MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2012

Big Hole Grazing Association
Beaverhead County, Montana

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
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December 2012

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MDT Project Number STPX-0001(45)
Control Number 4668

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Cover: Woodduck box in *Carex* wetland (Community 3) near west boundary of the Big Hole Grazing Association wetland mitigation site.

1. INTRODUCTION

The Big Hole Grazing Association (BHGA) Wetland Mitigation 2012 Monitoring Report documents the fifth year of monitoring at the Big Hole mitigation site. The BHGA wetland mitigation project was constructed in fall 2007 by the Montana Department of Transportation (MDT). The purpose of the project was to restore approximately 45 acres of wetland habitat within a 96-acre easement area owned by the BHGA. The project provided a wetland mitigation reserve in Watershed 6 – Upper Missouri River Basin.

The mitigation site is located approximately seven miles southwest of Wisdom and approximately four miles west of Secondary Route 278 (Figure 1). The property is situated in the northwest quarter of Section 2, Township 4 South and Range 16 West in Beaverhead County. Figures 2 and 3 (Appendix A) show the Mapped Site Features and Monitoring Activity Locations, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring Form, the US Army Corps of Engineers (USACE) Routine Wetland Determination Data Forms (Environmental Laboratory 1987), and the MDT Montana Wetland Assessment Forms (Berglund and McEldowney 2008). Appendix C contains photographs of the project site and Appendix D includes the project design plan sheet.

Prior to project initiation, the BHGA used the project area for grazing and haying operations. The site was historically drained through a system of constructed ditches. The project area exhibits a naturally high groundwater table. Additional water sources include springs located on the hillside north of the site and Rock Creek, a perennial tributary to the Big Hole River that flows through the southern portion of the easement area.

The primary drainage ditch that formerly flowed northwest to southeast through the easement area was completely filled and reclaimed with the goal of restoring the natural hydrology and wetlands within the easement area. A secondary ditch that flows north to south across the west half of the site was plugged in three locations to reduce drainage from the site and to restore the wetland hydrology by raising groundwater levels at the site.

Prior to project implementation, MDT documented approximately 31 acres of degraded and relic emergent and scrub/shrub wetland across the 96-acre easement area, noting that some wetland areas were likely much larger prior to construction of drainage ditches across the site in the 1960's. The intent of the project was to restore the natural hydrology to the site in an attempt to restore wetlands within the easement area. According to project files, the goal is to generate 45.8 acres of USACE approved credit through the restoration of 42.3 acres of wetland credited at a 1:1 ratio and preservation of 14.0 acres of wetland credited at a 4:1 ratio (3.5 acres of credit).

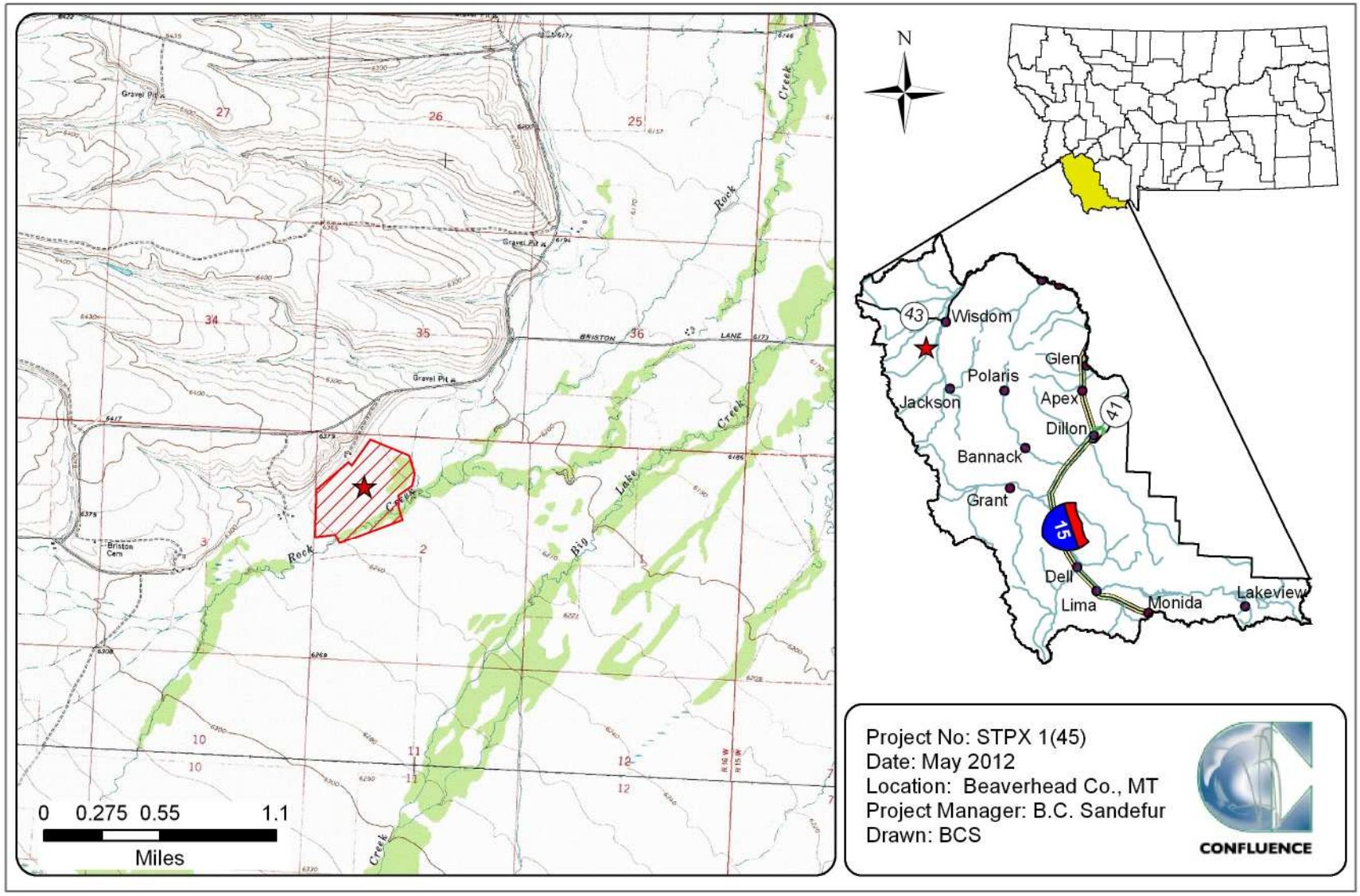

Figure 1. Project location of the BHGA Wetland Mitigation Site.

2. METHODS

A monitoring site visit was performed on July 12, 2012. Information contained on the Mitigation Monitoring Form and the Wetland Determination Data Forms was entered electronically in the field on a personal digital assistant (PDA) palmtop computer (Appendix B). Monitoring activity sites were located using a global positioning system (GPS) (Figure 2 Appendix A). Information collected included: a wetland delineation; vegetation community mapping; vegetation transect monitoring; soil data collection; hydrology data collection; bird and wildlife use documentation; photographic documentation; 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 more or 12.5 percent during the growing season" (Environmental Laboratory 1987). 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 determining wetland hydrology as the number of days when there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit (Environmental Laboratory 1987). Temperature data recorded for the meteorological station at Wisdom, Montana (249067) has a probability range of 17 to 79 days for temperatures above 28 degrees Fahrenheit. The median (5 years in 10) growing season is 48 days. (USDA 2010). Areas defined as wetlands would require at least 6 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

When present, hydrological indicators as outlined on the Wetland Determination Data Form were documented at three data points established within the project area (Figure 2, Appendix A). 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 goals addressing inundation/saturation requirements.

Eight groundwater monitoring wells at the site were routinely monitored by the US Geological Service (USGS) until 2009. The USGS discontinued monitoring of the wells at the request of MDT and the monitoring wells were not measured during the 2009 site visit. Groundwater depths in wells MW-1 through MW-8 were measured by the Confluence team from 2010 to 2012 during the annual site visits (Section 3.1). Soil pits excavated during the wetland delineation were also used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded electronically on the Wetland Determination Data Form (Appendix B).

2.2. Vegetation

The boundaries of dominant, species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2012 aerial photograph. Percent cover of dominant species within a community type was estimated and recorded using the following values: 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 (less than 50 percent) (Appendix B).

Temporal changes in vegetation were evaluated through annual assessments of a static belt transect (Figure 2, Appendix A). Vegetation composition was assessed and recorded along one vegetation belt transect approximately 10 feet wide and 1,247 feet long (Figure 2, Appendix A). The transect location was recorded with a GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. Percent cover of each vegetation species within the belt was estimated using the same values and cover ranges listed for the community polygon data on the aerial photograph (Appendix A). Photographs were taken at the endpoints of the transect during the monitoring event (Page C-22 and C-23, Appendix C).

The location of noxious weeds was noted in the field and mapped on the aerial photo (Figure 3, Appendix A). 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 1.0 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 A).

Woody species were planted in clusters across the site in May 2008. The clusters were examined for plant survival in 2012.

2.3. Soil

Soil information was obtained from the Soil Survey for *Beaverhead County Area Soil Survey* (USDA 2010) and in situ soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987). A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Determination Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the US including jurisdictional wetlands and other special aquatic sites were delineated throughout the project area in accordance with criteria established in the 1987 USACE delineation manual. In order to delineate a representative area as wetland, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology must be satisfied. The name and indicator status of plant species was derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). Previous years' reports used the 1988

National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The 2012 NWPL 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 is likely an error, this species' common name would be reported here as "spiked bent (grass)". A Routine Level-2 Onsite Determination Method (Environmental Laboratory 1987) was used to delineate wetland areas within the project boundaries. The information was recorded electronically on the USACE Wetland Determination Data Form (Appendix B).

The USACE determined that the 1987 Wetland Manual should continue to be used at MDT mitigation sites where baseline wetland conditions had been established prior to 2008. Consequently, the use of the 2010 Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010) was not required.

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site, i.e., mudflat. The wetland boundary was demarcated on the aerial photograph. Wetland areas were estimated using geographic information system (GIS) methods.

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the 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 monitoring period to date was compiled.

2.6. Functional Assessment

The 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999) was employed to complete functional assessments of the site in 2001. The 2008 MWAM (Berglund and McEldowney 2008) was used to evaluate functions and values on the site from 2009 to 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. The 2008 revision refines ratings for some wetland functions, land management, and fish and wildlife habitat.

Field data for this assessment were collected during the site visit. A Wetland Assessment Form was completed for each wetland or group of wetlands (Assessment Areas). The forms are located in Appendix B.

2.7. Photo Documentation

Monitoring at photo points provides supplemental information documenting wetland and upland conditions within the monitored area, site trends, current land uses surrounding the site, and the vegetation transects. Photographs were taken at established photo points and transect end points throughout the mitigation site during the site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 2, Appendix A).

2.8. 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.

2.9. Maintenance Needs

Channels, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. This was a cursory examination that did not constitute an engineering-level structural inspection. The BHGA mitigation site is sourced by groundwater and does not encompass any manmade diversions, water level control structures, or other structures that might need periodic maintenance.

3. RESULTS

3.1. Hydrology

The Wisdom station, Montana (249067), located within 10 miles of the project site in the same valley, recorded an average total annual precipitation rate of 11.89 inches from January 1923 to December 2011 (WRCC 2011). Annual precipitation was 14.51 inches in 2010 and 11.98 inches in 2011. Long-term precipitation data recorded for January through August was 8.63 inches. These values were 11.41 inches, 8.7 inches and 7.58 inches for 2010, 2011, and 2012, respectively. Overall, 2010 was wetter than average, 2011 was very near average, and 2012 was slightly drier than average.

