# MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2002

*Stillwater River*
*Absarokee, Montana*

Prepared for:

**MONTANA DEPARTMENT OF TRANSPORTATION**
2701 Prospect Avenue
Helena, MT 59620-1001

Prepared by:

**LAND & WATER CONSULTING, INC.**
P.O. Box 8254
Missoula, MT 59807

February 2003

Project No: 130091.032

# MONTANA DEPARTMENT OF TRANSPORTATION

## WETLAND MITIGATION MONITORING REPORT:

## YEAR 2002

*Stillwater River*
*Absarokee, Montana*

Prepared for:

**MONTANA DEPARTMENT OF TRANSPORTATION**
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

**LAND & WATER CONSULTING, INC.**
P.O. Box 8254
Missoula, MT 59807

February 2003

Project No: 130091.032

## TABLE OF CONTENTS

**1.0 INTRODUCTION ..... 1**

**2.0 METHODS ..... 1**

2.1 Monitoring Dates and Activities ..... 1

2.2 Hydrology ..... 1

2.3 Vegetation ..... 3

2.4 Soils ..... 3

2.5 Wetland Delineation ..... 3

2.6 Reptiles, Mammals and Amphibians ..... 3

2.7 Birds ..... 4

2.8 Macroinvertebrates ..... 4

2.9 Functional Assessment ..... 4

2.10 Photographs ..... 4

2.11 GPS Data ..... 4

2.12 Maintenance Needs ..... 5

**3.0 RESULTS ..... 5**

3.1 Hydrology ..... 5

3.2 Vegetation ..... 5

3.3 Soils ..... 7

3.4 Wetland Delineation ..... 7

3.5 Wildlife ..... 8

3.6 Macroinvertebrates ..... 9

3.7 Functional Assessment ..... 9

3.8 Photographs ..... 10

3.9 Maintenance Needs/Recommendations ..... 10

3.10 Current Credit Summary ..... 11

**4.0 REFERENCES ..... 11**

## TABLES

Table 1 *2002 Stillwater River Vegetation Species List*

Table 2 *Fish and Wildlife Species Observed on the Stillwater River Mitigation Site*

Table 3 *Summary of Wetlands Function/Value Ratings and Functional Points at the Stillwater River Wetland Mitigation Project*

## FIGURES

Figure 1 *Project Site Location Map*

## APPENDICES

Appendix A: *Figures 2 and 3*

Appendix B: *Completed 2002 Wetland Mitigation Site Monitoring Form*

*Completed 2002 Bird Survey Forms*

*Completed 2002 Wetland Delineation Forms*

*Completed 2002 Field and Full Functional Assessment Forms*

*Completed 2002 Macroinvertebrate Sampling Results*

Appendix C: *Representative Photographs*

*2002 Aerial Photograph*

Appendix D: *Proposed Wetland Mitigation Site Map*

Appendix E: *Bird Survey Protocol*

*Macroinvertebrate Sampling Protocol*

*GPS Protocol*

# 1.0 INTRODUCTION

The Stillwater River wetland was constructed in the spring of 1999 to mitigate wetland impacts associated with a proposed Federal Aviation Administration expansion of the Columbus airport and a proposed MDT roadway improvement project between Absarokee and Columbus in watershed #13 in the Billings District. The site is located in Stillwater County approximately eight miles southwest of the interstate interchange at Columbus, Section 22, Township 3 South, Range 19 East **(Figure 1)**. Elevations within the assessment area range from approximately 3,382 to 3,387 feet above sea level. The surrounding land uses include grazing, cropland and residential areas.

The project was anticipated to create approximately 10.69 acres of wetlands within a conservation easement owned by Virginia K. Thompson. Two dikes were constructed across a former channel of the Stillwater River to impound return irrigation water from the nearby Whitebird irrigation ditch. Excavation was completed to reach groundwater flows from the adjacent Stillwater River. The two dikes were to create 3.79 acres of wetland behind Dike #1 and 6.90 acres of wetland behind Dike #2 (total 10.69 acres). The mitigation activities were to impact approximately 3.77 acres of existing wetlands.

The impoundments have standing water with depths ranging from 0-6 feet. Outflow from the west (#1) to the east impoundment (#2) is through a beaver control device installed in the central dike separating the two impoundments. A similar device allows outflow through the second dike into a small stream connecting to the Stillwater River. The site boundary is illustrated on **Figure 2, Appendix A**.

# 2.0 METHODS

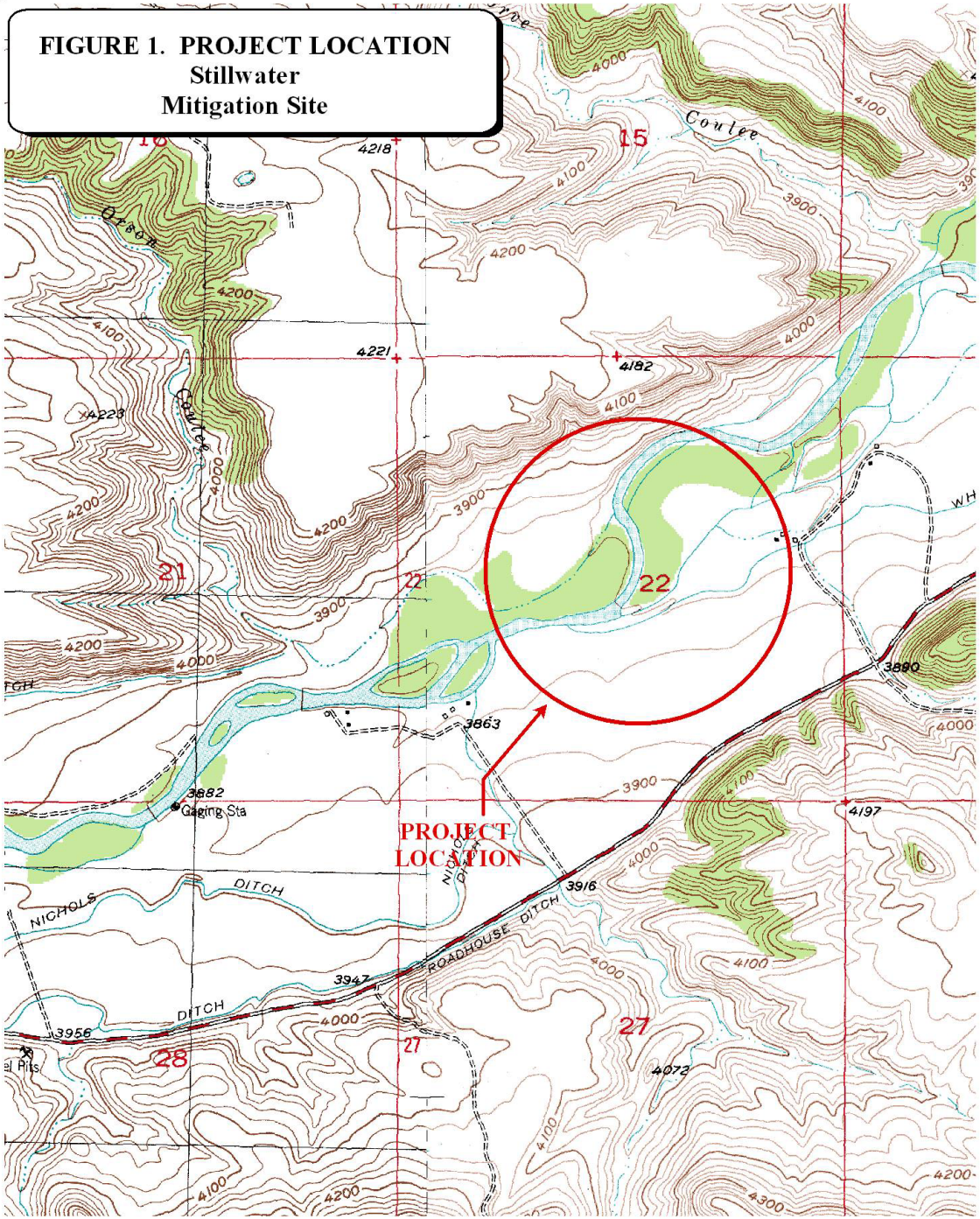
## 2.1 Monitoring Dates and Activities

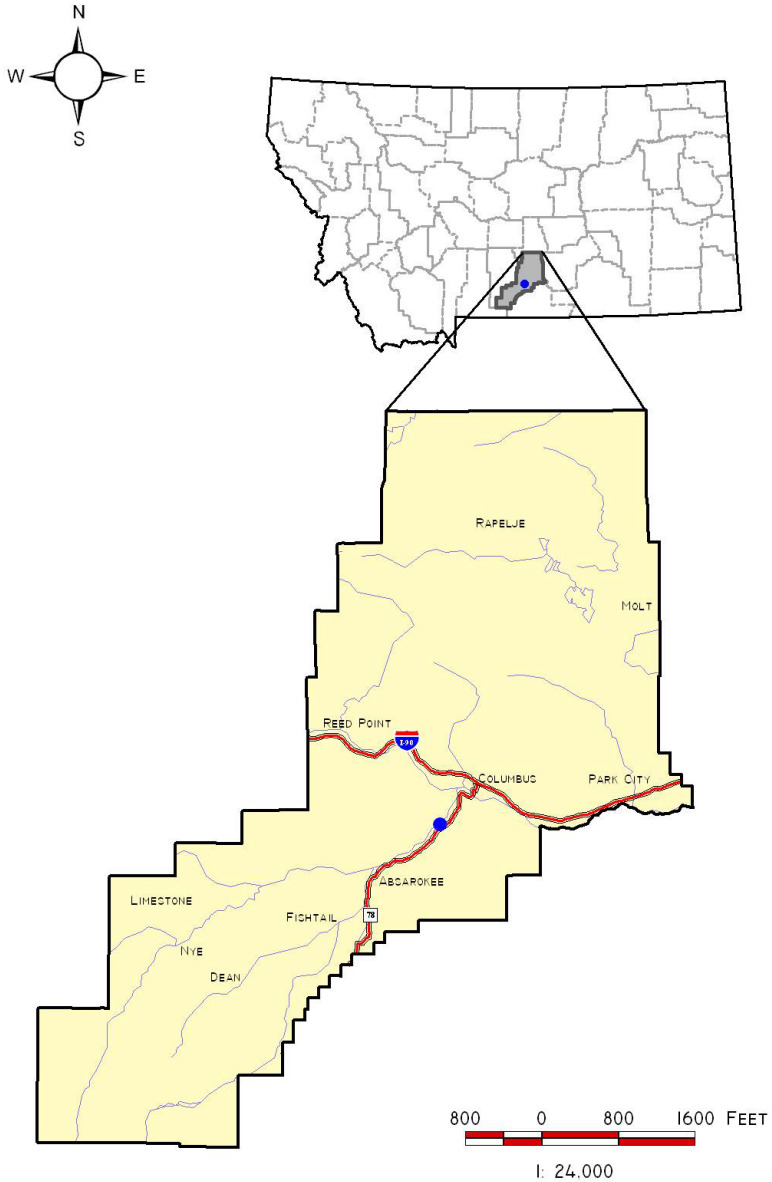
The site was visited during 2002 on May 5 for spring avian migration use, on July 19 to collect the wetland monitoring form data **(Appendix B)**, and on October 7 to survey fall avian migration use. Activities and information conducted/collected during the monitoring event included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; macroinvertebrate sampling; GPS data points; functional assessment; and, maintenance needs of any bird nesting structures and inflow and outflow structures (non-engineering).

## 2.2 Hydrology

Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual. Hydrology data were recorded on the COE Routine Wetland Delineation Data Form **(Appendix B)** at each wetland determination point. Precipitation data for the year 2002 were compared to the 1948-2001 average (WRCC 2002).

# FIGURE 1. PROJECT LOCATION
## Stillwater
## Mitigation Site




PROJECT #: 130091.032
DATE: APRIL 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER
M. ARTHUR

LAND & WATER CONSULTING, INC.

1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

All additional hydrologic data were recorded on the mitigation site monitoring form **(Appendix B)**. The boundary between emergent vegetation and open water was mapped on the aerial photograph **(Figure 3, Appendix A)**. There are no groundwater monitoring wells within the assessment area.

## 2.3 Vegetation

General vegetation types were delineated on the aerial photograph during the July site visit (**Figure 3, Appendix A)**. Coverage of the dominant species in each community type is listed on the monitoring form **(Appendix B)**. A comprehensive plant species list for the entire site was compiled and will be updated as new species are encountered. Observations from past years will be compared with new data to document vegetation changes over time. The assessment area is fenced and woody species were not planted on this site.

Two (2) transects were established during the 2001 monitoring event to represent the range of current vegetation conditions; the transect in the vicinity of impoundment #2 was relocated during 2002. These transects locations are shown on **Figure 2, Appendix A**. Percent cover for each species was recorded on the vegetation transect form **(Appendix B)**. The transects will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. Transect ends are marked with metal fence posts and their locations recorded with the GPS unit. Photos of each transect were taken during the mid-season visit.

## 2.4 Soils

Soils were evaluated during the mid-season visit according to the procedure outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form **(Appendix B)**. The most current terminology used by NRCS was used to describe hydric soils.

## 2.5 Wetland Delineation

A wetland delineation was conducted within the assessment area according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The information was recorded on the COE Routine Wetland Delineation Forms **(Appendix B)**. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The wetland/upland and open water boundaries were used to calculate the wetland area developed at the Stillwater River wetland. A pre-construction wetland map was completed by the MDT (Urban 1998) and is included in **Appendix D**.

## 2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations were recorded on the wetland monitoring form during each visit **(Appendix B)**. Indirect use indicators were also recorded including tracks, scat and burrows. A comprehensive wildlife species list for the entire site was compiled

and will be updated as new species are encountered. Observations from past years will be compared with new data to determine if wildlife use is changing over time.

