# MONTANA DEPARTMENT OF TRANSPORTATION STATEWIDE WETLAND MITIGATION SITE MONITORING PROJECT

Executive Summary – 2012 Monitoring Results



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## TABLE OF CONTENTS

1 INTRODUCTION ..... 1

2 INDIVIDUAL MITIGATION SITE DISCUSSIONS ..... 4

2.1 American Colloid (Glendive District, Year 2) ..... 4
2.2 Big Hole Grazing Association (Butte District, Year 5) ..... 6
2.3 Big Muddy (Glendive District, Year 2) ..... 9
2.4 Camp Creek (Missoula District, Year 10) ..... 12
2.5 DH Ranch (Billings District, Year 6) ..... 15
2.6 Dodson East (Glendive District, Year 2) ..... 17
2.7 Easton Ranch (Butte District, Year 3) ..... 19
2.8 I-90 East Bozeman (Butte District, Year 2) ..... 22
2.9 Lonepine (Missoula District, Year 5) ..... 26
2.10 McGinnis Meadows (Missoula District, Year 3) ..... 30
2.11 Murphy Ox Yoke (Butte District, Year 3) ..... 35
2.12 Schrieber Meadows (Missoula District, Year 2) ..... 39
2.13 Selkirk Ranch (Billings District, Year 6) ..... 45
2.14 Sportsman's Campground (Butte District, Year 5) ..... 49
2.15 Woodson Creek (Butte District, Year 5) ..... 52

3 REFERENCES ..... 55

## TABLES

Table 1. 2012 estimated credit summary for the American Colloid Wetland Mitigation Site. ....5
Table 2: Wetland assessment results for the American Colloid Wetland Mitigation Site in 2011-2012. ....6
Table 3: Summary of wetland credits for 2008 to 2012 for the BHGA Wetland Mitigation Site. ....7
Table 4 Summary of the 2009 to 2012 wetland function/value ratings and functional points at the BHGA Wetland Mitigation Site. ....8
Table 5: 2012 credit acreages for the Big Muddy Wetland Mitigation Site. ....10
Table 6: 2012 wetland function/value ratings and functional points at the Big Muddy Wetland Mitigation Site ....11
Table 7: Functional unit-based credit estimate for 2001 (baseline) and 2012 at the Camp Creek Wetland Mitigation Site. ....13
Table 8: Summary of the 2001 (baseline) and 2012 wetland function/value ratings and functional points at the Camp Creek Wetland Mitigation Site. ....14
Table 9: The 2012 estimated mitigation credit summary for the DH Ranch Wetland Mitigation Site. ....16
Table 10: Summary of the 2005 (baseline) and 2011 wetland function/value ratings and functional points at the DH Ranch Wetland Mitigation Site. ....17
Table 11: The 2012 estimated mitigation credit summary for the Dodson East Wetland Mitigation Site. ....18
Table 12: Summary of the function/value ratings and functional points at the Dodson East Wetland Mitigation Site in 2012. ....19
Table 13: The 2012 estimated mitigation credit summary of the Easton Ranch Wetland Mitigation Site. ....21
Table 14: Summary of the function/value ratings and functional points for 2011 at the Easton Ranch Wetland Mitigation Site. ....22
Table 15: Summary of estimated mitigation credits for the I-90 East Bozeman Wetland Mitigation Site in 2012. ....24
Table 16: Summary of the function/value ratings and functional points for 2010 and 2011 at the I-90 East Bozeman Wetland Mitigation Site. ....25
Table 17: The 2012 summary of estimated mitigation credits for the Lonepine Wetland Mitigation Site. ....28
Table 18: Summary of the function/value ratings and functional points at the Lonepine Wetland Mitigation Site for 2003 (baseline) and 2011. ....29
Table 19: Summary of estimated mitigation credits for the McGinnis Meadows Wetland Mitigation Site in 2012. ....32
Table 20: Summary of the function/value ratings and functional points at the McGinnis Meadows Wetland Mitigation Site for 2012. ....33
Table 21: Summary of estimated mitigation credits for the Murphy Ox Yoke Wetland Mitigation Site in 2012. ....36
Table 22: Summary of the function/value ratings and functional points at the Murphy Ox Yoke Wetland Mitigation Site for 2003 (baseline) and 2012. ....37
Table 23: Summary of estimated mitigation credits for the Schrieber Meadows Wetland Mitigation Site in 2012. ....42

Table 24: Summary of the estimated stream mitigation credits on Schrieber Meadows in 2012. ..... 43
Table 25. Summary of the function/value ratings and functional points at the Schrieber Meadows site for 2012 ..... 44
Table 26. Summary of 2012 estimated credit acreage for the Selkirk Wetland Mitigation Site. ..... 47
Table 27. Summary of 2006 (baseline) and 2012 function/value ratings and functional points at the Selkirk Wetland Mitigation Site. ..... 48
Table 28. Estimated credit acres in 2010-2012 for the Sportsman's Campground Wetland Mitigation Site ..... 50
Table 29. Wetland function/value ratings and functional points for 2008-2012 at the Sportsman's Campground Wetland Mitigation Site. ..... 51
Table 30. Estimated Credits for the Woodson Creek Wetland Mitigation Site in 2012. ..... 52
Table 31: Summary of the 2005 (baseline), 2010, and 2011 wetland function/value ratings and functional points at the Woodson Creek Wetland Mitigation Site. ..... 53

## APPENDICES

Appendix A Table 1: Summary Information for MDT Wetland Mitigation Sites

# 1 INTRODUCTION

This document summarizes the results of the 2011 monitoring efforts at 15 wetland mitigation sites located throughout Montana that were constructed by or for the Montana Department of Transportation (MDT). Full monitoring reports for each of these sites were prepared and presented to MDT in December 2012. The following mitigation sites were monitored in 2012 and locations shown in Figure 1:

American Colloid
Big Hole Grazing Association
Big Muddy
Camp creek
DH Ranch
Dodson East
Easton Ranch
I-90 East Bozeman
Lonepine
McGinnis Meadows
Murphy Ox Yoke
Schreiber Meadows
Selkirk Ranch
Sportsman's Campground
Woodson Creek

Monitoring activities were conducted by Confluence Consulting Inc., wetlands scientists during July and August 2012 in accordance with U.S. Army Corps of Engineers (USACE) wetlands standards and MDT wetland mitigation site monitoring protocols. Activities conducted and information collected included: wetland delineation, wetland boundaries, vegetation community mapping, vegetation transects, soils and hydrology data, wildlife observations, photograph points, functional assessments, and non engineering examination of constructed features. Monitoring methods are discussed at length in the individual site monitoring reports and are not discussed in detail in this summary.

In all formal monitoring events prior to 2008, wetland delineation was conducted within monitoring areas according to the 1987 USACE Wetland Delineation Manual. In 2008 the USACE determined that where the 1987 manual was used to establish baseline wetland conditions at MDT wetland mitigation site, it should continue to be applied at such sites for the duration of the monitoring period. This approach was applied to Camp Creek, Lone Pine, Big Hole Grazing Association, Sportsman's Campground, Woodson Creek, DH Ranch, and Selkirk Ranch. During the 2010 monitoring year, implementation of the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual Western Mountains, Valleys* (MVC)*, and Coast Region* and 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (GP) were used to evaluate sites constructed during or after 2008. Sites evaluated using the MVC version included: McGinnis Meadows, Easton, I-90 East Bozeman, Schreiber Meadows and Murphy Ox Yoke. Sites evaluated with the GP version included: American Colloid, Big Muddy, and Dodson East.

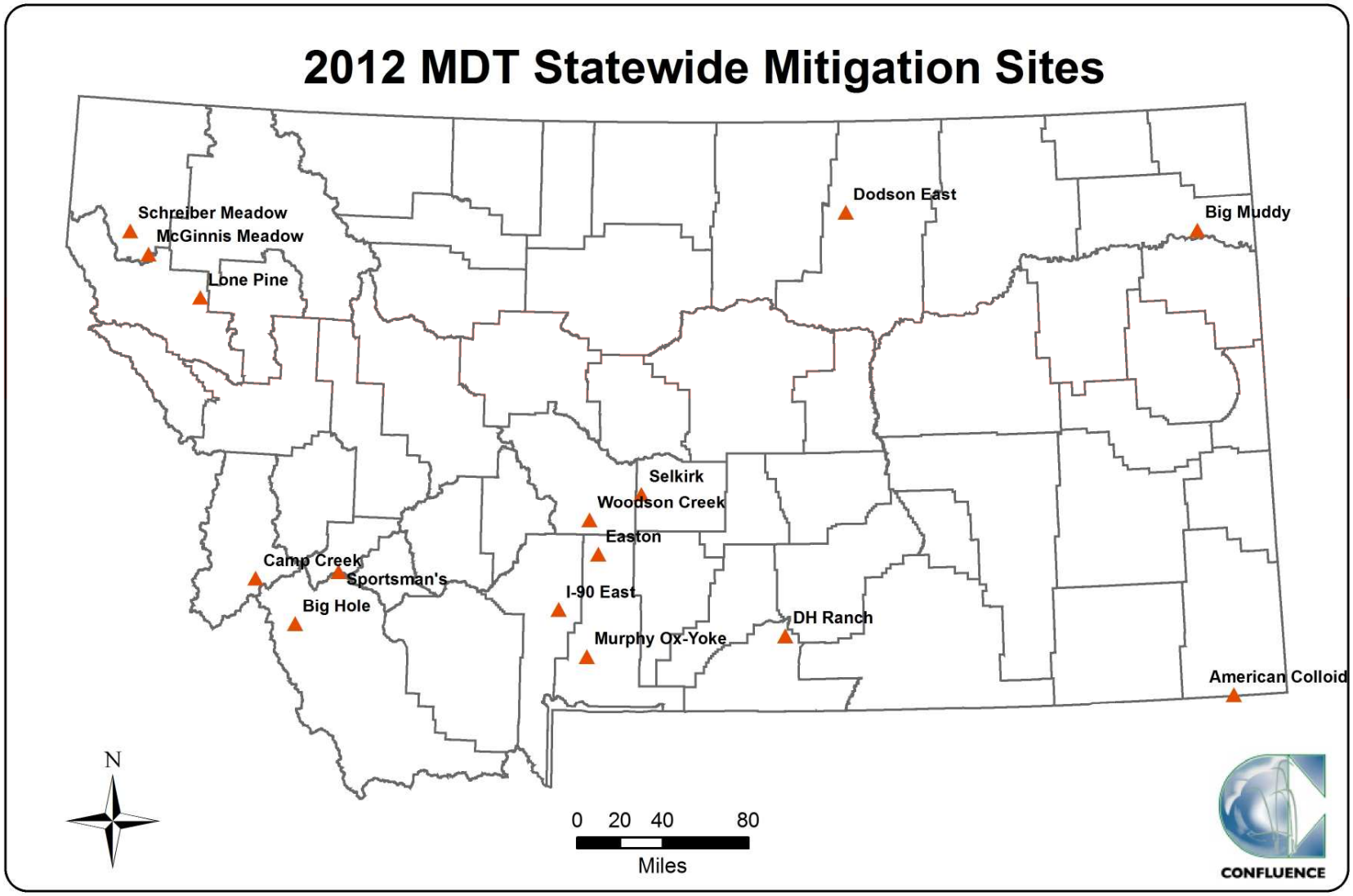



**Figure 1. Location map for all 15 MDT mitigation sites monitored in 2012.**

From 2001 to 2007 wetland functional assessments were conducted at all monitoring sites using the 1999 MDT Montana Wetland Assessment Method (MWAM). In 2008, use of the 1999 method was discontinued at most sites, as the 2008 MWAM became available and was applied. Use of the 1999 method was continued at sites for which baseline conditions were established using the method and functional assessment using that version of the method was integrated into credit calculation. Sites that used the 1999 MWAM version included: Camp Creek, US93, Woodson Creek, and Selkirk. Sites that used the 2008 MWAM version included: Lonepine, McGinnis Meadows, Big Hole Grazing Association, Easton, I-90 East Bozeman, Murphy Ox Yoke, Sportsman's Camp, Alkali Lake, Little Muddy, American Colloid, Big Muddy, Dodson East, DH Ranch, and Wagner Marsh.

Monitoring summaries for all mitigation sites investigated in 2012 are presented in alphabetical order in Section 2.0. Each discussion section includes site history and objectives, delineation, crediting, functional assessment results, and maintenance recommendations. Supporting materials are provided in detail within the individual monitoring reports and are not included in this summary.

Appendix A provides for each monitoring site: the site name, MDT District, year constructed, major Montana watershed basin, pre-project wetland acreage and functional assessment category, target wetland credit, 2012 wetland acreage and functional assessment category, enhancement credit ratios, upland buffer acreage, total wetland acreage and functional unit as of 2012, and general site comments.

# 2 INDIVIDUAL MITIGATION SITE DISCUSSIONS

## 2.1 American Colloid (Glendive District, Year 2)

The American Colloid wetland mitigation project is situated approximately 2 miles south and 7 miles west of Alzada, Montana, on Lot 7, Lot 10, and Lot 11 of Section 36, Township 9 South, Range 58 East, Carter County, Montana. These parcels are Montana School Trust Land administered by the Montana Department of Natural Resources and Conservation (DNRC). The site was formerly leased to the American Colloid Mining Company, and is currently under an MDT conservation easement. The project serves the mitigation requirements of MDT's Little Missouri River Basin (Watershed 16), in the Glendive District.

The project elevation is approximately 3,518 feet above mean sea level. The site was mined for bentonite clay prior to the 1971 Open Cut Mining Act and is surrounded by topography typical of open cut mining activities. A dike approximately 190 feet in length was constructed along a topographic depression to impound precipitation runoff from an approximate 167-acre ephemeral drainage. Soil borings at the site revealed highly erodible clay soils underlain by shale, suitable for impounding and storing surface water. A fenced enclosure surrounds the 15-acre site, which includes the proposed 5-acre wetland and a 10-acre buffer zone of upland vegetation. The mitigation monitoring limits, for purposes of this report, encompass only 6.44 acres of created wetland and upland buffer within the fenced enclosure.

The MDT designed and constructed the American Colloid wetland restoration project. The site was constructed in October 2001 to mitigate for 4.4 acres of wetland impacts associated within the Alzada-West and Alzada-South projects in Watershed 16. The initial mitigation monitoring event was conducted in 2002. Monitoring ceased in 2007 following the dike failure, and resumed in 2011, making the 2012 monitoring event the second since the dike repair.

Well below-average precipitation was recorded for the area during the spring. There were approximately two acres of surface water (down from three acres the previous year) at depths ranging from 0.0 to 2.5 feet. Field conditions indicated that water levels had been at the maximum elevation during spring runoff and the beginning of the growing season.

Table 1 presents the current credit summary for this site. A total of 3.27 acres of aquatic habitat, predominantly open water, was delineated in 2012. The calculation of estimated credit acres shown in Table 1 assumed a mitigation ratio of 1:1 for the created wetland and aquatic bed habitat within the wetland depression and a 1:5 ratio for preservation and maintenance of the upland buffer. The estimated credit acres for 2012 totaled 5.62 .

No formal goals or success criteria were required by USACE for this project, which was constructed prior to release of the 2008 USACE mitigation rule

requiring such components. All MDT internal success criteria for the delineated wetlands and upland buffer have been achieved.

**Table 1. 2012 estimated credit summary for the American Colloid Wetland Mitigation Site.**

| COMPENSATORY MITIGATION TYPE | USACE MITIGATION RATIO | USACE PROPOSED ACRES | 2011 DELINEATED ACRES | 2011 CREDIT ACRES | 2012 DELINEATED ACRES | 2012 CREDIT ACRES |
|---|---|---|---|---|---|---|
| Creation: Establishment (wetland) | 1:1 | 5 | 0.26 | 0.26 | 1.23 | 1.23 |
| Creation: Establishment (open water) | 1:1 | | 3.01 | 3.01 | 2.04 | 2.04 |
| Upland Buffer (Preservation and Maintenance) | 5:1 | 10 | 11.73* | 2.35 | 11.73* | 2.35 |
| **Total** | | | 3.27 | 5.62 | 3.27 | 5.62 |

*Value includes all uplands within fenced 15-acre site

The first year of monitoring in 2011 provided the baseline for comparison for the 2012 and subsequent functional assessments. The American Colloid wetland assessment encompasses one 3.27-acre AA that includes the open water depression and adjacent wetland fringe. Table 2 summarizes the function and value ratings of the AA for 2011 and 2012.

The AA was rated as a Category III wetland with 43 percent of the total possible points. This is an increase up from 39 percent in 2011, achieved through improvement in the scores for wildlife habitat, food chain support, and uniqueness of habitat. The site is moderately disturbed with one vegetation class. Wildlife use was minimal during the site visit. A total of 12.75 functional units were achieved at the American Colloid mitigation site in 2012. Overall ratings are expected to continue to improve as the site develops wetland characteristics.

There were no nesting structures currently installed on the site. The outlet control structure was repaired in 2010 and was in good, working condition when inspected in August 2012. A wildlife friendly fence surrounding the 15 acre site was in good condition and did not require maintenance. Less than 0.1 acre of Canada thistle, a Priority 2B weed, was noted near the northwest mitigation boundary. The MDT administers an ongoing weed control program that annually assesses the location and size of State noxious weed infestations on each mitigation site.