Eight groundwater monitoring wells installed in 2001 were monitored annually by the USGS through 2008. Well locations are shown on Figure 2 (Appendix A). One of the primary goals of the project was to raise groundwater levels across the easement area by plugging two drainage ditches across the site. Groundwater levels measured in 2008 following site construction were higher than in 2007, reflecting a positive response in wetland hydrology to mitigation efforts. Water levels in 2009 were above the ground surface at wells MW-6, MW-7, and MW-8. Saturation and inundation levels observed in several wet meadows in 2008 and 2009 indicated that the groundwater levels were similar, reflecting a positive trend toward the development of wetland hydrology. Groundwater levels measured in 2010 were less than one foot below the ground surface (bgs) in wells MW-1, and M-4 through MW-8. Depths in MW-7 and MW-8 were within 0.1 foot of the ground surface. Groundwater levels measured in 2011 (Table 1) showed that, with the exception of MW-1, all wells exhibited water levels within one foot of the ground surface. Water levels in three wells, MW-2, MW-4, and MW-5, were above the ground surface supporting the observation of extensive areas of inundation during the 2011 monitoring event.

Groundwater levels increased from 2011 to 2012 in MW-1, MW-3, MW-6 and MW-8. Groundwater levels decreased in wells MW-2, MW-4, and MW-5 in 2012 where ponded surface water had been observed in 2011. The groundwater elevations in these wells were within one foot of the ground surface in 2012. The groundwater level data collected from pre- and post-construction have documented a site-wide increase in the groundwater table following modifications to the drainage ditches.

Table 1. Groundwater depths measured in wells MW-1 through MW-8 from 2010 to 2012 at the BGHS Wetland Mitigation Site.

Well Number	*2001 Water Surface	*2002 Water Surface	*2003 Water Surface	*2004 Water Surface	*2005 Water Surface	*2006 Water Surface	*2007 Water Surface	*2008 Water Surface	2010 Water Surface	2011 Water Surface	2012 Water Surface
MW-1	-0.9	-0.7	-0.8	-0.2	-0.4	-0.3	-0.6	-0.4	-0.9	-1.3	-0.2
MW-2	-1.4	-0.5	-0.2	-1.6	-0.6	-0.9	-1.4	-0.6	-1.4	0.3	-0.3
MW-3	-4	-2.2	-1.7	-3	-2.9	-3.5	-2.7	-1.4	-1.4	-1	-0.9
MW-4	-0.3	-0.7	-1.3	-1.7	-1.9	-1.1	-1.4	-0.3	-0.4	0.1	-0.1
MW-5	-2	-1.5	-1.5	-1.8	-1.3	-1.7	-1.5	-0.4	-0.4	0.2	-0.0
MW-6	-0.9	-1.2	-0.6	-0.8	-1.3	-1.4	-0.6	0.1	-0.6	-0.4	-0.0
MW-7	-1.6	-1.4	-1.3	-1.6	-1.8	-1.1	-1.4	-0.2	-0.1	-0.0	-0.4
MW-8	-0.9	-0.9	-0.7	-0.8	-0.9	-1.0	-0.3	-0	-0.1	-1.0	-0.3

*Values estimated from Chart 1 in 2008 Big Hole Grazing Association Wetland Mitigation Monitoring Report.

Surface water depths on the site in 2012 ranged from 0.0 to 3.0 feet with an average depth site wide of 0.2 feet. Approximately 60 percent of the site was inundated, a slight decrease of approximately 5 percent from 2011. Two data points, BH-1 and BH-3, were located within wetlands (Figure 2, Appendix A). Hydrologic indicators included local soil survey data, the FAC-Neutral Test, dry season water table, saturation within the upper 12 inches of the soil profile, drift lines, and sediment deposits.

3.2. Vegetation

The 100 plant species identified at the mitigation site from 2008 to 2012 are listed in Table 2. Vegetation community types were identified based on dominance and plant composition. There were six vegetation communities identified in 2012, one upland community and five wetland communities (Figure 3, Appendix A; Monitoring Form, Appendix B). The 2012communities were upland Type 1 – *Poa pratensis/Phleum pratense*, wetland Type 3 – *Carex* species (spp.), wetland Type 4 – *Salix* spp./ *Carex* spp., wetland Type 5 – *Juncus* spp./*Agrostis gingantea* (called *Agrostis alba* on 1988 list) wetland Type 7 – *Carex* spp./*Juncus* spp., and wetland Type 8 – *Juncus arcticus* (called *J. balticus* on 1988 list). The community types correlated to those identified in 2011.

The northwest corner of the project contains a sedge-dominated fen (community 3) that had not been impacted by historic ditching activities. This area receives abundant hydrology from the natural spring located at the base of the hillside in the northwest area of the site. After years of dewatering and grazing, the northeast side of the easement area transitioned from a willow community to upland and wet meadow habitat. Since 2009, the area has shown evidence of reverting to historical conditions with the restoration of site hydrology and natural regeneration of willows (Community 6, Figure 3, Appendix A).

Upland vegetation community Type 1 – *Poa pratensis/Phleum pratense* was identified on 6.6 acres located at the south boundary and in isolated islands within the site. Community type 1 was dominated by herbaceous species that included in descending order of abundance Kentucky bluegrass (*Poa pratensis*), common timothy (*Phleum pratense*), field meadow-foxtail (*Alopecurus pratensis*), pale-yellow Indian-paintbrush (*Castilleja occidentalis*), common yarrow (*Achillea millefolium*), creeping wildrye (*Elymus repens*, called *Agropyron repens* on 1988 list), and arctic rush (*Juncus arcticus*). The areal extent of this community has shown a steady decrease since 2008 as a result of the increase in saturation and inundation levels.

Wetland community Type 3 – *Carex* spp. extended across 23.9 acres in the northwest quarter and center of the site. The community was predominantly vegetated by Northwest Territory sedge (*Carex utriculata*) with less cover of leafy tussock sedge (*Carex aquatilis*), slender-beak sedge (*Carex athrostachya*), and Nebraska sedge (*Carex nebrascensis*). Other hydrophytic species in this community included field meadow-foxtail, large-leaf avens (*Geum macrophyllum*), arctic rush, yellow willow (*Salix lutea*), American sloughgrass (*Beckmania syzigachne*), black bent grass (*Agrostis gigantea*), and fowl manna grass (*Glyceria striata*).

Table 2. Vegetation species observed from 2008 to 2012 at the BHGA Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
Achillea millefolium	Common Yarrow	FACU
Aconitum columbianum	Columbian Monkshood	FACW
Agrostis gigantea	Black Bent	FAC
Agrostis stolonifera	Spreading Bent	FAC
Allium geyeri	Geyer's Onion	FACU
Alnus incana	Speckled Alder	FACW
Alopecurus aequalis	**Short-Awn Meadow-Foxtail**	**OBL**
Alopecurus pratensis	Field Meadow-Foxtail	FAC
Arnica lanceolata	Lance-Leaf Leopardbane	FACW
Aster sp.	**Aster**	**NL**
Bassia scoparia	Mexican-Fireweed	FAC
Beckmannia syzigachne	American Slough Grass	OBL
Betula pumila	Bog Birch	OBL
Bromus inermis	Smooth Brome	FAC
Calamagrostis canadensis	Bluejoint	FACW
Calamagrostis scopulorum	Ditch Reed Grass	FAC
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex athrostachya	Slender-Beak Sedge	FACW
Carex nebrascensis	Nebraska Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex utriculata	Northwest Territory Sedge	OBL
Castilleja miniata	Great Red Indian-Paintbrush	FAC
Castilleja occidentalis	Pale-Yellow Indian-Paintbrush	FAC
Centaurea maculosa	Spotted Knapweed	UPL
Cirsium arvense	Canadian Thistle	FAC
Cirsium scariosum	Meadow Thistle	FAC
Cornus alba	Red Osier	FACW
Crataegus douglasii	Black Hawthorn	FAC
Crepis capillaris	Smooth Hawk's-Beard	FACU
Dasiphora fruticosa	Golden-Hardhack	FAC
Deschampsia cespitosa	Tufted Hairgrass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Eleocharis quinqueflora	Few-Flower Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum arvense	Field Horsetail	FAC
Eriophorum gracile	Slender Cotton-Grass	OBL
Geum aleppicum	Yellow Avens	FACW
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria elata	Tall Manna Grass	FACW
Glyceria striata	Fowl Manna Grass	OBL

[1]Draft 2012 NWPL.
New species identified in 2012 are bolded.

Table 2. (Continued). Vegetation species observed from 2008 to 2012 at the BHGA Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
Glycyrrhiza lepidota	American Licorice	FAC
Gnaphalium palustre	Western Marsh Cudweed	FACW
Hippuris vulgaris	Common Mare's-Tail	OBL
Hordeum brachyantherum	Meadow Barley	FACW
Hordeum jubatum	Fox-Tail Barley	FAC
Iris missouriensis	Rocky Mountain Iris	FACW
Juncus arcticus	Arctic Rush	FACW
Juncus effusus	Lamp Rush	FACW
Juncus ensifolius	Dagger-Leaf Rush	FACW
Juncus longistylis	Long-Style Rush	FACW
Juncus tenuis	Lesser Poverty Rush	FAC
Juncus torreyi	Torrey's Rush	FACW
Lemna minor	Common Duckweed	OBL
Lupinus polyphyllus	**Blue-Pod Lupine**	**FAC**
Lupinus wyethii	Wyeth's Lupine	UPL
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Myosotis scorpioides	True Forget-Me-Not	FACW
Myriophyllum hippuroides	Western Water-Milfoil	OBL
Pedicularis groenlandica	**Bull Elephant's-Head**	**OBL**
Penstemon procerus	Pincushion Beardtongue	FAC
Persicaria amphibia	Water Smartweed	OBL
Phleum pratense	Common Timothy	FAC
Poa palustris	**Fowl Blue Grass**	**FAC**
Poa pratensis	Kentucky Blue Grass	FAC
Poa secunda	Curly Blue Grass	FACU
Polemonium acutiflorum	Sticky Tall Jacob's-Ladder	UPL
Polemonium occidentale	**Western Jacob's-Ladder**	**FACW**
Populus tremuloides	Quaking Aspen	FACU
Potentilla glandulosa	Sticky Cinquefoil	FAC
Potentilla gracilis	Graceful Cinquefoil	FAC
Ranunculus repens	**Creeping Buttercup**	**FAC**
Ranunculus sp.	Buttercup	NL
Ribes lacustre	**Bristly Black Gooseberry**	**FAC**
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Salix bebbiana	Gray Willow	FACW
Salix drummondiana	**Drummond's Willow**	**FACW**
Salix exigua	Narrow-Leaf Willow	FACW
Salix lemmonii	Lemmon's Willow	FACW
Salix lutea	Yellow Willow	OBL
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL

[1]Draft 2012 NWPL.
New species identified in 2012 are bolded.

Table 2. (Continued). Vegetation species observed from 2008 to 2012 at the BHGA Wetland Mitigation Site.

Scientific Names	Common Names	WMVC Indicator Status[1]
Scutellaria galericulata	**Hooded Skullcap**	**OBL**
Senecio sphaerocephalus	Mountain-Marsh Ragwort	FACW
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sisyrinchium montanum	Strict Blue-Eyed-Grass	FAC
Sonchus arvensis	Field Sow-Thistle	FACU
Sparganium emersum	European Burr-Reed	OBL
Stellaria longifolia	Long-Leaf Starwort	FACW
Symphyotrichum lanceolatum	White Panicled American-Aster	OBL
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Penny-Cress	UPL
Toxicoscordion venenosum	**Meadow Poison Camas**	**FACU**
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FAC
Triglochin maritima	Seaside Arrow-Grass	OBL
Triglochin palustris	Marsh Arrow-Grass	OBL
Typha latifolia	Broad-Leaf Cat-Tail	OBL

[1]Draft 2012 NWPL.
New species identified in 2012 are bolded

Wetland community Type 4 – *Salix* spp./ *Carex* spp. was located on 18.8 acres of the Rock Creek corridor and along the east half and southwest corner of the project area. This community was dominated primarily by woody species including narrow-leaf willow (*Salix exigua*), gray willow (*Salix bebbiana*), and Lemmon's willow (*Salix lemmonii*). Northwest Territory sedge, clustered field sedge (*Carex praegracilis*), and arctic rush dominated the herbaceous species. Shoots of graceful cinquefoil (*Potentilla gracilis*) and quaking aspen (*Populus tremuloides*) were also present within the community.