## 2.7 Birds

Bird observations were recorded during the site visit according to the established bird survey protocol **(Appendix E).** A general, qualitative bird list has been compiled using these observations. Observations will be compared between years in future studies.

## 2.8 Macroinvertebrates

One (1) macroinvertebrate composite sample was collected during the site visit following the protocol **(Appendix E)**; a sample was collected from each impoundment and mixed. Samples were preserved as outlined in the sampling procedure and sent to a laboratory for analysis. The approximate sampling locations are indicated on **Figure 2, Appendix A**.

## 2.9 Functional Assessment

A functional assessment form was completed for the site using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were collected on a condensed data sheet included in the mitigation site monitoring form **(Appendix B)**. The remainder of the assessment was completed in the office. Pre-construction functional assessments were completed by MDT and are included in the 2001 monitoring report.

## 2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the wetland buffer, the monitored area, and the vegetation transects **(Appendix C)**. A description and compass direction for each photograph were recorded on the wetland monitoring form.

During the 2001 monitoring season, each photograph point was marked on the ground with a wooden stake and the location recorded with a resource grade GPS. The approximate locations are shown on **Figure 2, Appendix A**. Photos were taken from the same locations during the 2002 mid-season visit. All photographs were taken using a 50 mm lens.

## 2.11 GPS Data

During the 2002 monitoring season survey points were collected using a resource grade Trimble, Geoexplorer III hand-held GPS unit **(Appendix E)**. Points collected included: the beginning and end locations of the vegetation transects, the jurisdictional wetland boundary, and the sample point locations. In addition, GPS data were collected for four (4) landmarks recognizable on the air photo for purposes of line fitting to the topography.

## 2.12 Maintenance Needs

The condition of inflow and outflow structures, habitat enhancement structures or other mitigation related structures were evaluated. Minor maintenance needs and recommendations can be found in **Section 3.9**. This examination did not entail an engineering-level analysis.

# 3.0 RESULTS

## 3.1 Hydrology

The Stillwater River wetland source of hydrology is groundwater from the river and irrigation return water from the nearby Whitebird irrigation ditch. The historic river channel where the wetlands are located has been diked from receiving natural river flows over the last 30 years (Urban 1998). Water is conveyed from the first to the second impoundment through a "beaver-proofed" outflow device. A similar device allows outflow through the second dike into a small stream connecting to the Stillwater River.

During the July 19, 2002 assessment visit approximately 65% of the assessment area was inundated with 0-6 feet of standing water and appeared to be at the full-pond level, partly because the outflow devises were partially clogged with debris. Open water, or the area without emergent vegetation, is depicted on **Figure 3, Appendix A**.

According to the Western Regional Climate Center (WRCC, 2002), the Columbia station annual mean (1948 – 2001) precipitation is 14.42 inches; the average precipitation through the month of July is 9.87 inches. For the year 2002, precipitation through July was 7.6 inches or 77% of the mean.

## 3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and in the monitoring form **(Appendix B)**. The vegetation communities were compressed into 3 types during the 2002 site visit **(Figure 3, Appendix A).** The noxious weeds are still present at the site. Of most concern are the areas of spotted knapweed located primarily on the central dike and north of impoundment #2, and leafy spurge, which is primary located on the beaver lodge peninsula. Two areas of submerged (drowned) cottonwoods remain within each impoundment; molting and brood-rearing waterfowl use these areas, as well as the vegetated shallows, for protective cover. The Stillwater vegetation types include: Type 1, *Typha latifolia.*; Type 2, *Carex* spp./*Juncus* spp./*Scirpus* spp; and, Type 3, *Agropyron trachycaulus/Poa pratensis.* Dominant species within each community are listed on the monitoring form **(Appendix B)**.

The site has developed wetland vegetation along >95% of the open water periphery and along several shallow lobes or arms of water to the northwest side of the main impoundments. This area is comprised of a sparse forested overstory (largely cottonwoods), and emergent vegetation such as cattail, bulrush, rush, spiked rush, sedge, manna grass, and reed canary grass. Much of the open water is colonized with aquatic species, patches of smart weed, and cattail.

**Table 1:** ***2002 Stillwater River Vegetation Species List***

| Scientific Name | Common Name | Indicator Status [1] |
|---|---|---|
| *Agropyron trachycaulum* ** | slender wheatgrass | FAC |
| *Agrostis alba* * | redtop | FACW |
| *Alnus incana** | speckled alder | FACW |
| *Alopecurus arundinaceus*** | creeping meadow foxtail | NI |
| *Beckmannia syzigachne* ** | American sloughgrass | OBL |
| *Bromus inermis** | smooth brome | - |
| *Bromus japonicus** | Japanese brome | FACU |
| *Calamagrostis Canadensis*** | blue-joint reedgrass | FACW+ |
| *Carex hystericina* ** | porcupine sedge | OBL |
| *Carex limnophilia* ** | appressed sedge | FACW |
| *Carex nebrascensis** | Nebraska sedge | OBL |
| *Carex stipata*** | saw-beak sedge | - |
| *Centaurea maculosa** | spotted knapweed | - |
| *Cirsium arvense** | Canada thistle | FACU+ |
| *Cynoglossum officinale* * | hound's-tongue | * |
| *Dactylis glomerata* * | orchard grass | FACU |
| *Eleocharis palustris*** | creeping spikerush | OBL |
| *Epilobium spp.*** | willow-herb | - |
| *Equisetum arvense*** | field horsetail | FAC |
| *Euphorbia esula* * | leafy spurge | - |
| *Glyceria grandis (=G. maxima)* * | reed meadowgrass | OBL |
| *Hordeum jubatum* ** | barley fox-tail | FAC+ |
| *Juncus balticus** | Baltic rush | OBL |
| *Juncus nevadensis*** | Sierra rush | FACW |
| *Juncus tenuis*** | slender rush | FAC |
| *Juniperus scopulorum* * | Rocky Mountain juniper | * |
| *Lemna spp.* ** | duckweed | - |
| *Melilotus officinalis*** | yellow sweetclover | FACU |
| *Mimulus spp.*** | monkeyflower | - |
| *Phalaris arundinacea* * | reed canary grass | FACW |
| *Phleum pretense** | timothy | FACU |
| *Poa pratensis** | Kentucky bluegrass | FACU+ |
| *Polygonum amphibium* * | water smartweed | OBL |
| *Populus angustifo lia** | narrowleaf cottonwood | FACW |
| *Potentilla argentea*** | silver cinquefoil | FAC- |
| *Prunus virginiana*** | common chokecherry | FACU |
| *Ranunculus sceleratus*** | celery-leaf buttercup | OBL |
| *Ribes spp.** | currant | - |
| *Rumex crispus** | curly dock | FACW |
| *Salix exigua* * | sandbar willow | OBL |
| *Salix lasiandra*** | pacific willow | FACW+ |
| *Scirpus pallidus*** | cloaked bulrush | OBL |
| *Scirpus validus** | soft-stem bulrush | OBL |
| *Symphoricarpos albus** | snowberry | FACU |
| *Typha latifolia* * | broad-leaf cattail | OBL |
| *Verbascum thapsus*** | mullein | - |
| *Veronica worm skjoldii (?)*** | American alpine speedwell | FAC+ |

- : species not listed in National List.
*denotes observed in 2002 in addition to previous years
**denotes observed in 2002 for the first time
No star indicates a species was observed in 2001, but not in 2002

The vegetation transect results are detailed in the monitoring form **(Appendix B)** and are summarized below. Both transects are located on the northwest side of the impoundments; one adjacent to each impoundment. Transect 2 on the east impoundment was moved during 2002 to better represent wetland changes over time.

***2001 Transect Data***

| | | | | |
|---|---|---|---|---|
| Transect 1 Start | Vegetation Type 2 (9’) | Vegetation Type 3 (36’) | Total 45’ | End Transect 1 |
| Transect 2 Start | Vegetation Type 3 (75’) | Veg. Type 2 (2’) | Total 77’ | End Transect 2 |

***2002 Transect Data***

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Transect 1 Start | Vegetation Type 2/3 (12’) | | Vegetation Type 3 (23’) | | | Vegetation Type 1 (10’) | | Total 45’ | End Transect 1 |
| Transect 2 Start | Veg. Type 1 (3’) | Veg. Type 2 (3’) | Vegetation Type 3 (30’) | Vegetation Type 1/2 (27’) | Vegetation Type 3 (114’) | Veg. Type 1 (12’) | Veg. Type 3 (9’) | Total 198’ | End Transect 2 |

## 3.3 Soils

The site was mapped as part of the Carter County Stillwater Soil Survey (USDA 1980). The dominant soil on the site is mapped as the undifferentiated Lolo and Nesda soils, flooded (38). These soils are found on low stream terraces and flood plains. Lolo is a very gravelly loam that is taxonomically classified as a Pachic Haploboroll and Nesda is a gravelly loam with the classification of Fluventic Haploboroll. The Lolo-Nesda soil complex has four inclusions with only the Larry inclusion being hydric; neither component is hydric. The Larry inclusion is typical of wooded terraces like the Stillwater site.

Soils were sampled at two (2) wetland sample points (SP-1, Transect 1 and SP-3, Transect 2). Soils at SP-1 (Transect 1) were reddish black (2.5YR 2.5/1) sandy loam from 0-9 inches; at 4 inches the sand component increased. Below 9 inches rocks were observed. The soils at SP-3 (Transect 2) were black (7YR 2/1) silty loam from 0-5 inches and below 5 inches the same rock layer was observed, typical of river flood plains. The upland soil pits revealed the same soil profiles, suggesting the area is converting to wetland, however, the vegetation is still marginally dominated by upland species.

## 3.4 Wetland Delineation

The delineated wetland boundary is depicted on **Figure 3, Appendix A**. The COE data forms are included in **Appendix B**. Emergent vegetation has developed beyond the edge of the water for almost the entire circumference. Aquatic vegetation has also developed in the shallow backwater areas. Submerged aquatic vegetation (not identified) appears to occur throughout the wetland and as far into the open water as can be observed from shore. According to MDT (L. Urban, pers. comm.), submerged aquatics were observed during the aerial flights throughout the open water component of the impoundments. The wetland boundary encompasses 9.24 acres of wetland and includes 5.98 acres of shallow open water (<6 feet deep). Wetland acreage increased 0.75 acre since 2001.

## 3.5 Wildlife

Wildlife species are listed in **Table 2.** Activities and densities associated with these observations area are included on the monitoring form in **Appendix B**. Observations included recent beaver sign such as chewed and fallen trees and a young beaver was sighted during the spring swimming in pond #1. The "beaver relievers" placed around the outflow structures work to some degree, but beaver-chewed sticks were seen inside the structures during the fall visit, which was causing the pond levels to increase. Also, a beaver slide had been excavated in the central dike, which may compromise the dam if the trench is deepened.

Fencing has preserved some cottonwoods from beaver felling, but in some cases they are toppled regardless. A finer mesh fence or double fencing would be more proficient at preserving what remains standing. Exterminating the beaver will have no long-term affect; therefore, remedies may look toward allowing the beaver but in a more tightly controlled manner.

The cottonwoods will likely die off as the wetland encroaches further into the upland peninsulas in the backwater areas. The forest die-off will occur at a faster rate if the beaver are allowed to continue harvesting. No doubt, the beaver are an integral part of wetlands, and in many cases move on once the resources (trees and shrubs) have been removed either by drowning or harvesting. If this were to happen, the wetland will likely become two large ponds, with no shading from cottonwoods unless a planting program is initiated.

The real issue is loss of the cottonwood forest as a result of the creation of the impoundments and the subsequent drowning of the trees and beaver harvesting. The outcome is the same regardless of cause. The question concerns the future vision for the Stillwater wetland and whether the cottonwood forest is an integral part of that vision. If so, several avenues of management may be taken: more aggressive beaver management; decrease water levels to prevent eventual drowning of the trees by impoundment; initiating a cottonwood planting program; double fence the remaining trees; and the combination of several management tactics.

Bird nesting material was observed in some of the bluebird boxes but no bluebirds were observed. No sign of nesting was observed in the wood duck boxes; however, given these boxes are large and out of reach and the presence of wood ducks and broods on site, some of them may have been used. Three (3) of the wood duck boxes require maintenance: one near the back fence north of pond #2 has partially fallen out; one on the northern edge of pond #2 has partially fallen; and one in the backwater area of pond #2 has fallen into an inlet of open water. These problems were shown to the landowner during the fall site visit. The boxes that are dislodged and hanging at a angle may present a problem if nesting does occur in these structures as the young would likely not be able to climb out.

Avian species diversity is high for the Stillwater wetland and totals 36 species. Painted turtles were also observed and several deer beds (see cover photo). A white-tailed deer fawn was flushed from the backwater area during the mid-season visit. No fish rises have been observed but it is assumed that colonization is occurring either from the ditch or human planting. The landowner will be asked for his observations regarding fish presence.

