MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2012

Schrieber Meadows
Lincoln County, Montana



Prepared for:

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December 2012

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MDT Project Number NH 27(021)
Control Number 1027

Corps #: NOW-2004-90280-MTH

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CCI Project No: MDT.004

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Cover: View of southeast cell, photo from 2011 due to smoky conditions in 2012.

1. INTRODUCTION

The Schrieber Meadows Wetland Mitigation 2012 Monitoring Report presents the results of the second year of post-construction monitoring at the Schrieber Meadows mitigation area for three pilot cells constructed in 2007 and the first year of post-construction monitoring for the remaining cells and new stream channels constructed during the fall of 2011. 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 147-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 within 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 western and northern edges by the Kootenai National Forest and the US Highway 2 corridor and on the south by private property.

Figures 2 and 3 in Appendix A of the Mitigation 2012 Monitoring Report show the monitoring activity locations and mapped site features, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring Forms, 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 stability of US Highway 2. In 2007, a pilot wetland project to excavate several shallow depressional wetland cells within these peat and lacustrine soils 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.

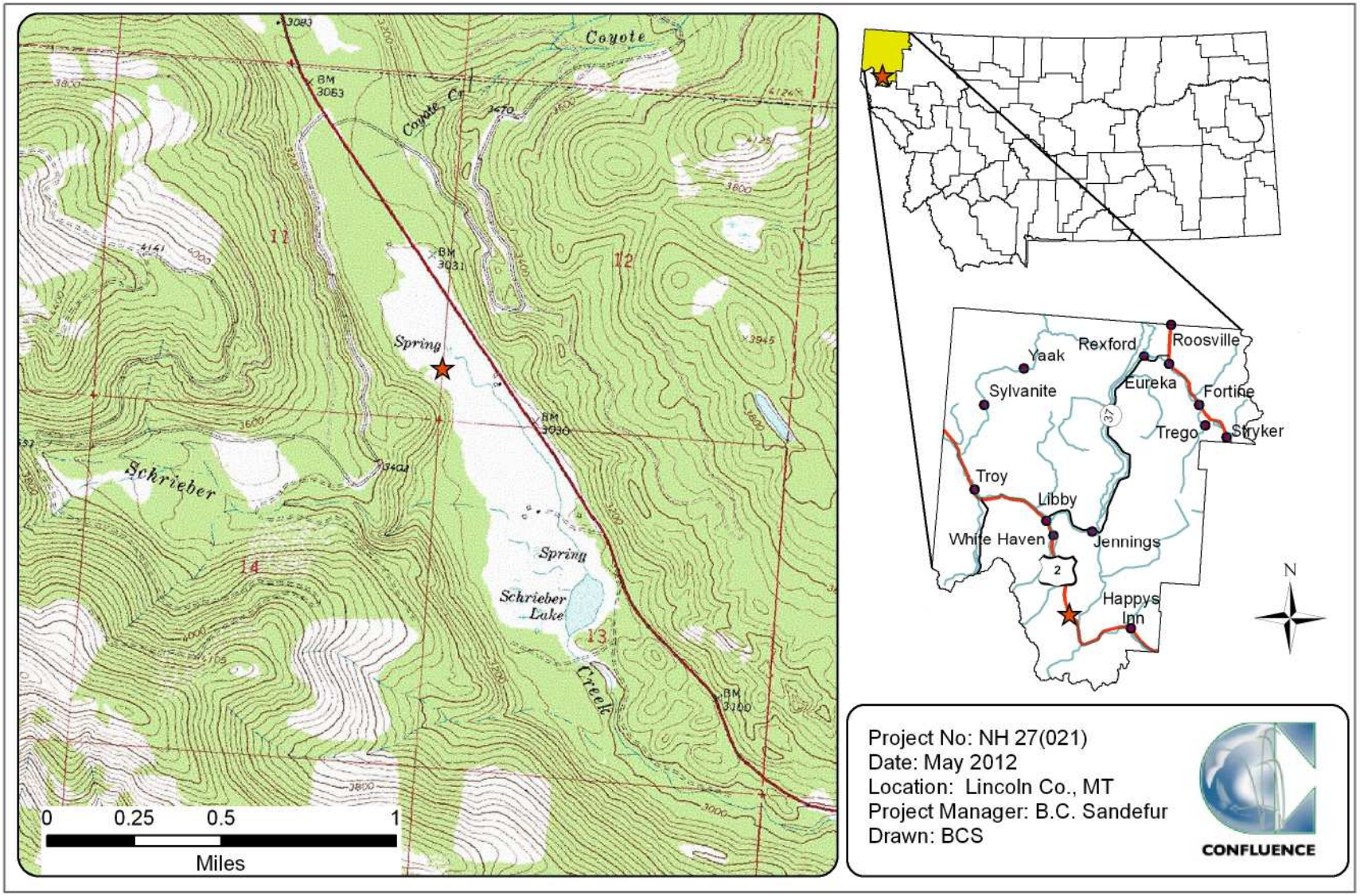


Figure 1. Project location for Schrieber Meadows Mitigation Site.

The project credit ratios approved by the USACE for the initial pilot project are shown in Table 1 (MDT 2009).

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**

Based on the results of the pilot project, this wetland and stream restoration project was scaled back from the original design. A 300-foot buffer was established by the MDT Geotechnical Section from the edge of 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 along the western 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 drainage ditch along the eastern boundary of the site was plugged to prevent excessive drainage and create pockets of surface water. The overall objective for the MDT was to create and restore wetlands, and to restore the natural stream sinuosity and associated riparian/floodplain corridor to both Coyote and Schrieber Creeks within the USFS and MDT properties.

A total of approximately 3.72 acres of mitigation credit were developed in the original pilot project in 2007, involving 2.38 credit acres of wetland creation, 0.75 credit acres of restoration (rehabilitation) of existing wetlands (1.12 acres), and 0.59 acres of upland (2.96 acres) buffer around these wetlands. The objectives of the Schrieber Meadows stream and wetland restoration project are to:

Wetland Mitigation

- Create an additional 6.53 wetland credit acres of new 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 1.56 wetland credit acres through the restoration (rehabilitate) of 2.36 acres of degraded wetlands (at 1.5:1 ratio) that are dominated by tame pasture grasses such as meadow foxtail (*Alopecurus* sp.), reed canary grass (*Phalaris arundinacea*), timothy (*Phleum pretense*)

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,
- Establish an overall total of 17.84 acres of wetland mitigation credits to mitigate wetland impacts associated with MDT projects within Watershed #1 – Kootenai River Basin; and
- Effect approximately 0.08 acres of wetlands through the installation of ditch plugs along the Perennial Spring Channel ditch.

Stream Mitigation
- Restore approximately 7,756 linear feet of new stream channel to 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 for diverting flows for flood irrigation into adjacent hay pastures. Prior to this disturbance, 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 and surface hydrology to restore existing de-graded wetland communities, and
- improving wildlife habitat across the entire project area.

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.

Coyote and Schrieber Creeks provide the project area a source of seasonal and perennial surface water, and establish a seasonal groundwater table within 0.5 to 3 feet of the pre-construction ground elevation during the spring. This seasonal groundwater is expected to provide the necessary hydrology for the majority of the created depressional 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 some level of natural recruitment anticipated.

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% cover within the riparian buffer areas. Any areas within the creditable buffer area disturbed by the project construction must have at least 50% aerial cover on 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 in ≥70% and Montana State-listed noxious weeds do not exceed 10% cover, subject to the woody standards listed below.
    ii. **Woody Plants** – Planted
3. **Channel Restoration Success** will be evaluated in terms of re-vegetation success.
    i. Re-vegetation 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.a and 3.b 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 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, 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. 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 second annual monitoring event was completed on July 31 and August 1, 2012. Information contained on the Mitigation Monitoring Form and Wetland Determination Data Form was entered electronically in the field on a palmtop 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 assessment, and a non-engineering examination of the infrastructure established within the mitigation project area.

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 degrees Fahrenheit (Environmental Laboratory 1987). The growing season recorded for the meteorological station at Libby 32 SSE (245020), located approximately 8 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 Form (USACE 2010) were documented at five 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). Hydrologic assessments allow 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. During the 2012 site visit, eleven permanent cross-sections were established across the constructed streams (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 using survey-grade GPS with a base station established on site to improve accuracy. The cross-section data are shown in Appendix E and will be used in subsequent monitoring events to compare temporal 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 dominant species within a community type was estimated and recorded using the following ranges as listed verbatim on the monitoring forms: 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 will be 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 dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same cover ranges listed above (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C).

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 by T, L, M, or H, for less than 1 percent, 1 to 5 percent, 2 to 25 percent, and 25 to 100 percent, respectively, as listed on Figure 3 (Appendix C).

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 USACE 1987 manual and 2010 Regional Supplement. 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 USACE Wetland Delineation Manual and the 2010 Regional Supplement.

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 Manual and 2010 Regional Supplement, must be satisfied. The 2012 NWPL (Lichvar and Kartesz. 2009) indicator status and scientific plant names were used in this report. Many common names used in the 2012 NWPL appear incomplete or erroneous. When used in this report, 2012 NWPL common names that appear to be incomplete or erroneous are provided with parenthetical clarification. For example, the common given name for the plant *Agrostis exarata* in the 2012 NWPL is “spiked bent”. As this name is incomplete, this species’ common name would be reported here as “spiked bent(grass)”. Previous years’ reports used the 1988 National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The 2012 plant names are used in this report with the 1988 name noted when different. 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 identified on 2012 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 will be compiled each year.

2.7. Functional Assessment

The 2008 MDT MWAM was used to evaluate functions and values on the site in 2010 and 2012. 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 condition, trends, current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transects. Photographs were taken at established photo points throughout the mitigation site, at the transect end points, 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 during the 2012 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. 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 fence boundaries, photograph points, transect endpoints, 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. A cursory examination was completed rather than an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

Climate data from the Libby weather station recorded an average total annual precipitation rate of 24.54 inches from 1910 to 2012 (WRCC 2010). Annual precipitation totals for 2009, 2010, and 2011 were 19.74, 22.01, and 22.64 inches, respectively. Average precipitation for the period of record from January to July was 13.86 inches. Precipitation totals recorded from January to July in 2010, 2011, and 2012 were 11.65 inches, 15.05 inches, and 16.2 inches, respectively (WRCC 2012). In general, the area around the project area exhibited above-average precipitation in 2011 and 2012 prior to and during the growing season.

During the 2012 investigation, the average depth of surface water across the site was estimated at 1 foot with a range of depths of 0 to 3.5 feet. Approximately 60 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 majority of the lower half of the site was inundated due to the plugged drainage ditch and abundant surface and ground water moving through this valley. Inundation was observed in all of the excavated basins below the access drive, and in several of the excavated basins in the northern half of the site. A few of the constructed depressions in the upgradient area of the site were dry at the time of the field survey but supported positive indicators of seasonal inundation. Other site-wide indicators of wetland hydrology included drift deposits, saturation/inundation visible on aerial photographs, FAC-neutral test, and seasonal high groundwater table.

Data points SM-1, SM-2, and SM-5, shown on Figure 2, Appendix A, were located within areas that met the wetland criteria. Data point SM-1 exhibited one primary hydrologic indicator, drift deposits, and one secondary indicator, geomorphic position. Data point SM-2 showed saturation on aerials and was saturated at 12 inches below ground surface. Data point SM-5 was similar to SM-1 with drift deposits across the soil surface. Saturation at this data point was also observed on the aerial photograph. There were no hydrologic indicators at the upland data point SM-3 and only one secondary indicator, a positive FAC-neutral test, at SM-4. As a result, these areas were mapped in uplands.

3.2. Channel Cross-Sections

The survey results for eleven permanent cross-sections established along the constructed Coyote and Schrieber Creeks (Figure 2, Appendix A) are shown in Appendix E. These data will be used for comparison against future surveys to assess stream channel stability.

3.3. Vegetation

A comprehensive list of 98 plant species identified on the site during the 2010 and 2012 field surveys is presented in Table 2. Four wetland and two upland community types were identified and mapped at the mitigation site in 2012 (Figure 3, Appendix A). The vegetation community types identified on the site in

2012 are described below. 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 dominant species for each vegetation community types observed on the Schrieber Meadows mitigation site are discussed below in descending order of abundance.

Wetland community Type 3 – *Phalaris arundinacea* was the dominant vegetation community on the site in 2012, covering nearly 24 acres of the project area. This community is a robust stand of reed canary grass (*Phalaris arundinacea*) with twenty-five other species identified around the margins. Creeping meadow-foxtail (*Alopecurus arundinaceus*), field meadow-foxtail (*Alopecurus pratensis*), American slough grass (*Beckmmannia syzigachne*), water smartweed (*Persicaria amphibia*), and thick-head sedge (*Carex pachystachya*) were each present in community Type 3 and ranged in cover from one to five percent.

Wetland community Type 5 – Aquatic macrophytes/Open Water included the excavated cells throughout the site and covered 9.61 acres. The three cells constructed in 2007 exhibited a well developed aquatic community with emergent, floating, and submergent plant species. The cells constructed in 2011 did not display the same level of vegetation development. In general, the cells located toward the northern boundary (upgradient) were drier and appeared to experience a greater level of water table fluctuation. Inundation levels within the constructed cells increased downstream. Dominant vegetation within this community included tall manna grass (*Glyceria elata*), common spike-rush (*Eleocharis palustris*), field meadow-foxtail, creeping meadow-foxtail, reed canary grass, and stalk-grain sedge (*Carex stipata*) around the margins. Within the deeper water, water smartweed (*Persicaria amphibia*), floating pondweed (*Potamogeton natans*), coon's-tail (*Ceratophyllum demersum*), sago false pondweed (*Stuckenia pectinata*), green algae, and brown algae were common. A total of 23 species were identified within this community.

Wetland community Type 6 – *Alopecurus* spp. was located across 12.36 acres around the constructed cells along the Upper Coyote Creek reach of the site. This area appeared to experience periodic flooding during peak spring runoff with a 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, western-wheat grass, tall scouring-rush (*Equisetum hyemale*), great plantain (*Plantago major*), Kentucky blue grass (*Poa pratensis*), and common dandelion (*Taraxacum officinale*). A total of 31 plant species were identified within this 12.36-acre community.

Wetland community Type 7 – *Juncus bufonius*/Bare Ground was located on 1.70 acres on the perimeter of the constructed cells excavated in 2011. These areas

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

Scientific Names	Common Names	WMVC Indicator Status[1]
Achillea millefolium	Common Yarrow	FACU
Achnatherum nelsonii	Columbia Needlegrass	UPL
Agastache urticifolia	**Nettle-Leaf Giant-Hyssop**	**FACU**
Agropyron cristatum	Crested Wheatgrass	UPL
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
Aster sp.	**Aster**	**NL**
Beckmannia syzigachne	American Slough Grass	OBL
Bromus carinatus	California Brome	UPL
Bromus inermis	**Smooth Brome**	**FAC**
Cardaria sp.	Whitetop	NL
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
Centaurea maculosa	Spotted Knapweed	UPL
Cerastium arvense	Field Mouse-Ear Chickweed	FACU
Cerastium fontanum	Common Mouse-Ear Chickweed	FACU
Ceratophyllum demersum	Coon's-Tail	OBL
Cirsium arvense	Canadian Thistle	FAC
Cleome serrulata	**Rocky Mountain Beeplant**	**FACU**
Collomia linearis	Narrow-Leaf Mountain-Trumpet	FACU
Cynoglossum officinale	Gypsy-Flower	FACU
Deschampsia cespitosa	Tufted Hairgrass	FACW
Eleocharis flavescens	Yellow Spike-Rush	OBL
Eleocharis palustris	Common Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	**Fringed Willowherb**	**FACW**
Epilobium sp.	Willowherb	NL
Equisetum hyemale	**Tall Scouring-Rush**	**FACW**
Erysimum cheiranthoides	Worm-Seed Wallflower	FACU

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).

