MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2011

DH Ranch
Carbon County, Montana



Prepared for:

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December 2011

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Edger, Carbon County, Montana

MDT Project Number NH-STPP 5(39)

Control Number 5987

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CONFLUENCE

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1. INTRODUCTION

The Wetland Mitigation 2011 Monitoring Report presents the results of the fifth year of wetland monitoring at the DH Ranch wetland mitigation project. This mitigation site was constructed during the spring of 2007 in the east portion of the Upper Yellowstone River watershed (Watershed 13). MDT has acquired approximately 17.4 acres of potential wetland credits from this site through a wetland credit purchase. The site was constructed to provide compensatory mitigation for wetland impacts resulting from MDT highway and bridge reconstruction projects within this watershed.

The DH Ranch mitigation site was constructed on private property owned by Mr. George Duke. The goal of the project was to provide sufficient wetland hydrology to support the creation of 23 acres of palustrine emergent and scrub-shrub wetland within the confines of the site. Approximately 0.38 acres of palustrine emergent and scrub-shrub wetland had been incidentally created along irrigation ditches traversing the site prior to construction.

The project is located at an elevation of approximately 3,430 feet above mean sea level (amsl) in Carbon County, Montana, roughly three miles northeast of Edgar on the eastern floodplain of the Clarks Fork of the Yellowstone River (Figure 1). The site is shown on the Silesia, MT U. S. Geological Survey 7.5 minute topographic quadrangle in the southeast quarter of Section 1, Township 4 South, Range 23 East. The approximate universal transverse Mercator (UTM) coordinates for the central portion of the site are in Zone 12 at 5,041,967 Northing and 669,792 Easting.

Figures 2 and 3 in Appendix A show the site monitoring activity locations and mapped site features, respectively. The MDT Mitigation Site Monitoring Form, US Army Corps of Engineers (USACE) Routine Wetland Determination Data Forms (Environmental Laboratory 1987), and the 2008 MDT Montana Wetland Assessment Forms (Berglund and McEldowney 2008) are included in Appendix B. Representative photographs are included in Appendix C and the Project Plan Sheet is included in Appendix D.

The wetland creation project entailed constructing a series of wetland cells with the water supplied by irrigation return flow and minor contributions from precipitation. Wetland crediting ratios for the site were 1:1 for wetland creation areas and 4:1 for riparian buffers. The site encompasses 27.78 acres that is surrounded by jackleg and barbwire fences.

The approved performance standards are listed below.

1. **Wetland Characteristics**: Sites will develop hydrophytic vegetation, wetland hydrology, and hydric soils as outlined in the

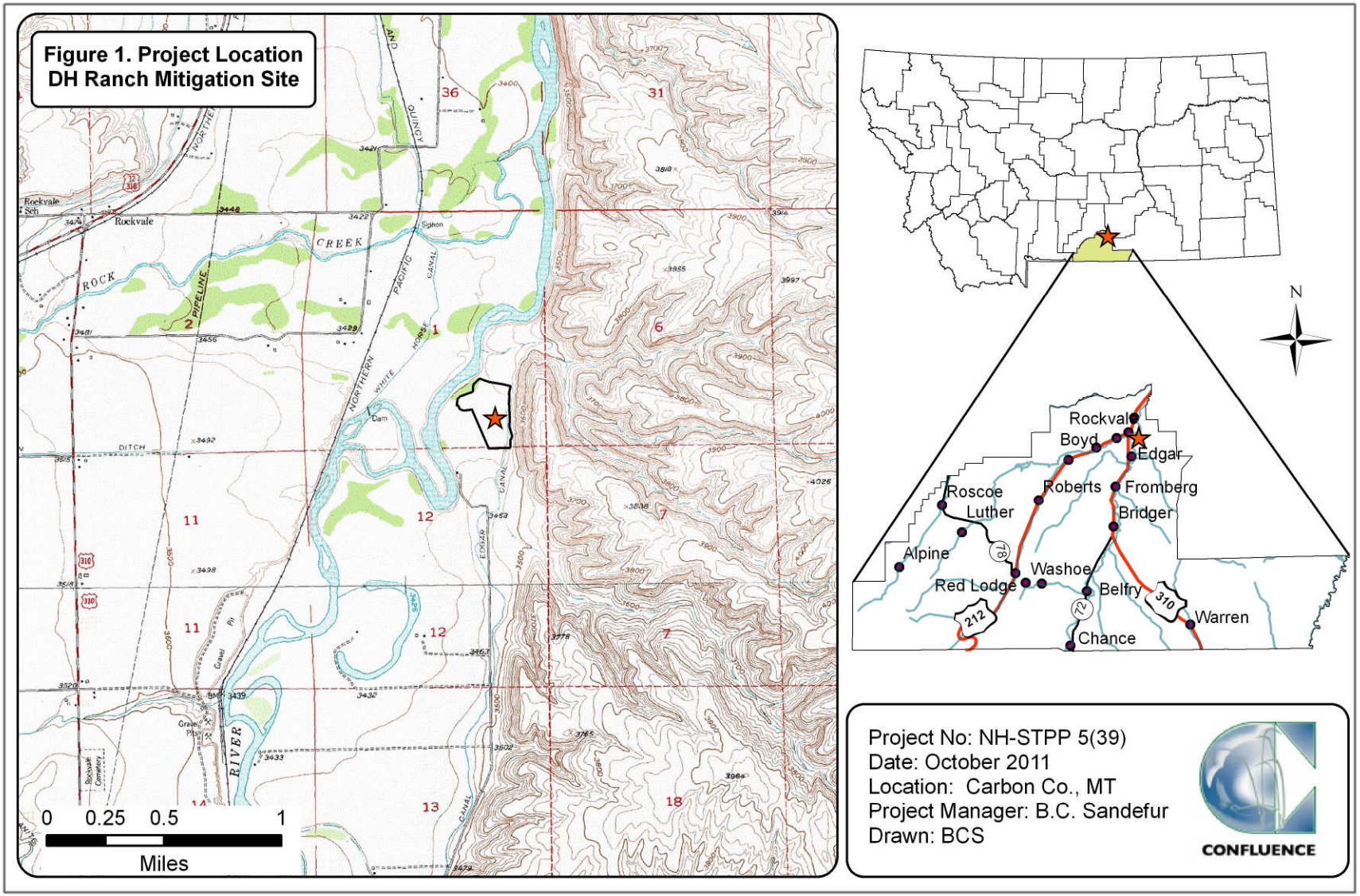


Figure 1. Project Location for DH Ranch Mitigation Site.

1987 USACE Wetland Delineation Manual (Environmental Laboratory 1987) for the Determination of Wetlands

1. **Herbaceous Plants:** Ocular coverage of desirable herbaceous wetland plant species will be at least 80 percent. Except for desirable native emergent wetland species, no species may comprise more than 25 percent of a vegetated layer in a wetland community. Aggressive non-preferred species (such as reed canary grass) may comprise a maximum of 10 percent of any given wetland area.

2. **Hydrology:** Soil saturation will be present for at least 12.5 percent of the growing season (18 days). The requirement for monitoring wells was removed in December 2007.

3. **Open Water:** At the conclusion of the monitoring period, open water (aquatic bed) wetlands will encompass less than 10 percent of the total wetland area and will remain saturated for more than 12.5 percent of the growing season.

4. **Woody Plants:** Woody planting zones (berms) will have a minimum of 1,000 stems per acre.

2. METHODS

The site was monitored on August 10, 2011. Information contained on the Monitoring Form and Wetland Data Form was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity locations were located using a global positioning system (GPS) (Figure 2, Appendix A). Information collected included wetland delineation, wetland/open water/aquatic habitat boundary mapping, vegetation community mapping, vegetation transect monitoring, woody species survival monitoring, soil data collection, hydrology data collection, bird and wildlife use documentation, photographs, functional assessment, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

Technical criteria for wetland hydrology guidelines have been established as “permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (usually 14 days or more or 12.5 percent) during the growing season” (Environmental Laboratory 1987). The growing season is defined for purposes of this report as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit (Environmental Laboratory 1987). The growing season recorded for the meteorological station at Joliet, Montana (244506), extends from May 5 through September 29, approximately 146 days (USDA 2002). Areas defined as wetlands would require 18 days of inundation or

saturation within 12 inches of the ground surface to meet the wetland hydrology criteria.

Hydrological indicators as outlined on the Wetland Data Form were documented at four points established within the project area. 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 allowed evaluation of mitigation goals addressing inundation/saturation requirements. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded electronically on the Wetland Data Form (Appendix B).

2.2. Vegetation

The boundaries of general dominant species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2011 aerial photograph. The 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 (greater than 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure 3, Appendix).

Temporal changes in vegetation were evaluated through annual assessments of a static belt transect. The transect location is shown on Figure 2 (Appendix A). Vegetation composition was assessed and recorded on one vegetation belt transect approximately 10 feet wide and 590 feet long running west to east in the southern portion of the site. The transect location was recorded with a GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent cover of each vegetation species within the transect interval was estimated using the same cover ranges listed for the community polygon data (Appendix B). Photographs were taken at the endpoints of the transect during the monitoring event (Appendix C).

The location of noxious weeds was noted in the field and mapped on the aerial photo (Figure 3, Appendix A). The noxious weed species identified were color-coded. The locations are denoted with the symbol "**X**", "▲", or "■" representing 0 to 0.1 acre, 0.1 to 1.0 acre, or 1.0 acre to 5 acres in extent, respectively. Cover classes listed on Figure 3 (Appendix A) are represented by T, L, M, or H, corresponding to less than 1 percent, 1 to 5 percent, 2 to 25 percent, and 25 to 100 percent, respectively

Containerized woody species were planted at the mitigation site. Survival of individual plants has been assessed annually.

2.3. Soil

Soil information was obtained from the *Soil Survey for Carbon County* and *in situ* soil descriptions (USDA 2010). Soil cores were excavated using a hand auger

and evaluated according to procedures outlined in the 1987 Wetland Manual. A description of the site soils is included on the Wetland Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the US including jurisdictional wetlands and special aquatic sites were delineated throughout the project area in accordance with criteria established in the 1987 Wetland Manual. In order to delineate a representative area as wetland, the technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology, as described in the 1987 Manual, must be satisfied. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Great Plains Region 4 (Reed 1988). A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate wetland areas within the project boundaries. The information was recorded electronically on the Wetland Data Form (Appendix B).