**Table 2.** ***Fish and Wildlife Species Observed on the Stillwater River Wetland Mitigation Site***

| | |
|---|---|
| **REPTILES**<br>**Painted turtle (*Chrysemys picta*)** | |
| **BIRDS** | |
| American Robin (*Turdus migratorius*) [1, 2*]<br>American Coot (*Fulica americana*)<br>Belted Kingfisher (*Ceryle alcyon*) [1, 2*]<br>Black-capped Chickadee (*Poecile atricapillus*)<br>Canada Goose (*Branta canadensis*) [1*]<br>**Cedar Waxwing (*Bombycilla cedrorum*)** [2 **]<br>**Cinnamon Teal (*Anas cyanoptera*)** [1**]<br>**Common Grackle (*Quiscalus quiscula*)** [1, 2**]<br>**Common Nighthawk (*Chordeiles minor*)** [2**]<br>**Common Snipe (*Gallinago gallinago*)** [1**]<br>**Common Yellowthroat (*Geothlypis trichas*)** [1**]<br>**Double-crested Cormorant (*Phalacrocorax auritus*)[2]****<br>Downy Woodpecker (*Picoides villosus*)<br>**Eastern Kingbird (*Tyrannus tyrannus*)** [2**]<br>**Great Blue Heron (*Ardea herodias*)** [2**]<br>Green-winged Teal (*Anas crecca*)<br>**House Wren (*Troglodytes aedon*)** [2**]<br>Killdeer (*Charadrius vociferous*) [1*]<br>**Least Flycatcher (*Empidonax minimus*)** [2**] | Mallard (*Anas platyrhynchos*) [1.3*]<br>Mourning Dove (*Zenaida macroura)*<br>**Northern Flicker (*Colaptes auratus*)** [2**]<br>**Pied-billed Grebe (*Podilymbus podiceps*)** [3**]<br>Red-winged Blackbird (*Agelaius phoeniceus*) [1, 2*]<br>**Ruddy Duck (*Oxyura jamaicensis*)** [2**]<br>Sandhill Crane (*Grus canadensis*)<br>Song Sparrow *(Melospiza melodia*) [1, 2*]<br>Spotted Sandpiper (*Actitis macularia*) [1*]<br>Starling (*Sturnus vulgaris*) [1*]<br>Tree Swallow (*Tachycineta bicolor*) [1, 2*]<br>**female duck in tree (unidentified species)** [1**]<br>**sparrow (unidentified species)** [3**]<br>Western Meadowlark (*Sturnella neglecta*)<br>**Western Wood Pewee (*Contopus sordidulus*)** [2**]<br>Willet (*Catoptrophorus semipalmatus*)<br>Wood Duck (*Aix sponsa*) [2*]<br>**Yellow Warbler (*Dendroica petechia*)** [2**]<br>**Yellow-rumped Warbler (*Dendroica coronata*)** [1**] |
| **MAMMALS**<br>beaver (*Castor Canadensis*) [1]<br>rabbit (*Lepus spp.*)<br>**white-tailed deer *(Odocoileus virginianus)*** [2] | |

[1] Spring Visit 2002
[2] Mid-season 2002
[3] Fall Visit 2002
*denotes observed in 2002 in addition to previous years
**denotes observed in 2002 for the first time
No star indicates a species was observed in 2001, but not in 2002

## 3.6 Macroinvertebrates

The macroinvertebrate sampling results are included in **Appendix B**. Rhithron, Inc. summarized the results as stated below.

The sub-optimal conditions measured in 2001 apparently improved to optimal conditions by 2002. Taxa richness in the sampled assemblage increased, and the overall tolerance of the fauna decreased, suggesting an amelioration of water temperatures and nutrient enrichment. The robust mayfly richness strengthened this hypothesis. Ample diverse habitats were apparently available.

## 3.7 Functional Assessment

Completed functional assessment forms are included in **Appendix B** and summarized in **Table 3**. Pre-construction functional assessments were completed for the wetlands by the MDT (Urban

1998) and results of that assessment are included in **Table 3.** The net functional units have gained 14.88 points since 2001 due to several high to exceptional ranking variables.

**Table 3:** ***Summary of 1998, 2001, and 2002 Wetland Function/Value Ratings and Functional Points at the Stillwater River Wetland Mitigation Project***

| Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method | Pre-construction 1998 | Post-construction 2001 | Post-construction 2002 |
|---|---|---|---|
| Listed/Proposed T&E Species Habitat | High (1.0) | Moderate (0.80) | Moderate (0.8) |
| MNHP Species Habitat | Low (0.1) | Moderate (0.7) | low (.1) |
| General Wildlife Habitat | Moderate (0.5) | Moderate (0.7) | Exceptional (1.0) |
| General Fish/Aquatic Habitat | High (0.8) | Moderate (0.6) | High (0.8) |
| Flood Attenuation | Moderate (0.5) | Moderate (0.6) | High (0.7) |
| Short and Long Term Surface Water Storage | NA | High (1.0) | High (1.0) |
| Sediment, Nutrient, Toxicant Removal | Moderate (0.5) | Moderate (0.6) | High (1.0) |
| Sediment/Shoreline Stabilization | NA | High (1.0) | High (1.0) |
| Production Export/Food Chain Support | High (1.0) | High (0.9) | High (0.9) |
| Groundwater Discharge/Recharge | Low (0.1) | High (1.0) | High (1.0) |
| Uniqueness | Moderate (0.4) | Moderate (0.5) | Moderate (0.6) |
| Recreation/Education Potential | Low (0.1) | Low (0.3) | Moderate (0.7) |
| Actual Points/Possible Points | 5/10 | 8.7/12 | 10.5/12 |
| % of Possible Score Achieved | 50% | 73% | 88% |
| Overall Category | III | II | II |
| Total Acreage of Assessed Wetlands within Easement | 3.77 | 8.49 ac | 9.24 ac |
| Functional Units (acreage x actual points) | 15fu | 73.82 fu | 88.7 |
| Net Acreage Gain | NA | 4.72 ac | 9.24 |
| Net Functional Unit Gain | | 58.82 fu | 88.7 |
| Total Functional Unit "Gain" | | 58.82 fu | 88.7 |

## 3.8 Photographs

Representative photos taken from photo points and transect ends are included in **Appendix C.** A 2002 aerial photograph is also provided in **Appendix C**.

## 3.9 Maintenance Needs/Recommendations

All inflow and outflow structures were functioning; however, when the site was visited in October, debris had accumulated in the outflow beaver exclusion devises and was slowing the passage of water.

Three of the wood duck boxes require re-hanging and the landowner was shown the problems during the October visit.

There was one cottonwood tree on the back fence of pond #1 during the July site visit; otherwise the fence was intact. The landowner was informed.

The noxious weed infestations of knapweed and leafy spurge are increasing and control is recommended.

Management of the cottonwood forest is recommended to prevent drowning of the trees by wetland encroachment and from beaver over-harvesting (see section **3.5 Wildlife**).

### 3.10 Current Credit Summary

Using GPS surveying again in 2002 to delineate the wetland because of its apparent rapid change, the gross wetland boundary was measured at 9.24 acres (**Figure 3**). Open water was estimated at 5.98 acres for a net of 3.26 acres of wetland. The open water should be considered wetland because of the shallow depth and colonization by aquatic and emergent vegetation species. The net functional units have gained 14.88 points since 2001 due to several high to exceptional ranking variables.

MDT anticipated creating 10.69 acres of wetland within a 15 to 20-acre conservation easement (MDT 1998). The mitigation efforts have thus far resulted in 86% of the creation goal (9.24 created/10.69 goal). Subtracting the original wetland impact that resulted from the wetland creation, 3.77 acres (see 2001 report, MDT 1998), the new net wetland acreage totals 5.47 acres.

## 4.0 REFERENCES

Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. Prepared for Montana Department of Transportation. May 1999.

Montana Dept. of Transportation. 1996. *MDT Biological Resources Report: Alzada South.* Helena, MT.

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

Urban, L. 1998. *Montana Department of Transportation Stillwater Wetland Mitigation Site Wetland Report.*

.

US Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual.* US Army Corps. Washington, DC.

USDA Natural Resource Conservation Service. 1980. *Soil Survey of Stillwater County, Montana.*

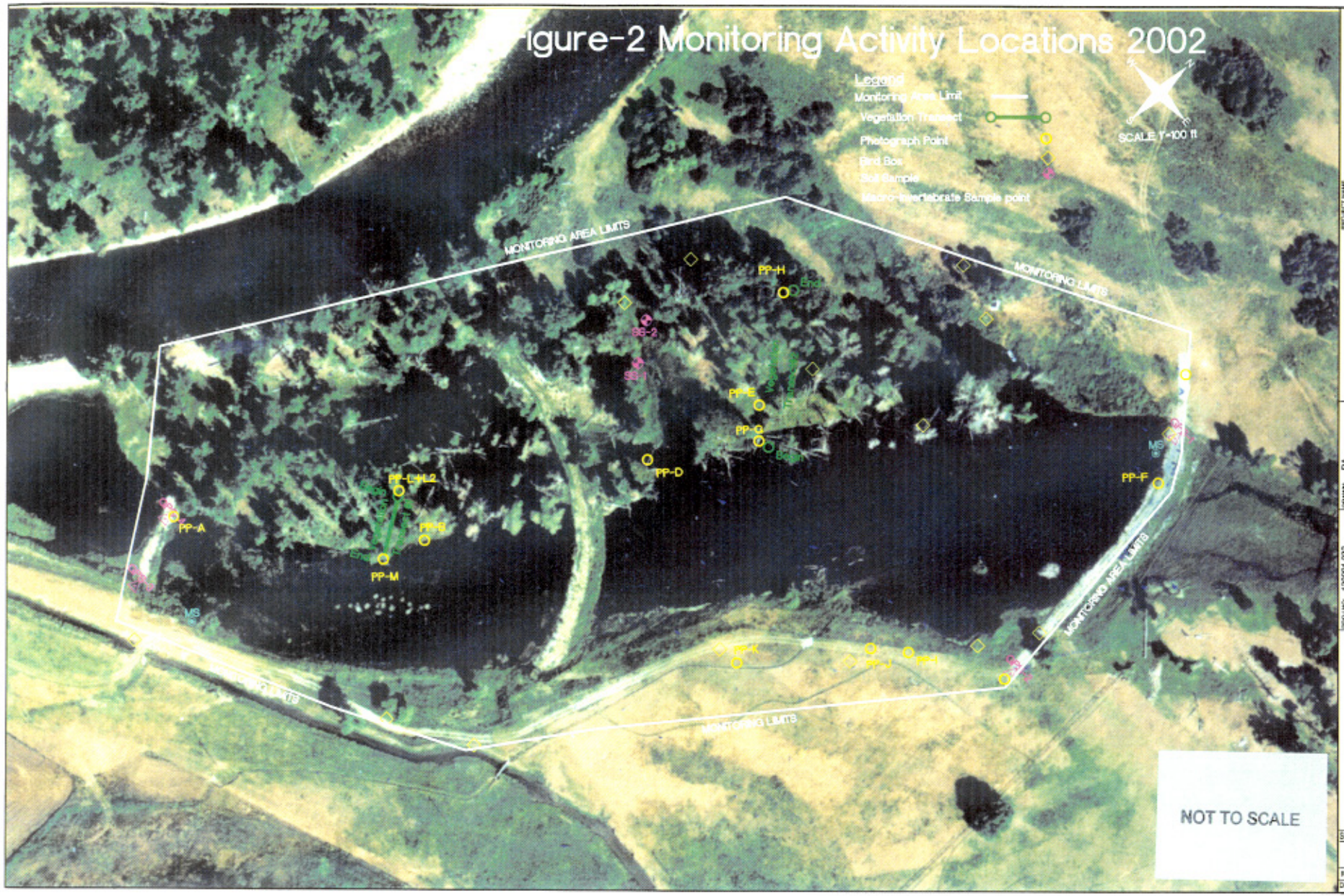
Western Regional Climate Center, 2002. Columbus Station: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mtcolu.

# Appendix A

## FIGURES 2 - 3

***MDT Wetland Mitigation Monitoring***
***Stillwater River***
***Absarokee, Montana***

LAND & WATER




PROJECT NAME
MDT Stillwater Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2002

PROJ NO: 130091.032
FILE NAME: TASK02BASE.dwg
SCALE: 1"= 100 ft
LOCATION: Stillwater River

DRAWN: RA
CHECKED:
APPVD: BD
PROJ MGR: BD

LAND & WATER CONSULTING, INC.
P.O. BOX 9364
Missoula, MT 59807

SHEET NUMBER
2 of
REV -
DATE: 12-10-02

Figure 3 - Mapped Site Features 2002
Legend
Monitoring Area Limit
Wetland Boundary
Vegetation Community Boundary
Open Water Boundary
Vegetation Types
Typha latifolia
Carex spp./Juncus spp./Scirpus spp.
Agropyron trachycaulum/Populus angustifolia
Wetland Area
Gross Wetland Area 9.24 Acres
Open Water -5.98 Acres
Net Wetland Area 3.26 Acres
SCALE 1"=100 ft
MONITORING AREA LIMITS
MONITORING LIMITS
OW
DIKE
NOT TO SCALE
PROJECT NAME
MDT Stillwater Wetland Mitigation
DRAWING TITLE
Mapped Site Features 2002
PROJ NO 300-0917A3K32
DRAWN RA
FILE NAME TASK3EBASE.dwg
CHECKED JH
SCALE 1"= 100ft
APPVD BD
LOCATION Stillwater
PROJ MGR BD
LAND & WATER CONSULTING, INC.
P.O. BOX 6594
Missoula, MT 59807
SHEET NUMBER
3 OF
REV -
DATE 12-11-02

# Appendix B

---

**COMPLETED 2002 WETLAND MITIGATION SITE MONITORING FORM**
**COMPLETED 2002 BIRD SURVEY FORMS**
**COMPLETED 2002 WETLAND DELINEATION FORMS**
**COMPLETED 2002 FIELD AND FUNCTIONAL ASSESSMENT FORMS**
**COMPLETED 2002 MACROINVERTEBRATE SAMPLING RESULTS**

---

***MDT Wetland Mitigation Monitoring***
***Stillwater River***
***Absarokee, Montana***

LAND & WATER

# LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:___Stillwater___ Project Number:__130091-032____ Assessment Date:_7 / 19 / 02___
Location:____8.6 mi sw of Columbus__ MDT District:__Billings District #13_ Milepost:_37.31____
Legal description: T__3S__ R_19E___ Section_22___ Time of Day:___6:30 AM_____
Weather Conditions:__overcast/windy_____ Person(s) conducting the assessment:____LB/LWC__
Initial Evaluation Date:__7 / 19 /02____ Visit #:_2___ Monitoring Year:__2002_____
Size of evaluation area:___9.24_acres Land use surrounding wetland:___livestock grazing_____