New species identified in 2012 are shown in bold type.

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

Scientific Names	Common Names	WMVC Indicator Status[1]
Fragaria virginiana	Virginia Strawberry	FACU
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 bufonius	Toad Rush	FACW
Juncus confusus	Colorado Rush	FAC
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus nodosus	Knotted Rush	OBL
Lemna minor	Common Duckweed	OBL
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	**Lady's-Thumb**	**FACW**
Phalaris arundinacea	Reed Canary Grass	FACW
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	Floating Pondweed	OBL
Potentilla gracilis	Graceful Cinquefoil	FAC
Potentilla norvegica	Norwegian Cinquefoil	FAC
Ranunculus sceleratus	Cursed Buttercup	OBL
Rumex acetosella	Common Sheep Sorrel	FACU
Rumex crispus	Curly Dock	FAC
Salix drummondiana	**Drummond's Willow**	**FACW**
Sisymbrium altissimum	**Tall Hedge-Mustard**	**FACU**
Sparganium emersum	European Burr-Reed	OBL

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).

New species identified in 2012 are shown in bold type.

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

Scientific Names	Common Names	WMVC Indicator Status[1]
Spiranthes romanzoffiana	**Hooded Ladies'-Tresses**	**FACW**
Stuckenia pectinata	**Sago False Pondweed**	**OBL**
Suaeda calceoliformis	**Paiuteweed**	**FACW**
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Penny-Cress	UPL
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 peregrina	Neckweed	OBL
Veronica serpyllifolia	Thyme-Leaf Speedwell	FAC

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).
New species identified in 2012 are shown in bold type.

only had a couple months of growing season to establish between construction and the 2012 monitoring event and exhibited between 21 and 50 percent bare ground. Toad rush (*Juncus bufonius*) was the dominant successional plant species in this community. Field meadox-foxtail, American slough grass, American manna grass, common spike rush, seep monkey-flower (*Mimulus guttatus*), Kentucky blue grass, and paiuteweed (*Suaeda calceoliformis*) were identified in this community between 1 and 10 percent cover. A total of 25 vegetation species were identified in community Type 7.

Upland community Type 8 – *Elymus repens/Pascopyrum smithii* was mapped across 2.57 acres within the spoil pile from the cells and stream channels. This area was seeded following construction in 2011. Dominant vegetation species within this community included western-wheat grass, creeping wild rye (*Elymus repens*), and black medick (*Medicago lupulina*). Other species included field meadow-foxtail, smooth brome (*Bromus inermis*), slender wild rye (*Elymus trachycaulus*), reed canary grass, graceful cinquefoil (*Potentilla gracilis*), tall hedge-mustard (*Sisymbrium altissimum*), and 13 other species in trace amounts.

Upland Type 9 – *Alopecurus* spp./*Bromus inermis* was located across 6.45 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 (*Achilea millefolium*), western-wheatgrass, Kentucky blue grass, tall hedge-mustard, great plantain, common dandelion, and 6 other species at trace amounts.

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. The upland community Type 1 – *Agropyron repens*/*Centaurea maculosa* identified in 2010 was generally replaced by upland community Type 8 – *Elymus repens*/*Pascopyrum smithii* mapped in 2012. The upland community Type 3 – *Phalaris arundinacea* identified in 2010 likely represented persistent hydrophytic vegetation within historic wetland areas adversely affected by draining. These areas were generally inundated in 2012 due to the substantially increased water table levels. Wetland community Type 4 – *Glyceria elata*/*Eleocharis* spp. was identified in 2010 around the fringes adjacent to the open water within the constructed cells. This community type was replaced in 2012 by Type 5 – Aquatic Macrophytes/Open Water where increased water levels inundated the community and by Type 3 where reed canary grass became the dominant.

Trends in plant species composition were measured on three transects (T-1, T-2, and T-3) in 2012. One 318-foot transect, T-1, was established during the initial monitoring at this site in 2010. Table 3 summarizes the transect data and Charts 1 and 2 graph the results for T-1 (Monitoring Form, Appendix B). Photographs of the transect end points are shown on pages C-15 and C-16 of Appendix C. Vegetation communities 3, 5, and 6 were identified on the transect. Hydrophytic species comprised 62 percent of the transect and open water encompassed 25 percent of the transect in 2010. In 2012, these values shifted to 27 percent of the transect dominated by hydrophytic species and 73 percent open water. This increase of open water reflected the inundated conditions present within the excavated cells, a result of the plugged ditch along the eastern boundary and substantial increase in surface water across the site. Unlike 2010, no portion of this transect crossed through a mapped upland community type in 2012.

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

Monitoring Year	**2010**	**2012**
Transect Length (feet)	**318**	**318**
Vegetation Community Transitions along Transect	7	6
Vegetation Communities along Transect	3	2
Hydrophytic Vegetation Communities along Transect	2	2
Total Vegetative Species	32	15
Total Hydrophytic Species	22	12
Total Upland Species	10	3
% Transect Length Comprising Hydrophytic Vegetation Communities	62	27
% Transect Length Comprising Upland Vegetation Communities	13	0
% Transect Length Comprising Open Water	25	73
% Transect Length Comprising Bare Substrate	0	0

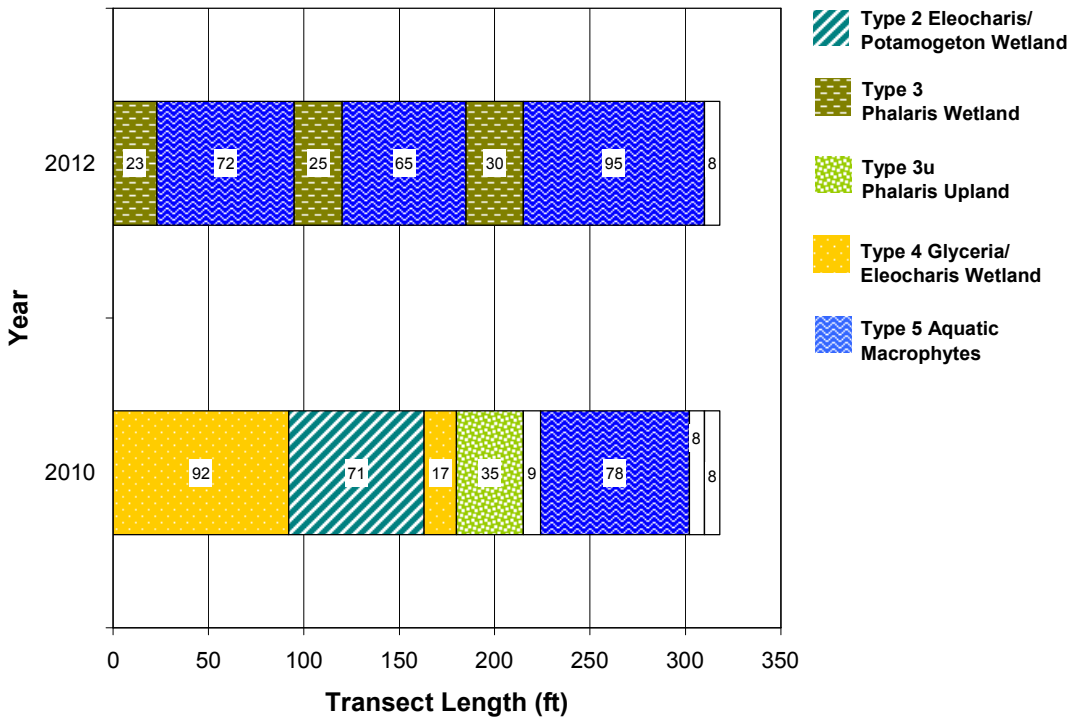


Chart 1. Transect map showing community types on transect T-1 in 2010 and 2012 from start (0 feet) to end (318 feet).

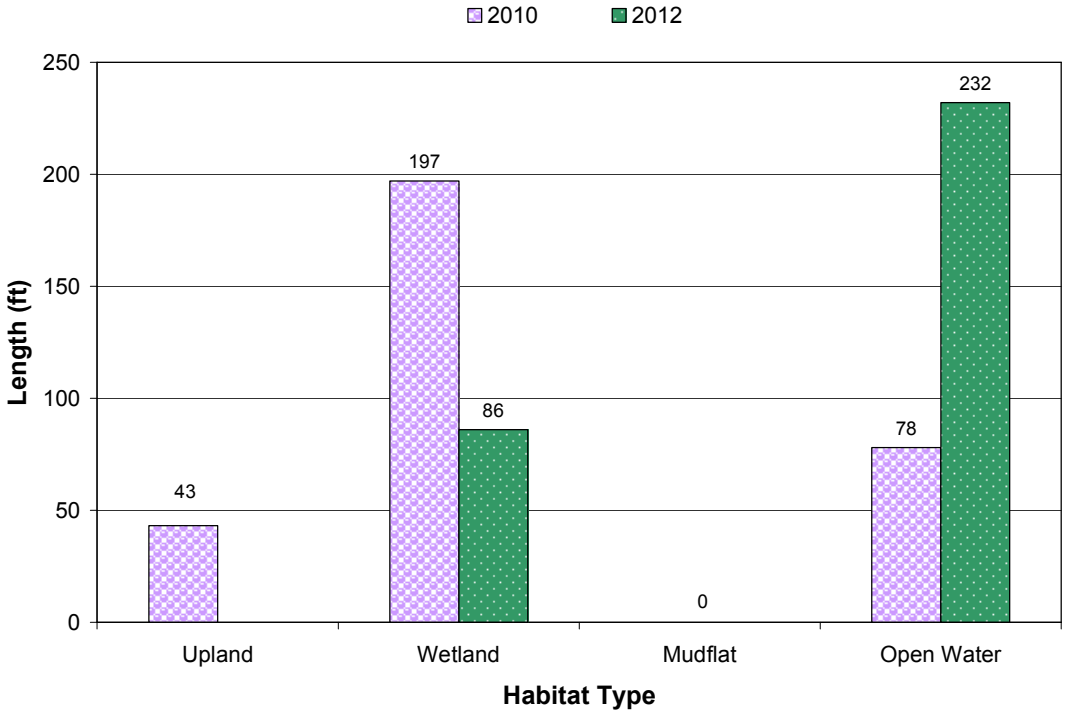


Chart 2. Length of habitat types within transect T-1 in 2010 and 2012.

Transect T-2 was established across three constructed cells within the northern portion of the project site (Figure 2, Appendix A). This transect intersected vegetation community types 5, 6, and 7. One hundred percent of the transect contained wetland communities in 2012. Transect details 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-16 of Appendix C.

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

Monitoring Year	**2012**
Transect Length (feet)	**594**
Vegetation Community Transitions along Transect	16
Vegetation Communities along Transect	3
Hydrophytic Vegetation Communities along Transect	3
Total Vegetative Species	26
Total Hydrophytic Species	17
Total Upland Species	9
% Transect Length Comprising Hydrophytic Vegetation Communities	100
% Transect Length Comprising Upland Vegetation Communities	0.0
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	0.0

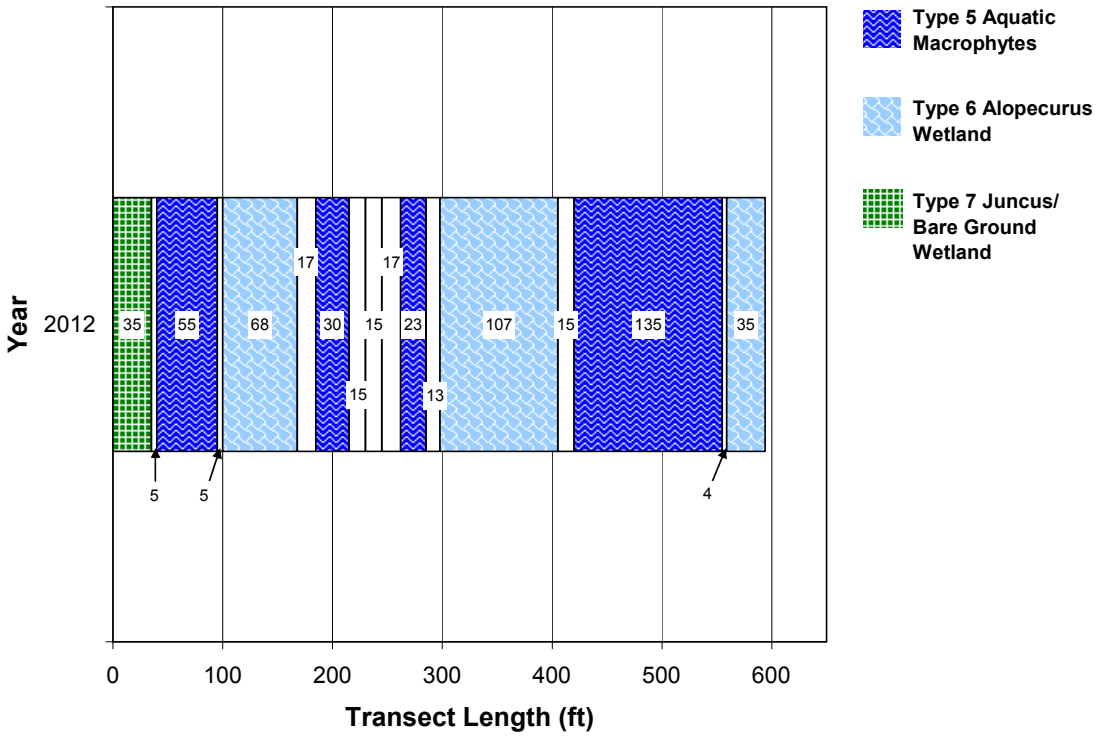


Chart 3. Transect map showing community types on transect T-2 in 2012 from start (0 feet) to end (594 feet).

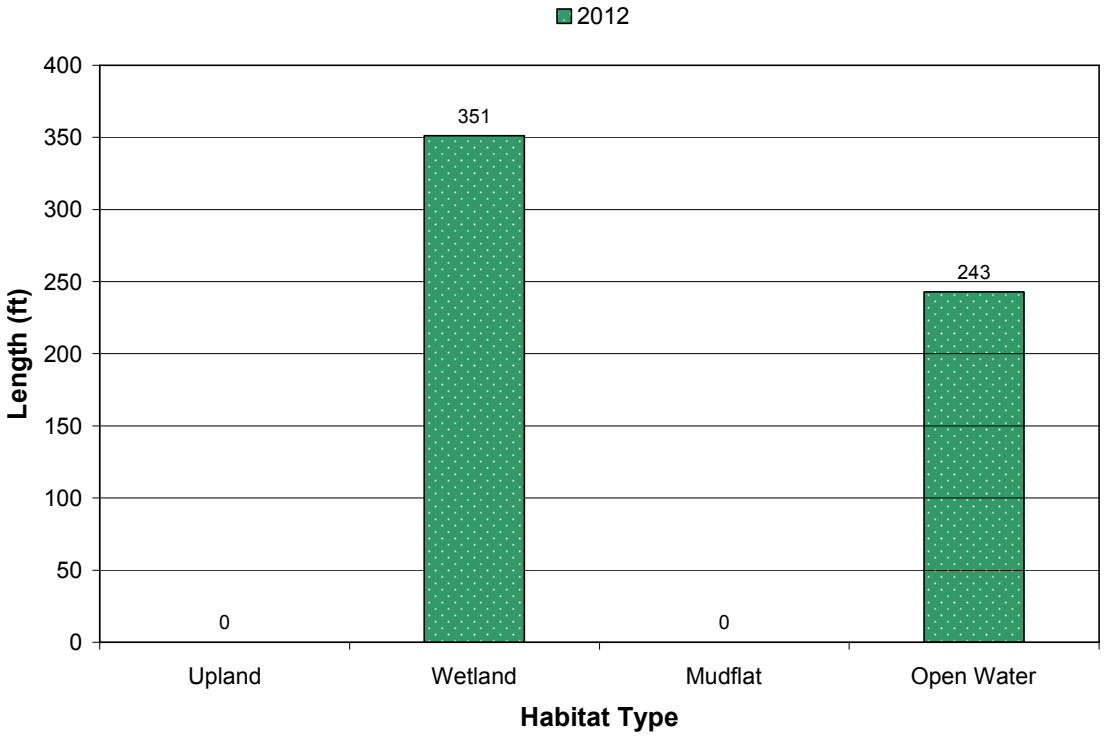


Chart 4. Length of habitat types within transect T-2 in 2012.