Consultation with the USACE determined that the 1987 Wetland Manual should continue to be used at this site where baseline wetland conditions had been established prior to 2008. The use of the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains 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 a special aquatic site, an atypical situation, or a problem area. The wetland boundary was identified on the 2011 aerial photography. Wetland areas reported were estimated using geographic information system (GIS) methodology.

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the Mitigation Monitoring Form during the site visit. Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded (Appendix B). Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A list of wildlife species observed from 2007 to 2011 list was compiled.

2.6. Functional Assessment

Pre-construction and 2007 conditions were assessed using the 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999). Wetland functions for 2008 through 2011 were assessed using the 2008 MWAM (Berglund & McEldowney 2008). Field data for the assessment were collected

during the site visit. A Wetland Assessment Form was completed for each wetland or group of wetlands [Assessment Areas (AA)] (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provides supplemental information documenting the wetland and upland conditions, trends, current land use surrounding the site, and the vegetation transects. Photographs were taken at established photo 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 2011 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. The collected data were transferred to a personal computer, exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto an aerial photograph, then digitized. Site features and survey points that were mapped included fence boundaries, photograph points, transect beginnings and endings, wetland boundaries, and vegetation community boundaries.

2.9. Maintenance Needs

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

3. RESULTS

3.1. Hydrology

Average total annual precipitation recorded at the Joliet station, Montana (244506), was 14.96 inches for the period of record from September 1951 to December 2010 (WRCC 2011). The total precipitation in 2010 was 13.25 inches, 1.71 inches below the 59 year average. Monthly precipitation from January to June totaled 7.68 and 14.57 inches in 2010 and 2011 (NCDC), respectively. Cumulative precipitation from January to June 2011 was 1.32 inches greater than the total precipitation in 2010.

Irrigation return flow from the Edgar Canal operated by the Orchard Canal Company is the primary source of water at the DH Ranch mitigation site. The irrigation flow enters the mitigation site from the south. There is an outfall structure located in the northeast corner of the site that discharges to a forested riparian area along the Clarks Fork of the Yellowstone River. Surface water was present at various levels within all of the wetland cells during the field investigation (Figure 3, Appendix A). Water depths ranged from 0.0 to 3.0 feet, with an average of 1.2 feet. The approximate depth at the emergent vegetation and open water boundary was 0.8 feet. Wetland areas that were not inundated

were generally saturated within 12 inches (1.0 foot) of the ground surface (see discussion below). Approximately 75 percent of the assessment area was inundated at the time of the field survey.

Four data points DH-1, DH-2, DH-3, and DH-4 were used to define the wetland and upland boundaries. The data points are shown on Figure 2 (Appendix A). Only data point DH-3 was located in an area that met the three wetland criteria. The primary indicators of wetland hydrology at DH-3 were 3 inches of surface water, saturation within 12 inches of the ground surface, water marks, and drainage patterns in the wetland. There were no hydrologic indicators observed at data points DH-1, DH-2, and DH-4, which were located in upland communities.

3.2. Vegetation

A comprehensive list of 100 vegetation species identified on the site from 2007 to 2011 is presented in Table 1 and by community type on the Monitoring Form (Appendix B). Figure 3 (Appendix A) defines the vegetation community polygons and wetland and upland areas. Construction of the site was completed in July 2007. Invasive plants species such as cheatgrass (*Bromus tectorum)* dominated a majority of the mitigation area prior to construction.

Nine dominant community types, six wetland and three upland, were identified at the site in 2011 and include Type 1 – *Scirpus acutus/Typha latifolia* Wetland, Type 2 – *Typha latifolia/Scirpus* spp. Wetland, Type 4 – *Hordeum jubatum/Festuca pratensis* Upland, Type 5 – Aquatic Macrophytes/Algae, Type 6 – *Salix amygdaloides* Wetland, Type 11 –*Alopecurus arundinaceus* Wetland, Type 12 – *Hordeum jubatum/Bromus inermis* Upland, Type 14 – *Bromus japonicas/Chrysothamnus nauseousus* Upland, and Type 15 – *Populus deltoides/Alopecurus arundinaceus* Wetland. The community types are detailed below. Dominant species are listed in descending order of abundance for each vegetation community type.

Community Types 1 and 2 are cattail and bulrush communities that were associated with open water areas in 2010. Community Types 1 and 2 persisted in 2011 although the vegetation in some areas of the community transitioned to Type 11. The 2010 open water community was reclassified as an aquatic bed wetland based on the dominance of aquatic macrophytes and algae. Foxtail barley (*Hordeum jubatum*) dominated upland community Types 4 and 12, along with meadow fescue (*Festuca pratensis)* and smooth brome (*Bromus inermis*), respectively. Creeping foxtail (*Alopecurus arundinaceus*) persisted in community Types 11 and 15.

Wetland community Type 1 – *Scirpus acutus/Typha latifolia* was identified in three small areas located near the east and west boundaries and in the central section of the site. Dominant species included hard-stem bulrush (*Scirpus*

Table 1. Vegetation species identified from 2007 to 2011 at the DH Ranch Wetland Mitigation Site.

SCIENTIFIC NAME	COMMON NAME	REGION 4 INDICATOR STATUS[1]
Achillea millefolium	yarrow,common	FACU
Agropyron cristatum	**crested wheatgrass**	**NL**
Agropyron repens	quackgrass	FAC
Agropyron smithii	wheatgrass,western	FACU
Algae, green	**algae, green**	**NL**
Alopecurus arundinaceus	foxtail,creeping	NI
Alyssum alyssoides	pale madwort	NL
Ambrosia psilostachya	**ragweed,naked-spike**	**FAC**
Ambrosia sp.		NL
Ambrosia trifida	ragweed,great	FAC
Artemisia cana	sagebrush,silver	FACU
Asclepias fascicularis	milkweed,narrow-leaf	NO
Asclepias speciosa	milkweed,showy	FAC
Asclepias spp.		NL
Asparagus officinalis	asparagus-fern,garden	FACU
Aster sp.		NL
Atriplex canescens	saltbush,four-wing	FACU-
Bromus inermis	smooth brome	NL
Bromus japonicus	brome,Japanese	FACU
Bromus tectorum	cheatgrass	NL
Capsella bursa-pastoris	purse,common shepherd's	FACU
Carduus nutans	**musk thistle**	**NL**
Carex sp.		NL
Carex stricta	sedge,uptight	OBL
Carex utriculata*	**beaked sedge**	**OBL**
Carex vulpinoidea	sedge,fox	OBL
Chenopodium album	goosefoot,white	FAC
Chrysothamnus nauseousus	rubber rabbitbrush	NL
Cirsium arvense	thistle,Canada	FACU
Convolvulus arvensis	field bindweed	NL
Cynoglossum officinale	gypsy-flower	NL
Deschampsia cespitosa	hairgrass,tufted	FACW
Distichlis spicata	saltgrass,seashore	NI
Echinochloa muricata	grass,rough barnyard	OBL
Elaeagnus angustifolia	olive,russian	FAC-
Eleocharis palustris	spikerush,creeping	OBL
Elymus trachycaulus	slender wheatgrass	NL
Epilobium sp.		**NL**
Festuca arundinacea	fescue,Kentucky	NI
Festuca pratensis	fescue,meadow	FAC
Grindelia squarrosa	gumweed,curly-cup	UPL
Hordeum jubatum	barley,fox-tail	FACW

[1]Region 4 Great Plains (Reed 1988).
New species identified in 2011 are show in **bold** type.
***Commonly accepted name not included on the 1988 list.

Table 1 (Continued). Vegetation species identified from 2007 to 2011 at the DH Ranch Wetland Mitigation Site.

SCIENTIFIC NAME	COMMON NAME	REGION 4 INDICATOR STATUS[1]
Juncus balticus	rush,Baltic	OBL
Juncus bufonius	rush,toad	OBL
Juncus effusus	rush,soft	OBL
Juncus nevadensis	rush,Sierra	NO
Kochia scoparia	summer-cypress,Mexican	FAC
Lactuca serriola	lettuce,prickly	FACU
Lemna minor	**duckweed,lesser**	**OBL**
Lepidium perfoliatum	pepper-grass,clasping	FACU
Medicago sativa	alfalfa	NL
Melilotus alba	sweetclover,white	FACU-
Melilotus sp.		NL
Mentha arvensis	mint,field	FACW
Nepeta cataria	**catnip**	**FACU**
Panicum virgatum	switchgrass	FAC
Phalaris arundinacea	grass,reed canary	FACW+
Phleum pratense	timothy	FACU
Plantago major	plantain,common	FAC
Poa pratensis	bluegrass,Kentucky	FACU
Polygonum amphibium	**smartweed,water**	**OBL**
Polygonum sp.		NL
Populus deltoides	cotton-wood,eastern	FAC
Potentilla anserina	silverweed	OBL
Rhus trilobata	sumac,smooth	NI
Ribes sp.		**NL**
Rosa multiflora	**rose,multiflora**	**NI**
Rosa woodsii	rose,Woods	FACU
Rumex crispus	dock,curly	FACW
Ruppia sp.	**widgeonweed**	**NL**
Salix amygdaloides	willow,peach-leaf	FACW
Salix exigua	willow,sandbar	FACW+
Salix sp.		NL
Sarcobatus vermiculatus	greasewood,black	FACU
Scirpus acutus	bulrush,hard-stem	OBL
Scirpus cyperinus	wool-grass	OBL
Scirpus maritimus	bulrush,saltmarsh	NI
Scirpus microcarpus	bulrush,small-fruit	OBL
Scirpus pallidus	bulrush,cloaked	OBL
Scirpus pungens	bulrush,three-square	OBL
Scirpus validus	**bulrush,soft-stem**	**OBL**
Shepherdia argentea	**silver buffaloberry**	**NL**
Shepherdia canadensis	buffalo-berry,Canada	NI
Sisymbrium altissimum	mustard,tall tumble	UPL
Solanum dulcamara	**nightshade,climbing**	**FACU**

[1]Region 4 Great Plains (Reed 1988).
New species identified in 2011 are show in **bold** type.

Table 1 (Continued). Vegetation species identified from 2007 to 2011 at the DH Ranch Wetland Mitigation Site.