## HYDROLOGY

**Surface Water** Source:__Stillwater River_____
Inundation: Present__X__ Absent____ Average depths:__3__ft Range of depths:_0__-__6__ft
Assessment area under inundation:_65_%
Depth at emergent vegetation-open water boundary:__3__ft
If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes_X___No____
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): __(all 3)_____

**Groundwater**
Monitoring wells: Present_____ Absent X_____
Record depth of water below ground surface

| Well # | Depth | Well # | Depth | Well # | Depth |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Additional Activities Checklist:**
__X___Map emergent vegetation-open water boundary on air photo
__X___Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
__-___GPS survey groundwater monitoring wells locations if present

**COMMENTS/PROBLEMS:** _____

## VEGETATION COMMUNITIES

LAND & WATER B-2

Community No.:__1__ Community Title (main species):__*Typha latifolia*_____

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| *Typha latifolia* | 95 | | |
| *Epilobium* spp. | <5 | | |
| *Lemna* spp. | <5 | | |
| *Polygonum amphibium* | <5 | | |
| | | | |

**COMMENTS/PROBLEMS:** ____this CT is in OW areas_____

Community No.:__2__ Community Title (main species):___*Carex* spp./ *Juncus* spp./*Scirpus* spp._____

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| *Carex nebrascensis* | 15 | *J. tenuis* | 10 |
| *C. stipata* | 15 | *J. nevadensis* | <5 |
| *C. limnophilia* | <5 | *Scirpus pallidus* | <5 |
| *C. hystricina* | <5 | *S. vallidus* | <5 |
| *Juncus balticus* | <5 | *Typha latifolia* | 10 |
| *Agrostis alba* | 35 | *Glyceria grandis* | <5 |
| *Eleocharis palustris* | 10 | *Populus angustifolia* | <5 |

**COMMENTS/PROBLEMS:** _____very diverse and fairly evenly distributed throughout WL_____

Community No.:_3___ Community Title (main species):___*Agropyron trachycaulus/Poa pratensis*___

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| *Agropyron trachycaulus* | 30 | | |
| *Poa pratensis* | 30 | | |
| *Bromus inermis* | 30 | | |
| *Populus angustifolia* (overstory) | 35 | | |
| | | | |

**COMMENTS/PROBLEMS:** _____

**Additional Activities Checklist:**

__X__Record and map vegetative communities on air photo

Comprehensive Vegetation List

LAND & WATER B-3

| Species | Vegetation Community Number(s) | Species | Vegetation Community Number(s) |
|---|---|---|---|
| *Agropyron trachycaulum*** | 3 | *Rumex crispus** | 2 |
| *Agrostis alba** | 2 | *Salix exigua** | 2 |
| *Alnus incana*** | 2 | *Salix lasiandra*** | 2 |
| *Alopecurus arundinaceus*** | 2 | *Scirpus pallidus*** | 2 |
| *Beckmannia syzigachne*** | 2 | *Scirpus validus** | 2 |
| *Bromus inermis** | 3 | *Symphoricarpos albus** | 3 |
| *Bromus japonicus** | 3 | *Typha latifolia** | 1, 2 |
| *Calamagrostis Canadensis*** | 2 | *Verbascum thapsus*** | 2, 3 |
| *Carex hystericina*** | 2 | *Veronica wormskjoldii (?)*** | 1, 2 |
| *Carex limnophilia*** | 2 | | |
| *Carex nebrascensis** | 2 | | |
| *Carex stipata*** | 2 | | |
| *Centaurea maculosa** | 3 | | |
| *Cirsium arvense** | 2, 3 | | |
| *Cynoglossum officinale** | 3 | | |
| *Dactylis glomerata** | 3 | | |
| *Eleocharis palustris*** | 1, 2 | | |
| *Epilobium spp.*** | 1 | | |
| *Equisetum arvense*** | 2 | | |
| *Euphorbia esula** | 3 | | |
| *Glyceria grandis (=G. maxima)** | 1, 2 | | |
| *Hordeum jubatum*** | 2 | | |
| *Juncus balticus** | 2 | | |
| *Juncus nevadensis*** | 2 | | |
| *Juncus tenuis*** | 1, 2 | | |
| *Juniperus scopulorum** | 3 | | |
| *Lemna spp.*** | 1 | | |
| *Melilotus officinalis*** | 3 | | |
| *Mimulus spp.*** | 2 | | |
| *Phalaris arundinacea** | 2 | | |
| *Phleum pretense** | 2, 3 | | |
| *Poa pratensis** | 2, 3 | | |
| *Polygonum amphibium** | 1 | | |
| *Populus angustifolia** | 2, 3 | | |
| *Potentilla argentea*** | 2 | | |
| *Prunus virginiana*** | 2 | *denotes observed in 2002 in addition to previous years | |
| *Ranunculus sceleratus*** | 2 | **denotes observed in 2002 for the first time | |
| *Ribes spp.** | 3 | No star indicates a species was observed in 2001, but not in 2002 | |

**COMMENTS/PROBLEMS:** _____

# PLANTED WOODY VEGETATION SURVIVAL

LAND & WATER B-4

| Species | Number Originally Planted | Number Observed | Mortality Causes |
|---|---|---|---|
| none | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**COMMENTS/PROBLEMS:** _____

## WILDLIFE

LAND & WATER B-5

## BIRDS

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes__X__ No____Type:_BB/Woodie_ How many?_10/7_____
Are the nesting structures being utilized? Yes_X ___ No____ Do the nesting structures need repairs?
Yes_X___ No____

## MAMMALS AND HERPTILES

| Species | Number Observed | Indirect indication of use | | | |
|---|---|---|---|---|---|
| | | Tracks | Scat | Burrows | Other |
| White-tailed deer *(Odocoileus virginianus)* (fawn) | 1 | | X | | beds |
| Painted Turtle (*Chrysemys picta*) | 1+ | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Additional Activities Checklist:**
__X___Macroinvertebrate sampling (if required)

**COMMENTS/PROBLEMS:** __Three (3)__wood duck on NW side of east pond require fixing, one near back fence has partially fallen out, one near pond edge partially fallen, and one interior has fallen into finger of open water. Shown to landowner._____

## PHOTOGRAPHS

Using a camera with a 50 mm lenses and color film take photographs of the following permanent reference points listed in the checklist below. Record the direction of the photograph using a compass. (The first time at each site establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3' above ground, survey the location with a resource grade GPS and mark the location on the air photo.)
Checklist:

__X___ One photo for each of the 4 cardinal directions surrounding wetland
__X__ At least one photo showing upland use surrounding wetland – if more than one upland use exists, take additional photos
__X__ At least one photo showing buffer surrounding wetland
__X___ One photo from each end of vegetation transect showing transect

| Location | Photo Frame # | Photograph Description | Compass Reading |
|---|---|---|---|
| A | | (camera malfunction-will take in 2003) | |
| B | 4/4A* | pond #1 | SE |
| D | 4/1A | pond #2 interior OW finger | NE |
| E | 4/11A | pond #2 | NE |
| F | 2/18A | pond #2 | SW |
| G | 4/0A | Transect 2: pond #2 transect from WL end | NW |
| H | 2/23A | Transect 2: pond #2 transect from UPL end | SE |
| I | 2/19A | pond #2 | NW |
| J | 2/20A | UPL adjacent to pond #2 | SW |
| K | 2/21A | UPL/WL interface pond #2 | SW |
| L | 4/3A | Transect 1: Pond #1 interior | SE |
| L-2 | 4/2A | Transect 1: View into WL fingers inside pond #1 from L-stake | NW |
| M | 4/5A | Transect 1: from M-stake toward L-stake | NW |

**COMMENTS/PROBLEMS:** _____

___* roll #/photo #_____

## GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points with the GPS unit set at 5 second recording rate. Record file numbers fore site in designated GPS field notebook

Checklist:

_ X___ Jurisdictional wetland boundary
__X___ 4-6 landmarks recognizable on the air photo
__X___ Start and end points of vegetation transect(s)
_2001_ Photo reference points
__-___ Groundwater monitoring well locations

**COMMENTS/PROBLEMS:** _____

## WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:
__X___Delineate wetlands according to the 1987 Army Corps manual.
__X__ Delineate wetland-upland boundary on the air photo
__X___ Survey wetland-upland boundary with a resource grade GPS survey

**COMMENTS/PROBLEMS:** __Wetland boundary will include more area within the interior OW fingers; UPL converting to WL. _____

## FUNCTIONAL ASSESSMENT

(Complete and attach full MDT Montana Wetland Assessment Method field forms; also attach abbreviated field forms, if used)

**COMMENTS/PROBLEMS:** _____

## MAINTENANCE

Were man-made nesting structures installed at this site? YES_X__ NO____
If yes, do they need to be repaired? YES_X___ NO____
If yes, describe problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures build or installed to impound water or control water flow into or out of the wetland? YES__X__ NO____
If yes, are the structures working properly and in good working order? YES_X___ NO_(X)__
If no, describe the problems below.

**COMMENTS/PROBLEMS:** _ Three (3)__wood duck on NW side of east pond require fixing, one near back fence has partially fallen out, one near pond edge partially fallen, and one interior has fallen into finger of open water. Shown to landowner._____

__Outflow structures are clogged with debris but were still functioning.

## MDT WETLAND MONITORING – VEGETATION TRANSECT

LAND & WATER B-8

Site: Stillwater Date: 7/19/02 Examiner: LB/LWC Transect # 1

Approx. transect length: 75' Compass Direction from Start (Upland): 148 deg

| **Vegetation type A:** | CT 2/3 Transition (mix) | |
|---|---|---|
| Length of transect in this type: | 12 | feet |
| Species: | | Cover: |
| GLYGRA | | <10 |
| ELEPAL | | 30 |
| CARLIM | | <1 |
| CLOVERspp. | | 15 |
| AGRTRA | | 20 |
| VERTHA | | <1 |
| CARNEB | | <3 |
| TYPLAT | | <1 |
| POAPRA | | 20 |
| | | |
| | | |
| | Total Vegetative Cover: | 100 |

| **Vegetation type B:** | CT 3 | |
|---|---|---|
| Length of transect in this type: | 33 | feet |
| Species: | | Cover: |
| POAPRA | | 95 |
| CLOVERspp. | | <1 |
| POPANG | | <1 |
| SYMALB | | <1 |
| AGRALB | | <5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total Vegetative Cover: | 100 |

| **Vegetation type C:** | CT 1 | |
|---|---|---|
| Length of transect in this type: | 21' | feet |
| Species: | | Cover: |
| SCIPAL | | 5 |
| JUNTEN | | 30 |
| GLYGRA | | 5 |
| AGRALB | | 35 |
| ELOPAL | | 20 |
| AGRTRA | | <5 |
| RANSCE | | <5 |
| HORJUB | | <5 |
| EQUARV | | <5 |
| | | |
| | | |
| | Total Vegetative Cover: | 100% |

| **Vegetation type D:** | | |
|---|---|---|
| Length of transect in this type: | | feet |
| Species: | | Cover: |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total Vegetative Cover: | |

## MDT WETLAND MONITORING – VEGETATION TRANSECT

LAND & WATER B-9

Site: Stillwater Date: 7/19/02 Examiner: LB/LWC Transect # 2

Approx. transect length: 198' Compass Direction from Start (Upland): 306 deg

| **Vegetation type A:** | CT 1 |
|---|---|
| Length of transect in this type: | 3 feet |
| Species: | Cover: |
| TYPLAT | 95 |
| ELEPAL | 5 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 100% |

| **Vegetation type B:** | CT 2 |
|---|---|
| Length of transect in this type: | 3 feet |
| Species: | Cover: |
| CARLIM | 15 |
| GLYGRA | <5 |
| JUNTEN | 15 |
| CARSTP | 15 |
| AGRALB | 55 |
| | |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 100% |

| **Vegetation type C:** | CT 3 |
|---|---|
| Length of transect in this type: | 30' feet |
| Species: | Cover: |
| DACGLO | 30 |
| PHLPRA | 30 |
| AGRALB | <5 |
| AGRTRA | 30 |
| POPANG | <5 |
| | |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | 100% |

| **Vegetation type D:** | CT 1/2 |
|---|---|
| Length of transect in this type: | 27' feet |
| Species: | Cover: |
| (open water) (CT1) | (40%) |
| TYPLAT (CT1+OW)) | 10 |
| GLYGRA | 20 |
| CARHYS | 10 |
| CARLIM | 10 |
| AGRALB | 10 |
| JUNTEN | <1 |
| EPILOBIUM spp (?) (CT 1+OW) | <5 (ow) |
| SCIVAL | <1 |
| SCIPAL | <1 |
| | |
| Total Vegetative Cover: | 65% |

## MDT WETLAND MONITORING – VEGETATION TRANSECT (continued)

Site: _____ Date: 7/19/02 Examiner: LB/LWC Transect # 2 CONT'D

Approx. transect length: _____ Compass Direction from Start (Upland): _____

| **Vegetation type E:** | CT 3 | |
|---|---|---|
| Length of transect in this type: | 114 | feet |
| Species: | | Cover: |
| DACGLO | | 85 |
| POPANG | | 5 |
| PHLPRA | | 5 |
| VERTHA | | <1 |
| AGRTRA | | 5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total Vegetative Cover: | 100% |

| **Vegetation type F:** | CT 1 | |
|---|---|---|
| Length of transect in this type: | 12' | feet |
| Species: | | Cover: |
| POLAMI | | <1 |
| (OPEN WATER) | | (99%) |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total Vegetative Cover: | 1% |

| **Vegetation type G:** | CT 3 | |
|---|---|---|
| Length of transect in this type: | 9' | feet |
| Species: | | Cover: |
| DACGLO | | 95 |
| PHLPRA | | 5 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total Vegetative Cover: | 100% |

| **Vegetation type H:** | | |
|---|---|---|
| Length of transect in this type: | | feet |
| Species: | | Cover: |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Total Vegetative Cover: | |

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

**Cover Estimate**
+ = <1%
1 = 1-5%
2 = 6-10%
3 = 11-20%
4 = 21-50%
5 = >50%

**Indicator Class:**
+ = Obligate
- = Facultative/Wet
0 = Facultative

**Source:**
P = Planted
V = Volunteer

Percent of perimeter 100% % developing wetland vegetation – excluding dam/berm structures.