Transect T-3 begins between two constructed cells along the Middle Coyote Creek reach and extends east 440 feet to the edge of the plugged drainage ditch along the eastern boundary of the site. This transect crosses two communities, including Type 3 – *Phalaris arundinacea* and Type 5 – Aquatic macrophytes/Open Water. Because of the dominance of reed canary grass within this area of the mitigation site, only 9 vegetative species were identified along this transect. The greatest diversity of plant species along transect T-3 were located within the inundated constructed wetland cells. 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-16 of Appendix C.

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

Monitoring Year	**2012**
Transect Length (feet)	**440**
Vegetation Community Transitions along Transect	4
Vegetation Communities along Transect	2
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	9
Total Hydrophytic Species	7
Total Upland Species	2
% Transect Length Comprising Hydrophytic Vegetation Communities	100
% Transect Length Comprising Upland Vegetation Communities	0.0
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	0.0

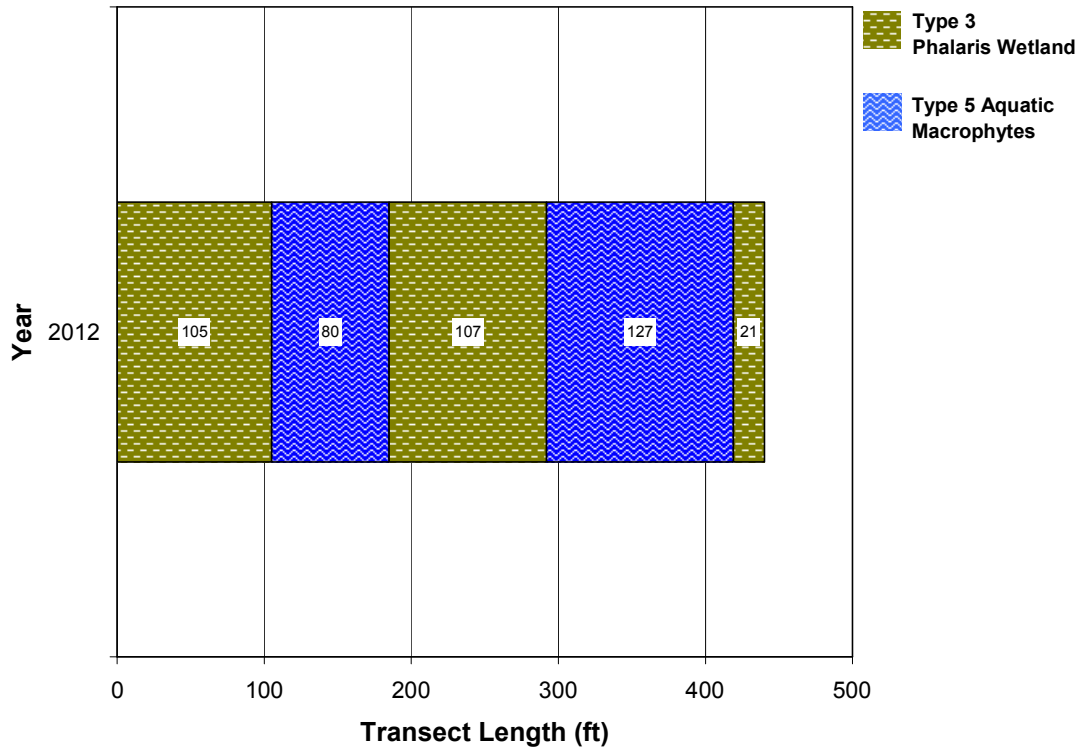


Chart 5. Transect map showing community types on transect T-3 in 2012 from start (0 feet) to end (440 feet).

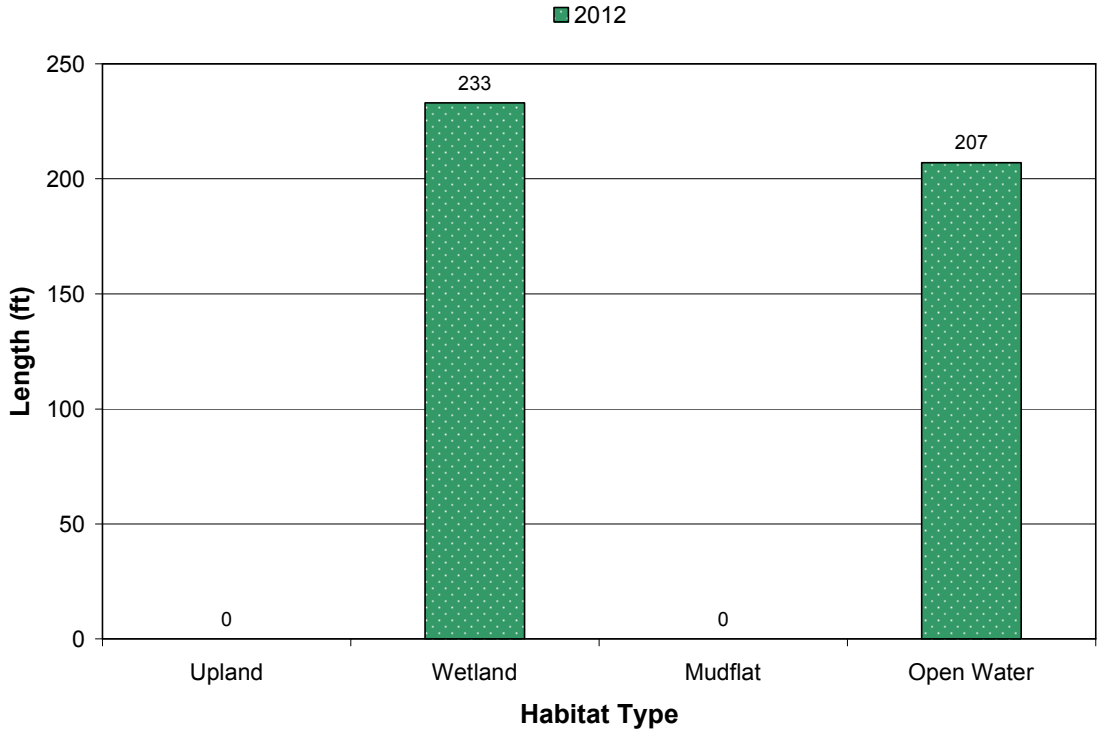


Chart 6. Length of habitat types within transect T-3 in 2012.

Three areas of Canadian thistle (*Cirsium arvensis*) were identified with the upland community Types 8 and 9. Infestation sizes ranged from less than 0.1 acre to 0.1 to 1 acre. Cover class ranged from low (1-5% cover) to high (25-100% cover), with the most significant area of infestation located along the western boundary in community Type 9 near the merged Coyote/Schrieber Creek reach in the lower half of the site (Figure 3, Appendix A).

Several stems of speckled alder (*Alnus incana*) were planted along the newly constructed stream channel. Fifty-five live stems were observed throughout the mitigation site. These stems appeared healthy with vigorous new green growth.

3.4. Soil

The primary map unit on the site (~70%) 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 reach of the site and includes silty glaciolacustrine deposits common on lacustrine terraces and glacial outwash terraces.

The soil in wetland test pit SM-1 was a very dark brown (10YR 2/2) silty clay over a light gray (10YR 7/1) silt with five percent yellowish brown redox concentrations. The depleted matrix provided a positive indicator (F3) of hydric soil. At soil pit SM-2, a 4-inch thick peat layer was observed at the surface. The diagnostic hydric indicator for SM-2 was A11, depleted below dark surface. The soil at upland data point SM-3 included a 10-inch thick dark brown (10YR 3/3) silt loam over a light gray (10YR 7/2) sandy loam. Below 14 inches in the profile, the soil expressed 5 percent redox concentrations and hydric conditions. Data point SM-4 was located along the western boundary of the site at the toe of the forested slope. No redoximorphic features were identified within this profile and it was not classified as hydric. The depleted matrix within the soil profile at data point SM-5 provided a positive indication of hydric soils.

3.5. Wetland Delineation

Five data points were sampled on July 31, 2012 to assist in determining wetland and upland boundaries. 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 the completion of the second construction phase mapped a total of 47.58 acres of wetlands across the 56.95-acre site. Aside from the excavation of the wetland cells, the primary factors influencing the extensive development of wetlands at this site were the plugging of the drainage ditch and raised bed elevation of the restored creek channel. Wide-spread inundation was present throughout the southern half 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 indications of surface inundation (drift lines, sediment deposits) were observed throughout the northern, upgradient region of the mitigation area

through the seasonally intermittent Upper Coyote Creek reach. This creek becomes perennial at the large spring that originates within the project area near the access drive that separates the upper and lower regions of the site. Below this access drive, the site was predominantly inundated during the site visit. Approximately 0.34 acres of the site was open water riverine habitat associated with the restored stream channel. A total of 47.92 acres of jurisdictional wetland were delineated at the Schrieber Meadows mitigation site in 2012 (Table 6).

Table 6. Total wetland acres delineated in 2010 and 2012.

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

3.6. Wildlife

A list of animal species observed directly or indirectly during the 2010 and 2012 monitoring events is presented in Table 7. A substantial number of bird species were identified on-site in 2012, including 195 individuals of 21 species. Two amphibian species were observed using the site, including the Columbia spotted frog and western toad, and it is presumed these individuals were using the site as primary habitat. A green sunfish was observed within a constructed cell in the lower portion of the site. A painted turtle was observed basking on a log within a constructed cell near the northern boundary of the site. Gray wolf tracks were documented within the mud around a constructed cell in this same area. Moose tracks were identified, and it appears this animal utilizes the constructed cells with more established aquatic macrophytes for forage. Other species noted using the site include the common gartersnake, white-tailed deer, coyote, and pacific tree frogs.

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

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***
Common Raven	***Corvus corax***
Eared Grebe	***Podiceps nigricollis***
Eastern Kingbird	***Tyrannus tyrannus***
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***
Spotted Sandpiper	***Actitis macularius***
Turkey Vulture	***Cathartes aura***
Unknown Sparrow	
Vaux's Swift	***Chaetura vauxi***
Virginia Rail	***Rallus limicola***
Wilson's Snipe	***Gallinago delicata***
FISH	
Green Sunfish	***Lepomis cyanellus***
MAMMAL	
Coyote	*Canis latrans*
Gray Wolf	***Canis lupus***
Deer Sp.	
Moose	***Alces americanus***
White-tailed Deer	***Odocoileus virginianus***
REPTILE	
Common Gartersnake	***Thamnophis sirtalis***
Painted Turtle	***Chrysemys picta***

Species identified in 2012 are bolded.

3.7. Functional Assessment

The 2008 MDT MWAM was used to evaluate the site in 2010 and 2012. The functional assessment completed in 2010 incorporated the three constructed wetland cells 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 two additional AAs, including the restored stream channel and additional constructed wetlands cells. As a result of these additions, the 2012 monitoring event assessed three AAs (Table 8).

Table 8. Functions and Values of Schrieber Meadows wetlands.

Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method[1]	2010 Creation/ Enhancement AA	2012 Restoration AA	2012 Enhancement AA	2012 Creation AA
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.7)	High (0.9)	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	NA	NA	NA	Mod (0.6)
Flood Attenuation	NA	Mod (0.6)	Mod (0.6)	Mod (0.6)
Short and Long Term Surface Water Storage	Mod (0.6)	High (0.8)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	Low (0.3)	NA	Mod (0.7)
Production Export/ Food Chain Support	Mod (0.5)	Mod (0.7)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Low (0.3)	Mod (0.4)	Low (0.3)
Recreation/Education Potential	Low (0.5)	High (0.2)	High (0.2)	High (0.2)
Actual Points / Possible Points	**5.45 / 8**	**6.7/10**	**7.1/9**	**8.3/11**
% of Possible Score Achieved	**68%**	**67%**	**79%**	**75%**
Overall Category	**II**	**II**	**II**	**II**
Acreage of Assessed Aquatic Habitats within Easement (ac)	**4.84**	**3.46**	**13.22**	**30.9**
Functional Units (acreage x actual points) **(f^1-)**	**26.38**	**23.18**	**93.86**	**256.47**

[1] Berglund and McEldowney 2008.

The 2012 **restoration AA** included 3.46 acres of pre-existing wetlands within the footprint of the excavated cells. This AA includes both aquatic bed and emergent wetland habitats. A moderate disturbance rating, resulting from the recent construction of these cells, was a key factor affecting the overall score within this AA and is expected to improve as vegetation develops. The AA rated as a Category II wetland, scoring high for general wildlife habitat and achieving greater than 65% of possible score.

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. Plugging the drainage ditch has resulted in increased inundation through this AA and may eventually promote the conversion of the reed canary grass-dominated AA into wetland habitat supporting an increased diversity of vegetation species. This AA achieved 79% of possible score, rated as a Category II wetland, and attained 93.86 functional units.

The 2012 **creation AA** included all wetland areas within the site that were not identified as wetland habitat during the baseline delineation. An increase of wetlands above the anticipated target value of 6.53 acres has developed on site

due to the increased water table observed site wide. This 30.9 acre AA rated as a Category II wetland and obtained 256.47 functional units since completion of construction in 2011.

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). The locations of these photographs are illustrated on Figure 2 in Appendix A. Photos are shown in Appendix C.

3.9. Maintenance Needs

No man-made water control structures were installed on the property. Three locations of the priority 2B noxious weed, Canadian thistle, were identified within the site. An on-going weed management plan administered by MDT should address these locations to prevent any further spread of weeds within the site.

3.10. Current Credit Summary

Wetland Mitigation Credit

The pilot project objectives included the following:

- Create 2.38 acres of emergent depression wetlands within portions of existing upland hay fields using a variety of herbaceous wetland communities.
- 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.

Approximately 3.72 acres of emergent depression wetland and open water had developed within the constructed cells by 2010. The total credit acres included 1.12 acres of restoration/rehabilitation in the southeast cell calculated at a 1.5:1 ratio (0.75 acres). The 2010 calculated credits at the Schrieber wetland mitigation area totaled 5.06 credit acres (Table 9).

Table 9. Summary of 2010 credit acres.

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

It was anticipated that a total of approximately 17.84 wetland credit acres would result from the full Schrieber Meadows project, including the approved credits from the 2007 pilot project. The proposed wetland credits are shown in Table 10 and described below. It was predicted that approximately 6.53 acres of wetlands would have been created through the excavation of wetland cells 1 to 11 (Project Plan sheet, Appendix D). A total of 1.56 acres of wetland credit would develop as a result of the restoration of 2.34 acres of wetlands within a small portion of the USFS property with the remaining conducted on the MDT property in wetland cells 4, 5, 8, 9, 10, and 11 (Appendix D). A total of 4.41 acres of wetland credit would develop through the enhancement of 13.22 acres of existing wetlands located between the stream mitigation portion of the project area and the US Hwy 2 corridor. Approximately 1.70 acres of mitigation credit has been obtained through protecting a 50-foot buffer around the perimeter of the constructed wetland cells. Due to the extensive response of the water table to the plugged drainage ditch and substantial site-wide increase of wetland hydrology, the projected credit acres for this site has exceeded the proposed credit acres necessary for compensatory mitigation. A total of 39.42 credit acres have developed at this site following construction. All wetlands delineated in 2012 met the performance standards approved for this site, which included meeting the three parameter criteria for hydrology, vegetation, and soils. Open water areas were given full credit due to the initial intent of the project to provide open water during the spring and early summer within the excavated depressions. Weed cover within the upland buffers did not exceed 5 percent and therefore met performance success criteria. Weeds were mapped throughout the mitigation site and will be controlled by MDT as part of the performance standard stipulating the control of noxious weed species within the site.