The dominant species in the 12.9-acre wetland community Type 5 – *Juncus spp./Agrostis gigantea* were arctic rush, black bent grass, Northwest Territory sedge, Western Jacob's-ladder (*Poleminium occidentale*), field meadow foxtail, lamp rush (*Juncus effusus*), dagger-leaf rush (*Juncus ensifolius*), clustered field sedge, Rocky Mountain iris (*Iris missouriensis*), and graceful cinquefoil. The community developed on drier moisture regimes in the northeast corner and center of the site. The community is expected to transition from Type 5 to Type 4 as willows continue to proliferate.

Wetland community Type 7 – *Carex* spp./*Juncus* spp. covered 31.7 acres in the west half and central region of the site. This community has expanded since 2010 replacing areas of community 1 as a result of the increased wetland hydrology at the site. Northwest Territory sedge, field clustered sedge, slender-beak sedge, arctic rush, lesser poverty rush (*Juncus tenuis*), meadow fox-tail, and 24 other species contributed to the diverse cover in this community.

Wetland community Type 8 – *Juncus arcticus* replaced a small area mapped as community 6 (Type 6 – *Carex* spp./*Alopecurus pratensis*) in 2010. The community was slightly drier than the adjacent wetland communities. It was dominated by arctic rush, black bent grass, graceful cinquefoil, common yarrow, meadow barley (*Hordeum brachyantherum*), Kentucky bluegrass (*Poa pratensis*), curly dock (*Rumex crispus*), field penny-cress (*Thlaspi arvense*), fringed willowherb (*Epilobium ciliatum*), common dandelion (*Taraxacum officinale*), and white clover (*Trifolium repens*).

Overall plant composition was quantified on the 1,247-foot vegetation transect during the 2012 monitoring event. Transect data are summarized in Table 3 and Charts 1 and 2 and on the monitoring form (Appendix B). The transect was established south to north through the center of the mitigation area, beginning at well MW-3 and ending at MW-6 (Figure 2, Appendix A).

The transect intercepted community 7 –*Carex* spp./*Juncus* spp., community 5 – *Juncus* spp./*Agrostis gigantea*, and community 3 – *Carex* spp. Hydrophytic communities dominated 100 percent of the transect in 2011 and 2012, an increase of 34.2 percent from 2010 and an increase of 45 percent since 2009. The data reflect the steady increase in wetland hydrology, development of hydrophytic vegetation, and expansion of wetland acreage within the BHGA mitigation site since construction. Photographs of the transect end points from 2009 to 2012 are shown on pages C-22 and C-23 of Appendix C.

Table 3. Data summary for Transect 1 from 2008 to 2012 at the BHGA Wetland Mitigation Site.

Monitoring Year	**2008**	**2009**	**2010**	**2011**	**2012**
Transect Length (feet)	**1247**	**1247**	**1247**	**1247**	**1247**
Vegetation Community Transitions along Transect	7	7	7	5	5
Vegetation Communities along Transect	3	3	4	3	3
Hydrophytic Vegetation Communities along Transect	2	2	3	3	3
Total Vegetative Species	22	22	31	30	30
Total Hydrophytic Species	13	14	26	23	26
Total Upland Species	9	8	5	7	4
Estimated % Total Vegetative Cover	75	80	90	100	100
% Transect Length Comprising Hydrophytic Vegetation Communities	45	55	65.8	100	100
% Transect Length Comprising Upland Vegetation Communities	55	45	34.2	0.0	0.0
% Transect Length Comprising Unvegetated Open Water	0	0	0.0	0.0	0.0
% Transect Length Comprising Bare Substrate	0	0	0.0	0.0	0.0

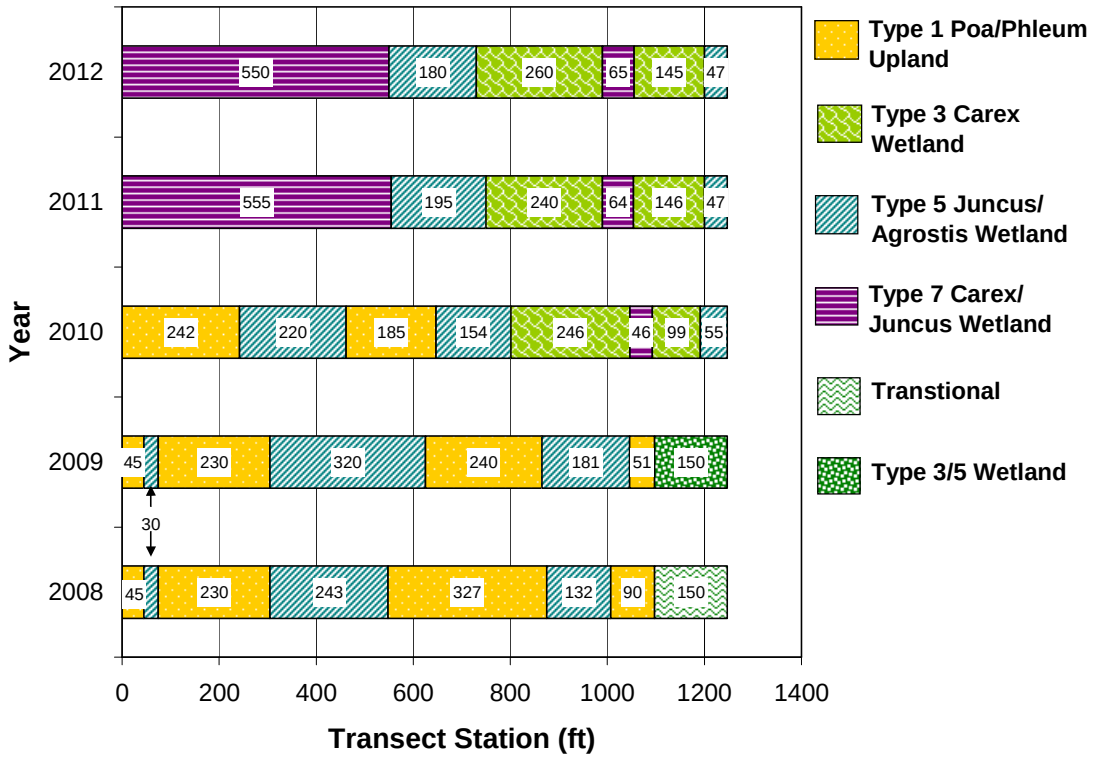

Chart 1. Transect map showing community types on Transect 1 from beginning (0 feet) to end (1,247 feet) from 2008 to 2012 at the BHGS Wetland Mitigation Site.

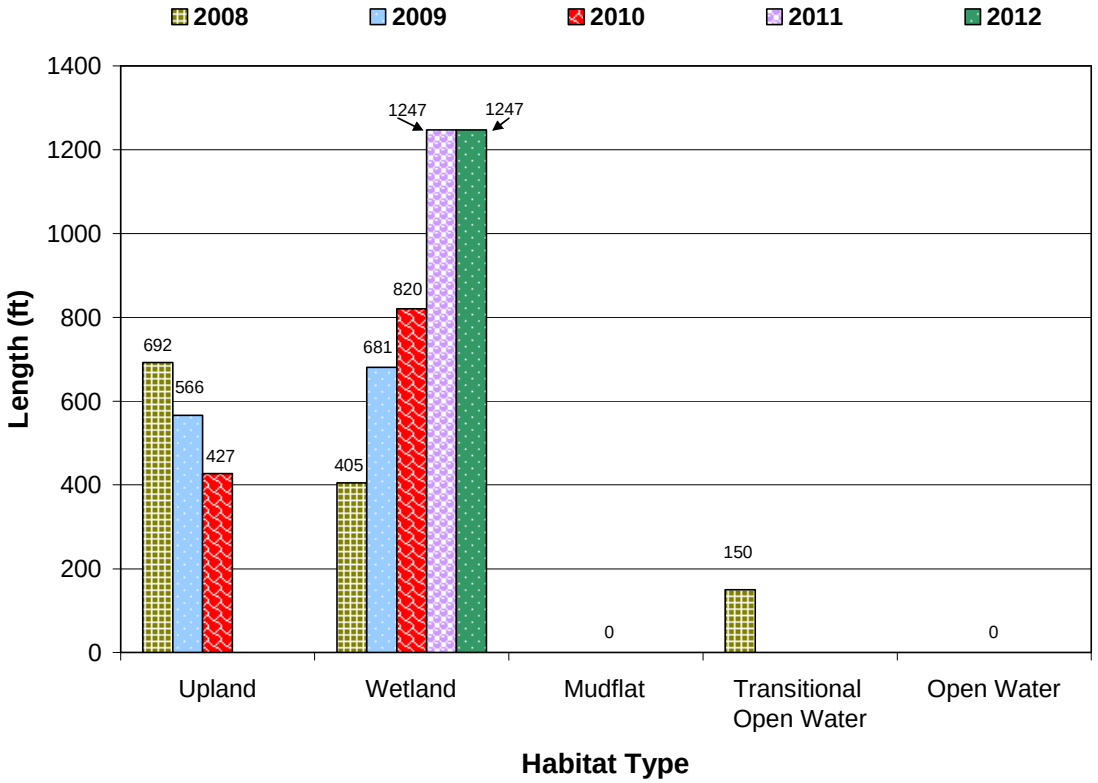

Chart 2. Length of habitat types within Transect 1 from 2008 to 2012 at the BHGS Wetland Mitigation Site.

Canadian thistle (*Cirsium arvense*), a Priority 2B noxious weed, was identified in two areas on the northwest mitigation boundary near the home site (Figure 3, Appendix A). The infestation size ranged between less than 0.1 to 1.0 acre with cover ranging between 1 to 5 percent and 5 to 25 percent.

Woody vegetation planted in May 2008 consisted of 45 plant clusters placed along the filled drainage ditch and the secondary ditch plugged in three locations. Plant species included bog birch (*Betula pumila*), speckled alder (*Alnus incana*), and red-osier dogwood (*Cornus alba,* called *C. stolonifera* on 1988 list). Approximately 961 plants were inspected during 2008 monitoring. Approximately 79 percent (756 stems) survived the first growing season. Survival decreased dramatically to 35 percent in 2009 (339 stems). Speckled alder exhibited the least mortality in 2009 at 45 percent survival. Mortality in 2009 for red-osier dogwood and bog birch was approximately 70 percent and 98 percent, respectively. The high mortality of red-osier dogwood and bog birch containerized species was potentially the result of excessively wet conditions and competition from forbs and grasses. Fifty out of 246 red-osier dogwood planted (20 percent) were alive in 2010. Approximately 200 speckled alder saplings were alive out of the 470 planted (43 percent survival). No live bog birch saplings were noted in 2010. Similar survival rates were noted in 2011, with roughly 200 speckled alders, 50 red-osier dogwoods, and no live bog birch observations recorded.

There were no live stems of red-osier dogwood or bog birch observed in 2012. One hundred fifty (150) speckled alder were alive in 2012. Numerous volunteer willows and shrubby cinquefoil were observed throughout community Type 4 indicating the natural establishment of a scrub/shrub overstory.