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 food depth (in open water), or at a point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 ft wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Notes:

Wetland developing in cottonwood area, cottonwoods may eventually die out because of high water table.

**BIRD SURVEY – FIELD DATA SHEET**

Page_1__of_1___
Date: see below
Survey Time: varied

**SITE:** Stillwater

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|---|---|---|---|---|---|---|---|
| **Spring 2002-5/10/02** | | | | **(Mid-season con'd)** | | | |
| American Robin | X | B | OW/UPL | Western Wood Peewee | 1 | BD | MA |
| Canada Goose | 2 | N | island | Wood Duck (F) | 1 | F | OW |
| Cinnamon Teal | 2 | F | OW | Yellow Warbler | 1 | F | MA |
| Common Grackle | X | BD | OW | | | | |
| Common Snipe | 2 | ? | MA | | | | |
| Common Yellowthroat | 1 | F | OW/MA | **Fall: 10/7/02** | | | |
| Killdeer | X | BD | dike | Pied-billed Grebe | 4 | F | MA |
| King Fisher | X | FL | (OW) | Mallard | 6 | F | MA |
| Mallard | 4 | F/L | OW | Unid. Sparrow | 1 | F | MA |
| Red-winged Blackbird | X | F | OW/UPL | | | | |
| Song Sparrow | X | F | OW/MA | | | | |
| Spotted Sandpiper | 1 | F | OW | | | | |
| Starling | X | BD | OW/FO | | | | |
| Tree Swallow | X | F | (OW) | | | | |
| Unid. Hen Duck (in tree) | 1 | L | MA | | | | |
| Yellow-rumped Warbler | X | F | OW/MA | | | | |
| | | | | | | | |
| | | | | | | | |
| **Mid-season – 7/19/02** | | | | | | | |
| American Robin | | | | | | | |
| Cedar Waxwing | | | | | | | |
| Common Grackle | | | | | | | |
| Common Nighthawk | 1 | FO | OW | | | | |
| Double-crested Cormorant | 1 | F | OW | | | | |
| Eastern Kingbird | 1 | F | UPL | | | | |
| Great Blue Heron | 1 | F | OW | | | | |
| House Wren | 1 | | | | | | |
| King Fisher | 1 | F | OW | | | | |
| Least Flycatcher | 1 | | MA | | | | |
| Northern Flicker | 1 | F | MA | | | | |
| Red-winged Blackbird | | | | | | | |
| Ruddy Duck | 3 | F | OW | | | | |
| Song Sparrow | 1 | | | | | | |
| Tree Swallow | | | | | | | |

**Notes:**

X=uncountable/many

**Behavior**: BP – one of a breeding pair; BD – breeding display; F – foraging; FO – flyover; L – loafing; N – nesting

**Habitat**: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline

# DATA FORM
# ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

LAND & WATER B-13

| | |
|---|---|
| Project/Site: Stillwater | Date: 7/19/02 |
| Applicant/Owner: MDT | County: Stillwater |
| Investigator: LB/LWC | State: MT |
| Do Normal Circumstances exist on the site: X Yes ___ No | Community ID: Impoundment #1; CT 2/3 |
| Is the site significantly disturbed (Atypical Situation)? ___ Yes X No | Transect ID: 1 |
| Is the area a potential Problem Area?: ___ Yes X No | Plot ID: SP-1 |
| (If needed, explain on reverse.) | |

## VEGETATION

| | Dominant Plant Species | Stratum | Indicator | | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|---|---|
| 1 | ELEPAL | H | OBL | 9 | | | |
| 2 | JUNTEN | H | FAC | 10 | | | |
| 3 | AGRTRA | H | FAC | 11 | | | |
| 4 | TYPLAT | H | OBL | 12 | | | |
| 5 | CLOVERspp. | H | unk | 13 | | | |
| 6 | AGRALB | H | FACW | 14 | | | |
| 7 | | | | 15 | | | |
| 8 | | | | 16 | | | |

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 5/6

SP on edge of open water north of pond #1

## HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: - (in.)

Depth to Free Water in Pit: 4 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- x Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
Saturated edge of OW area.

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Lolo - Nesda | Drainage Class: | well |
| Taxonomy (Subgroup): | Pachic Haploboroll; Fluventic Haploboroll. | Field Observations Confirm Mapped Type? | X Yes ___ No |

Profile Description:

| Depth inches | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 2.5YR 2.5/1 | | | large grained sandy loam |
| 4-9 | A | 2.5YR 2.5/1 | | | large grained sandy loam (more sand) |
| 9+ | A | large rocks | | | |
| | | | | | |

Hydric Soil Indicators:

| | | | |
|---|---|---|---|
| ___ | Histosol | ___ | Concretions |
| ___ | Histic Epipedon | ___ | High Organic Content in surface Layer in Sandy Soils |
| ___ | Sulfidic Odor | ___ | Organic Streaking in Sandy Soils |
| X | Aquic Moisture Regime | ___ | Listed on Local Hydric Soils List |
| X | Reducing Conditions | ___ | Listed on National Hydric Soils List |
| X | Gleyed or Low-Chroma Colors | ___ | Other (Explain in Remarks) |

Hydric soil

## WETLAND DETERMINATION

| | | | | |
|---|---|---|---|---|
| Hydrophytic Vegetation Present? | X Yes | ___ No | Is this Sampling Point Within a Wetland? | X Yes ___ No |
| Wetland Hydrology Present? | X Yes | ___ No | | |
| Hydric Soils Present? | X Yes | ___ No | | |

Remarks:

Positive indicators for wetland boundary.

Approved by HQUSACE 2/92

LAND & WATER B-15

# DATA FORM
# ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

| | |
|---|---|
| Project/Site: Stillwater | Date: 7/19/02 |
| Applicant/Owner: MDT | County: |
| Investigator: LB/MDT | State: MT |

| | | | | | |
|---|---|---|---|---|---|
| Do Normal Circumstances exist on the site: | X | Yes | | No | Community ID: Impoundment #1; CT 3 |
| Is the site significantly disturbed (Atypical Situation)? | | Yes | X | No | Transect ID: 1 |
| Is the area a potential Problem Area?: (If needed, explain on reverse.) | | Yes | X | No | Plot ID: SP-2 |

## VEGETATION

| | Dominant Plant Species | Stratum | Indicator | | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|---|---|
| 1 | CLOVERspp. | H | unk | 9 | | | |
| 2 | SYMALB | S | UPL | 10 | | | |
| 3 | POPANG | T | FACW | 11 | | | |
| 4 | AGRALB | H | FACW | 12 | | | |
| 5 | POAPRA | H | FACU+ | 13 | | | |
| 6 | | | | 14 | | | |
| 7 | | | | 15 | | | |
| 8 | | | | 16 | | | |

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 2/5

Area transitioning to a wetland, but remains upland in 2002.

## HYDROLOGY

X Recorded Data (Describe in Remarks):
- Stream, Lake, or Tide Gauge
- X Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

Depth of Surface Water: - (in.)

Depth to Free Water in Pit: - (in.)

Depth to Saturated Soil: (5) (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- Inundated
- X Saturated in Upper 12 Inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- Oxidized Root Channels in Upper 12 Inches
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

higher in elevation than SP-1, but soil is moist at 5 inches and likely saturated w/in 12"

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Lolo - Nesda | Drainage Class: | well |
| Taxonomy (Subgroup): | Pachic Haploboroll; Fluventic Haploboroll. | Field Observations Confirm Mapped Type? | X Yes ____ No |

Profile Description:

| Depth inches | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 2.5YR 2.5/1 | | | loam |
| 5+ | | | | | cobbles |
| | | | | | |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ____ Concretions
- ____ High Organic Content in surface Layer in Sandy Soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

Hydric because of low-chroma and moist to touch. at 5" depth.

## WETLAND DETERMINATION

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | ____ Yes | ____ No | |
| Wetland Hydrology Present? | ____ Yes | ____ No | |
| Hydric Soils Present? | ____ Yes | ____ No | Is this Sampling Point Within a Wetland? ____ Yes ____ No |

Remarks:

Likely this area is converting to WL but at his time it appears to be UPL only because of plant composition, but it narrowly is w/in the non-hydric required ratio.

Approved by HQUSACE 2/92

LAND & WATER B-17

# DATA FORM
## ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

| | |
|---|---|
| Project/Site: Stillwater | Date: 7/19/02 |
| Applicant/Owner: MDT | County: Stillwater |
| Investigator: LB/LWC | State: MT |

| | | | | | |
|---|---|---|---|---|---|
| Do Normal Circumstances exist on the site: | X | Yes | | No | Community ID: Impoundment #2; CT 1/2 |
| Is the site significantly disturbed (Atypical Situation)? | | Yes | X | No | Transect ID: 2 |
| Is the area a potential Problem Area?: (If needed, explain on reverse.) | | Yes | X | No | Plot ID: SP-3 |

## VEGETATION

| | Dominant Plant Species | Stratum | Indicator | | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|---|---|
| 1 | TYPLAT | H | OBL | 9 | SCIVAL | H | OBL |
| 2 | GLYGRA | H | OBL | 10 | PHLPTA | H | FAC- |
| 3 | ELEPAL | H | OBL | 11 | | | |
| 4 | JUNTEN | H | OBL | 12 | | | |
| 5 | CARHYS | H | OBL | 13 | | | |
| 6 | CARLIM | H | FACW | 14 | | | |
| 7 | CARSTI | H | no ind. | 15 | | | |
| 8 | AGRALB | H | FACW | 16 | | | |

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 8/9

Diverse wetland community.

## HYDROLOGY

X Recorded Data (Describe in Remarks):
- Stream, Lake, or Tide Gauge
- X Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

Depth of Surface Water: - (in.)

Depth to Free Water in Pit: 2 (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- Inundated
- X Saturated in Upper 12 Inches
- X Water Marks
- X Drift Lines
- Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- Oxidized Root Channels in Upper 12 Inches
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

SP located along north edge of impoundment #2 where saturation zone extends ~ 20 feet into former upland area.

## SOILS

Map Unit Name (Series and Phase): Lolo - Nesda

Drainage Class: well

Field Observations Confirm Mapped Type? X Yes ___ No

Taxonomy (Subgroup): Pachic Haploboroll; Fluventic Haploboroll.

Profile Description:

| Depth inches | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-5 | A | 7.5YR 2/1 | | | silty loam |
| 5+ | | | | | cobbles/gravels |
| | | | | | |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- X Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Zone of saturation.

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes ___ No

Wetland Hydrology Present? X Yes ___ No

Hydric Soils Present? X Yes ___ No

Is this Sampling Point Within a Wetland? X Yes ___ No

Remarks:

Diverse wetland community is beginning to develop into the interior areas as this transect is illustrating.

Approved by HQUSACE 2/92

# DATA FORM
# ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

LAND & WATER B-19

| | |
|---|---|
| Project/Site: Stillwater | Date: 7/19/02 |
| Applicant/Owner: MDT | County: Stillwater |
| Investigator: LB/LWC | State: MT |
| Do Normal Circumstances exist on the site: X Yes ___ No | Community ID: Impoundment #2; CT 3 |
| Is the site significantly disturbed (Atypical Situation)? ___ Yes X No | Transect ID: 2 |
| Is the area a potential Problem Area?: ___ Yes X No | Plot ID: SP-4 |
| (If needed, explain on reverse.) | |

## VEGETATION

| | Dominant Plant Species | Stratum | Indicator | | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|---|---|
| 1 | DACGLO | H | FACU | 9 | | | |
| 2 | | | | 10 | | | |
| 3 | | | | 11 | | | |
| 4 | | | | 12 | | | |
| 5 | | | | 13 | | | |
| 6 | | | | 14 | | | |
| 7 | | | | 15 | | | |
| 8 | | | | 16 | | | |

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 1/1

Area also has (non-dominant) POPANG (1 tree 15 feet from SP) and unk. grass (<5%); dominant sp. is non-hydrophytic.

## HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

no wetland hydrology

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Lolo - Nesda | Drainage Class: | well |
| Taxonomy (Subgroup): | Pachic Haploboroll; Fluventic Haploboroll. | Field Observations Confirm Mapped Type? | X Yes ___ No |

Profile Description:

| Depth inches | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-4 | A | 7.5YR 2/1 | | | sandy loam |
| 4+ | | | | | large rocks |
| | | | | | |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Hydric soil given low-chroma, however no wetland veg or evidence of hydrology at this SP.

## WETLAND DETERMINATION

| | | | | |
|---|---|---|---|---|
| Hydrophytic Vegetation Present? | ___ Yes | X No | | |
| Wetland Hydrology Present? | ___ Yes | X No | | |
| Hydric Soils Present? | X Yes | ___ No | Is this Sampling Point Within a Wetland? | ___ Yes X No |

Remarks:

SP on bank above finger of open water; not w/in WL boundary.