Table 10. Summary of Wetland Credits at the Schrieber Meadows Wetland Mitigation Site.

Mitigation Type	Proposed Acreage	Ratio	Proposed Credit Acres	2012 Delineated Acreage	2012 Credit Acres
Wetland Credit Acres established with 2007 project	6.46	Varies (See Table 8)	3.72	*	*
Creation - USFS/MDT Property	6.53	1:1	6.53	30.90	30.90
Restoration on USFS/MDT Property	2.34	1.5:1	1.56	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
Upland Buffer (50 feet)	8.50	5:1	1.70	8.50	1.70
Project Impacts	-0.08	None	-0.08	-0.08	-0.08
Total Mitigation Acreage	**36.97**		**17.84**	**47.58**	**39.24**

*Acreages included into appropriate mitigation category

Stream Mitigation Credit

As discussed in the introduction of this report, the goal of the stream mitigation component of the Schrieber Meadows project included restoring approximately **7,756 linear feet** of new stream channel to 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 to the MDT property line and is considered a seasonally intermittent stream. This segment of stream does not become perennial again until it reaches the spring area on the MDT property.
2. **Coyote Creek Spring Area** is 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 areas 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 in nature 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. As this perennial flow contributes to Coyote Creek and at the suggestion of the MFWP fisheries biologist for this region, the ditch was reconstructed into a natural channel and connected to Coyote Creek.
5. **Merged Coyote/Schrieber Creeks** is the segment of stream at the southeastern portion of the MDT property where Schrieber Creek merges with Coyote Creek to form Schrieber Creek and then continues to the property boundary. The stream 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 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 a 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 be used to offset impacts within the watershed >0.5 mile away, the off-site factor of 0.10 was utilized.

In determining stream credits for the Coyote and Schrieber Creek corridors, many of the same factors used in the riparian credit calculations were utilized. 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.

Although full stream credit has been calculated using the proposed constructed stream length, no as-built survey has been completed to verify the full length of the proposed stream has been constructed. Based on the results of 2012 monitoring efforts, 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% aerial cover by deep-rooting vegetation and less than 10% 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 plants survival exceeding 50% after 5 years will require on-going evaluation but has exhibited positive signs of survival after year one. The 35,551 stream credits calculated for this site following construction achieves the goals for the stream mitigation component for the Schrieber Meadows project.

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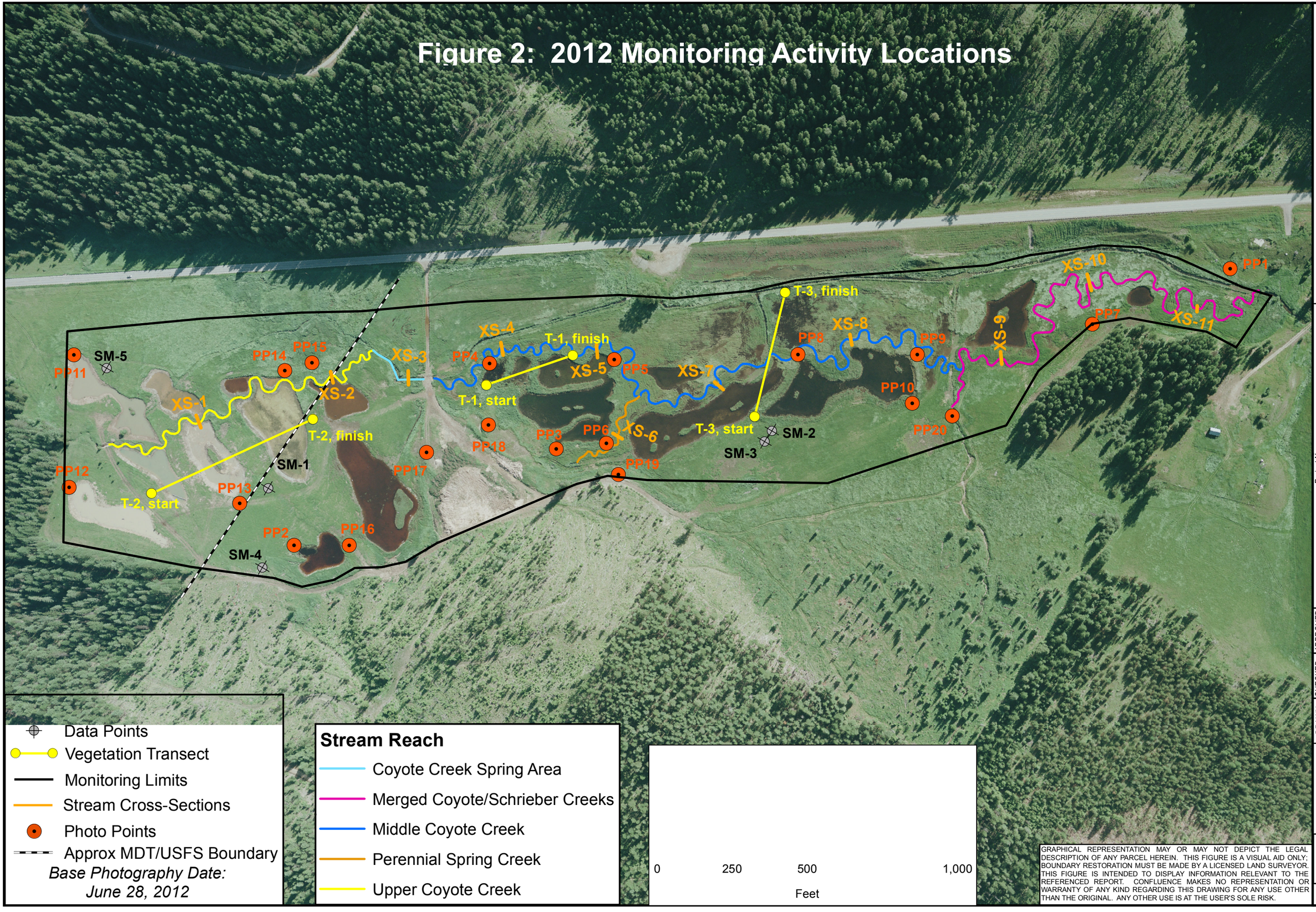
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Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

Figure 2: 2012 Monitoring Activity Locations



Data Points
Vegetation Transect
Monitoring Limits
Stream Cross-Sections
Photo Points
Approx MDT/USFS Boundary

Base Photography Date:
June 28, 2012

Stream Reach

- Coyote Creek Spring Area
- Merged Coyote/Schrieber Creeks
- Middle Coyote Creek
- Perennial Spring Creek
- Upper Coyote Creek

0 250 500 1,000
Feet

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/Monitor2012.mxd

Project Name
Schrieber Meadows Mitigation Site

Drawing Title
2012 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	MS	JJ

SCALE: Noted
Drawn: August 23, 2012
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 2

REV -

Figure 3: 2012 Mapped Site Features

Acreages

Project Area	56.95 acres
Wetlands	47.58 acres
Stream Channel (10)	0.34 acres
Uplands	9.03 acres

N

0 250 500 1,000
Feet

Legend

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

Base Photography Date: June 28, 2012

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

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 (5-25% cover)
H = High (25-100% 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/Veg2012.mxd

Project Name: Schrieber Meadows Mitigation Site
Drawing Title: 2012 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED JL
SCALE: Noted
Drawn: August 27, 2012
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2012 MDT Wetland Mitigation Site Monitoring Form
2012 USACE Wetland Determination Data Form
2012 MDT Wetland Assessment Form

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Schrieber Meadows Assessment Date/Time 7/31/2012 10:48:30 AM

Person(s) conducting the assessment: B Sandefur, E Sandefur

Weather: Sunny & hot, slight breeze Location: Highway 2, Swamp Creek East

MDT District: Missoula Milepost: NA

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

Initial Evaluation Date: 8/29/2010 Monitoring Year: 2 #Visits in Year: 2

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, groundwater

Inundation: ☑ Average Depth: 1.3 **(ft)** Range of Depths: 0-3.5 **(ft)**

Percent of assessment area under inundation: 60 %

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**:**

Drift deposits, 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, especially throughout the lower reach of the restored channel. Area was a bit drier along the upper reach of the creek (northwest area of project). With the exception of 2 cells, the excavated depression contained surface water.

VEGETATION COMMUNITIES

Site Schrieber Meadows

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

* Indicates accepted spp name not on '88 list.

Community # 3 **Community Type:** Phalaris arundinacea / **Acres:** 23.92

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Alnus incana	0
Alopecurus arundinaceus	1	Alopecurus pratensis	1
Beckmannia syzigachne	1	Carex athrostachya	0
Carex nebrascensis	0	Carex pachystachya	1
Cerastium fontanum	0	Cirsium arvense	0
Eleocharis palustris	0	Elymus repens	0
Epilobium ciliatum	0	Erysimum cheiranthoides	0
Erysimum cheiranthoides	0	Glyceria grandis	0
Juncus bufonius	0	Mimulus guttatus	0
Persicaria amphibia	1	Phalaris arundinacea	5
Poa palustris	0	Populus balsamifera	0
Rumex crispus	0	Salix drummondiana	0
Taraxacum officinale	0	Verbascum thapsus	0

Comments:

Community # 5 **Community Type:** Aquatic macrophytes / Open Water **Acres:** 9.61

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	1
Alopecurus pratensis	1	Bare Ground	0
Carex aquatilis	0	Carex nebrascensis	0
Carex pellita	0	Carex stipata	1
Ceratophyllum demersum	1	Eleocharis palustris	2
Epilobium sp.	0	Glyceria elata	3
Glyceria grandis	0	Gnaphalium palustre	0
Lemna minor	0	Marsilea vestita	0
Open Water	5	Persicaria amphibia	1
Phalaris arundinacea	1	Potamogeton natans	1
Stuckenia pectinata	1	Typha latifolia	1
Veronica americana	0		

Comments:

Community # 6 **Community Type:** Alopecurus spp. / **Acres:** 12.36

Species	Cover class	Species	Cover class
Agastache urticifolia	0	Agrostis gigantea	0
Alopecurus arundinaceus	3	Alopecurus pratensis	4
Aster sp.	0	Beckmannia syzigachne	0
Bromus inermis	0	Carex pachystachya	0
Cirsium arvense	0	Cynoglossum officinale	0
Epilobium ciliatum	0	Equisetum hyemale	1
Erysimum cheiranthoides	0	Fragaria virginiana	0
Gnaphalium palustre	0	Juncus bufonius	0
Juncus confusus	0	Mimulus guttatus	0
Pascopyrum smithii	1	Persicaria amphibia	0
Phalaris arundinacea	2	Pinus contorta	0
Pinus ponderosa	0	Plantago major	1
Poa pratensis	1	Potentilla gracilis	0
Rumex acetosella	0	Rumex crispus	0
Spiranthes romanzoffiana	0	Taraxacum officinale	1
Verbascum thapsus	0		

Comments:

Community # 7 **Community Type:** Juncus bufonius / Bare Ground **Acres:** 1.7

Species	Cover class	Species	Cover class
Alnus incana	0	Alopecurus arundinaceus	0
Alopecurus pratensis	2	Aster sp.	0
Bare Ground	4	Beckmannia syzigachne	2
Bromus carinatus	0	Carex athrostachya	0
Carex pachystachya	0	Eleocharis palustris	1
Epilobium ciliatum	0	Erysimum cheiranthoides	0
Fragaria virginiana	0	Glyceria grandis	2
Juncus bufonius	3	Juncus confusus	0
Juncus ensifolius	0	Mimulus guttatus	1
Persicaria maculosa	0	Poa pratensis	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:** 2.57

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agropyron cristatum	0
Alopecurus pratensis	1	Bare Ground	2
Bromus inermis	1	Cirsium arvense	0
Cleome serrulata	0	Elymus repens	3
Elymus trachycaulus	1	Erysimum cheiranthoides	0
Gnaphalium palustre	0	Matricaria discoidea	0
Medicago lupulina	3	Pascopyrum smithii	3
Phalaris arundinacea	1	Poa pratensis	0
Potentilla gracilis	1	Rumex acetosella	0
Rumex crispus	0	Sisymbrium altissimum	1
Taraxacum officinale	0	Thlaspi arvense	0
Trifolium hybridum	0		

Comments:

Community # 9 **Community Type:** Alopecurus spp. / Bromus inermis **Acres:** 6.45

Species	Cover class	Species	Cover class
Achillea millefolium	1	Alopecurus arundinaceus	3
Alopecurus pratensis	5	Bromus inermis	3
Cirsium arvense	0	Cynoglossum officinale	0
Pascopyrum smithii	1	Phalaris arundinacea	0
Pinus contorta	0	Plantago major	1
Poa pratensis	1	Rumex acetosella	0
Sisymbrium altissimum	1	Taraxacum officinale	1
Verbascum thapsus	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: 7/31/2012 10:48:30 AM

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

Interval Data:

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

Species	Cover class	Species	Cover class
Eleocharis palustris	1	Glyceria grandis	1
Phalaris arundinacea	5		

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

Species	Cover class	Species	Cover class
Carex stipata	1	Eleocharis palustris	4
Glyceria grandis	1	Persicaria amphibia	2
Phalaris arundinacea	1		

Ending Station 120 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Alopecurus pratensis	0
Glyceria grandis	1	Phalaris arundinacea	5

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

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	2
Eleocharis palustris	3	Glyceria grandis	1
Persicaria amphibia	1	Phalaris arundinacea	1

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

Species	Cover class	Species	Cover class
Alnus incana	1	Carex athrostachya	1
Cirsium arvense	1	Epilobium ciliatum	0
Glyceria grandis	1	Phalaris arundinacea	5
Rumex crispus	0		

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

Species	Cover class	Species	Cover class
Algae, brown	1	Algae, green	2
Eleocharis palustris	1	Open Water	5
Persicaria amphibia	1	Phalaris arundinacea	1

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

Species	Cover class	Species	Cover class
Phalaris arundinacea	5		

Transect Notes:

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

Interval Data:

Ending Station 35 **Community Type:** Juncus bufonius / Bare Ground

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

Ending Station 40 **Community Type:** Alopecurus spp. /

Species	Cover class	Species	Cover class
Agrostis gigantea	3	Alopecurus arundinaceus	3
Alopecurus pratensis	1	Aster sp.	0
Carex pachystachya	0	Equisetum hyemale	0
Juncus bufonius	2	Juncus confusus	1
Potentilla gracilis	0	Taraxacum officinale	1

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

Species	Cover class	Species	Cover class
Open Water	5		

Ending Station 100 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	3	Bare Ground	5
Beckmannia syzigachne	1	Juncus bufonius	3

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

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alnus incana	1
Alopecurus arundinaceus	5	Bare Ground	3
Beckmannia syzigachne	1	Juncus bufonius	2
Plantago major	0		

Ending Station 185 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	3	Bare Ground	5
Beckmannia syzigachne	1	Suaeda calceoliformis	1
Trifolium pratense	1		

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

Species	Cover class	Species	Cover class
Bare Ground	4	Open Water	4

Ending Station 230 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	3	Bare Ground	4
Juncus bufonius	2	Suaeda calceoliformis	1
Taraxacum officinale	1	Trifolium pratense	1

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

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	4	Alopecurus pratensis	3
Bromus inermis	0		

Ending Station 262 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	3	Juncus bufonius	2
Suaeda calceoliformis	0	Taraxacum officinale	1
Trifolium pratense	0		

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

Species	Cover class	Species	Cover class
Bare Ground	5		

Ending Station 298 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	3	Beckmannia syzigachne	0
Juncus bufonius	2	Suaeda calceoliformis	1
Trifolium pratense	0		

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

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	4	Alopecurus pratensis	4
Bromus inermis	1	Potentilla gracilis	1
Taraxacum officinale	0		

Ending Station 420 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Beckmannia syzigachne	1
Bromus carinatus	1	Erysimum cheiranthoides	1
Fragaria virginiana	0	Trifolium pratense	1
Verbascum thapsus	0		

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

Species	Cover class	Species	Cover class
Open Water	5	Persicaria amphibia	1

Ending Station 559 **Community Type:** Juncus bufonius / Bare Ground

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Bare Ground	4
Beckmannia syzigachne	1	Carex athrostachya	1
Juncus bufonius	2	Juncus confusus	1

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

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	5	Alopecurus pratensis	4
Carex stipata	0	Epilobium ciliatum	1
Juncus bufonius	2	Persicaria amphibia	0

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
Phalaris arundinacea	5		

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

Species	Cover class	Species	Cover class
Algae, green	1	Ceratophyllum demersum	1
Open Water	5	Persicaria amphibia	1
Phalaris arundinacea	1		

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

Species	Cover class	Species	Cover class
Persicaria amphibia	0	Phalaris arundinacea	5

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

Species	Cover class	Species	Cover class
Algae, green	2	Algae, green	1
Carex aquatilis	1	Carex nebrascensis	1
Eleocharis palustris	2	Lemna minor	1
Open Water	4	Persicaria amphibia	3
Phalaris arundinacea	1		

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

Species	Cover class	Species	Cover class
Phalaris arundinacea	5		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Schrieber Meadows

Planting Type	#Planted	#Alive	Notes
Alnus incana		55	Majority of plantings along newly constructed channel

Comments

All stems of Alnus located in field appeared healthy with new green growth.