3.3. Soil

Two soil units were mapped within the easement area, the Mooseflat Loam, 0 to 4 percent slopes, located along the Rock Creek corridor and the Foxgulch-Copperbasin-Wisdom complex, 0 to 2 percent slopes, that encompasses the remaining study area (USDA 2010). The Mooseflat series is classified as a Typic Cryaquoll. The Foxgulch series is a Fluvaquentic Haplocryolls. The Wisdom series is a superactive Oxyaquic Haplocryolls and the Copperbasin is classified as an Aquic Haplocryolls. All four of these series are listed on the Montana Hydric Soils list.

Data points BH-1 and BH-3 were located in areas that met the wetland criteria. The soil profile at BH-1 revealed a black clay loam (10 YR 2/1) soil with dark yellowish brown (10 YR 4/4) mottles. The soil at BH-3 was identified as a clay loam (10 YR 3/1) with redoximorphic concentrations (10 YR 4/4) in the matrix. Hydric soil indicators were the low-chroma colors. The soil profile at BH-2 revealed a sandy clay (10YR 4/2) without redox features. The test pit soils generally correlated with the soil map units.

3.4. Wetland Delineation

The site was delineated by MDT in June 2001. At that time, approximately 31 acres of degraded wetland habitat were delineated within the project boundaries. Table 4 shows a consistent increase in wetland acreage from 2008 to 2011, a reflection of abundant surface water and groundwater inflow to the site and of the maximization of water availability across the site via the plugged historic drain ditches. This total wetland acreage included 14 acres of pre-existing wetlands targeted for preservation located in the Rock Creek corridor and the northwest corner of the site.

The wetland boundaries delineated in 2012 are mapped on Figure 3 (Appendix A). Table 4 summarizes the wetland acreages delineated from 2008 to 2012. Approximately 88.26 acres of wetland were delineated in 2012. This represented an increase of 7.03 in total wetland acres from 2010. From 2008 to 2012, the plant habitat near the center of the site transitioned from upland community Type 1 to wetland community Type 7. Uplands encompassed 6.60 acres within the project area in 2012. The wetland acreage remained consistent from 2011 to 2012 and is not expected to increase significantly based on the topography of the site.

Table 4. Wetland acreages delineated in 2008 to 2012 at the BHGA Wetland Mitigation Site.

Habitat Type	2008 Acreage	2009 Acreage	2010 Acreage	2011 Acreage	2012 Acreage
Wetland	49.81	56.76	81.23	88.26	88.26

3.5. Wildlife

Direct and indirect observations of wildlife species from 2008 to 2012 are listed in Table 5 and Appendix B. Multiple individuals of fourteen bird species were observed during the 2012 survey. The mountain bluebird (*Sialia currucoides*) and yellow-headed blackbird (*Xanthocephalus xanthocephalus*) were observed for the first time in 2012. Thirty-four bird species have been identified within the site to date.

The landowner observed a fox den and five kits in 2012. He also observed a cow moose (*Alces americanus*) giving birth to a calf on site the day before Memorial Day of 2012. A red fox (*Vulpes vulpes*) and tracks of a beaver (*Caster canadensis*), deer (*Odocoileus* sp.), elk (*Cervus canadensis*), and moose were observed during the 2012 site visit. Elk use the site extensively. The landowner has also observed solitary gray wolves (*Canus lupus*) and grizzly bears (*Ursus arctos horribilis*) traversing the site. Indications of beaver browse and dam construction were observed along Rock Creek.

Table 5. Wildlife species observed within the BHGA Wetland Mitigation Site from 2008 to 2012.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Columbia Spotted Frog	*Rana luteiventris*
BIRD	
American Crow	*Corvus brachyrhynchos*
American Kestrel	***Falco sparverius***
American Robin	***Turdus migratorius***
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Black-billed Magpie	*Pica hudsonia*
Black-capped Chickadee	*Poecile atricapillus*
Bobolink	*Dolichonyx oryzivorus*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Raven	*Corvus corax*
Great Blue Heron	***Ardea herodias***
Great Horned Owl	*Bubo virginianus*
House Wren	*Troglodytes aedon*
Killdeer	*Charadrius vociferus*
Mallard	***Anas platyrhynchos***
Mountain Bluebird	***Sialia currucoides***
Northern Harrier	*Circus cyaneus*
Northern Shrike	*Lanius excubitor*
Red-tailed Hawk	***Buteo jamaicensis***
Red-winged Blackbird	***Agelaius phoeniceus***
Rock Pigeon	*Columba livia*
Rough-legged Hawk	*Buteo lagopus*
Sandhill Crane	***Grus canadensis***
Song Sparrow	***Melospiza melodia***
Spotted Sandpiper	*Actitis macularius*
Tree Swallow	***Tachycineta bicolor***
Violet-green Swallow	*Tachycineta thalassina*
Western Bluebird	*Sialia mexicana*
Western Meadowlark	***Sturnella neglecta***
Wilson's Phalarope	*Phalaropus tricolor*
Wilson's Snipe	***Gallinago delicata***
Yellow Warbler	***Dendroica petechia***
Yellow-headed Blackbird	***Xanthocephalus xanthocephalus***
Yellow-rumped Warbler	*Dendroica coronata*
MAMMAL	
Badger	*Taxidea taxus*
Beaver	***Castor canadensis***
Coyote	*Canis latrans*
Deer Sp.	

Bolded species were observed in 2012.

Table 5. (continued). Wildlife species observed within the BHGA Wetland Mitigation Site from 2008 to 2012.

COMMON NAME	SCIENTIFIC NAME
MAMMAL	
Elk or Wapiti	***Cervus canadensis***
Gray Wolf	*Canus Lupus*
Grizzly Bear	*Ursus arctos horribilis*
Meadow Vole	*Microtus pennsylvanicus*
Moose	***Alces americanus***
Muskrat	*Ondatra zibethicus*
Raccoon	*Procyon lotor*
Red Fox	***Vulpes vulpes***
Richardson's Ground Squirrel	*Spermophilus richardsonii*
Striped Skunk	*Mephitis mephitis*
White-tailed Deer	*Odocoileus virginianus*

Bolded species were observed in 2012

3.6. Functional Assessment

The 2001 baseline functional assessment by MDT rated the wetlands that occurred along the Rock Creek corridor and in the northwest corner (fen area) as Category II wetlands and the remaining wetlands on the site as Category III using the 1999 MDT MWAM (Berglund 1999). The 2009 through 2011 wetland conditions were assessed using the 2008 MWAM (Berglund and McEldowney 2008). The 2009 through 2012 assessment results are shown in Table 6. Two assessment areas (AA) were evaluated within the BHGA wetland mitigation site (Functional Assessment Forms, Appendix B). The Rock Creek corridor AA encompassed 10 acres. The remaining wetlands on the site were included in the second 78.26-acre AA. The difference in acreages of the AAs between years is the result of continued wetland development at the site.

All wetlands within the BHGA mitigation area were rated as Category I wetlands in 2011 and 2012, an improvement from Category II wetlands in 2010 (Table 6). The Rock Creek corridor (AA-1) rated excellent for general wildlife habitat, general fish habitat, and production export/food chain support and rated high for flood attenuation, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and groundwater discharge/recharge. The rating for uniqueness increased by 0.2 points in 2012 based on the rating of aquatic bed habitat in the creek. This AA also gained 0.2 points due to increased ratings for short and long term surface water storage The ratings for the remaining wetland functions were the same between 2011 and 2012. Wetlands outside the Rock Creek corridor (AA-2) received an excellent rating for general wildlife habitat, and high ratings for short and long term surface water storage, sediment/nutrient, toxicant removal, production export/food chain support, groundwater discharge/recharge, and uniqueness. The AA-2 encompasses an historic fen located in the northwest corner of the site.

Table 6. Summary of 2009 through 2012 wetland function/value ratings and functional points at the BHGA Wetland Mitigation Site.

Function and Value Parameters 2008 MDT Montana Wetland Assessment Method	2009 AA 1 (Rock Creek Wetlands)	2009 AA 2 (Remaining Wetlands)	2010 AA 1 (Rock Creek Wetlands)	2010 AA 2 (Remaining Wetlands)	2011 AA 1 (Rock Creek Wetlands)	2011 AA 2 (Remaining Wetlands)	2012 AA 1 (Rock Creek Wetlands)	2012 AA 2 (Remaining Wetlands)
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	High (0.9)	Mod (0.7)	High (0.9)	Mod (0.7)	Exc. (1.0)	Exc. (1.0)	Exc. (1.0)	Exc. (1.0)
General Fish/Aquatic Habitat	High (0.8)	NA	High (0.8)	NA	Exc. (1.0)	NA	Exc. (1.0)	NA
Flood Attenuation	High (0.8)	NA	High (0.8)	NA	High (0.9)	NA	High (0.9)	NA
Short and Long Term Surface Water Storage	High (0.8)	High (1.0)	High (0.8)	High (1.0)	High (0.8)	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (1.0)	High (0.9)	High (1.0)	High (0.9)	High (1.0)	High (0.9)	High (1.0)
Sediment/Shoreline Stabilization	High (1.0)	NA	High (1.0)	NA	High (1.0)	NA	High (1.0)	NA
Production Export/Food Chain Support	High (1.0)	Mod (0.6)	High (1.0)	Mod (0.6)	Exc. (1.0)	High (0.8)	Exc. (1.0)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Mod (0.4)	High (0.9)	Mod (0.4)	High (0.9)	Mod (0.4)	High (0.9)	Mod (0.6)	High (0.9)
Recreation/Education Potential	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Mod (0.1)	Mod (0.1)	Mod (0.1)	Mod (0.1)
Actual Points / Possible Points	**7.85 / 11**	**5.45 / 8**	**8.15 / 11**	**5.75 / 8**	**9 / 11**	**6.7 / 8**	**9.4 / 11**	**6.7 / 8**
% of Possible Score Achieved	**71%**	**68%**	**74.1%**	**71.9%**	**81.8%**	**83.8%**	**85.5%**	**83.8%**
Overall Category	**II**	**II**	**II**	**II**	**I**	**I**	**I**	**I**
Total Acreage of Assessed Wetlands within Site Boundaries (ac)	**10**	**39.81**	**10**	**71.23**	**10**	**78.26**	**10**	**78.26**
Functional Units (acreage x actual points)	**78.50**	**217**	**81.50**	**409.6**	**90.00**	**524.3**	**94.0**	**524.3**

3.7. Photo Documentation

Representative photographs were taken from photo points one to seven (PP1 to PP7) and of the transect end points (Appendix C). Photos of PP1 to PP7 taken between 2009 and 2012 are presented on pages C-1 to C-21 of Appendix C. Photos of transect end points shot between 2009 and 2012 are shown on C-22 and 23 of Appendix C. Photographs of the three wetland data points are shown on C-24. The 2012 aerial photograph was used as a base for Figures 2 and 3 (Appendix A).

3.8. Maintenance Needs

There are no man-made water control features on the site. The wooden fence surrounding the perimeter was in good condition in 2012. All man-made bird nesting structures installed in 2008 by MDT were in good condition, although two of the wood duck boxes were tilted from frost-heave in 2011 and 2012 and may require maintenance to promote continued bird usage.

Containerized plant survival declined significantly from 2008 to 2010. Mortality may be related to excessively saturated soil conditions. Survival appeared to stabilize in 2011 potentially reflecting suitable micro-habitats within the inundated/saturated wetlands. No supplemental planting is recommended for the BHGA site based on the natural regeneration of numerous willows.