Approved by HQUSACE 2/92

*Field Data Sheet for 1999 MDT Wetland Assessment Form* Site: Stillwater Date: 7/19/02 By: B/LWX

Estimated AA Size (Circle Ac.): <1 1-5 >5 Brief Description: Excavated river ox bow w/ dikes

| HGM Class (CIRCLE) | Cowardin Class | Est. % of AA | Predominant Water Regime (CIRCLE) |
|---|---|---|---|
| Mineral Soil Flats | Emergent | 50 | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Organic Soil Flats | Aquatic Bed | 40 | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Riverine (nonperennial) | Moss-Lichen | | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Riverine (upper perennial) | Scrub-Shrub | <5 | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Riverine (lower perennial) | Forested | 30 | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Lacustrine Fringe | Unconsolidated Bottom | 5 | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Depression (closed) | Other: | | Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood |
| Depression (open, groundwater) | Total Estimated % Vegetated | 95% | counting aquatic |
| Depression (open, surface water) | | | |
| Slope | | | |
| Organic Soil Flats | | | |

**RELATIVE ABUNDANCE:** rare com. abun. **DISTURBANCE** is: High Moderate Low

**HYDROLOGY:** Max. acre-ft surf. water at wetlands in AA subject to inundation: <1 1-5 >5 (if no flooding/ponding, go to groundwater* section)

Does AA contain surface or subsurface outlet? Y N If outlet present, is it restricted (subsurface will always be "yes")? Y N

| Longest duration of surface water: | | Surface Water Duration and other attributes (circle) | | |
|---|---|---|---|---|
| at any wetlands within AA | | Perm / Peren | Seas / Intermit | Temp / Ephem |
| in at least 10% of AA (both wetlands and nonwetlands [deepwater, streambed...] | | Perm / Peren | Seas / Intermit | Temp / Ephem |
| Where fish are or historically were present (circle NA if not applicable) | | Perm / Peren | Seas / Intermit | Temp / Ephem |
| | % of waterbody containing cover objects | >25% | 10-25% | <10% |
| | % bank or shore with riparian or wetland shrub or forested communities | >75% | 50-74% | <50% |
| adjacent to rooted wetland vegetation along a defined watercourse or shoreline subject to wave action (circle NA if not applicable) | | Perm / Peren | Seas / Intermit | Temp / Ephem |
| | % cover of wetland bank or shore by sp. with binding rootmasses | >65% | 35-64% | <35% |

Flood Attenuation: Do any wetlands on site flood as a result of in-channel or overbank flow? Y N (if no, go to groundwater* section below)

| | | | |
|---|---|---|---|
| Estimated wetland area subject to periodic flooding (acres): | ≥10 | 2-10 | <2 |
| Estimated % of flooded wetland classified SS, FO or both: | ≥75 | 25-74 | <25 |

*Evidence of groundwater discharge or recharge? Y N List: back water areas have springs

**HABITAT**

Habitat for Listed or Proposed Threatened, Endangered, or Montana Natural Heritage Program S1, S2, or S3 Plants or Animals:

AA is Documented (D) or Suspected (S) to contain (circle based on definitions contained in instructions):

| | | | | | |
|---|---|---|---|---|---|
| Primary or critical habitat (list species) | D S | T/E: | D S | MNHP: | |
| Secondary habitat (list species) | D S | T/E: | D S | MNHP: | |
| Incidental habitat (list species) | D S | T/E: yellowstone cutthroat | D S | MNHP: | |
| No usable habitat | D S | T/E: | D S | MNHP: | |

Wildlife observations? deer fawn; beds; beaver in spring + fresh beaver chews

Fish observations? none yet

**OTHERS**

Do wetlands have potential to receive excess sediments, nutrients, or toxicants? Y N From: livestock excrement in upper

Potential to receive: low to moderate levels high levels On TMDL List? Y N Ox bo

Does site contain bog, fen, warm springs, >80 year-old forested wetland, or MNHP "S1" or "S2" plant association? Y N

List: Old cottonwoods

Is AA a known recreation / education site? Y N Type: boating, fishing

Does AA offer strong potential for use as recreation / education site? Y N Type: same plus birding/amphib. ide

# MDT Montana Wetland Assessment Form (revised 5/25/1999)

LAND & WATER B-22

1. Project Name: Stillwater 2. Project #: 13091-032 Control #:

3. Evaluation Date: Mo. 7 Day 19 Yr. 02 4. Evaluator(s): BJ/LWC 5. Wetlands/Site #(s)

6. Wetland Location(s): I. Legal: T 3 N or (S) R 19 (E) or W; S 22 ; T ___ N or S; R ___ E or W; S ___ ;
II. Approx. Stationing or Mileposts:

III. Watershed: 10070005 GPS Reference No. (if applies):
Other Location Information:

7. a. Evaluating Agency: LWC ;
b. Purpose of Evaluation:
1. ___ Wetlands potentially affected by MDT project
2. ___ Mitigation wetlands; pre-construction
3. X Mitigation wetlands; post-construction
4. ___ Other

8. Wetland size: (total acres) ___ (visually estimated)
9.24 (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) ___ (visually estimated)
9.24 (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

| HGM Class | System | Subsystem | Class | Water Regime | Modifier | % of AA |
|---|---|---|---|---|---|---|
| Riverine | Riverine | Lower perennial | RB, UB | H B | E I | 30 |
| Depressional | Palustrine | | AB Em SS, FO | H B | E I | 70 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

(Abbreviations: System: Palustrine(P)/ Subsyst.: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ System: Lacustrine (L)/, Subsyst.: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsyst.: Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3)/ Classes: RB, UB, AB, US/ Water Regimes: Permanently Flooded (H), Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) HGM Classes: Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare Common Abundant
Comments:

12. General condition of AA:
I. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

| Conditions within AA | Predominant conditions adjacent to (within 500 feet of) AA | | |
|---|---|---|---|
| | Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings | Land not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings | Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, cleaning, or hydrological alteration; high road or building density |
| AA occurs and is managed in predominantly natural state, is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings | low disturbance | low disturbance | moderate disturbance |
| AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hyerological alteration; contains few roads or buildings | moderate disturbance | moderate disturbance | high disturbance |
| AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, cleaning, or hydrological alteration; high road or building density | high disturbance | high disturbance | high disturbance |

Comments: (types of disturbance, intensity, season, etc.): - occasional sheep break-in
II. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) knapweed, thistle, leafy spurge
III. Provide brief descriptive summary of AA and surrounding land use/habitat: cattle, horse, sheep, llama grazing all sides of WL

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

| # of "Cowardin" vegetated classes present in AA (see #10) | ≥ 3 vegetated classes (or ≥ 2 if one is forested) | 2 vegetated classes (or 1 if forested) | ≤ 1 vegetated class |
|---|---|---|---|
| Rating (circle) | High | Moderate | Low |

Comments: Cottonwoods flooding out - will die off eventually

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

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

| | | |
|---|---|---|
| Primary or critical habitat (**list species**) | D S | |
| Secondary habitat (**list species**) | (D) S | Bald Eagle (T) |
| Incidental habitat (**list species**) | D S | |
| No usable habitat | D S | |

II. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Highest Habitat Level* | doc./primary | sus/primary | doc./secondary | sus./secondary | doc./incidental | sus./incidental | None |
|---|---|---|---|---|---|---|---|
| *Functional Points and Rating* | 1 (H) | .9 (H) | .8 (M) | .7 (M) | .5 (L) | .3 (L) | 0 (L) |

Sources for documented use (e.g. observations, records, etc):

**14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program:** (not including species listed in14A above)

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

| | | |
|---|---|---|
| Primary or critical habitat (**list species**) | D S | |
| Secondary habitat (**list species**) | D S | |
| Incidental habitat (**list species**) | D (S) | Yellowstone cutthroat (S2) |
| No usable habitat | D S | |

II. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Highest Habitat Level* | doc./primary | sus/primary | doc./secondary | sus./secondary | doc./incidental | sus./incidental | None |
|---|---|---|---|---|---|---|---|
| *Functional Points and Rating* | 1 (H) | .8 (H) | .7 (M) | .6 (M) | .2 (L) | .1 (L) | 0 (L) |

Sources for documented use (e.g. observations, records, etc.):

**14C. General Wildlife Habitat Rating:**

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

*Substantial* (based on any of the following [check]):
- X observations of abundant wildlife #'s or high species diversity (during any period)
- X abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ presence of extremely limiting habitat features not available in the surrounding area
- __ interviews with local biologists with knowledge of the AA

*Low* (based on any of the following [check]):
- __ few or no wildlife observations during peak use periods
- __ little to no wildlife sign
- __ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

*Moderate* (based on any of the following [check]):
- __ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- __ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ adequate adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

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

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

**III. Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

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

**Comments:** 36 spp. birds; turtles, deer, beaver; deer beds, fawn

**14D. General Fish/Aquatic Habitat Rating:** (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle NA here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in ii below, and noted in the comments.)

i. **Habitat Quality** (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating.

| *Duration of surface water in AA* | Permanent / Perennial | | | Seasonal / Intermittent | | | Temporary / Ephemeral | | |
|---|---|---|---|---|---|---|---|---|---|
| *Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.* | >25% | 10–25% | <10% | >25% | 10–25% | <10% | >25% | 10–25% | <10% |
| Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities | E | E | H | H | H | M | M | M | M |
| Shading – 50 to 75% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities | H | H | M | M | M | M | M | L | L |
| Shading - < 50% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities | H | M | M | M | L | L | L | L | L |

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* Y N Modified habitat quality rating = (circle) E H M L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

| *Types of fish known or suspected within AA* | *Modified Habitat Quality (ii)* | | | |
|---|---|---|---|---|
| | Exceptional | High | Moderate | Low |
| **Native game fish** | 1 (E) | .9 (H) | .7 (M) | .5 (M) |
| **Introduced game fish** | .9 (H) | .8 (H) | .6 (M) | .4 (M) |
| **Non-game fish** | .7 (M) | .6 (M) | .5 (M) | .3 (L) |
| **No fish** | .5 (M) | .3 (L) | .2 (L) | .1 (L) |

**Comments:** Assumed given veg cover and low water temp (constant river flow throug

**14E. Flood Attenuation:** (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function.)

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

| *Estimated wetland area in AA subject to periodic flooding* | ≥ 10 acres | | | ~~<10, >2 acres~~ | | | ≤2 acres | | |
|---|---|---|---|---|---|---|---|---|---|
| *% of flooded wetland classified as forested, scrub/shrub, or both* | 75% | 25-75% | <25% | 75% | 25-75% | <25% | 75% | 25-75% | <25% |
| AA contains no outlet or restricted outlet | 1(H) | .9(H) | .6(M) | .8(H) | .7(H) | .5(M) | .4(M) | .3(L) | .2(L) |
| AA contains unrestricted outlet | .9(H) | .8(H) | .5(M) | .7(H) | .6(M) | .4(M) | .3(L) | .2(L) | .1(L) |

ii. Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA (circle)? Y N
**Comments:**

**14F. Short and Long Term Surface Water Storage:** (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle NA here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

| *Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding* | >5 acre feet | | | <5, >1 acre feet | | | ≤1 acre foot | | |
|---|---|---|---|---|---|---|---|---|---|
| *Duration of surface water at wetlands within the AA* | P/P | S/I | T/E | P/P | S/I | T/E | P/P | S/I | T/E |
| Wetlands in AA flood or pond ≥ 5 out of 10 years | 1(H) | .9(H) | .8(H) | .8(H) | .6(M) | .5(M) | .4(M) | .3(L) | .2(L) |
| Wetlands in AA flood or pond < 5 out of 10 years | .9(H) | .8(H) | .7(M) | .7(M) | .5(M) | .4(M) | .3(L) | .2(L) | .1(L) |

**Comments:**

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

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

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

**Comments:** Counting on aquatic

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

**I. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

| *% Cover of wetland streambank or shoreline by species with deep, binding rootmasses* | *Duration of surface water adjacent to rooted vegetation* | | |
|---|---|---|---|
| | permanent / perennial | seasonal / intermittent | Temporary / ephemeral |
| ≥ 65% | 1 (H) | .9 (H) | .7 (M) |
| 35-64% | .7 (M) | .6 (M) | .5 (M) |
| < 35% | .3 (L) | .2 (L) | .1 (L) |

**Comments:**

**14I. Production Export/Food Chain Support:**

**I. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or absent [see instructions for further definitions of these terms])

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

**Comments:**

**14J. Groundwater Discharge/Recharge:** (Check the indicators in i & ii below that apply to the AA)

**i. Discharge Indicators**

- X Springs are known or observed
- ___ Vegetation growing during dormant season/drought
- ___ Wetland occurs at the toe of a natural slope
- ___ Seeps are present at the wetland edge
- ___ AA permanently flooded during drought periods
- ___ Wetland contains an outlet, but no inlet
- ___ Other

**ii. Recharge Indicators**

- X Permeable substrate present without underlying impeding layer
- ___ Wetland contains inlet but no outlet
- ___ Other

reviewed

**iii. Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

| *Criteria* | *Functional Points and Rating* |
|---|---|
| AA is known Discharge/Recharge area or one or more indicators of D/R present | 1 (H) |
| No Discharge/Recharge indicators present | .1 (L) |
| Available Discharge/Recharge information inadequate to rate AA D/R potential | N/A (Unknown) |

**Comments:**

**14K. Uniqueness:**

**I. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

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

**Comments:**

**14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site:** (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

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

**iii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use?** Y N
(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

**iv. Rating** (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

| *Ownership* | *Disturbance at AA (#12i)* | | |
|---|---|---|---|
| | low | moderate | high |
| public ownership | 1 (H) | .5 (M) | .2 (L) |
| private ownership | .7 (M) | .3 (L) | .1 (L) |

**Comments:**

## FUNCTION & VALUE SUMMARY & OVERALL RATING

| Function & Value Variables | Rating | Actual Functional Points | Possible Functional Points | Functional Units; (Actual Points x Estimated AA Acreage) 9.24 AC |
|---|---|---|---|---|
| A. Listed/Proposed T&E Species Habitat | m | .8 | 1 | |
| B. MT Natural Heritage Program Species Habitat | L | .1 | 1 | |
| C. General Wildlife Habitat | E | .1 | 1 | |
| D. General Fish/Aquatic Habitat | H | .8 | 1 | |
| E. Flood Attenuation | H | .7 | 1 | |
| F. Short and Long Term Surface Water Storage | H | 1 | 1 | |
| G. Sediment/Nutrient/Toxicant Removal | H | 1 | 1 | |
| H. Sediment/Shoreline Stabilization | H | 1 | 1 | |
| I. Production Export/Food Chain Support | H | .9 | 1 | |
| J. Groundwater Discharge/Recharge | H | 1 | 1 | |
| K. Uniqueness | m | .6 | 1 | |
| L. Recreation/Education Potential | m | .7 | 1 | |
| Totals: | | 9.6 | 12 | 88.7 |