**Table 2: Wetland assessment results for the American Colloid Wetland Mitigation Site in 2011-2012.**

| Function and Value Parameters from the 2008 Montana Wetland Assessment Method | 2011 | 2012 |
|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Low (0.1) | Low (0.1) |
| General Wildlife Habitat | Mod (0.4) | Mod (0.6) |
| General Fish/Aquatic Habitat | NA | NA |
| Flood Attenuation | NA | NA |
| Short and Long Term Surface Water Storage | High (1.0) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.6) | Mod (0.6) |
| Sediment/Shoreline Stabilization | Low (0.3) | Low (0.3) |
| Production Export/Food Chain Support | Mod (0.7) | High (0.8) |
| Groundwater Discharge/Recharge | Low (0.1) | Low (0.1) |
| Uniqueness | Low (0.3) | Low (0.4) |
| Recreation/Education Potential (bonus points) | NA | NA |
| **Actual Points/Possible Points** | **3.5 / 9** | **3.9 / 9** |
| **% of Possible Score Achieved** | **39%** | **43%** |
| **Overall Category** | **III** | **III** |
| **Total Acreage of Assessed Wetlands within Site Boundaries** | **3.27** | **3.27** |
| **Functional Units** (acreage x actual points) | **11.45** | **12.75** |

## 2.2 Big Hole Grazing Association (Butte District, Year 5)

The Big Hole Grazing Association (BHGA) wetland mitigation project was constructed in the fall 2007 by MDT. The purpose of the project was to restore approximately 45 acres of wetland habitat within a 96 acre easement area owned by the BHGA. The project provided a wetland mitigation reserve in the Upper Missouri River Basin (Watershed 6). The mitigation site is located approximately seven miles southwest of Wisdom and approximately four miles west of Secondary Route 278.

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

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

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

There are currently 88.26 acres of wetland habitat within the BHGA mitigation site, including 14.0 acres of preserved wetlands. These acreages are summarized with the appropriate credit ratios in Table 3. A total of 77.76 credit acres have been calculated for this site based on the results of the 2012 monitoring efforts.

**Table 3: Summary of wetland credits for 2008 to 2012 for the BHGA Wetland Mitigation Site.**

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

The 2001 baseline functional assessment by MDT rated the wetlands that occurred along the Rock Creek corridor and in the northwest corner (fen area) as Category II wetlands and the remaining wetlands on the site as Category III using the 1999 MDT MWAM (Berglund 1999). The 2009 through 2012 wetland conditions were assessed using the 2008 MWAM (Berglund and McEldowney 2008). Results are shown in Table 4. Two AAs were evaluated within the BHGA wetland mitigation site. One AA encompassed 10 acres of the Rock Creek corridor. The remaining wetlands on the site were included in the second 78.26 acre AA. The difference in AA-2 acreages over the years is the result of continued wetland development at the site.

Both AAs maintained their status as Category I wetlands, first achieved in 2011. This confirms that this mitigation project has resulted in the creation and protection of high quality wetlands within the Upper Missouri watershed. No supplemental planting is recommended for the BHGA site based on the woody plantings mortality linked to excessively wet conditions and the natural regeneration of willows and shrubby cinquefoil within the site. Continued weed spraying is recommended to control small weed infestations Less than 1 acre total) within the BHGA mitigation area. Based on current trends, the BHGA site should continue to provide high quality plant and wildlife wetland habitat.

**Table 4 Summary of the 2009 to 2012 wetland function/value ratings and functional points at the BHGA Wetland Mitigation Site.**

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

### 2.3 Big Muddy (Glendive District, Year 2)

The Big Muddy Creek Wetland Mitigation Project is located four miles west of Culbertson, along US Highway 2, in Section 21, Township 28 North, Range 55 East, Roosevelt County, Montana (Figure 1). This project is situated within the Lower Missouri River Basin (Watershed 12). Wetlands developed at this location were to provide compensatory mitigation for wetland impacts associated with transportation improvement projects in the Glendive District including Brockton-East and Big Muddy-West.

The MDT completed an initial feasibility study in August 2009. The baseline delineation and Montana Wetland Assessment were completed in 2010. The initial work on this site was completed in spring 2011. The area of wetland mitigation was increased in 2012 by 7.25 acres to provide additional mitigation for unavoidable impacts associated with the MDT Brockton – East project. The Approximately 0.73 acres of wetlands were delineated within the project boundary as part of the baseline assessment completed in June 2010. The wetlands encompassed an inundated, emergent marsh that extended from the banks of an unnamed tributary to Big Muddy Creek and a narrow emergent wet meadow that extended into upland habitat from the marsh.

The mitigation goals were to create and preserve wetland habitat functions associated with rangeland located adjacent to the Big Muddy Creek tributary. The project objectives include:

- Maximize the development of emergent and aquatic bed wetlands, general wildlife habitat, short and long-term surface water storage, sediment/nutrient/toxicant removal, and production export/food chain support.
- Create up to approximately 9.32 acres of wetland.
- Preserve approximately 0.73 acres of wetland through permanent protection and weed management
- Preserve a protected, managed 0.43-acre upland buffer adjacent to site wetlands.
- Minimize site operation and maintenance requirements.

The original mitigation plan proposed the creation of 6.53 acres of emergent/aquatic bed shallow marsh within three wetland cells. The cells were to be excavated to intersect groundwater and provide water depths ranging from 0.5 to 2 feet. Additional hydrology was to be provided by direct precipitation and snowmelt.

The potential passive development of approximately 1.03 acres of emergent wet meadow located at the north boundary and adjacent to the existing wet meadow was to be facilitated by increasing/augmenting hydrology to the south within the excavated cells. Up to an additional 1.76 acres of emergent wetland may form in excavated areas between the three cells due to increased proximity to

groundwater during spring/early summer of most years, allowing soil saturation within the root zone via capillary action within actually exposing groundwater in these areas.

The project was increased in 2012 to include an additional 7.25-acre parcel located to the south of US Hwy 2. This revision included the construction of a 5.47 acre wetland depression in 2011 along the floodplain of an unnamed tributary to Big Muddy Creek in an area previously delineated as upland. A 1.83-acre pre-existing wetland was located in the additional project area and is included was included in the preservation credit category this year.

Table 5 summarizes the 2012 wetland delineation and calculated credit acreages. A total of 12.87 acres of wetlands were identified in 2012, up from 6.92 in 2011. The created open water and emergent wetland of the cells anf fringe area amounted to 10.31 acres. The preservation area was 2.56 acres.

The total estimated credit acreage in 2012 was 8.86 acres. This estimate assumes that all performance standards will be met as the site continues to develop. Currently, all of the wetlands meet at least one of the three applicable wetland performance standards and are making demonstrable progress on the other two. The 5 acres of upland buffer is meeting the sole applicable performance standard (the absolute cover noxious weeds being less than five percent) and is expect6ed to continue to do so.

**Table 5: 2012 credit acreages for the Big Muddy Wetland Mitigation Site.**

| Compensatory Mitigation Type | USACE Mitigation Credit Ratio | 2011 Delineated Acres | Scaled % Credit Standards | 2011 Credit Acres | 2012 Delineated Acres | Scaled % Credit Standards | 2012 Credit Acres |
|---|---|---|---|---|---|---|---|
| **Wetland Creation: Establishment (Area between cells)** | 1:1 | 0.44 | 70% | 0.31 | 0.00* | 0% | 0.00 |
| **Wetland Creation: Establishment (wetland cells)** | 1:1 | 5.75 | 70% | 4.03 | 10.31 | 70% | 7.22 |
| **Wetland Preservation** | 4:1 | 0.73* | 100% | 0.18 | 2.56** | 100% | 0.64* |
| **Upland Buffer** | 5:1 | 3.70 | 100% | 0.74 | 5.00 | 100% | 1.00 |
| **Total** | | **10.62** | | **5.26** | **17.87** | | **8.86** |

*0.9 acres delineated in 2011 were determined to be within excavated cells in 2012.
**Preservation wetland acreage increased in 2012 due to increased monitoring area.

The 2008 MWAM was used in the May 2011 Mitigation Plan to evaluate 8 acres of the existing riverine wetland associated with the tributary to Big Muddy Creek and 2 acres of the remnant wet meadow located north and south of the mitigation site. Both AAs extended outside the current project boundaries. Consequently,

the functional points and values could not be compared to the post-construction mitigation site.

The 2008 MWAM was used in the May 2011 Mitigation Plan to evaluate 8 acres of the existing riverine wetland associated with the tributary to Big Muddy Creek and 2 acres of the remnant wet meadow located north and south of the mitigation site. Both AAs extended outside the current project boundaries. Consequently, the functional points and values of the pre-existing wetlands would not be appropriately compared to the post-construction mitigation site. The 2008 MWAM was used to evaluate the functional values of the mitigation wetlands in 2011 and 2012 (Table 6).

**Table 6: 2012 wetland function/value ratings and functional points at the Big Muddy Wetland Mitigation Site.**

| Function and Value Parameters from the 2008 Montana Wetland Assessment Method | 2011 (Creation) AA-1 | 2011 (Preservation) AA-2 | 2012 (Creation) AA-1 | 2012 (Preservation) AA-2 |
|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Mod (0.5) | Mod (0.5) | Mod (0.5) | Mod (0.5) |
| General Wildlife Habitat | Mod (0.5) | High (0.9) | Mod (0.7) | High (0.9) |
| General Fish/Aquatic Habitat | NA | NA | NA | NA |
| Flood Attenuation | Mod (0.5) | Mod (0.4) | Mod (0.5) | Mod (0.4) |
| Short and Long Term Surface Water Storage | High (1.0) | Mod (0.4) | High (1.0) | High (0.8) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.7) | High (0.9) | High (1.0) | High (0.9) |
| Sediment/Shoreline Stabilization | Low (0.3) | High (1.0) | High (1.0) | High (1.0) |
| Production Export/Food Chain Support | Mod (0.5) | High (0.9) | Mod (0.6) | High (1.0) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | High (1.0) | High (1.0) |
| Uniqueness | Low (0.2) | Mod (0.4) | Low (0.2) | Mod (0.4) |
| Recreation/Education Potential (bonus points[3]) | High (0.15) | High (0.15) | High (0.15) | High (0.15) |
| **Actual Points/Possible Points** | **5.35/10** | **6.55/10** | **6.65/10** | **7.05/10** |
| **% of Possible Score Achieved** | **53.5%** | **65.5%** | **66.5%** | **70.5%** |
| **Overall Category** | **III** | **II** | **II** | **II** |
| **Total Acreage of Assessed Wetlands within Site Boundaries** | **6.19** | **0.73** | **10.31** | **2.56** |
| **Functional Units** (acreage x actual points) | **33.12** | **4.78** | **68.56** | **18.05** |

The created (AA-1) and preserved (AA-2) wetlands were assessed as separate AAs. The depression characterized by wetland community Type 7 located south of Highway 2 was included in the 10.31 acre created wetland (AA-1) in 2012. AA-1 encompassed the constructed wetland cells, which included wetland and open water community Types 3, 6, and 7. AA-1 was rated as a Category II wetland in 2012 with 66.5 percent of the total possible points, a 13 percent improvement over 2011 when the created wetlands received a Category III rating. The disturbance rating improved from high to moderate in 2012 based on the increase in overall vegetation cover. The improvement in the vegetation percent cover also increased the ratings in the categories of short and long term surface water storage, sediment/nutrient/toxicant removal, and sediment/shoreline stabilization. The inclusion of the well-vegetated wetland depression located south of the highway also increased the overall functional value of the created wetland. High ratings were given for short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline

stabilization, and groundwater discharge and recharge. Ratings are expected to improve with increases in the cover of wetland vegetation species

There are no diversion structures or nesting structures currently installed at the site. One infestation of Canada thistle was observed at the edge of the unnamed tributary. The MDT has an ongoing weed control program that includes an annual assessment through the monitoring program of weeds identified within the site.

### 2.4 Camp Creek (Missoula District, Year 10)

The MDT developed the Camp Creek mitigation project to compensate for stream and wetland impacts associated with the Sula-North and South construction projects. Camp Creek is located in Ravalli County, MT in the Lower Clark Fork watershed (Watershed 3), approximately three miles south of Sula, Montana. The Camp Creek mitigation site occurs on both an MDT owned parcel and private property (Grasser). Excess credits may be applied toward future MDT projects within the Bitterroot Valley.

The project is located along the historic Camp Creek floodplain within the Sula Basin. Camp Creek traverses the valley bottom, eventually draining into the East Fork of the Bitterroot River. The primary source of hydrology for the restored channel and floodplain margins is seasonal flooding and perennial surface water flow. Groundwater stored in the deep alluvial substrate of the Sula Basin serves as a secondary hydrology source. Andrews and Praine Creeks drain into Camp Creek within the project boundaries.

Construction at the Camp Creek mitigation site was completed during spring 2002. Long-term project goals included restoration of the Camp Creek channel bottom, restoration of wetland functions, creation, and enhancement of riverine wetlands, and enhancement of heavily grazed and cleared riparian vegetation.

The credit allocation method for this site was determined by MDT and USACE in early 2006. Current credit acreages for both the MDT and Grasser parcels AA are summed to arrive at the site total and presented in Table 7. Approximately 134 functional units (functional points times wetland acreage) have been gained to date at the Camp Creek mitigation site. This translates to 13.67 credit acres, a 10% increase over 2011 achieved through a slight increase in both delineated wetland area and wetland functional value.

**Table 7: Functional unit-based credit estimate for 2001 (baseline) and 2012 at the Camp Creek Wetland Mitigation Site.**

| AA | 2001 Baseline Functional Units | 2012 Wetland & Channel Acreage | 2012 Functional Points | 2012 Functional Units | 2012 Functional Unit "Gain" | 2012 "Gain" Divided by Current Score (potential credit acres) |
|---|---|---|---|---|---|---|
| MDT (AA-1) | 222.30 | 29.98 | 10.1 | 302.80 | 86.49 | 8.56 |
| Grasser (AA-2) | 29.28 | 8.25 | 9.3 | 76.73 | 47.45 | 5.10 |
| **Total** | **251.58** | **38.23** | **19.4** | **379.53** | **133.94** | **13.67** |

The 2001 baseline assessment was completed by Turnstone Biological. They separated the Grasser property into three assessment areas, emergent (Type I), scrub-shrub emergent (Type II), and rock bottom with narrow mixed wetland fringe (Type III) wetland classifications. This AA was later modified to encompass the entire Grasser parcel. The 2012 functional assessment used the 1999 MDT MWAM method (Berglund 1999) on two assessment areas, the MDT parcel and the Grasser parcel, consistent with all assessments performed since 2009. Results are presented in Table 8.

The AA on the MDT parcel was rated in 2011 as a Category I wetland with 87 percent of the total points possible. This is a slight increase over 2011, due to improved scores for fish and wildlife habitat. Ratings were high or excellent for all scoring categories except uniqueness, which was moderate and is likely to remain so.

The AA on the Grasser parcel is not within a conservation easement and, therefore, is subject to a higher degree of disturbance from grazing. The Grasser parcel was rated as a Category II wetland in 2012, scoring 78 percent of the possible points. The AA received high ratings for listed/proposed T&E species habitat (bull trout), general fish habitat, MTNHP species habitat (based on the suspected presence of westslope cutthroat trout), sediment/shoreline stabilization, production export/food chain support, surface water storage, and groundwater discharge/recharge. Wetland area on the Grasser parcel has been consistent at 8.25 acres since 2010.

**Table 8: Summary of the 2001 (baseline) and 2012 wetland function/value ratings and functional points at the Camp Creek Wetland Mitigation Site.**

| Function and Value Parameters from the 1999[1] MDT Montana Wetland Assessment Method | 2001 Type I, MDT Parcel | 2001 Type III, MDT Parcel | 2001 Type I, Grasser Parcel | 2001 Type II, Grasser Parcel | 2001 Type III, Grasser Parcel | 2012 Grasser Parcel AA-2 | 2012 MDT Parcel AA-1 |
|---|---|---|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Mod (0.8) | Mod (0.8) | Mod (0.8) | Mod (0.8) | Mod (0.8) | High (0.8) | High (0.8) |
| MTNHP Species Habitat | Low (0.1) | Low (0.1) | Low (0.1) | Low (0.1) | Low (0.1) | High (0.8) | High (0.8) |
| General Wildlife Habitat | Low (0.3) | Mod (0.5) | Low (0.3) | Mod (0.5) | Mod (0.5) | Mod (0.7) | High (0.9) |
| General Fish/Aquatic Habitat | Low (0.1) | Mod (0.5) | Low (0.1) | Low (0.1) | Mod (0.5) | High (0.9) | Exel (1.0) |
| Flood Attenuation | Mod (0.6) | Mod (0.4) | Mod (0.6) | Mod (0.5) | Mod (0.4) | Mod (0.6) | High (0.8) |
| Short and Long Term Surface Water Storage | Low (0.3) | High (0.8) | Low (0.3) | Low (0.3) | High (0.8) | High (0.8) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.7) | Mod (0.6) | Mod (0.7) | Mod (0.7) | Mod (0.6) | High (0.9) | High (0.9) |
| Sediment/Shoreline Stabilization | Low (0.2) | Low (0.3) | Low (0.2) | Mod (0.6) | Low (0.3) | High (1.0) | High (1.0) |
| Production Export/Food Chain Support | Mod (0.7) | High (0.9) | Mod (0.7) | Mod (0.7) | High (0.9) | High (1.0) | High (0.8) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) |
| Uniqueness | Low (0.1) | Low (0.2) | Low (0.1) | Low (0.3) | Low (0.2) | Mod (0.5) | Mod (0.4) |
| Recreation/Education Potential | Low (0.2) | Low (0.1) | Low (0.2) | Low (0.3) | Low (0.1) | Low (0.3) | High (1.0) |
| **Actual Points / Possible Points** | **5.1 / 12** | **6.1 / 12** | **5.1 / 12** | **5.9 / 12** | **6.2 / 12** | **9.3 / 12** | **10.4 / 12** |
| **% of Possible Score Achieved** | **42%** | **52%** | **42%** | **49%** | **52%** | **78%** | **87%** |
| **Overall Category** | **III** | **III** | **III** | **III** | **III** | **II** | **I** |
| **Total Acreage of Assessed Wetlands and Open Water within Easement** | **42.3** | **1.062** | **3.512** | **0.502** | **1.362** | **8.25** | **29.98** |
| **Functional Units** (fu) (acreage x actual points) | **215.73** | **6.57** | **17.90** | **2.95** | **8.43** | **76.73** | **311.79** |
| **Functional Unit Gain to Date by Ownership** | NA | NA | NA | NA | NA | **47.45** | **96.062** |
| **Total Functional Unit Gain** | NA | NA | NA | NA | NA | **143.512** | |

Due to the continued aggrading of the right bank along this feature, the flood channel created by MDT to inundate the large emergent wetland complex was regraded in 2012 to re-activate the ability of the stream to access the flood channel. There was evidence of surface inundation within the flood channel; however, it was not apparent during this year's field survey that Camp Creek flows entered the flood channel in 2012. Localized streambank erosion observed along two reaches within the Grasser parcel was mapped on Figure 3 in Appendix 1 and has resulted in minor lateral migration of the corridor from the original plan form. This natural stream process does not threaten any structures or the overall stability of this reach.

