MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2010

Murphy Ox Yoke Ranch
Park County, Montana



Prepared for:

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November 2010

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MORRISON MAIERLE, INC.
An Employee-Owned Company

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Murphy Ox Yoke Ranch
Park County, Montana

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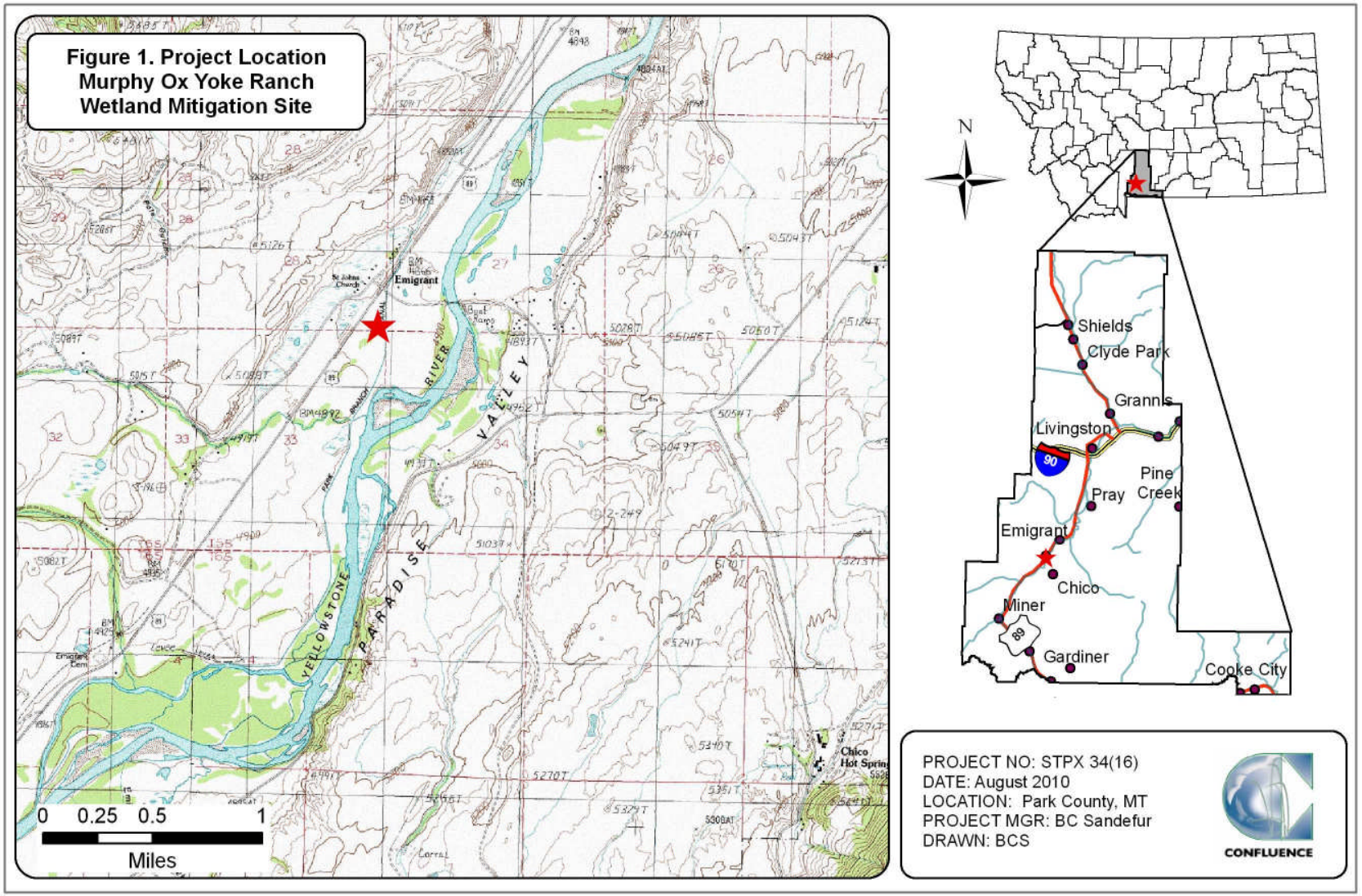
1. INTRODUCTION

The Murphy Ox Yoke Wetland Mitigation 2010 Monitoring Report presents the results of the first year monitoring. The 12.6-acre Murphy Ox Yoke Ranch wetland mitigation site is located east of US Highway 89 and south of Murphy Lane in Emigrant, Montana. The site is located near the Yellowstone River and is bordered on the east by the Park Branch Canal and on the west by US 89. The property is legally described as Sections 28 and 33, Township 5 South, Range 8 East, Park County (Figure 1). Figures 2 and 3 in Appendix A show the monitoring activity locations and mapped site features, respectively. The Montana Department of Transportation (MDT) Mitigation Monitoring Forms, the US Army Corps of Engineers Routine Wetland Determination Data Forms, and the MDT functional assessment forms are included in Appendix B. Appendix C contains representative photographs of the site and Appendix D shows the project plan sheet.

The project was developed to mitigate for wetland impacts associated with the East River Road and Yellowstone River Bridge (northeast of Livingston) MDT transportation projects. Remaining wetland credits will be held in reserve for application against future MDT highway projects in the Upper Yellowstone River, Watershed #13 (PBS&J 2009). The purpose of the mitigation project was to restore, create, enhance, and preserve wetlands within a 12-acre tract on the Murphy Ox Yoke Ranch. The 12-acre parcel is under a protective conservation easement between MDT and the Gallatin Valley Land Trust. The project site encompasses upland, wet meadow, riparian, emergent, and scrub/shrub wetland habitat. Historic wetlands located within the project area had been drained for agricultural purposes. The Park Branch irrigation canal borders the property to the east and increases the localized groundwater elevation throughout the project area. Murphy Swamp, located across Highway 89, supplies the site surface hydrology. Fridley Creek is located south of the project. An historic channel of Fridley Creek located within the property boundary maintains a surface water flow that enters the property from the spring-fed Murphy Swamp. Water entering the site from Murphy Swamp is referred to as Murphy Creek, a perennial stream that ultimately drains to the Yellowstone River in the northeast corner of the property.

Water sources supporting the wetland creation include Murphy Creek, an artesian well located in the northwest corner of the site, and elevated groundwater and seepage from the Park Branch Canal. Goals of the mitigation project are to (PBS&J 2009):

- Maximize emergent wetland development by excavating 4.1 acres to expose shallow groundwater in order to improve wildlife habitat, nutrient/toxicant removal functions, surface water storage functions, and production export/food chain support on the site;
- Restore/rehabilitate approximately 2.0 acres of existing degraded wetlands by plugging a drainage ditch, removing spoil piles, augmenting vegetation through planting and seeding, implementing a weed



- **Figure 1. Project Location Murphy Ox Yoke Ranch**

management plan, removing grazing, installing fencing to exclude livestock, and establishing a perpetual conservation easement.

- Create a scrub-shrub component within and around the periphery of created wetlands and increase the scrub-shrub component in existing wetlands; and
- Enhance and protect uplands and preserve existing wetlands within the project area by implementing a weed management plan, installing fencing and removing grazing from the site.

Crediting details for the project (Table 1) were compiled based on guidance by the USACE. Credit ratios and acreage were approved by USACE in a letter to MDT dated September 17, 2008.

Table 1. Wetland Crediting Summary (PBS&J 2009).

Creation of palustrine emergent and scrub/shrub wetlands through shallow excavation to groundwater in Cell 1.	Creation	1:1	2.70	2.70
Creation of palustrine emergent and scrub/shrub wetlands through shallow excavation to groundwater in Cell 2.	Creation	1:1	1.40	1.40
Rehabilitation of most wetlands west of the Park Branch Canal.	Restoration (Rehabilitation)	1.5:1	2.00	1.33
Preservation of existing scrub/shrub and emergent wetlands not included in restoration/rehabilitation.	Preservation	4:1	1.89	0.47
Upland buffer will be included in the conservation easement area to protect aquatic resources within project limits.	Upland Buffer	5:1	3.00	0.60
Total				6.50

The approved success/performance standards as stated verbatim in the Wetland Mitigation Plan are listed below (PBJ&J 2009). The baseline delineation was completed using the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987). The 2010 Regional Supplement: Western Valleys, Mountains and Coast Regions (USACE 2010) was used to delineate wetlands for 2010 monitoring.

1. **Wetland Hydrology Success** will be achieved where wetland hydrology is present as specified in the technical guidelines in the 1987 Manual. Wetland hydrology will be confirmed through continued monitoring of an existing piezometer that was left undisturbed during and following construction as well as through the periodic observations of surface water across the site and saturated soil conditions during the annual mid-season monitoring event.
2. **Hydric Soil Success** will be achieved where hydric soil conditions are present (provided through the most recent Natural Rescoure Conservation Service (NRCS) definitions for hydric soil) or appear to be forming, the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Since typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.
3. **Hydrophytic Vegetation Success** will be achieved where wetland vegetation is dominant as specified in the technical guidelines established in the 1987 Manual and 2010 Regional Supplement and noxious weeds do not exceed 5% cover. The following concept of "dominance", as defined in the 1987 Manual, will be applied during routine wetland determinations in created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines)* (Environmental Laboratory 1987).
   Additionally, as provided in guidance from the USACE, hydrophytic vegetation success will include achieving a minimal overall vegetation cover of 80% in created wetland areas within 5 years following site construction. For areas within and around the periphery of Cells 1 and 2, successful creation of scrub/shrub wetland will be achieved when 550 (50% of total plantings) or more live wetland shrubs are present in these areas (cumulatively within 5 years following site construction.)
4. **Restoration/Rehabilitation Success** will be achieved when the site is fenced, grazing is removed from existing wetlands, and the drain ditch is plugged.
5. **Upland Buffer Success** will be achieved when the site is fenced and noxious weeds do not exceed 5% cover within the buffer.
6. **Site Protection** will be achieved when MDT and the landowner have successfully agreed upon, signed, and filed a perpetual conservation easement for the project area.

2. METHODS

The first year of monitoring was initiated on July 30, 2010. Information for the Wetland Mitigation Site Monitoring Form and USACE Routine Wetland Determination Data Form (USACE 2010) was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field

investigation. Monitoring activity locations were located using global positioning system (GPS) as shown on Figure 2 (Appendix A). Information collected included the wetland delineation, vegetation community mapping, vegetation transect monitoring, weed assessment, planted woody species survival assessment, soil data collection, hydrology data collection, bird and wildlife use documentation, photographs, and a non-engineering examination of the infrastructure established within the mitigation project area (Appendix B).

2.1. Hydrology

Hydrological indicators, as outlined on the wetland determination data form (USACE 2010), were documented at five points established within the project area. Hydrologic assessments allow evaluation of mitigation goals addressing inundation and saturation requirements. The hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on electronic field data sheets (Appendix B). Areas of surface inundation were delineated during the growing season via aerial photography, staff gage pool elevation measurements, general observations, or GPS measurements of the wetted perimeter during field visits. Water depths in the constructed depression wetlands were measured and recorded.

Five shallow groundwater wells were installed onsite in November 2002 and two additional wells were installed in April 2008. Three wells remain within the project area. Well TP-4 is outside the south boundary. Well TP-5 is within the site boundary and T-6 was removed. Only one well remained within the site following construction. Water levels were measured in one well (Well 1, Figure 2, Appendix A) with a Solinst water level meter in 2010. The water surface level was recorded electronically on the delineation data form (Appendix B). Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The observed groundwater data were recorded electronically on the delineation 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 July 15, 2010, aerial photograph. The percent cover of dominant species within a community type was estimated and recorded using the following ranges listed on the monitoring form: 0 (<1%), 1 (1-5%), 2 (6-10%), 3 (11-20%), 4 (21-50%), and 5 (>50%) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure 3, Appendix A).

Temporal changes in vegetation will be evaluated through annual assessments of static belt transects established in summer 2010 (Figure 2, Appendix A). Vegetation composition was assessed and recorded along two vegetation belt transects approximately 10 feet wide and 450 and 610 feet long (Transect 1 and Transect 2, respectively). The transect locations were recorded with a GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species

within the belt transect was estimated using the same values and cover ranges listed in the above paragraph (Appendix B). A comprehensive plant species list will be developed for each annual monitoring report (Table 2 and Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C).