Canadian thistle (*Cirsium arvense*), a Priority 2B noxious weed, was identified in two areas on the northwest mitigation boundary near the home site (Figure 3, Appendix A). The infestation size ranged between less than 0.1 to 1.0 acre with the percent cover ranging between 1 to 5 and 5 to 25. The MDT has an ongoing weed control program.

3.9. Current Credit Summary

The mitigation goal for the Big Hole project was to provide 45.8 acres of Corps-approved mitigation credit within the 96-acre easement area. Credit was to be obtained for 42.3 acres of wetland restoration at a ratio of 1:1, and 3.5 acres of credit was to be obtained for preservation of 14.0 acres at a ratio of 4:1. The 14.0 acres of preservation applies to the Rock Creek corridor and fen area in northwest corner of the site – neither of which was impacted by the filling of the ditches. These areas did however benefit from the removal of cattle grazing from the site. This project was established prior to the adoption of the 2008 USACE mitigation guidelines requiring the development of success criteria, therefore success was based on achieving wetland criteria defined by the 1987 Manual.

As of 2012, 74.26 acres of restored/created wetland habitat and 14.0 acres of preserved wetlands were delineated within the BHGA mitigation site. These acreages and the applicable credit ratios are summarized in Table 7. The total accumulated credit acres based on the 2012 monitoring results are 77.76. The ratings of the two AAs increased from Category II to Category I wetlands in 2011 and continued through 2012, reflecting the successful restoration and preservation of highly functioning wetlands within the Upper Missouri watershed.

Numerous stands of willow and shrubby cinquefoil have established voluntarily within the site. No additional woody plantings are recommended. The current hydrological conditions should continue to support high quality wetland habitat for plants and wildlife for the long term.

Table 7. Summary of wetland credits from 2008 to 2012 at the BHGS Wetland Mitigation Site.

Mitigation Type	Credit Ratios	2008 Acreage	2008 Credit Acres	2009 Acreage	2009 Credit Acres	2010 Acreage	2010 Credit Acres	2011 Acreage	2011 Credit Acres	2012 Acreage	2012 Credit Acres
Wetland Restoration	1:1	35.81	35.81	42.76	42.76	67.23	67.23	74.26	74.26	74.26	74.26
Wetland Preservation (pre-existing)	4:1	14.00	3.50	14.00	3.50	14.00	3.50	14.00	3.50	14.00	3.50
TOTAL		**49.81**	**39.31**	**56.76**	**46.26**	**81.23**	**70.73**	**88.26**	**77.76**	**88.26**	**77.76**

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Appendix A

Project Area Maps – Figures 2 and 3

2012 MDT Wetland Mitigation Monitoring
Big Hole Grazing Association
Beaverhead County, Montana

Figure 2: 2012 Monitoring Activity Locations

Legend

- Vegetation Transect
- Monitoring Limits
- Data Points
- Photo Points
- Bluebird Box
- Wood Duck Box
- MonitoringWell

Base Photography Date: June 27, 2012

PP4
BB2
BB1
WDB1
BH-1
PP5
PP3
MW-6
T-1 End
MW-8
PP6
WDB1
MW-1
MW-4
MW-5
WDB4
PP2
MW-7
BB10
BB9
BB8
BB7
PP7
MW-2
WDB3
MW-3
T-1 Start
PP1
BB5
BB6
BB3
BB4
BH-3
BH-2

N

0 125 250 500
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: Beaverhead Co., MT
PROJ NO: STPX-0001(45)
FILE: BigHole/Monitor2012.mxd

Project Name: Big Hole Grazing Association Wetland Mitigation Site
Drawing Title: 2012 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JU

SCALE: Noted
Drawn: September 10, 2012
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 2

REV -

Figure 3: 2012 Mapped Site Features

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: June 27, 2012

Noxious Weeds
Cirsium arvense
Infestation SIze
X = <0.1 acre
▲= 0.1 to 1 acre
Cover Class
L = Low (1-5% cover)
M = Moderate (5-25% cover)

N

0 125 250 500
Feet

Vegetation Community Types

1. Poa pratensis/Phleum pratense
3. Carex spp.
4. Salix spp./Carex spp.
5. Juncus spp./Agrostis gigantea
7. Carex spp/Juncus spp.
8. Juncus arcticus

Acreages

Project Area	94.86 acres
Wetlands	88.26 acres
Uplands	6.60 acres

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: Beaverhead Co., MT
PROJ NO: STPX-0001(45)
FILE: BigHole/Veg2012.mxd

Project Name
Big Hole Grazing Association
Wetland Mitigation Site

Drawing Title
2012 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted
Drawn: September 16, 2011
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 3

REV -

Appendix B

2012 Wetland Mitigation Site Monitoring Form
2012 USACE Wetland Delineation Data Form
2012 MDT Functional Assessment Form

2012 MDT Wetland Mitigation Monitoring
Big Hole Grazing Association
Beaverhead County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Big Hole Grazing Assessment Date/Time 7/12/2012 9:18:36 AM

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

Weather: Sunny & warm in am, hot in pm Location: 10 miles southwest of Wisdom, MT

MDT District: Butte Milepost:

Legal Description: T 4S R 16W Section(s) 2

Initial Evaluation Date: 8/6/2008 Monitoring Year: 5 #Visits in Year: 1

Size of Evaluation Area: 95 (acres)

Land use surrounding wetland:

Rangeland, agriculture (hayland), riparian, rural residential

HYDROLOGY

Surface Water Source: Rock Creek, precipitation, springs, high water table

Inundation: ☑ Average Depth: 0.2 **(ft)** Range of Depths: 0-3 **(ft)**

Percent of assessment area under inundation: 60 %

Depth at emergent vegetation-open water boundary: 2 **(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**:**

Surface water, high water table, saturated soils, sediment and drift deposits along Rock Creek, drain patterns through wetland.

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)	
MW-7	0.4	
MW-8	0.3	
MW-4	0.1	
MW-1	0.2	
MW-2	0.3	
MW-3	0.9	
MW-6	0	**(at ground surface)**
MW-5	0	**(at ground surface)**

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 is a slight bit drier in 2012 than in 2010 and 2011 with a reduction in inundation. Extensive areas of saturation sustained by perennially high water table.

VEGETATION COMMUNITIES

Site Big Hole Grazing

(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 # 1 **Community Type:** Poa pratensis / Phleum pratense **Acres:** 6.6

Species	Cover class	Species	Cover class
Achillea millefolium	2	Alopecurus pratensis	3
Castilleja occidentalis	2	Cirsium arvense	1
Elymus repens	2	Hordeum jubatum	1
Iris missouriensis	0	Juncus arcticus	2
Phleum pratense	3	Poa pratensis	4
Potentilla gracilis	1	Ranunculus repens	1
Rumex crispus	0	Sisymbrium altissimum	0
Taraxacum officinale	1	Thlaspi arvense	0
Toxicoscordion venenosum	1		

Comments:

Community # 3 **Community Type:** Carex spp. / **Acres:** 23.89

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis gigantea	1
Alopecurus pratensis	1	Aster sp.	0
Beckmannia syzigachne	0	Calamagrostis scopulorum	0
Carex aquatilis	2	Carex athrostachya	0
Carex nebrascensis	2	Carex utriculata	5
Deschampsia cespitosa	2	Epilobium ciliatum	0
Geum macrophyllum	1	Glyceria striata	2
Hordeum brachyantherum	0	Hordeum jubatum	1
Juncus arcticus	1	Juncus tenuis	0
Lemna minor	0	Mentha arvensis	1
Mimulus guttatus	0	Pedicularis groenlandica	1
Polemonium occidentale	2	Potentilla gracilis	0
Rumex crispus	0	Salix drummondiana	0
Salix lutea	1	Scutellaria galericulata	0
Sisyrinchium montanum	0	Sonchus arvensis	0

Comments:

Community # 4 **Community Type:** Salix spp. / Carex spp. **Acres:** 18.76

Species	Cover class	Species	Cover class
Allium geyeri	1	Alopecurus aequalis	0
Alopecurus pratensis	1	Aster sp.	0
Beckmannia syzigachne	0	Carex athrostachya	1
Carex praegracilis	2	Carex utriculata	3
Castilleja miniata	0	Dasiphora fruticosa	1
Epilobium ciliatum	1	Equisetum arvense	0
Geum macrophyllum	1	Juncus arcticus	2
Myosotis scorpioides	0	Pedicularis groenlandica	0
Populus tremuloides	0	Potentilla gracilis	0
Ribes lacustre	1	Rumex crispus	1
Salix bebbiana	3	Salix exigua	3
Salix lemmonii	3	Salix lutea	1
Senecio sphaerocephalus	0		

Comments:

Community # 5 **Community Type:** Juncus spp. / Agrostis gigantea **Acres:** 12.93

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis gigantea	3
Allium geyeri	0	Alnus incana	0
Alopecurus pratensis	1	Carex praegracilis	1
Carex utriculata	2	Cirsium scariosum	0
Dasiphora fruticosa	1	Epilobium ciliatum	0
Glyceria striata	0	Iris missouriensis	1
Juncus arcticus	3	Juncus effusus	1
Juncus ensifolius	0	Poa palustris	0
Polemonium occidentale	2	Potentilla gracilis	1
Salix exigua	0	Salix lutea	0
Taraxacum officinale	0		

Comments:

Community # 7 **Community Type:** Carex spp. / Juncus sp. **Acres:** 31.71

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis gigantea	0
Allium geyeri	1	Alopecurus pratensis	3
Arnica lanceolata	0	Beckmannia syzigachne	0
Calamagrostis scopulorum	1	Carex athrostachya	0
Carex praegracilis	1	Carex utriculata	4
Castilleja occidentalis	0	Cirsium scariosum	0
Eleocharis palustris	0	Epilobium ciliatum	0
Geum macrophyllum	0	Glyceria striata	3
Juncus arcticus	3	Lupinus polyphyllus	0
Pedicularis groenlandica	0	Poa palustris	0
Potentilla gracilis	0	Ranunculus repens	0
Rumex crispus	0	Senecio sphaerocephalus	1
Senecio sphaerocephalus	2	Sisyrinchium montanum	0
Taraxacum officinale	0	Toxicoscordion venenosum	1
Trifolium pratense	0	Trifolium repens	2

Comments:

Community # 8 **Community Type:** Juncus arcticus / **Acres:** 0.97

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agrostis gigantea	2
Aster sp.	0	Epilobium ciliatum	1
Hordeum brachyantherum	1	Juncus arcticus	4
Poa pratensis	1	Potentilla gracilis	2
Rumex crispus	1	Taraxacum officinale	1
Thlaspi arvense	1	Trifolium repens	1

Comments:

Total Vegetation Community Acreage **94.86**

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

VEGETATION TRANSECTS

Site: Big Hole Grazing Date: 7/12/2012 9:18:36 AM

Transect Number: 1 **Compass Direction from Start:** 5

Interval Data:

Ending Station 550 **Community Type:** Carex spp. / Juncus spp.

Species	Cover class	Species	Cover class
Achillea millefolium	0	Allium geyeri	1
Alopecurus pratensis	1	Aster sp.	1
Calamagrostis scopulorum	0	Carex athrostachya	2
Carex utriculata	2	Eleocharis palustris	1
Glyceria striata	3	Juncus arcticus	4
Phleum pratense	1	Poa palustris	1
Ranunculus repens	1	Rumex crispus	1
Salix exigua	0	Senecio sphaerocephalus	1
Toxicoscordion venenosum	0	Trifolium repens	1

Ending Station 730 **Community Type:** Juncus spp. / Agrostis gigantea

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis gigantea	3
Allium geyeri	0	Alopecurus pratensis	1
Carex praegracilis	1	Carex utriculata	2
Epilobium ciliatum	0	Glyceria striata	0
Juncus arcticus	5	Poa palustris	0
Potentilla gracilis	0	Ranunculus repens	0
Senecio sphaerocephalus	1		

Ending Station 990 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis gigantea	1
Allium geyeri	0	Alopecurus pratensis	2
Carex aquatilis	1	Carex athrostachya	0
Carex utriculata	5	Epilobium ciliatum	0
Geum macrophyllum	0	Juncus arcticus	2
Potentilla gracilis	0	Ranunculus repens	0

Ending Station 1055 **Community Type:** Carex spp. / Juncus spp.

