/11**
% of Possible Score Achieved	**68%**	**79%**	**80%**	**89%**	**75%**	**77%**	**80%**
Overall Category	**II**	**II**	**II**	**I**	**II**	**II**	**II**
Acreage of Assessed Aquatic Habitats within Easement (ac)	**4.84**	**13.22**	**13.22**	**13.22**	**22.40**	**22.43**	**22.43**
Functional Units (acreage x actual points)	**26.38**	**93.86**	**95.18**	**105.76**	**185.92**	**190.66**	**197.38**

[1]Berglund and McEldowney 2008.

3.8. Photo Documentation

Ten photo points were initially established within the three 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 PP7 from its original 2010 location. In addition to established photo points, photographs were taken at each surveyed stream cross-section, each sampled data point, and at each end of the vegetation transects (T-1, T-2, and T-3) in 2014. The locations of these photographs are illustrated on Figure 2 in Appendix A. The 2014 photos are provided 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 repair with signs of continued use. Four infestations of Canadian thistle (*Cirsium arvense*) were identified within wetland and upland community Types 6, 8, and 9. Infestation sizes ranged from less than 0.1 acre to 1.0 acre. Cover classes ranged from low (1 to 5 percent cover) to high (25 to 100 percent cover). The largest infestation was located along the west boundary in upland community Type 9 near the merged Coyote and Schrieber Creek reach in the south half of the site (Figure 3, Appendix A). The MDT has an annual weed management plan to control noxious infestations identified on their mitigation sites. Weed spraying has been conducted annually within this site to eliminate Canadian thistle and spotted knapweed with documented weed control activities completed on June 22 and August 5, 2013 and June 20 and August 20, 2014.

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 records 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 D). The 2013 and 2014 delineated acreages indicated that 22.40 acres of wetland habitat have been created within this mitigation site. It should be noted that plugging the former Coyote Creek channel has resulted in substantially increased water levels across the site. 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.

Table 9. Summary of Wetland Credits at the Schrieber Meadows Wetland Mitigation Site in 2010 and 2012 thru 2014.

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
Creation - USFS/MDT Property	8.91	1:1	8.91	22.40	22.40	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
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
Riparian Buffer*	-	-	-	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
Project Impacts	-0.08	None	-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**

*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.

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 D). 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 2014 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 2014 are compared to the approved performance standards and success criteria in Table 10. The wetlands delineated in 2014 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 10. Summary of Performance Standards and Success Criteria at Schrieber Meadows in 2014.

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 D). 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 3 percent survival rate for the planted woody species was estimated in 2014. 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 2014 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

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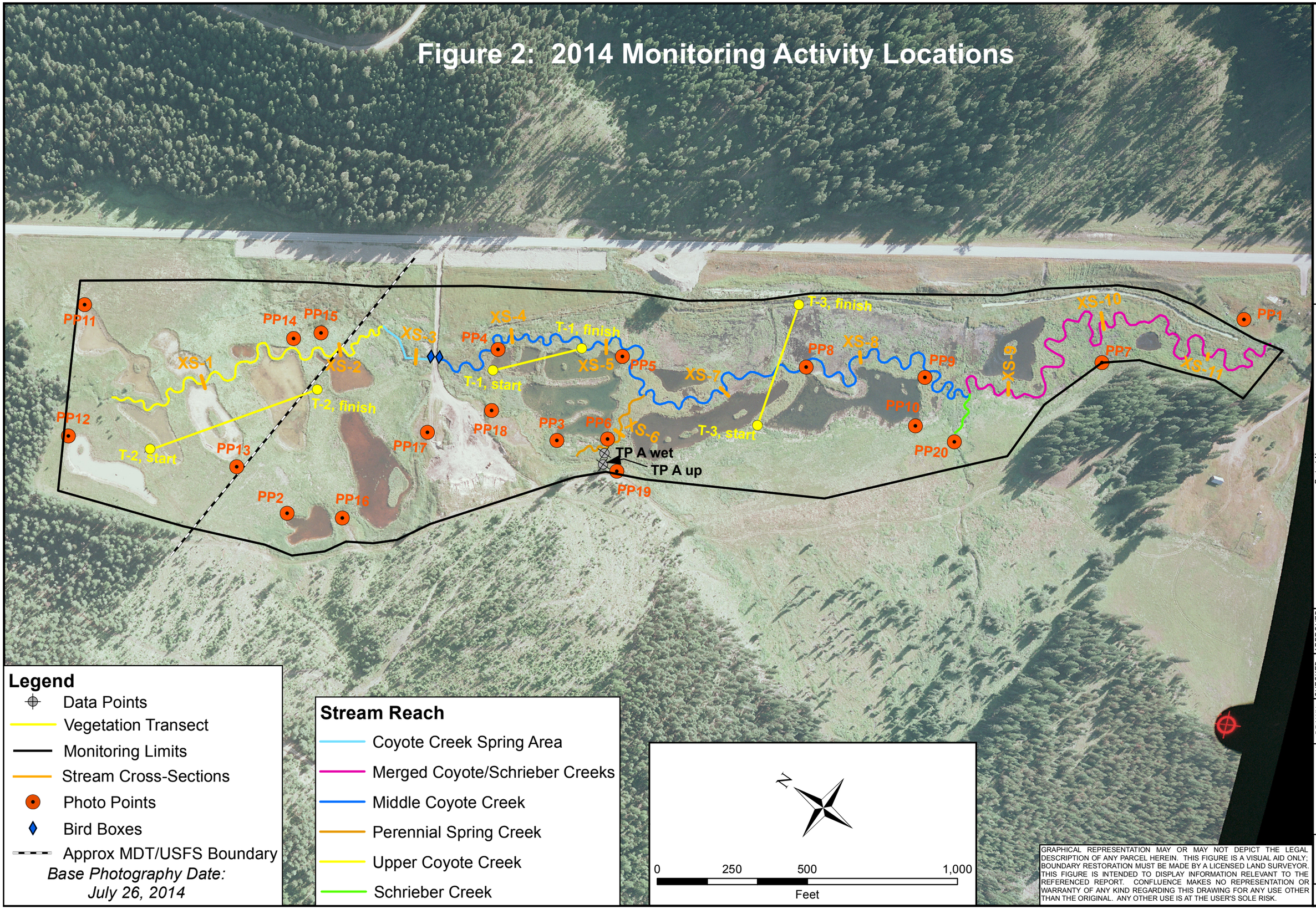
Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

Figure 2: 2014 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/Monitor2014.mxd

Project Name
Schrieber Meadows Mitigation Site

Drawing Title
2014 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 2

REV -

Figure 3: 2014 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: July 26, 2014

Vegetation Community Types

(3) Phalaris arundinacea
(5) Aquatic Macrophytes/Open Water
(6) Alopecurus spp.
(7) Juncus bufonius/Bare Ground
(8) Elymus repens/Pascopyrum smithii
(9) Alopecurus spp./Bromus inermis
(11) Beckmannia syzigachne/Bare Ground
(12) Agrostis stolonifera/Juncus bufonius

Noxious Weeds

Cirsium arvense
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)

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: Schreiber/Veg2014.mxd

Project Name: Schrieber Meadows Mitigation Site
Drawing Title: 2014 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED LU
SCALE: Noted
Drawn: October 10, 2014
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2014 MDT Wetland Mitigation Site Monitoring Form
2014 USACE Wetland Determination Data Forms
2014 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 7/29/2014 9:26:10 AM

Person(s) conducting the assessment: S Wall, B. Sandefur

Weather: Sunny, mid 90s 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: 4 #Visits in Year: 1

Size of Evaluation Area: 56.9 (acres)

Land use surrounding wetland:

US Hwy 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 aerials and in field, FAC-neutral test, seasonal high groundwater table.

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
No wells	

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 extensively saturated and inundated throughout the southern 2/3 of the site. The site was drier toward the north end. All of the excavated ponds contained surface water but are below full level. Schrieber Creek was dry above 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** 21.92

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Alnus incana	0
Alopecurus arundinaceus	1	Alopecurus pratensis	1
Arctium minus	0	Beckmannia syzigachne	1
Carex aquatilis	0	Carex athrostachya	0
Carex nebrascensis	0	Carex pachystachya	1
Carex utriculata	0	Cirsium arvense	0
Eleocharis palustris	0	Epilobium ciliatum	0
Erysimum cheiranthoides	0	Galium mexicanum	0
Glyceria grandis	0	Juncus bufonius	0
Lemna minor	0	Mimulus guttatus	0
Open Water	1	Persicaria amphibia	1
Phalaris arundinacea	5	Poa palustris	0
Populus balsamifera	0	Potentilla norvegica	0
Rumex crispus	0	Salix drummondiana	0
Taraxacum officinale	0	Verbascum thapsus	0

Comments:

Community # 5 **Community Type:** Aquatic macrophytes / Open Water **Acres** 8.88

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	1
Aquatic macrophytes	1	Bare Ground	0
Beckmannia syzigachne	0	Carex aquatilis	0
Carex nebrascensis	0	Carex stipata	1
Carex utriculata	0	Chara sp.	0
Eleocharis palustris	2	Epilobium sp.	0
Glyceria elata	3	Glyceria grandis	0
Lemna minor	0	Open Water	5
Persicaria amphibia	1	Phalaris arundinacea	1
Typha latifolia	1	Veronica americana	0

Comments:

Community # 6 **Community Type:** Alopecurus spp. / **Acres** 13.23

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron sp.	0
Agrostis gigantea	0	Alnus incana	0
Alopecurus arundinaceus	3	Alopecurus pratensis	4
Aster sp.	0	Beckmannia syzigachne	0
Bromus inermis	0	Carex athrostachya	0
Carex pachystachya	0	Cirsium arvense	0
Epilobium ciliatum	0	Fragaria virginiana	0
Glyceria grandis	0	Juncus bufonius	0
Juncus ensifolius	0	Juncus tenuis	0
Mimulus guttatus	0	Persicaria amphibia	0
Persicaria amphibia	0	Phalaris arundinacea	2
Pinus contorta	0	Pinus ponderosa	0
Plantago major	1	Poa pratensis	1
Potentilla gracilis	0	Rumex crispus	0
Salix drummondiana	1	Senecio hydrophiloides	0
Spiranthes romanzoffiana	0	Taraxacum officinale	1
Trifolium arvense	1	Verbascum thapsus	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	3
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	Rumex acetosella	0
Senecio hydrophiloides	1	Taraxacum officinale	1
Trifolium pratense	0	Verbascum thapsus	0

Comments:

Community # 11 **Community Type:** Beckmannia syzigachne / Bare Ground **Acres** 1.53