The revegetation design specified the seeding of disturbed upland areas and the seeding and planting of willow cuttings and containerized trees and shrubs in the constructed wetlands. Survival will be evaluated annually. The survival of woody species planted onsite was recorded on the mitigation monitoring forms (Appendix B).

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

2.3. Soil

Soil information was obtained from the Soil Survey for Park County Area and in situ soil descriptions (USDA 2010). Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Manual and 2010 Regional Supplement. A description of the soil profile, including hydric indicators when present, was recorded on the USACE Wetland Determination 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 and 2010 Regional Supplement.

In order to delineate a representative area as jurisdictional, 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: Northwest Region 9 (Reed 1988). A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate waters of the US within the project boundaries. The information was recorded electronically on the Wetland Determination Data Form (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross referenced with soil and vegetation communities as supportive information for the delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and upland boundaries. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation

community type. If both hydrology and vegetation met wetland criteria, the area was assumed to be a wetland with hydric soils anticipated to develop with time. If either hydrology or vegetation did not exhibit positive wetland indicators, the area was determined to be upland. The wetland boundary was delineated on aerial imagery and digitized into Geographic Information System (GIS) format. Wetland areas reported were estimated using GIS methodology.

2.5. Fish, Birds, and Wildlife

Observations and other positive indicators of use by 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. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list for the entire site was compiled.

2.6. Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was used to evaluate functions and values on the site in 2010. This method provides an objective means of assigning wetlands an overall rating and provides regulators a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values (Berglund and McEldowney 2008).

Field data for this assessment were collected during the site visit. The functional assessment form was completed at a later date in the office. A Functional Assessment Form was completed for each wetland assessment areas (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland condition, trends, current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transects. Photographs were taken at five established photo points throughout the mitigation site during the site visit (Appendix C). Photo point locations were recorded with a sub-meter grade GPS unit (Figure 2, Appendix C). Photographs of the transect end points and five wetland data points are included in Appendix C.

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit during the 2010 monitoring season. Points were collected using WAAS-enabled differential corrected satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, imported 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 and then digitized. Site features and survey points that were mapped included fence boundaries, photograph points,

transect beginning and ending points, wetland boundaries, and non-wetland plant 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 did not constitute an engineering-level structural inspection, but rather a cursory examination. Details of observed maintenance requirements were recorded on data forms (Appendix B).

3. RESULTS

3.1. Hydrology

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (usually 14 days or more or 12.5 percent) during the growing season (Environmental Laboratory 1987)." Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is defined for purposes of this report as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit (Environmental Laboratory 1987). The growing season recorded for the meteorological station at Livingston FAA airport (12 S), Montana (245080) extends from May 6 through September 24 for a total of 141 days (USDA 2010). Areas defined as wetlands would require 18 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Climate data from a weather station located near Emigrant, Montana, recorded an average annual precipitation rate of 12.07 inches from 1950 to 1968 (Western Regional Climate Center - WRCC 2010). The Emigrant weather station was closed in 1968. The Livingston weather station recorded an average annual precipitation rate of 16.22 inches from June 1951 to December 2009. May and June are the peak months of precipitation at both stations. The annual precipitation rate in 2009 recorded at the Livingston 12S station was 12.11 inches, which was the lowest annual precipitation total since 2004. Precipitation data recorded from January to May in 2009 was 4.24 inches. It was 4.02 inches for the same period in 2010. The monthly data for June through September 2010 had not been posted on the WRCC website as of October 5, 2010.

The Yellowstone River flows near the east property boundary at the Murphy Ox Yoke site. Murphy Creek is a perennial stream that originates at the outlet of Murphy Swamp, a spring-fed pond located west of US Highway 89 and the project area. Average flow rates for Murphy Creek measured east of the Park Branch Canal during 2003 and 2004 were 0.75 cubic feet per second (cfs) (PBS&J 2009). The Park Branch Canal that parallels the east boundary of the project area is in operation from April 15 to October 30.

The mitigation goal was to create shallow water, emergent wetlands within two excavated cells (Cell 1, north; Cell 2, south) (PBS&J 2009) by intercepting the groundwater table. Elevated groundwater levels and seepage from the Park Branch Canal were expected to contribute to long-term wetland hydrology, particularly in Cell 2. Murphy Creek and an artesian spring located in the northwest corner of the site were expected to provide additional surface water to the surrounding existing wetlands and Cell 1 (PBS&J 2009). The east end of the existing drainage ditch north of Cell 1 was plugged to augment surface water flow into Cell 1.

Inundation was present at depths of 0.25 feet and 0.5 feet in the north ends of Cells 1 and 2, respectively (data points M-5 and M-3 on Figure 2, Appendix A**)**. The south end of Cell 2 exhibited surface soil cracks and saturation at 1.33 feet below the ground surface (bgs) (M-2, Figure 2, Appendix A). Approximately 10 percent of the site was inundated. The average water depth across the entire site was estimated at 0.8 foot with a range of 0 to 2.5 feet. The groundwater depth measured in Well 1 (originally Piezometer 6) was 1.5 feet bgs (Figure 2, Appendix A).

Inundation within the cells appeared to be primarily the result of groundwater inflow into the excavated wetland depressions. The abandoned drainage ditch located north of Cell 1 (open water identified as number 8 on Figure 3, Appendix A) contained less than 0.5 feet of surface water. Surface water from the ditch augmented water levels in Cell 1 to a minimal degree. There was no evidence of flooding from Murphy Creek into the project site.

3.2. Vegetation

Vegetation plant communities were identified by plant composition, topography, and hydrology. There were fifty-five plant species observed site wide in 2010 (Table 2) and six wetland communities and five upland communities. Vegetation community types named for the dominant species based on percent cover were Type 1 – *Festuca pratensis*/*Agropyron repens* Upland; Type 2 – *Festuca pratensis* Upland; Type 3 – *Typha latifolia*/bare ground Wetland; Type 4 – *Salix exigua/Salix lasiandra* Wetland; Type 5 – *Agropyron repens/Agropyron smithii* Upland; Type 6 – *Agrostis alba/Chenopodium leptophyllum* Upland; Type 7 – *Alopecurus pratensis*/*Carex rostrata* Wetland; Type 8 – Open Water; Type 9 – *Carex nebrascensis*/*Carex rostrata* Wetland; Type 10 – *Salix exigua/Salix drummondiana* Wetland; Type 11 – *Bromus inermis/Agropyron repens* Upland*;* and Type 12 - *Typha latifolia* Wetland (Figure 3, Appendix A). Type 8 was characterized by open water habitat and minimal vegetation cover. The six wetland communities are detailed below followed by a discussion of the five upland communities.

The north ends of the wetland cells currently support wetland communities. The south half of the north cell is currently dominated by the Type 6 upland community that contains several wetland plants albeit at cover percentages of six to 10 percent. The cover of wetland vegetation is expected to increase based on

the inundation levels observed in August in the north half of the cell. The south half of the south cell is drier. The prevalent community (Type 2) is upland although it contains numerous wetland plants. The cover of hydrophytic plants is expected to increase in subsequent years based on the presence of inundation in the north end of the cell and of a relatively high groundwater table.

Community Type 3 – *Typha latifola* bare ground was a transitional wetland community found in the inundated areas of the constructed wetland cells (Figure 3, Appendix A). The plant community was characterized by broad-leaf cattail (*Typha latifolia*) and minor amounts of beaked sedge (*Carex utriculata*), creeping spikerush (*Eleocharis palustris*), meadow fescue (*Festuca pratensis*), and fowl mannagrass (*Glyceria striata*). Bare ground defined by inundated soils and an absence of plant cover encompassed from 11 to 20 percent of the community. A second well-established *Typha* community (Type 12 - *Typha latifolia* Wetland) was located southeast of Cell 1 in an existing wetland. The wetland was dominated by broad-leaf cattail with minor amounts of creeping spikerush and common mint (*Mentha arvensis*).

Community Type 4 – *Salix exigua/Salix lasiandra* was found in a pre-existing shrub/scrub wetland located between the wetland cells. The species were dominated by sandbar willow (*Salix exigua*), Pacific willow (*Salix lasiandra*), Drummond willow (*Salix drummondiana*), creeping foxtail (*Alopecurus arundinaceus*), and lesser amounts of redtop (*Agrostis stolonifera*), Western water hemlock (*Cicuta douglasii*), fowl mannagrass, common mint, and annual rabbit foot grass (*Polypogon monspeliensis*).

The second *Salix* community, Type 10 – *Salix exigua/Salix drummondiana,* is found in a pre-existing shrub/scrub wetland located in an historic channel of Fridley Creek that parallels the east property boundary. The dominant species were sandbar willow, Drummond willow, Pacific willow, Lemmon's willow (*Salix lemmonii*), and diamond-leaf willow (*Salix planifolia*) with minor cover contributed by redtop, hairy willow herb (*Epilobium ciliatum*), common mint, multiflora rose (*Rosa multiflora*), broad-leaf cattail, and stinging nettle (*Urtica dioica*).

Vegetation community Type 7 – *Alopecurus pratensis*/*Carex nebrascensis* was identified in the pre-existing wetland located north of Cell 1 and dominated by meadow foxtail, beaked sedge, water sedge (*Carex aquatilis*), foxtail barley (*Hordeum jubatum*), and minor amounts of rough horsetail (*Equisetum hyemale*), America licorice (*Glycyrrhiza lepidota*), common sunflower (*Helianthus annuus*), Baltic rush (*Juncus balticus*), soft rush (*Juncus effusus*), prickly lettuce (*Lactuca serriola*), and seaside arrowgrass (*Triglochin maritimum*). The area encompassed by community 7 was targeted for rehabilitation.

Community Type 9 – *Carex nebrascensis*/*Carex rostrata* was found in the pre-existing wetland located between Cell 2 and the historic Fridley Creek corridor (Community 10). The predominant species were Nebraska sedge (*Carex nebrascensis)*, beaked sedge, meadow foxtail, water sedge, small-fruited bulrush

(*Scirpus microcarpus*),broad-leaf cattail, tall mannagrass (*Glyceria grandis*), and common sunflower.

Type 1 – *Festuca pratensis*/*Agropyron repens* was identified in the upland area on the south edge of the mitigation project. The community contained meadow fescue, quackgrass (*Agropyron repens*), reed canary grass (*Phalaris arundinacea*), redtop, Western wheatgrass (*Agropyron smithii*), white sweetclover (*Melilotus alba*), yellow sweetclover (*Melilotus officinalis*), and common timothy (*Phleum pratense*). Isolated plants of Canada thistle (*Cirsium arvense*), field pennycress (*Thlaspi arvense*), and hound's tongue (*Cynoglossum officinale*) were also observed (Figure 3 in Appendix A).

The Type 2 upland community, *Festuca pratensis*, was identified in the south half of Cell 2. Cover species included meadow fescue, yellow sweetclover, with minor cover percentages contributed by quackgrass, hound's tongue, creeping spikerush, rough horsetail, Baltic rush, annual rabbit foot grass (*Polypogon monspeliensis*), strawberry clover (*Trifolium pratense*), white clover (*Trifolium repens*), and broad-leaf cattail. The community encompassed between 11 and 20 percent bare ground. The species dominance is expected to shift to hydrophytic plants overtime based on the level of inundation in the north half of the cell and the presence of a shallow groundwater table (16 inches bgs) in the south half of the cell.

The south half of Cell 1 is characterized by community 6 – A*grostis alba/Chenopodium leptophyllum* upland that included redtop, narrow-leaf goosefoot (*Chenopodium leptophyllum*), creeping spikerush, fowl mannagrass, water hemlock, American licorice, Lady's thumb (*Polygonum persicaria*), annual rabbit foot grass, and broad-leaf cattail. The percent cover of wetland species is expected to increase over time within the constructed wetland assuming the surface water and groundwater levels observed in 2010 persist.

Community Type 11 – *Bromus inermis/Agropyron repens* was an upland community located on the southeast edge of the project similar in composition to Type 1 except for the addition of smooth brome (*Bromus inermis*) (Figure 3, Appendix A).

Upland community Type 5 – *Agropyron repens/Agropyron smithii* was located on the west boundary of the project adjacent to US Highway 89. The plant species were dominated by quackgrass, Western wheatgrass, narrow-leaf goosefoot, and meadow fescue (Figure 3, Appendix A).