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Carex athrostachya	0
Carex praegracilis	0	Epilobium ciliatum	0
Hordeum brachyantherum	0	Juncus arcticus	5
Potentilla gracilis	0		

Ending Station 1200 **Community Type:** Carex spp. /

Species	Cover class	Species	Cover class
Agrostis gigantea	0	Alopecurus aequalis	0
Alopecurus pratensis	1	Beckmannia syzigachne	1
Calamagrostis scopulorum	0	Carex aquatilis	1
Carex nebrascensis	1	Carex praegracilis	2
Carex utriculata	5	Epilobium ciliatum	0
Glyceria striata	0	Lemna minor	0

Ending Station 1247 **Community Type:** Juncus spp. / Agrostis gigantea

Species	Cover class	Species	Cover class
Agrostis gigantea	3	Alopecurus pratensis	3
Carex praegracilis	2	Carex utriculata	3
Epilobium ciliatum	0	Juncus arcticus	2
Juncus effusus	1	Lemna minor	0

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Big Hole Grazing

Planting Type	#Planted	#Alive	Notes
Red-osier Dogwood	246	0	No live stems observed
Thin-leaf Alder	470	150	Potential alder recruitment at site
Water Birch	245	0	No live stems observed

Comments

Site is too wet for survival of red-oiser dogwood and water birch. Grazing in 2011 may have resulted in the loss of the dogwoods that had remained through 2011 monitoring. These species may also have also been outcompeted by herbaceous forbs and grasses or just not well suited for the cold environment of the Big Hole Valley. Willow recruitment continues along Rock Creek corridor and within comm 4.

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: 10 BB; 4 WDB

How many? 14

Are the nesting structures being used? Yes

Do the nesting structures need repairs? Yes

Nesting Structure Comments:
The wood duck boxes that are leaning from frost heave should be leveled.

Species	#Observed	Behavior	Habitat
American Kestrel	2	FO	UP, WM
American Robin	1	F, L	UP, WM
Great Blue Heron	4	FO	OW, SS, UP, WM
Mallard	1	F	OW
Mountain Bluebird	2	F, N	OW, SS, UP, WM
Red-tailed Hawk	1	FO	UP, WM
Red-winged Blackbird	10	L	OW, SS, WM
Sandhill Crane	2	F, N	WM
Song Sparrow	1	L	UP, WM
Tree Swallow	30	F, FO, N	OW, SS, UP, WM
Western Meadowlark	4	L	OW, SS, UP, WM
Wilson's Snipe	2	FO	OW, SS, UP, WM
Yellow Warbler	2	L	SS, WM
Yellow-headed Blackbird	2	L	SS, UP, WM

Bird Comments

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
Beaver		Yes	No	No	signs of forage
Deer Sp.		Yes	No	No	
Elk or Wapiti		Yes	Yes	No	
Moose		Yes	Yes	No	
Red Fox	1	No	No	Yes	

Wildlife Comments:

Fox den located along northern boundary of site, raised 5 kits in 2012 (landowner sighting). Landowner also observed a mother moose give birth to a calf in the center of the mitigation site the day before Memorial Day. Site is also used extensively by elk.

Big Hole Grazing

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
9410	45.518528	-113.545311	270	PP-1, photo 2
9411	45.518528	-113.545311	0	PP-1, photo 1
9412	45.518528	-113.545311	90	PP-1, photo 3
9413	45.519218	-113.545784	360	PP-2, photo 1
9414	45.519218	-113.545784	270	PP-2, photo 2
9415	45.519218	-113.545784	90	PP-2, photo 3
9417	45.521358	-113.549263	145	PP-4, photo 1
9418	45.521358	-113.549263	120	PP-4, photo 2
9419	45.521358	-113.549263	260	PP-4, photo 3
9420	45.520237	-113.550194	90	PP-5, photo 1
9421	45.520237	-113.550194	160	PP-5, photo 2
9422	45.520237	-113.550194	270	PP-5, photo 3
9426	45.518433	-113.551643	180	PP-6, photo 2
9427	45.518433	-113.551643	315	PP-6, photo 3
9428	45.518433	-113.551643	135	PP-6, photo 1
9432	45.517132	-113.550613	90	PP-7, photo 1
9433	45.517132	-113.550613	270	PP-7, photo 2
9434	45.517132	-113.550613	180	PP-7, photo 3
9437	45.517292	-113.547882	5	Veg tran 1, start
9438	45.520527	-113.548622	185	Veg tran 1, end
9439	45.520527	-113.548622	135	PP-3, photo 1
9440	45.520527	-113.548622	270	PP-3, photo 2
9441	45.520527	-113.548622	320	PP-3, photo 3
9447	45.5217067	-113.547475	45	BH-1
9455	45.51555167	-113.5495816667	165	BH-2

9456	45.515655	-113.5497233333	195	BH-3

Comments:

Big Hole Grazing

ADDITIONAL ITEMS CHECKLIST

Hydrology

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

Photos

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

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

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

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

Were man-made nesting structure installed at this site? Yes

If yes, do they need to be repaired? Yes

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.

The wood duck boxes that are leaning from frost heave should be leveled.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Big Hole Grazing | City/County: Beaverhead | Sampling Date: 7/12/2012

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

Investigator(s): B Sandefur | Section, Township, Range: S 2 T 4S R 16W

Landform (hillslope, terrace, etc.): Lowland | Local relief (concave, convex, none): undulating | Slope (%):

Subregion (LRR): LRR E | Lat: 45.5217067 | Long: -113.547475 | Datum: WGS84

Soil Map Unit Name: Foxgulch-Copperbasin-Wisdom complex

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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:
Data point in veg com 8.

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. Poa palustris	20	☑	FAC
2. Potentilla gracilis	25	☑	FAC
3. Juncus arcticus	40	☑	FACW
4. Carex praegracilis	20	☑	FACW
5. Thlaspi arvense	15	☐	UPL
6. Trifolium repens	10	☐	FAC
7. Hordeum brachyantherum	5	☐	FACW
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	135 = 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: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: BH-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
0-4	10YR 3/2	100					Peat	
4-20	10YR 2/1	100					Clay Loam	Soil color black
20-24	10YR 3/1	95	10YR 4/4	5	C	M	Sandy Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Fluvaquentic Haplocryolls

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☑ Other (Explain in Remarks)

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 ☐

Remarks: No signs of hydro @ surface, high early season water table. Wetland seasonally endo-saturated.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Big Hole Grazing | City/County: Beaverhead | Sampling Date: 7/12/2012

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

Investigator(s): B Sandefur | Section, Township, Range: S 2 T 4S R 16W

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

Subregion (LRR): LRR E | Lat: 45.51555167 | Long: -113.54958167 | Datum: WGS84

Soil Map Unit Name: Wisdom-Shewag complex

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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 on upland side of wetland 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. Phleum pratense	45	☑	FAC
2. Poa pratensis	35	☑	FAC
3. Achillea millefolium	5	☐	FACU
4. Taraxacum officinale	5	☐	FACU
5. Potentilla gracilis	10	☐	FAC
6. Thlaspi arvense	5	☐	UPL
7. Trifolium repens	5	☐	FAC
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	110 = 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)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
Hydrophytic vegetation community present based on FAC indicator status for timothy and KY bluegrass.

SOIL

Sampling Point: BH-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
0-6	10YR 2/2	100					Clay Loam	
6-10	10YR 3/2	100					Clay Loam	
10-15	10YR 4/2	100					Sandy 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:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Oxyaquic Haplocryolls

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☐ No ☑

Remarks:

No redox features identified within soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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 ☑

Remarks: Pnt along upper terrace of Rock Creek, no signs of surface hydro.

WETLAND DETERMINATION DATA FORM – Routine Weltand Delineation, 1987 COE Protocol

Project/Site: Big Hole Grazing | City/County: Beaverhead | Sampling Date: 7/12/2012

Applicant/Owner: MDT | State: MT | Sampling Point: BH-3

Investigator(s): B Sandefur | Section, Township, Range: S 2 T 4S R 16W

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

Subregion (LRR): LRR E | Lat: 45.515655 | Long: -113.549723 | Datum: WGS84

Soil Map Unit Name: Wisdom-Shewag complex

Do Normal Circumstances Exist on this site? Yes ☑

Is the site significantly disturbed (Atypical Situation)? Yes ☐

Is the area a potential Problem Area? Yes ☐

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 4 along Rock Creek corridor.

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: 15ft)			
1. Salix bebbiana	15	☑	FACW
2. Salix exigua	30	☑	FACW
3. Salix lemmonii	10	☐	FACW
4.	0	☐	
5.	0	☐	
	55 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Alopecurus pratensis	35	☑	FAC
2. Mentha arvensis	5	☐	FACW
3. Rumex crispus	5	☐	FAC
4. Carex utriculata	40	☑	OBL
5. Mimulus guttatus	5	☐	OBL
6. Alopecurus aequalis	5	☐	OBL
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	95 = 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: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: BH-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
0-9	10YR 2/1	95	10YR 4/4	5	C	M	Clay Loam	
9-13	10YR 3/1	95	10YR 4/4	5	C	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☑ Listed on Local Soils List
- ☐ Listed on National Soils List
- ☐ Other (explain in remarks)

Taxonomy Subgroup: Oxyaquic Haplocryolls

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators

- ☐ Innundated
- ☑ Saturated in upper 12 inches
- ☐ Water Marks
- ☑ Drift Lines
- ☑ Sediment Deposits
- ☐ Drainage patterns in wetlands

Secondary Indicators (2 or more required)

- ☐ Oxidized Rhizospheres along Living Roots
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☑ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

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): 10

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Big Hole Grazing Assoc. **2. MDT project#** STPX 1(45) **Control#** CN 4668

3. Evaluation Date 7/12/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** All wetlands outside Rock Creek AA

6. Wetland Location(s): **T** 4S **R** 16W **Sec1** 2 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 10020004 **Watershed/County** Upper Missouri Watershed/Beaverhead County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 78.26

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 78.26

☐ **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		Permanent/Perennial	50
Depressional	Scrub-Shrub Wetland		Seasonal/Intermittant	20
Depressional	Emergent Wetland		Seasonal/Intermittant	30

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)

Area managed in conservation easement with no disturbance identified within AA. Abundant willow/woody regeneration within AA.

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

Canada thistle (Cirsium arvensis)

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

AA is a large wet meadow, emergent marsh, and shrub/scrub wetland created/restored by plugging man-made drain ditches. AA does not include Rock Creek channel or corridor. All disturbed areas have revegetated. Wetland acreage within AA has continued to increase with increase water table elevation. A majority of the site was inundated during the site investigation. AA is not grazed or hayed. Land surrounding AA moderately grazed with horses and cattle observed adjacent to AA. Moose and Elk common within AA.

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: Woody regeneration within AA along established willow stands.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species)	○ D ○ S	
Secondary habitat (list Species)	○ D ○ S	
Incidental habitat (list species)	◉ D ○ S	Grizzly bear
No usable habitat	☐ S	

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

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

Sources for documented use US F&WS, ranch manager on-site wldlf observations.