Schrieber Meadows

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Bank Swallow	30	F, FO	UP
Barn Swallow	75	F, FO	UP, WM
Belted Kingfisher	1	F	AB, OW
Brewer's Blackbird	20	F, FO, L	UP, WM
Canada Goose	3	L	AB, OW
Cedar Waxwing	8	L	UP, WM
Common Raven	3	FO	UP
Eared Grebe	1	F	OW
Eastern Kingbird	8	F, FO	UP, WM
Green-winged Teal	1	L	OW
Killdeer	9	F, L	OW, WM, US
Lesser Yellowlegs	1	F	AB, OW, US
Mallard	4	L, N	AB, OW
Osprey	1	F	OW
Redhead	2	F	OW
Red-winged Blackbird	11	FO, L	UP, WM
Spotted Sandpiper	11	F	AB, OW, US
Turkey Vulture	2	FO	UP
Vaux's Swift	3	F, FO	UP, WM
Virginia Rail	1	F	AB, OW
Wilson's Snipe	3	F, L	AB, OW, WM, US

Bird Comments

Goose scat observed.

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	5	No	No	No	
Common Gartersnake	1	No	No	No	
Deer Sp.		Yes	No	No	
Gray Wolf		Yes	No	No	
Green Sunfish	1	No	No	No	
Moose		Yes	No	No	
Painted Turtle	1	No	No	No	
Western Toad	1	No	No	No	
White-tailed Deer	1	No	No	No	

Wildlife Comments:

Schrieber Meadows

PHOTOGRAPHS

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

Photograph Checklist:

☐ One photograph for each of the four cardinal directions surrounding the wetland.

☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.

☐ At least one photograph showing the buffer surrounding the wetland.

☐ One photograph from each end of the vegetation transect, showing the transect.

Photo #	Latitude	Longitude	Bearing	Description
9528-31	48.112938	-115.418388	270	PP-17
9532-34	48.112938	-115.418388	350	PP-17
9535-37	48.114323	-115.418449	180	PP-15
9538-40	48.114655	-115.41893	230	PP-14
9544-46	48.11422	-115.420403	280	PP-13
9547	48.113403	-115.420128	290	PP-16
9548-50	48.113403	-115.420128	70	PP-16
9555	48.113735	-115.420509	150	PP-2
9556-58	48.116409	-115.420021	190	PP-11
9560-62	48.1129	-115.417618	90	PP-18
9563-65	48.112183	-115.417503	90	PP-3
9566	48.111553	-115.417084	10	PP-19
9567	48.111553	-115.417084	100	PP-19
9568-72	48.111904	-115.417023	0	PP-6
9574	48.112614	-115.415977	300	PP-5
9575	48.113213	-115.416832	180	PP-4
9577	48.111172	-115.413643	250	T-3, start
9579	48.11121	-115.414238	190	PP-8
9580	48.109997	-115.413765	280	PP-9
9581	48.109737	-115.414024	0	PP-10
9582	48.109493	-115.413918	100	PP-20
9583-89	48.108841	-115.41201	0	PP-7
9590-93	48.10804	-115.410172	270	PP-1
9594	48.108101	-115.410858		XS-11
9595	48.109222	-115.411369		XS-10

9596	48.109451	-115.413124		XS-9
9598	48.110458	-115.414055		XS-8
9599	48.111282	-115.415581		XS-7
9600	48.111713	-115.416618		XS-6
9601	48.112629	-115.415916		XS-5
9603	48.112934	-115.41658		XS-4
9604	48.113773	-115.418007		XS-3
9606	48.1143	-115.418259		XS-2
9608	48.115082	-115.419876		XS-1
9611-15	48.115673	-115.421562	180	PP-12
9625	48.114126666	-115.4199283		SM-1
9626	48.115017	-115.421089	100	T-2, start
9630	48.113152	-115.417336	112	T-1, start
9636	48.112415	-115.416618	248	T-1, end
9639	48.111298	-115.413948	200	T-3, end
9640	48.1106866	-115.4156116		SM-2
9641	48.1106883	-115.4157883		SM-3
9643	48.11383	-115.4210683		SM-4
9655	48.1160283	-115.420025		SM-5

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? No

If yes, do they need to be repaired?

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 | Sampling Date: 7/30/2012

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

Investigator(s): B Sandefur | Section, Township, Range: S 11 T 27N R 30W

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

Subregion (LRR): LRR E | Lat: 48.1141266666667 | Long: -115.419928333333 | Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents | NWI classification:

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:
DP in veg com 6, area not disturbed during construction.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Alopecurus arundinaceus	75	☑	FAC
2. Juncus bufonius	20	☑	FACW
3. Poa palustris	5	☐	FAC
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 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: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	20	x 2 =	40
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		280 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SM-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/2	100					Silty Clay	
5-12	10YR 7/1	95	10YR 5/6	5	C	M	Silt	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

Area w/ seasonal saturation, soils moist @ 12in.

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

Project/Site: Schrieber Meadows City/County: Lincoln Sampling Date: 7/30/2012

Applicant/Owner: MDT State: MT Sampling Point: SM-2

Investigator(s): B Sandefur Section, Township, Range: S 11 T 27N R 30W

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

Subregion (LRR): LRR E Lat: 48.1106866666667 Long: -115.415611666667 Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents NWI classification:

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:
DP along boundary of phalaris/alopecurus com.

VEGETATION – Use scientific names of plants.

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

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SM-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Peat	
4-10	10YR 2/1	100					Silt	
10-16	10YR 4/2	95	10YR 4/6	5	C	M	Silty Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 12

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

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

Project/Site: Schrieber Meadows City/County: Lincoln Sampling Date: 7/30/2012

Applicant/Owner: MDT State: MT Sampling Point: SM-3

Investigator(s): B Sandefur Section, Township, Range: S 11 T 27N R 30W

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

Subregion (LRR): LRR E Lat: 48.1106883333333 Long: -115.415788333333 Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents NWI classification:

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:
DP in veg com 9. Slight increase in topo from adjacent wetland veg com 3. May become wet as site hydrology develops.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Phalaris arundinacea	10	☐	FACW
2. Alopecurus arundinaceus	50	☑	FAC
3. Alopecurus pratensis	40	☑	FAC
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 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: 1 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SM-3

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 3/3	100					Silt Loam	
10-14	10YR 7/2	100					Sandy Loam	
14-18	10YR 7/2	95	10YR 5/6	5	C	M	Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

Hydric below 14in

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:

Area with seasonal groundwater table w/in 2ft of surface. No surface hydro signs.

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

Project/Site: Schrieber Meadows City/County: Lincoln Sampling Date: 7/30/2012

Applicant/Owner: MDT State: MT Sampling Point: SM-4

Investigator(s): B Sandefur Section, Township, Range: S 11 T 27N R 30W

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

Subregion (LRR): LRR E Lat: 48.11383 Long: -115.421068333333 Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents NWI classification:

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:
DP along foot of hillslope in comm. 9, slight rise in elev from adj wet.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Alopecurus pratensis	45	☑	FAC
2. Phalaris arundinacea	40	☑	FACW
3. Cirsium arvense	5	☐	FAC
4. Achillea millefolium	5	☐	FACU
5. Taraxacum officinale	5	☐	FACU
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 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: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	40	x 2 =	80
FAC species	50	x 3 =	150
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		270 (B)

Prevalence Index = B/A = 2.7

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SM-4

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
0-11	7.5YR 5/3	100					Clay Loam	
11-15	10YR 7/3	100					Silt Loam	

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

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

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

Redox features below 15in.

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:

Groundwater table likely w/in 2ft of surface during wettest periods.

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

Project/Site: Schrieber Meadows | City/County: Lincoln | Sampling Date: 7/30/2012

Applicant/Owner: MDT | State: MT | Sampling Point: SM-5

Investigator(s): B Sandefur | Section, Township, Range: S 11 T 27N R 30W

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

Subregion (LRR): LRR E | Lat: 48.1160283333333 | Long: -115.420025 | Datum: WGS84

Soil Map Unit Name: Aquic Udifluvents | NWI classification:

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:
DP near FS boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Taraxacum officinale	5	☐	FACU
2. Alopecurus arundinaceus	95	☑	FAC
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	100 (A)		305 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: SM-5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/3	100					Loam	
2-5	10YR 6/2	100					Silt Loam	
5-14	10YR 6/2	95	10YR 4/6	5	C	M	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): _____

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:

Broad flat valley bottom w/ signs of surface hydro during early growing season/spring runoff. Near excavared depression w/ dry-season watertable.

MDT Montana Wetland Assessment Form (revised March 2008)

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

3. Evaluation Date 8/1/2012 **4. Evaluators** B Sandefur **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 30.9

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 30.9

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

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

Creation AA includes previous and recently excavated depressions and adjacent undisturbed wetland habitat created as result of increased water table throughout project area. Highway 2 close to AA.

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

Cirsium arvense, occassional Cynoglossum officinale

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes constructed wetland depressions and adjacent wetland habitat (Phalaris & Alopecurus veg coms) that has been created by a substantial increase in ground water elevation due to plugging of drainage ditch along northeastern boundary of site. Some surrounding land previously hayed, currently managed in natural state. Majority of area surrounding AA managed by USFS in forest habitat.

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 habitat 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	Grizzlies
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, wolf tracks observed within site.

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, toad documented breeding on site by MDT and USFS.

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 ≥ 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 Several breeding waterfowl, abundance of wildlife tracks and scat observed within AA.

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** .6M

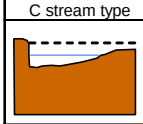
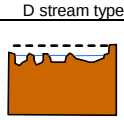
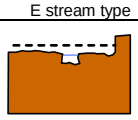
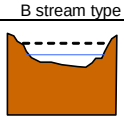
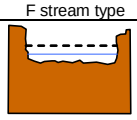
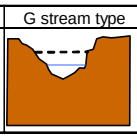
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating .6M

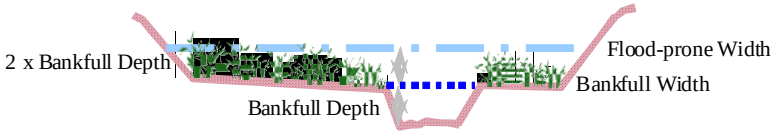
iii. Final Score and Rating: .6 M **Comments:** Several fish observed within a few of the excavated depressions. Fish are able to migrate from Coyote Creek into depression as a result of increased inundation associated with plugging the ditch. Juvenile trout observed

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
						



Floodrpone 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: One old FS cabin located downstream, above potential flood zone.

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 **≥ 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 inundation observed across AA in 2012.

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: Although recently excavated cells supported <70% veg cover in 2012, adjacent wetlands are 100% vegetated.

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

Comments: Perennial hydrologic regime in at least 10% of AA. Sedge, rush, spikerush and mannagrass species are establishing on the depression permimeters.

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	.9	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8	.5M	.6M	.3	.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:

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 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:

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: Moderate disturbance result of recent excavation, anticipated to improve as site revegetates.

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:

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	9.27	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	27.81	☑
C. General Wildlife Habitat	H	.9	1	27.81	☐
D. General Fish Habitat	M	.6	1	18.54	☐
E. Flood Attenuation	M	.6	1	18.54	☐
F. Short and Long Term Surface Water Storage	H	1	1	30.9	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	30.9	☑
H. Sediment/Shoreline Stabilization	M	.7	1	21.63	☐
I. Production Export/Food Chain Support	H	.8	1	24.72	☐
J. Groundwater Discharge/Recharge	H	1	1	30.9	☑
K. Uniqueness	L	.3	1	9.27	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	6.18	☐
Totals:		8.3	11	256.47	
Percent of Possible Score			**75.45** %		

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

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 8/1/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Enhancement

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

Approx Stationing or Mileposts Approximately milepost 53.5

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

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 13.22

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

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

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is <=15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is <=15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate	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 enhancement AA was not disturbed during other phases of this project. Close to US Hwy 2 corridor.

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 portion of the project area and the US Hwy 2 corridor. Area dominated by reed canary grass and foxtail. Increased inundation throughout this area as a result of drainage ditch plugs. Adjacent land use inlcudes forest and 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:

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	Grizzlies
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 USFS wildlife tracking via GPS collars, wolf tracks observed on site.

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 Documented by MDT and USFS on site (breeding)

14C. General Wildlife Habitat Rating:

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

Moderate

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 ≥ 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

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**

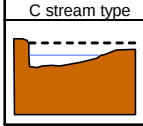
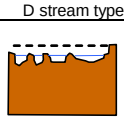
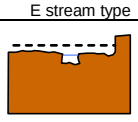
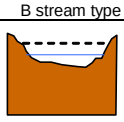
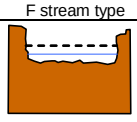
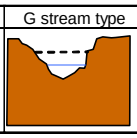
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

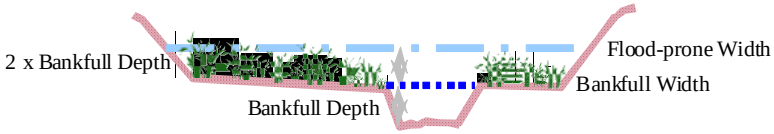
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within enhancement AA

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
						



Floodrpone 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:

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 **≥ 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: Recent ditch plugging has likely increased flooding and duration of surface water within 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							
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

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

Comments:

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	.9	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8	.5M	.6M	.3	.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:

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:

14K. Uniqueness:

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

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

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

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

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

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

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

Comments:

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	NA	0	0	0	☐
I. Production Export/Food Chain Support	H	.8	1	10.576	☐
J. Groundwater Discharge/Recharge	H	1	1	13.22	☑
K. Uniqueness	M	.4	1	5.288	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	2.644	☐
Totals:		7.1	9	93.862	
Percent of Possible Score			**78.89** %		

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

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 8/1/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Restoration

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

Approx Stationing or Mileposts Approximately milepost 53.5

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

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 3.46

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

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

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

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

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 project area that were modified by excavation to increase the groundwater availabiity 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 wetlands.