Table 2. Vegetation species observed in 2010 at the Murphy Ox Yoke Wetland Mitigation Site.

Agropyron repens	QUACKGRASS	FACU
Agropyron smithii	WHEATGRASS,WESTERN	FACU
Agropyron sp.	WHEATGRASS	
Agropyron trachycaulum	WHEATGRASS,SLENDER	FAC
Agrostis alba	REDTOP	FACW
Agrostis stolonifera	BENTGRASS,SPREADING	FAC+
Alopecurus arundinaceus	FOXTAIL,CREEPING	NI
Alopecurus pratensis	FOXTAIL,MEADOW	FACW
Bromus inermis	SMOOTH BROME	NL
Bromus japonicus	BROME,JAPANESE	FACU
Bromus vulgaris	BROME,COLUMBIA	FACU-
Carex aquatilis	SEDGE,WATER	OBL
Carex nebrascensis	SEDGE,NEBRASKA	OBL
Carex rostrata	SEDGE,BEAKED	OBL
Chenopodium album	GOOSEFOOT,WHITE	FAC
Chenopodium leptophyllum	GOOSEFOOT,NARROW-LEAF	FACU
Chenopodium murale	NETTLE-LEAF GOOSEFOOT	NL
Cicuta douglasii	WATER-HEMLOCK,WESTERN	OBL
Cirsium arvense	THISTLE,CREEPING	FACU+
Cynoglossum officinale	HOUND'S TONGUE	FACU
Descurainia sophia	FLIXWEED	NL
Eleocharis palustris	SPIKERUSH,CREEPING	OBL
Epilobium ciliatum	WILLOW-HERB,HAIRY	FACW-
Equisetum hyemale	HORSETAIL,ROUGH	FACW
Festuca arundinacea	FESCUE,KENTUCKY	FACU-
Festuca pratensis	FESCUE,MEADOW	FACU+
Glyceria grandis	MANNAGRASS, AMERICAN	OBL
Glyceria striata	MANNAGRASS, FOWL	OBL
Glycyrrhiza lepidota	LICORICE,AMERICAN	FAC+
Green algae		
Helianthus annuus	SUNFLOWER,COMMON	FACU+

[1]Region 9 (Northwest) (Reed 1988).

Table 2. Vegetation species observed in 2010 at the Murphy Ox Yoke Wetland Mitigation Site (continued).

Hordeum jubatum	BARLEY,FOX-TAIL	FAC+
Iva axillaris	SUMPWEED,SMALL-FLOWER	FAC
Juncus balticus	RUSH,BALTIC	OBL
Juncus effusus	RUSH,SOFT	FACW+
Lactuca serriola	LETTUCE,PRICKLY	FAC-
Medicago sativa	ALFALFA	NL
Melilotus alba	SWEETCLOVER,WHITE	FACU
Melilotus officinalis	SWEETCLOVER,YELLOW	FACU
Mentha arvensis	MINT,FIELD	FAC
Phalaris arundinacea	GRASS,REED CANARY	FACW
Phleum pratense	TIMOTHY	FACU
Plantago major	PLANTAIN,COMMON	FAC+
Poa pratensis	BLUEGRASS,KENTUCKY	FACU+
Polygonum persicaria	THUMB,LADY'S	FACW
Polypogon monspeliensis	GRASS,ANNUAL RABBIT-FOOT	FACW+
Potentilla anserina	SILVERWEED	OBL
Rosa multiflora	MULTI-FLOWERED ROSE	NL
Salix drummondiana	WILLOW,DRUMMOND	FACW
Salix exigua	WILLOW,SANDBAR	OBL
Salix lasiandra	WILLOW,PACIFIC	FACW+
Salix lemmonii	WILLOW,LEMMON'S	FACW+
Salix planifolia	WILLOW,DIAMOND-LEAF	OBL
Scirpus microcarpus	BULRUSH,SMALL-FRUIT	OBL
Solidago canadensis	GOLDEN-ROD,CANADA	FACU
Sonchus arvensis	SOWTHISTLE,FIELD	FACU+
Taraxacum officinale	DANDELION,COMMON	FACU
Thlaspi arvense	PENNY-CRESS,FIELD	NI
Trifolium pratense	CLOVER,RED	FACU
Trifolium repens	CLOVER,WHITE	FACU+
Triglochin maritimum	ARROW-GRASS,SEASIDE	OBL
Typha latifolia	CATTAIL,BROAD-LEAF	OBL
Urtica dioica	NETTLE,STINGING	FAC+

[1]Region 9 (Northwest) (Reed 1988).

Type 8 is an open water habitat characterized by surface water, green algae, and minor amounts of common cattail. An existing irrigation ditch was plugged to provide additional water to Cell 1. Surface water has collected in the base of the west half of the ditch forming the Type 8 habitat.

Less than 0.1 acre total and 1 to 5 percent cover of hound's tongue (*Cynoglossum officinale*), a Category I noxious weed, were identified in the upland between the constructed wetland cells (Figure 3, Appendix A). Isolated plants of hound's tongue and Canada thistle, a Category 1 noxious weed, were recorded within communities 1,2,4, 5, and 11. Common dandelion, annual pennycress, prickly lettuce, yellow sow thistle, and narrow-leaf goosefoot are other plants identified that are considered non-noxious although undesirable.

Two vegetation transects were monitored at the Murphy Ox Yoke Wetland Mitigation Site in 2010 (Figure 2, Appendix A). The data recorded on Transect 1 (Monitoring Forms, Appendix B) is summarized in tabular and graphical formats (Table 3 and Chart 1 and Chart 2, respectively). The transect ends were photographed (Page C-2, Appendix C).

Transect 1 traverses Cell 2 (south cell) southwest to northeast. Two upland vegetation communities and one wetland vegetation community (Charts 1 and 2) were identified along this transect. Wetland community type 3 encompassed inundated areas interspersed with hydrophytic plants and unvegetated bare ground. Greater than 50 percent of the area contained plant cover. Thirty-seven percent (37%) of the transect was dominated by a wetland community.

Table 3. Data summary for Transect 1 in 2010 at the Murphy Ox Yoke Ranch Wetland Mitigation Site.

Vegetation Community Transitions along Transect	3
Vegetation Communities along Transect	3
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	39
Total Hydrophytic Species	9
Total Upland Species	30
% Transect Length Comprised of Hydrophytic Vegetation Communities	37
% Transect Length Comprised of Upland Vegetation Communities	63
% Transect Length Comprised of Unvegetated Open Water	0
% Transect Length Comprised of Bare Substrate	0

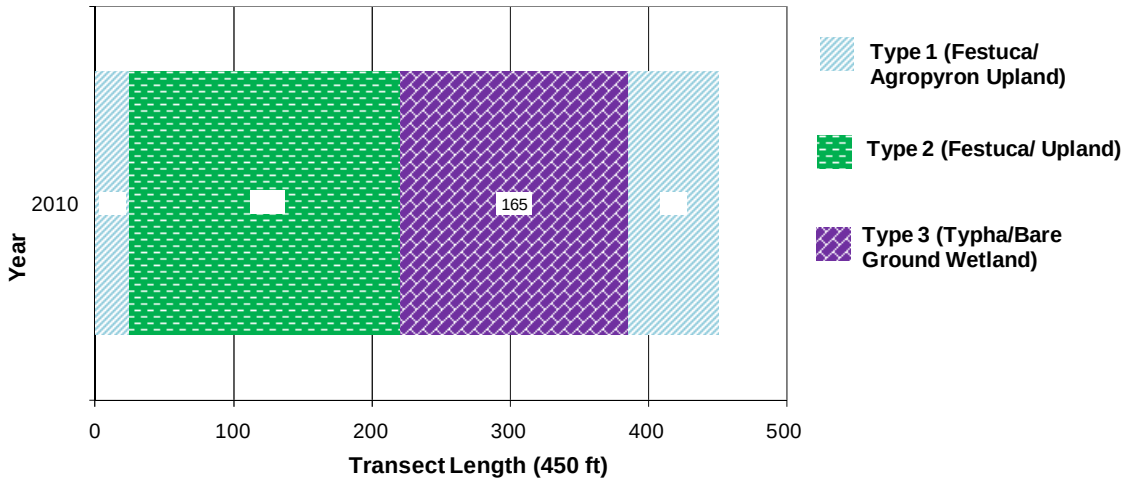


Chart 1. Transect map showing community types on Transect 1 in 2010 from start (0 feet) to end (450 feet).

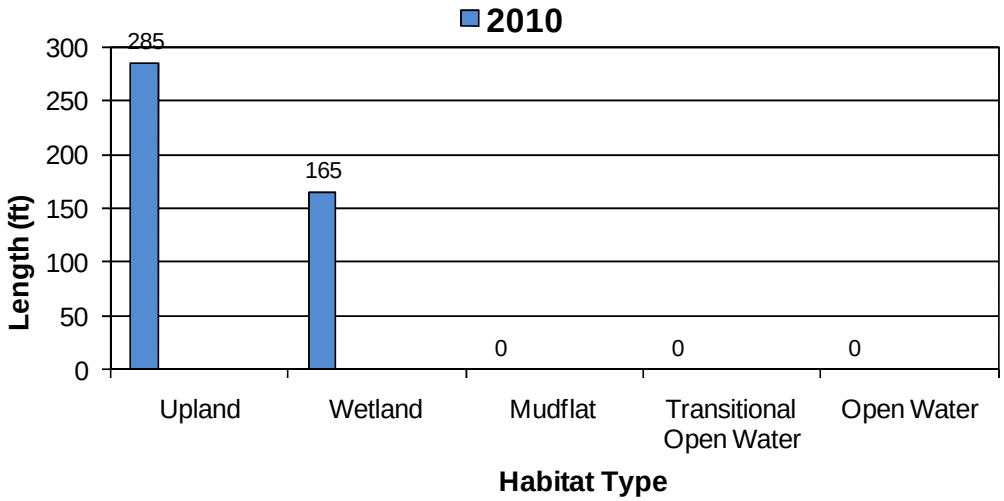


Chart 2. Length of habitat types within Transect 1 in 2010.

Data collected on Transect 2 (Monitoring Form in Appendix B) were summarized in tabular and graphic formats (Table 4**,** Chart 3 and Chart 14, respectively). The start and end of Transect 2 were photographed (Page C-2 in Appendix C).

Table 4. Data summary for Transect 2 in 2010 at the Murphy Ox Yoke Wetland Mitigation Site.

Vegetation Community Transitions along Transect	5
Vegetation Communities along Transect	4
Hydrophytic Vegetation Communities along Transect	2
Total Vegetative Species	40
Total Hydrophytic Species	23
Total Upland Species	17
% Transect Length Comprised of Hydrophytic Vegetation Communities	77.5
% Transect Length Comprised of Upland Vegetation Communities	20.7
% Transect Length Comprised of Unvegetated Open Water	1.8
% Transect Length Comprised of Bare Substrate	0.0

Transect 2 traverses the west half of Cell 1 (N), north to south. Two wetland vegetation communities, two upland communities, and one open water interval were identified within this transect. Hydrophytic vegetation communities dominated 77.5 percent of Transect 2.

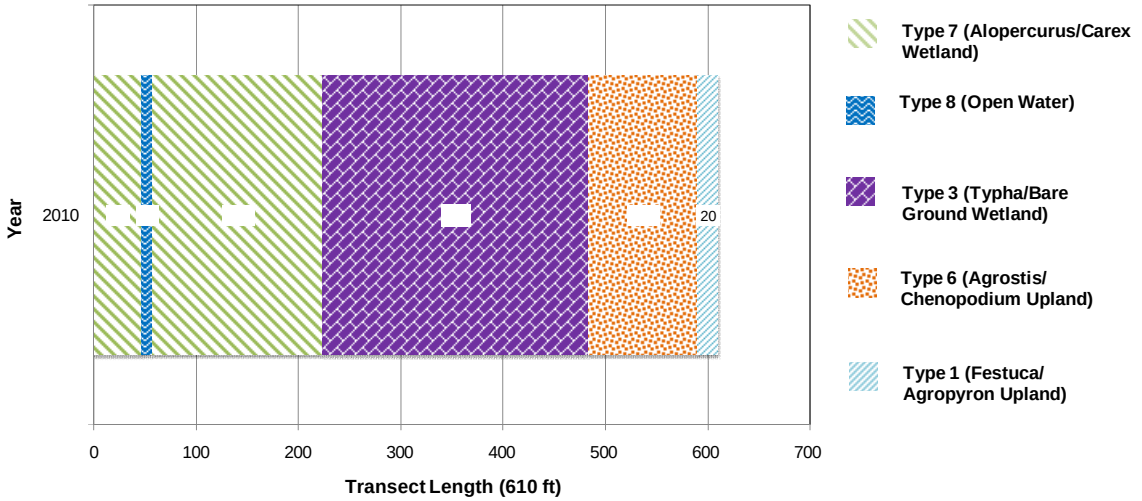


Chart 3. Transect maps showing community types on Transect 2 from transect start (0 feet) to end (610) feet).