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	
Secondary habitat (list Species)	◉ D ○ S	Great Blue Heron (S3)
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 MTNHP, animals observed on-site

14C. General Wildlife Habitat Rating:

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

Substantial

Substantial (based on any of the following [check]):

- [x] observations of abundant wildlife #s or high species diversity (during any period)
- [x] 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 Remote site with low human disturbance, good connectivity to surrounding habitats. Abundant wildlife observed on site.

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 [x] **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**

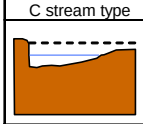
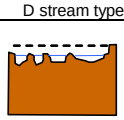
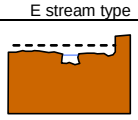
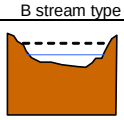
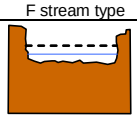
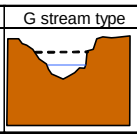
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

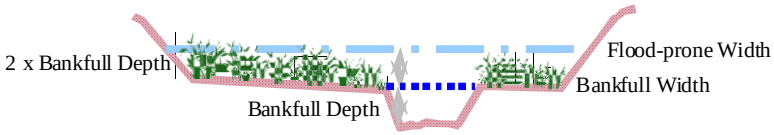
iii. Final Score and Rating: 0 NA **Comments:**

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 / **Bankfull width** = **Entrenchment ratio**

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: AA appeared to store greater than 5 acre feet during investigation as 80-acre site was largely inundated. Site with the potential to store a large quantity of water during spring run-off.

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: Large site with considerable area of inundation present during growing-season site visit.

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

- [x] The AA is a slope wetland
- [x] Springs or seeps are known or observed
- [ ] Vegetation growing during dormant season/drought
- [x] 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
- [x] Shallow water table and the site is saturated to the surface
- [ ] Other:

ii. Recharge Indicators

- [ ] Permeable substrate present without underlying impeding layer
- [x] 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: Known springs along boundary of AA in northwest corner of site.

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: Organic accumulation at soil surface within Carex wetland near spring source.

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:

Permission required to access property.

General Site Notes

Substantial increase in ratings and FU since 2010 due to abundant hydrologic input, improved wildlife habitat, and an increase in wetland acreage.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): All wetlands outside Rock Creek AA

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	23.478	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	46.956	☐
C. General Wildlife Habitat	E	1	1	78.26	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	H	1	1	78.26	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	78.26	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	H	.8	1	62.608	☐
J. Groundwater Discharge/Recharge	H	1	1	78.26	☑
K. Uniqueness	H	.9	1	70.434	☐
L. Recreation/Education Potential (bonus points)	M	.1	NA	7.826	☐
Totals:		6.7	8	524.342	
Percent of Possible Score			**83.75** %		

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 Big Hole Grazing Assoc. **2. MDT project#** STPX 1(45) **Control#** CN 4668

3. Evaluation Date 7/12/2012 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Rock Creek corridor-AA1

6. Wetland Location(s): **T** 4S **R** 16W **Sec1** 2 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed 10020004 **Watershed/County** Upper Missouri Watershed/Beaverhead County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 10

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 10

☐ **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
Riverine	Rock Bottom		Permanent/Perennial	5
Riverine	Emergent Wetland		Permanent/Perennial	20
Riverine	Scrub-Shrub Wetland		Permanent/Perennial	40
Riverine	Scrub-Shrub Wetland		Seasonal/Intermittant	30
Riverine	Aquatic Bed		Permanent/Perennial	5

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)

Natural disturbance within AA includes beaver, elk and moose foraging. No human or livestock disturbance identified during site evaluation.

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

Canada thistle (Cirsium arvensis)

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

AA includes Rock Creek channel and adjacent SS and EM wetland. Land surrounding AA includes undisturbed wetland, pasture, and rangeland.

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: Established willow corridor along creek, regeneration along margins of community. S/S, Emergent, and AB comm.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species)	○ D ○ S	
Secondary habitat (list Species)	○ D ○ S	
Incidental habitat (list species)	◉ D ○ S	Grizzly bear
No usable habitat	☐ S	

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

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

Sources for documented use US F&WS, ranch manager on-site wldlf observations.

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	
Secondary habitat (list Species)	◉ D ○ S	Great blue heron (S3)
Incidental habitat (list species)	◉ D ○ S	Arctic grayling (S1), westslope cutthroat (S2)
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 MTNHP, MFWP-MFISH, animals observed on-site

14C. General Wildlife Habitat Rating:

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

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 species of wildlife observed within AA, including moose, elk, and numerous birds. Sandhill cranes suspected to nest 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** 1 E

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:*

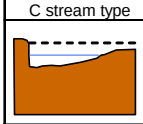
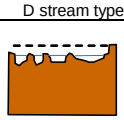
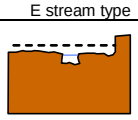
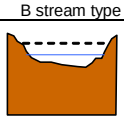
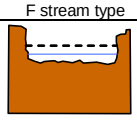
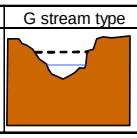
Modifed Rating 1 E

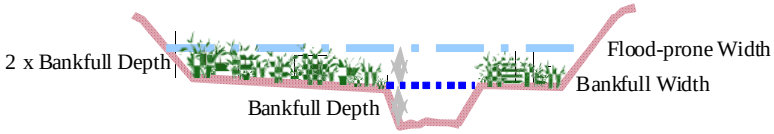
iii. Final Score and Rating: 1 E **Comments:** Excellent cover, abundant pools and undercut banks along stream. Downstream irrigation structure sometimes inhibits fish passage. Grayling and Westslope cutthroat. Tier 1

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 74 **/ Bankfull width** 24 **= Entrenchment ratio** 3.08333333333333

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: D-type channel (numerous channels), well-vegetated with willows and deep-binding roots.

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: Beaver dams/debris jams observed along channel increase water storage within creek.

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: Abundant willows, sedges, and rush along banks of Rock 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: Willows, sedges, and other deep-rooted hydrophytes well-established along streambanks.

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** 1 E

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: Three habitat types present along Rock Creek corridor, including aquatic bed present within creek channel.

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:

Fishing and hunting by permission.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Rock Creek corridor-AA1

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	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	6	☐
C. General Wildlife Habitat	E	1	1	10	☑
D. General Fish Habitat	E	1	1	10	☑
E. Flood Attenuation	H	.9	1	9	☐
F. Short and Long Term Surface Water Storage	H	1	1	10	☐
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	9	☐
H. Sediment/Shoreline Stabilization	H	1	1	10	☑
I. Production Export/Food Chain Support	E	1	1	10	☑
J. Groundwater Discharge/Recharge	H	1	1	10	☐
K. Uniqueness	M	.6	1	6	☐
L. Recreation/Education Potential (bonus points)	M	.1	NA	1	☐
Totals:		9.4	11	94	
Percent of Possible Score			**85.45** %		

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

Appendix C

Project Area Photographs

2012 MDT Wetland Mitigation Monitoring
Big Hole Grazing Association
Beaverhead County, Montana

Photo Point 1 – *Photo 1*
Bearing: North
Location: Veg Com 3
Taken in 2009

Photo Point 1 – *Photo 1*
Bearing: North
Location: Veg Com 3
Taken in 2010

Photo Point 1 – *Photo 1*
Bearing: North
Location: Veg Com 3
Taken in 2011

Photo Point 1 – *Photo 1*
Bearing: North
Location: Veg Com 3
Taken in 2012

Photo Point 1 – *Photo 2* **Location:** Veg Com 5
Bearing: West **Taken in 2009**

Photo Point 1 – *Photo 2* **Location:** Veg Com 5
Bearing: West **Taken in 2010**

Photo Point 1 – *Photo 2* **Location:** Veg Com 5
Bearing: West **Taken in 2011**

Photo Point 1 – *Photo 2* **Location:** Veg Com 5
Bearing: West **Taken in 2012**

Photo Point 1 – *Photo 3* **Location:** Veg Com 6
Bearing: East **Taken in 2009**

Photo Point 1 – *Photo 3* **Location:** Veg Com 6
Bearing: East **Taken in 2010**

Photo Point 1 – *Photo 3* **Location:** Veg Com 6
Bearing: East **Taken in 2011**

Photo Point 1 – *Photo 3* **Location:** Veg Com 6
Bearing: East **Taken in 2012**

Photo Point 2 – *Photo 1*
Bearing: Northwest
Location: Veg Com 3
Taken in 2009

Photo Point 2 – *Photo 1*
Bearing: Northwest
Location: Veg Com 3
Taken in 2010

Photo Point 2 – *Photo 1*
Bearing: Northwest
Location: Veg Com 3
Taken in 2011

Photo Point 2 – *Photo 1*
Bearing: Northwest
Location: Veg Com 3
Taken in 2012

Photo Point 2 – *Photo 2*
Bearing: West
Location: Veg Com 4
Taken in 2009

Photo Point 2 – *Photo 2*
Bearing: West
Location: Veg Com 4
Taken in 2010

Photo Point 2 – *Photo 2*
Bearing: West
Location: Veg Com 4
Taken in 2011

Photo Point 2 – *Photo 2*
Bearing: West
Location: Veg Com 4
Taken in 2012

Photo Point 2 – *Photo 3*
Bearing: East
Location: Veg Com 6
Taken in 2009

Photo Point 2 – *Photo 3*
Bearing: East
Location: Veg Com 6
Taken in 2010

Photo Point 2 – *Photo 3*
Bearing: East
Location: Veg Com 6
Taken in 2011

Photo Point 2 – *Photo 3*
Bearing: East
Location: Veg Com 6
Taken in 2012

Photo Point 3 – *Photo 1*
Bearing: Southeast
Location: Veg Com 5
Taken in 2009

Photo Point 3 – *Photo 1*
Bearing: Southeast
Location: Veg Com 5
Taken in 2010

Photo Point 3 – *Photo 1*
Bearing: Southeast
Location: Veg Com 5
Taken in 2011

Photo Point 3 – *Photo 1*
Bearing: Southeast
Location: Veg Com 5
Taken in 2012

Photo Point 3 – *Photo 2*
Bearing: West
Location: Veg Com 3
Taken in 2009

Photo Point 3 – *Photo 2*
Bearing: West
Location: Veg Com 3
Taken in 2010

Photo Point 3 – *Photo 2*
Bearing: West
Location: Veg Com 3
Taken in 2011

Photo Point 3 – *Photo 2*
Bearing: West
Location: Veg Com 3
Taken in 2012

Photo Point 3 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2009

Photo Point 3 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2010

Photo Point 3 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2011

Photo Point 3 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2012

Photo Point 4 – *Photo 1* **Location:** Veg Com 7
Bearing: Southeast **Taken in 2009**

Photo Point 4 – *Photo 1* **Location:** Veg Com 7
Bearing: Southeast **Taken in 2010**

Photo Point 4 – *Photo 1* **Location:** Veg Com 7
Bearing: Southeast **Taken in 2011**

Photo Point 4 – *Photo 1* **Location:** Veg Com 7
Bearing: Southeast **Taken in 2012**

Photo Point 4 – *Photo 2*
Bearing: Southeast
Location: Veg Com 3
Taken in 2009

Photo Point 4 – *Photo 2*
Bearing: Southeast
Location: Veg Com 3
Taken in 2010

Photo Point 4 – *Photo 2*
Bearing: Southeast
Location: Veg Com 3
Taken in 2011

Photo Point 4 – *Photo 2*
Bearing: Southeast
Location: Veg Com 3
Taken in 2012

Photo Point 4 – *Photo 3*
Bearing: Southwest
Location: Veg Com 1
Taken in 2009

Photo Point 4 – *Photo 3*
Bearing: Southwest
Location: Veg Com 1
Taken in 2010

Photo Point 4 – *Photo 3*
Bearing: Southwest
Location: Veg Com 1
Taken in 2011

Photo Point 4 – *Photo 3*
Bearing: Southwest
Location: Veg Com 1
Taken in 2012

Photo Point 5 – *Photo 1* **Location:** Veg Com 7
Bearing: East **Taken in 2009**