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	Grizzlies
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: USFS wildlife tracking via GPS collars, wolf tracks observed on site.

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: Documented by MDT and USFS on site (breeding)

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 ≥ 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

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**

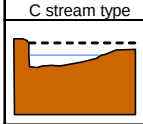
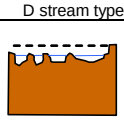
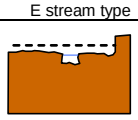
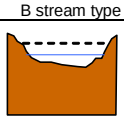
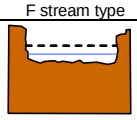
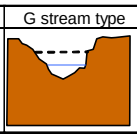
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

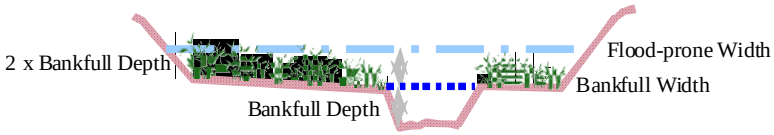
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat identified in 2012 within Restoration AA.

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
						



Floodrpone 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 cells subject to periodic 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 **≥ 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 is 3.46 acres, water depth varies.

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

Comments: Low vegetation cover result of recent excavation

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	.9	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8	.5M	.6M	.3	.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:

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: Moderate disturbance result of recent excavation, disturbance in AA will decrease as vegetation develops.

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:

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	L	.3	1	1.038	☐
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:		6.7	10	23.182	
Percent of Possible Score			**67** %		

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

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana



Photo Point 1 – *Photo 1*
Bearing: 350 degrees

Location: SW corner of site
Taken in 2012



Photo Point 2 – *Photo 1*
Bearing: 190 degrees

Location: Cell 7 (Created 2007)
Taken in 2010



Photo Point 2 – *Photo 1*
Bearing: 190 degrees

Location: Cell 7 (Enhanced in 2011)
Taken in 2012



Photo Point 3 – *Photo 1*
Bearing: 90 degrees

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



Photo Point 3 – *Photo 1*
Bearing: 110 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2012



Photo Point 4 – *Photo 1*
Bearing: 180 degrees

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



Photo Point 4 – *Photo 1*
Bearing: 160 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2012



Photo Point 5 – *Photo 1*
Bearing: 270 degrees

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



Photo Point 5 – *Photo 1*
Bearing: 270 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2012



Photo Point 6 – *Photo 1*
Bearing: 40 degrees

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



Photo Point 6 – *Photo 1*
Bearing: 40 degrees

Location: Cell 2 (Constructed in 2007)
Taken in 2012

2010 Photo Point 7 moved in 2012

Photo Point 7 – *Photo 1*
Bearing: 110 degrees

Location: Cell 3
Taken in 2010



Photo Point 7 – *Photo 1*
Bearing: 110 degrees

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



Photo Point 8 – *Photo 1*
Bearing: 200 degrees

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



Photo Point 8 – *Photo 1*
Bearing: 200 degrees

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



Photo Point 9 – *Photo 1*
Bearing: 330 degrees

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



Photo Point 9 – *Photo 1*
Bearing: 330 degrees

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



Photo Point 10 – *Photo 1*
Bearing: 30 degrees

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



Photo Point 10 – *Photo 1*
Bearing: 30 degrees

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



Photo Point 11 – *Photo 1*
Bearing: 190 degrees

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



Photo Point 12 – *Photo 1*
Bearing: 180 degrees

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



Photo Point 13 – *Photo 1*
Bearing: 280 degrees

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



Photo Point 14 – *Photo 1*
Bearing: 230 degrees

Location: Cell $c (Constructed in 2011)
Taken in 2012



Photo Point 15 – *Photo 1*
Bearing: 180 degrees

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



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

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



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



Photo Point 17 – *Photo 1*
Bearing: 270 degrees
Location: Cell 6 (Constructed in 2011)
Taken in 2012



Photo Point 17 – *Photo 2*
Bearing: 350 degrees
Location: Cell 6 (Constructed in 2011)
Taken in 2012



Photo Point 18 – *Photo 1*
Bearing: 90 degrees

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



Photo Point 19 – *Photo 1*
Bearing: 10 degrees

Location: West boundary
Taken in 2012



Photo Point 19 – *Photo 2*
Bearing: 100 degrees

Location: West boundary
Taken in 2012



Photo Point 20 – *Photo 1*
Bearing: 100 degrees

Location: Schrieber Creek
Taken in 2012





XS – 2
Bearing: 110 degrees

Location: Upper Coyote Creek
Taken in 2012



XS – 3
Bearing: 130 degrees

Location: Coyote Creek Spring Area
Taken in 2012



XS – 4
Bearing: 125 degrees

Location: Middle Coyote Creek
Taken in 2012



XS – 5
Bearing: 150 degrees

Location: Middle Coyote Creek
Taken in 2012



XS – 6
Bearing: 90 degrees

Location: Perennial Spring Creek
Taken in 2012





XS – 8 **Location:** Middle Coyote Creek
Bearing: : 170 degrees **Taken in 2012**



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**





Veg Tran 1 **Location:** T-1 start
Bearing: 115 degrees **Taken in 2010**



Veg Tran 1 **Location:** T-1 start
Bearing: 115 degrees **Taken in 2012**



Veg Tran 1
Bearing: 245 degrees

Location: T-1 end
Taken in 2010



Veg Tran 1
Bearing: 245 degrees

Location: T-1 end
Taken in 2012



Veg Tran 2
Bearing: 100 degrees

Location: T-2 start
Taken in 2012



Veg Tran 3
Bearing: 250 degrees

Location: T-3 start
Taken in 2012



Veg Tran 3
Bearing: 200 degrees

Location: T-3 end
Taken in 2012



Data Point: SM-1
Bearing: 15 degrees
Location: Veg Com 6
Taken in 2012



Data Point: SM-2
Bearing: 90 degrees
Location: Veg Com 3
Taken in 2012



Data Point: SM-3
Bearing: 145 degrees
Location: Veg Com 9
Taken in 2012



Data Point: SM-4
Bearing: 10 degrees
Location: Veg Com 9
Taken in 2012



Data Point: SM-5
Bearing: 190 degrees
Location: Veg Com 6
Taken in 2012

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

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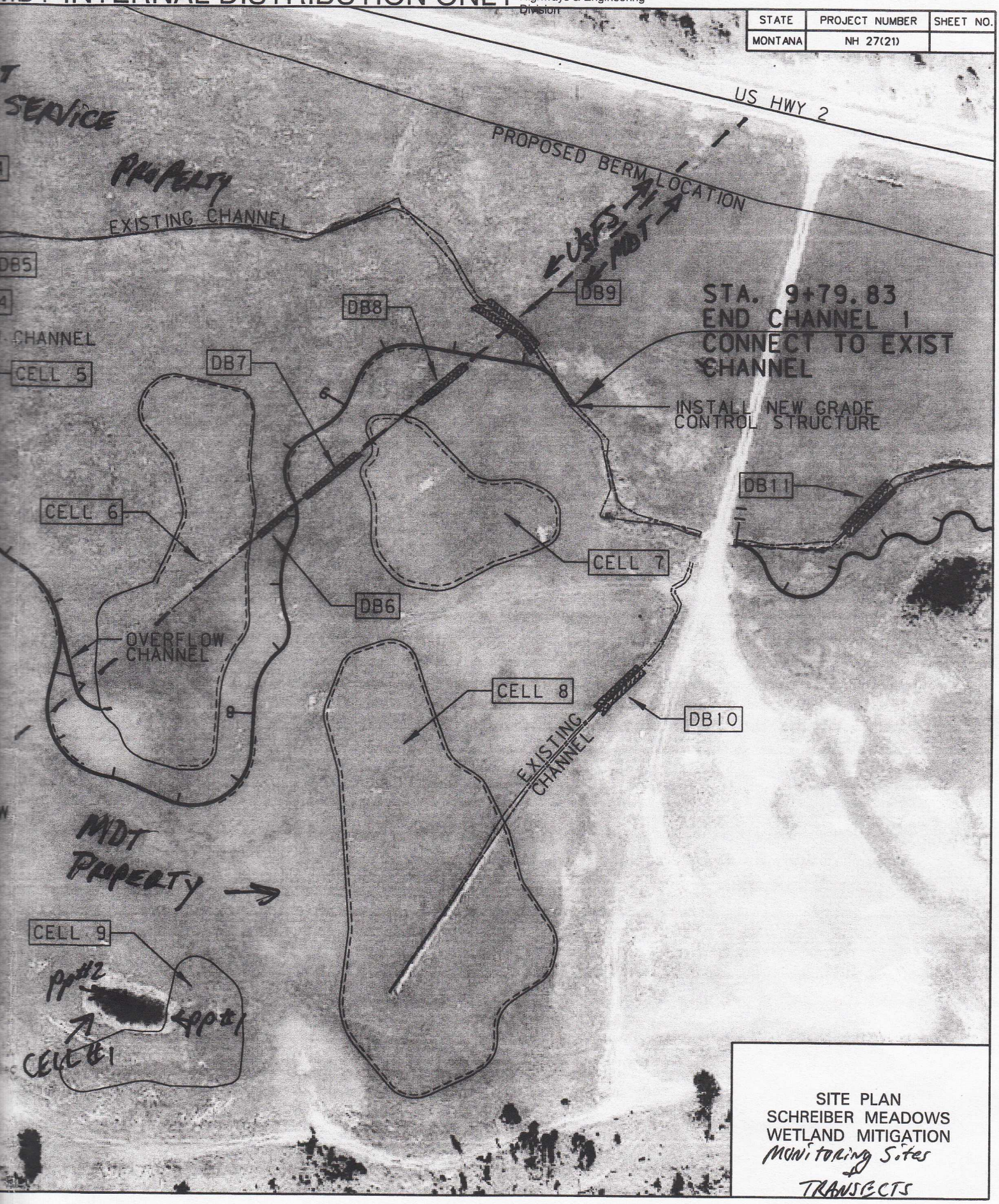
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REVIEWED BY
CHECKED BY

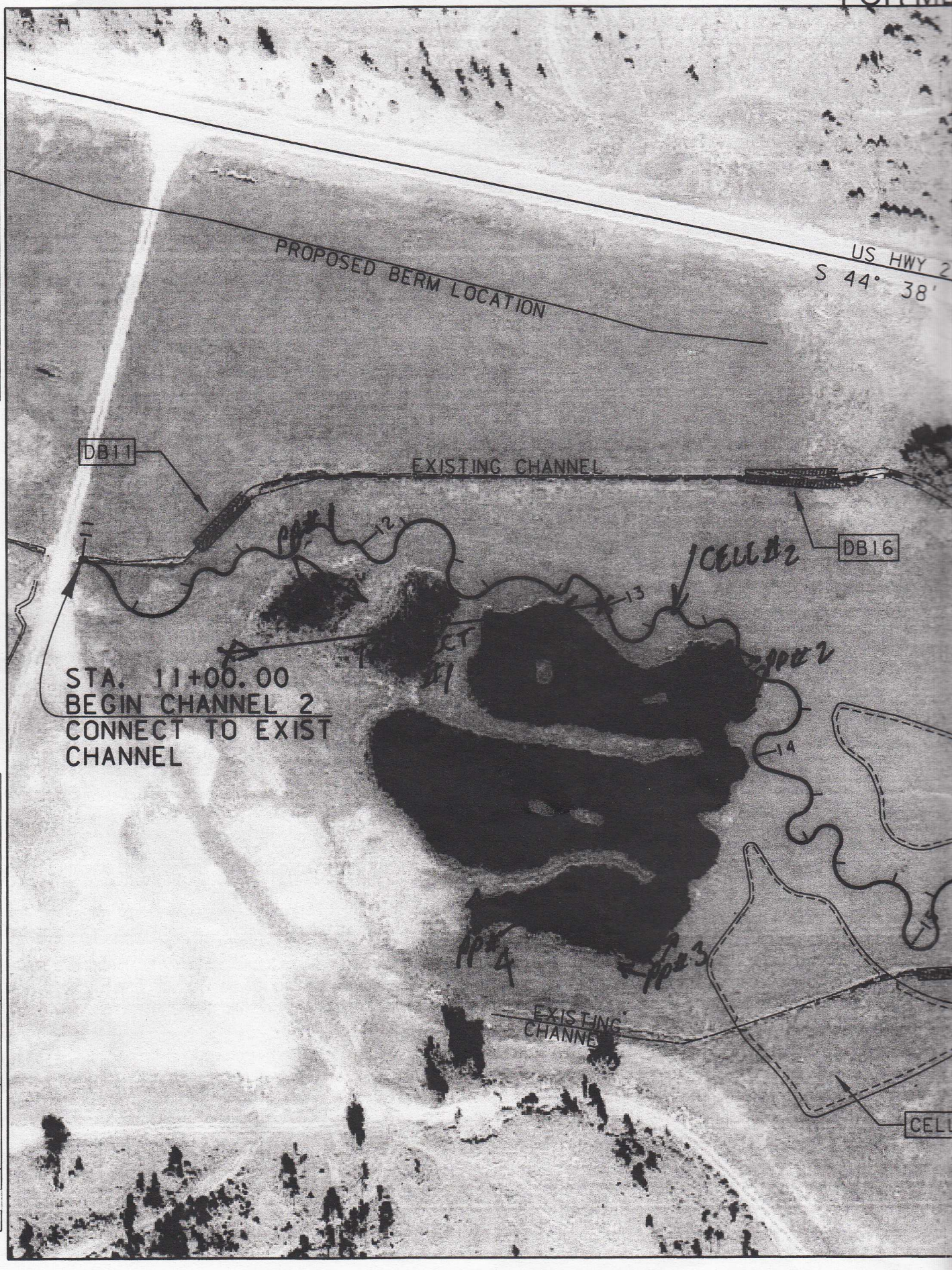
DAVID EVANS AND ASSOCIATES INC.
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Spokane Washington 99201
Phone: 509.327.8697

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Phone: 509.327.8697

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

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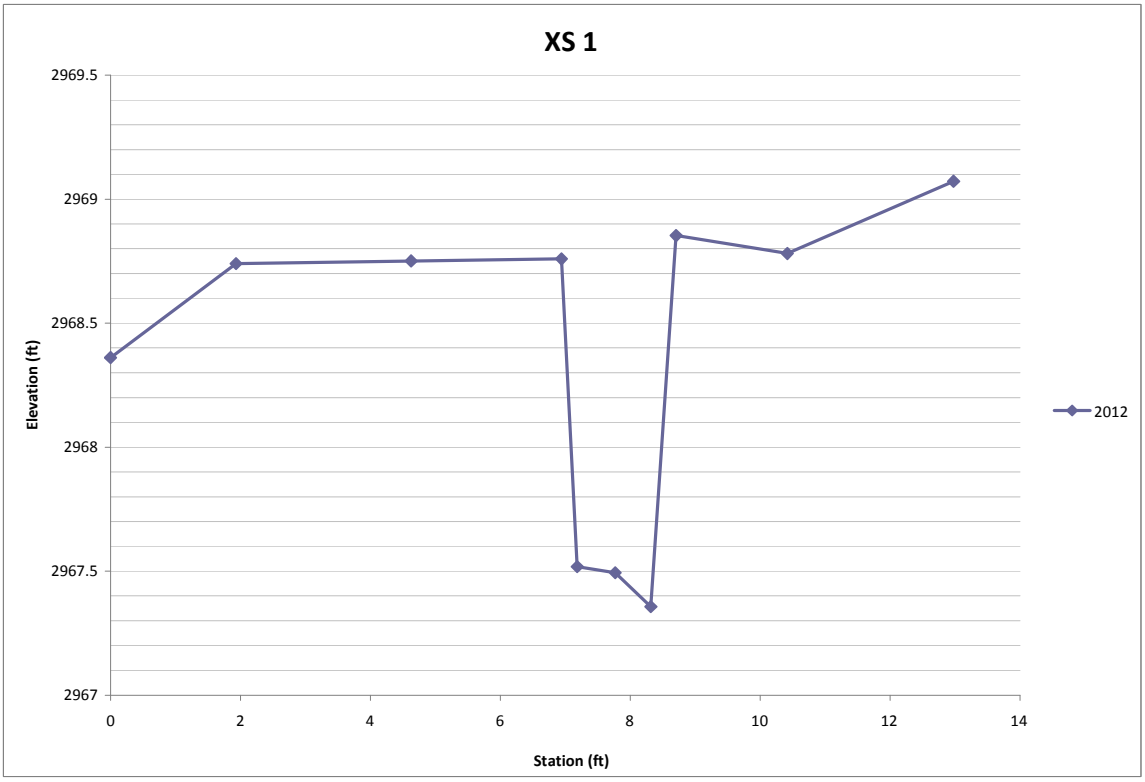