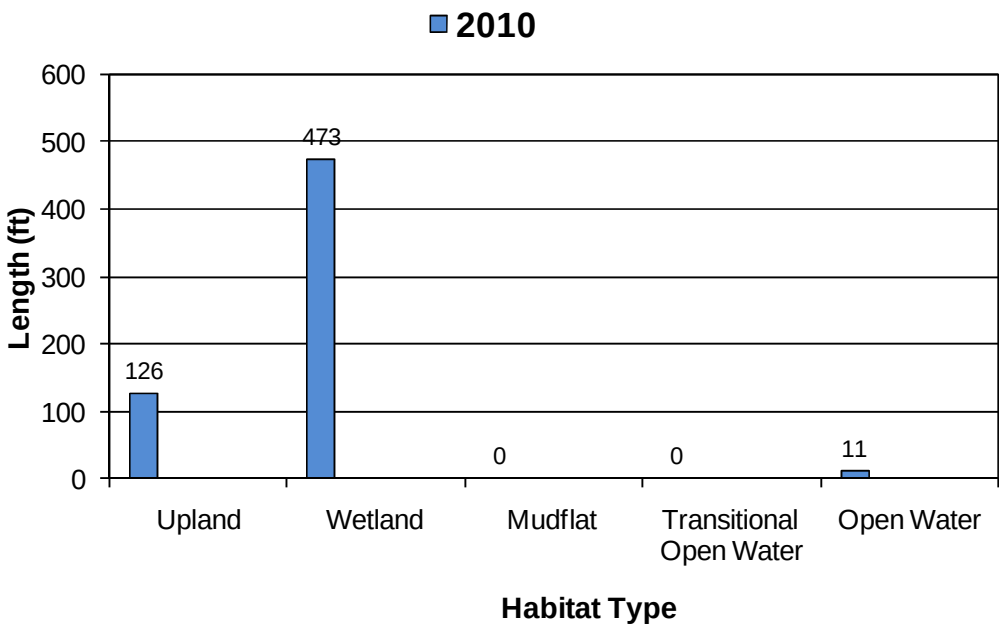


Chart 4. Length of habitat types within Transect 2 in 2010.

The 2009 Mitigation Plan specified planting 100 1-gallon willow and black cottonwood species and 1,000 willow cuttings. A majority of the woody plant materials were installed on the northwest edges of Cells 1 and 2. Fifty willow saplings in excellent condition were noted on Cell 1 and 15 willow saplings in good condition were observed in Cell 2. Survival rates of the woody species could not be calculated accurately based on plant obscuration and the absence of data on the final planting numbers and locations.

3.3. Soil

The project site was mapped in the Park County Soil Survey (USDA 2010) as the Vendome Meadowcreek Complex found on 0 to 4 percent slopes. The Vendome series consists of very deep, well drained sandy loam soils identified on alluvial fans, stream terraces, knolls, and plains. They are considered non-hydric and taxonomically classified as Aridic Haplustolls. The Meadowcreek series are poorly drained soils formed in alluvium. The fine-sandy loam soil unit is hydric and taxonomically classified as a Fluvaquentic Haplustolls. The map units did not correspond to the soil profile identified in the test pits. Site soils were disturbed by construction activities.

Soil test pits were excavated at five locations (M-1 through M-5, Figure 2**,** Appendix A). Data points M-3 (Cell 2) and M-5 (Cell 1) were located within the inundated areas of the constructed cells. Data point M-4 was located in the existing wetland north of Cell 1. Data points M-1 and M-2 were located in upland. The profiles at M-3 and M-5 revealed silty clay loam soils (10 YR 3/1 and 10 YR 2/1, respectively) with redoximorphic depletions (10 YR 6/1) in the

matrix of the M-3 profile. The soil at M-4 was a silty clay loam (10 YR 4/2) with redoximorphic depletions (10 YR 6/1).

3.4. Wetland Delineation

Five data points were used to define the vegetation, soil, and hydrology of site wetlands (M-1 to M-5, Figure 2, Appendix A; Wetland Delineation Forms, Appendix B). The July 30, 2010, delineation identified and mapped 2.15 acres of created emergent wetland within the constructed cells and 0.02 acres of open water that resulted from plugging the existing drain ditch (Table 5, Figure 3, Appendix A). Approximately 5.18 acres of existing wet meadow, emergent marsh, scrub/shrub and aquatic bed habitats wetland within the 12.59 acre site was delineated during 2010 mitigation monitoring. The baseline delineation completed in 2003 identified 3.89 acres of existing wetlands and a total mitigation area of 10.99 acres (PBS&J 2009).

Table 5. Total wetland acres delineated in July 2010.

Existing Wetland Area	3.89	5.18
Created Wetland Area	---	2.15
Created Open Water Area		0.02
Total Aquatic Habitat	**3.89**	**7.35**

[1]Baseline delineation (PBS&J 2009).

3.5. Fish, Birds, and Wildlife

A comprehensive list of bird and other wildlife species observed directly or indirectly during the 2010 monitoring visit is presented in Table 6**.** Eleven bird species were observed directly including killdeer, red-winged blackbird, American robin, double-crested cormorant, semipalmated sandpiper, and yellow-headed blackbird. Mule deer, white-tailed deer, and Merriam's shrew were viewed onsite. Reptile and amphibians observed included northern leopard frog, painted turtle, plains gartersnake, and Woodhouse's toad. Tracks of coyote, deer mouse, meadow vole, and raccoon were noted.

Table 6. Comprehensive list of bird and other wildlife species observed directly or indirectly in 2010 at the Murphy Ox Yoke Mitigation Site.

BIRDS	
American Avocet	*Recurvirostra americana*
American Goldfinch	*Spinus tristus*
American Robin	*Turdus migratorius*
Barn Swallow	*Hirundo rustica*
Black-billed Magpie	*Pica hudsonia*
Cooper's Hawk	*Accipiter cooperii*
Double-crested Cormorant	*Phalacrocorax auritus*
Eastern Kingbird	*Tyrannus tyrannus*
Green-winged Teal	*Anas crecca*
Killdeer	*Charadrius vociferus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Sandhill Crane	*Grus canadensis*
Semipalmated Sandpiper	*Calidris pusilla*
Tree Swallow	*Tachycineta bicolor*
Wilson's Phalarope	*Phalaropus tricolor*
Wilson's Snipe	*Gallinago delicata*
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*
Yellow-rumped Warbler	*Dendroica coronata*
MAMMALS	
Coyote	*Canis latrans*
Deer Mouse	*Peromyscus maniculatus*
Meadow Vole	*Microtus pennsylvanicus*
Merriam's Shrew	*Sorex merriami*
Mule Deer	*Odocoileus hemionus*
Raccoon	*Procyon lotor*
White-footed Mouse	*Peromyscus leucopus*
White-tailed Deer	*Odocoileus virginianus*
REPTILES	
Painted Turtle	*Chrysemys picta*
Plains Gartersnake	*Thamnophis radix*
AMPHIBIANS	
Columbia Spotted Frog	*Rana luteiventris*
Western Toad	*Bufo boreas*
Woodhouse's Toad	*Bufo woodhousii*

3.6. Functional Assessment

A baseline functional assessment using the 1999 MDT wetland assessment method (Berglund 1999) was completed in 2003 for the wet meadow habitat located in the northwest corner of the site (Community Type 7) and the remaining wetlands located west of the Park Branch Canal (PBS&J 2009). The two

assessment areas were rated as Category III wetlands in 2003 partly as a result of moderate to high level disturbances site wide (PBS&J 2009). Historic forms of disturbance included grazing, haying, ditching, channel straightening, and road building.

Functional assessments of the existing wet meadow (Restoration – 2.04 acres), existing shrub-scrub and cattail wetlands west of the canal (Preservation – 1.89 acres), and created wetland cells (Creation – 2.15 acres) were completed in 2010 (Berglund and McEldowney 2008). The 2003 acreages for the existing restoration and preservation AAs were used for consistency. The 2010 survey data showed that there is approximately one additional acre within the mitigation boundary. The 2010 GIS information indicates that the acre lies within the existing wet meadow targeted for restoration located in the northwest corner of the site. The assessment results are summarized in Table 7.

The wet meadow northwest of Cell 1 (N) was rated as a Category III wetland with 54.5 percent of the total possible points. The rating was high for sediment/shoreline stabilization. The existing wetlands west of the canal were rated as a Category II system with 76.5 percent of the total possible points based on an excellent rating for production export/food chain support and high ratings for general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and groundwater discharge and recharge. The constructed cells were rated as Category IV wetlands with 34.5 percent of the possible functional points. Ratings were low in all categories except for moderate assessments in short and long term surface water storage, sediment/nutrient/toxicant removal, and groundwater discharge and recharge. Wetland functions of the constructed cells are expected to improve as the cover of hydrophytic plants and wildlife use increase.

Table 7. Functions and Values of Murphy Ox Yoke wetlands.

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2003 Baseline[1] Wet Meadow	2003 Baseline West of Canal	2010 Created Wetland Cells[2]	2010 Wet Meadow	2010 West of Canal
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.1)	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.0)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)	Low (0.3)	Mod (0.7)	High (0.9)
General Fish/Aquatic Habitat	--	--	NA	NA	--
Flood Attenuation	Low (0.1)	Mod (0.6)	Mod (0.6)	Low (0.1)	Mod (0.7)
Short and Long Term Surface Water Storage	Mod (.5)	High (0.8)	Mod (0.5)	Mod (.5)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (0.9)	Mod (0.5)	Mod (0.7)	High (0.9)
Sediment/Shoreline Stabilization	--	High (1.0)	Low (0.2)	High (0.9)	High (1.0)
Production Export/ Food Chain Support	Mod (0.6)	High (0.9)	Low (0.3)	Mod (0.7)	Exc (1.0)
Groundwater Discharge/Recharge	High (1.0)	Low (0.1)	Mod (0.7)	Mod (0.7)	High (1.0)
Uniqueness	Low (0.3)	Mod (0.5)	Low (0.2)	Low (0.2)	Mod (0.4)
Recreation/Education Potential (bonus points)	Low (0.3)	Low (0.3)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points / Possible Points	**4.4/10**	**6.2/11**	**3.45/10**	**5.45/10**	**7.65/10**
% of Possible Score Achieved	**44%**	**56%**	**34.5%**	**54.5%**	**76.5%**
Overall Category	**III**	**III**	**III**	**III**	**II**
Acreage of Assessed Aquatic Habitats within Easement (ac)			**2.15**	**2.04**	**1.89**
Functional Units (acreage x actual points) **(f^1-)**			**7.42**	**11.12**	**14.46**

[1]Berglund 1999 MDT MWAM.
[2]Berglund and McEldowney 2008 MDT MWAM.

3.7. Photo Documentation

Photographs taken of photo points one through five (PP1 through PP5, Figure 2, Appendix A) are shown on pages C-1 to C-2 of Appendix C. Transect end points are shown on page C-2 of Appendix C and photos of data points M-1 through M-5 are included on page C-3.

3.8. Maintenance Needs

No man-made nesting structures or water control structures were installed on the property. Less than 0.1 acre total and 1 to 5 percent cover of hound's tongue, a Category I noxious weed, were identified in the upland between the constructed wetland cells (Figure 3, Appendix A). Isolated plants of hound's tongue and Canada thistle (also a Category 1 noxious weed) were recorded within communities 1, 2, 4, 5, and 11. The weed management plan should continue to be implemented for the site to prevent noxious weeds from spreading to other areas.