SCIENTIFIC NAME	COMMON NAME	REGION 4 INDICATOR STATUS[1]
Solanum sp.		NL
Sonchus arvensis	**sowthistle,field**	**FAC**
Spartina pectinata	cordgrass,prairie	FACW
Sporobolus airoides	sacaton,alkali	FAC
Symphoricarpos albus	snowberry	FACU-
Taraxacum officinale	dandelion,common	FACU
Thlaspi arvense	penny-cress,field	NI
Tragopogon dubius	yellow salsify	NL
Trifolium hybridum	clover,alsike	FACU
Trifolium pratense	clover,red	FACU
Trifolium repens	clover,white	FACU
Typha angustifolia	cattail,narrow-leaf	OBL
Typha latifolia	cattail,broad-leaf	OBL
Verbascum thapsus	common mullein	NL
Verbena bracteata	vervain,prostrate	FACU
Verbena hastata	**vervain,blue**	**FACW**
Veronica sp.		NL
Vicia sativa	vetch,common	FACU

[1]Region 4 Great Plains (Reed 1988).
New species identified in 2011 are show in **bold** type.

acutus), broad-leaf cattail (*Typha latifolia*), and creeping foxtail (*Alopecurus arundinaceus*). There was 1 to 5 percent cover of creeping spikerush (*Eleocharis palustris*) and saltmarsh bulrush (*Scirpus maritimus*).

Wetland community Type 2 – *Typha latifolia/Scirpus* spp was found in larger, isolated wetlands across the site. It was interspersed with other communities throughout the site, including Types 1 and 11. The community was dominated by broad-leaf cattail, hard-stem bulrush, and creeping spikerush, creeping foxtail, and rough barnyard grass (*Echinochloa muricata*).

Upland community Type 4 – *Hordeum jubatum/Festuca pratensis* was found primarily in the northwest and southeast outer perimeters of the site. Dominant species were foxtail barley and meadow fescue. Japanese brome (*Bromus japonicus*), Western wheatgrass (*Agropyron smithii*), and white sweetclover (*Melilotus alba*) occurred in lesser amounts.

Wetland community Type 5 – Aquatic macrophytes/algae replaced the open water community of 2010. This aquatic bed community is generally defined as a wetland class dominated by plants "that grow principally on or below the surface of the water for most of the growing season in almost all years (Cowardin et al. 1979)." The Montana Natural Heritage Program (MTNHP) website further defines the Palustrine Aquatic Bed Class (PAB) as having aquatic plants at greater than 30 percent cover and water depths of greater than 0.5 meters (and

less than 2 meters) (MTNHP 2011). This community contained 21 to 50 percent green algae and 11 to 20 percent wigeongrass (*Ruppia* sp.).

Wetland Type 6 - *Salix amygdaloides* (peach-leaf willow) dominated the woody overstory in an isolated strip of trees and shrubs located in the northwest quarter of the site. Creeping foxtail and hard-stem bulrush were present in lesser amounts across the community.

Wetland community Type 11 – *Alopecurus arundinaceus* (creeping foxtail) was found in the west and southwest portions of the mitigation area. Creeping spikerush, foxtail barley, and Baltic rush dominated the herbaceous species. Alkali sacaton (*Sporobolus airoides*) was present at 1 to 5 percent coverage. The Montana Natural Heritage Program (MTNHP) classifies the *Alkali sacaton Southern Plains Grassland* community type as "S2- at risk" based on very limited and/or declining numbers, range, and/or habitat, making it vulnerable to extirpation in the state. The decline for this species at the DH Ranch location is likely the result of natural succession following increased inundation and saturation levels at the site.

Upland community Type 12 – *Hordeum jubatum/Bromus inermis* was identified on a small berm located between two wetland areas near the southwest boundary. Dominant species in the community were foxtail barley and smooth brome. Japanese brome, white sweet clover, and meadow fescue occurred in lesser amounts within the community.

Upland community Type 14 – *Bromus japonicas/Chrysothamnus nauseousus* was identified in an area on the north project boundary. Japanese brome, rubber rabbit bush (*Chrysothamnus nauseousus*), Western wheatgrass, silver sagebrush (*Artemisia cana*), and crested wheatgrass (*Agropyron cristaum*) contributed to the vegetative cover.

The transect length measured in 2010 and 2011 was 590 feet versus 645 feet in 2007 through 2009. Data collected along the transect is summarized in Table 2 and graphed on Charts 1 and 2. The transect location is illustrated on Figure 2 (Appendix A) and the data is presented on the Monitoring Form (Appendix B). Transect endpoints photographed in 2009, 2010, and 2011 are shown in Appendix C.

Table 2. Transect 1 data summary from 2007 to 2011.

Monitoring Year	2007	2008	2009	2010	2011
Transect Length (feet)	645	645	645	590	590
# Vegetation Community Transitions along Transect	9	12	10	10	7
# Vegetation Communities along Transect	3	5	4	5	5
# Hydrophytic Vegetation Communities along Transect	2	4	3	4	3
Total Vegetative Species	39	47	34	34	33
Total Hydrophytic Species	20	15	18	18	16
Total Upland Species	19	32	16	16	17
Estimated % Total Vegetative Cover	50	66	78	80	80
% Transect Length Comprising Hydrophytic Vegetation Communities	88.4	90	91	92.4	92.4
% Transect Length Comprising Upland Vegetation Communities	11.6	10	9	7.6	7.6
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Bare Substrate	0	0	0	0	0

The transect traversed the site from east to west along the south portion of the project area. The transect intersected wetland community Types 1 and 2, and upland community Types 4, 11, and 12 (Appendix B). Hydrophytic species dominated 92.4 percent of the transect interval. The transect was inundated in several locations. There was no change in the percentage of wetland and upland communities from 2010 to 2011. Two vegetation areas along the transect interval transitioned in 2011. One area was remapped as Type 11 – *Alopecurus* wetland based on the dominance of creeping meadow foxtail in this community, although *Typha* and *Scirpus* both exhibited between six and ten percent cover each along this interval. A 38 foot interval identified as Type 9-*Alopecurus*/*Eloecharis* wetland in 2010 transitioned to Type 2 – *Typha*/*Scirpus* wetland in 2011, likely a response to the inundated conditions observed in this community during the site investigation.

The location of infestations of Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and salt cedar (*Tamarix* spp.), Priority 2B weeds, were mapped on Figure 3 (Appendix A). Infestations of Canada thistle were identified at 8 locations across the site, ranging in size from less than 0.1 acre to 1 acre. The weed cover within the infestations ranged from 1 percent to 100 percent. Field bindweed was identified in 3 separate infestations across the project site. The size of the infestations ranged from less than 0.1 acre to between 0.1 and 1.0 acre. The cover class was trace to moderate. A single stem of salt cedar was found along the northeastern edge of the project area. Removal of the salt cedar was unsuccessfully attempted.

The number of woody plants observed onsite decreased from 315 (the total number planted) in 2007 to 13 in 2011. Buffaloberry (*Shepherdia argentea*) stems were identified along the vegetation transect within community 2. Volunteer woody species establishing on the site included cottonwood and willows, particularly along the inlet channel and within community Type 6.

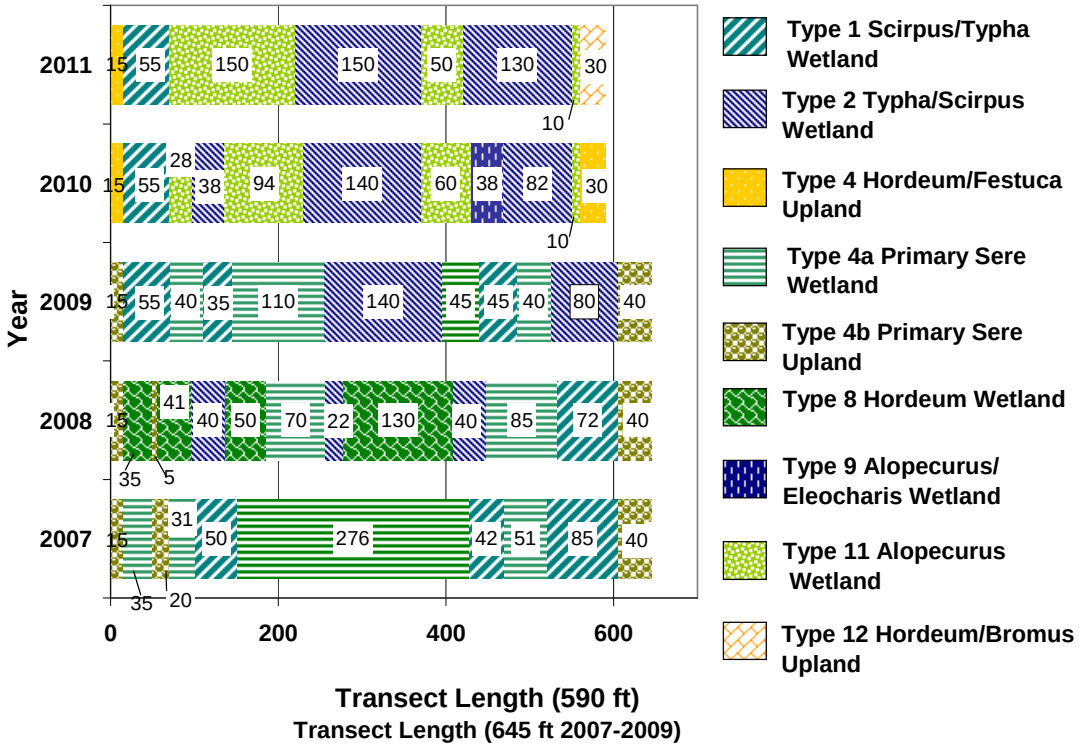


Chart 1. Transect map showing vegetation communities from transect beginning (0 feet) to end (590 feet in 2010 and 2011, 645 feet in 2007 to 2009).