Species	Cover class	Species	Cover class
Agrostis gigantea	0	Agrostis stolonifera	0
Alopecurus arundinaceus	3	Bare Ground	4
Beckmannia syzigachne	4	Bromus carinatus	0
Carex athrostachya	1	Eleocharis palustris	0
Elymus trachycaulus	0	Epilobium ciliatum	0
Fragaria virginiana	0	Geum macrophyllum	0
Glyceria grandis	0	Juncus articulatus	0
Juncus bufonius	2	Juncus tenuis	0
Mentha arvensis	1	Open Water	1
Plantago major	0	Potentilla norvegica	0
Suaeda calceoliformis	0	Taraxacum officinale	0
Trifolium pratense	0	Typha latifolia	0
Verbascum thapsus	0	Veronica americana	0
Veronica anagallis-aquatic	0		

Comments:

Community # 12 **Community Type:** Agrostis stolonifera / Juncus bufonius **Acres** 1.8

Species	Cover class	Species	Cover class
Agrostis stolonifera	4	Bare Ground	0
Bromus inermis	1	Equisetum arvense	0
Juncus bufonius	2	Leucanthemum vulgare	0
Phleum pratense	0	Prunella vulgaris	0
Spiranthes romanzoffiana	0		

Comments:

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: 7/29/2014 9:26:10 AM

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

Interval Data:

Ending Station 23 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Open Water	3	Phalaris arundinacea	5

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

Species	Cover class	Species	Cover class
Eleocharis palustris	1	Open Water	5
Persicaria amphibia	1	Phalaris arundinacea	2

Ending Station 115 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Glyceria grandis	0	Persicaria amphibia	1
Phalaris arundinacea	5		

Ending Station 188 **Community Type:** Aquatic macrophytes / Open Water

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

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

Species	Cover class	Species	Cover class
Alnus incana	2	Carex utriculata	0
Eleocharis palustris	0	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	Carex utriculata	0
Eleocharis palustris	0	Open Water	5
Persicaria amphibia	0	Phalaris arundinacea	1

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

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

Transect Notes:

More open water present than during the last monitoring. Approximately 7 inches of standing water at the end of transect 1.

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

Interval Data:

Ending Station 35 **Community Type:** Agrostis stolonifera / Juncus bufonius

Species	Cover class	Species	Cover class
Agrostis stolonifera	4	Bare Ground	0
Bromus inermis	1	Equisetum arvense	1
Leucanthemum vulgare	1	Phleum pratense	2
Prunella vulgaris	1		

Ending Station 42 **Community Type:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Bare Ground	2	Beckmannia syzigachne	4
Juncus articulatus	0	Juncus bufonius	3
Juncus tenuis	4		

Ending Station 93 **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:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Bare Ground	1
Beckmannia syzigachne	2	Juncus bufonius	3
Juncus tenuis	4		

Ending Station 168 **Community Type:** Alopecurus spp. /

Species	Cover class	Species	Cover class
Agrostis gigantea	4	Alnus incana	0
Alopecurus pratensis	4	Beckmannia syzigachne	0
Carex athrostachya	0	Juncus ensifolius	0
Juncus tenuis	0	Phalaris arundinacea	1

Ending Station 185 **Community Type:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Bare Ground	4	Beckmannia syzigachne	0
Eleocharis palustris	1	Epilobium ciliatum	2
Juncus bufonius	0	Juncus tenuis	1
Plantago major	0	Suaeda calceoliformis	1
Trifolium pratense	0		

Ending Station 215 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Bare Ground	0	Open Water	5

Ending Station 230 **Community Type:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Bare Ground	3
Beckmannia syzigachne	1	Epilobium ciliatum	0
Juncus bufonius	1	Juncus tenuis	1
Suaeda calceoliformis	2	Trifolium pratense	2

Ending Station 245 **Community Type:** Alopercurus spp. /

Species	Cover class	Species	Cover class
Achillea millefolium	0	Alopecurus arundinaceus	3
Alopecurus pratensis	5	Bromus inermis	2

Ending Station 262 **Community Type:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Bare Ground	3	Beckmannia syzigachne	2
Epilobium ciliatum	1	Juncus bufonius	2
Juncus tenuis	3	Potentilla norvegica	1
Suaeda calceoliformis	0	Taraxacum officinale	0
Trifolium pratense	3	Verbascum thapsus	0

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

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

Ending Station 298 **Community Type:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Bare Ground	4	Beckmannia syzigachne	0
Juncus bufonius	2	Juncus tenuis	3
Potentilla norvegica	1	Suaeda calceoliformis	0
Trifolium pratense	3		

Ending Station 405 **Community Type:** Alopecurus spp. /

Species	Cover class	Species	Cover class
Agropyron sp.	0	Alopecurus arundinaceus	4
Alopecurus pratensis	4	Bromus inermis	1
Taraxacum officinale	0		

Ending Station 423 **Community Type:** Beckmannia syzigachne / Bare Ground

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alopecurus arundinaceus	1
Bare Ground	2	Beckmannia syzigachne	1
Bromus carinatus	1	Carex athrostachya	1
Elymus trachycaulus	1	Geum macrophyllum	0
Glyceria grandis	2	Mentha arvensis	0
Suaeda calceoliformis	0	Trifolium pratense	0
Typha latifolia	1		

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

Species	Cover class	Species	Cover class
Eleocharis palustris	0	Open Water	5
Persicaria amphibia	1	Phalaris arundinacea	0
Typha latifolia	0		

Ending Station 594 **Community Type:** Alopercurus spp. /

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	5	Alopecurus pratensis	4
Carex athrostachya	1	Glyceria grandis	0
Phalaris arundinacea	2	Poa pratensis	1

Transect Notes:

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

Interval Data:

Ending Station 105 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Open Water	1	Phalaris arundinacea	5

Ending Station 185 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, green	1	Chara sp.	4
Lemna minor	0	Open Water	5
Persicaria amphibia	1	Phalaris arundinacea	1

Ending Station 292 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Carex utriculata	1	Lemna minor	3
Open Water	4	Persicaria amphibia	3
Phalaris arundinacea	5		

Ending Station 419 **Community Type:** Aquatic macrophytes / Open Water

Species	Cover class	Species	Cover class
Algae, green	2	Eleocharis palustris	0
Lemna minor	3	Open Water	5
Persicaria amphibia	3	Phalaris arundinacea	1

Ending Station 440 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Carex nebrascensis	2	Lemna minor	2
Phalaris arundinacea	5		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Schrieber Meadows

Planting Type	#Planted	#Alive	Notes
Alnus incana	1000	52	The majority of plantings observed were along the newly constructed channel and ponds in the north 1/3 of the site.
Salix spp.	750	7	Difficult to identify small shrubs due to robust reed canarygrass.

Comments

Several of the observed alder plants had dead tops but were regrowing from the roots.

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 fence posts at the entrance gate, continued signs of use.

Species	#Observed	Behavior	Habitat
Canada Goose	10	L	OW, WM
Cinnamon Teal	5	F, L	OW
Cliff Swallow	5	F	UP, WM
Common Yellowthroat	1	FO	WM
Killdeer	3	F, L	UP
Red-winged Blackbird	2	FO, N	MA, OW, WM
Vesper Sparrow	1	FO	UP, WM
Wilson's Snipe	1	FO	WM

Bird Comments

Goose scat observed near many of the ponds in the north 1/3 of the site. Behavior indicated pairs were nesting.

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	
Coyote		Yes	Yes	No	
Deer sp.		Yes	No	No	
Elk or Wapiti		Yes	No	No	
Moose		Yes	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
1337	48.115673	-115.421562	180	PP-12
1342-1345	48.113403	-115.420128	290	PP-16
1347	48.113735	-115.420509	150	PP-2
1348-1350	48.11422	-115.420403	280	PP-13
1351-1353	48.116409	-115.420021	190	PP-11
1354-1356	48.114655	-115.41893	230	PP-14
1357-1360	48.114323	-115.418449	180	PP-15
1361-1364	48.112938	-115.418388	270	PP-17
1366	48.1129	-115.417618	90	PP-18
1367-1368	48.111553	-115.417084	10	PP-19
1369	48.111808	115.417183	0	TP A Wet
1370	48.11175	115.407317	0	TP A Up
1371-1373	48.109737	-115.414024	0	PP-10
1374	48.109493	-115.413918	100	PP-20
1375-1379	48.108841	-115.41201	0	PP-7
1424-1427	48.10804	-115.410172	270	PP-1
1428	48.112183	-115.417503	90	PP-3
1429	48.111134	-115.415642	45	Veg Tran 3, start
1430	48.111187	-115.413849	225	Veg Tran 3, end
1434-1437	48.113213	-115.416832	180	PP-4
1438	48.112663	-115.41642	242	Veg Tran 1, end
1439-1442	48.112614	-115.415977	300	PP-5
1443-1446	48.111904	-115.417023	0	PP-6
1447	48.114197	-115.418991	280	Veg Tran 2, end
1448	48.115204	-115.421013	100	Veg Tran 2, start

1448	48.115204	-115.417503	112	Veg Tran 1, start
3179	48.108139	-115.410866		XS-11
3180	48.108887	-115.411713		XS-10
3181	48.109467	-115.413162		XS-9
3182	48.110458	-115.414063		XS-8
3183	48.111332	-115.415527		XS-7
3184	48.111832	-115.416817		XS-6
3185	48.112434	-115.416061		XS-5
3188	48.113205	-115.416702		XS-4
3191	48.113651	-115.417885		XS-3
3194	48.114304	-115.418381		XS-2
3196	48.115028	-115.41993		XS-1
3238	48.11121	-115.414238	190	PP-8
3239	48.109997	-115.413765	280	PP-9

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.