3.9. Current Credit Summary

Table 8 presents the 2010 summary of wetland credits. Credit ratios were taken from the USACE September 2008 letter to MDT (PBS&J 2009). The total area of projected wetland within the constructed cells was estimated at 4.1 acres in 2008 (2008 credit acres). The 2010 survey measured the post-construction footprint of the cells at 4.5 acres. The actual wetland area developed to date within the cells was 2.15 acres with additional acreages anticipated as wetland hydrology and

hydrophytic vegetation develops. Acreages of the existing rehabilitation and preservation wetlands and upland buffer surveyed in 2010 were higher than the 2008 baseline assessment totals presented in the Mitigation Plan. The 2008 survey identified 10.99 acres within the mitigation site boundary. The 2010 survey identified 12.59 acres within the mitigation site boundary. The additional area appears to be within the area targeted for rehabilitation/restoration. However, the 2010 estimated credits shown in Table 8 are based on the projected targets presented in the original 2008 Mitigation Plan.

Table 8. 2010 Summary of Estimated Wetland Credits.

PROPOSED FEATURE	COMPENSATORY MITIGATION TYPE	COE CREDIT RATIO	2008 CREDIT ACRES	2008 COE CREDIT TARGET	2010 CREDIT ACRES	2010 ESTIMATED CREDITS
Creation of palustrine emergent and scrub/shrub wetlands through shallow excavation of groundwater in Cell 1.	Creation	1:1	2.70	2.70	1.59	1.59
Creation of palustrine emergent and scrub/shrub wetlands through shallow excavation of groundwater in Cell 2.	Creation	1:1	1.40	1.40	0.56	0.56
Rehabilitation of most wetlands west of the Park Branch Canal.	Restoration (Rehabilitation)	1.5:1	2.00	1.33	2.00	1.33
Preservation of existing scrub/shrub and emergent wetlands not included in restoration/rehabilitation.	Preservation	4:1	1.89	0.47	1.89	0.47
Upland buffer will be included in the conservation easement area to protect aquatic resources within project limits.	Upland Buffer	5:1	3.00	0.60	3.00	0.60
		Totals	10.99	6.50	9.04	4.56

4. REFERENCES

Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. Prepared for Montana Department of Transportation and Morrison-Maierle, Inc. Prepared by Western EcoTech. Helena, Montana. 18pp

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Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1. U.S. Army Corps of Engineers Waterways Experiment Station. Vicksburg, Miss.

Post, Buckley, Schuh & Jernigan. April 2009. *Wetland Mitigation Plan* prepared for MDT Project STPX-BR 34(16).

Reed, P.B. 1988. *National list of plant species that occur in wetlands: North West (Region 9)*. Biological Report 88(26.9), May 1988. U.S. Fish and Wildlife Service, Washington, DC.

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Websites:

USDA/NRCS Web Soil Survey. Park County accessed August 2010: http://websoilsurvey.nrcs.usda.gov/app/.

Western Regional Climate Center (WRCC). Precipitation data for Emigrant and Livingston (12S) accessed August 2010 from http://www.wrcc.dri.edu/CLIMATEDATA.html.

Appendix A

Figure 2 – Monitoring Activity Locations
Figure 3 – Mapped Site Features

MDT Wetland Mitigation Monitoring
Murphy Ox Yoke Ranch
Park County, Montana

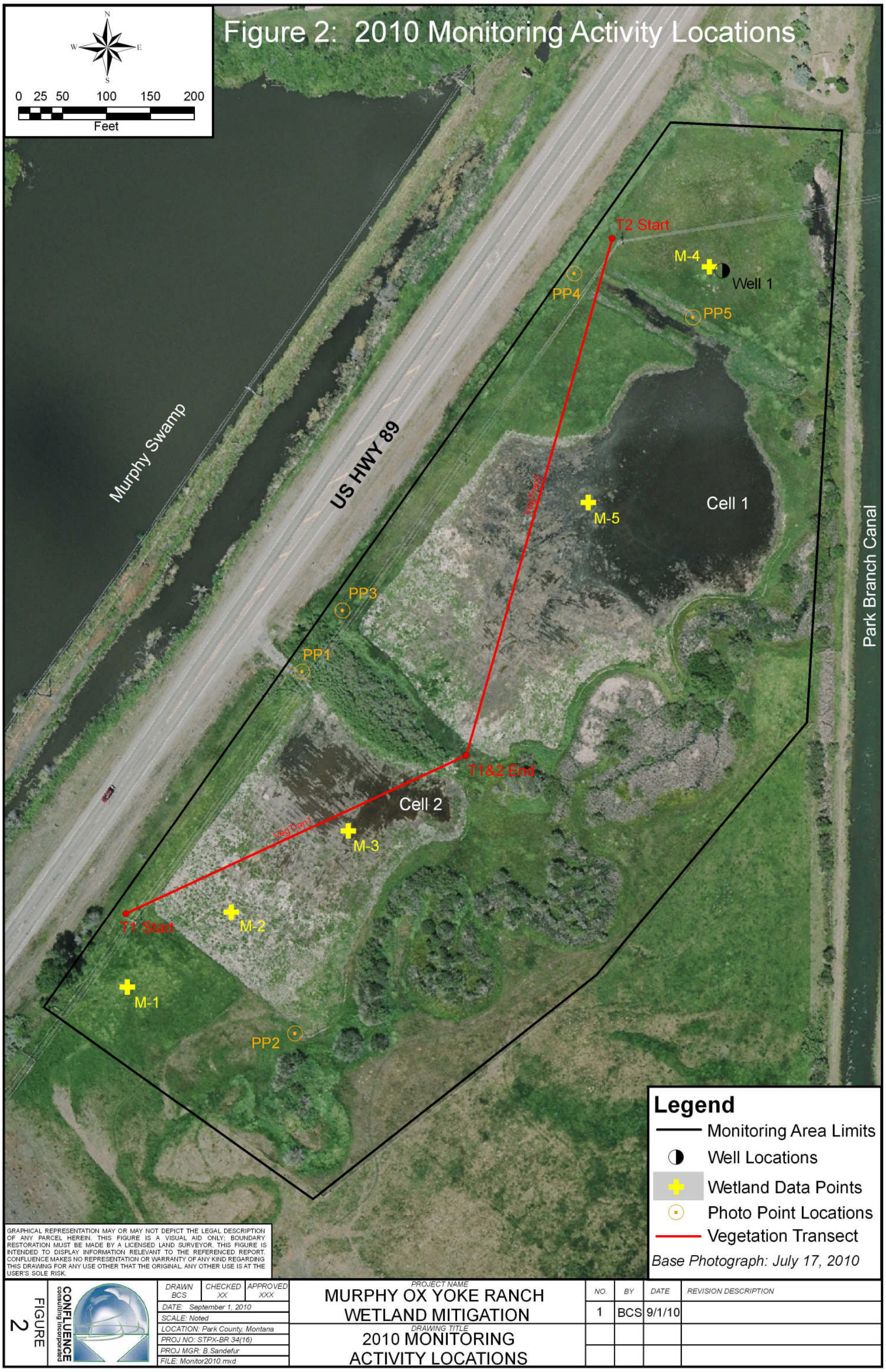

Figure 2: 2010 Monitoring Activity Locations
N
W
E
S
0 25 50 100 150 200
Feet
T2 Start
M-4
Well 1
PP4
PP5
Murphy Swamp
US HWY 89
Veg Trans2
Cell 1
M-5
Park Branch Canal
PP3
PP1
T1&2 End
Cell 2
Veg Trans1
M-3
T1 Start
M-2
M-1
PP2
Legend
Monitoring Area Limits
Well Locations
Wetland Data Points
Photo Point Locations
Vegetation Transect
Base Photograph: July 17, 2010
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 THAT THE ORIGINAL, ANY OTHER USE IS AT THE USER'S SOLE RISK.
FIGURE 2
CONFLUENCE consulting incorporated
DRAWN BCS
CHECKED XX
APPROVED XXX
DATE: September 1, 2010
SCALE: Noted
LOCATION: Park County, Montana
PROJ NO: STPX-BR 34(16)
PROJ MGR: B.Sandefur
FILE: Monitor2010.mxd
PROJECT NAME
MURPHY OX YOKE RANCH WETLAND MITIGATION
DRAWING TITLE
2010 MONITORING ACTIVITY LOCATIONS
NO. 1
BY BCS
DATE 9/1/10
REVISION DESCRIPTION


Figure 3: Mapped Site Features 2010
N
W
E
S
0 25 50 100 150 200
Feet
Acreages
Gross Wetland 7.35 acres
Existing Wetland 5.18 acres
Open Water Area 0.02 acres
Net Wetland 2.15 acres
Monitoring Area Limits
Wetland Boundary
Vegetation Community Boundary
Open Water (8)
Base photograph July 17, 2010
Murphy Swamp
US HWY 89
Park Branch Canal
1
2
3
4
5
6
7
8
9
10
11
12
Noxious Weeds
Cynoglossum officinale
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 TYPES
1 - Festuca pratensis/Agropyron repens
2 - Festuca pratensis
3 - Typha latifolia/Bare ground
4 - Salix exigua/Salix lasiandra
5 - Agropyron repens/Agropyron smithii
6 - Agrostis alba/Chenopodium leptophyllum
7 - Alopecurus pratensis/Carex rostrata
9 - Carex nebrascensis/Carex rostrata
10 - Salix exigua/Salix drummondiana
11 - Bromus inermis/Agropyron repens
12 - Typha latifolia
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 THAT THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.
FIGURE 3
CONFLUENCE consulting incorporated
DRAWN BCS
CHECKED XX
APPROVED XXX
DATE: September 1, 2010
SCALE: Noted
LOCATION: Park County, Montana
PROJ NO: STPX-BR 34(16)
PROJ MGR: B.Sandefur
FILE: VegCom2010.mxd
PROJECT NAME
MURPHY OX YOKE RANCH WETLAND MITIGATION
DRAWING TITLE
MAPPED SITE FEATURES 2010
NO. BY DATE REVISION DESCRIPTION
1 BCS 9/1/10
2 BCS 9/2/10

Appendix B

2010 Wetland Mitigation Site Monitoring Form
2010 USACE Wetland Delineation Form
2010 MDT Functional Assessment Form

MDT Wetland Mitigation Monitoring
Murphy Ox Yoke Ranch
Park County, Montana

1

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Murphy Ox-Yoke Assessment Date/Time 7/30/2010 11:45:27 AM

Person(s) conducting the assessment: BCS

Weather: Clear & sunny, warm. Rain appro Location: S of Murphy Lane in Emigrant, MT

MDT District: Butte Milepost:

Legal Description: T 5S R 8E Section(s) 28 and 33

Initial Evaluation Date: 7/30/2010 Monitoring Year: 1 #Visits in Year: 1

Size of Evaluation Area: 12.6 (acres) Land use surrounding wetland: agricultural

HYDROLOGY

Surface Water Source: Groundwater from Park Branch canal; Murphy Creek flow from Murphy Swa

Inundation: ☑ Average Depth: 0.4 **(ft)** Range of Depths: 0-2.5 **(ft)**

Percent of assessment area under inundation: 10 %

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

If assessment area is not inundated then are the soils saturated within 12 inches of surface: No

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

Groundwater Monitoring Wells

Record depth of water surface below ground

Well ID	**Water Surface Depth**
W-1(TP 6)	1.5 **(ft)**

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:

VEGETATION COMMUNITIES

Site Murphy Ox-Yoke

(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:** Festuca pratensis / Agropyron repens

Species	Cover class	Species	Cover class
Agropyron repens	4	Agropyron smithii	2
Agrostis stolonifera	2	Chenopodium leptophyllum	1
Cirsium arvense	1	Festuca pratensis	4
Melilotus alba	2	Melilotus officinalis	2
Phalaris arundinacea	3	Phleum pratense	2
Thlaspi arvense	1		

Comments:

Community # 2 **Community Type:** Festuca pratensis /

Species	Cover class	Species	Cover class
Agropyron repens	1	Bare Ground	3
Chenopodium leptophyllum	1	Cirsium arvense	0
Eleocharis palustris	1	Equisetum hyemale	1
Festuca pratensis	2	Juncus balticus	1
Melilotus officinalis	2	Polypogon monspeliensis	1
Thlaspi arvense	0	Trifolium pratense	1
Trifolium repens	1	Typha latifolia	1