Infestations of spotted knapweed, ox-eye daisy (*Chrysanthemum leucanthemum*), and Canadian thistle (*Cirsium arvense*), Priority 2B noxious weeds, were identified and mapped in 2012. Community 5 was dominated by spotted knapweed and twelve additional infestations of spotted knapweed were identified across the site ranging in size from less than 0.1 acre to 1.0 acre. The cover class ranged from low to high within the infestations. A majority of the spotted knapweed was observed in the upland periphery of the site. Spotted knapweed was also prevalent in the USFS areas surrounding the project site. The USFS would have to implement weed control measures on their property to fully control the weeds on the MDT property. The cover of spotted knapweed within the stream corridor on the MDT parcel decreased between 2009 and 2012 in response to MDT's weed-spraying efforts.

## 2.5 DH Ranch (Billings District, Year 6)

The DH Ranch mitigation site was constructed during the spring of 2007 in the east portion of the Upper Yellowstone Basin (Watershed 13) on private property owned by Mr. George Duke. The MDT has acquired approximately 17.4 acres of potential wetland credits from this site through a wetland credit purchase. The site was constructed to provide compensatory mitigation for wetland impacts resulting from MDT highway and bridge reconstruction projects within this watershed.

The goal of the project was to provide sufficient wetland hydrology at the site to support the creation of 23 acres of palustrine emergent and scrub-shrub wetland within the confines of the site. Approximately 0.38 acres of palustrine emergent and scrub-shrub wetland had been incidentally created along irrigation ditches traversing the site prior to construction.

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

The wetland mitigation design for DH Ranch stipulated the creation of a maximum of 21.1 acres of wetland, 1.65 acres of shrub-dominated riparian islands, and 0.8 acres of riparian buffer. Table 9 compares and summarizes the 2012 status of the created wetland areas. Full credit at a 1:1 ratio was given for the 17.27 acres of created emergent wetland delineated in 2012. This represents a decrease of approximately three acres since 2011, as areas reclassified from open water/aquatic bed in 2011 returned to that status in 2012. There was no change in upland buffer credits for this project in 2012.

Two of the five wetland success criteria for this project, (establishment of hydrophytic vegetation and hydric soils) have been met by its current wetlands. The continued presence of creeping foxtail stands exceeding the 10 percent maximum cover for aggressive non-preferred species causes two of the wetland vegetation communities to only partially meet the herbaceous plant performance standards, though the site as a whole meets that standard. Approximately one third of the 2.73 acres of open water wetlands on the site are ineligible for credit, as they exceed the 10% of total wetlands cap for the crediting of these type of wetlands. The woody vegetation planting zones do not meet the 1,000 stems per acre success criterion, owing to the very poor survival of the woody vegetation plantings and low natural recruitment of those species. Continued failure to meet success criteria may reduce the credits ultimately earned versus the estimate presented here.

**Table 9: The 2012 estimated mitigation credit summary for the DH Ranch Wetland Mitigation Site.**

| Credit Category | Proposed Credit Acres | 2012 Delineated Acres | Credit Ratio | 2012 Credit Acres |
|---|---|---|---|---|
| Emergent wetland creation | 21.1[1] | 17.27 | 1:1 | 17.27 |
| Open water (Aquatic Bed) | Up to 10% of wetland area | 2.73 | Up to 10% of wetland area | 1.73 |
| Shrub-dominated riparian islands (i.e. berms) | 1.65 | 1.65 | 4:1 | 0.41 |
| Upland buffer | 0.80 | 0.80 | 4:1 | 0.20 |
| **TOTAL** | | **22.45** | | **19.61** |

[1]Included open water creation

In 2012, the mitigation site was evaluated as a single AA, consistent with previous years. The AA received a Category II rating with 71 percent of the total (Table 10). The wetland received excellent marks for general wildlife habitat and production export/food chain support, and high marks for short and long term surface water storage, sediment/nutrient/toxicant removal, and sediment/shoreline stabilization. These results remain unchanged from 2011.

The irrigation ditch that delivers water to the site from the Edgar Canal was in good condition in 2012. The split channel that diverts water along the east and west sides of the wetland appeared to be functioning as designed and was effectively spreading irrigation return flows through the site No repairs were necessary.

Infestations of Canadian thistle were identified at 13 locations across the site. Field bindweed was identified in 4 separate infestations. Two infestations of houndstongue were observed on the west boundary and a single stem of salt cedar was found along the northeast edge of the project area. Removal of the salt cedar was attempted unsuccessfully. The MDT has an ongoing weed control program including an annual assessment of weed management needs.

**Table 10: Summary of the 2005 (baseline) and 2011 wetland function/value ratings and functional points at the DH Ranch Wetland Mitigation Site.**

| Function and Value Parameters from the MDT Montana Wetland Assessment Method | 2005 Baseline | 2012[2] |
|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Low (0.1) | Mod (0.6) |
| General Wildlife Habitat | Mod (0.5) | Exc. (1.0) |
| General Fish/Aquatic Habitat | NA | NA |
| Flood Attenuation | NA | NA |
| Short and Long Term Surface Water Storage | Low (0.3) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | NA | High (1.0) |
| Sediment/Shoreline Stabilization | High (0.9) | High (1.0) |
| Production Export/Food Chain Support | Mod (0.5) | Exc. (1.0) |
| Groundwater Discharge/Recharge | NA | Low (0.1) |
| Uniqueness | Mod (0.4) | Mod (0.6) |
| Recreation/Education Potential (bonus points) | Low (0.1) | Mod (0.1) |
| **Actual Points / Possible Points** | **2.8 / 8** | **6.4 / 9** |
| **% of Possible Score Achieved** | **35** | **71** |
| **Overall Category** | **III** | **II** |
| **Total Acreage of Assessed Aquatic Habitat within AA Boundaries** | **0.570** | **20.00** |
| **Functional Units** (acreage x actual points) | **1.6** | **128.0** |
| **Net Acreage Gain** | NA | **19.43** |
| **Net Functional Unit Gain** | NA | **126.40** |

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

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

## 2.6 Dodson East (Glendive District, Year 2)

The Dodson East 2012 Wetland Mitigation Monitoring Report presents the results of the second year of post-construction monitoring at the Dodson East Wetland Mitigation Site. The Montana Department of Transportation wetland mitigation project is located in Sections 1 and 2, Township 30 North, Range 27 East, Phillips County, Montana, approximately four miles east of Dodson on US Highway 2 (Figure 1).The Dodson East wetland conservation easement area encompasses 14.92 fenced acres, situated north of the Milk River and Highway 2 and south of the railroad.

The wetland mitigation site is located within Watershed 11, the Milk River Basin. Wetlands developed at this location were designed to provide compensatory mitigation for approximately 4.4 acres of wetland impacts associated with the planned reconstruction of 4.4 miles of US Highway 2 east of Dodson.

Two cells were constructed in 2008 to create at least 4.92 acres of shallow water (palustrine), emergent, and aquatic bed wetland types. The bases of the wetland cells were constructed with an undulating bottom below the plan elevation. The final elevation of at least 75% of the cell area was to be at or below the plan elevation after the placement of salvaged wetland materials and topsoil (USACE Permit No. 2004-90-518 dated July 22, 2004).

The performance standards listed in the USACE Permit specified that the mitigation wetlands were to have at least 60 percent cover by desirable wetland species in the herbaceous layer after 3 years, and 75 percent cover after five years. Invasive and noxious species were to comprise no more than 10 percent of the relative cover, and not dominate the vegetation in any extensive area of the mitigation wetland. The wetland was to be inundated or saturated to the surface continuously for at least 12.5 percent of the growing season in most years. Mitigation construction was to be initiated prior to or concurrent with impacts..

The 2012 credit summary is presented in Table 11. The total wetland acreage was 7.74 acres consisting of emergent and aquatic bed wetland vegetation classes. An undisturbed upland buffer of 7.18 acres was maintained within the mitigation site. Credit ratios for the site will be determined by the USACE at end of the monitoring period, and were assumed for the purposes of this estimate to be to be 1:1 for created wetlands based on the requirement in the permit to create 4.92 acres of wetland for 4.4 acres of wetland impact. There was 7.63 acres of upland on the site in 2011and 1.52 acres of upland buffer credit calculated at a 5:1 ratio.

The projects wetland acreage goal of at least 4.92 acres was met in 2011. The site's wetlands currently meet all of the performance standards (herbaceous vegetation cover, weed presence, and hydric soils) established for the project.

**Table 11: The 2012 estimated mitigation credit summary for the Dodson East Wetland Mitigation Site.**

| WETLAND | Credit Ratio | 2011 Wetland Acres | 2011 Credit Acres | 2012 Wetland Acres | 2012 Credit Acres |
|---|---|---|---|---|---|
| Created Wetland | 1:1 | 7.29 | 7.29 | 7.74 | 7.74 |
| Upland Buffer | 5:1 | 7.63 | 1.53 | 7.18 | 1.44 |
| **Total Credit Acres** | | | **8.82** | | **9.18** |

The 2011 functional assessment provided a baseline to gauge functional changes at the mitigation site (Table 12). The assessment used the 2008 MWAM (Berglund and McEldowney 2008) and encompassed the west and east cells and the pre-existing wetland located between the cells. In 2012 the 7.7 acre AA was rated as a Category II wetland with 68.5 percent of the total possible points, an increase of 6.5 percentage points and a Category jump

versus 2011. The increase was driven by the higher ratings earned for sediment/toxicant removal and sediment/shoreline stabilization, which both rose from moderate to high in 2012.

**Table 12: Summary of the function/value ratings and functional points at the Dodson East Wetland Mitigation Site in 2012.**

| Function and Value Parameters from the 2008 Montana Wetland Assessment Method | 2011 | 2012 |
|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Mod (0.5) | Mod (0.5) |
| General Wildlife Habitat | Mod (0.7) | Mod (0.7) |
| General Fish/Aquatic Habitat | NA | NA |
| Flood Attenuation | Mod (0.6) | Mod (0.6) |
| Short and Long Term Surface Water Storage | High (1.0) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.7) | High (1.0) |
| Sediment/Shoreline Stabilization | Mod (0.7) | High (1.0) |
| Production Export/Food Chain Support | High (0.8) | High (0.8) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) |
| Uniqueness | Low (0.2) | Low (0.2) |
| Recreation/Education Potential (bonus points) | NA | Low (.05) |
| **Actual Points/Possible Points** | **6.2/ 10** | **6.85/ 10** |
| **% of Possible Score Achieved** | **62.0%** | **68.5%** |
| **Overall Category** | **III** | **II** |
| **Total Acreage of Assessed Wetlands within Site Boundaries** | **7.29** | **7.74** |
| **Functional Units** (acreage x actual points) | **45.2** | **53.0** |

No Priority 2B noxious weeds were identified at the site in 2012. Approximately ten Russian olive trees were observed in the northwest corner of the project area. Russian olive is considered a Priority 3 weed that has the potential to have significant negative impacts. The state recommends research, education and prevention to minimize the spread of this regulated plant. Measures should be taken to ensure that Russian olive seedlings do not establish within this mitigation site. There are no nesting structures or inlet/outlet structures controlling water levels installed at the site.

## 2.7 Easton Ranch (Butte District, Year 3)

The Montana Department of Transportation wetland mitigation project at the Easton Ranch is located in the northwest quarter of Section 32, Township 4 North, Range 9 East, Park County, Montana. The property is located approximately three miles east of US Highway 89 and four miles northeast of Wilsall. The wetland mitigation conservation easement area encompasses approximately 34 fenced acres and is located east of the Shields River within the boundaries of the larger Easton Family Ranch, the previous landowner.

The wetland restoration site is located within Watershed 13 – Upper Yellowstone River Basin. Wetlands were developed at this location to provide compensatory

mitigation for wetland impacts associated with transportation projects in the Butte District.

Construction entailed the excavation of a series of wetland cells and a flood channel that bisects the 34 acre mitigation area. The primary source of wetland hydrology is groundwater supplemented by surface water from high flows associated with the Shields River. An existing irrigation diversion and delivery system was maintained to provide water to the northeast corner of the site. Revegetation tasks included planting cuttings and containerized shrubs, seeding wetland herbaceous species within the excavated wetland areas, and transplanting wetland plants and soils from existing wetlands to excavated areas. The wetland project was designed to increase flood storage, improve wildlife habitat, and restore riparian and wetland habitat impacted by past agricultural practices within the Shields River watershed. The project objectives include:

- Re-establish a previously existing, relic floodplain channel and associated riparian and floodplain wetland areas.
- Create approximately 25 acres of emergent, scrub/shrub and riparian wetlands by replacing existing hay fields with a variety of wetland communities that mimic habitats found in bio-reference wetland areas located north and south of the project
- Re-establish hydrology to approximately 1.56 acres of drained wetlands in the north portion of the site.
- Preserve 1.1 acres of existing scrub/shrub, forested, and palustine emergent communities at several locations within the project area.
- Mimic old meander scars and relic flood channels within the wetland mitigation site.
- Improve water storage capacity and increase the amount of floodplain area across the site.
- Increase the amount of wildlife habitat in this reach of the Shields River.

Table 13 summarizes the current wetland credits based on the USACE approved credit ratios (MDT 2008) and the wetland delineation completed in 2012. Delineated wetland acres and estimated wetland and upland credits earned remain unchanged from 2011 values.

The Easton wetland mitigation site was separated into three AAs (Table 14). The Creation AA encompassed 9.09 acres of constructed palustrine, emergent wetland cells. The Restoration AA consisted of 1.45 acres of re-established flood channel that currently meets the wetland criteria. The 1.1 acre Preservation AA encompassed the existing forested, shrub/scrub and palustrine emergent wetlands.

**Table 13: The 2012 estimated mitigation credit summary of the Easton Ranch Wetland Mitigation Site.**

| Proposed Mitigation Features | Compensatory Mitigation Type | USACE Mitigation Ratios | Final Credit Acreages | Proposed Final Wetland Credits (Acres) | 2012 Wetland Acreages | 2012 Credit Acres |
|---|---|---|---|---|---|---|
| Creation of palustrine emergent wetland via shallow excavation. | Creation | 1:1 | 24.95 | 24.95 | 9.09 | 9.09 |
| Re-establishment of relic flood channel. | Restoration (Re-establishment) | 1:1 | 1.56 | 1.56 | 1.45 | 1.45 |
| Preservation of existing shrub/scrub and palustrine emergent wetland. | Preservation | 4:1 | 1.10 | 0.28 | 1.10 | 0.28 |
| Establish a 50-foot wide upland buffer. | Upland Buffer | 5:1 | 6.43 | 1.29 | 6.43* | 1.29 |
| Project Impacts | | | -0.67 | -0.67 | -0.67 | -0.67 |
| **Total** | | | | **27.41** | | **11.44** |

*The current upland buffer calculated to be 11.97ac and is expected to decrease as wetland areas expand within mitigation boundary. Value presented in this table (6.43ac) represents the expected extent of upland buffer once maximum wetland acreage is achieved.

The Creation AA maintained its 2011 rating as a Category III wetland with 57.5 percent of the total possible points. Wetland ratings are expected to improve as the AA transitions from high to low disturbance and continue to develop wetland habitat. As in 2011, the Restoration AA (flood channel) received a Category III rating and the Preservation AA was rated as a Category II wetland. Both AAs had a minor drop in the percentage of the total possible points earned, due to correction of errors made in the 2011 ratings for MTNHP species habitat and flood attenuation.

**Table 14: Summary of the function/value ratings and functional points for 2011 at the Easton Ranch Wetland Mitigation Site.**

| Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method | 2012 Creation | 2012 Restoration | 2012 Preservation |
|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.1) | Low (0.1) | Low (0.1) |
| MTNHP Species Habitat | Low (0.2) | Low (0.2) | Low (0.2) |
| General Wildlife Habitat | Mod (0.7) | Mod (0.7) | High (0.9) |
| General Fish/Aquatic Habitat | NA | NA | NA |
| Flood Attenuation | Mod (0.5) | Mod (0.6) | Mod (0.6) |
| Short and Long Term Surface Water Storage | High ( 0.8) | Mod (0.6) | High ( 0.8) |
| Sediment/Nutrient/Toxicant Removal | High (0.9) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | Mod (0.6) | Mod (0.6) | NA |
| Production Export/ Food Chain Support | High (0.8) | Mod (0.7) | Exc (1.0) |
| Groundwater Discharge/Recharge | Mod (0.7) | Mod (0.7) | High (1.0) |
| Uniqueness | Mod (0.4) | Mod (0.4) | Mod (0.6) |
| Recreation/Education Potential (bonus points) | Low (0.05) | Low (0.05) | Low (0.05) |
| **Actual Points / Possible Points** | **5.75 / 10** | **5.65 / 10** | **6.25 / 9** |
| **% of Possible Score Achieved** | **57.5%** | **56.5%** | **69.4%** |
| **Overall Category** | **III** | **III** | **II** |
| **Acreage of Assessed Aquatic Habitats within Easement** | **9.09** | **1.45** | **1.1** |
| **Functional Units (acreage x actual points)** | **52.27** | **8.19** | **6.88** |

Nine infestations of Canadian thistle (*Cirsium arvense*), a Priority 2B noxious weed, were identified primarily around the site perimeter (Figure 3). The Canadian thistle is spreading to the constructed wetland areas. The infestations ranged in area from less than 0.1 acre to between 0.1 and 1.0 acre. The cover classes ranged from trace (<1 percent) to low (1 to 5 percent cover). Canadian thistle was observed in communities 1, 3, 5, and 8. Five infestations of houndstongue (*Cynoglossum officinale*) were observed primarily in the north half of the site. The size of the infestations was less than 0.1 acres with less than 1.0 percent cover.