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

Project/Site: Schrieber Meadows | City/County: Lincoln Co. | Sampling Date: 7/29/2014

Applicant/Owner: MDT | State: Montana | Sampling Point: TP A Up

Investigator(s): S. Wall | Section, Township, Range: S 12 T 27N R 30W

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

Subregion (LRR): LRR E | Lat: 48.11175 | Long: 115.407317 | Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents, Andic Dystic Eutrochrepts | 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:
Vegetation meets hydric criteria but soil and hydrology indicators are lacking.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Pinus contorta	5	☑	FAC

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Elymus repens	100	☑	FAC

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: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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	0	X 2	0
FAC species	105	X 3	315
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	105 (A)		315 (B)

Prevalence Index = B/A = 3

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: TP A Up

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
0-10	10YR 3/2	100					Sandy Loam	
10+							gravel and cobble	

[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 soul 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 wetland hydrology indicators present

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

Project/Site: Schrieber Meadows | City/County: Lincoln Co. | Sampling Date: 7/29/2014

Applicant/Owner: MDT | State: Montana | Sampling Point: TP A Wet

Investigator(s): S. Wall | Section, Township, Range: S 12 T 27N R 30W

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

Subregion (LRR): LRR E | Lat: 48.111808 | Long: 115.417183 | Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents, Andic Dystic Eutrochrepts | 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:

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Glyceria grandis	40	☑	OBL
Phalaris arundinacea	60	☑	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: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	40	X 1	40
FACW species	60	X 2	120
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	100 (A)		160 (B)

Prevalence Index = B/A = 1.6

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: TP A wet

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
0-3	10YR 5/1	100					Muck	**many roots**
3-20	2.5Y 5/2	70	10YR 5/8	30	C	PL	Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy 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): 6

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

MDT Montana Wetland Assessment Form (revised March 2008)

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

3. Evaluation Date 7/21/2014 **4. Evaluators** 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/Intermittent	35
Depressional	Aquatic Bed	Excavated	Permanent/Perennial	10
Slope	Emergent Wetland		Seasonal/Intermittent	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. Road work in 2014 included excavation of upland 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 increase in ground water table due to plugging the abandoned Coyote Creek channel along the northeast boundary. Some surrounding land was recently hayed and 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 ASSESSMENT

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	
Incidental habitat (list species)	◉ D ○ S	Grizzly bear
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

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 (moose, deer and coyote).

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** .7M

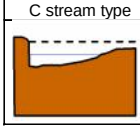
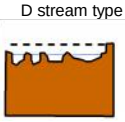
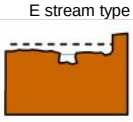
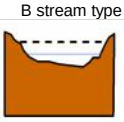
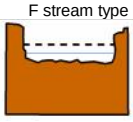
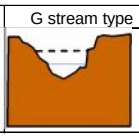
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◉ **Y** ○ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .8H

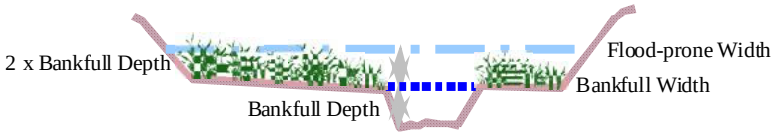
iii. Final Score and Rating: .8 H **Comments:** An upwelling area is located adjacent to Coyote Creek in the north 1/3 of the site. Sunfish observed in open water.

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 and 2014.

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 (reed canarygrass, sedges). Depression 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 have established around the perimeters 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** .8H

Comments: High level of biological activity, veg component >5ac, no surface outlet, perennial

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 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 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 at 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	L	.3	1	6.729	☐
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	H	.8	1	17.944	☐
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	H	.8	1	17.944	☐
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:		8.8	11	197.384	
Percent of Possible Score			**80** %		

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 7/21/2014 **4. Evaluators** 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 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/Intermittent	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 road fill in the upland between the AA and Highway 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. Abandoned stream plugs 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: Very close to a monoculture of reed canary grass.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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**	
Incidental habitat (list species)	◉ **D** ○ **S**	Grizzly bear
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

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 AA, heavy traffic directly adjacent.

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**

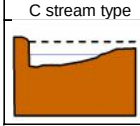
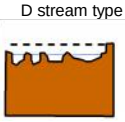
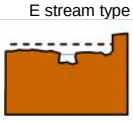
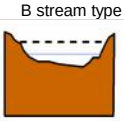
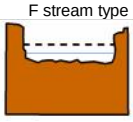
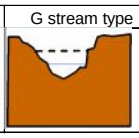
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

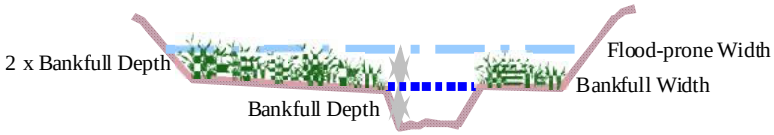
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within enhancement AA although occassional fish may migrate through AA due to surface water connection to creek and extensive inundation.

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, no tree or shrub community 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: Plugging the abandoned Coyote Creek channel has increased flooding and duration of surface water in the AA.

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 thick stand of 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** .8H

Comments: No fish habitat, vegetated component >5ac, 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 active road construction.

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	L	.3	1	3.966	☐
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	0	13.22	☐
I. Production Export/Food Chain Support	H	.8	1	10.576	☐
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	9	105.76	
Percent of Possible Score			**88.89** %		

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 7/21/2014 **4. Evaluators** 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 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. New road fill between the AA and Hwy 2 due to active construction in 2014.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Cirsium arvense

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 ASSESSMENT

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	
Incidental habitat (list species)	◉ D ○ S	Grizzly bear
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

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**

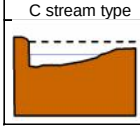
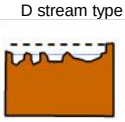
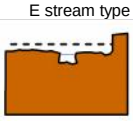
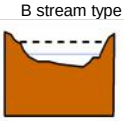
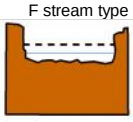
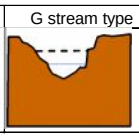
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

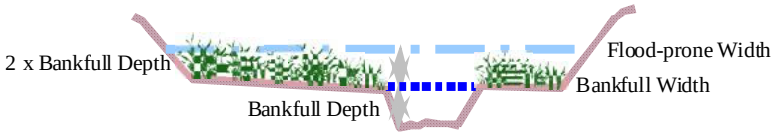
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat identified within restoration AA.

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: Constructed wetland cell 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** .7M

Comments: No fish habitat with high biological activity, well-vegetated buffer.

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: Disturbance in AA continues to decrease as vegetation fills in.

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): 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	L	.3	1	1.038	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	3.114	☑
C. General Wildlife Habitat	H	.9	1	3.114	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.6	1	2.076	☐
F. Short and Long Term Surface Water Storage	H	.8	1	2.768	☑
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	2.422	☐
H. Sediment/Shoreline Stabilization	H	1	1	3.46	☐
I. Production Export/Food Chain Support	M	.7	1	2.422	☐
J. Groundwater Discharge/Recharge	H	1	1	3.46	☑
K. Uniqueness	L	.3	1	1.038	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	0.692	☐
Totals:		7.4	10	25.604	
Percent of Possible Score			**74** %		

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*
Bearing: 270 degrees

Location: SW corner of site
Taken in 2012

Photo Point 1 – *Panorama*
Bearing: 270 degrees

Location: SW corner of site
Taken in 2013

Photo Point 1 – *Panorama*
Bearing: 270 degrees

Location: SW corner of site
Taken in 2014

Photo Point 2
Bearing: 190 degrees
Location: Cell 7 (Created 2007)
Taken in 2010

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

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

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

Photo Point 3
Bearing: 90 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2010

Photo Point 3
Bearing: 90 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2013

Photo Point 3
Bearing: 90 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2014

Photo Point 4
Bearing: 180 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2010

Photo Point 4
Bearing: 180 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2013

Photo Point 4
Bearing: 180 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2014

Photo Point 5
Bearing: 270 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2010

Photo Point 5
Bearing: 300 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2013

Photo Point 5
Bearing: 300 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2014

Photo Point 6
Bearing: 40 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2010

Photo Point 6
Bearing: 0 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2013

Photo Point 6
Bearing: 0 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2014

2010 Photo Point 7 moved in 2012

Photo Point 7
Bearing: 110 degrees

Location: Cell 3
Taken in 2010

Photo Point 7
Bearing: 0 degrees

Location: Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris
Taken in 2012

Photo Point 7
Bearing: 0 degrees

Location: Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris
Taken in 2013

Photo Point 7
Bearing: 0 degrees

Location: Lower reach of merged Coyote/Schrieber Creek in sea of Phalaris
Taken in 2014

Photo Point 8
Bearing: 200 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2010

Photo Point 8
Bearing: 190 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2013

Photo Point 8
Bearing: 190 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2014

Photo Point 9
Bearing: 330 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2010

Photo Point 9
Bearing: 280 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2013

Photo Point 9
Bearing: 280 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2014

Photo Point 10
Bearing: 30 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2010

Photo Point 10
Bearing: 0 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2013

Photo Point 10
Bearing: 30 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2014

Photo Point 11
Bearing: 190 degrees

Location: Cell 2B (Constructed in 2011)
Taken in 2012

Photo Point 11
Bearing: 190 degrees

Location: Cell 2B (Constructed in 2011)
Taken in 2013

Photo Point 11
Bearing: 190 degrees

Location: Cell 2B (Constructed in 2011)
Taken in 2014

Photo Point 12
Bearing: 180 degrees

Location: Cell 1 (Constructed in 2011)
Taken in 2012

Photo Point 12
Bearing: 180 degrees

Location: Cell 1 (Constructed in 2011)
Taken in 2013

Photo Point 12
Bearing: 180 degrees

Location: Cell 1 (Constructed in 2011)
Taken in 2014

Photo Point 13
Bearing: 280 degrees

Location: Cell 3A (Constructed in 2011)
Taken in 2012

Photo Point 13
Bearing: 280 degrees

Location: Cell 3A (Constructed in 2011)
Taken in 2013

Photo Point 13
Bearing: 280 degrees

Location: Cell 3A (Constructed in 2011)
Taken in 2014

Photo Point 14
Bearing: 230 degrees

Location: Cell 4C (Constructed in 2011)
Taken in 2012

Photo Point 14
Bearing: 230 degrees

Location: Cell 4C (Constructed in 2011)
Taken in 2013

Photo Point 14
Bearing: 230 degrees

Location: Cell 4C (Constructed in 2011)
Taken in 2014

Photo Point 15
Bearing: 180 degrees

Location: Cell 5A (Constructed in 2011)
Taken in 2012

Photo Point 15
Bearing: 180 degrees

Location: Cell 5A (Constructed in 2011)
Taken in 2013

Photo Point 15
Bearing: 180 degrees

Location: Cell 5A (Constructed in 2011)
Taken in 2014

Photo Point 16 – *Photo 1*
Bearing: 70 degrees

Location: Cell 6 (Constructed in 2011)
Taken in 2012

Photo Point 16 – *Photo 1*
Bearing: 70 degrees

Location: Cell 6 (Constructed in 2011)
Taken in 2013

Photo Point 16 – *Photo 1*
Bearing: 70 degrees

Location: Cell 6 (Constructed in 2011)
Taken in 2014

Photo Point 16 – *Photo 2*
Bearing: 290 degrees
Location: Cell 5A (Constructed in 2011)
Taken in 2012