Comments:

Community # 3 **Community Type:** Typha latifolia / Bare ground

Species	Cover class	Species	Cover class
Bare Ground	3	Carex rostrata	1
Eleocharis palustris	1	Festuca pratensis	1
Glyceria striata	1	Typha latifolia	4

Comments:

Community # 4 **Community Type:** Salix exigua / Salix lasiandra

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alopecurus arundinaceus	2
Cicuta douglasii	1	Cirsium arvense	0
Glyceria striata	1	Glycyrrhiza lepidota	1
Mentha arvensis	1	Polypogon monspeliensis	1
Salix drummondiana	2	Salix exigua	4
Salix lasiandra	3		

Comments:

Pht 5580

Community # 5 **Community Type:** Agropyron repens / Agropyron smithii

Species	Cover class	Species	Cover class
Agropyron repens	3	Agropyron smithii	3
Agropyron trachycaulum	1	Bromus japonicus	1
Chenopodium leptophyllum	2	Cynoglossum officinale	0
Equisetum hyemale	1	Festuca pratensis	2
Glycyrrhiza lepidota	1	Hordeum jubatum	1
Iva axillaris	1	Lactuca serriola	1
Melilotus alba	1	Solidago canadensis	1
Sonchus arvensis	1		

Comments:

Community # 6 **Community Type:** Agrostis alba / Chenopodium leptophyllum

Species	Cover class	Species	Cover class
Agrostis alba	2	Chenopodium leptophyllum	2
Cicuta douglasii	1	Eleocharis palustris	2
Glyceria striata	2	Glycyrrhiza lepidota	1
Polygonum persicaria	1	Polypogon monspeliensis	1
Typha latifolia	1		

Comments:

20+% bare ground

Community # 7 Community Type: Alopecurus pratensis / Carex rostrata

Species	Cover class	Species	Cover class
Alopecurus pratensis	3	Carex aquatilis	2
Carex rostrata	3	Equisetum hyemale	1
Glycyrrhiza lepidota	1	Helianthus annuus	1
Hordeum jubatum	2	Juncus balticus	1
Juncus effusus	1	Lactuca serriola	1
Triglochin maritimum	1		

Comments:

Community existing wetland

Community # 8 Community Type: Open water /

Species	Cover class	Species	Cover class
Algae, green	2	Open Water	5
Typha latifolia	1		

Comments:

Community # 9 Community Type: Carex nebrascensis / Carex rostrata

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Carex aquatilis	2
Carex nebrascensis	4	Carex rostrata	3
Glyceria grandis	1	Helianthus annuus	1
Scirpus microcarpus	2	Typha latifolia	2

Comments:

Existing wetland

Community # 10 Community Type: Salix exigua / Salix drummondiana

Species	Cover class	Species	Cover class
Agrostis alba	1	Epilobium ciliatum	1
Mentha arvensis	1	Rosa multiflora	1
Salix drummondiana	3	Salix exigua	3
Salix lasiandra	2	Salix lemmonii	2
Salix planifolia	2	Typha latifolia	1
Urtica dioica	1		

Comments:

Existing wetland

Community # 11 **Community Type:** Bromus inermis / Agropyron repens

Species	Cover class	Species	Cover class
Agropyron repens	4	Bromus inermis	4
Chenopodium leptophyllum	1	Cirsium arvense	0
Equisetum hyemale	1	Festuca pratensis	3
Thlaspi arvense	1		

Comments:

Similar veg community to 1, no distinct transition between 1 and 11

Community # 12 **Community Type:** Typha latifolia /

Species	Cover class	Species	Cover class
Eleocharis palustris	1	Mentha arvensis	1
Typha latifolia	5		

Comments:

VEGETATION TRANSECTS

Site: Murphy Ox-Yoke Date: 0/2010 11:45:27 AM

Transect Number: 1 **Compass Direction from Start:** 40

Interval Data:

Ending Station 25 **Community Type:** Festuca pratensis / Agropyron repens

Species	Cover class	Species	Cover class
Agropyron repens	3	Agropyron smithii	3
Agrostis stolonifera	2	Festuca pratensis	4
Phleum pratense	2	Taraxacum officinale	2
Trifolium pratense	1		

Ending Station 220 **Community Type:** Festuca pratensis /

Species	Cover class	Species	Cover class
Bare Ground	3	Bromus vulgaris	1
Chenopodium leptophyllum	1	Descurainia sophia	1
Festuca pratensis	2	Melilotus officinalis	1
Melilotus officinalis	1	Phleum pratense	1
Salix exigua	1	Taraxacum officinale	1
Thlaspi arvense	1	Trifolium pratense	1
Trifolium repens	1		

Ending Station 385 **Community Type:** Typha latifolia / Bare ground

Species	Cover class	Species	Cover class
Agropyron smithii	1	Agrostis stolonifera	1
Bare Ground	4	Cirsium arvense	0
Eleocharis palustris	1	Festuca pratensis	1
Iva axillaris	1	Phalaris arundinacea	1
Phleum pratense	1	Salix lasiandra	1
Typha latifolia	3		

Ending Station 450 **Community Type:** Festuca pratensis / Agropyron repens

Species	Cover class	Species	Cover class
Agropyron repens	4	Agrostis stolonifera	2
Alopecurus arundinaceus	3	Chenopodium leptophyllum	1
Cirsium arvense	0	Glycyrrhiza lepidota	2
Helianthus annuus	1	Lactuca serriola	1
Melilotus officinalis	1	Plantago major	1
Polypogon monspeliensis	1		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 190

Interval Data:

Ending Station 47 **Community Type:** Alopecurus pratensis / Carex nebrascensis

Species	Cover class	Species	Cover class
Agropyron smithii	2	Agropyron spp.	1
Alopecurus pratensis	5	Carex aquatilis	1
Carex rostrata	3	Chenopodium album	1
Glyceria striata	1	Thlaspi arvense	1

Ending Station 58 **Community Type:** Open water /

Species	Cover class	Species	Cover class
Algae, green	2	Open Water	5
Typha latifolia	2		

Ending Station 224 **Community Type:** Alopecurus pratensis / Carex nebrascensis

Species	Cover class	Species	Cover class
Alopecurus pratensis	4	Carex aquatilis	1
Carex rostrata	2	Chenopodium album	1
Glyceria striata	1	Juncus balticus	1
Potentilla anserina	1	Thlaspi arvense	1

Ending Station 484 **Community Type:** Typha latifolia / Bare ground

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Bare Ground	4
Chenopodium album	2	Eleocharis palustris	2
Glyceria striata	2	Glycyrrhiza lepidota	1
Polypogon monspeliensis	1	Typha latifolia	4

Ending Station 590 **Community Type:** Agrostis alba / Chenopodium leptophyllum

Species	Cover class	Species	Cover class
Agropyron smithii	2	Agropyron spp.	2
Agrostis alba	3	Chenopodium leptophyllum	2
Equisetum hyemale	2	Festuca pratensis	3
Glyceria striata	1	Helianthus annuus	1
Medicago sativa	1	Sonchus arvensis	2

Ending Station 610 **Community Type:** Festuca pratensis / Agropyron repens

Species	Cover class	Species	Cover class
Agropyron repens	2	Agrostis alba	2
Bromus inermis	1	Chenopodium album	2
Cicuta douglasii	2	Equisetum hyemale	1
Equisetum hyemale	2	Festuca pratensis	3
Lactuca serriola	2	Melilotus alba	1

Transect Notes:

Community 1 and 3 within transect 2 very similar in composition, separated by 11ft of open water in ditch. Community 4 consists predominantly of planted willows with high rate of survival (>90%).

PLANTED WOODY VEGETATION SURVIVAL

Murphy Ox-Yoke

Planting Type	#Planted	#Alive	Notes
Salix border around Cell 1		50	Excellent willow survival
Salix clumps in Cell 2		15	Good survival

Comments

Murphy Ox-Yoke

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 Goldfinch	1	FO	SS
American Robin	2		WM
Double-crested Cormorant	2	L	MF
Eastern Kingbird	1	FO	WM
Killdeer	6		MF
Red-tailed Hawk	1	FO	UP, WM
Red-winged Blackbird	5	FO	MA
Semipalmated Sandpiper	2		MF
Wilson's Phalarope	1		MF
Yellow-headed Blackbird	2	FO	MA, SS
Yellow-rumped Warbler	1	FO	SS

BEHAVIOR CODES

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

HABITAT CODES

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

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

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Columbia Spotted Frog	2	No	No	No	
Coyote		Yes	No	No	
Deer Mouse		Yes	No	No	
Meadow Vole		Yes	No	No	
Merriam's Shrew	1	No	No	No	
Mule Deer	2	No	No	No	
Painted Turtle	1	No	No	No	
Plains Gartersnake	1	No	No	No	
Raccoon		Yes	No	No	
Western Toad	4	No	No	No	
White-footed Mouse		No	No	Yes	
White-tailed Deer	1	Yes	No	No	
Woodhouse's Toad	1	No	No	No	

Wildlife Comments:

Murphy Ox-Yoke

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
5569	45.365799	-110.735619		5569-72
5573	45.365761	-110.735809	180	Cover shot
5574	45.365185	-110.736504	70	veg tran 1-start
5575	45.365108	-110.736435		M-1,eg com 1
5578	45.365276	-110.73616	60	M-2
5579	45.365028	-110.734428	290	boundary of veg com 1 & 4
5581	45.365627	-110.735069	280	Veg tran 1, end
5582	45.365627	-110.735069	30	Veg tran 2, end
5586	45.366108	-110.735634	60	5586-5591
5592	45.367165	-110.734535	140	pp 4
5594	45.367268	-110.734436	200	Veg tran 2, start
5602	45.36478	-110.735756	300	5602-06, pp2
5610	45.366997	-110.734016	180	pp5

Comments:

Murphy Ox-Yoke

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 bounda

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate weltands 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:

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

Project/Site: MurphY Ox-Yoke City/County: Park Sampling Date: 7/30/2010

Applicant/Owner: MDT State: MT Sampling Point: M-1

Investigator(s): BCS Section, Township, Range: S 33 T 5S R 8E

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

Subregion (LRR): LRR E Lat: 45.3651283333333 Long: -110.73654 Datum: WGS 84

Soil Map Unit Name: Vendome-Meadow Creek complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 0)	Absolute % Cover	Dominant Species?	Indicator Status
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
5. 0	0	☐	0
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Festuca arundinacea	40	☑	FACU-
2. Phleum pratense	10	☐	FACU
3. Chenopodium murale	5	☐	NO
4. Agropyron repens	35	☑	FACU
5. Poa pratensis	15	☐	FACU+
6. Agrostis stolonifera	10	☐	FAC+
7. 0	0	☐	0
8. 0	0	☐	0
9. 0	0	☐	0
10. 0	0	☐	0
11. 0	0	☐	0
	115 = Total Cover		
Woody Vine Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	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: 2 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 3.90909

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:
0

SOIL

Sampling Point: M-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
0-6	10YR 3/4	100					Silt Loam	
6-12	10YR 3/2	95	10YR 3/4	5	C	M	Silt Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Abundant Fe concentrations below A

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

No indicators

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

Project/Site: MurphY Ox-Yoke City/County: Park Sampling Date: 7/30/2010

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

Investigator(s): BCS Section, Township, Range: S 33 T 5S R 8E

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

Subregion (LRR): LRR E Lat: 45.3651283333333 Long: -110.73654 Datum: WGS 84

Soil Map Unit Name: Vendome-Meadow Creek complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☑, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 0)	Absolute % Cover	Dominant Species?	Indicator Status
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
5. 0	0	☐	0
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Phleum pratense	10	☑	FACU
2. Taraxacum officinale	5	☐	FACU
3. Festuca arundinacea	20	☑	FACU-
4. Trifolium pratense	10	☑	FACU
5. Juncus balticus	5	☐	OBL
6. 0	0	☐	0
7. 0	0	☐	0
8. 0	0	☐	0
9. 0	0	☐	0
10. 0	0	☐	0
11. 0	0	☐	0
	50 = Total Cover		
Woody Vine Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
	0 = Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	
FACW species	0	x 2 =	
FAC species	0	x 3 =	
FACU species	45	x 4 =	
UPL species	0	x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:
0

SOIL

Sampling Point: M-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	10YR 5/2	100					Sandy Loam	Dry, friable
8-16	10YR 2/1	95	10YR 6/2	3	D	M	Silty Clay Loam	Soil moist a 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: (Applicable to all LRRs, unless otherwise noted.)