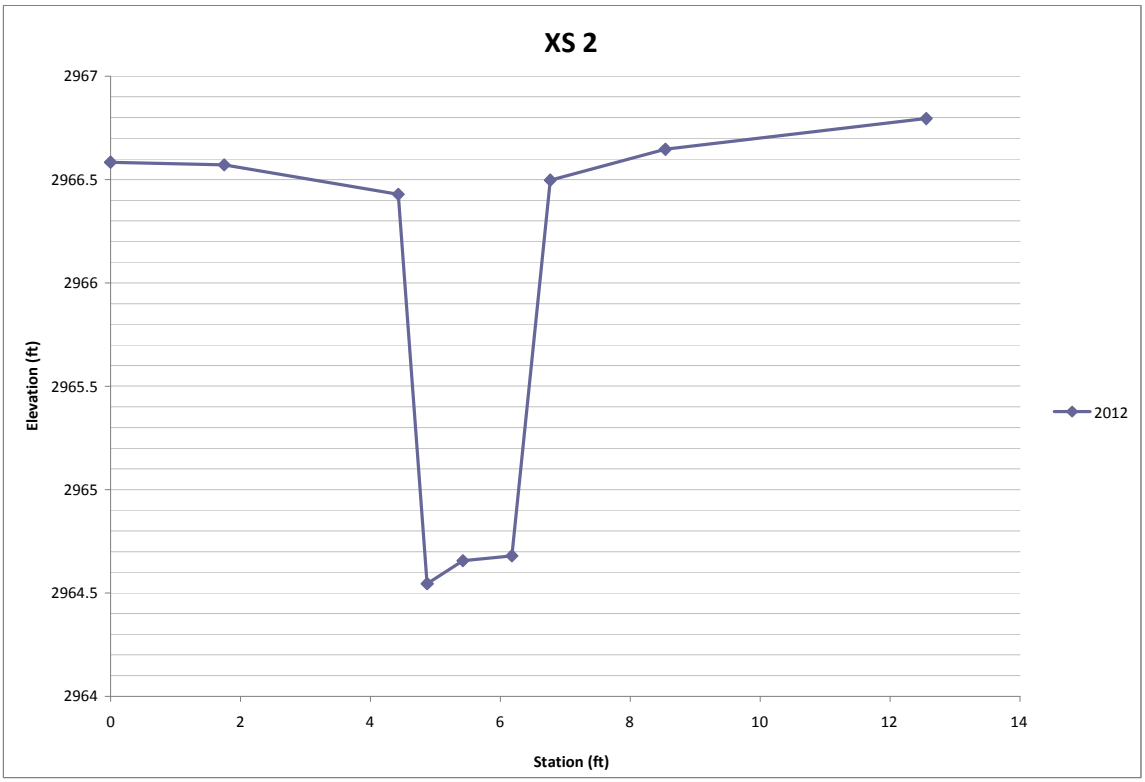
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SCHREIBER MEADOWS
WETLAND MITIGATION
Monitoring Points
+
TRANSECTS

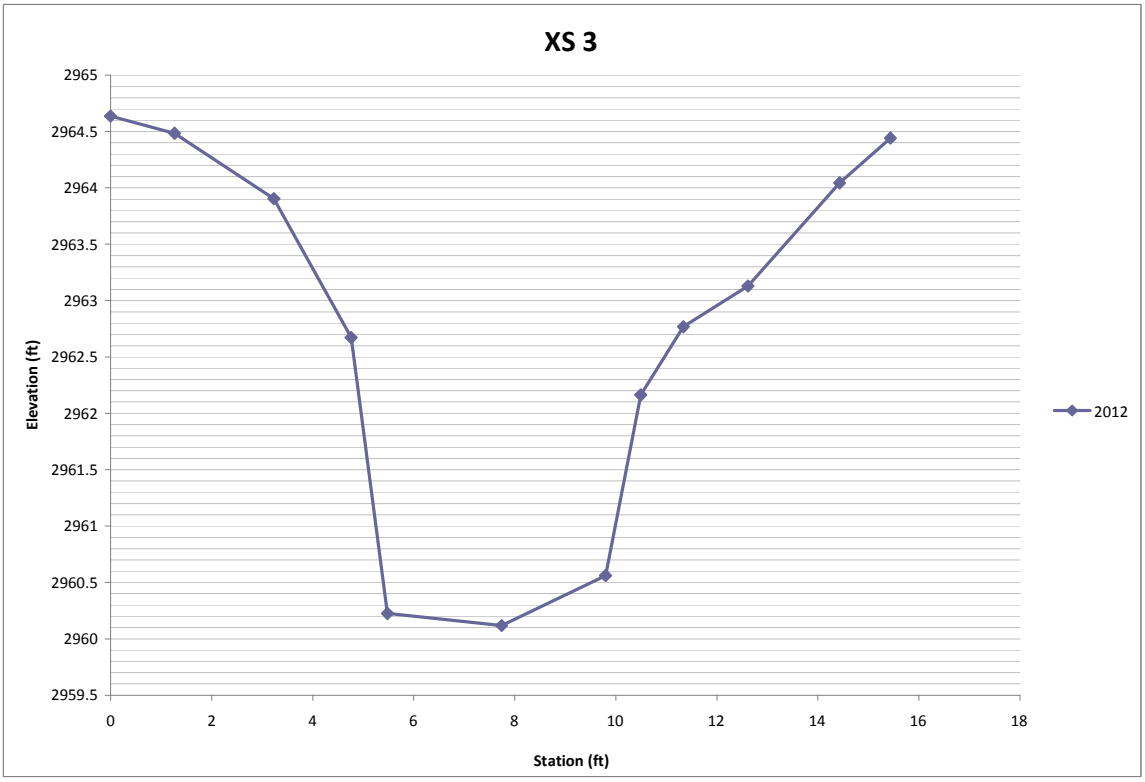
Appendix E

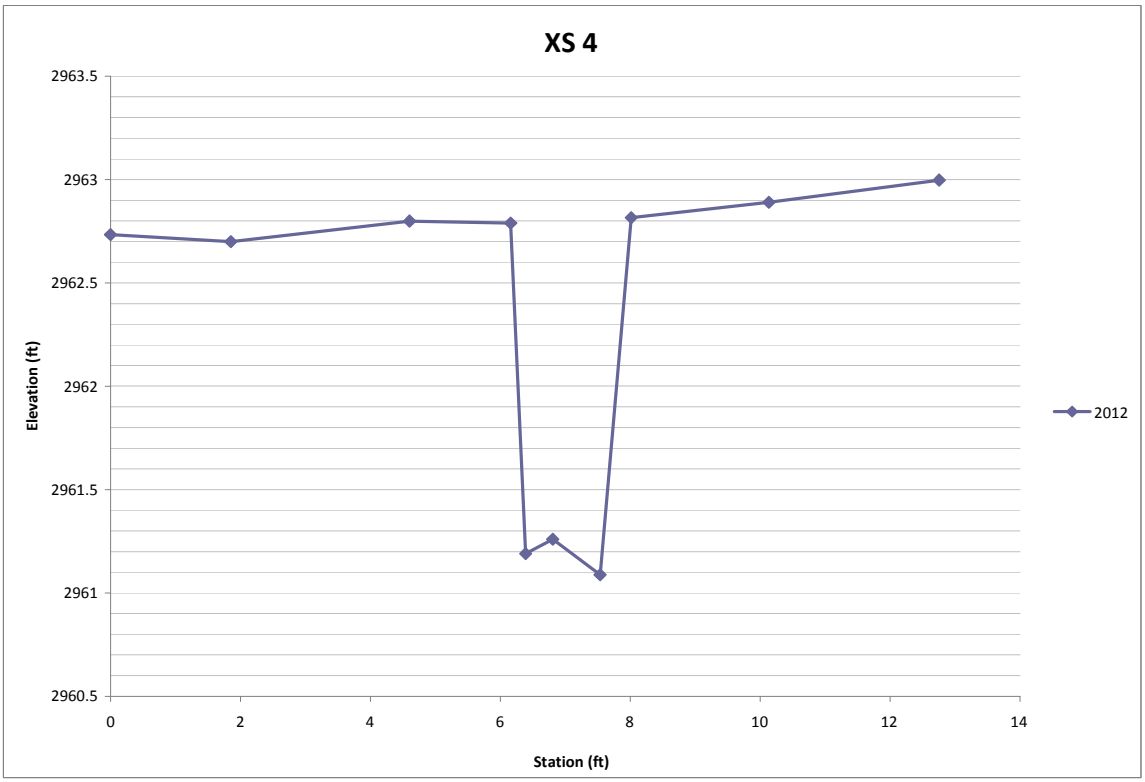
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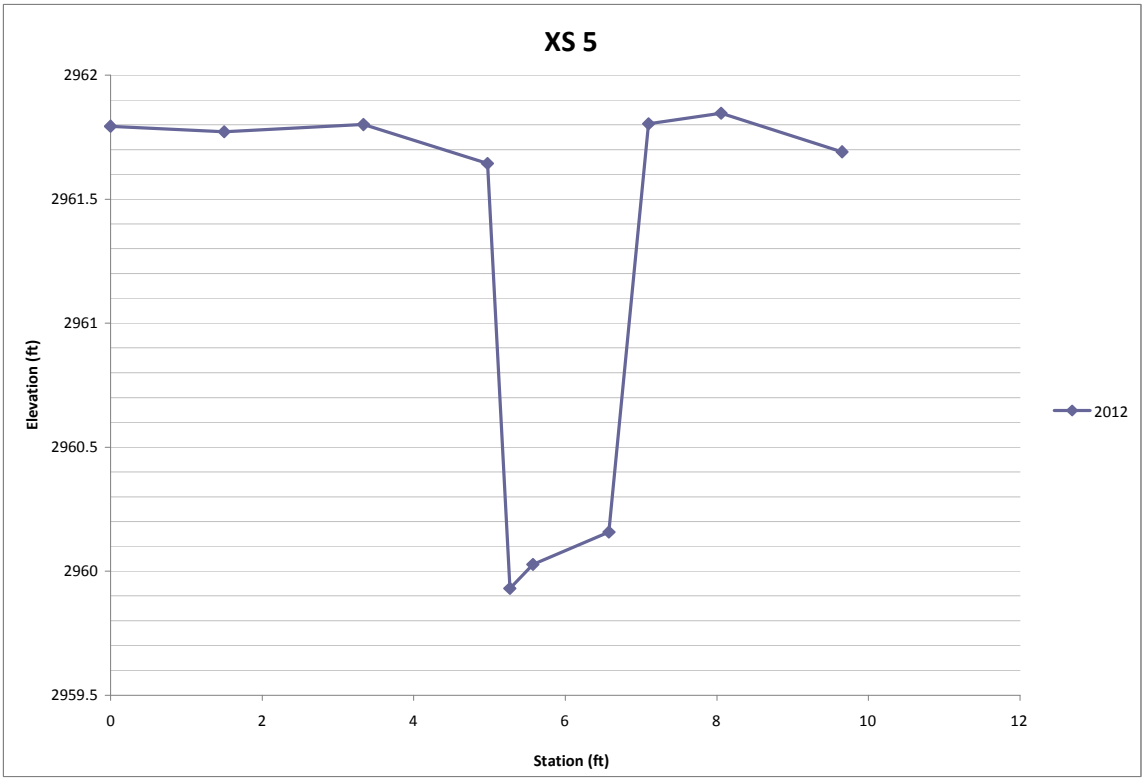
MDT Wetland Mitigation Monitoring
Schrieber Meadows
Lincoln County, Montana

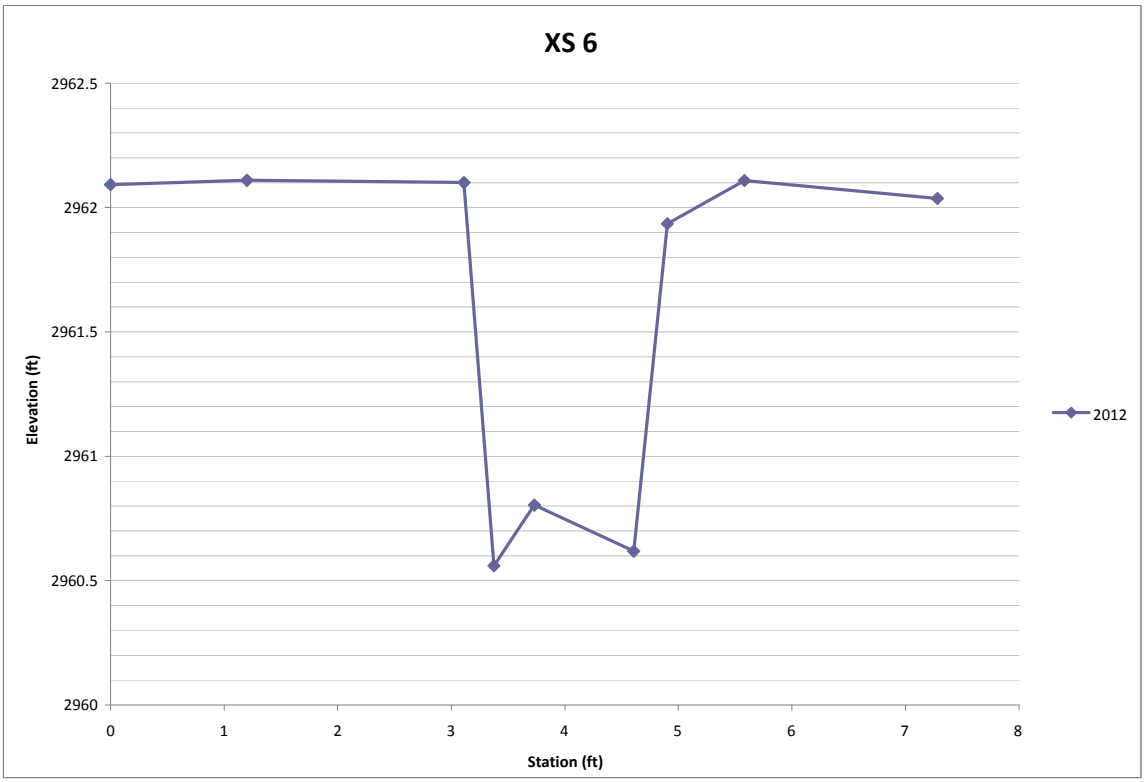

XS 1
2969.5
2969
2968.5
2968
2967.5
2967
Elevation (ft)
0
2
4
6
8
10
12
14
Station (ft)
2012