Photo Point 16 – *Photo 2*
Bearing: 290 degrees
Location: Cell 5A (Constructed in 2011)
Taken in 2013

Photo Point 16 – *Photo 2*
Bearing: 290 degrees
Location: Cell 5A (Constructed in 2011)
Taken in 2014

Photo Point 17
Bearing: 270 degrees

Location: Cell 6 (Constructed in 2011)
Taken in 2012

Photo Point 17
Bearing: 270 degrees

Location: Cell 6 (Constructed in 2011)
Taken in 2013

Photo Point 17
Bearing: 270 degrees

Location: Cell 6 (Constructed in 2011)
Taken in 2014

Photo Point 18
Bearing: 90 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2012

Photo Point 18
Bearing: 90 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2013

Photo Point 18
Bearing: 90 degrees

Location: Cell 3 (Constructed in 2007)
Taken in 2014

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 20
Bearing: 100 degrees

Location: Schrieber Creek
Taken in 2012

Photo Point 20
Bearing: 100 degrees

Location: Schrieber Creek
Taken in 2013

Photo Point 20
Bearing: 100 degrees

Location: Schrieber Creek
Taken in 2014

XS – 1
Bearing: 130 degrees
Location: Upper Coyote Creek
Taken in 2012

XS – 2
Bearing: 320 degrees
Location: Upper Coyote Creek
Taken in 2013

XS – 1
Bearing: 280 degrees
Location: Upper Coyote Creek
Taken in 2013

XS – 2
Bearing: 320 degrees
Location: Upper Coyote Creek
Taken in 2013

XS – 1
Bearing: 280 degrees
Location: Upper Coyote Creek
Taken in 2014

XS – 2
Bearing: 320 degrees
Location: Upper Coyote Creek
Taken in 2014

XS – 3 **Location:** Coyote Creek Spring Area
Bearing: 320 degrees **Taken in 2012**

XS – 4 **Location:** Middle Coyote Creek
Bearing: 125 degrees **Taken in 2012**

XS – 3 **Location:** Coyote Creek Spring Area
Bearing: 320 degrees **Taken in 2013**

XS – 4 **Location:** Middle Coyote Creek
Bearing: 290 degrees **Taken in 2013**

XS – 3 **Location:** Coyote Creek Spring Area
Bearing: 320 degrees **Taken in 2014**

XS – 4 **Location:** Middle Coyote Creek
Bearing: 290 degrees **Taken in 2014**

XS – 5 **Location:** Middle Coyote Creek
Bearing: 150 degrees **Taken in 2012**

XS – 6 **Location:** Perennial Spring Creek
Bearing: 90 degrees **Taken in 2012**

XS – 5 **Location:** Middle Coyote Creek
Bearing: 300 degrees **Taken in 2013**

XS – 6 **Location:** Perennial Spring Creek
Bearing: 230 degrees **Taken in 2013**

XS – 5 **Location:** Middle Coyote Creek
Bearing: 300 degrees **Taken in 2014**

XS – 6 **Location:** Perennial Spring Creek
Bearing: 230 degrees **Taken in 2014**

XS – 7
Bearing: 90 degrees

Location: Middle Coyote Creek
Taken in 2012

XS – 8
Bearing: : 170 degrees

Location: Middle Coyote Creek
Taken in 2012

XS – 7
Bearing: 220 degrees

Location: Middle Coyote Creek
Taken in 2013

XS – 8
Bearing: : 270 degrees

Location: Middle Coyote Creek
Taken in 2013

XS – 7
Bearing: 220 degrees

Location: Middle Coyote Creek
Taken in 2014

XS – 8
Bearing: : 270 degrees

Location: Middle Coyote Creek
Taken in 2014

XS – 9 **Location:** Merged Coyote/Schrieber Creeks
Bearing: 130 degrees **Taken in 2012**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks
Bearing: 140 degrees **Taken in 2012**

XS – 9 **Location:** Merged Coyote/Schrieber Creeks
Bearing: 90 degrees **Taken in 2013**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks
Bearing: 270 degrees **Taken in 2013**

XS – 9 **Location:** Merged Coyote/Schrieber Creeks
Bearing: 90 degrees **Taken in 2014**

XS – 10 **Location:** Merged Coyote/Schrieber Creeks
Bearing: 270 degrees **Taken in 2014**