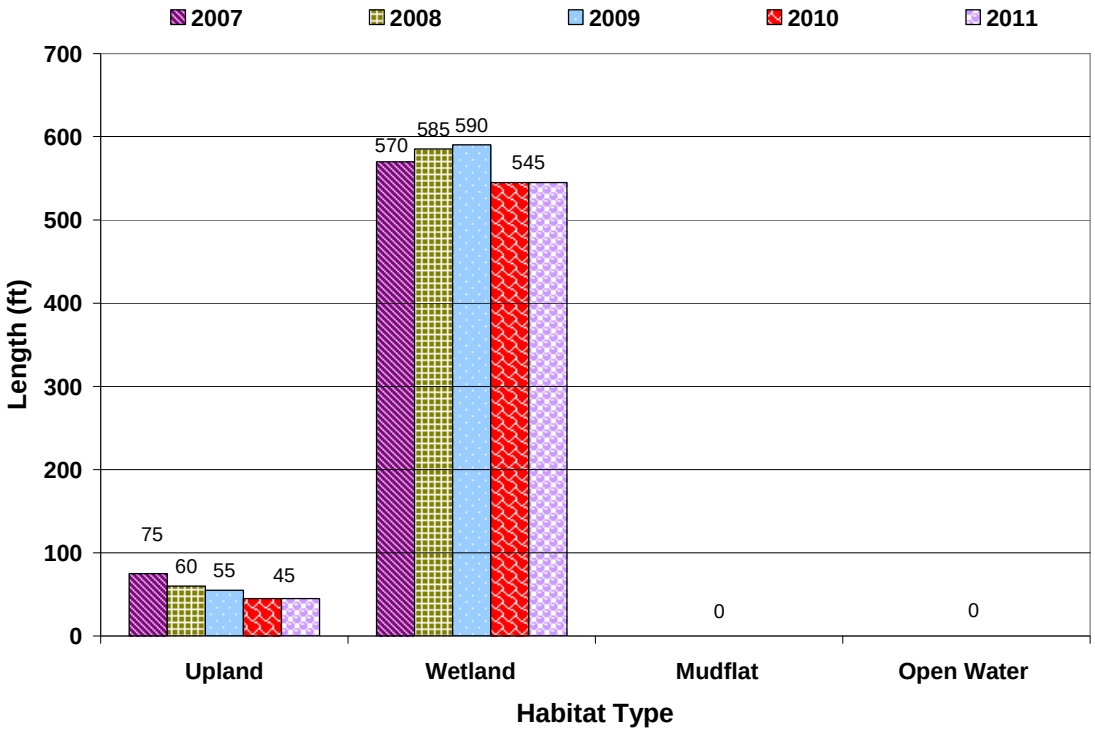


Chart 2. Length of transect communities within Transect 1 from 2007 to 2011.

3.3. Soil

The predominant soil complex across the site, the Heldt silty clay loam is found on 0 to 8 percent slopes. These soils are formed in alluvial parent material and found on alluvial fans and stream terraces. This moderately well drained, non-hydric soil is taxonomically classified as a fine, smectitic, mesic Ustertic Haplocambid. The test pit soils did not confirm the mapped unit.

Four test pits DH-1, DH-2, DH-3, and DH-4 were used to define the wetland boundary and to characterize soils. The test pits are shown on Figure 2 (Appendix A). Test pit DH-3 was located in an area that met the three wetland criteria. Test pits DH-1, DH-2, and DH-4 were located in areas that met the hydric soil criteria, but lacked vegetative and hydrologic characteristics for wetland determination. Test pits DH-1, DH-2, and DH-4 were located in areas that appeared to support a high water table based on water levels observed during the site survey, yet were not considered wetlands based on criteria in the 1987 Manual. The soil profile at DH-1 and DH-3 revealed dark gray (10 YR 4/1) silt loam and clay soils, respectively. The soil at DH-1 exhibited redoximorphic depletions (10 YR 2/2) within the matrix. The profile at DH-3 exhibited redox concentrations (10 YR 4/6) within the matrix. Profile DH-2 displayed a dark gray (10YR 4/1) silty clay soil, with redoximorphic depletions (10 YR 2/2) present in the matrix. Soil profile DH-4 was characterized by a very dark grayish brown (10YR 3/2) silty clay soil with redox concentrations (10 YR 4/4) in the matrix. Low-chroma colors provided a positive indication of hydric soil at all four locations.

3.4. Wetland Delineation

Table 3 summarizes the wetland acreages delineated in 2011. The wetland boundaries are shown on Figure 3 (Appendix A). Four data points were used to characterize the vegetation, soil, and hydrology of site wetlands (DH-1 through DH-4, Figure 2, Appendix A; Wetland Data Forms, Appendix B). One data point, DH-3, was located within an area that met the three wetland criteria. The other three data points were located in uplands in close proximity to standing water to determine if these areas had transitioned into wetland status. The August 2011 delineation identified 20.00 acres of wetlands. The 2010 open water community was reclassified as an aquatic bed wetland class in 2011. There was a slight increase (0.03 acres) in the wetland acreage along the south boundary of the site where a portion of upland community Type 4 transitioned to wetland community Type 11.

Table 3. Total aquatic habitat delineated from 2007 to 2011.

Aquatic Habitat	2005 (baseline)	2007	2008	2009	2010	2011
Open Water (acres)	0.00	5.39	6.05	3.18	3.07	0.00
Wetland (acres)	0.57	11.31	11.39	15.25	16.90	20.00
Total Aquatic Habitat (acre)	0.57	16.70	17.44	18.43	19.97	20.00

3.5. Wildlife

Table 4 lists the wildlife species identified from 2007 to 2011 at the mitigation site. Twenty-nine bird species, three amphibians, seven mammals, and two reptiles have been observed since 2007. Seven bird species were observed in 2011 (listed in bold type in Table 4). Whitetail deer (*Odocoileus* virginianus), black-tailed prairie dogs (*Cynomys ludovicianus*), and northern leopard frogs (*Rana pipens*) were also identified in 2011.

Table 4. Wildlife species observed from at the DH Ranch mitigation site from 2007 to 2011.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIAN	
Northern Leopard Frog	***Rana pipiens***
Woodhouse's Toad	*Bufo woodhousii*
Unidentified toad	
BIRD	
American Goldfinch	*Spinus tristus*
American Robin	***Turdus migratorius***
American White Pelican	*Pelecanus erythrorhynchos*
Bald Eagle	*Haliaeetus leucocephalus*
Barn Swallow	***Hirundo rustica***
Blue-winged Teal	*Anas discors*
Canada Goose	*Branta canadensis*
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	*Tyrannus tyrannus*
Golden Eagle	***Aquila chrysaetos***
Grasshopper Sparrow	*Ammodramus savannarum*
Gray Catbird	*Dumetella carolinensis*
Greater Yellowlegs	*Tringa melanoleuca*
Killdeer	*Charadrius vociferus*
Lesser Yellowlegs	*Tringa flavipes*
Mallard	***Anas platyrhynchos***
Mourning Dove	***Zenaida macroura***
Osprey	*Pandion haliaetus*
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-necked Pheasant	*Phasianus colchicus*
Rock Pigeon	*Columba livia*
Sandhill Crane	***Grus canadensis***
Solitary Sandpiper	*Tringa solitaria*
Song Sparrow	*Melospiza melodia*
Spotted Sandpiper	*Actitis macularius*
Western Kingbird	*Tyrannus verticalis*
Wild Turkey	*Meleagris gallopavo*
Willow Flycatcher	*Empidonax traillii*
Wilson's Snipe	*Gallinago delicata*
Yellow Warbler	*Dendroica petechia*

Species identified in 2011 are listed in **bold** type.

Table 4 (continued). Wildlife species observed at the DH Ranch mitigation site from 2007 to 2011.

COMMON NAME	SCIENTIFIC NAME
MAMMAL	
Black Bear	*Ursus americanus*
Black-tailed Prairie Dog	***Cynomys ludovicianus***
Moose	*Alces americanus*
Mountain Cottontail	*Sylvilagus nuttallii*
Raccoon	*Procyon lotor*
Striped Skunk	*Mephitis mephitis*
White-tailed Deer	***Odocoileus virginianus***
REPTILE	
Plains Gartersnake	*Thamnophis radix*
Rattlesnake	*Crotalus sp.*

Species identified in 2011 are listed in **bold** type.

3.6. Functional Assessment

Pre-construction and 2007 wetland conditions were assessed using the 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999). Functions were assessed from 2008 through 2011 using the 2008 MWAM (Berglund and McEldowney 2008). The 2005 baseline and 2007 through 2011 functional assessments are summarized for general comparison in Table 5. The 2011 wetland assessment form is presented in Appendix B.

The mitigation site was evaluated as a single AA, consistent with previous years. The AA received a Category II rating with 71 percent of the total, and increase of 5 percent from 2010. The wetland received excellent marks for general wildlife habitat and production export/food chain support, and high marks for short and long term surface water storage, sediment/nutrient/toxicant removal, and sediment/shoreline stabilization. The ratings were higher in 2011 than 2010 for general wildlife habitat, sediment/nutrient/toxicant removal, uniqueness, and recreation/education potential.

3.7. Photo Documentation

Representative photographs taken from photo points and transect endpoints are provided in Appendix C. Photo points PP1 through PP5 and the transect end points photographed in 2009, 2010, and 2011 are shown on pages C-1 to C-13 and C-14, respectively, in Appendix C. The data points are included on page C-15 of Appendix C.

Table 5. Summary of 2005 (baseline) through 2011 wetland functions, value ratings, and functional points at the DH Ranch Wetland Mitigation Site.

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2005 Baseline	2007[1]	2008[2]	2009[2]	2010[2]	2011[2]
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Mod (0.6)	High (1.0)	Mod (0.7)	Mod (0.6)
General Wildlife Habitat	Mod (0.5)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	Exc. (1.0)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	NA
Flood Attenuation	NA	NA	NA	NA	NA	NA
Short and Long Term Surface Water Storage	Low (0.3)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	NA	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (1.0)
Sediment/Shoreline Stabilization	High (0.9)	Low (0.3)	Low (0.3)	Mod (0.7)	High (1.0)	High (1.0)
Production Export/Food Chain Support	Mod (0.5)	High (0.9)	High (1.0)	High (1.0)	Exc(1.0)	Exc. (1.0)
Groundwater Discharge/Recharge	NA	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
Uniqueness	Mod (0.4)	Low (0.3)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.6)
Recreation/Education Potential (bonus points*)	Low (0.1)	Low (0.1)	Low (0.05)	Low (0.05)	Low (0.05)	Mod (0.1)
Actual Points / Possible Points	**2.8 / 8**	**4.4 / 10**	**5.15 / 9**	**5.95 / 9**	**5.95 / 9**	**6.4 / 9**
% of Possible Score Achieved	**35**	**44**	**57**	**66**	**66**	**71**
Overall Category	**III**	**II**	**II**	**II**	**II**	**II**
Total Acreage of Assessed Aquatic Habitat within AA Boundaries	**0.570**	**16.70**	**17.44**	**18.43**	**19.97**	**20.00**
Functional Units (acreage x actual points)	**1.6**	**73.5**	**89.8**	**109.7**	**122.5**	**128.0**
Net Acreage Gain**	NA	**16.13**	**16.87**	**17.86**	**19.40**	**19.43**
Net Functional Unit Gain	NA	**71.90**	**88.22**	**108.06**	**120.86**	**126.40**

[1] 1999 MDT Montana Wetland Assessment Method (Bergland)

[2] 2008 MDT Montana Wetland Assessment Method (Bergland and McEldowney)

3.8. Maintenance Needs

Priority 2B weeds Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and salt cedar (*Tamarix* spp.) were identified during the 2011 monitoring visit. Infestations of Canada thistle ranged in size from less than 0.1 acre to 1 acre. The weed cover within the infestations ranged from 1 percent to 100 percent. Field bindweed was identified in 3 separate infestations across the project site. The size of the infestations ranged from less than 0.1 acre to between 0.1 and 1.0 acre. The cover class was trace to moderate. The extent of the Canada thistle and field bindweed populations appear to have decreased across the site since 2010. The lone stem of salt cedar persisted on the site in 2011. No additional salt cedar plants were observed during the 2011 field investigation. The MDT has an ongoing weed control program including an annual assessment of weed control needs. This site was not sprayed in 2011.