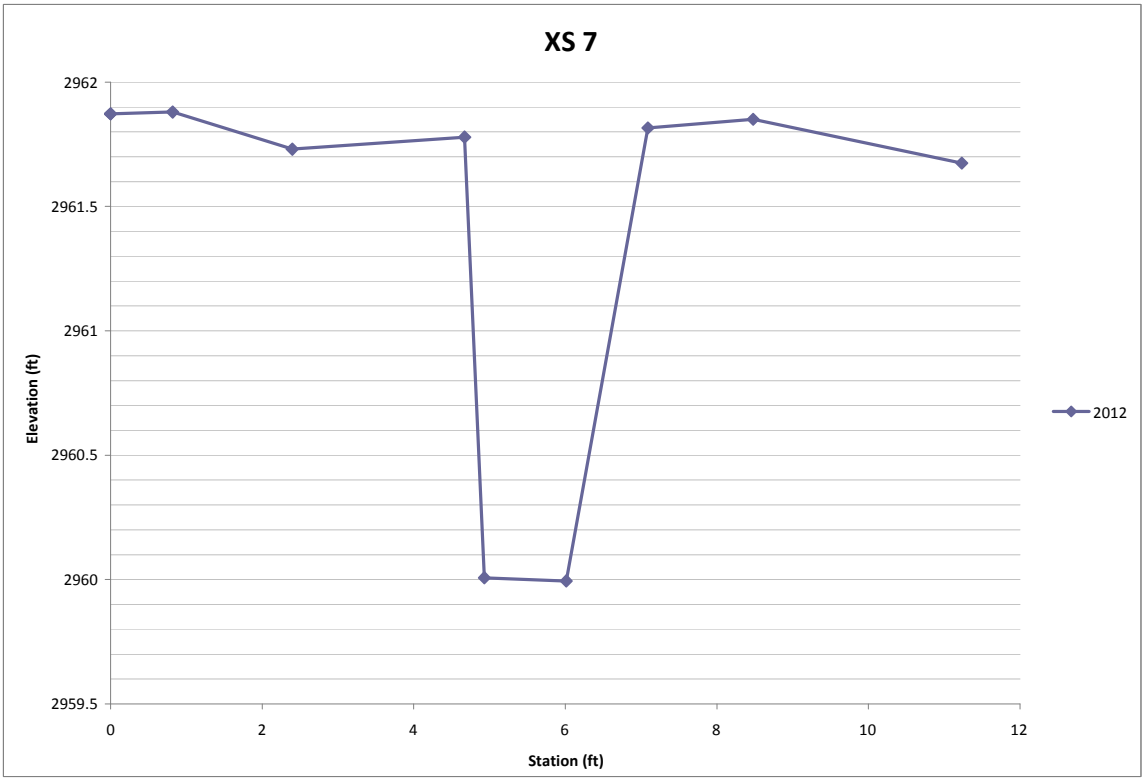

XS 2
2967
2966.5
2966
2965.5
2965
2964.5
2964
Elevation (ft)
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2
4
6
8
10
12
14
Station (ft)
2012

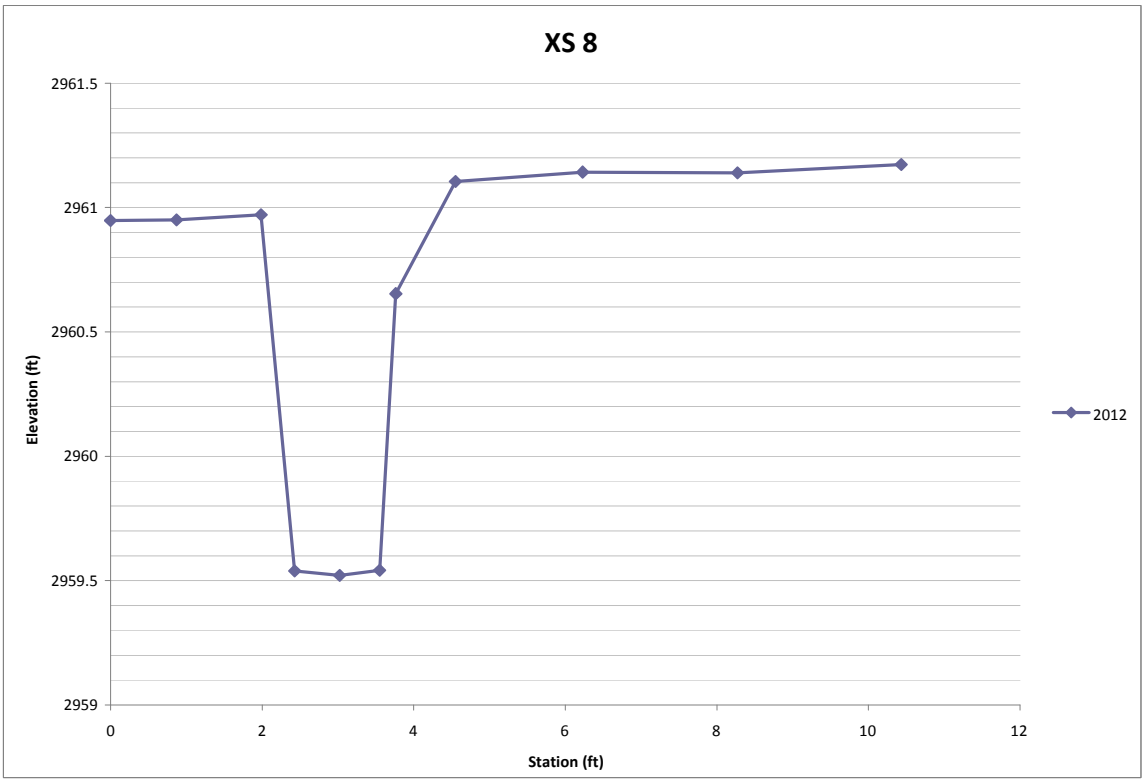

XS 3
Elevation (ft)
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2964.5
2964
2963.5
2963
2962.5
2962
2961.5
2961
2960.5
2960
2959.5
0
2
4
6
8
10
12
14
16
18
Station (ft)
2012

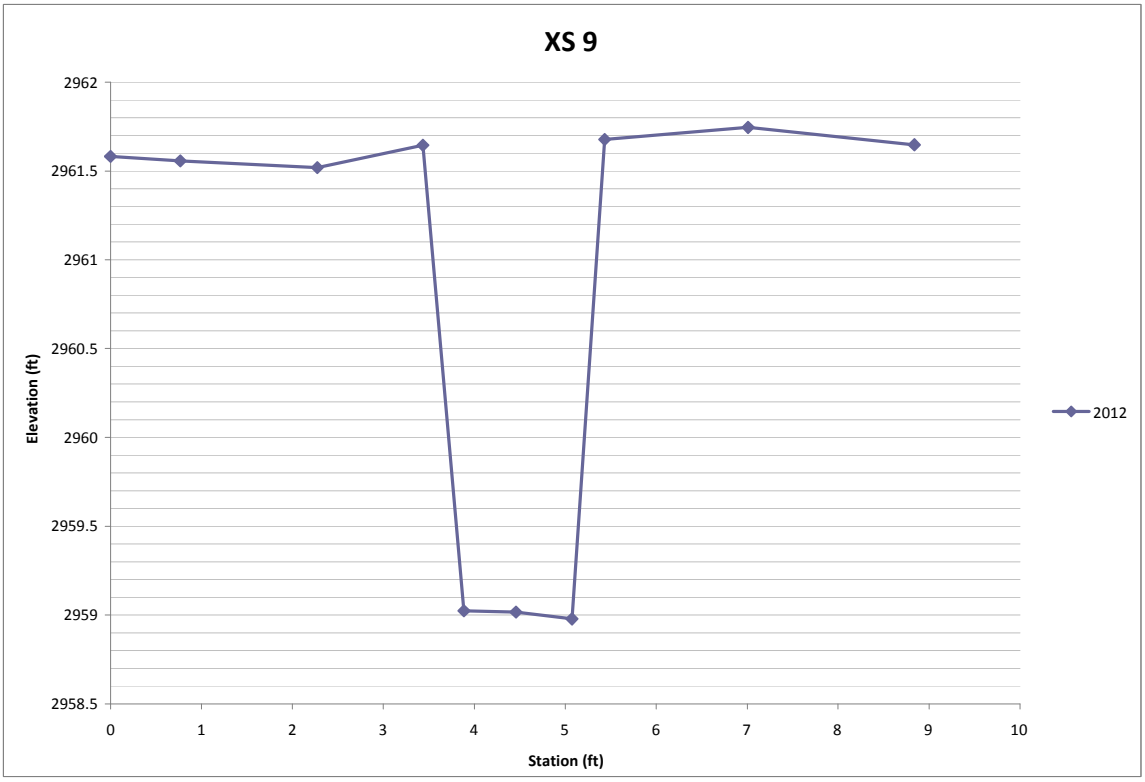

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Elevation (ft)
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2963
2962.5
2962
2961.5
2961
2960.5
0
2
4
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8
10
12
14
Station (ft)
2012

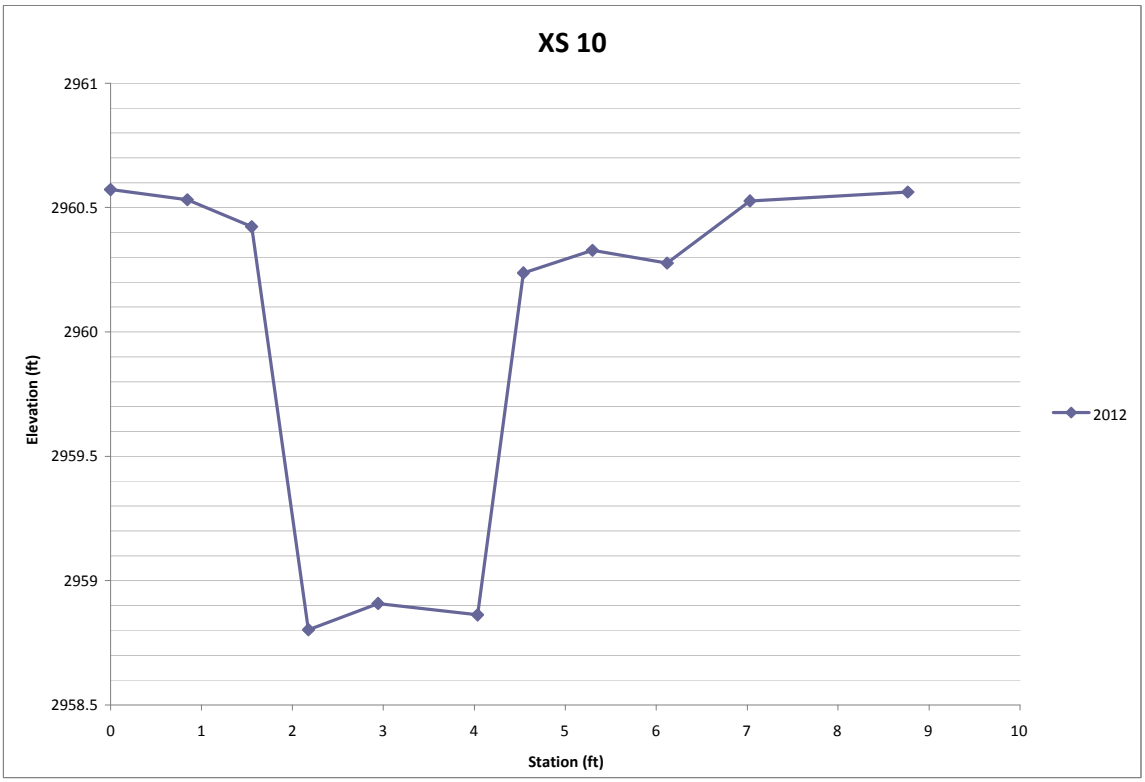

XS 5
2962
2961.5
2961
2960.5
2960
2959.5
Elevation (ft)
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2
4
6
8
10
12
Station (ft)
2012

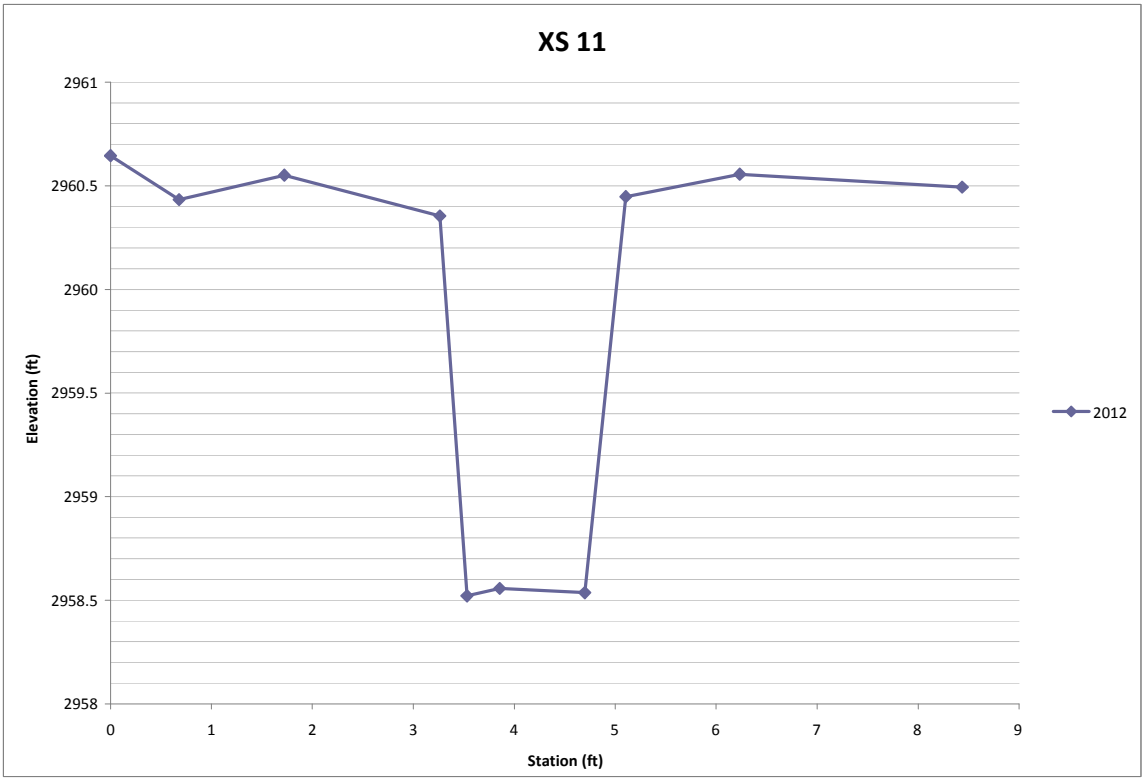

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2962
2961.5
2961
2960.5
2960
Elevation (ft)
0
1
2
3
4
5
6
7
8
Station (ft)
2012


XS 7
2962
2961.5
2961
2960.5
2960
2959.5
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012


XS 8
2961.5
2961
2960.5
2960
2959.5
2959
Elevation (ft)
0
2
4
6
8
10
12
Station (ft)
2012


XS 9
2962
2961.5
2961
2960.5
2960
2959.5
2959
2958.5
Elevation (ft)
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1
2
3
4
5
6
7
8
9
10
Station (ft)
2012


XS 10
2961
2960.5
2960
2959.5
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2958.5
Elevation (ft)
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1
2
3
4
5
6
7
8
9
10
Station (ft)
2012


XS 11
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2959.5
2959
2958.5
2958
Elevation (ft)
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2
3
4
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6
7
8
9
Station (ft)
2012