The diversion structure was closed during the July 2011 and June 2012 investigations. Six bird-boxes were installed at the site between 2010 and 2011. Several of the bird boxes were occupied by swallows. The fences were intact. No maintenance was required for the structures.

### 2.8 I-90 East Bozeman (Butte District, Year 2)

The I-90 East Bozeman wetland and stream mitigation site was constructed in 2009 on a 14.81 acre parcel owned by MDT, located in the northwest corner of the interchange between I-90 and East Main Street in Bozeman, Montana. The

project is located in the southeast quarter, northwest quarter of Section 8 in Township 2 South, Range 6 East, in Gallatin County. The wetland and stream restoration site lies within the Upper Missouri River Basin (Watershed 6).

A wetland delineation completed in 2005 identified 3.47 acres of wetlands, an increase from the 0.2 acres identified in 1997. These additional wetlands developed in part as a result of partial channel reconstruction in 1999 that allowed surface water to flow across the site. The existing Story Ditch conveys water along the west and north boundaries of the MDT property. The Story Ditch was channelized historically for agricultural purposes. It is incised with little to no fisheries habitat. An unnamed perennial creek discharges from the culvert outlet that crosses under East Main Street into the site at the southwest boundary. The stream exits the property at the northwest corner, converging with the Story Ditch north of the project site. The unnamed creek conveys spring flows from the hills south of the site and runoff from ephemeral drainages southwest of the site converging with stormwater runoff from residential and commercial development located west and south of the site. The Story Ditch channel flows under the Montana Rail Line railroad and I-90 into Rocky Creek, ultimately draining to the East Fork of the Gallatin River.

The USACE 404 permit authorized the following work in May 14, 2008 (Corps File Number NWO-2007-3408-MTH).

- Create wetlands and a new stream channel in upland areas by excavation and revegetation.
- The new 885 linear feet of channel will be 2 to 3 feet wide, 0.5 to 1.0 foot deep, and will create 0.95 acres of open water riverine habitat with a wetland fringe.
- Four new wetland depressions will be created totaling 5.15 acres.
- MDT is requesting acknowledgement of mitigation credit in the amount of 9.77 acres.
- Topsoil will be salvaged and replaced where possible
- Vegetation will be established by seeding and planting of wetland species trees and shrubs.
- Weeds will be controlled in both the wetland and upland areas.

The USACE acknowledged an available credit of 5.51 acres for the site as summarized below:

- 3.51 acres of wetlands that had developed since 2000;
- 0.17 acres of upland buffer; and
- 30 percent of the expected 6.1 acres of created wetlands or 1.83 acres.

Table 15 presents the 2012 summary of wetland credits. To date, 9.73 credit acres have developed on the site. This is essentially unchanged from 2011.

**Table 15: Summary of estimated mitigation credits for the I-90 East Bozeman Wetland Mitigation Site in 2012.**

| Proposed Mitigation Features | Compensatory Mitigation Type | USACE Mitigation Ratios | MDT Final Credit Goal (Acres) | USACE Acknowledged Credit* | 2012 Delineated Wetland Acres | 2012 Credit Acres |
|---|---|---|---|---|---|---|
| Creation of riverine wetland, 2 to 3 feet wide, one half to one foot deep | Creation | 1:1 | 0.95 | 1.83 | 0.90 | 0.90 |
| Creation of four wetland depressions | Creation | 1:1 | 5.15 | | 5.15 | 5.15 |
| Maintain 3.51 acres of wetland developed since 2000. | Creation | 1:1 | 3.51 | 3.51 | 3.51 | 3.51 |
| Existing open water/WUS | | | | | 0.11 | NA |
| Maintain upland buffer | Upland buffer | 5:1 | 0.17 | 0.17 | -- | 0.17 |
| Total Available Credit | | | 9.78 | 5.51 | 9.67 | 9.73 |

*USACE acknowledged credit for 30% of the total created (6.1 acres) from 2008 correspondance.

**Wetland fringe associated with the created riverine wetland was included in created wetland depressions. This area was included in riverine creation in 2011 and 2012.

Comparison against the sites success criteria demonstrates that the areas currently defined as wetland meet the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. The cover of desirable hydrophytic plants in a majority of the footprint of the created wetland cells and riverine wetland meets the 80 percent criterion. The upland buffer exhibits greater than 50 percent areal cover of desirable vegetation and less than 10 percent weed cover, fulfilling the requirements for upland credit.

The woody overstory, particularly on the stream channel, continues to develop site wide. It is not possible to determine if this criterion has been met, for although “woody plants” is listed among the project performance standards, no quantitative criterion for success of this parameter is provided.

The success criteria state that bank stability success will be evaluated by using the previously constructed stream channel downstream of the new channel construction as a reference reach. Bank stability success will be achieved when less than 25 percent of the banks are unstable or the percent stability of the restored channel is within 5 percent of the downstream reference reach. The banks of the constructed channel appear to be stable without any measurable lateral migration based on the cross-section data collected from 2010 to 2012. However, the average width of the constructed creek channel (riverine wetland) is greater than the 2 to 3 feet stipulated in the project design. The channel width at cross-section 2 is approximately 20 feet. Continued deposition of sediment within the channel may eventually result in a channel width reflective of the design dimensions.

The functions and values of two assessment areas (AA) within the I-90 East Bozeman mitigation wetlands were evaluated from 2010 to 2012 using the 2008

Montana Wetland Assessment Form (Table 16). The constructed wetland depressions, channel, and additional riverine wetlands were evaluated as one AA and encompassed 6.16 acres. This Creation AA received a Category II rating with 70.9 percent of the total points possible in 2012, an improvement over the Category III rating and 62.7 percentage points assigned in 2011. The improvement was the result of higher ratings in the general fish/aquatic habitat function based on the August, 2011 observation by MDT of Yellowstone cutthroat trout (*Onchorhynchus clarki bouvieri*) in the channel, an increase in the percent cover of vegetation on the streambanks, and an increase of recreation/education potential bonus points.

**Table 16: Summary of the function/value ratings and functional points for 2010 and 2011 at the I-90 East Bozeman Wetland Mitigation Site.**

| Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method1 | 2010 Pre-Existing Wetland | 2012 Pre-Existing Wetland | 2010 Created Wetland Depressions & Channel | 2012 Created Wetland Depressions & Channel |
|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Mod (0.5) | Mod (0.6) | Mod (0.5) | Mod (0.6) |
| General Wildlife Habitat | Mod (0.7) | Mod (0.7) | Low (0.3) | Mod (0.7) |
| General Fish/Aquatic Habitat | Mod (0.4) | Mod ( 0.6) | Low (0.2) | Low (0.6) |
| Flood Attenuation | Mod (0.6) | Mod (0.7) | Mod (0.5) | Mod (0.5) |
| Short and Long Term Surface Water Storage | High (0.8) | High (0.8) | High (0.8) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | High (0.9) | High (1.0) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | High (1.0) | High (1.0) | Mod (0.7) | High (1.0) |
| Production Export/ Food Chain Support | High (0.8) | High (0.8) | Mod (0.6) | High (0.9) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | High (1.0) | High (1.0) |
| Uniqueness | Low (0.3) | Low (0.3) | Low (0.2) | Low (0.3) |
| Recreation/Education Potential (bonus points) | Mod (0.1) | High (0.2) | Mod (0.1) | High (0.2) |
| **Actual Points / Possible Points** | **7.1 / 11** | **7.7 / 11** | **5.9 / 11** | **7.8 / 11** |
| **% of Possible Score Achieved** | **64.6%** | **70.0%** | **53.6%** | **70.9%** |
| **Overall Category** | **II** | **II** | **III** | **II** |
| **Acreage of Assessed Aquatic Habitats within Easement (ac)** | **3.51** | **3.51** | **5.32** | **6.16** |
| **Functional Units (acreage x actual points) (f1-)** | **24.92** | **27.03** | **31.39** | **48.05** |

High ratings were achieved for short and long term surface water storage, sediment/nutrient/toxicant removal, production export/food chain support, groundwater discharge/recharge, and recreation/education potential.

The second AA encompassed 3.51 acres of pre-existing wetlands acknowledged by the USACE as onsite wetlands constructed prior to 2009. The pre-existing wetlands were rated as a Category II with 70.0 percent of the total points possible, or an increase of 3.6 percent since 2011. The increase was the result of the Yellowstone cutthroat trout observation, which increased the MTNHP species habitat and general fish/aquatic habitat ratings, and an increase of recreation/education potential bonus points. Ratings were high for the functional variables of short and long term surface water storage, sediment/nutrient/toxicant

removal, sediment/shoreline stabilization, production export/food chain support, ground/discharge/recharge, and recreation/education potential.

The entire site was rated as documented secondary habitat for Yellowstone cutthroat trout and suspected secondary habitat for the great blue heron (*Ardea herodias*) yielding a moderate rating for Montana Natural Heritage Program species habitat

Infestations of common tansy and Canadian thistle found on the site. A single infestation of spotted knapweed at the fence line on the southwest boundary was recorded, and is noted here owing to the aggressive nature of this weed. The percent cover of Canadian thistle decreased site-wide in 2012 as a result of herbicide spraying completed in August, 2011. Isolated Canadian thistle plants and several infestations of were observed near the site entry at the southwest boundary, and adjacent to the stream near the Story Ditch confluence.

A rock vane was installed across the existing channel to restrict potential head cutting resulting from the excavation of the Story Ditch channel by the adjacent property owner. No head cutting was observed on MDT property in 2012. The grade-control structure was in good condition and stable. The concrete blocks and fencing associated with the wildlife jump out on I-90 along the east fence boundary of the mitigation site were repaired after the July 2011 field visit and this jump out was in good condition in 2012.

Four wood duck boxes and four bluebird boxes were observed on the site. The nesting structures were in good condition. One bluebird box showed signs of use.

### 2.9 Lonepine (Missoula District, Year 5)

The Lonepine wetland mitigation site was constructed to mitigate for wetland impacts incurred by the MDT Lonepine North and East highway reconstruction project and any wetland credits developed beyond project needs would be held in reserve and applied towards future MDT projects in the Lower Clark Fork watershed (Watershed #3) and Confederated Salish and Kootenai Tribes (CSKT) reservation. The project was constructed on MDT property between summer 2007 and summer 2008, concurrent with the adjacent Lower Dry Fork Reservoir dam re-construction.

The project is located at 2,840 feet above mean sea level on the west edge of the Flathead Indian Reservation, approximately 1.5 miles west of Lonepine and south of the Lower Dry Fork Reservoir dam. The project area is located on the Lonepine USGS 7.5 topographic map in the NW quarter of Section 3, Township 22 North, Range 24 West, Montana.

Project goals were the development of 23.85 acres of USACE approved wetland credit and 11.86 acres of CSKT approved wetland credit at the 80 acre site. The mitigation design focused on the creation of emergent wetlands with a minor

component of aquatic bed and scrub-shrub wetlands. The target wetland functions included wildlife habitat, sediment/nutrient/toxicant removal, surface water storage, and production export/food chain support.

The project encompasses a series of five excavated wetland cells. The primary water source is the Lower Dry Fork Reservoir via the Camas C Canal and the secondary water source is precipitation. Project objectives are listed below.

- Maximize emergent wetland development, associated wildlife habitat, nutrient//toxicant removal functions, surface water storage functions, and production export/food chain support on the site by constructing several large, interconnected cells that flood to a maximum depth of approximately one foot.
- Restore, sinuosity and connectivity to ditched and straightened segments of Dry Fork Creek, including reactivation of a cutoff meander loop
- Provide a riparian scrub-shrub component by revegetating the restored Dry Fork Creek channel margins and intercell watercourses with riparian shrub species.
- Enhance and protect uplands and existing wetlands along Dry Fork Creek by removing grazing from the site, planting upland shrubs, prohibiting development, and fencing.
- Minimize operational maintenance and promote a self-sustaining system by placing permanent spillways at all cell outlets to control water elevations.

Table 17 summarizes the calculated credit acreages for 2012. The CSKT and USACE will authorize the final mitigation credits developed at the site. 2012 credits based on CSKT ratios totaled 14.06 credit acres, a slight decrease of 0.2 credit acres since 2011. 2012 credits based on USACE ratios totaled 28.51 acres, a decrease of 0.6 credit acres from 2011. Full credit was applied to the constructed Dry Fork channel based on the percent survival (210 live cuttings observed) and continued propagation of narrow-leaf willow cuttings. The USACE credit for the riparian intercell swales was 0.0 acres due to the lack of shrub planting success (less than 12 percent) in this area. All performance standards adopted for this mitigation project have been met with the exception of the standard addressing the planted shrub densities. Woody species survival for the containerized materials and cuttings was less than the 75 percent target. The cover of Canadian thistle in the upland areas located in the west half of the site increased from 2010 to 2011. The thistle and spotted knapweed were sprayed by MDT in 2011. No spotted knapweed was observed in 2012. The site wide noxious weed cover was less than 10 percent, meeting the success criteria.

**Table 17: The 2012 summary of estimated mitigation credits for the Lonepine Wetland Mitigation Site.**

| PROPOSED FEATURE | CSKT CREDIT RATIOS | CSKT CREDIT TARGET (ACRES) | USACE CREDIT RATIOS | USACE CREDIT TARGET | 2012 DELINEATED WETLAND ACRES | 2012 CSKT CREDIT ACRES | USACE 2012 CREDIT ACRES | 2012 PERFORMANCE STANDARD COMMENTS |
|---|---|---|---|---|---|---|---|---|
| Wetland cells, wetland excavation, and designed intercell swales that have developed into wetlands | 1:3.04 | 7.02 | 1:1 (OW limited to 10% of wetlands) | 21.35 | 24.79 | 8.15 | 24.79 | **Wetland Hydrology**: Satisfied; **Hydric Soil**: Satisfied; **Noxious Weed Cover**: Satisfied; **Hydrophytic Veg Cover in Gypsum-Treated Areas**: Satisfied; **Hydrophytic Veg Cover in Untreated Areas**: Meeting target |
| New Dry Fork channel and wetland fringe along dam face | 1:1.54 | 0.19 | 1:1 | 0.3 | 1.54 | 1.00 | 1.54 | **Bank Stability**: Satisfied; **Noxious Weed Cover**: Satisfied; **Cutting Survival**: On target; **Shrub Survival**: Below target |
| New Dry Fork Creek channel in pre-existing Wetland 1 | 1:1.54 | 0.03 | 1:1.5 | 0.03 | 0.04 | 0.03 | 0.03 | **Bank Stability**: Satisfied |
| Dry Fork Creek meander re-activation | 1:1.54 | 0.17 | 1:1.5 | 0.17 | 0.26 | 0.17 | 0.17 | **Bank Stability**: Satisfied; **Noxious Weed Cover**: Satisfied; **Cutting Survival**: On target |
| Protection / grazing removal at pre-existing wetlands | 1:1.54 | 4.31 | 1:5 | 1.33 | 7.13 | 4.63 | 1.43 | **Fencing and Grazing Exclusion**: Satisfied |
| Riparian intercell swales | 1:3.04 | 0.14 | 1:4 | 0.11 | 0.24 | 0.08 | 0.00** | **Noxious Weed Cover**: Satisfied; **Shrub Survival**: Below target |
| Upland buffer | None (no planting proposed) | 0.00 | 1:4 (max. 50-ft width) | 0.56 | 2.23 | 0.00 | 0.56 | **Fencing**: Satisfied; **Noxious Weed Cover**: Marginal; **Vegetation Cover**: Satisfied |
| **TOTAL** | | **11.86** | | **23.85** | **34.00** | **14.06** | **28.51** | |

*Estimated credit acreage of the new Dry Fork channel reduced by 0.16 acres in 2010 based on low woody species survival.
**The acreage associated with the riparian intercell swales not included in credit acre estimate based on less than 12 % shrub survival.

The 2003 baseline assessment was completed using the 1999 MWAM while the post-construction conditions were assessed using the 2008 MWAM. Only general comparisons in wetland functional development can be made between the baseline and post-construction functional assessments. The site was separated into two AAs; Cells 1 to 5 and the Dry Fork Creek riparian area. The respective areas of the AAs in 2012 were 23.73 acres and 10.27 acres. Table 18 summarizes the results of the 2003 (Baseline) and 2010 to 2012 functional assessments.

The areal extent of the Dry Fork Creek AA decreased by 0.6 acres from 2011 to 2012 as a result of a transition from wetland community 13 to upland community 16. The Dry Fork Creek riparian area has been rated as a Category II wetland since 2010. The score rose from 72 percent in 2011 to 75 percent in 2012 reflecting the increase in the percent cover of the streambank vegetation. The Dry Creek riparian corridor provided documented secondary habitat for great blue heron, long-billed curlew and western toad, and documented incidental habitat for the American white pelican and bobolink. The functional units decreased slightly from 85.87 to 84.21 and reflected the change in wetland acreage.