The irrigation ditch that delivers water to the site from the Edgar Canal was in good condition in 2011. The split channel that diverts water along the east and west sides of the wetland appeared to be functioning as designed and was effectively spreading irrigation return flows through the site No repairs were necessary.

3.9. Current Credit Summary

The wetland mitigation design for DH Ranch stipulated the creation of a maximum of 21.1 acres of wetland, 1.65 acres of shrub-dominated riparian islands, and 0.8 acre of riparian buffer. Table 6 compares the 2011 status of the created wetland areas to the success criteria established in 2007. Table 7 summarizes the estimated credit acres for 2011. Full credit at a 1:1 ratio was given for the 20.00 acres of created emergent wetland delineated in 2011. A majority of the performance standards have been achieved for the wetlands delineated in 2011. The cover of creeping foxtail exceeded 25 percent in wetland communities 11 and 15, exceeding the 10 percent maximum for aggressive non-preferred species within these wetland areas. Site wide, however, this species did not exceed 10 percent cover within the mitigation boundary. Established woody species were also lacking on the riparian islands. The USACE will determine the final credits that can be applied to the mitigation site. Created palustrine, emergent wetlands encompassed 20.00 acres, an increase of 0.03 acres of wetland since 2010. The area defined as open water in 2010 (3.07 acres) was reclassified as an aquatic bed wetland community (Type 5) in 2011.

The acreages for the riparian islands and upland buffer were taken from the Aquatic Design and Construction Services (ADC) Mitigation Design Report (ADC 2006). The mitigation design report included a credit category for the shrub-dominated riparian islands located on the water diversion berms. The riparian islands were classified as wetland in 2010 and 2011. The upland buffer is primarily characterized by Type 4, which was dominated by foxtail barley and meadow fescue and Type 14, which was dominated by Japanese brome and rubber rabbit bush. No success criteria were applied to the upland buffer. There was no change in credits to the upland buffer in 2011.

Table 6. Success criteria for the DH Ranch Wetland Mitigation Site.

Success Criteria	2011 Status
Wetland Characteristics:	
Site will develop hydrophytic vegetation, wetland hydrology, and hydric soils as outlined in the COE 1987 wetlands delineation manual.	*Criteria achieved.* Approximately 20.0 acres of wetlands delineated within the project area met the three criteria to date.
Herbaceous Plants:	
Ocular coverage of desirable herbaceous wetland plant species will be at least 80 percent. Except for desirable native emergent wetland species, no species may comprise more than 25 percent of a vegetated layer in a wetland community. Aggressive non-preferred species (such as reed canarygrass) may comprise a maximum of 10 percent of any given wetland area.	*Criteria partially achieved.* A majority of the site achieved the 80 percent cover target. None of the delineated emergent wetland communities contain a non-native species exceeding 25 percent composition of a given vegetation layer. Creeping foxtail contributed between 21 and greater than 50 percent cover to wetland communities 11 and 15. The sitewide weed cover is approximately 10 percent.
Hydrology:	
Soil saturation will be present for at least 12.5 percent of the growing season (18 days). The requirement for monitoring wells was removed in December 2007.	*Criteria achieved.* The hydrology criteria was met in the areas delineated as wetlands in 2011.
Open Water:	
At the conclusion of the monitoring period, open water (aquatic bed) wetlands will encompass < 10 percent of the total wetland area and will remain saturated for more than 12.5 percent of the growing season.	*Criteria achieved.* Open water areas encompassed less than 10 percent of the total wetland area and remained saturated for more than 12.5 percent of the growing season.
Woody Plants:	
Woody planting zones (berms) will have a minimum of 1,000 stems/acre	*Criteria not achieved to date.* Few of the woody plants installed as part of mitigation construction in 2007 were observed in 2011. There has been some natural recruitment of *Salix* and *Populus* spp.

Table 7. Mitigation credit summary in 2011 for the DH Ranch Wetland Mitigation Site.

Credit Category	Proposed Credit Acres	2010 Delineated Acres	2011 Delineated Acres	Credit Ratio	2010 Credit Acres	2011 Credit Acres
Emergent wetland creation	21.1[1]	16.9	20.00	1:1	16.9	20.00
Open water	--	3.07	--*	1:1	3.07	--*
Shrub-dominated riparian islands[1] (i.e. berms)	1.65	1.65	1.65	4:1	0.41	0.41
Upland buffer	0.80	0.8	0.80	4:1	0.2	0.20
TOTAL		22.42	**22.45**		20.58	**20.61**

[1]Included open water creation

*Open water reclassified in 2011 based on prevalence of vegetation within these areas.

4. REFERENCES

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Appendix A

Figures 2 and 3

MDT Wetland Mitigation Monitoring
DH Ranch
Carbon County, Montana

Figure 2: 2011 Monitoring Activity Locations

Legend

- Vegetation Transect
- Monitoring Limits
- Data Point ID
- Photo Point ID

Base Photography Date: August 17, 2011

PP1
PP2
PP3
PP4
PP5
T-1 start
T-1 end
DH-1
DH-2
DH-3
DH-4

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: Carbon Co., MT
PROJECT NO: NH-STPP 5(39)
FILE: DHRanch/Monitor2011.mxd

Project Name
DH Ranch Mitigation Site

Drawing Title
2011 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	JJ

SCALE: Noted
Drawn: August 23, 2011
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure
2

Figure 3: 2011 Mapped Site Features

Acreages	
Project Area	27.78 acres
Wetland Area	20.00 acres
Uplands	7.78 acres

0 50 100 200
Feet

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: August 17, 2011

Noxious Weeds
- Cirsium arvense
- Convolvulus arvensis
- Tamarisk

Infestation SIze
- X = <0.1 acre
- ▲ = 0.1 to 1 acre
- ■ = 1 to 5 acre

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

Vegetation Community Types

1 Scirpus acutus/Typha latifolia
2 Typha latifolia/Scirpus spp.
4 Hordeum jubatum/Festuca pratensis
5 Aquatic Macrophytes/Algae
6 Salix amygdaloides
11 Alopecurus arundinaceus
12 Hordeum jubatum/Bromus inermis
14 Bromus japonicus/Chrysothamnus nauseousus
15 Populus deltoides/Alopecurus arundinaceus

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: Carbon Co., MT
PROJECT NO: NH-STPP 5(39)
FILE: DHRanch/Veg2011.mxd

Project Name: DH Ranch Mitigation Site
Drawing Title: 2011 Mapped Site Features

DRAWN BCS | CHECKED BV | APPROVED JJ
SCALE: Noted
Drawn: August 31, 2011
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2011 MDT Wetland Mitigation Site Monitoring Form
2011 USACE Wetland Determination Data Form
2011 MDT Montana Wetland Assessment Form

MDT Wetland Mitigation Monitoring
DH Ranch
Carbon County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: DH Ranch Assessment Date/Time 8/10/2011 7:34:56 AM

Person(s) conducting the assessment: B. Sandefur, L. Soderquist

Weather: Warm & sunny, mid 80's Location: Edgar, MT

MDT District: Billings Milepost: NA

Legal Description: T 4S R 23E Section(s) 1

Initial Evaluation Date: 9/7/2007 Monitoring Year: 5 #Visits in Year: 1

Size of Evaluation Area: 27.78 (acres)

Land use surrounding wetland:

Natural, agriculture/ranchland, Clark Fork of the Yellowstone River

HYDROLOGY

Surface Water Source: Edgar Canal irrigation return

Inundation: ☑ Average Depth: 1.2 **(ft)** Range of Depths: 0-3.0 **(ft)**

Percent of assessment area under inundation: 75 %

Depth at emergent vegetation-open water boundary: 0.8 **(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**:**

Groundwater Monitoring Wells

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

Well ID	**Water Surface Depth (ft)**
No wells	

Additional Activities Checklist:

☐ Map emergent vegetation-open water boundary on aerial photograph.

☐ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)

☐ Use GPS to survey groundwater monitoring well locations, if present.

Hydrology Notes:

Abundant surface water recharge into wetland. Areas of surface flow observed between wetland cells.

VEGETATION COMMUNITIES

Site DH Ranch

(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:** Scirpus acutus / Typha latifolia **Acres** 1.17

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Eleocharis palustris	1
Juncus effusus	0	Populus deltoides	0
Rosa multiflora	0	Scirpus acutus	5
Scirpus maritimus	1	Typha latifolia	2

Comments:

Community # 2 **Community Type:** Typha latifolia / Scirpus spp. **Acres** 9.14

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Carex stricta	0
Carex utriculata*	1	Echinochloa muricata	2
Eleocharis palustris	2	Open Water	2
Polygonum amphibium	1	Scirpus acutus	2
Scirpus maritimus	1	Scirpus microcarpus	0
Shepherdia argentea	0	Typha latifolia	5

Comments:

Community # 4 **Community Type:** Hordeum jubatum / Festuca pratensis **Acres** 2.71

Species	Cover class	Species	Cover class
Agropyron smithii	2	Alyssum alyssoides	1
Bromus japonicus	2	Chenopodium album	1
Cirsium arvense	0	Cynoglossum officinale	0
Festuca pratensis	3	Grindelia squarrosa	1
Hordeum jubatum	4	Kochia scoparia	1
Lactuca serriola	0	Lepidium perfoliatum	1
Melilotus alba	2	Phleum pratense	1
Sarcobatus vermiculatus	1	Sporobolus airoides	0
Verbascum thapsus	0		

Comments:

Community # 5 Community Type: Aquatic Macrophytes / Algae **Acres** 3.07

Species	Cover class	Species	Cover class
Algae, green	4	Echinochloa muricata	0
Lemna minor	0	Open Water	4
Ruppia sp.	3		

Comments:

Community # 6 Community Type: Salix amygdaloides / **Acres** 0.23

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Eleocharis palustris	1
Lemna minor	1	Polygonum amphibium	0
Ribes spp.	1	Rosa woodsii	1
Salix amygdaloides	5	Scirpus acutus	3
Solanum dulcamara	1		

Comments:

Community # 11 Community Type: Alopecurus arundinaceus / **Acres** 6.22

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	5	Alyssum alyssoides	1
Asclepias speciosa	1	Bromus japonicus	1
Carduus nutans	0	Carex sp.	1
Chenopodium album	0	Distichlis spicata	0
Echinochloa muricata	1	Elaeagnus angustifolia	0
Eleocharis palustris	2	Epilobium spp.	0
Hordeum jubatum	2	Juncus balticus	2
Kochia scoparia	0	Lactuca serriola	0
Lactuca serriola	0	Melilotus alba	0
Nepeta cataria	1	Poa pratensis	0
Polygonum amphibium	1	Populus deltoides	0
Scirpus acutus	0	Scirpus maritimus	1
Sporobolus airoides	1	Typha latifolia	1

Comments:

Community # 12 Community Type: Hordeum jubatum / Bromus inermis **Acres** 0.16

Species	Cover class	Species	Cover class
Agropyron repens	2	Agropyron smithii	1
Ambrosia psilostachya	1	Asclepias speciosa	1
Bromus inermis	3	Bromus japonicus	2
Carduus nutans	0	Chenopodium album	1
Cirsium arvense	1	Convolvulus arvensis	1
Cynoglossum officinale	0	Festuca pratensis	2
Hordeum jubatum	4	Lactuca serriola	1
Lepidium perfoliatum	1	Medicago sativa	1
Melilotus alba	2	Thlaspi arvense	1

Comments:

Community # 14 Community Type: Bromus japonicus / Chrysothamnus nauseousus **Acres** 4.91

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Agropyron smithii	2
Alyssum alyssoides	2	Artemisia cana	2
Atriplex canescens	1	Bromus japonicus	4
Chenopodium album	1	Chrysothamnus nauseousu	3
Cirsium arvense	1	Cynoglossum officinale	0
Grindelia squarrosa	1	Kochia scoparia	0
Lactuca serriola	1	Sarcobatus vermiculatus	1
Sisymbrium altissimum	0	Sonchus arvensis	0
Symphoricarpos albus	0	Tragopogon dubius	1
Verbena hastata	1		

Comments:

Community # 15 Community Type: Populus deltoides / Alopecurus arundinaceus **Acres** 0.18

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	4	Echinochloa muricata	1
Eleocharis palustris	2	Juncus balticus	2
Populus deltoides	5	Scirpus acutus	2
Scirpus microcarpus	1	Scirpus validus	1

Comments:

Total Vegetation Community Acreage **27.79**

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

VEGETATION TRANSECTS

Site: DH Ranch Date: 8/10/2011 7:34:56 AM

Transect Number: 1 **Compass Direction from Start:** 260

Interval Data:

Ending Station 15 **Community Type:** Hordeum jubatum / Festuca pratensis

Species	Cover class	Species	Cover class
Alyssum alyssoides	0	Bromus japonicus	1
Festuca pratensis	0	Grindelia squarrosa	2
Hordeum jubatum	4	Lactuca serriola	0
Lepidium perfoliatum	0	Melilotus alba	1

Ending Station 70 **Community Type:** Scirpus acutus / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Eleocharis palustris	1
Populus deltoides	0	Rosa multiflora	0
Scirpus acutus	5	Scirpus maritimus	1
Typha latifolia	2		

Ending Station 220 **Community Type:** Alopecurus arundinaceus /

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	5	Carex spp.	1
Epilobium spp.	0	Hordeum jubatum	2
Kochia scoparia	1	Lactuca serriola	0
Melilotus alba	0	Poa pratensis	0
Scirpus maritimus	2	Sporobolus airoides	2
Typha latifolia	2		

Ending Station 370 **Community Type:** Typha latifolia / Scirpus spp.

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Carex utriculata*	1
Eleocharis palustris	1	Scirpus acutus	3
Scirpus maritimus	1	Typha latifolia	5

Ending Station 420 **Community Type:** Alopecurus arundinaceus /

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	5	Hordeum jubatum	0
Poa pratensis	0	Typha latifolia	2

Ending Station 550 **Community Type:** Typha latifolia / Scirpus spp.

Species	Cover class	Species	Cover class
Carex stricta	2	Eleocharis palustris	3
Scirpus acutus	3	Scirpus microcarpus	2
Shepherdia argentea	0	Typha latifolia	5

Ending Station 560 **Community Type:** Alopecurus arundinaceus /

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	5	Eleocharis palustris	4

Ending Station 590 **Community Type:** Hordeum jubatum / Bromus inermis

Species	Cover class	Species	Cover class
Agropyron repens	2	Agropyron smithii	1
Ambrosia psilostachya	1	Asclepias speciosa	0
Bromus inermis	1	Bromus inermis	4
Chenopodium album	1	Cirsium arvense	3
Convolvulus arvensis	0	Cynoglossum officinale	0
Festuca pratensis	1	Hordeum jubatum	2
Lactuca serriola	1	Lepidium perfoliatum	1
Melilotus alba	1		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

DH Ranch

Planting Type	#Planted	#Alive	Notes
Atriplex canescens	40	0	
Rhus triobata	103	0	
Shepherdia argentea	172	13	

Comments

Live stems of buffaloberry were identifed along T-1 in veg com 2

DH Ranch

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Robin	2	L	SS, UP
Barn Swallow	5	F, FO	OW, UP, WM
Golden Eagle	1	FO	
Mallard	3	N	OW
Mourning Dove	4	FO, L	UP
Red-winged Blackbird	8	L	MA
Sandhill Crane	4	F, FO, L	SS, 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
Black-tailed Prairie Dog	6	No	No	Yes	Colony along northern boundary of site
Northern Leopard Frog	14	No	No	No	
Raccoon		Yes	No	No	
White-tailed Deer	5	No	No	No	

Wildlife Comments:

DH Ranch

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
8537	45.509148	-108.824715	260	T1 start
8545	45.509003	-108.826904	80	T-1, end
8546	45.509933	-108.827164	42	PP-4
8547	45.509933	-108.827164	142	PP-4
8548	45.509933	-108.827164	104	PP-4
8549	45.509933	-108.827164	142	PP-4
8550	45.509933	-108.827164	165	PP-4
8551	45.509933	-108.827164	337	PP-4
8552	45.509933	-108.827164	354	PP-4
8556	45.511211	-108.827553	36	PP-5
8557	45.511211	-108.827553	66	PP-5
8558	45.511211	-108.827553	97	PP-5
8559	45.511211	-108.827553	153	PP-5
8560	45.511211	-108.827553	182	PP-5
8561	45.511211	-108.827553	221	PP-5
8562	45.512432	-108.827141	188	PP-1
8563	45.512432	-108.827141	207	PP-1
8564	45.512432	-108.827141	221	PP-1
8565	45.512432	-108.827141	256	PP-1
8568	45.511333	-108.826966	179	PP-2
8569	45.511333	-108.826966	203	PP-2
8570	45.511333	-108.826966	238	PP-2
8571	45.511333	-108.826966	264	PP-2
8576	45.50914	-108.824699	212	PP-3
8577	45.50914	-108.824699	239	PP-3

8578	45.50914	-108.824699	272	PP-3
8579	45.50914	-108.824699	304	PP-3
8580	45.50914	-108.824699	334	PP-3
8585	45.510605	-108.825569	280	DH-1
8586	45.509529	-108.825188	65	DH-2
8587	45.509537	-108.825371	270	DH-3
8593	45.509464	-108.826103	120	DH-4

Comments:

DH Ranch

ADDITIONAL ITEMS CHECKLIST

Hydrology

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

Photos

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

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

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

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

Were man-made nesting structure installed at this site? No

If yes, do they need to be repaired?

If yes, describe the problems below and indicate if any actions were taken to remedy the problems

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? Yes

If yes, are the structures in need of repair? No

If yes, describe the problems below.

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

Project/Site: DH Ranch | City/County: Carbon County | Sampling Date: 8/10/2011

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

Investigator(s): B. Sandefur | Section, Township, Range: S 1 T 4S R 28E

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

Subregion (LRR): LRR G | Lat: 45.5105516666667 | Long: -108.825915 | Datum: WGS 84

Soil Map Unit Name: Heldt silty clay loam, saline

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:
Point taken along top of berm, wetland on either side.

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. Alyssum alyssoides	90	☑	NL
2. Lactuca serriola	10	☐	FACU
3. Bromus japonicus	5	☐	FACU
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	105 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: DH-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
0-16	10YR 4/1	95	10YR 2/2	5	D	M	Silt Loam	

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

Hydric Soil Indicators:

- ☐ 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: Ustertic Haplocambids

Confirm Mapped Type?: ☐

Hydric Soil Present? Yes ☑ No ☐

Remarks:
Soils mixed from wetland excavation/berm construction

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: Surface soil cracks indicate presence of one secondary indicator.

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

Project/Site: DH Ranch | City/County: Carbon County | Sampling Date: 8/10/2011

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

Investigator(s): B. Sandefur | Section, Township, Range: S 1 T 4S R 28E

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

Subregion (LRR): LRR G | Lat: 45.5095433333333 | Long: -108.825238333333 | Datum: WGS 84

Soil Map Unit Name: Heldt silty clay loam, saline

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:
Point taken near end of berm.

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. Bromus japonicus	5	☐	FACU
2. Alyssum alyssoides	60	☑	NL
3. Hordeum jubatum	15	☐	FACW
4. Kochia scoparia	15	☐	FAC
5. Chenopodium album	5	☐	FAC
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:
Alyssum alyssoides assumed to be UPL

SOIL

Sampling Point: DH-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
0-8	7.5YR 3/2	100					Silty Clay	
8-13	10YR 4/1	95	10YR 2/2	5	D	M	Silty Clay	Moist around 10in
13-16	10YR 3/1	95	10YR 4/4	5	C	M	Clay	Saturated at 16in

[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: Ustertic Haplocambids

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: Soils moist @ 10in, sat @ 16in. Surface soil cracks present.