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Hydric soil indicators likely exposed as recent construction excavated down to historic water levels.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): 16

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

Indicators for wetland hydrology not yet well developed.

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

Project/Site: MurphY Ox-Yoke City/County: Park Sampling Date: 7/30/2010

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

Investigator(s): BCS Section, Township, Range: S 33 T 5S R 8E

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

Subregion (LRR): LRR E Lat: 45.3656116666667 Long: -110.735283333333 Datum: WGS 84

Soil Map Unit Name: Vendome-Meadow Creek complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☑, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 0)	Absolute % Cover	Dominant Species?	Indicator Status
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
5. 0	0	☐	0
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Typha latifolia	30	☑	OBL
2. Alopecurus arundinaceus	15	☑	NI
3. Polypogon monspeliensis	5	☐	FACW+
4. Eleocharis palustris	5	☐	OBL
5. 0	0	☐	0
6. 0	0	☐	0
7. 0	0	☐	0
8. 0	0	☐	0
9. 0	0	☐	0
10. 0	0	☐	0
11. 0	0	☐	0
	55 = Total Cover		
Woody Vine Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	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: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	
FACW species	5	x 2 =	
FAC species	0	x 3 =	
FACU species	0	x 4 =	
UPL species	0	x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = 1.125

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
0

SOIL

Sampling Point: M-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
0-8	10YR 2/2	100					Silt Loam	
8-12	10YR 3/1	95	10YR 6/1	3	D	M	Silty Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Soils recently disturbed from construction activity.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 6

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

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

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

Project/Site: MurphY Ox-Yoke City/County: Park Sampling Date: 7/30/2010

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

Investigator(s): BCS Section, Township, Range: S 28 T 5S R 8E

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

Subregion (LRR): LRR E Lat: 45.3672683333333 Long: -110.734116666667 Datum: WGS 84

Soil Map Unit Name: Vendome-Meadow Creek complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 0)	Absolute % Cover	Dominant Species?	Indicator Status
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
5. 0	0	☐	0
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Carex aquatilis	10	☐	OBL
2. Carex rostrata	30	☑	OBL
3. Hordeum jubatum	5	☐	FAC+
4. Juncus balticus	10	☐	OBL
5. Carex nebrascensis	40	☑	OBL
6. 0	0	☐	0
7. 0	0	☐	0
8. 0	0	☐	0
9. 0	0	☐	0
10. 0	0	☐	0
11. 0	0	☐	0
	95 = Total Cover		
Woody Vine Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 1.10526

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
0

SOIL

Sampling Point: M-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 2/1	100					Silty Clay Loam	Moist to surface
10-18	10YR 4/2	95	10YR 6/1	3	D	M	Silty Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes ☑ No ☐ Depth (inches): 16

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

Plot near well, water level at -1.5ft

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

Project/Site: MurphY Ox-Yoke City/County: Park Sampling Date: 7/30/2010

Applicant/Owner: MDT State: MT Sampling Point: M-5

Investigator(s): BCS Section, Township, Range: S 28 T 5S R 8E

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

Subregion (LRR): LRR E Lat: 45.366255 Long: -110.734798333333 Datum: WGS 84

Soil Map Unit Name: Vendome-Meadow Creek complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☑, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 0)	Absolute % Cover	Dominant Species?	Indicator Status
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
3. 0	0	☐	0
4. 0	0	☐	0
5. 0	0	☐	0
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Typha latifolia	30	☑	OBL
2. Eleocharis palustris	10	☐	OBL
3. Glyceria striata	10	☐	OBL
4. Polypogon monspeliensis	5	☐	FACW+
5. 0	0	☐	0
6. 0	0	☐	0
7. 0	0	☐	0
8. 0	0	☐	0
9. 0	0	☐	0
10. 0	0	☐	0
11. 0	0	☐	0
	55 = Total Cover		
Woody Vine Stratum (Plot size: 0)			
1. 0	0	☐	0
2. 0	0	☐	0
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 1.09091

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
0

SOIL

Sampling Point: M-5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Silty Clay Loam	Mucky

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

Disturbed soils from recent excavation

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 3

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

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Murphy Ox Yoke Ranch **2. MDT project#** STPX 34(16) **Control#**

3. Evaluation Date 7/30/2010 **4. Evaluators** BCS **5. Wetland/Site# (s)** Wetland Restoration

6. Wetland Location(s): T 5S **R** 8E **Sec1** 28 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed Yellowstone **County** Yellowstone River - Big Creek Park County

7. Evaluating Agency Confluence

8. Wetland size acres 2.04

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 2.04

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland		Seasonal/Intermittant	100

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)

ii. Prominent noxious, aquatic nuisance, other exotic species: None

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

AA in NW corner of project area delienated as wet meadow and included in mitigation plan as enhancement, prior baseline documented in 2003; Area adjacent to Hwy 89 on west, created wetland to south.

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

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

Comments:

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

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

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

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

Sources for documented use USF&WS

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	Merriam's shrew, western toad
Incidental habitat (list species)	○ D ○ S	
No usable habitat	☐ S	

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

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

Sources for documented use MT NHP

14C. General Wildlife Habitat Rating:

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

Moderate

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

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☑ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

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

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◯ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** _____

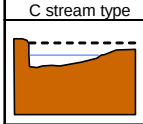
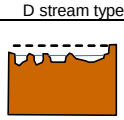
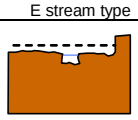
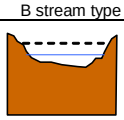
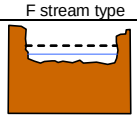
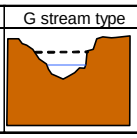
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating _____

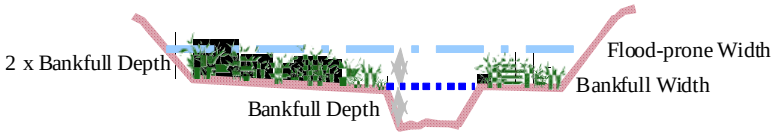
iii. Final Score and Rating: _____ **Comments:**

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: _____

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:

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

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

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

Comments:

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

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

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

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .7M

Comments:

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

i. Discharge Indicators

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

ii. Recharge Indicators

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

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

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

Comments:

14K. Uniqueness:

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

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

Comments:

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

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

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

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

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

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Wetland Restoration

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	.3	1	0.612	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	1.224	☐
C. General Wildlife Habitat	M	.7	1	1.428	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	L	.1	1	0.204	☐
F. Short and Long Term Surface Water Storage	M	.5	1	1.02	☐
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	1.428	☑
H. Sediment/Shoreline Stabilization	H	.9	1	1.836	☐
I. Production Export/Food Chain Support	M	.7	1	1.428	☑
J. Groundwater Discharge/Recharge	M	.7	1	1.428	☑
K. Uniqueness	L	.2	1	0.408	☐
L. Recreation/Education Potential (bonus points)	L	.05	NA	0.102	☐
Totals:		5.45	10	11.118	
Percent of Possible Score			**54.5** %		

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

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

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

☑

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

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

I	II	III	IV

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Murphy Ox Yoke Ranch **2. MDT project#** STPX 34(16) **Control#**

3. Evaluation Date 7/30/2010 **4. Evaluators** BCS **5. Wetland/Site# (s)** Wetland Preservation

6. Wetland Location(s): **T** 5S **R** 8E **Sec1** 28 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed Upper Yellowstone-13 **County** Yellowstone River - Big Creek Park County

7. Evaluating Agency Confluence

8. Wetland size acres 1.89

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 1.89

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland		Permanent/Perennial	50
Depressional	Scrub-Shrub Wetland		Permanent/Perennial	50

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)

ii. Prominent noxious, aquatic nuisance, other exotic species: None

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

AA includes 1.89 acres of wetland identified as preservation prior to mitigation efforts, adjacent areas predominantly include undisturbed uplands/wetlands with a lesser amount recently disturbed through wetland creation.

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

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

Comments:

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

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

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

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

Sources for documented use USF&WS

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	Merriam's shrew, western toad
Incidental habitat (list species)	◉ D ◉ S	
No usable habitat	▣ S	

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

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

Sources for documented use MT NHP

14C. General Wildlife Habitat Rating:

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

Moderate

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

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☑ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

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

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◯ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** _____

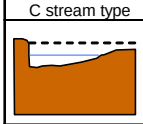
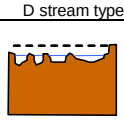
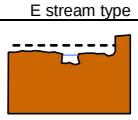
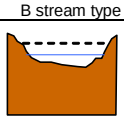
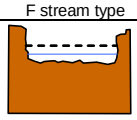
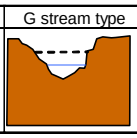
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating _____

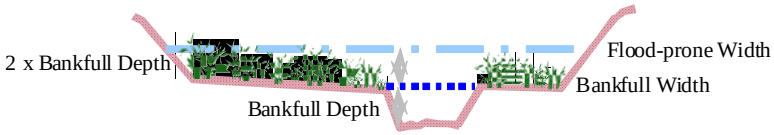
iii. Final Score and Rating: _____ **Comments:**

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: _____

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:

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

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

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

Comments:

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

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

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

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

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

Comments:

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

i. Discharge Indicators

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

ii. Recharge Indicators

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

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

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

Comments:

14K. Uniqueness:

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

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

Comments:

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

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

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

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

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

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Wetland Preservation

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	.3	1	0.567	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	1.134	☐
C. General Wildlife Habitat	H	.9	1	1.701	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.7	1	1.323	☐
F. Short and Long Term Surface Water Storage	H	.8	1	1.512	☐
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	1.701	☐
H. Sediment/Shoreline Stabilization	H	1	1	1.89	☐
I. Production Export/Food Chain Support	E	1	1	1.89	☐
J. Groundwater Discharge/Recharge	H	1	1	1.89	☐
K. Uniqueness	M	.4	1	0.756	☐
L. Recreation/Education Potential (bonus points)	L	.05	NA	0.0945	☐
Totals:		7.65	10	14.4585	
Percent of Possible Score			**76.5** %		

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

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

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

☐

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

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

I	II	III	IV

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Murphy Ox Yoke Ranch **2. MDT project#** STPX 34(16) **Control#**

3. Evaluation Date 7/30/2010 **4. Evaluators** BCS **5. Wetland/Site# (s)** Wetland Creation

6. Wetland Location(s): **T** 5S **R** 8E **Sec1** 28 **T** **R** **Sec2**

Approx Stationing or Mileposts

Watershed Yellowstone **County** Yellowstone River - Big Creek Park County

7. Evaluating Agency Confluence

8. Wetland size acres 2.15

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 2.15

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Temporary/Ephemeral	100

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)

AA condition based on recent excavation of wetland area and lack of native root mat

ii. Prominent noxious, aquatic nuisance, other exotic species: none

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

AA within recently excavated (2009) basin, area adjacent to Hwy 89 and undisturbed wetlands and uplands

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

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

Comments:

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◉ S

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

No usable habitat ▣ S

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

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

Sources for documented use USF&WS

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

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use MT NHP

14C. General Wildlife Habitat Rating:

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

Moderate

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

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

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

- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☑ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

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

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◯ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating** _____

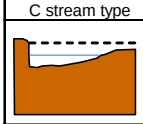
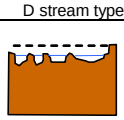
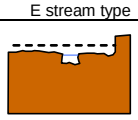
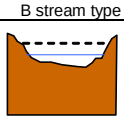
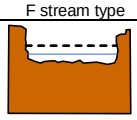
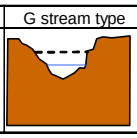
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating _____

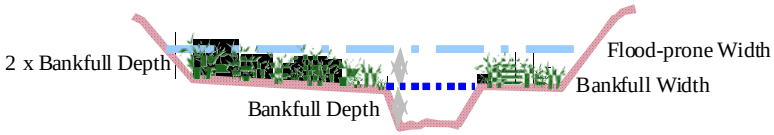
iii. Final Score and Rating: _____ **Comments:**