80 %

**OVERALL ANALYSIS AREA (AA) RATING:** (Circle appropriate category based on the criteria outlined below) I (II) III IV

**Category I Wetland:** (Must satisfy one of the following criteria; if does not meet criteria, go to Category II)
___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or
___ Score of 1 functional point for Uniqueness; or
___ Score of 1 functional point for Flood Attenuation and answer to Question 14E.ii is "yes"; or
___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

**Category II Wetland:** (Criteria for Category I not satisfied and meets any one of the following criteria; if not satisfied, go to Category IV)
___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or
___ Score of .9 or 1 functional point for General Wildlife Habitat; or
___ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or
___ "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or
___ Score of .9 functional point for Uniqueness; or
X Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)
___ "Low" rating for Uniqueness; and
___ "Low" rating for Production Export/Food Chain Support; and
___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

| Montana Department of Transportation | | | | |
|---|---|---|---|---|
| Wetland Mitigation Monitoring Project | | | | |
| Rhithron Associates, Inc. | | | | |
| for Land and Water Consulting | | Project Name | Stillwater River | Stillwater |
| 2001 and 2002 | | | | |
| | | Date | 8/6/2001 | 7/19/2002 |
| Coelenterata | | *Hydra* | | |
| Turbellaria | | *Dugesia* | | |
| Oligochaeta | Enchytraeidae | Enchytraeidae | | |
| | Lumbriculidae | Lumbriculidae | | |
| | Naididae | *Chaetogaster* | | |
| | | *Nais elinguis* | | |
| | | *Nais variabilis* | 162 | |
| | | *Ophidonais serpentina* | 1 | |
| | Tubificidae | Tubificidae - immature | | |
| | | *Limnodrilus hoffmeisteri* | | |
| Hirudinea | | *Mooreobdella microstoma* | | |
| | | *Nephelopsis* | | |
| | | *Helobdella stagnalis* | | |
| | | *Helobdella* | | |
| | | *Glossiphonia* | | |
| | | *Theromyzon* | | |
| Bivalvia | Sphaeriidae | *Sphaerium* | | |
| Gastropoda | Lymnaeidae | *Fossaria* | | 1 |
| | Physidae | *Physa* | 1 | |
| | Planorbidae | *Gyraulus* | | 5 |
| | | *Helisoma* | | |
| | | *Planorbella* | | |
| Crustacea | Cladocera | Cladocera | 2 | 1 |
| | Copepoda | Calanoida | 1 | |
| | | Cyclopoida | | |
| | Ostracoda | Ostracoda | 5 | 7 |
| | Amphipoda | *Gammarus* | | |
| | | *Hyalella azteca* | 11 | 4 |
| | Isopoda | *Caecidotea* | | |
| | Decapoda | *Orconectes* | | |
| Acarina | | Acari | 1 | 3 |
| Odonata | Aeshnidae | *Anax junius* | | 1 |
| | Libellulidae | Libellulidae-early instar | | |
| | | *Sympetrum* | | |
| | Coenagrionidae | Coenagrionidae-early instar | 3 | 3 |
| | | *Enallagma* | 1 | |
| | Lestidae | *Lestes* | | |
| Ephemeroptera | Baetidae | *Baetis tricaudatus* | | |
| | | *Callibaetis* | 3 | 18 |
| | | *Centroptilum* | | 1 |
| | Caenidae | *Caenis* | | 20 |
| | Ephemerellidae | *Ephemerella* | | |
| | Heptageniidae | *Cinygma* | | |
| | | *Nixe* | | |
| | Leptophlebiidae | *Paraleptophlebia* | | |
| | Ameletidae | *Ameletus* | | |
| Homoptera | Corixidae | Corixidae - immature | | 18 |
| | | *Corisella tarsalis* | | |
| | | *Hesperocorixa* | | |
| | | *Palmacorixa buenoi* | | 8 |
| | | *Sigara* | | 7 |
| | | *Trichocorixa* | | |
| | Nepidae | *Ranatra* | | |
| | Notonectidae | *Notonecta* | | 1 |
| Plecoptera | Chloroperlidae | *Sweltsa* | | |
| | Perlodidae | *Skwala* | | |
| Trichoptera | Brachycentridae | *Brachycentrus* - early instar | | |
| | Hydroptilidae | Hydroptilidae - pupa | | |

| | | | | |
|---|---|---|---|---|
| | | *Hydroptila* | | |
| | Lepidostomatidae | *Lepidostoma* | | |
| | Leptoceridae | Leptoceridae - early instar | | |
| | | *Ceraclea* | | |
| | | *Mystacides* | | 1 |
| | | *Nectopsyche* | | |
| | | *Ylodes* | | |
| | Limnephilidae | *Psychoglypha suborealis* | | |
| Coleoptera | Chysomelidae | Chrysomelidae | | |
| | Curculionidae | *Bagous* | | |
| | Dytiscidae | *Acilius* | | |
| | | Dytiscidae - early instar larvae | | |
| | | Hydroporinae - early instar larvae | | |
| | | *Hygrotus* | | |
| | | *Liodessus* | | |
| | | *Laccophilus* | | |
| | | *Neoporus* | | |
| | | *Oreodytes* | | |
| | | *Rhantus* | | |
| | | *Stichtotarsus* | | |
| | Elmidae | *Dubiraphia* | | |
| | | *Heterlimnius* | | |
| | | *Lara avara* | | |
| | | *Optioservus* | | |
| | | *Zaitzevia* | | |
| | Haliplidae | *Haliplus* | 1 | |
| | | *Peltodytes* | | |
| | Hydrophilidae | Hydrophilidae - early instar larvae | | |
| | | *Berosus* | | |
| | | *Helophorus* | | |
| | | *Hydrobius* | | |
| | | *Hydrochara* | | |
| | | *Laccobius* | | |
| | | *Tropisternus* | | |
| Diptera | Athericidae | *Atherix* | | |
| | Ceratopogonidae | *Bezzia/Palpomyia* | 5 | |
| | | *Dasyhelea* | 1 | |
| | Chaoboridae | *Chaoborus* | | |
| | Culicidae | *Anopheles* | | |
| | | *Culex* | | |
| | Dixidae | *Dixella* | | |
| | Dolichopodidae | Dolichopodidae | | |
| | Empididae | *Clinocera* | | |
| | Ephydridae | Ephydridae | | |
| | Muscidae | Muscidae | | |
| | Pelecorhynchidae | *Glutops* | | |
| | Psychodidae | *Pericoma* | | |
| | Simuliidae | *Simulium* | | |
| | Sciomyzidae | Sciomyzidae | | |
| | Stratiomyidae | *Odontomyia* | | |
| | Tabanidae | Tabanidae | | |
| | Tipulidae | *Hexatoma* | | |
| | | *Tipula* | | |
| | Chironomidae | *Ablabesmyia* | | |
| | | *Acricotopus* | 5 | |
| | | *Camptocladius* | | |
| | | *Chironomus* | | 3 |
| | | *Cladotanytarsus* | | |
| | | *Corynoneura* | | |
| | | Cricotopus Bicinctus Gr. | | |
| | | Cricotopus (Cricotopus) Gr. | | |
| | | *Cricotopus nostococladius* | | |
| | | *Cryptotendipes* | | |
| | | *Diamesa* | | |

| | | | | |
|---|---|---|---|---|
| | | *Dicrotendipes* | | 16 |
| | | *Einfeldia* | | |
| | | *Endochironomus* | 2 | 19 |
| | | *Labrundinia* | | |
| | | *Micropsectra* | | |
| | | *Microtendipes* | | |
| | | *Odontomesa* | | |
| | | *Orthocladius annectens* | 2 | 11 |
| | | *Pagastia* | | |
| | | *Parachironomus* | | |
| | | *Paracladopelma* | | |
| | | *Paramerina* | | |
| | | *Parametriocnemus* | | |
| | | *Paratanytarsus* | 32 | 34 |
| | | *Paratendipes* | | |
| | | *Phaenopsectra* | | |
| | | *Polypedilum* | | |
| | | *Procladius* | | |
| | | *Psectrocladius elatus* | | 2 |
| | | *Psectrocladius vernalis* | | |
| | | *Psectrotanypus* | | |
| | | *Pseudochironomus* | | |
| | | *Stichtochironomus* | | |
| | | *Tanypus* | | 1 |
| | | *Tanytarsus* | 3 | |
| | | *Theinemanniella* | | |
| | | *Tvetenia* | | |
| | | | | |
| | | Total | 242 | 185 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | Total taxa | 19 | 23 |
| | | POET | 3 | 6 |
| | | Chironomidae taxa | 5 | 7 |
| | | Crustacea taxa + Mollusca taxa | 5 | 5 |
| | | % Chironomidae | 18.18% | 46.49% |
| | | Orthocladiinae/Chironomidae | 0.16 | 0.15 |
| | | %Amphipoda | 4.55% | 2.16% |
| | | %Crustacea + %Mollusca | 8.26% | 9.73% |
| | | HBI | 7.60 | 6.99 |
| | | %Dominant taxon | 66.94% | 18.38% |
| | | %Collector-Gatherers | 93.80% | 63.24% |
| | | %Filterers | 0.83% | 0.54% |
| | | | | |
| | | Scores (2002 criteria) | | |
| | | Total taxa | 3 | 5 |
| | | POET | 3 | 5 |
| | | Chironomidae taxa | 3 | 5 |
| | | Crustacea taxa + Mollusca taxa | 5 | 5 |
| | | % Chironomidae | 3 | 1 |
| | | Orthocladiinae/Chironomidae | 1 | 1 |
| | | %Amphipoda | 5 | 5 |
| | | %Crustacea + %Mollusca | 5 | 5 |
| | | HBI | 3 | 5 |
| | | %Dominant taxon | 1 | 5 |
| | | %Collector-Gatherers | 5 | 3 |
| | | %Filterers | 1 | 1 |
| | | | | |
| | | Total score | 38 | 46 |

# Appendix C

## REPRESENTATIVE PHOTOGRAPHS
## 2002 AERIAL PHOTOGRAPH

***MDT Wetland Mitigation Monitoring***
***Stillwater River***
***Absarokee, Montana***

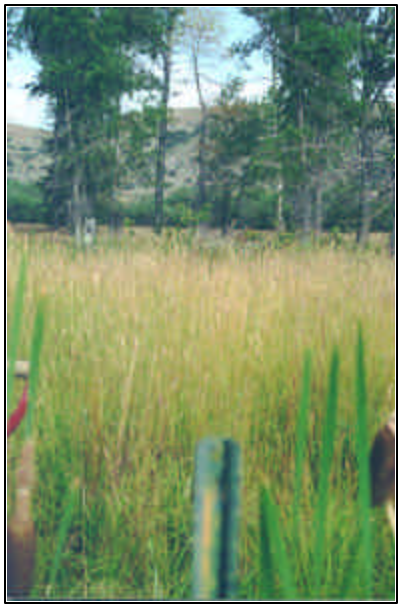
LAND & WATER

**Location:** B **Photo Frame:** 4/4A **Description:** Pond #1 **Compass Reading:** SE

**Location:** D **Photo Frame:** 4/1A **Description:** Pond #2 interior OW finger **Compass Reading:** NE

**Location:** E **Photo Frame:** 4/11A **Description:** Pond #2 **Compass Reading:** NE

**Location:** F **Photo Frame:** 2/18A **Description:** Pond #2 **Compass Reading:** SW



**Location:** G **Photo Frame:** 4/0A **Description:** Transect 2: pond #2 transect from WL end **Compass Reading:** NW

**Location:** H **Photo Frame:** 2/23A **Description:** Transect 2: pond #2 transect from WL end **Compass Reading:** SE

**Location:** I **Photo Frame:** 2/19A **Description:** Pond #2 **Compass Reading:** NW

**Location:** J **Photo Frame:** 2/20A **Description:** UPL adjacent to pond #2 **Compass Reading:** SW

**Location:** K **Photo Frame:** 2/21A **Description:** UPL/WL interface pond #2 **Compass Reading:** SW

**Location:** L **Photo Frame:** 4/3A **Description:** Transect 1:pond #1 interior **Compass Reading:** SE

**Location:** L-2 **Photo Frame:** 4/2A **Description:** Transect 1: view into WL fingers inside pond #1 from L-stake **Compass Reading:** NW