**Table 18: Summary of the function/value ratings and functional points at the Lonepine Wetland Mitigation Site for 2003 (baseline) and 2011.**

| Function and Value Parameters from the MDT Montana Wetland Assessment Method | 2003 Baseline Dry Fork Creek | 2003 Baseline Isolated Wetlands | 2012 Dry Fork Creek | 2012 Cells 1-5 |
|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.3) | Low (0.0) | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Low (0.1) | Low (0.1) | Mod (0.6) | Mod (0.6) |
| General Wildlife Habitat | Low (0.3) | Low (0.1) | Exc. (1.0) | High. (.9) |
| General Fish/Aquatic Habitat | Mod (0.4) | NA | Mod (0.4) | Low (0.3) |
| Flood Attenuation | Mod (0.5) | NA | Mod (0.6) | NA |
| Short and Long Term Surface Water Storage | Mod (0.6) | Low (0.3) | High (1.0) | High (0.9) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.7) | NA | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | Mod (0.6) | NA | High (1.0) | High (0.9) |
| Production Export/ Food Chain Support | High (0.8) | Low (0.1) | Exc. (1.0) | Mod (0.7) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | High (1.0) | High (1.0) |
| Uniqueness | Low (0.2) | Low (0.2) | Mod (0.4) | Mod (0.4) |
| Recreation/Education Potential (bonus points) | Low (0.1) | Low (0.1) | High (0.2) | High (0.2) |
| **Actual Points / Possible Points** | **5.0 / 12** | **1.9 / 8** | **8.2/11** | **6.9/10** |
| **% of Possible Score Achieved** | **47%** | **24%** | **75%** | **69%** |
| **Overall Category** | **III** | **IV** | **II** | **II** |
| **Acreage of Assessed Aquatic Habitats within Easement** (ac) | **6.87** | **0.31** | **10.27** | **23.73** |
| **Functional Units** (acreage x actual points) **($f^1$-)** | **34.35** | **0.59** | **84.21** | **163.74** |
| **Net Acreage Gain** (ac) | NA | | **26.81** | |
| **Net Functional Unit Gain** (fu) | NA | | **213.01** | |

The areal extent of the Dry Fork Creek AA decreased by 0.6 acres from 2011 to 2012. The Dry Fork Creek riparian area has been rated as a Category II wetland since 2010. The score rose from 72 percent in 2011 to 75 percent in 2012 reflecting the increase in the percent cover of the streambank vegetation. The Dry Creek riparian corridor provided documented secondary habitat for great blue heron, long-billed curlew and western toad, and documented incidental habitat for the American white pelican and bobolink. The functional units decreased slightly from 85.87 to 84.21 and reflected the change in wetland acreage.

The constructed wetland cells (Cells 1 to 5) received 69.0 percent of the total points possible in 2011 and 2012. The score was reported in 2011 as 73.0 percent due to an error in rating calculations and has been corrected in Table 8 of the 2012 report. Ratings for the constructed cells in 2011 and 2012 were High for general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, groundwater discharge/recharge, and recreation/education potential (bonus points).

The net gain in wetland acreage across the site since 2003 has been 26.81 acres. The total functional units achieved at the site in 2012 were 247.95, a net functional unit gain for both assessment areas of 213.01 compared to 2003 baseline conditions.

There were no maintenance recommendations identified for the ditches, inlet, or outlet structures within the mitigation site. Infestations of Canadian thistle, a Priority 2B noxious weed, were recorded on site. Canadian thistle was identified primarily in the upland perimeter of the west half of the site, near the east

boundary, and within the riparian corridor. The size ranged from less than 0.1 acre to between 0.1 and 1.0 acre. The cover class ranged from trace (less than 1 percent) to moderate (5 to 25 percent). Two acres of Canadian thistle and spotted knapweed (*Centaurea maculosa*) were sprayed by MDT in 2011.

### 2.10 McGinnis Meadows (Missoula District, Year 3)

The McGinnis Meadows MDT wetland mitigation project is located in Section 33, Township 26 North, Range 28 West, Lincoln County, Montana. McGinnis Meadows is located approximately seven miles south of the US Highway 2 corridor on two parcels encompassing 33 acres of an historic hay field and pasture. McGinnis Creek, a tributary to the Fisher River, bisects the parcels. This wetland restoration project lies within the Kootenai River Basin (Watershed 1).

Wetlands developed at this location provide compensatory mitigation for wetland impacts associated with transportation projects in the Missoula District. The McGinnis Meadows site was selected after an extensive search of potential wetland and stream restoration sites by MDT within the Kootenai River Watershed in cooperation with a consortium of Conservation Districts known as the Montana Watersheds Incorporated (MWI). The consortium consisted of the Lincoln, Sanders, and Flathead County Conservation Districts with technical assistance from the USDA Natural Resource Conservation Service Centers (NRCS) in Bozeman, Kalispell, Libby, and Eureka. The wetland and stream restoration project will ultimately aid in improving the flood storage, stream length, and fisheries habitat of McGinnis Creek, and improve the overall wildlife, riparian, and wetland habitats impacted by past agricultural practices within the McGinnis Creek watershed.

Project goals for the McGinnis Meadows mitigation project included the restoration (establishment and rehabilitation) of approximately 0.8 acres of riparian habitat and 17.3 acres of degraded wetlands, creation of 2.9 acres of new emergent wetlands, enhancement of 1.74 acres of emergent wetlands and intermittent drainage, preservation of 0.3 acres of existing riparian communities within McGinnis Creek, and protection of 2.2 acres of upland buffer. The project credit ratios approved by the USACE and the 2012 credits are shown in Table 19.

The areas delineated as wetlands within the created cells met the criteria for vegetation, soil, and hydrology. The cover of wetland plants increased significantly from less than 50 percent in 2012 to 95 percent in 2012. The acreage of the created wetland cells has exceeded the anticipated 2.90 acres proposed in the 2009 MDT Mitigation Plan by 3.52 acres. The 2012 credits calculated for this AA are 6.42 acres.

Approximately 17.08 acres of wetland were identified within the restoration (rehabilitation) AA in 2012. The restored area included the pre-existing impaired reed canary grass wet meadow. The estimated credit acres for restoration were

11.39 in 2012 based on a 1.5:1, restoration to impact, credit ratio. This represents a 2.99-acre increase since 2011.

The proposed 0.30 credit acres for preservation presented in the Mitigation Plan were used to calculate the allowable credit estimates. Preservation credits in 2012 were 0.08 acres based on a 4:1 preservation to impact ratio.

The enhancement AA included the existing emergent wetland along the south and southwest boundary of the property upgradient from the channel restoration area. The 2011 and 2012 wetland delineation defined 1.32 acres of wetland within this AA. Applying the USACE approved 3:1 credit ratio to this area netted 0.44 acres of wetland credit in 2012.

The restored McGinnis Creek channel encompassed 0.75 acre of riverine habitat. The MDT seeks to obtain approximately 8,835 stream credits for the restoration of 2,850 linear feet of McGinnis Creek associated with the area below the OHWM of the channel. The acreage was excluded from the wetland credit totals summarized on Table 19.

The success criteria stipulating 70 percent cover of wetland plants was met site-wide in 2012. The vegetation cover in the upland buffer also exceeded 50 percent. The cover of weed species in the site wetlands was less than five percent and satisfied the performance standard for pertaining to Montana State-listed noxious weed cover not exceeding 5 percent cover. The weed cover in the upland buffer is currently succeeding but near the margin of failure regarding the success criteria for five percent or less cover by noxious weeds. The woody plants installed in 2011 are still developing. The success criteria of a long term, 50 percent survival rate for woody vegetation has not yet been met. Photographs of the cross-sections in Appendix C illustrate the increase in the percent cover and diversity of the vegetation along the banks of the restored channel and satisfy the McGinnis Creek channel restoration success criteria pertaining to well-vegetated banks with a majority of deep-rooting riparian and wetland plant species. The total mitigation credits calculated for the McGinnis Meadows Wetland Mitigation Site in 2012 was 18.76 credit acres, an increase of 2.98 credits since 2011

**Table 19: Summary of estimated mitigation credits for the McGinnis Meadows Wetland Mitigation Site in 2012.**

| Proposed Mitigation Activity | Compensatory Mitigation Type | COE Mitigation Ratios | Proposed Acres | Final Credit Estimate (Acres) | 2012 Delineated Acreage | 2012 Credit (acres) |
|---|---|---|---|---|---|---|
| Creation of palustrine emergent depression wetlands through shallow excavation. | Creation | 1:1 | 2.90 | 2.90 | 6.42 | 6.42 |
| Restoration/Re-establishment of the McGinnis Creek Channel and wetland fringe. | Restoration (Re-Establishment) | 1:1 | 0.80 | 0.80 | 0.75* | 0.75* |
| Rehabilitation of existing impaired wet meadow wetlands. | Restoration (Rehabilitation) | 1.5:1 | 17.30 | 11.53 | 17.08 | 11.39 |
| Enhancement of existing emergent wetland upgradient of channel restoration. | Enhancement | 3:1 | 1.74 | 0.58 | 1.32 | 0.44 |
| Preservation of existing wetlands within abandoned McGinnis Creek reaches. | Preservation | 4:1 | 0.30 | 0.08 | 0.30 | 0.08 |
| Maintenance of upland buffer averaging 50 feet in length on site perimeter. | Upland Buffer | 5:1 | 2.20 | 0.44 | 2.20 | 0.44 |
| **Total** | | | | **16.33** | **27.32** | **18.76** |

*Stream Credit being sought for McGinnis Creek, acreage excluded from total.

Functional assessments were completed on four AAs from 2010 to 2012 using the 2008 MWAM. Results for 2012 are presented in Table 20. The four AAs were divided into creation (excavated cells – 6.42 acres), restoration (re-establishment and rehabilitation – 17.08 acres), enhancement (existing emergent wetland – 1.32 acres), and preservation (existing riverine wetlands – 0.30 acres). The acreage of the Restoration AA increased from 12.60 acres in 2011 to 17.08 acres in 2012, primarily as a result of wetland development in former upland community Types 1 and 7.

According to the 2005 baseline site evaluation, wetlands on the site were highly disturbed from grazing, leveling, channel straightening and the resultant impacts to hydrology. Wetlands were rated as Category III by David, Evans & Associates using the 1999 MDT Wetland Assessment Method.

**Table 20: Summary of the function/value ratings and functional points at the McGinnis Meadows Wetland Mitigation Site for 2012.**

| Function and Value Parameters 2008 MDT Montana Wetland Assessment Method[1] | 2012 Creation (Excavated Cells) | 2012 Restoration (Re-establishment and Rehabilitation-Existing wet meadow) | 2012 Enhancement (Existing emergent wetland) | 2012 Preservation (Existing riverine wetlands) |
|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.3) | Low (0.3) | Low (0.3) | Low (0.3) |
| MTNHP Species Habitat | Low (0.2) | Mod (0.6) | Low (0.2) | Low (0.2) |
| General Wildlife Habitat | Exc. (1.0) | Exc. (1.0) | High (0.9) | Exc. (1.0) |
| General Fish/Aquatic Habitat | NA | High (0.8) | NA | NA |
| Flood Attenuation | Mod (0.6) | Mod (0.5) | Mod (0.6) | High (0.9) |
| Short and Long Term Surface Water Storage | High (1.0) | High (1.0) | Low (0.1) | High (0.8) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.7) | High (0.9) | High (0.8) | High (1.0) |
| Sediment/Shoreline Stabilization | Mod (0.7) | High (1.0) | NA | High (1.0) |
| Production Export/ Food Chain Support | High (0.8) | Exc. (1.0) | Mod (0.5) | Mod(0.7) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | NA | High (1.0) |
| Uniqueness | Mod (0.4.) | Mod (0.4) | Mod (0.4) | Mod (0.4) |
| Recreation/Education Potential (bonus points) | High (0.20) | High (0.20) | High (0.20) | High (0.2) |
| Actual Points / Possible Points | **6.90 / 10** | **8.70 / 11** | **41007.00** | **7.50 / 10** |
| % of Possible Score Achieved | **69.0** | **79.1** | **50.0** | **75.0** |
| Overall Category | **II** | **II** | **III** | **II** |
| Acreage of Assessed Aquatic Habitats within Easement (ac) | **6.42** | **17.08** | **1.32** | **0.30** |
| Functional Units (acreage x actual points). | **44.30** | **148.60** | **5.28** | **2.25** |

[1]Berglund and McEldowney 2008 MDT MWAM.

Approximately 6.19 acres of wetlands have developed within the created cells that were located in areas identified as uplands in the baseline delineation. The cover of wetland vegetation within the footprints of the excavated cells increased rapidly from 2010 to 2012. The creation AA received 69.0 percent of the total possible points, an increase of 2.5 percent since 2011. Ratings in the general wildlife, Montana Natural Heritage Program species habitat, and recreation/education potential categories increased in 2012 as a result of substantial wildlife observations and documented sightings of S3 species such as great blue heron and pileated woodpecker. Ratings were excellent for general wildlife habitat and high for short and long-term surface water storage, production export/food chain support, groundwater discharge/recharge, and recreation/education potential.

The acreage of the restoration AA increased 4.48 acres in 2012. The restoration/rehabilitation of the existing wet meadow received 79.1 percent of the total possible with excellent ratings for general wildlife habitat and production export/food chain support. The approximate 1.5 percent increase over 2011 was the result of substantial wildlife sightings, documented sightings of S3 species, and an increase in the cover of streambank species with high stability ratings.

The 1.32-acre enhancement AA received 50 percent of the total possible points in 2012, an increase of 9.4 percentage points from 2011. The increase was the result of greater wildlife use and improvement in production export/food chain support. The survival of the woody species planted in 2009 was low owing to intensive wildlife browse. The woody plants installed in spring 2011 are expected to enhance the mitigation site by broadening the structural diversity.

The preservation AA for the existing riverine wetlands along the abandoned ditch was identified in the USACE-approved mitigation plan as 0.30 acres in size. Since 2010, the wetland fringe along the abandoned ditch has been delineated as 0.53 acres. It has been assumed that the wetland fringe along this ditch has expanded due to increased water levels resulting from the ditch plugs. The difference between the original 0.30 acres and the current 0.53 acres (0.23 acres) has been included in the creation AA to maintain congruence between the approved mitigation plan and original credit ratios. Therefore, the preservation AA assesses the 0.30 acres directly along the plugged ditch. This AA received 75.0 percent of the total points in 2012. An increase in wildlife sightings site wide in 2012 resulted in an excellent rating for general wildlife habitat and a 2.5 percent increase in the overall score versus 2011.

Canadian thistle and gypsy flower (aka houndstongue, *Cynoglossum officinale*), both Priority 2B noxious weeds, were identified at the McGinnis Creek Mitigation Site. Twenty-nine Canadian thistle infestations were observed across the site. Infestations ranged in size from less than 0.1 acre to 1.0 acre in size with cover classes ranging from trace (less than 1 percent) to high (25 to 100 percent cover). Canadian thistle has invaded areas that were disturbed during construction. One infestation of gypsy flower was mapped in the northwest quarter of the site. The MDT has an ongoing weed assessment and management program for their mitigation sites.

No man-made nesting structures have been installed on site. The mitigation site design relied on the excavation of shallow depressions to intercept groundwater, increased hydrologic connectivity with McGinnis Creek and the adjacent floodplain, and the passive increase in the local water table. Therefore, water control structures were not a part of the design. The majority of fencing surrounding the perimeter of the site was intact; however, a short stretch of fencing (~30ft) had been knocked down between the site and the adjacent landowner to the west and should be repaired. Other maintenance needs include continued implementation of the ongoing weed management plan.

### 2.11 Murphy Ox Yoke (Butte District, Year 3)

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 situated west of the Yellowstone River, bordered by the Park Branch Canal to the east and US 89 to the west. The property is legally described as Sections 28 and 33, Township 5 South, Range 8 East, Park County, Montana.

The site 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 were to be held in reserve for application against future MDT highway projects within the Upper Yellowstone River Basin (Watershed 13). 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, the landowners, and Gallatin Valley Land Trust. The project site encompasses upland, wet meadow, riparian, emergent, and scrub-shrub wetland habitats. Historic wetlands located within the project area had been drained for agricultural purposes. The Park Branch irrigation canal raises the groundwater elevation throughout the project area. Murphy Swamp, located across Highway 89, provides the surface water source for Murphy Creek via culvert under the highway. The creek is a perennial stream that parallels the east property boundary, ultimately discharging to the Yellowstone River located east of the project site and the Park Branch Canal. An artesian well located outside the northwest corner of the site supplies an additional source of water.
Goals of the mitigation project were to:

- 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 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.

Table 21 presents the summary of wetland credits from 2012. Credit ratios were taken from the *Wetland Compensatory Mitigation Ratios, Montana Regulatory Program* (USACE 2005) and the approved wetland mitigation plan. The total area of projected wetland within the constructed cells was estimated at 4.10 acres in 2008. The 2010 survey measured the designed post-construction

footprint of the cells at 4.50 acres. The actual wetland area developed to date within the cells was measured at 4.09 acres in 2011 and 2012.

**Table 21: Summary of estimated mitigation credits for the Murphy Ox Yoke Wetland Mitigation Site in 2012.**

| PROPOSED FEATURE | COMPENSATORY MITIGATION TYPE | USACE CREDIT RATIO | 2008 PROPOSED CREDIT ACRES | 2008 USACE CREDIT TARGET | 2012 DELINEATED ACRES | 2012 CALCULATED CREDITS |
|---|---|---|---|---|---|---|
| Creation of palustrine emergent and scrub/shrub wetlands through shallow excavation of groundwater in Cell 1. | Creation | 1:1 | 2.70 | 2.70 | 2.92 | 2.92 |
| Creation of palustrine emergent and scrub/shrub wetlands through shallow excavation of groundwater in Cell 2. | Creation | 1:1 | 1.40 | 1.40 | 1.17 | 1.17 |
| Rehabilitation of wetlands in NW corner of site 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 |
| Creation of wetlands outside of excavated cells and existing restoration and preservation areas | Creation | 1:1 | --- | --- | 1.31 | 1.31 |
| Upland buffer included in the conservation easement area to protect aquatic resources within project limits. | Upland Buffer | 5:1 | 3.00 | 0.60 | 3.30 | 0.66 |
| | | **Totals** | **10.99** | **6.50** | **12.59** | **7.87** |

*Area not differentiated in 2010

An additional 1.31 acres of wetland have developed outside the excavated cells as a result of increased water levels within the mitigation site. The ditch in the northwest corner of the site was plugged during construction, raising groundwater elevations in the adjacent palustrine wetland. This additional wetland development was not anticipated or accounted for in the USACE approved crediting strategy. A request for acknowledgement and approval of the 1.31 credit acres should be made to the USACE.