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

Project/Site: DH Ranch | City/County: Carbon County | Sampling Date: 8/10/2011

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

Investigator(s): B. Sandefur | Section, Township, Range: S 1 T 4S R 28E

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

Subregion (LRR): LRR G | Lat: 45.509555 | Long: -108.8254 | Datum: WGS 84

Soil Map Unit Name: Heldt silty clay loam, saline

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:
Point taken near boundary of comm 2 in comm 11.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Alopecurus arundinaceus	60	☑	NI
2. Typha latifolia	20	☑	OBL
3. Scirpus acutus	20	☑	OBL
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Dominance Test is >50% ☑

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: DH-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
0-12	10YR 4/1	95	10YR 4/6	5	C	PL	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: Ustertic Haplocambids

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):	3
Water Table Present?	Yes ☑ No ☐	Depth (inches):	3
Saturation Present? (includes capillary fringe)	Yes ☑ No ☐	Depth (inches):	2

Wetland Hydrology Present? Yes ☑ No ☐

Remarks:

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

Project/Site: DH Ranch | City/County: Carbon County | Sampling Date: 8/10/2011

Applicant/Owner: MDT | State: MT | Sampling Point: DH-4

Investigator(s): B. Sandefur | Section, Township, Range: S 1 T 4S R 28E

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

Subregion (LRR): LRR G | Lat: 45.5092116666667 | Long: -108.826643333333 | Datum: WGS 84

Soil Map Unit Name: Heldt silty clay loam

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:
Point located along upland berm, water table appears to fluc 2ft bgs.

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. Festuca pratensis	45	☑	FAC
2. Medicago sativa	20	☐	NL
3. Carduus nutans	5	☐	NL
4. Melilotus alba	35	☑	FACU-
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
	105 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.5 (A/B)

Dominance Test is >50% ☐

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: DH-4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Silty Clay	
10-16	10YR 3/2	95	10YR 4/4	5	C	M	Silty Clay	Soils moist at 12in

[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: Ustertic Haplocambids

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: Water table at 18in bgs, no hydro indicators at surface or within 10in bgs.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name DH Ranch **2. MDT project#** NH-STPP 5(39) **Control#**

3. Evaluation Date 8/10/2011 **4. Evaluators** B. Sandefur, L. Soderq **5. Wetland/Site# (s)** DH Ranch

6. Wetland Location(s): **T** 4S **R** 23E **Sec1** 1 **T** **R** **Sec2**

Approx Stationing or Mileposts NA

Watershed 10070006 **Watershed/County** Upper Yellowstone Watershed/Carbon County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 20

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 20

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Aquatic Bed	Excavated	Permanent/Perennial	25
Depressional	Emergent Wetland	Impounded	Permanent/Perennial	70
Depressional	Scrub-Shrub Wetland	Impounded	Seasonal/Intermittant	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)

Wetland mitigation site constructed in 2007, no disturbance since construction.

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

Canada thistle, field bindweed, tamarisk

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

AA is a marsh on a terrace of the Clark's Fork of the Yellowstone River. Surrounding land to the west, north, and south sides are grazed and/or hayed. To the east is a ranch road and a steep hillside comprised of native vegetation. The primary source of water is irrigation return flow that is directed onto the south end of the site.

13. Structural Diversity: (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

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

Comments: Few scattered cottonwoods and peachleaf willow stand.

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

No usable habitat ☑ S

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

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

Sources for documented use USFWS database, no documented or suspected use by T&E species.

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 Black-tailed prairie dogs (S3), Golden Eagle (S3)

Incidental habitat (list species) ○ D ◉ S Bald Eagle (S3), Peregrine Falcon (S3)

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, Black-tailed prairie dog colony in northern uplands of site. Golden eagle observed in 2011.

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 Numerous bird species, northern leopard frogs, black-tailed prairie dogs, and whitetail deer 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 ☑ **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**

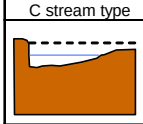
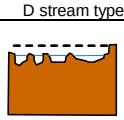
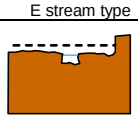
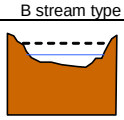
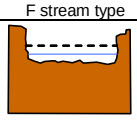
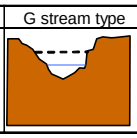
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

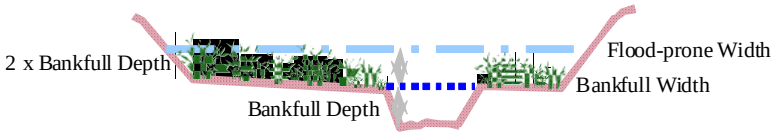
iii. Final Score and Rating: 0 NA **Comments:**

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: Multiple impoundments with total estimated water storage greater than 20 acre feet.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, click ☐ **NA** here and proceed to 14H.)

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA is well-vegetated with restricted outlet.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click ☐ **NA** here and proceed to 14I.)

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

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Cottonwoods, bulrush, sedges, rushes, and cattails common components around aquatic beds/open water.

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: Wetland complex has a restricted outlet.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- ☐ The AA is a slope wetland
- ☐ Springs or seeps are known or observed
- ☐ Vegetation growing during dormant season/drought
- ☐ Wetland occurs at the toe of a natural slope
- ☐ Seeps are present at the wetland edge
- ☐ AA permanently flooded during drought periods
- ☐ Wetland contains an outlet, but no inlet
- ☐ Shallow water table and the site is saturated to the surface
- ☐ Other:

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other:

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

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

Comments: Site is supported by irrigation return flow. There is no evidence of a groundwater discharge component. The soils are clayey, so groundwater recharge is unlikely.

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: Scattered cottonwoods, scrub/shrub, emergent marsh, and aquatic macrophyte communities present.

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:

AA in private ownership without general public access, permission required.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): DH Ranch

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	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	12	☐
C. General Wildlife Habitat	E	1	1	20	☐
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	20	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	20	☑
H. Sediment/Shoreline Stabilization	H	1	1	20	☑
I. Production Export/Food Chain Support	E	1	1	20	☑
J. Groundwater Discharge/Recharge	L	.1	1	2	☐
K. Uniqueness	M	.6	1	12	☐
L. Recreation/Education Potential (bonus points)	M	.1	NA	2	☐
Totals:		6.4	9	128	
Percent of Possible Score			**71.11** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☑ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☑ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

☐

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
DH Ranch
Carbon County, Montana



Photo Point 1 – *Photo 1* **Location:** North Side
Bearing: 188 Degrees **Taken in 2009**



Photo Point 1 – *Photo 2* **Location:** North Side
Bearing: 207 Degrees **Taken in 2009**



Photo Point 1 – *Photo 1* **Location:** North Side
Bearing: 188 Degrees **Taken in 2010**



Photo Point 1 – *Photo 2* **Location:** North Side
Bearing: 207 Degrees **Taken in 2010**



Photo Point 1 – *Photo 1* **Location:** North Side
Bearing: 188 Degrees **Taken in 2011**



Photo Point 1 – *Photo 2* **Location:** North Side
Bearing: 207 Degrees **Taken in 2011**



Photo Point 1 – *Photo 3* **Location:** North end
Bearing: 221 Degrees **Taken in 2009**



Photo Point 1 – *Photo 4* **Location:** North Side
Bearing: 256 Degrees **Taken in 2009**



Photo Point 1 – *Photo 3* **Location:** North end
Bearing: 221 Degrees **Taken in 2010**



Photo Point 1 – *Photo 4* **Location:** North Side
Bearing: 256 Degrees **Taken in 2010**



Photo Point 1 – *Photo 3* **Location:** North end
Bearing: 221 Degrees **Taken in 2011**



Photo Point 1 – *Photo 4* **Location:** North Side
Bearing: 256 Degrees **Taken in 2011**



Photo Point 2 – *Photo 1* **Location:** NE Corner
Bearing: 179 Degrees **Taken in 2009**



Photo Point 2 – *Photo 2* **Location:** NE Corner
Bearing: 203 Degrees **Taken in 2009**



Photo Point 2 – *Photo 1* **Location:** NE Corner
Bearing: 179 Degrees **Taken in 2010**



Photo Point 2 – *Photo 2* **Location:** NE Corner
Bearing: 203 Degrees **Taken in 2010**



Photo Point 2 – *Photo 1* **Location:** NE Corner
Bearing: 179 Degrees **Taken in 2011**



Photo Point 2 – *Photo 2* **Location:** NE Corner
Bearing: 203 Degrees **Taken in 2011**



Photo Point 2 – *Photo 3* **Location:** NE Corner
Bearing: 238 Degrees **Taken in 2009**



Photo Point 2 – *Photo 4* **Location:** NE Corner
Bearing: 264 Degrees **Taken in 2009**



Photo Point 2 – *Photo 3* **Location:** NE Corner
Bearing: 238 Degrees **Taken in 2010**



Photo Point 2 – *Photo 4* **Location:** NE Corner
Bearing: 264 Degrees **Taken in 2010**



Photo Point 2 – *Photo 3* **Location:** NE Corner
Bearing: 238 Degrees **Taken in 2011**



Photo Point 2 – *Photo 4* **Location:** NE Corner
Bearing: 264 Degrees **Taken in 2011**



Photo Point 3 – *Photo 1* **Location:** SW Corner
Bearing: 212 Degrees **Taken in 2009**



Photo Point 3 – *Photo 2* **Location:** SW Corner
Bearing: 239 Degrees **Taken in 2009**



Photo Point 3 – *Photo 1* **Location:** SW Corner
Bearing: 212 Degrees **Taken in 2010**



Photo Point 3 – *Photo 2* **Location:** SW Corner
Bearing: 239 Degrees **Taken in 2010**



Photo Point 3 – *Photo 1* **Location:** SW Corner
Bearing: 212 Degrees **Taken in 2011**



Photo Point 3 – *Photo 2* **Location:** SW Corner
Bearing: 239 Degrees **Taken in 2011**



Photo Point 3 – *Photo 3* **Location:** SW Corner
Bearing: 272 Degrees **Taken in 2009**



Photo Point 3 – *Photo 4* **Location:** SW Corner
Bearing: 304 Degrees **Taken in 2009**



Photo Point 3 – *Photo 3* **Location:** SW Corner
Bearing: 272 Degrees **Taken in 2010**



Photo Point 3 – *Photo 4* **Location:** SW Corner
Bearing: 304 Degrees **Taken in 2010**



Photo Point 3 – *Photo 3* **Location:** SW Corner
Bearing: 272 Degrees **Taken in 2011**



Photo Point 3 – *Photo 4* **Location:** SW Corner
Bearing: 304 Degrees **Taken in 2011**



Photo Point 3 – *Photo 5* **Location:** SW Corner
Bearing: 334 Degrees **Taken in 2009**