**Location:** M **Photo Frame:** 4/5A **Description:** Transect 1: from M-stake toward L-stake **Compass Reading:** NW

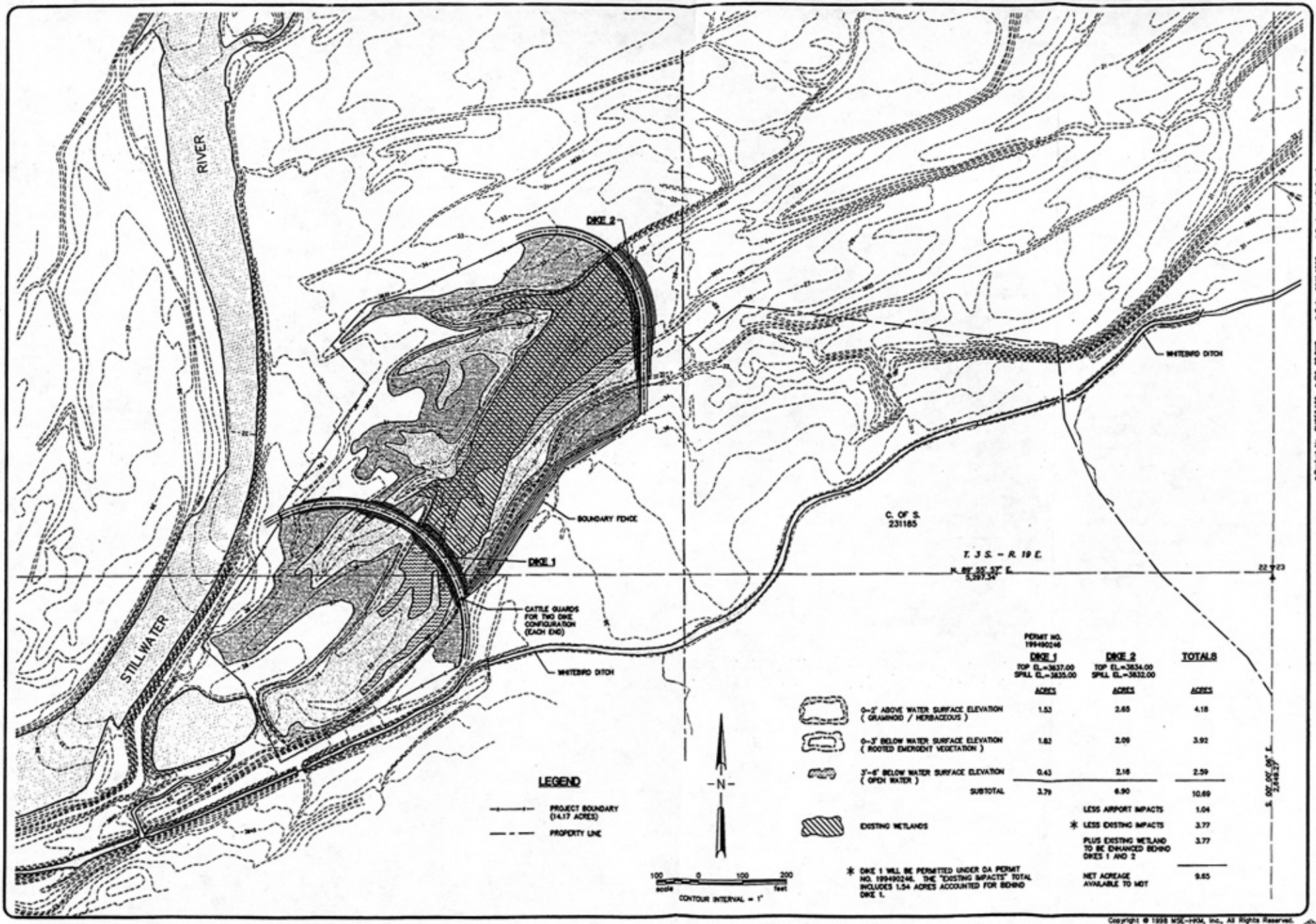
JOB:STILLWATER WETLAND ROLL:000 SCALE:1:6000 FLT:27 07/22/2002 14:19:59
STILLWATER 2002
FS100 1/ 300 f/5.6 FF1.0 EC 0 SIN dt362.3 27.3V -59mb

# Appendix D

## PROPOSED WETLAND MITIGATION SITE MAP

***MDT Wetland Mitigation Monitoring***
***Stillwater River***
***Absarokee, Montana***

LAND & WATER




PERMIT NO. 199490246

| | DIKE 1 TOP EL.=3837.00 SPILL EL.=3835.00 ACRES | DIKE 2 TOP EL.=3834.00 SPILL EL.=3832.00 ACRES | TOTALS ACRES |
|---|---|---|---|
| 0-2" ABOVE WATER SURFACE ELEVATION ( GRAMINOID / HERBACEOUS ) | 1.53 | 2.65 | 4.18 |
| 0-3" BELOW WATER SURFACE ELEVATION ( ROOTED EMERGENT VEGETATION ) | 1.83 | 2.09 | 3.92 |
| 3"-6" BELOW WATER SURFACE ELEVATION ( OPEN WATER ) | 0.43 | 2.16 | 2.59 |
| SUBTOTAL | 3.79 | 6.90 | 10.69 |
| LESS AIRPORT IMPACTS | | | 1.04 |
| * LESS EXISTING IMPACTS | | | 3.77 |
| PLUS EXISTING WETLAND TO BE ENHANCED BEHIND DIKES 1 AND 2 | | | 3.77 |
| NET ACREAGE AVAILABLE TO MDT | | | 9.65 |

* DIKE 1 WILL BE PERMITTED UNDER DA PERMIT NO. 199490246. THE "EXISTING IMPACTS" TOTAL INCLUDES 1.54 ACRES ACCOUNTED FOR BEHIND DIKE 1.

| No. | Revision | By | Date |
|---|---|---|---|
| | | | |

WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

# STILLWATER RIVER WETLAND MITIGATION PLAN

## WETLAND MITIGATION SITE


MSE-HKM, Inc.
2727 Central Avenue
P.O. Box 31318
Billings, MT 59107-1318
(406) 656-6399
FAX (406) 656-6398


MSE HKM ENGINEERING

FIGURE 2b

Copyright © 1998 MSE-HKM, Inc., All Rights Reserved.

LAND & WATER D-1

# Appendix E

---

## BIRD SURVEY PROTOCOL
## MACROINVERTEBRATE SAMPLING PROTOCOL
## GPS PROTOCOL

---

***MDT Wetland Mitigation Monitoring***
***Stillwater River***
***Absarokee, Montana***

LAND & WATER

# BIRD SURVEY PROTOCOL

The following is an outline of the MDT Wetland Mitigation Site Monitoring Bird Survey Protocol. Though each site is vastly different, the bird survey data collection methods must be standardized to a certain degree to increase repeatability. An Area Search within a restricted time frame will be used to collect the following data: a bird species list, density, behavior, and habitat-type use. There will be some decisions that team members must make to fit the protocol to their particular site. Each of the following sections and the desired result describes the protocol established to reflect bird species use over time.

**Species Use within the Mitigation Wetland: Survey Method**

Result: To conduct a bird survey of the wetland mitigation site within a restricted period of time and the budget allotment.

***Sites that can be circumambulated or walked throughout.***

These types of sites will include ponds, enhanced historic river channels, wet meadows, and any area that can be surveyed from the entirety of its perimeter or walked throughout. If the wetland is not uncomfortably inundated, conduct several "meandering" transects through the site in an orderly fashion (record the number and approximate location/direction of the transects in the field notebook; they do not have to be formalized or staked). If a very small portion of the site cannot be crossed due to inundation, this method will also apply. Though the sizes of the site vary, each site will require surveying to the fullest extent possible within a set time limit. The optimum times to conduct the survey are in the morning hours. Conduct the survey from sunrise to no later than 11:00 AM. (Note: some sites may have to be surveyed in the late afternoon or evening due to time constraints or weather; if this is the case, record the time of day and include this information in your report discussion.) If the survey is completed before 11:00 AM and no additions are being made to the list, then the task is complete. The overall limiting factor regarding the number of hours that are spent conducting this survey is the number of budgeted hours; this determination must be made by site by each individual.

In many cases, binoculars will be the only instrument that is needed to identify and count the birds using the wetland. If the wetland includes deep water habitat that can not be assessed with binoculars, then a scope and tripod are necessary. If this is the case, establish as many lookout posts as necessary from key vantage points to collect the data. Depending on the size of the open water, more time may be spent viewing the mitigation area from these vantage points than is spent walking the peripheries of more shallow-water wetlands.

***Sites that cannot be circumambulated.***

These types of sites will include large-bodied waters, such as reservoirs, particularly those with deep water habitat (>6 ft) close to the shore and no wetland development in that area of the shoreline. If one area of the reservoir was graded in such a way to create or enhance the development of a wetland, then that will be the area in which the ambulatory bird survey is conducted. The team member must then determine the length of the shoreline that will be surveyed during each visit.

As stated above in the ambulatory site section, these large sites most likely will have to be surveyed from established vantage points.

**Species Use within the Mitigation Wetland: Data Recording**

Result: A complete list of bird species using the site, an estimate of bird densities and associated behaviors, and identification of habitat use.

***1. Bird Species List***

Record the bird species on the Bird Survey - Field Data Sheet using the appropriate 4-letter code of the common name. The coding uses the first two letters of the first two words of the birds' common name or if one name, the first four (4) letters. For example, mourning dove is coded MODO and mallard is MALL. If an unknown individual is observed, use the following protocol and define your abbreviation at the bottom of the field data sheet: unknown shorebird: UNSB; unknown brown bird (UNBR); unknown warbler (UNWA); unknown waterfowl (UNWF). For a flyover of a flock of unknown species, use a term that describes the birds' general characteristics and include the approximate flock size in parentheses; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded: UNBB / FO (25). You may also note on the data sheet if that particular individual is using a constructed nest box.

***2. Bird Density***

In the office, sum the Bird Survey – Field Data Sheet data by species and by behavior. Record this data in the Bird Summary Table.

***3. Bird Behavior***

Bird behavior must be identified by what is known. When a species is simply observed, the behavior that it is immediately exhibiting is what is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair individual (BP); foraging (F); flyover (FO); loafing (L; e.g. sleeping, roosting, floating with head tucked under wing are loafing behaviors); and, nesting (N). If more behaviors are observed that do have a specific descriptive word, use them and we will add it to the protocol; descriptive words or phrases such as "migrating" or "living on site" are unknown behaviors.

***4. Bird Species Habitat Use***

We are interested in what bird species are using which particular habitat within the mitigation wetlands. This data is easily collected by simply recording what habitat the species was initially observed. Use the following broad category habitat classifications: aquatic bed (AB - rooted floating, floating-leaved, or submergent vegetation); forested (FO); marsh (MA – cattail, bulrush, emergent vegetation, etc. with surface water); open water (OW – primarily unvegetated); scrub-shrub (SS); and upland buffer (UP); wet meadow (WM – sedges, rushes, grasses with little to no surface water). If other categories are observed onsite that are not suggested here, we will make a new category next year.

# AQUATIC INVERTEBRATE SAMPLING PROTOCOL

## Equipment List

- D-frame sampling net with 1 mm mesh. Wildco is a good source of these.
- Spare net.
- 1-liter plastic sample jars, wide-mouth. VWR has these: catalog #36319-707.
- 95% ethanol: Northwest Scientific in Billings carries this.

All these other things are generally available at hardware or sporting goods stores. Make the labels on an ink jet printer preferably.

- hip waders.
- pre-printed sample labels (printed on Rite-in-the-Rain or other coated paper, two labels per sample).
- pencil.
- plastic pail (3 or 5 gallon).
- large tea strainer or framed screen.
- towel.
- tape for affixing label to jar.
- cooler with ice for sample storage.

## Site Selection

Select the sampling site with these considerations in mind:

- Select a site accessible with hip waders. If substrates are too soft, lay a wide board down to walk on.
- Determine a location that is representative of the overall condition of the wetland.

## Sampling

Wetland invertebrates inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. Your goal is to sweep the collecting net through each of these habitat types, and then to combine the resulting samples into the 1-liter sample jar.

Dip out about a gallon of water into the pail. Pour about a cup of ethanol into the sample jar. Fill out the top half of the sample labels, using pencil, since ink will dissolve in the ethanol.

Ideally, you can sample a swath of water column from near-shore outward to a depth of approximately 3 feet with a long sweep of the net, keeping the net at about half the depth of the water throughout the sweep. Sweep the water surface as well. Pull the net through a vegetated area, beneath the water surface, for at least a meter of distance.

Sample the substrate by pulling the net along the bottom, bumping it against the substrate several times as you pull.

This step is optional, but it gives you a chance to see that you've collected some invertebrates. Rinse the net out into the bucket, and look for insects, crustaceans, etc. If necessary, repeat the sampling process in a nearby location, and add the net contents to the bucket. Remember to sample all four environments.

Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar.

If you skip the bucket-and-sieve steps, simply lift handfuls of material out of the sampling net into the jars. In either case, please include some muck or mud and some vegetation in the jar. Often, you will have collected a large amount of vegetable material. If this is the case, lift out handfuls of material from the sieve into the jar, until the jar is about half full. Please limit material you include in the sample, so that there is only a single jar for each sample.

Top off the sample jar with enough ethanol to cover all the material in the jar. Leave as little headroom as possible.

It is not necessary to sample habitats in any specified order. Keep in mind that disturbing the habitats prior to sampling will chase off the animals you are trying to capture.

Complete the sample labels. Place one label inside the sample jar and tape the other label securely to the outside of the jar. Dry the jar before attaching the outer label if necessary. In some situations, it may be necessary to collect more than one sample at a site. If you take multiple samples from the same site, clearly indicate this by using individual sample numbers, along with the total number of samples collected at the site (e.g. Sample #3 of 5 total samples).

Photograph the sampled site.

**Sample Handling/Shipping**

- In the field, keep collected samples cool by storing them in a cooler. Only a small amount of ice is necessary.
- Inventory all samples, preparing a list of all sites and enumerating all samples, before shipping or delivering to the laboratory.
- Deliver samples to Rhithron.

## GPS Mapping and Aerial Photo Referencing Procedure

The wetland boundaries, photograph location points and sampling locations were field located with mapping grade Trimble Geo III GPS units. The data was collected with a minimum of three positions per feature using Course/Acquisition code. The collected data was then transferred to a PC and differentially corrected to the nearest operating Community Base Station. The corrected data was then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet.

The GPS positions collected and processed had a 68% accuracy of 7 feet except in isolated areas of Tasks .008 and .011, where it went to 12 feet. This is within the 1 to 5 meter range listed as the expected accuracy of the mapping grade Trimble GPS.

Aerial reference points were used to position the aerial photographs. This positioning did not remove the distortion inherent in all photos; this imagery is to be used as a visual aide only. The located wetland boundaries were given a final review by the wetland biologist and adjustments were made if necessary.

Any relationship of features located to easement or property lines are not to be construed from these figures. These relationships can only be determined with a survey by a licensed surveyor.