Preservation of 1.89 acres of the existing scrub/shrub and emergent wetlands within the creek corridor west of the canal accounted for 0.47 credit acres at a 4:1 impact to credit ratio. The 3.3-acre upland buffer provided 0.66 credit acres at a 5:1 ratio. The 2012 calculated credits shown in Table 21 yielded 7.87 credit acres. This exceeds the 2008 credit target of 6.5 by 1.31 credit acres. This value is expected to increase as wetlands continue to develop within cell 2 of the migitation area.

With respect to the project's established success criteria, the site has met the criteria for wetland hydrology, soil, and vegetation in the areas of the constructed cells delineated as wetlands. The vegetation in wetland communities across the site exhibited an overall hydrophytic vegetation cover of 80 percent. The

herbaceous vegetation cover in wetland communities 13 and 15 and the planted woody vegetation cover are still developing. The weed cover in the upland buffer does not currently exceed 5 percent. The site is fenced, grazing has been removed, the drain ditch is plugged, and the site is protected in a conservation easement.

A baseline functional assessment using the 1999 MDT MWAM (Berglund 1999) was completed in 2003 for the wet meadow habitat located in the northwest corner of the site (2.00 acres, Community Type 7) and the remaining wetlands located west of the Park Branch Canal (1.89 acres, Communities 4, 9, 10, 12). The two assessment areas were rated as Category III wetlands in 2003 partly as a result of moderate to high level of disturbance site-wide. Historic forms of disturbance included grazing, haying, ditching, channel straightening, and road building. The 2003 baseline and 2012 results are presented in Table 22.

**Table 22: Summary of the function/value ratings and functional points at the Murphy Ox Yoke Wetland Mitigation Site for 2003 (baseline) and 2012.**

| Function and Value Parameters from the MDT Montana Wetland Assessment Method | 2003 Baseline[1] Wet Meadow | 2003 Baseline West of Canal | 2012 Created Wetland Cells[2] | 2012 Wet Meadow Restoration | 2012 West of Canal Preservation |
|---|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.3) | Low (0.3) | Low (0.3) | Low (0.3) | Low (0.3) |
| MTNHP Species Habitat | Low ( 0.1) | Low ( 0.1) | Mod (0.6) | Mod (0.6) | Mod (0.6) |
| General Wildlife Habitat | Mod (0.5) | Mod (0.7) | High (0.9) | Mod (0.7) | High (0.9) |
| General Fish/Aquatic Habitat | -- | -- | NA | NA | NA |
| Flood Attenuation | Low (0.1) | Mod (0.6) | Mod (0.6) | Mod (0.6) | High (0.9) |
| Short and Long Term Surface Water Storage | Mod (.5) | High (0.8) | High (1.0) | Mod (0.6) | High (0.8) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.7) | High (0.9) | High (1.0) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | -- | High (1.0) | High (1.0) | High (0.9) | High (1.0) |
| Production Export/ Food Chain Support | Mod (0.6) | High (0.9) | Mod (0.7) | Mod (0.7) | Exc. (1.0) |
| Groundwater Discharge/Recharge | High (1.0) | Low (0.1) | High (1.0) | Mod (0.7) | High 1.0) |
| Uniqueness | Low (0.3) | Mod (0.5) | Mod (0.4) | Low (0.3) | Mod (0.4) |
| Recreation/Education Potential (bonus points) | Low (0.3) | Low (0.3) | Mod (0.1) | Mod (0.1) | Mod (0.1) |
| **Actual Points / Possible Points** | **4.4 / 10** | **6.2 / 10** | **7.6/ 10** | **6.5 / 10** | **8.0/10** |
| **% of Possible Score Achieved** | **44%** | **56%** | **76.0%** | **65.0%** | **80.0%** |
| **Overall Category** | **III** | **III** | **II** | **II** | **II** |
| **Acreage of Assessed Aquatic Habitats within Easement** (ac) | **2.00** | **1.89** | **4.09** | **3.31** | **1.89** |
| **Functional Units** (acreage x actual points) **($f^1$-)** | | | **31.08** | **21.52** | **15.12** |

[1]Berglund 1999 MDT MWAM.

[2]Berglund and McEldowney 2008 MDT MWAM.

The 2008 MWAM was used from 2010 to 2012 to assess functional values for three AAs, including the Created Wetland Cells, the Wet Meadow Restoration area, and the area West of Canal Preservation. The AA for the created wetland cells encompasses 4.09 acres. The Restoration AA includes 1.31 acres of wetland that have developed outside the cells and 2.00 acres of existing wet meadow located in the northwest portion of the mitigation site. The Preservation AA encompasses the 1.89 acres of the pre-existing shrub-scrub and emergent wetlands located west of the canal.

The Created Wetland Cells AA rated in 2012 as Category II wetlands with 76 percent of the possible functional points. This represented an improvement in the category rating and an increase of 13 percent since 2011. The change in the disturbance rating from moderate to low and the continued development of the wetland vegetation cover resulted in higher ratings for general wildlife habitat, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, production export/food chain support, and uniqueness. Ratings were high in general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and groundwater discharge and recharge.

There was a slight change documented between 2011 to 2012 in the functions and values assessed for the 3.31 acre Restoration AA. This change included the adjustment of Sediment/Shoreline Stabilization rating as a result of the 2011 MWAM incorrectly classifying the duration of surface water as permanent/perennial. This correction bumbed the AA from a Category II to a Category III rating with 65 percent of the total points possible. The ratings were high for sediment/nutrient/toxicant removal and sediment/shoreline stabilization.

The 1.89 acre Preservation AA was rated as a Category II system with 80 percent of the total possible points in 2011 and 2012. The overall rating was based on an excellent rating for production export/food chain support and high ratings for general wildlife habitat, flood attenuation, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and groundwater discharge and recharge. The functional units increased for the Preservation AA from 14.46 in 2010 to 15.12 in 2011 and 2012.

Infestations of Canadian thistle (*Cirsium arvense*) and gypsy-flower (houndstongue - *Cynoglossum officinale*), both Priority 2B noxious weeds, were identified in the upland at the entrance to the site and on the east side of the Murphy Creek riparian corridor near the east property boundary. The infestations were less than 0.1 acre in extent and less than 1 percent of the total cover of the infestation. Isolated plants of houndstongue and/or Canadian thistle were recorded within communities 1, 4, 10, and 11. The Canadian thistle and gypsy-flower (houndstongue) infestations were sprayed by MDT in 2011 after the July site visit. The MDT has an ongoing weed management program for their mitigation sites that includes an annual assessment of weed conditions.

Two wood duck boxes, one floating nest, and eight bluebird boxes were installed at the site between 2010 and 2011. Four of the bluebird boxes appeared to be in use in 2012. All of the nest structures were in excellent condition and did not require maintenance. No water control structures were installed on the property.

### 2.12 Schrieber Meadows (Missoula District, Year 2)

The Montana Department of Transportation Schrieber Meadows mitigation project is located adjacent to the US Highway 2 corridor in Sections 11, 12, and 13, of Township 27 North, Range 30 West, MPM, Lincoln County (Figure 1). The 147-acre site lies within the boundaries of Watershed #1 – Kootenai River Basin. The majority of the site is situated on an MDT-owned parcel of land that consisted of hay fields, pastures, and clear-cut forest slopes. The remainder of the site is within a 16-acre easement area in the Kootenai National Forest adjacent to the MDT parcel. The property is bisected by Coyote Creek which eventually drains into Schrieber Lake and the Fisher River. Schrieber Meadows is situated within a narrow valley corridor bordered on the western and northern edges by the Kootenai National Forest and the US Highway 2 corridor and on the south by private property.

Based on the nature of the peat and lacustrine soils identified within the project area, the MDT Geotechnical Section indicated that construction of a new stream channel and wetlands within Schrieber Meadows could potentially affect stability of US Highway 2. In 2007, a pilot wetland project to excavate several shallow depressional wetland cells within these peat and lacustrine soils was completed in an effort to determine constructability within these soil types. Three shallow wetland cells were created in 2007 and initially monitored in 2010.

Based on the results of the pilot project, this wetland and stream restoration project was scaled back from the original design. A 300-foot buffer was established by the MDT Geotechnical Section from the edge of roadway, limiting potential areas of development for the new stream channel and depressional wetland areas within the project area. The existing Coyote and Schrieber Creek channels were relocated along the western side of the property away from the highway corridor in order to allow for natural channel migration and overbank flooding. The elevation of the restored channels was raised to promote access to the floodplain and increase the localized water table throughout this meadow. A series of wetland cells (depressions) were excavated throughout the floodplain to increase flood storage and provide for a diversity of wetland habitat. The existing drainage ditch along the eastern boundary of the site was plugged to prevent excessive drainage and create pockets of surface water.

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

Wetland Mitigation

- Create an additional 6.53 wetland credit acres of new seasonally inundated emergent depressional wetlands within portions of the existing upland hay fields on both the USFS and MDT properties with a variety of herbaceous wetland communities;
- Provide approximately 1.56 wetland credit acres through the restoration (rehabilitate) of 2.36 acres of degraded wetlands (at 1.5:1 ratio) that are dominated by tame pasture grasses such as meadow foxtail (*Alopecurus* sp.), reed canary grass (*Phalaris arundinacea*), timothy (*Phleum pretense*) and other hay species through the permanent restoration of hydrology, land surface manipulation (excavating shallow depressions), and re-vegetation with wetland plant seed;
- Provide approximately 4.41 wetland credit acres through the enhancement of 13.22 acres of existing wetlands (at 3:1 ratio) located between the proposed stream mitigation portion of the project area and the US Highway 2 corridor;
- Provide approximately 1.70 wetland credit acres through the development of upland buffers totaling 8.50 acres (at 5:1 ratio) around the created, restored and enhanced wetland areas and stream riparian corridors,
- Establish an overall total of 17.84 acres of wetland mitigation credits to mitigate wetland impacts associated with MDT projects within Watershed #1 – Kootenai River Basin; and
- Affect approximately 0.08 acres of wetlands through the installation of ditch plugs along the Perennial Spring Channel ditch.

Stream Mitigation

- Restore approximately 7,756 linear feet of new stream channel to both Coyote and Schrieber Creeks resulting in an overall increase of 3,327 linear feet of stream length to both creek corridors through restoration of sinuosity, floodplains and natural stream migration within the project site;
- Develop approximately 35,551 stream mitigation credits with the restoration of Coyote and Schrieber Creeks for use within Watershed #1 – Kootenai River Basin.

The approved performance standards for the mitigation activities are listed below (MDT 2009).

1. **Wetland Characteristics**: All restored, created, enhanced, and preserved wetlands within the project limits will meet the three parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010).
    a) **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987

Wetland Manual. Soil saturation will be present for at least 12.5 percent of the growing season.

b) **Hydric Soil Success** will be achieved where hydric soil conditions are present [per the most recent Natural Resource Conservation Service (NRCS) definitions for hydric soil or appear to be forming], the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Soil sampling will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Wetland Manual. Since typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.

c) **Hydrophytic Vegetation Success** will be achieved where combined absolute cover of facultative or wetter species is ≥70 percent and Montana State-listed noxious weeds do not exceed 5 percent absolute cover.

The following concept of "dominance", as defined in the 1987 USACE Wetland Delineation manual, will be applied during future routine wetland determinations in created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines).*"

2. **Riparian Buffer Success** will be achieved when woody and riparian vegetation becomes established, and noxious weeds do not exceed 10% cover within the riparian buffer areas. Any areas within the creditable buffer area disturbed by the project construction must have at least 50% aerial cover on non-noxious weed species by the end of the monitoring period.
    i. **Vegetation Success** will be achieved where combined aerial cover of riparian and stream bank vegetation communities in ≥70% and Montana State-listed noxious weeds do not exceed 10% cover, subject to the woody standards listed below.
    ii. **Woody Plants** – Planted
3. **Channel Restoration Success** will be evaluated in terms of re-vegetation success.
    i. Re-vegetation along the new Coyote and Schrieber Creek channel corridors will be considered successful when banks are vegetated with a majority of deep-rooting riparian and wetland herbaceous and woody plant species.
    ii. The intent of the stream restoration is to allow for the stream to naturally migrate within the floodplain and to give it enough room to move and stabilize itself within the site.

4. **Vegetation along the stream banks** will be considered successful when banks are vegetated with a majority of deep-rooting riparian plant species having root stability indexes ≥6 (subject to 3.a and 3.b above).
5. **Open Water:** It is the intent of the project to provide open water during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, it is anticipated that vegetation will germinate within the majority of the depressions. Open water with submerged and floating vegetation will therefore be considered successful and creditable.
6. **Upland Buffer Success** will be achieved when the noxious weeds do not exceed 5 percent of cover within the buffer areas on site. Any area within the creditable buffer zone disturbed by project construction must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.
7. **Weed Control** will be based upon annual monitoring of the site to determine weed species and degree of infestation within the site, and control measures based upon the monitoring results will be implemented by MDT to minimize and/or eliminate the intrusion of State Listed Noxious weed species within the site. The MDT managed the property to control known weed problems (knapweed and hounds tongue) prior to the initiation of wetland construction activities within the site.

The project credit ratios approved by the USACE and the 2012 monitoring results are presented in Table 23.

**Table 23: Summary of estimated mitigation credits for the Schrieber Meadows Wetland Mitigation Site in 2012.**

| Mitigation Type | Proposed Acreage | Ratio | Proposed Credit Acres | 2012 Delineated Acreage | 2012 Credit Acres |
|---|---|---|---|---|---|
| Wetland Credit Acres established with 2007 project | 6.46 | Varies (See Table 8) | 3.72 | * | * |
| Creation - USFS/MDT Property | 6.53 | 1:1 | 6.53 | 30.90 | 30.90 |
| Restoration on USFS/MDT Property | 2.34 | 1.5:1 | 1.56 | 3.46 | 2.31 |
| Enhancement of wetlands inside geotechnical limits adjacent to US 2 (MDT/USFS) | 13.22 | 3:1 | 4.41 | 13.22 | 4.41 |
| Upland Buffer (50 feet) | 8.50 | 5:1 | 1.70 | 8.50 | 1.70 |
| Project Impacts | -0.08 | None | -0.08 | -0.08 | -0.08 |
| **Total Mitigation Acreage** | **36.97** | | **17.84** | **47.58** | **39.24** |

*Acreages included into appropriate mitigation category

It was anticipated that a total of approximately 17.84 wetland credit acres would result from the full Schrieber Meadows project, including the approved credits from the 2007 pilot project. Due to the extensive response of the water table to the plugged drainage ditch and substantial site-wide increase of wetland hydrology, the projected credit acres for this site has exceeded the proposed credit acres necessary for compensatory mitigation. A total of 39.42 credit acres

have developed at this site following construction, including approximately 1.70 acres of mitigation credit obtained through protecting a 50-foot buffer around the perimeter of the constructed wetland cells. . All wetlands delineated in 2012 met the performance standards approved for this site, which included meeting the three parameter criteria for hydrology, vegetation, and soils. Open water areas were given full credit due to the initial intent of the project to provide open water during the spring and early summer within the excavated depressions. Weed cover within the upland buffers did not exceed 5 percent and therefore met performance success criteria. Weeds were mapped throughout the mitigation site and will be controlled by MDT as part of the performance standard stipulating the control of noxious weed species within the site.

In addition to wetland and upland buffer credits, the goal of the stream mitigation component of the Schrieber Meadows project the development of approximately **35,551** stream mitigation credits. Results of the stream mitigation monitoring are presented in Table 24.

**Table 24: Summary of the estimated stream mitigation credits on Schrieber Meadows in 2012.**

| Stream | | | | | |
|---|---|---|---|---|---|
| **Factors** | **Upper Coyote Creek (USFS)** | **Coyote Creek Spring Area** | **Middle Coyote Creek (MDT)** | **Perennial Spring Channel** | **Merged Coyote/ Schrieber Creeks** |
| Net Improvement | 2.50 | 0.00 | 2.50 | 2.50 | 2.50 |
| Stream Status | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| Type of Protection | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Mitigation Timing | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| Comparative Stream Order | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| Location | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| Sum of Factors (M) | 3.15 | 0.65 | 3.15 | 3.15 | 3.15 |
| Linear Feet (L) | 1,752 | 190 | 3,179 | 400 | 2,425 |
| **Total Stream Credits (M x L)** | **5,519** | **123** | **10,014** | **1,260** | **7,639** |
| **TOTAL STREAM CREDITS = 24,555** | | | | | |
| **Total Mitigation Credits (Riparian + Stream) = 10,996 + 24,555 = 35,551** | | | | | |

Although full stream credit has been calculated using the proposed constructed stream length, no as-built survey has been completed to verify the full length of the proposed stream has been constructed. Based on the results of 2012 monitoring efforts, the site has achieved the riparian buffer success and channel restoration success criteria to date. Both the stream channel and creditable buffer areas have greater than 70% aerial cover by deep-rooting vegetation and less than 10% cover by Montana State-listed noxious weeds. The construction technique employed for creating the new channels did not disturb the stream banks, which are predominantly covered by reed canary grass (plant stability rating of 9). The riparian success criteria pertaining to woody plants survival

exceeding 50% after 5 years will require on-going evaluation but has exhibited positive signs of survival after year one. The 35,551 stream credits calculated for this site following construction achieves the goals for the stream mitigation component for the Schrieber Meadows project

The 2008 MDT MWAM was used to evaluate the site in 2010 and 2012. The functional assessment completed in 2010 incorporated the three constructed wetland cells into one AA. The wetlands received a Category II rating with 68 percent of the total possible points in 2010. In 2012, the acreage of the project area increased to include two additional AAs, including the restored stream channel and additional constructed wetlands cells. As a result of these additions, the 2012 monitoring event assessed three AAs (Table 25).

**Table 25. Summary of the function/value ratings and functional points at the Schrieber Meadows site for 2012.**

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

[1]Berglund and McEldowney 2008.