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: _____

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:

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

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

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

Comments:

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

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

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

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.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** .3L

Comments:

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

i. Discharge Indicators

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

ii. Recharge Indicators

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

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

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

Comments:

14K. Uniqueness:

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

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

Comments:

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

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

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

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

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

Comments:

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Wetland Creation

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	.1	1	0.215	☐
B. MT Natural Heritage Program Species Habitat	L	0	1	0	☐
C. General Wildlife Habitat	L	.3	1	0.645	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.6	1	1.29	☑
F. Short and Long Term Surface Water Storage	M	.5	1	1.075	☑
G. Sediment/Nutrient/Toxicant Removal	M	.5	1	1.075	☑
H. Sediment/Shoreline Stabilization	L	.2	1	0.43	☐
I. Production Export/Food Chain Support	L	.3	1	0.645	☐
J. Groundwater Discharge/Recharge	M	.7	1	1.505	☑
K. Uniqueness	L	.2	1	0.43	☐
L. Recreation/Education Potential (bonus points)	L	.05	NA	0.1075	☐
Totals:		3.45	10	7.4175	
Percent of Possible Score			**34.5** %		

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

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

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

☑

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

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

I	II	III	IV

Appendix C

2010 Representative Photographs

MDT Wetland Mitigation Monitoring
Murphy Ox Yoke Ranch
Park County, Montana



Photo Point 1
Compass Bearing: 170 degrees

Location: West boundary near Hwy 89, NW Cell 2
Taken in 2010





Photo Point 3
Compass Bearing: 50 degrees

Location: SW corner of Cell 1
Taken in 2010



Photo Point 4
Compass Bearing: 140 Degrees
Location: Ditch inlet
Taken in 2010



Photo Point 5
Compass Bearing: 180 Degrees
Location: North side Cell 1
Taken in 2010



Transect 1 – Start
Compass Bearing: 70 Degrees
Location: SW Cell 2
Taken in 2010



Transect 1 - End
Compass Bearing: 280 Degrees
Location: NE Cell 2
Taken in 2010



Transect 2 - Start
Compass Bearing: 200 Degrees
Location: NW Cell 1
Taken in 2010



Transect 2 - End
Compass Bearing: 30 Degrees
Location: SE Cell 1
Taken in 2010



Wetland Data Point 1, Veg Com 1 **Location:** M-1
Compass Bearing: 90 Degrees **Taken in 2010**



Wetland Data Point 2, Veg Com 2 **Location:** M-2
Compass Bearing: 40 Degrees **Taken in 2010**



Wetland Data Point 3, Veg Com 3 **Location:** M-3
Compass Bearing: 210 Degrees **Taken in 2010**



Wetland Data Point 4, Veg Com 7 **Location:** M-4
Compass Bearing: 165 Degrees **Taken in 2010**

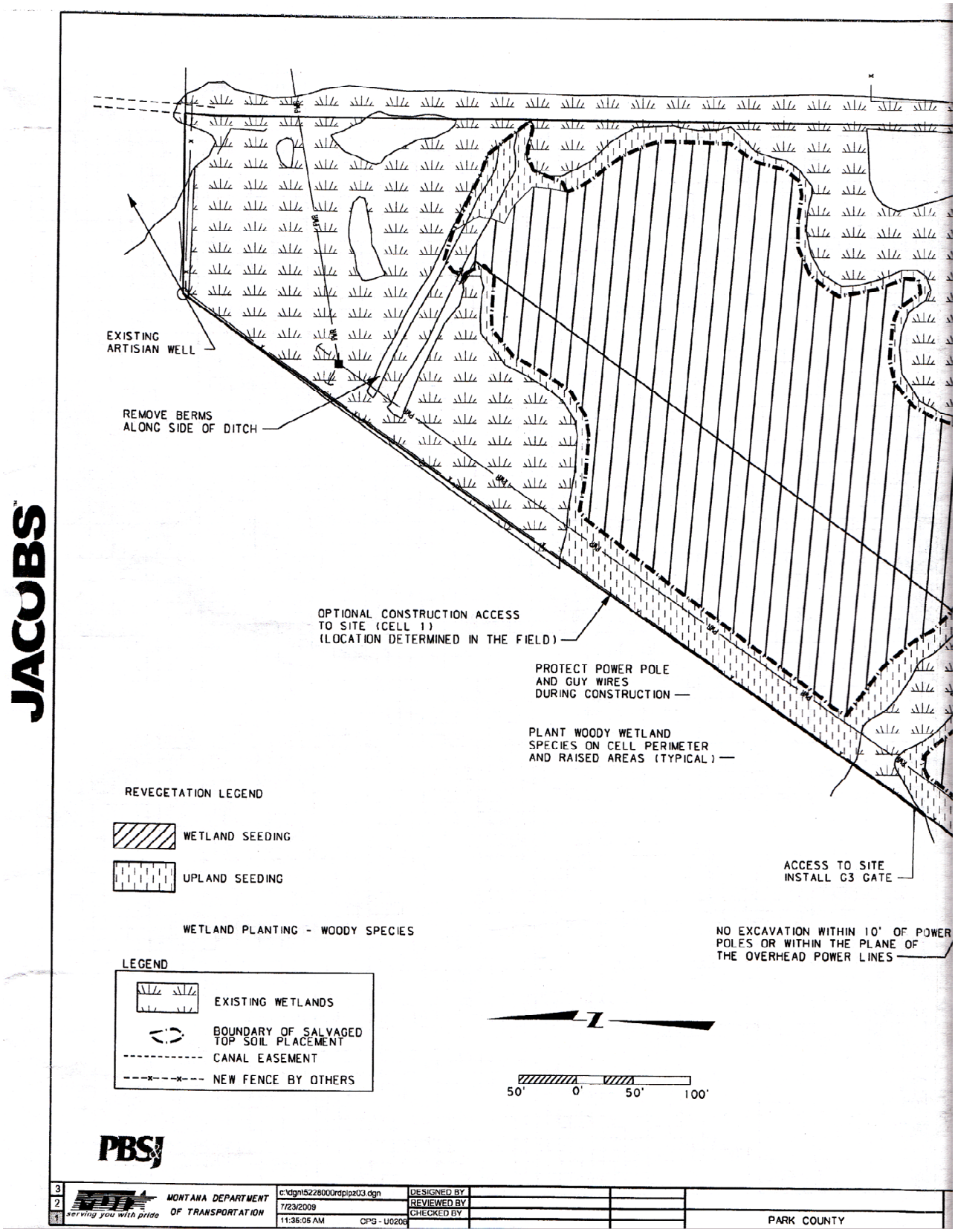


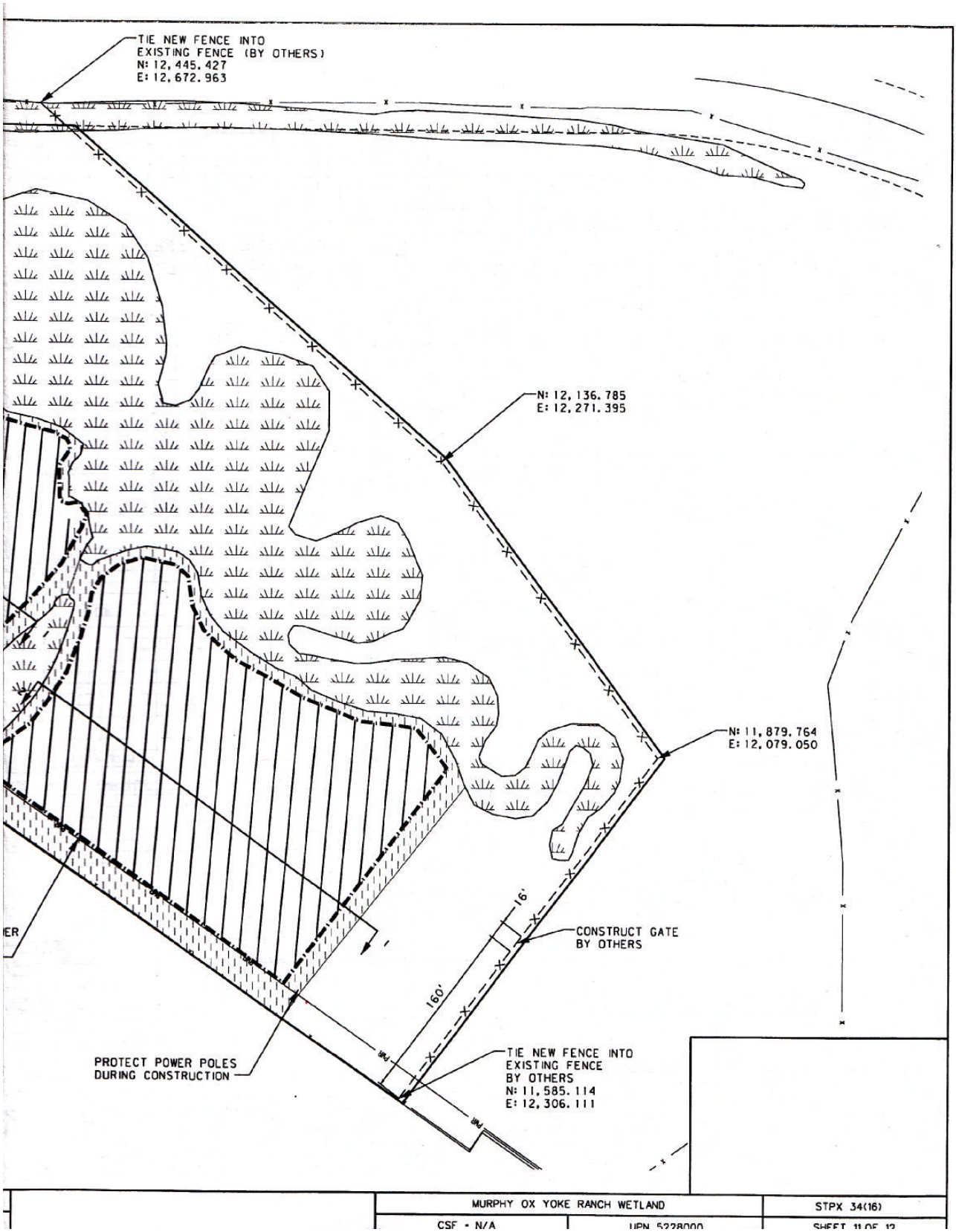


Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
Murphy Ox Yoke Ranch
Park County, Montana


JACOBS
EXISTING ARTISIAN WELL
REMOVE BERMS ALONG SIDE OF DITCH
OPTIONAL CONSTRUCTION ACCESS TO SITE (CELL 1) (LOCATION DETERMINED IN THE FIELD)
PROTECT POWER POLE AND GUY WIRES DURING CONSTRUCTION
PLANT WOODY WETLAND SPECIES ON CELL PERIMETER AND RAISED AREAS (TYPICAL)
REVEGETATION LEGEND
WETLAND SEEDING
UPLAND SEEDING
ACCESS TO SITE INSTALL G3 GATE
WETLAND PLANTING - WOODY SPECIES
NO EXCAVATION WITHIN 10' OF POWER POLES OR WITHIN THE PLANE OF THE OVERHEAD POWER LINES
LEGEND
EXISTING WETLANDS
BOUNDARY OF SALVAGED TOP SOIL PLACEMENT
CANAL EASEMENT
NEW FENCE BY OTHERS
50' 0' 50' 100'
PBSJ
MONTANA DEPARTMENT OF TRANSPORTATION
serving you with pride
c:\dgn\5228000rdpipz03.dgn
7/23/2009
11:35:05 AM CPG - U0208
DESIGNED BY
REVIEWED BY
CHECKED BY
PARK COUNTY


TIE NEW FENCE INTO
EXISTING FENCE (BY OTHERS)
N: 12, 445. 427
E: 12, 672. 963
N: 12, 136. 785
E: 12, 271. 395
N: 11, 879. 764
E: 12, 079. 050
16'
CONSTRUCT GATE
BY OTHERS
160'
PROTECT POWER POLES
DURING CONSTRUCTION
TIE NEW FENCE INTO
EXISTING FENCE
BY OTHERS
N: 11, 585. 114
E: 12, 306. 111
MURPHY OX YOKE RANCH WETLAND
STPX 34(16)