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**

Veg Tran 1
Bearing: 115 degrees

Location: T-1 start
Taken in 2010

Veg Tran 1
Bearing: 245 degrees

Location: T-1 end
Taken in 2010

Veg Tran 1
Bearing: 115 degrees

Location: T-1 start
Taken in 2013

Veg Tran 1
Bearing: 245 degrees

Location: T-1 end
Taken in 2013

Veg Tran 1
Bearing: 115 degrees

Location: T-1 start
Taken in 2014

Veg Tran 1
Bearing: 245 degrees

Location: T-1 end
Taken in 2014

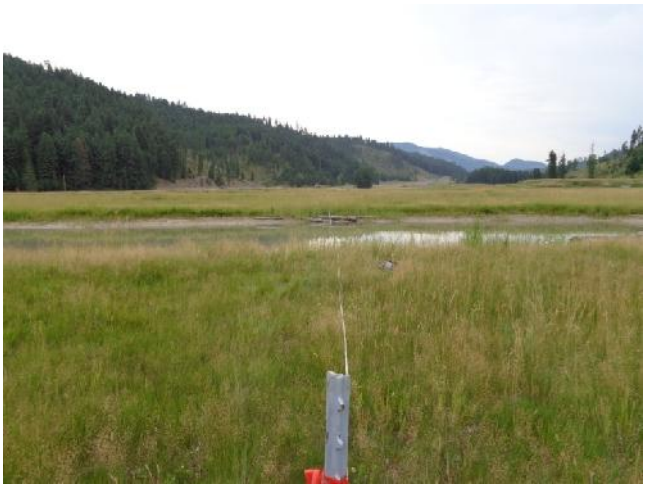
Veg Tran 2
Bearing: 100 degrees

Location: T-2 start
Taken in 2012

No Photo

Veg Tran 2
Bearing: 280 degrees

Location: T-2 end
Taken in 2012



Veg Tran 2
Bearing: 100 degrees

Location: T-2 start
Taken in 2013

Veg Tran 2
Bearing: 280 degrees

Location: T-2 end
Taken in 2013

Veg Tran 2
Bearing: 100 degrees

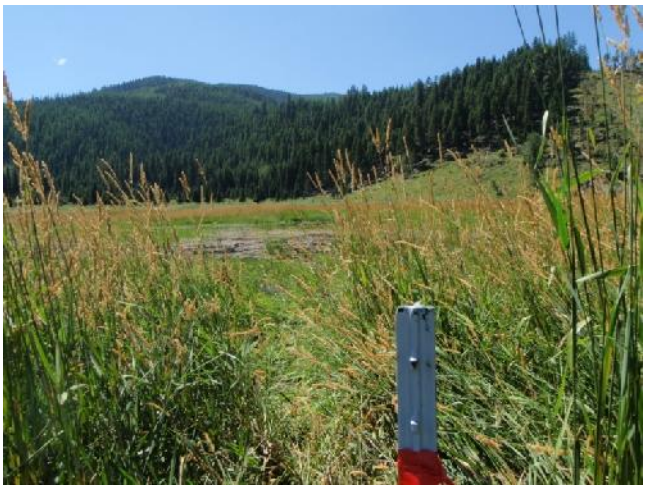
Location: T-2 start
Taken in 2014

Veg Tran 2
Bearing: 280 degrees

Location: T-2 end
Taken in 2014

Veg Tran 3
Bearing: 50 degrees

Location: T-3 start
Taken in 2012



Veg Tran 3
Bearing: 200 degrees

Location: T-3 end
Taken in 2012

Veg Tran 3
Bearing: 45 degrees

Location: T-3 start
Taken in 2013

Veg Tran 3
Bearing: 225 degrees

Location: T-3 end
Taken in 2013

Veg Tran 3
Bearing: 45 degrees

Location: T-3 start
Taken in 2014

Veg Tran 3
Bearing: 225 degrees

Location: T-3 end
Taken in 2014

Data Point: TP A Wet
Bearing: NA
Location: Veg Com 3
Taken in 2014

Data Point: TP A UP
Bearing: NA
Location: Veg Com 9
Taken in 2014

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

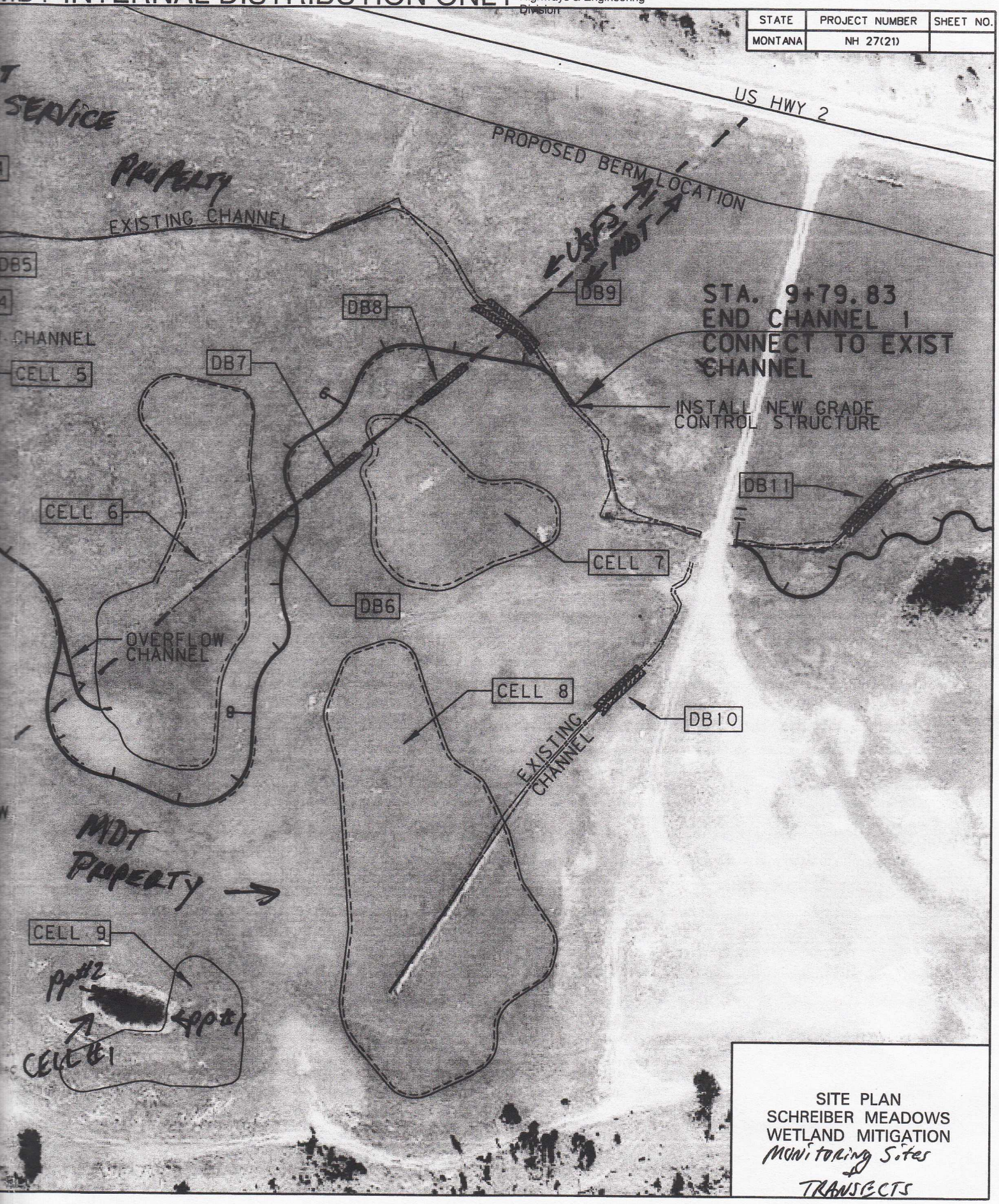
MONTANA CADD

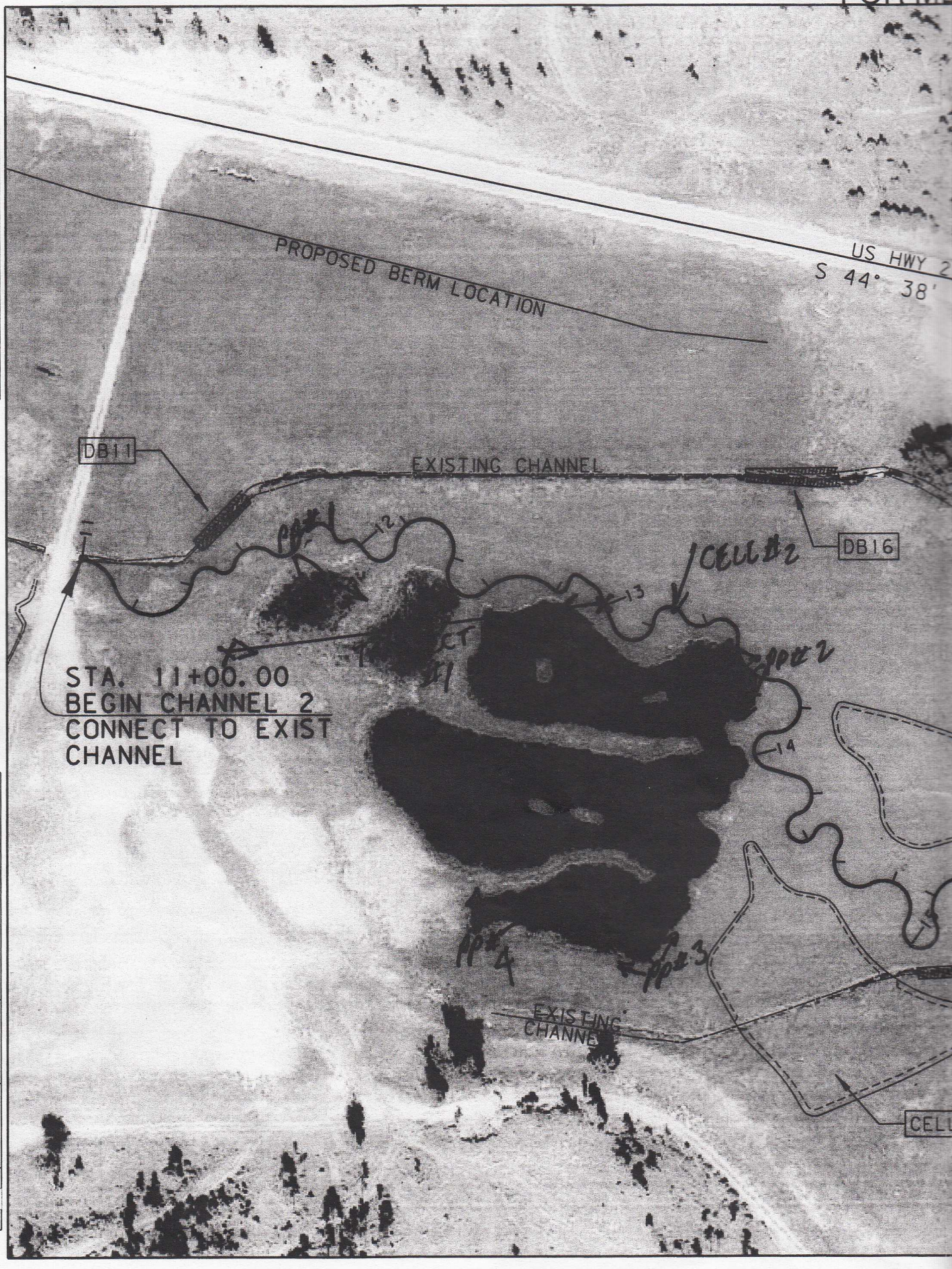
MDT MONTANA DEPARTMENT OF TRANSPORTATION

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		

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





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		

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

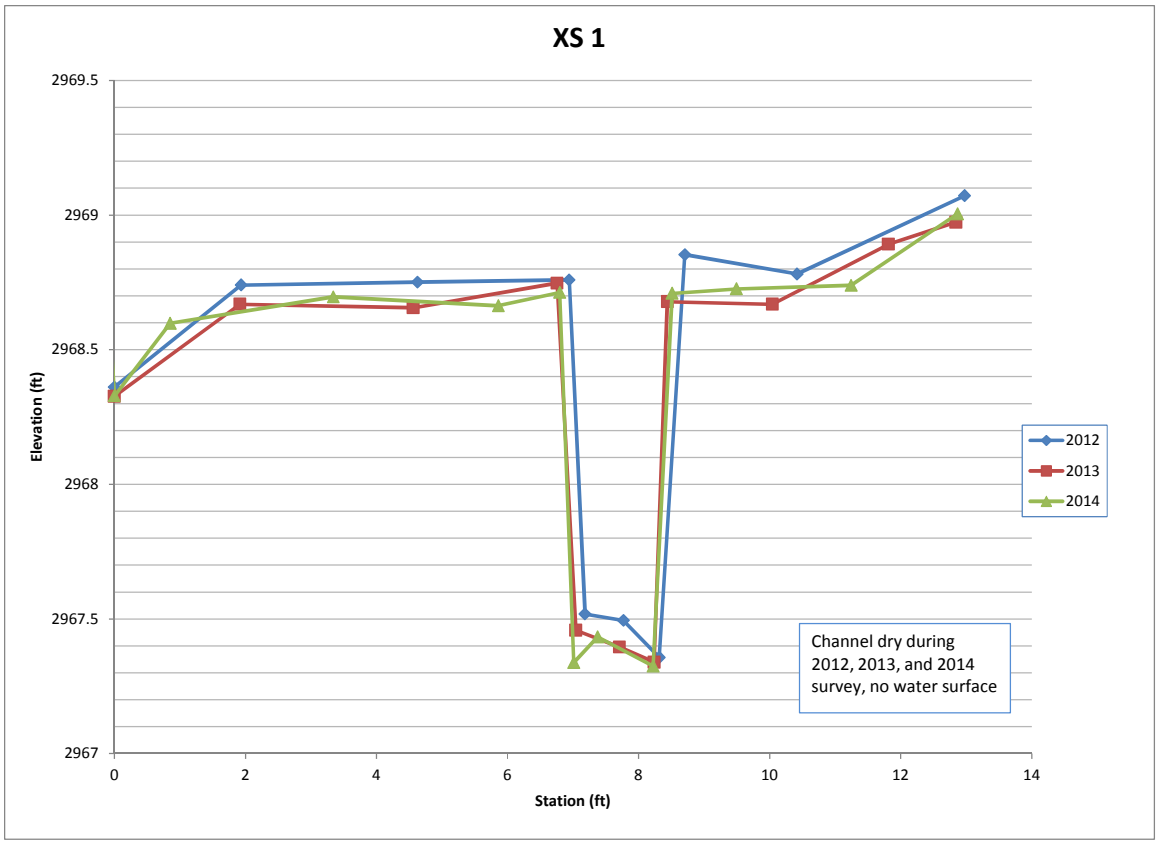
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 27(21)	