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

The 13.22-acre **enhancement AA** included existing wetlands located between the stream mitigation portion of the project area and the US Hwy 2 corridor. Plugging the drainage ditch has resulted in increased inundation through this AA and may eventually promote the conversion of the reed canary grass-dominated AA into wetland habitat supporting an increased diversity of vegetation species. This AA achieved 79% of possible score, rated as a Category II wetland, and attained 93.86 functional units.

The 2012 **creation AA** included all wetland areas within the site that were not identified as wetland habitat during the baseline delineation. An increase of wetlands above the anticipated target value of 6.53 acres has developed on site due to the increased water table observed site wide. This 30.9 acre AA rated as a Category II wetland and obtained 256.47 functional units since completion of construction in 2011.

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

### 2.13 Selkirk Ranch (Billings District, Year 6)

The Selkirk Wetland Mitigation Reserve wetland mitigation site is located in Wheatland County, Montana, near the community of Two Dot. The site sits at approximately 4,640 feet above mean sea level in the northeast quarter of Section 9 of Township 8 North, Range 12 East.

The 73.6-acer Selkirk mitigation site was constructed by a private party on private land during the winter of 2006 to 2007. The site consisted of mostly upland communities with approximately 25 acres of impaired wetland community prior to construction. The mitigation reserve currently encompasses an herbaceous wet meadow wetland, scrub/shrub wetland, open water, and upland buffer.

The original purpose of the mitigation project was to provide the Montana Department of Transportation with 50 acres of wetland mitigation credit prior to US Highway 12 road construction in Watershed 10, the Musselshell Basin. The desired net total was approximately 60.4 acres of wetland credit based on the application of appropriate credit ratios to various design features and after accounting for 0.4 acres of wetland impact associated with project construction.

Four different mitigation areas were originally developed with varying performance standards and credit ratios, including rehabilitation, 1.5:1; re-establishment/creation, 1:1; enhancement; 3:1; and, upland buffer, 5:1. The original performance standards were amended on March 29, 2010, as referenced in a USACE letter from Todd Tillinger dated August 6, 2010 (USACE 2010a). The amendment replaced the four previous sets of performance standards with a

single set of performance standards that apply to all assessment areas. The new method of awarding credits is based on a credit-reduction methodology in contrast to the prior standard which was pass/fail. The new standard requires an assurance of a functional lift with the most favorable credit ratios awarded if wetland assessment areas achieve a Category II status or better (USACE 2010a). The functional lift evaluation will be based on the 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999).

The Primary Standards for performance as amended in 2010 for the Selkirk Wetland Reserve are listed below.

a) Meet all three wetland criteria as defined in USACE Wetland Delineation Manual (Environmental Laboratory 1987).

b) Maximum noxious weed coverage is not to exceed 5 percent

c) Demonstrate soil saturation in the upper 12 inches of the soil profile for a minimum of 12.5 percent of the growing season.

d) Aerial coverage of all plant species must be at least 80 percent and requires a 2-year survival period; bare ground shall not exceed 20 percent aerial coverage.

e) Permanent open water lacking persistent emergent vegetation or aquatic bed vegetation will comprise less than 15 percent of the total wetland project area and no single body is to exceed 3 acres.

f) Achieve a Category II functional rating.

The estimated wetland credits for 2012 based on the creation, rehabilitation, enhancement, and upland buffer mitigation types are shown in Table 26. Approximately 71.01 acres of wetland were delineated site-wide in 2012, a decrease of 0.24 acres from 2011. This small decrease was the result of redefining the wetland/upland boundary in the northwest corner of the site based on the data collected at S-5. The creation AA encompassed 38.02 acres of wetland. The enhancement AA accounted for 1.0 acre on the site and the rehabilitation AA was 31.99 acres in size. All three wetland mitigation areas were rated as Category II wetlands in 2012. The upland buffer credit was based on the presence of 2.35 acres of existing upland. In total, the site has successfully generated 59.6 wetland credit acres and 0.5 upland buffer credit acres.

**Table 26. Summary of 2012 estimated credit acreage for the Selkirk Wetland Mitigation Site.**

| Mitigation Type | Proposed Credit Acreage | 2009 Acres | 2010 Acres | 2011 Acres | 2012 Acres | Credit Ratio | 2012 Wetland Credits** |
|---|---|---|---|---|---|---|---|
| 1 - Creation | 38.60 | 36.51 | 37.16 | 38.26 | 38.02 | 1.1 | 38.0 |
| 2 - Rehabilitation | 31.90 | 31.90 | 31.9 | 31.99 | 31.99 | 1.5:1 | 21.3 |
| 3 - Enhancement | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 3:1 | 0.3 |
| 4 - Upland Buffer* | 2.90 | 4.59 | 2.90 | 2.35 | 2.35 | 5:1 | 0.5 |
| Wetland Fill | | -0.4 | -0.4 | -0.4 | -0.4 | - | -0.4 |
| **TOTAL** | | | | | | | **59.7** |

*Upland credit acreage based on original proposed acreage in mitigation plan. The digital site boundary provided to Confluence defined a project area of 73.6 acres. The conservation easement encompasses 74.4 acres and is assumed to extend into the uplands surrounding the defined project area.

**MDT can only utilize 50 acres of credit from site, with option to purchase more at a later date.

With respect to the performance standards, the three wetland criteria were met for all areas identified as wetlands. The weed infestations were located primarily in the perimeter and northwest corner of the mitigation site. The percent weed cover did not exceed five percent site-wide in 2012. Soil saturation within 12 inches of the ground surface and inundation were evident site wide based on data collected at sample points and on the presence and extent of hydrophytic vegetation communities. The aerial vegetation coverage has exceeded 80 percent site-wide for over three years. The open water areas contained persistent emergent vegetation and aquatic bed vegetation and there was no single open water body that exceeded three acres.

Functional assessments were completed in 2012 for three AAs that correspond to the mitigation credit types approved by the USACE prior to mitigation activities (Table 27). The AAs include the 31.99-acre rehabilitation area, the 1-acre enhancement area located near the south property boundary, and the 38.02-acre creation area. The use of the 1999 MWAM was continued through 2012 for consistency.

**Table 27. Summary of 2006 (baseline) and 2012 function/value ratings and functional points at the Selkirk Wetland Mitigation Site.**

| Function and Value Parameters from the MDT Montana Wetland Assessment Method[1] | Rehabilitation AA | | Enhancement AA | | Creation AA | |
|---|---|---|---|---|---|---|
| | 2006 | 2012 | 2006 | 2012 | 2007 | 2012 |
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Low (0.0) | Mod (0.7) | Low (0.0) | Mod (0.7) | Mod (0.7) | Mod (0.7) |
| General Wildlife Habitat | Low (0.3) | Exc. (1.0) | Mod (0.5) | Exc. (1.0) | High (0.9) | Exc. (1.0) |
| General Fish/Aquatic Habitat | NA | NA | NA | NA | NA | NA |
| Flood Attenuation | NA | Mod (0.6) | NA | Low (0.2) | Mod (0.5) | Mod. (0.6) |
| Short and Long Term Surface Water Storage | Low (0.3) | High (1.0) | Low (0.2) | Mod (0.4) | High (0.9) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.6) | High (1.0) | High (0.9) | High (1.0) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | NA | High (1.0) | NA | High (1.0) | Mod (0.6) | High (1.0) |
| Production Export/Food Chain Support | Mod (0.7) | High (0.9) | Mod (0.6) | High (0.8) | Mod (0.7) | High (0.9) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) | High (1.0) |
| Uniqueness | Low (0.1) | Mod (0.4) | Low (0.3) | Mod (0.4) | Mod (0.6) | Mod (0.4) |
| Recreation/Education Potential | Low (0.1) | High (1.0) | Low (0.1) | High (1.0) | Mod (0.7) | High (1.0) |
| **Actual Points / Possible Points** | **3.1 / 9** | **8.6 / 11** | **3.6 / 9** | **7.5 / 11** | **7.6 / 11** | **8.6 / 11** |
| **% of Possible Score Achieved** | **34%** | **78%** | **43%** | **68%** | **69%** | **78%** |
| **Overall Category** | **III** | **II** | **III** | **II** | **II** | **II** |
| **Total Acreage of Assessed Aquatic Habitat within AA Boundaries** | **31.90** | **31.99** | **1.00** | **1.00** | **32.90** | **38.02** |
| **Functional Units** (acreage x actual points) | **98.90** | **275.1** | **3.6** | **7.5** | **250.00** | **327.0** |

The wetland acreage within the rehabilitated AA stayed the same from 2011 to 2012. The ratings, functional points, and percent score also remained the same. Ratings were excellent for general wildlife habitat and high for short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, production export/food chain support, groundwater discharge/recharge, and recreation/education potential. This AA was classified as a Category III wetland in 2006 and a Category II wetland from 2007 to present.

The enhancement AA is a one-acre wetland located near the outlet of the wetland complex that is exposed to most of the surface water that leaves the site. The area was flooded by the Musselshell River in May/June, 2011. It did not show signs of flooding in 2012. The ratings were excellent for general wildlife habitat and high for sediment/nutrient/toxicant removal, sediment/shoreline

stabilization, production export/food chain support, groundwater discharge/recharge, and recreation/education potential. The functional points for the enhancement area increased 0.7 points in 2011 based on the documented secondary habitat for the white-faced ibis. This AA was classified as a Category III wetland in 2006 and 2007, and as a Category II wetland from 2008 to present.

The wetland area within the creation AA decreased by 0.24 acres from 38.26 acres in 2011 to 38.02 acres in 2012. Data point S-5 was excavated in the northwest corner of the site. The sample plot did not meet the wetland criteria for hydric soil or hydrology. The wetland boundary shown on Figure 3 for 2012 reflects this slight shift. This AA increased in structural diversity in 2010 with the establishment of submerged and floating vegetation, which resulted in a corresponding increase of 9.3 functional units. Scores for this area were consistent between 2011 and 2012. The highest ratings were for general wildlife habitat (excellent), short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, production export/food chain support, groundwater discharge and recharge, and recreation/education potential. This AA has been classified as a Category II wetland since 2007.

The functional category standard requires an assurance of a functional lift with the most favorable credit ratios awarded if wetland assessment areas achieve a Category II status or better (USACE 2010). The creation, rehabilitation, and enhancement assessment areas have achieved a Category II rating.

Infestations of Canadian thistle (*Cirsium arvense*), a Priority 2B noxious weed, were mapped at five locations. The sizes of the infestations were less than 0.1 acre. The percent cover within each infestation ranged from low (less than 1 percent) to moderate (5 to 25 percent). The weeds were sprayed by the landowner in spring, 2010. Continued weed spraying is recommended to address the five infestations identified in 2012.

Eight bluebird and four wood duck nesting structures were installed on the site in 2007 and were in use in 2012. The nesting structures were intact.

### 2.14 Sportsman's Campground (Butte District, Year 5)

The Sportsman's Campground wetland mitigation project was constructed in 2007 by MDT. The purpose of the project was to create approximately 15.6 acres of palustrine emergent, scrub-shrub, and aquatic bed wetland habitat to serve as compensatory wetland mitigation for the MDT's Sportsman's Campground East and Dickie Bridge-Wise River reconstruction projects. Wetland impacts associated with these two projects totaled 14.36 acres, with an additional 0.18 acres of impact to existing wetlands that occurred during the mitigation project construction.

The project is located on Montana DNRC land that is protected by an MDT Wetland Conservation Easement. The site borders Montana State Highway 43, approximately 13 miles west of Wise River, Montana. The 24 acre project site was used by MDT for gravel mining, equipment storage, and gravel stockpiling prior to construction of the wetland mitigation site in 2007. Gravel mining for the Sportsman's Campground East highway reconstruction project created a pit approximately 19.2 acres in area. The gravel pit area was excavated to varying depths to provide a range of inundation levels that included permanent, semi-permanent, and seasonal moisture regimes. Four small islands were also included in the design. The mitigation area is assumed to be hydrologically connected via groundwater to the nearby Big Hole River, located south of Highway 43. Additional seasonal groundwater recharge is provided by snowmelt from the nearby Pintlar Mountain Range north of the site.

Prior to implementation of the mitigation project, wetland habitat began to develop in two areas within the project site as result of gravel mining activities. The MDT will receive credit at a 1:1 ratio for the pre-existing, 1.31-acre open water/aquatic bed pond with an emergent/scrub-shrub fringe and the pre-existing, 0.66-acre emergent marsh wetland south of the pond. Wetland communities targeted for development included open water/aquatic bed, scrub/shrub, and shallow marsh/wet meadow in support of a diversity of plant and wildlife habitat

The Sportsman's Campground mitigation site currently encompasses 15.31 acres of created, Class II wetland and 1.97 acres of pre-existing wetland developed prior to mitigation site construction (Table 28). The total of 17.28 acres of wetlands exceeds the projected goal of 15.6 acres and the 14.36 acres necessary to compensate for the impacts associated with the construction of aforementioned highway projects.

**Table 28. Estimated credit acres in 2010-2012 for the Sportsman's Campground Wetland Mitigation Site**

| Wetland and Open Water | Credit Ratio | 2010 Delineated Acres* | 2010 Credit Acres* | 2011 Delineated Acres | 2011 Credit acres | 2012 Delineated Acres | 2012 Credit acres |
|---|---|---|---|---|---|---|---|
| Pre-existing wetland | 1:1 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 |
| Created wetland | 1:1 | 9.77 | 9.77 | 15.31 | 15.31 | 15.31 | 15.31 |
| Pre-existing open water | 1:1 | 1.31 | 1.31 | 1.31 | 1.31 | 1.31 | 1.31 |
| Created open water | 1:1 | 4.20 | 4.20 | 0.00 | 0.00 | 0.00 | 0.00 |
| **TOTAL** | | 15.94 | 15.94 | 17.28 | 17.28 | 17.28 | 17.28 |

Project files at MDT indicate that wetlands identified within the mitigation site boundaries prior to construction were rated as Category IV systems using the 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999). The post-mitigation construction wetland functions and values assessed from

2008 to 2012 used the 2008 Montana Wetland Assessment Method (Berglund and McEldowney 2008).

The 17.28-acre AA includes the constructed and pre-existing wetlands (Table 29). The functional ratings decreased slightly in 2012 based on the removal of the bald eagle as an MTNHP S3 species. The bald eagle had been documented on the mitigation site; the western toad (S2) is suspected for incidental habitat, thus the lower rating for MTNHP species habitat in 2012. The AA was rated as a Category II wetland with 73.33 percent of the possible total score. The functional units totaled 114.05. The 2012 functional points included high ratings for General Wildlife Habitat, Short and Long Term Surface Water Storage, Sediment/Nutrient/Toxicant Removal, Sediment/Shoreline Stabilization, Production Export/Food Chain Support, Groundwater Discharge/Recharge, and Recreation/Education Potential.

**Table 29. Wetland function/value ratings and functional points for 2008-2012 at the Sportsman's Campground Wetland Mitigation Site.**

| Function and Value Parameters from the 2008 MDT Montana Wetland Assessment Method | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Listed/Proposed T&E Species Habitat | Low (0.00) | Low (0.00) | Low (0.00) | Low (0.0) | Low (0.0) |
| MTNHP Species Habitat | Low (0.10) | Low (0.10) | Low (0.20) | Low (0.2) | Low (0.1) |
| General Wildlife Habitat | High (0.90) | High (0.90) | High (0.90) | High (0.9) | High (0.9) |
| General Fish Habitat | NA | NA | NA | NA | NA |
| Flood Attenuation | NA | NA | NA | NA | NA |
| Short and Long Term Surface Water Storage | High (0.90) | High (0.90) | High (1.00) | High (1.0) | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.70) | Mod (0.70) | Mod (0.70) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | NA | Low (0.30) | Mod (0.70) | High (1.0) | High (1.0) |
| Production Export/Food Chain Support | High (0.80) | High (0.80) | High (0.80) | High (0.8) | High (0.8) |
| Groundwater Discharge/Recharge | High (1.00) | High (1.00) | High (1.00) | High (1.0) | High (1.0) |
| Uniqueness | Mod (0.40) | Mod (0.40) | Mod (0.40) | Mod (0.6) | Mod (0.6) |
| Recreation/Education Potential (bonus points) | High (0.20) | High (0.20) | High (0.20) | High (0.2) | High (0.2) |
| **Actual Points / Possible Points** | **5.0 / 8** | **5.3 / 9** | **5.9 / 9** | **6.7 / 9** | **6.6 / 9** |
| **% of Possible Score Achieved** | **63%** | **59%** | **65.56%** | **74.44%** | **73.33%** |
| **Overall Category** | **II** | **II** | **II** | **II** | **II** |
| **Total Acreage of Assessed Wetlands within Site Boundaries** | **14.95** | **15.52** | **15.93** | **17.28** | **17.28** |
| **Functional Units** (acreage x actual points) | **74.8** | **82.25** | **93.99** | **115.78** | **114.05** |

There are no man-made water level control features or nesting structures installed on this site. The project perimeter is fenced with barbed wire and in good condition.

Three infestations of spotted knapweed (*Centaurea maculosa*), each covering less than 0.1 acre and less than 1.0 percent of the total cover within the infestation, were identified near the south boundary during the 2012 investigation. Five infestations of Canadian thistle (*Cirsium arvense*) located near the north and east boundaries were observed in 2012. The areal extent ranged from less than 0.1 acre to 1.0 acre and the percent cover was less than 1.0 percent to 5.0 percent. Both invasive species are classified as Priority 2B noxious weeds

### 2.15 Woodson Creek (Butte District, Year 5)

The mitigation site was constructed in 2006 in Meagher County in the southeast portion of the Missouri-Sun-Smith watershed (Watershed 7). Approximately 50 acres of wetland credit were to be awarded to the MDT through a credit purchase agreement that would compensate for wetland impacts associated with MDT highway and bridge reconstruction projects in the watershed. Woodson Creek was constructed on the Ringling Land and Cattle Company property. The goal of the project was to restore Woodson Creek to its historical configuration (i.e., increase sinuosity), improve wetland hydrology in existing wetlands, and to create wetlands. The mitigation area was projected to provide a maximum of 73.3 acres of palustrine emergent and scrub-shrub wetland within the boundaries of the 105 acre site, although MDT's maximum amount of credit is 44.4 acres by an agreement with ADC, now Oasis Environmental and part of ERM.