Photo Point 5 – *Photo 1* **Location:** Veg Com 7
Bearing: East **Taken in 2010**

Photo Point 5 – *Photo 1* **Location:** Veg Com 7
Bearing: East **Taken in 2011**

Photo Point 5 – *Photo 1* **Location:** Veg Com 7
Bearing: East **Taken in 2012**

Photo Point 5 – *Photo 2*
Bearing: Southwest
Location: Veg Com 7
Taken in 2009

Photo Point 5 – *Photo 2*
Bearing: Southwest
Location: Veg Com 7
Taken in 2010

Photo Point 5 – *Photo 2*
Bearing: Southwest
Location: Veg Com 7
Taken in 2011

Photo Point 5 – *Photo 2*
Bearing: Southwest
Location: Veg Com 7
Taken in 2012

Photo Point 5 – *Photo 3*
Bearing: Northwest
Location: Veg Com 1
Taken in 2009

Photo Point 5 – *Photo 3*
Bearing: Northwest
Location: Veg Com 1
Taken in 2010

Photo Point 5 – *Photo 3*
Bearing: Northwest
Location: Veg Com 1
Taken in 2011

Photo Point 5 – *Photo 3*
Bearing: Northwest
Location: Veg Com 1
Taken in 2012

Photo Point 6 – *Photo 1*
Bearing: Southeast
Location: Veg Com 3
Taken in 2009

Photo Point 6 – *Photo 1*
Bearing: Southeast
Location: Veg Com 3
Taken in 2010

Photo Point 6 – *Photo 1*
Bearing: Southeast
Location: Veg Com 3
Taken in 2011

Photo Point 6 – *Photo 1*
Bearing: Southeast
Location: Veg Com 3
Taken in 2012

Photo Point 6 – *Photo 2*
Bearing: South
Location: Veg Com 3
Taken in 2009

Photo Point 6 – *Photo 2*
Bearing: South
Location: Veg Com 3
Taken in 2010

Photo Point 6 – *Photo 2*
Bearing: South
Location: Veg Com 3
Taken in 2011

Photo Point 6 – *Photo 2*
Bearing: South
Location: Veg Com 3
Taken in 2012

Photo Point 6 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2009

Photo Point 6 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2010

Photo Point 6 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2011

Photo Point 6 – *Photo 3*
Bearing: Northwest
Location: Veg Com 3
Taken in 2012

Photo Point 7 – *Photo 1*
Bearing: East
Location: Veg Com 7
Taken in 2009

Photo Point 7 – *Photo 1*
Bearing: East
Location: Veg Com 7
Taken in 2010

Photo Point 7 – *Photo 1*
Bearing: East
Location: Veg Com 7
Taken in 2011

Photo Point 7 – *Photo 1*
Bearing: East
Location: Veg Com 7
Taken in 2012

Photo Point 7 – *Photo 2*
Bearing: West
Location: Veg Com 1
Taken in 2009

Photo Point 7 – *Photo 2*
Bearing: West
Location: Veg Com 1
Taken in 2010

Photo Point 7 – *Photo 2*
Bearing: West
Location: Veg Com 1
Taken in 2011

Photo Point 7 – *Photo 2*
Bearing: West
Location: Veg Com 1
Taken in 2012

Photo Point 7 – *Photo 3*
Bearing: South
Location: Veg Com 7
Taken in 2009

Photo Point 7 – *Photo 3*
Bearing: South
Location: Veg Com 7
Taken in 2010

Photo Point 7 – *Photo 3*
Bearing: South
Location: Veg Com 7
Taken in 2011

Photo Point 7 – *Photo 3*
Bearing: South
Location: Veg Com 7
Taken in 2012

Transect 1 – *Start*
Bearing: 5 deg

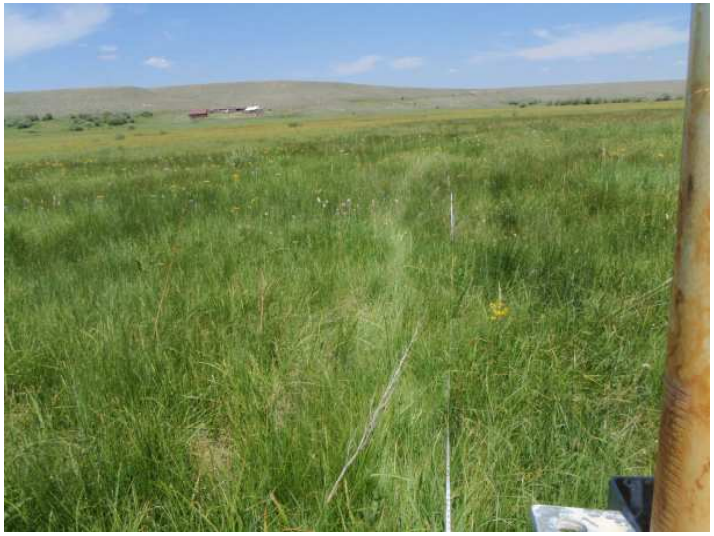
Location: Veg com 1
Taken in 2009

Transect 1 – *Start*
Bearing: 5 deg

Location: Veg com 1
Taken in 2010

Transect 1 – *Start*
Bearing: 5 deg

Location: Veg com 1
Taken in 2011



Transect 1 – *Start*
Bearing: 5 deg

Location: Veg com 1
Taken in 2012

Transect 1– End
Bearing: 185 deg

Location: Veg com 5
Taken in 2009

Transect 1– End
Bearing: 185 deg

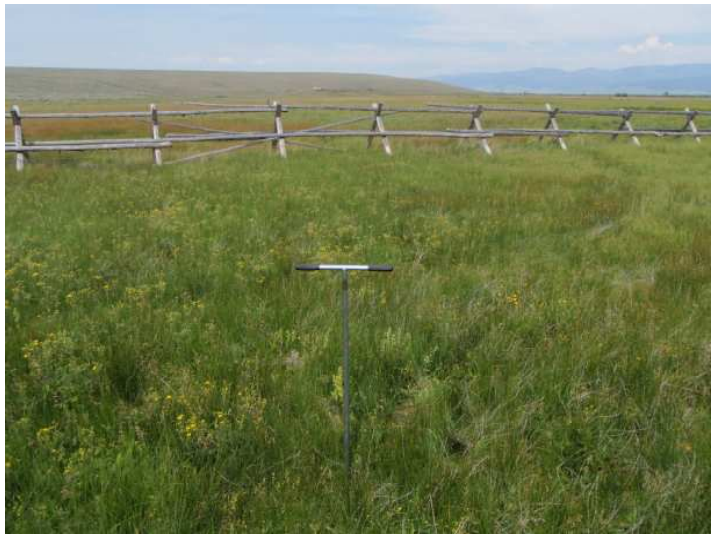
Location: Veg com 5
Taken in 2010

Transect 1– End
Bearing: 185 deg

Location: Veg com 5
Taken in 2011

Transect 1– End
Bearing: 185 deg

Location: Veg com 5
Taken in 2012



BH – 1 **Location:** North boundary
Bearing: **Taken in 2012**

BH – 2 **Location:** Southeast boundary
Bearing: **Taken in 2012**

BH – 3 **Location:** Southeast boundary
Bearing: **Taken in 2012**

Appendix D

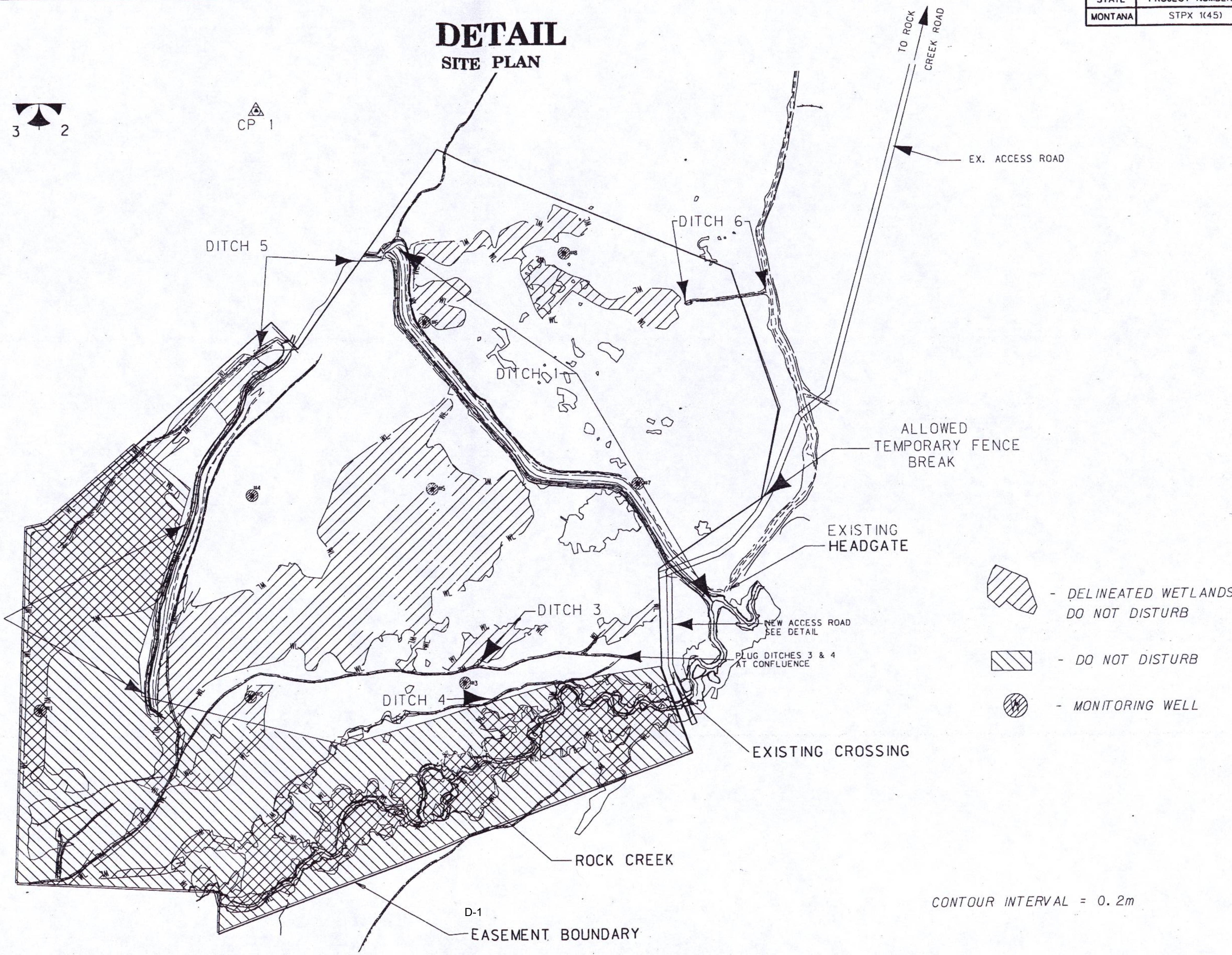
Project Plan Sheets

2012 MDT Wetland Mitigation Monitoring
Big Hole Grazing Association
Beaverhead County, Montana

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPX 1(45)	4

DETAIL

SITE PLAN



LENGTH OF DITCH TO BE FILLED

DITCH #1 = 520m±
DITCH #3 = 3m±
DITCH #4 = 3m±
DITCH #5 = 172m±
DITCH #6 = 82m±

MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

DESIGNED BY
REVIEWED BY
CHECKED BY

m466Brdpln999.dgn
2007
30 PM
PS - U0277