SITE PLAN
SCHREIBER MEADOWS
WETLAND MITIGATION
MONITORING POINTS
+
TRANSECTS

Appendix E

Surveyed Stream Cross Sections

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana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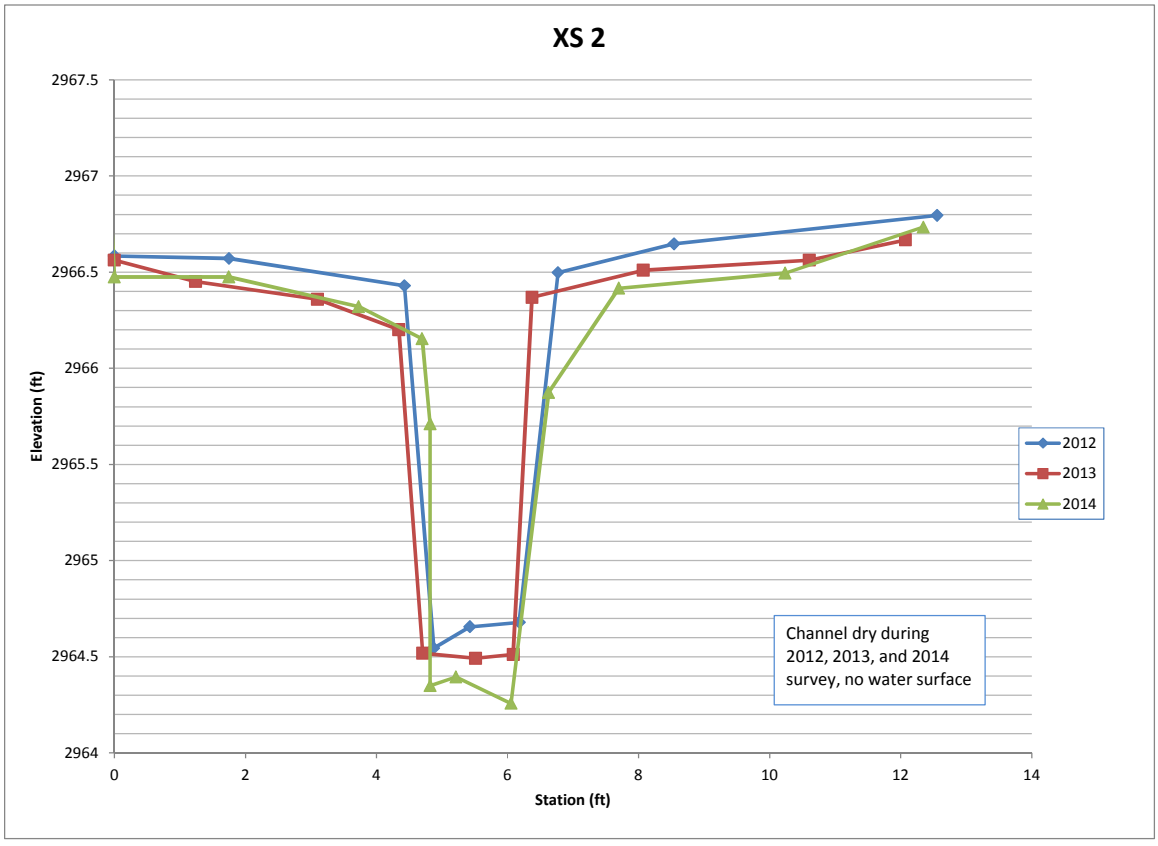
2969.5
2969
2968.5
2968
2967.5
2967
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
Channel dry during 2012, 2013, and 2014 survey, no water surface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2965.5
2965
2964.5
2964
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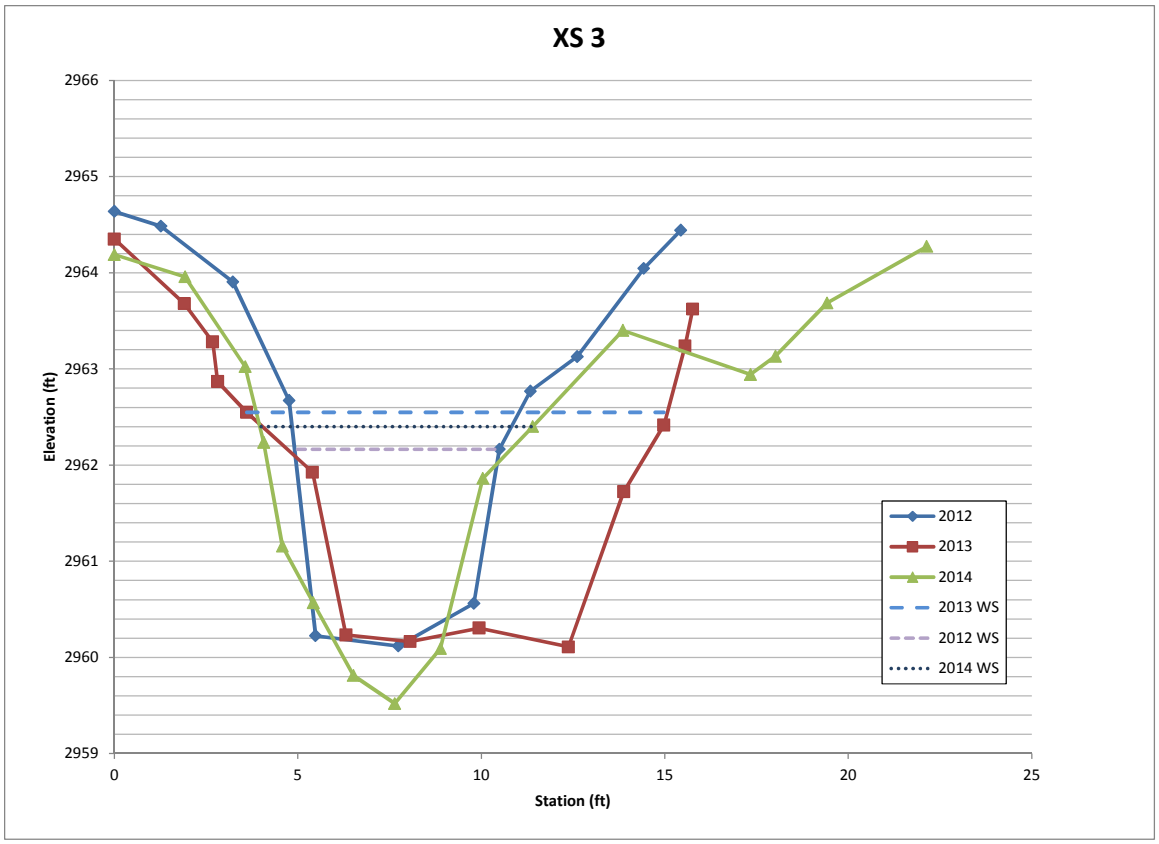
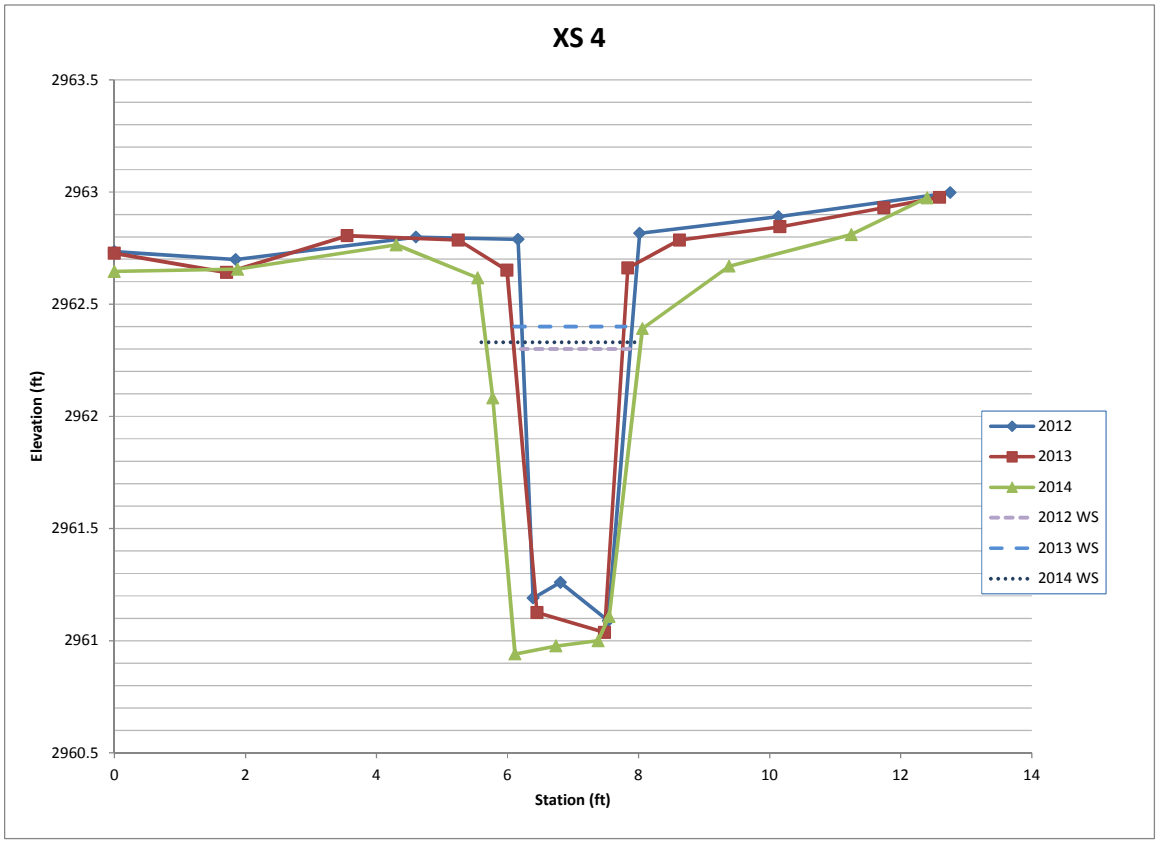
4
6
8
10
12
14
Station (ft)
2012
2013
2014
Channel dry during 2012, 2013, and 2014 survey, no water surface