The project occurs at an elevation of approximately 5,390 feet above mean sea level and is located three miles northeast of Ringling, Montana, in Meagher County. The Woodson Creek site is shown on the Hamen, Montana, USGS 7.5 minute topographic quadrangle in Sections 9 and 16, Township 6 North, Range 8 East.

Seven different crediting areas were developed originally with individual performance standards. Credit ratios were 1:1 for restoration and creation and 1.5:1 for rehabilitation once the performance standards were achieved. These complex performance standards for Woodson Creek were amended on March 29, 2010, as referenced in a USACE letter dated August 6, 2010 (USACE 2010a). The amendment replaced the previous seven sets of performance standards with a single set that uses a credit-reduction based methodology of awarding credits instead of a pass/fail system. This functional lift standard required an assurance of a functional lift with the most favorable credit ratios awarded if wetland assessment areas achieve a Category II status or better. The functional lift was to be assessed using the 1999 MDT MWAM (Berglund 1999).

The total area of aquatic habitat delineated in 2012, which includes wetlands and open water associated with Woodson Creek, was 69.58 acres (Table 30).

**Table 30. Estimated Credits for the Woodson Creek Wetland Mitigation Site in 2012.**

| AA | Credit Category | 2010 Credit Ratio | 2010 Acres | 2010 Credit Acres | 2011 Acres | 2011 Credit Acres | 2012 Acres | 2012 Credit Acres |
|---|---|---|---|---|---|---|---|---|
| Woodson Creek Floodplain | Restoration (Re-establishment) | 1:1 | 29.17 | 29.17 | 29.19 | 29.19 | 29.19 | 29.19 |
| East Parcel | Re-establishment | 1:1 | 31.23 | 31.23 | 31.27 | 31.27 | 31.27 | 31.27 |
| West Parcel | Rehabilitation | 1.5:1 | 7.3 | 4.87 | 9.18 | 6.12 | 9.18 | 6.12 |
| **Total** | | | **67.70** | **65.27** | **69.64** | **66.58** | **69.64** | **66.58** |

The mitigation site was separated into three AAs, Woodson Creek Floodplain, Woodson Creek East Parcel, and Woodson Creek West Parcel. Full credit has been assigned to all three AAs as a result of these areas achieving wetland category II in 2011. A total of 66.58 credit acres is estimated for the Woodson Creek wetland mitigation site based on the 2012 monitoring results.

The mitigation site was separated into three AAs, including Woodson Creek Floodplain, Woodson Creek East Parcel, and Woodson Creek West Parcel. The baseline assessment was completed in 2005. Functional assessment results for 2005, 2008, 2010, 2011, and 2012 are summarized in Table 31.

**Table 31: Summary of the 2005 (baseline), 2010, and 2011 wetland function/value ratings and functional points at the Woodson Creek Wetland Mitigation Site.**

| Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method[1] | 2005 Baseline | | 2012 | | |
|---|---|---|---|---|---|
| | Woodson Floodplain | East & West Parcel | Woodson Creek Floodplain | East Parcel | West Parcel |
| Listed/Proposed T&E Species Habitat | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) | Low (0.0) |
| MNHP Species Habitat | Low (0.1) | Low (0.1) | High (1.0) | High (1.0) | High (1.0) |
| General Wildlife Habitat | Low (0.3) | Low (0.3) | High (0.9) | High (0.8) | High (1.0) |
| General Fish/Aquatic Habitat | Low (0.3) | NA | Mod (0.6) | NA | NA |
| Flood Attenuation | Low (0.1) | NA | Mod (0.6) | Mod (0.5) | NA |
| Short and Long Term Surface Water Storage | Low (0.3) | NA | High (1.0) | Mod (0.6) | High (0.8) |
| Sediment/Nutrient/Toxicant Removal | Mod (0.6) | Mod (0.7) | High (1.0) | High (1.0) | High (1.0) |
| Sediment/Shoreline Stabilization | Mod (0.7) | NA | High (1.0) | High (0.9) | Low (0.3) |
| Production Export/Food Chain Support | Mod (0.4) | Mod (0.7) | High (0.9) | High (0.8) | Mod (0.7) |
| Groundwater Discharge/Recharge | High (1.0) | Low (0.1) | High (1.0) | High (1.0) | High (1.0) |
| Uniqueness | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.2) | Low (0.3) |
| Recreation/Education Potential | Low (0.1) | Low (0.1) | Low (0.3) | Low (0.3) | Mod (0.7) |
| Actual Points / Possible Points | 4.1/12 | 2.2 / 8 | 8.5 / 12 | 7.1 / 11 | 6.8/9 |
| % of Possible Score Achieved | 34.2 | 27.5 | 71 | 65 | 76 |
| Overall Category | III | IV | II | II | II |
| **Total Acreage of Assessed Aquatic Habitat within AA Boundaries** | 0.48 | 57.00 | **29.19** | **31.27** | **9.18** |
| **Functional Unit** (acreage x actual points) | 1.97 | 125.40 | **248.12** | **222.02** | **62.43** |
| **Net Acreage Gain** (from baseline conditions) | NA | NA | **12.16** | | |
| **Net Functional Unit Gain** (from baseline conditions) | NA | NA | **405.19** | | |

[1](Berglund 1999).

Functional assessment forms were completed for the Woodson Creek wetlands using the 1999 MDT MWAM. The 2012 functional assessments rated the restored Woodson Creek floodplain (29.19 acres), the rehabilitated west parcel (9.18 acres), and the reestablished east parcel (31.27 acres) as Category II wetlands, based on the high ratings for MTNHP species habitat.

The restored Woodson Creek floodplain AA was rated the same in 2011 and 2012. The AA received 71 percent of the possible points and high ratings for MTNHP species habitat, general wildlife habitat, short and long term surface water storage, sediment/nutrient/ toxicant removal, streambank/shoreline stabilization, production export/food chain support, and groundwater discharge and recharge.

The West parcel received 76 percent of the total possible points in 2012, an increase of 5 percent due to improvements in the Sediment/Shoreline and General Wildlife Habitat functional categories since 2011. The ratings were high for MTNHP species habitat, general wildlife habitat, short and long term water storage, sediment/nutrient/toxicant removal, and groundwater discharge/recharge.

The East parcel received 65 percent of the total possible points and high ratings for MTNHP species habitat, sediment/nutrient/toxicant removal, streambank/ shoreline stabilization, production export/food chain support, and groundwater discharge and recharge functions. The net wetland acreage gain at the Woodson Creek Wetland Mitigation Site since the 2005 baseline assessment was 12.16 acres and the net functional unit gain was 405.19.

Eight infestations of Canadian thistle (*Cirsium arvense*) were mapped within the site boundaries in 2012. The size of the infestations were less than 0.1 acre with cover classes ranging from trace (less than 1.0 percent cover) to high (25.0 percent to 100.0 percent cover). The percent cover of Canadian thistle increased site wide from 2010 to 2012. The site was not sprayed for weeds in 2011. Spraying is recommended for 2012.

The irrigation return on the north edge of the site was breached sometime between the 2010 and 2011 site visits. The entire flow of the canal was diverted to the mitigation area and a majority of the west parcel was flooded in 2011. The area surrounding the breach was well vegetated and showed no signs of erosion. The breach was repaired between 2011 and 2012.

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# Appendix A

# Summary Information for MDT Wetland Mitigation Sites

***MDT Wetland Mitigation Monitoring***

*2012 Executive Summary*

| Site | Year Built | Major Montana Watershed Basin | Pre Project Wetland Acreage & MDT Category | Target Wetland Credit | 2012 Wetland Acreage and MDT Category | Upland Acreage | Total Acreage Credit and Functional Unit as of 2012 | SITE NOTES: |
|---|---|---|---|---|---|---|---|---|
| **MISSOULA DISTRICT:** | | | | | | | | |
| Camp Creek – Sula | 2002 | 3- Lower Clark Fork | 48.73 ac<br>Category III<br>251.58 FU | 11.4 ac minimum | 38.23 ac<br>Categoy I / II | NA | 13.67 ac<br>379.53 FU | 2012 was the eleventh monitoring year. Intended to mitigate for Sula N&S (11.4 acres) and possibly other projects. Goals: overall goals of this project were restoration of Camp Creek channel bottom, associated wetland functional restoration/ enhancement and creation, and enhancement of heavily grazed and cleared riparian vegetation . USACE agreed to functional unit-based crediting approach in 2006. |
| Lone Pine – Hot Springs | 2007/2008 | 3- Lower Clark Fork | 7.18 ac<br>Category III and IV<br>34.94 FU | 23.85 ac USACE<br><br>11.86 ac CSKT | 34.0 ac<br>Category II | 2.23 ac | 28.51 ac USACE<br>14.06 ac CSKT<br>247.95 FU | 2012 was the fifth monitoring year. Credit is considered interim pending satisfaction of ultimate (end of monitoring period) performance standards. See report for full credit breakdown. |
| McGinnis Meadows – Libby | 2005 | 1- Kootenai River | 20.14 ac<br>Category III | 16.33 ac | 25.12 ac<br>Category II / III | 2.20 ac | 6.42 ac Creation<br>0.44 ac Enhancement<br>11.39 ac Rehabilitation<br>0.08 ac Preservation<br>0.44 ac Upland Buffer<br>200.43 FU | 2012 was the third monitoring event. Goals for the site included the restoration of 0.8 acres of riparian/stream habitat in McGinnis Creek, rehabilitation of 17.3 acres of degraded wetlands, creation of 2.9 acres of emergent wetlands, enhancement of 1.74 acres of emergent wetland, preservation of 0.3 acres of existing riparian communities along the abandonded McGinnis Creek corridor, and protection of 2.2 acres of upland buffer. See report for full credit breakdown. This site yielded 18.76 credit acres in 2012. |
| Schreiber Meadows - South of Libby | 2007/2011 | 1- Kootenai River | 13.22 ac<br>Category Unknown | 17.84 ac | 47.58 ac<br>Category II | 8.5 ac | 30.9 ac Creation<br>4.41 ac Enhancement<br>2.31 ac Restoration<br>1.70 ac Upland Buffer<br>373.51 FU | 2012 was the second monitoring event for the area of the pilot project, and the first monitoring event for the balance of the project which was completed in 2011. This site yielded 39.24 USACE credit acres as of 2012. Additionally, 35,551 stream credits are anticipated for this site. |

| Site | Year Built | Major Montana Watershed Basin | Pre Project Wetland Acreage & MDT Category | Target Wetland Credit | 2012 Wetland Acreage and MDT Category | Upland Acreage | Total Acreage Credit and Functional Unit as of 2012 | SITE NOTES: |
|---|---|---|---|---|---|---|---|---|
| **BUTTE DISTRICT:** | | | | | | | | |
| Big Hole Grazing Assoc. – Wisdom | 2007 | 6- Upper Missouri | 31 ac<br>Category II and III<br>FU unknown | 45.8 ac | 88.26 ac<br>Category I | NA | 74.26 ac Restoration<br>3.5 ac Preservation<br>618.3 FU | 2012 was the fourth monitoring year. The project goal was to provide 45.8 acres of USACE-approved mitigation credit within the 96-acre easemen area through restoring 42.3 acres of wetland and preserving 14.0 acres of existing wetlands. This site yielded a total of 77.76 credit acres in 2012, 184% of goal. |
| Easton – Wilsall | 2009 | 13- Upper Yellowstone | 1.10 ac | 27.41 ac | 11.64 ac<br>Category II / III | 6.43 ac | 0.28 ac Preservation<br>1.45 ac Restoration<br>9.09 ac Creation<br>1.29 ac Upland Buffer<br>67.34 FU | 2012 was the third monitoring year. The project goal was to create 24.95 acres of palustrine, emergent and shrub/scrub wetlands, re-establish 1.56 acres of flood channel, preserve 1.10 acres of pre-existing wetland, and maintain 6.43 acres of upland buffer. This site yielded a total of 12.11 credit acres in 2012. |
| I-90 East Bozeman | 2010 | 6- Upper Missouri | 3.51 ac | 9.78ac | 9.67 ac<br>Category II | 0.85 ac | 9.56 ac Created<br>0.17 ac Upland Buffer<br>75.08 FU | 2012 was the third monitoring year. The project goal was to maintain 3.51 acres of wetlands developed since 2000, create 0.95 acre of riverine wetland, create 5.15 acres of depressional wetlands, and maintain upland buffer. This site yielded a total of 9.73 credit acres in 2012. |
| Murphy Ox Yoke – Emigrant | 2009 | 13- Upper Yellowstone | 3.89 ac<br>Category III | 6.50 ac | 9.29 ac<br>Category II | 3.3 ac | 5.40 ac Creation<br>1.33 ac Restoration<br>0.47 ac Preservation<br>0.66 ac Upland Buffer<br>67.72 FU | 2012 was the second monitoring year. The project goal was to restore 2.0 acres of existing degraded wetland, create 4.1 acres of depressional wetlands in two excavated cells, enhance and protect uplands, and preserve 1.89 acres of existing scrub/shrub and emergent wetlands within the 12-acre tract. This site yielded a total of 7.86 credit acres in 2012. |
| Sportsman's Campground – Wise River | 2007 | 6- Upper Missouri | 0.66 ac wetland<br>1.31 ac open water<br>2.46 ac trans/mudflat<br>Category IV<br>FU unknown | 15.6 ac | 17.28 ac<br>Category II | NA | 15.31 ac Created<br>0.66 ac Existing<br>1.31 ac Open Water<br>114.05 FU | 2012 was the fifth monitoring year. The project goal was to create approximately 15.6 acres of palustrine emergent, scrub/shrub, and aquatic bed wetland habitat to compensate for MDT's Sportsman's Campground East and Dickie Bridge reconstruction projects. This site yielded a total of 17.28 credit acres in 2012. |
| Woodson Creek – Ringling | 2006 | 7- Missouri-Sun-Smith | 59.02 ac wetland<br>2.73 ac open water<br>Category II / III<br>418.49 FU | 50 ac | 69.64 ac<br>Category II | NA | 29.19 ac Restoration<br>31.27 Re-establishment<br>6.12 Rehabilitation<br>532.57 FU | 2012 was the fifth monitoring year. The project goal was to restore Woodson Creek to its historical configuration and establish 50 acres of wetland credit to compensate for impacts associated with MDT highway and bridge reconstruction projects within this watershed. Complex ultimate performance standards (see individual report). This site yielded a total of 66.58 credit acres in 2012. |

| Site | Year Built | Major Montana Watershed Basin | Pre Project Wetland Acreage & MDT Category | Target Wetland Credit | 2012 Wetland Acreage and MDT Category | Upland Acreage | Total Acreage Credit and Functional Unit as of 2012 | SITE NOTES: |
|---|---|---|---|---|---|---|---|---|
| **GLENDIVE DISTRICT:** | | | | | | | | |
| American Colloid – Alzada | Constructed 2001 Repaired 2008 | 16- Little Missouri | 0 ac | 4.4 ac | 1.23 ac emergent<br>2.04 open water<br>Category III | 11.73 ac | 3.27ac Created<br>2.35 Upland Buffer<br>11.45 FU | 2012 was the second monitoring year following repair of a dike breach that temporarily drained the site. The project goal was to mitigate for 4.4 acres of wetland impacts associated within the Alzada-West and Alzada-South projects in watershed 16. The site primarily open water. Counting presumed open water and upland buffer, the site yielded 5.62 USACE credit acres in 2012. |
| Big Muddy - Culbertson | 2011 | 12- Lower Missouri | 0.73 ac<br>Category II/III | 7.83 to 9.32 ac | 12.87 ac<br>Category II / III | 5 ac | 7.22 ac Creation<br>0.64 ac Preservation<br>1 ac Upland Buffer<br>86.61 FU | 2012 was the first monitoring year. Wetlands developed at this site were to provide compensatory mitigation for impacts within the Glendive District including Brockton-East and Big Muddy-West. Total estimated credit acreage in 2012 was 8.86 acres and was based on scaled performance standards. |
| Dodson East - Dodson | 2008 | 12- Lower Missouri | 0 ac | 4.92 ac | 7.74 ac<br>Category II | 7.18ac | 7.74 ac Created<br>1.44 ac Upland Buffer<br>53.0 FU | 2011 was first monitoring year post-construction. Wetland developed at this location were to provide compensatroy mitigation for approximately 4.4 acres of wetland impacts associated with planned reconstruction of US Hwy 2 east of Dodson. The site yielded 9.18 credit acres in 2012. |
| **BILLINGS DISTRICT:** | | | | | | | | |
| DH Ranch – Edgar | 2007 | 13- Upper Yellowstone | 0.57 ac<br>Category III<br>1.6 FU | 17.4 ac | 20.0 ac<br>Category II | 0.8 | 19.41 ac Creation<br>0.2 ac Upland Buffer<br>128 FU | 2012 was the sixth monitoring year. The goal of the project was to provide sufficient wetland hydrology to support the creation of 23 acres of palustrine emergent and scrub/shrub wetlands. MDT has acquired approximately 17.4 acres of potential wetland credits through a wetland credit purchase. The site yielded 19.61 credit acres in 2012, slightly less than the 20 acres of gross wetlands as some open water wetlands were in excess of the 10% cap on open water credit acres. |
| Selkirk Ranch – Two Dot | 2006 / 2007 | 10- Mussleshell | 32.9 ac<br>Category III<br>102.5 FU | 60.4 ac | 71.01 ac<br>Category II | 2.35 ac | 38.0 ac Creation<br>21.3 ac Rehabilitation<br>0.3 Enhancement<br>0.5 ac Upland Buffer<br>610.1 FU | 2012 was the sixth monitoring year. The goal of the project was to provide MDT with 50 acres of wetland mitigation credit prior to US Hwy 12 road construction in Watershed 10. Performance standards were amended in 2010 to include a functional lift standard credit-reduction based methodology. The site yielded 60.1 credit acres in 2012. |