Photo Point 4 – *Photo 1* **Location:** West Side
Bearing: 42 Degrees **Taken in 2009**



Photo Point 3 – *Photo 5* **Location:** SW Corner
Bearing: 334 Degrees **Taken in 2010**



Photo Point 4 – *Photo 1* **Location:** West Side
Bearing: 42 Degrees **Taken in 2010**



Photo Point 3 – *Photo 5* **Location:** SW Corner
Bearing: 334 Degrees **Taken in 2011**



Photo Point 4 – *Photo 1* **Location:** West Side
Bearing: 42 Degrees **Taken in 2011**



Photo Point 4 – *Photo 2* **Location:** West Side
Bearing: 142 Degrees **Taken in 2009**



Photo Point 4 – *Photo 3* **Location:** West Side
Bearing: 104 Degrees **Taken in 2009**



Photo Point 4 – *Photo 2* **Location:** West Side
Bearing: 142 Degrees **Taken in 2010**



Photo Point 4 – *Photo 3* **Location:** West Side
Bearing: 104 Degrees **Taken in 2010**



Photo Point 4 – *Photo 2* **Location:** West Side
Bearing: 142 Degrees **Taken in 2011**



Photo Point 4 – *Photo 3* **Location:** West Side
Bearing: 104 Degrees **Taken in 2011**



Photo Point 4 – *Photo 4* **Location:** West Side
Bearing: 142 Degrees **Taken in 2009**



Photo Point 4 – *Photo 5* **Location:** West Side
Bearing: 165 Degrees **Taken in 2009**



Photo Point 4 – *Photo 4* **Location:** West Side
Bearing: 142 Degrees **Taken in 2010**



Photo Point 4 – *Photo 5* **Location:** West Side
Bearing: 165 Degrees **Taken in 2010**



Photo Point 4 – *Photo 4* **Location:** West Side
Bearing: 142 Degrees **Taken in 2011**



Photo Point 4 – *Photo 5* **Location:** West Side
Bearing: 165 Degrees **Taken in 2011**



Photo Point 4 – *Photo 6* **Location:** West Side
Bearing: 337 Degrees **Taken in 2009**



Photo Point 4 – *Photo 7* **Location:** West Side
Bearing: 354 Degrees **Taken in 2009**



Photo Point 4 – *Photo 6* **Location:** West Side
Bearing: 337 Degrees **Taken in 2010**



Photo Point 4 – *Photo 7* **Location:** West Side
Bearing: 354 Degrees **Taken in 2010**



Photo Point 4 – *Photo 6* **Location:** West Side
Bearing: 337 Degrees **Taken in 2011**



Photo Point 4 – *Photo 7* **Location:** West Side
Bearing: 354 Degrees **Taken in 2011**



Photo Point 5 – *Photo 1* **Location:** Central
Bearing: 36 Degrees **Taken in 2009**



Photo Point 5 – *Photo 2* **Location:** Central
Bearing: 66 Degrees **Taken in 2009**



Photo Point 5 – *Photo 1* **Location:** Central
Bearing: 36 Degrees **Taken in 2010**



Photo Point 5 – *Photo 2* **Location:** Central
Bearing: 66 Degrees **Taken in 2010**



Photo Point 5 – *Photo 1* **Location:** Central
Bearing: 36 Degrees **Taken in 2011**



Photo Point 5 – *Photo 2* **Location:** Central
Bearing: 66 Degrees **Taken in 2011**



Photo Point 5 – *Photo 3* **Location:** Central
Bearing: 97 Degrees **Taken in 2009**



Photo Point 5 – *Photo 4* **Location:** Central
Bearing: 153 Degrees **Taken in 2009**



Photo Point 5 – *Photo 3* **Location:** West Side
Bearing: 97 Degrees **Taken in 2010**



Photo Point 5 – *Photo 4* **Location:** Central
Bearing: 153 Degrees **Taken in 2010**



Photo Point 5 – *Photo 3* **Location:** West Side
Bearing: 97 Degrees **Taken in 2011**



Photo Point 5 – *Photo 4* **Location:** Central
Bearing: 153 Degrees **Taken in 2011**



Photo Point 5 – *Photo 5* **Location:** Central
Bearing: 182 Degrees **Taken in 2009**



Photo Point 5 – *Photo 6* **Location:** Central
Bearing: 221 Degrees **Taken in 2009**



Photo Point 5 – *Photo 5* **Location:** Central
Bearing: 182 Degrees **Taken in 2010**



Photo Point 5 – *Photo 6* **Location:** West Side
Bearing: 221 Degrees **Taken in 2010**



Photo Point 5 – *Photo 5* **Location:** Central
Bearing: 182 Degrees **Taken in 2011**



Photo Point 5 – *Photo 6* **Location:** West Side
Bearing: 221 Degrees **Taken in 2011**



Transect 1 – *Photo 1* **Location:** T-1 Start
Bearing: 260 Degrees **Taken in 2009**



Transect 1 – *Photo 2* **Location:** T-1 End
Bearing: 80 Degrees **Taken in 2009**



Transect 1 – *Photo 1* **Location:** T-1 Start
Bearing: 260 Degrees **Taken in 2010**



Transect 1 – *Photo 2* **Location:** T-1 End
Bearing: 80 Degrees **Taken in 2010**



Transect 1 – *Photo 1* **Location:** T-1 Start
Bearing: 260 Degrees **Taken in 2011**

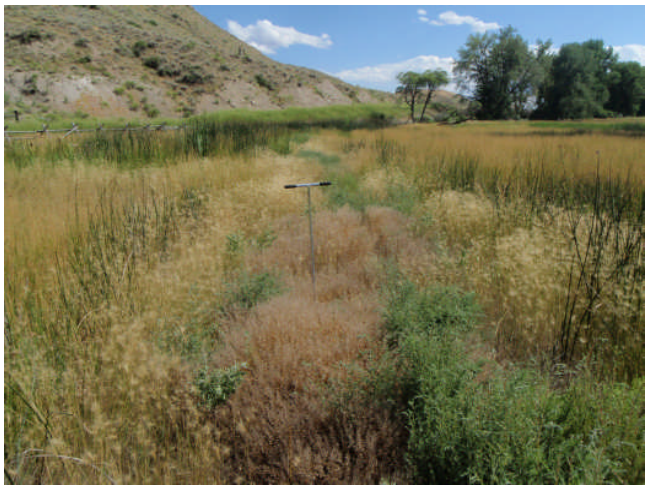


Transect 1 – *Photo 2* **Location:** T-1 End
Bearing: 80 Degrees **Taken in 2011**



Data Point DH-1
Bearing:

Location: Veg Com 4
Taken in 2011



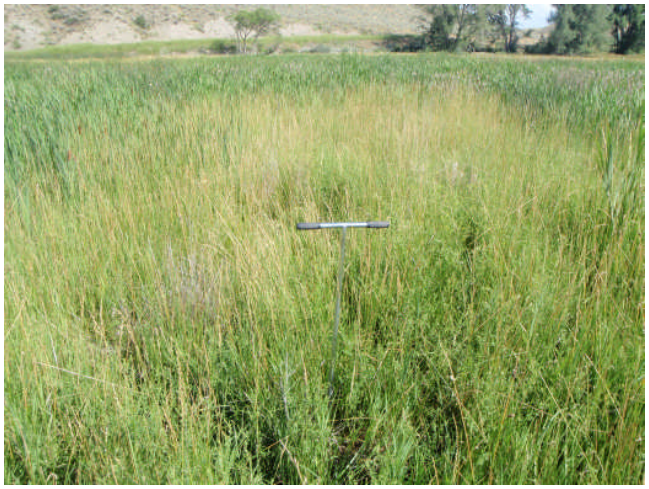
Data Point DH-2
Bearing: 65 Degrees

Location: Veg Com 4
Taken in 2011



Data Point DH-3
Bearing: 270 Degrees

Location: Veg Com 11
Taken in 2011



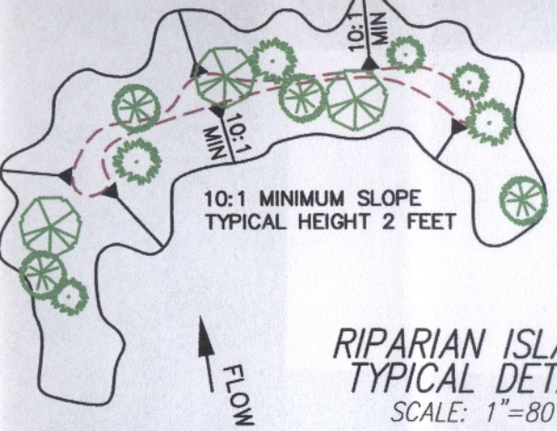
Data Point DH-4
Bearing: 120 Degrees

Location: Veg Com 12
Taken in 2011

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
DH Ranch
Carbon County, Montana



RIPARIAN ISLAND TYPICAL DETAIL

SCALE: 1"=80'

REVEGETATION ZONES (23.45 ac.)

WETLAND PEM	15.90 ac.
WETLAND PEM DEPRESSION	*2.25 ac.
WETLAND SALINE PEM	6.75 ac.
RIPARIAN ISLAND SCRUB-SHRUB	*1.65 ac.
RIPARIAN BUFFER SCRUB-SHRUB SALINE	0.80 ac.

* SUB AREAS OF WETLAND PEM

RANCH ACCESS ROAD IMPROVED TO ACT AS LOW HEAD IMPOUNDMENT AND CONTINUED RANCH ACCESS

PROJECT BOUNDARY

BUFFER SWALE NARROWS BECOMES OVERFLOW DRAINAGE DITCH

INTERCEPTOR DITCH

INTERCEPTOR DITCH

NORTH

0 50 150 300

REVEGETATION PLAN

SCALE: 1"=150'

NOTES:

1> AERIAL PHOTO BACKGROUND – MDT Flight on 6/17/2005

2> FINISHED DESIGN CONTOUR INTERVAL = 1 foot

REVEGETATION PLAN & PROPOSED GRADING

DRAWING NO. FIGURE 5

REVISION 1

DH RANCH & Montana Department of Transportation

WETLAND MITIGATION PROJECT

Sec 1 TAN R23E CARBON COUNTY, MT

DHDESIGN.dwg

SCALE: AS NOTED

PROJECT NO. 251A

DRAWN bz

CHECK --

DATE 10/05/05

REV NO.	REVISION DESCRIPTION	BY	REVISION DATE

ADC SERVICES INC.
water resource consulting
Phone 406.222.7600 – Fax 406.222.7677