XS 3
2966
2965
2964
2963
2962
2961
2960
2959
Elevation (ft)
0
5
10
15
20
25
Station (ft)
2012
2013
2014
2013 WS
2012 WS
2014 WS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2962.5
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2961.5
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2960.5
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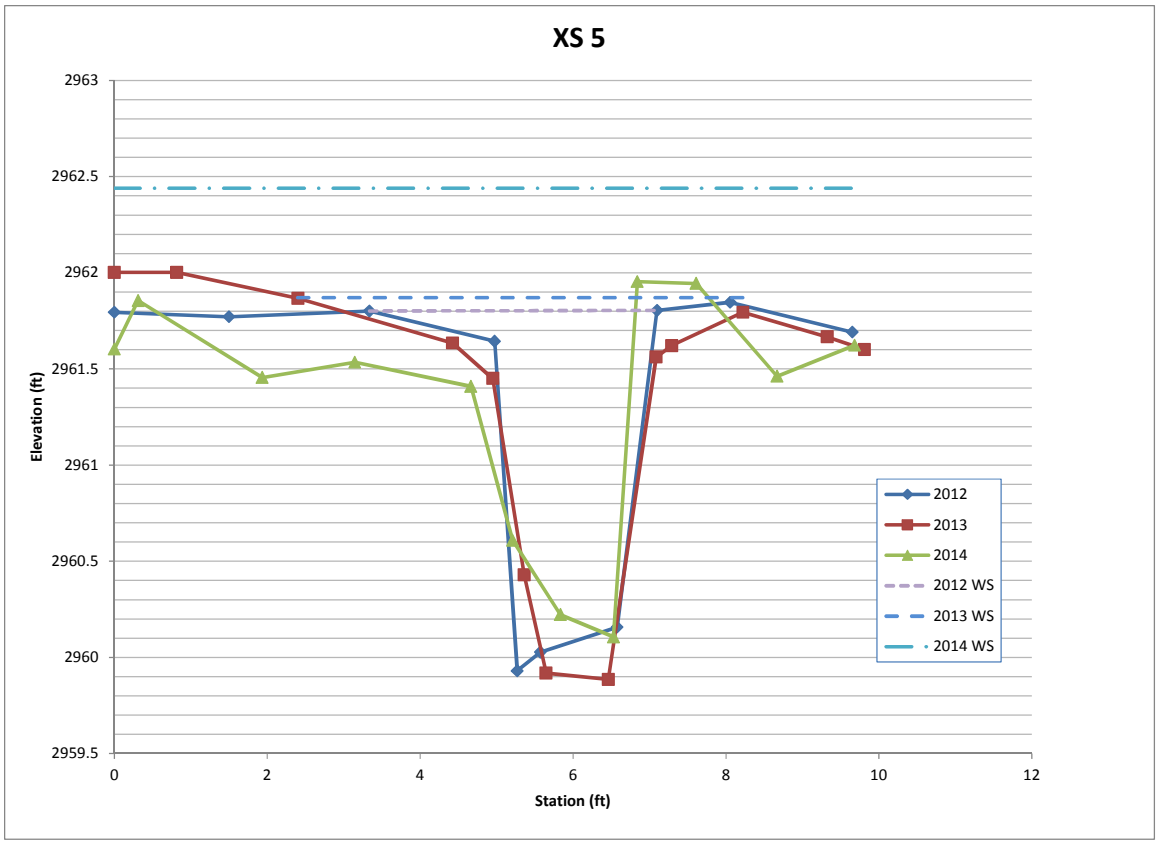
2
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS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2962.5
2962
2961.5
2961
2960.5
2960
2959.5
Elevation (ft)
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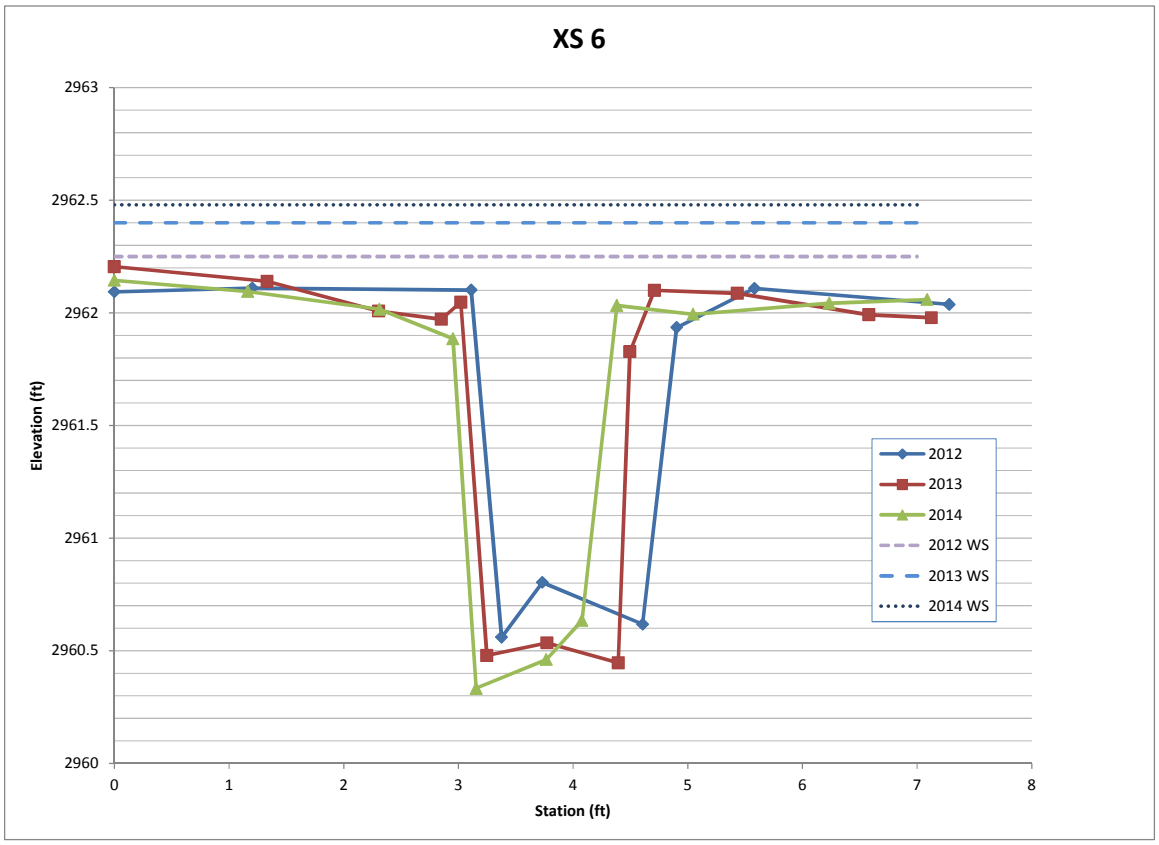
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS


XS 6
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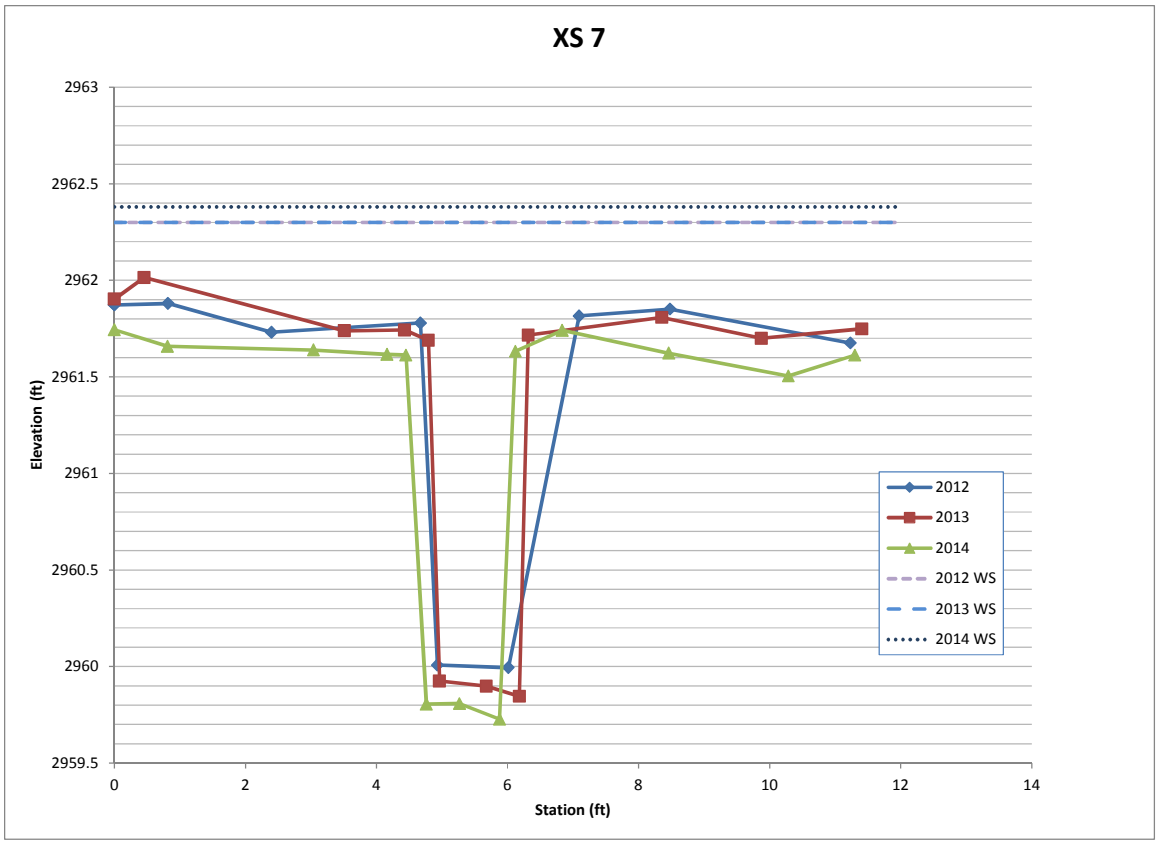
2962
2961.5
2961
2960.5
2960
Elevation (ft)
0
1
2
3
4
5
6
7
8
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS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Elevation (ft)
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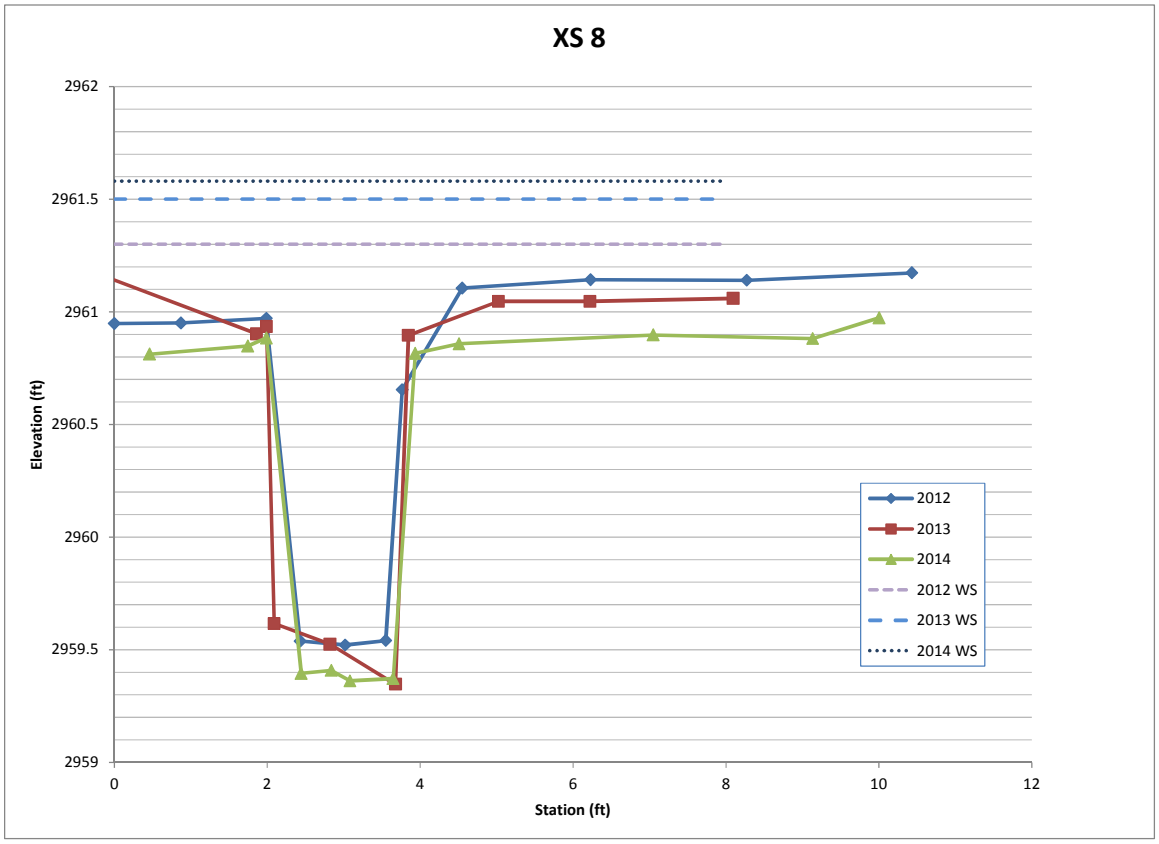
4
6
8
10
12
14
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS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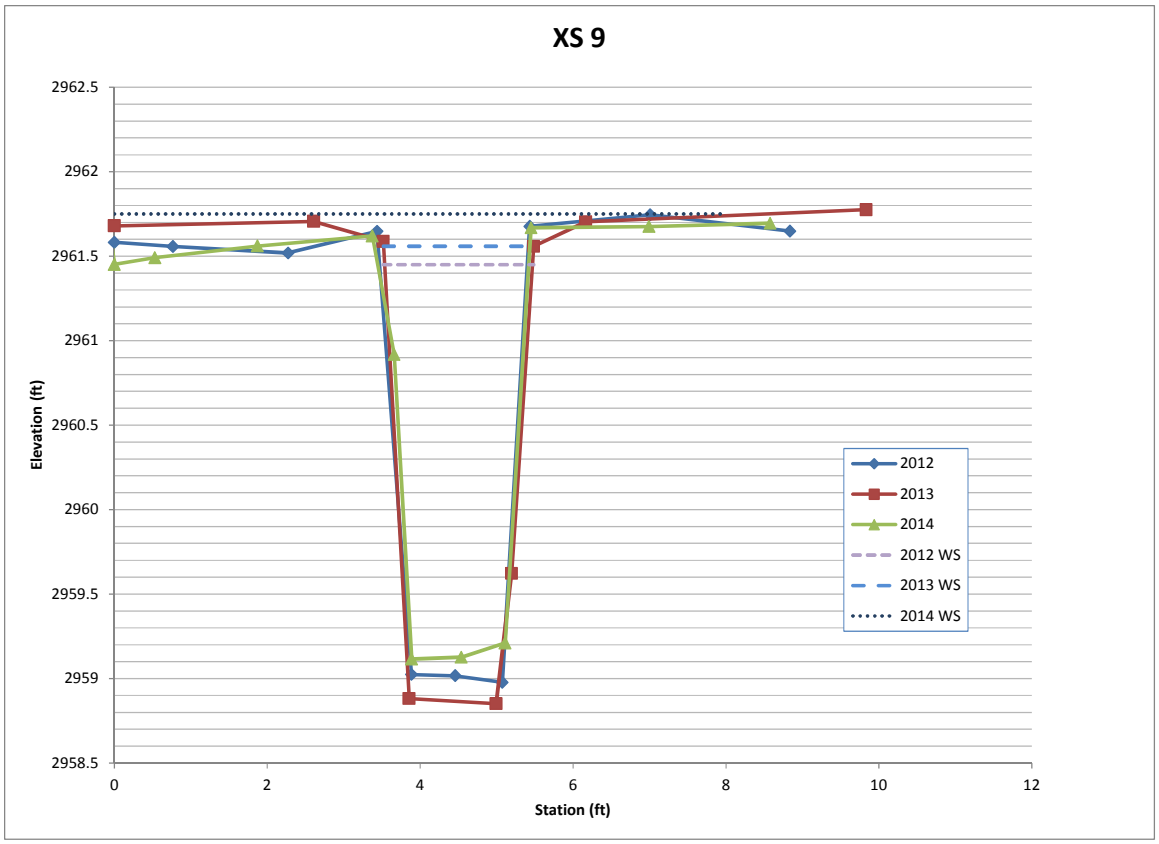
6
8
10
12
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS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Elevation (ft)
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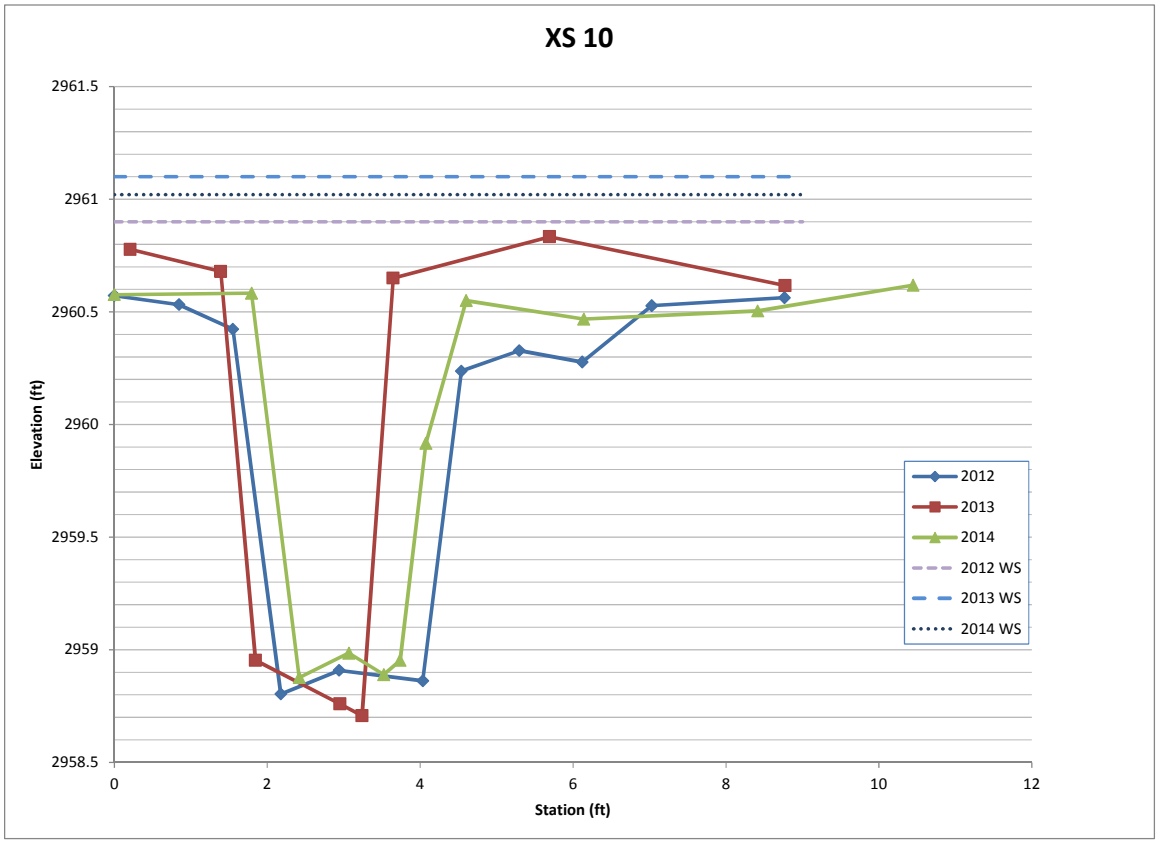
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS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2960.5
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2959.5
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Elevation (ft)
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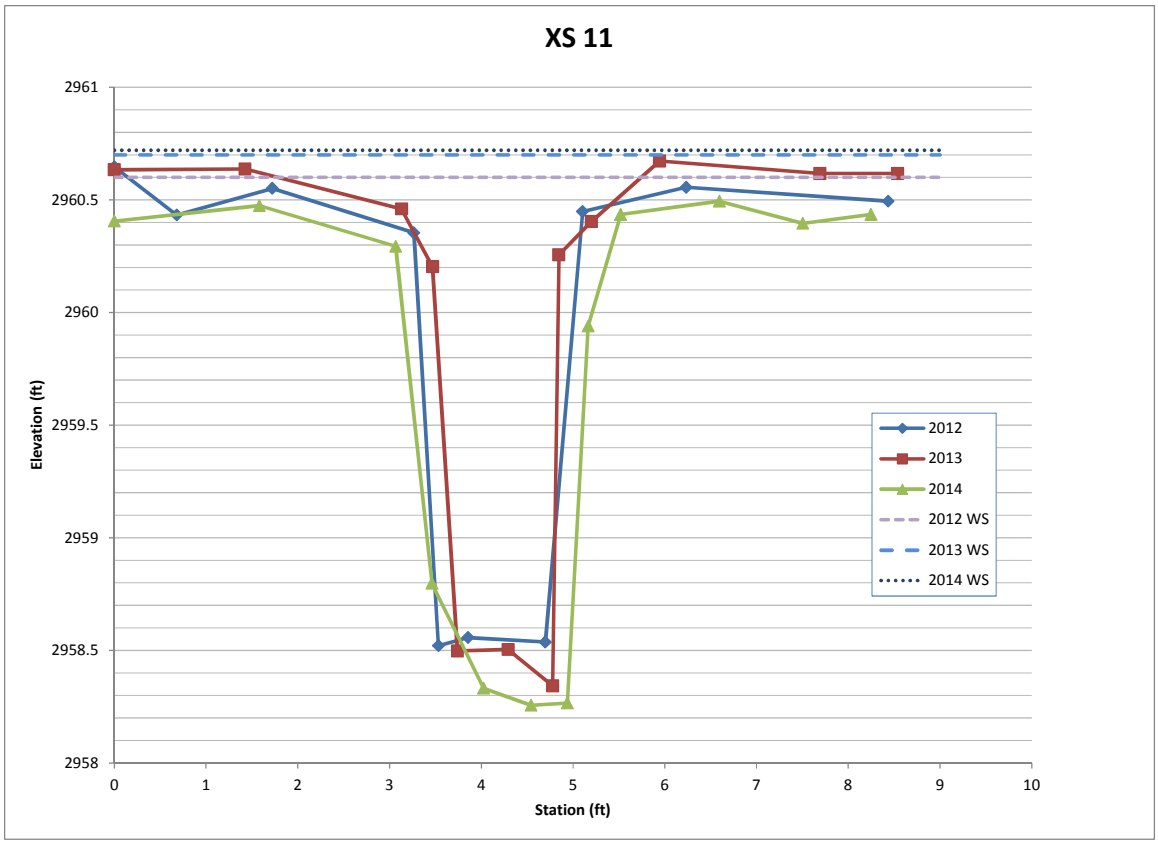
2
4
6
8
10
12
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS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Elevation (ft)
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1
2
3
4
5
6
7
8
9
10
Station (ft)
2012
2013
2014
2012 WS
2013 WS
2014 WS