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# MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2004

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*Batavia  
Kalispell, Montana*



Prepared for:

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

Prepared by:

**LAND & WATER CONSULTING**  
~ A DIVISION OF **PBS&J**  
P.O. Box 239  
Helena, MT 59624

June 2005

Project No: B43054.00 - 0104



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## 1.0 INTRODUCTION

The Batavia Waterfowl Production Area (WPA) mitigation project is located in Smith Valley, approximately 5 miles southwest of Kalispell (**Figure 1**). The general property location is within Township 28 North, Range 22 West, Sections 20 and 21, Flathead County.

The Batavia WPA mitigation project was developed to mitigate wetland impacts associated with Montana Department of Transportation (MDT) roadway projects that have been, or will be constructed in Watershed No. 4. Specifically, the mitigation pertains to impacts on the Missoula County Line North, Somers to Whitefish, Swan River Bridge, and future projects.

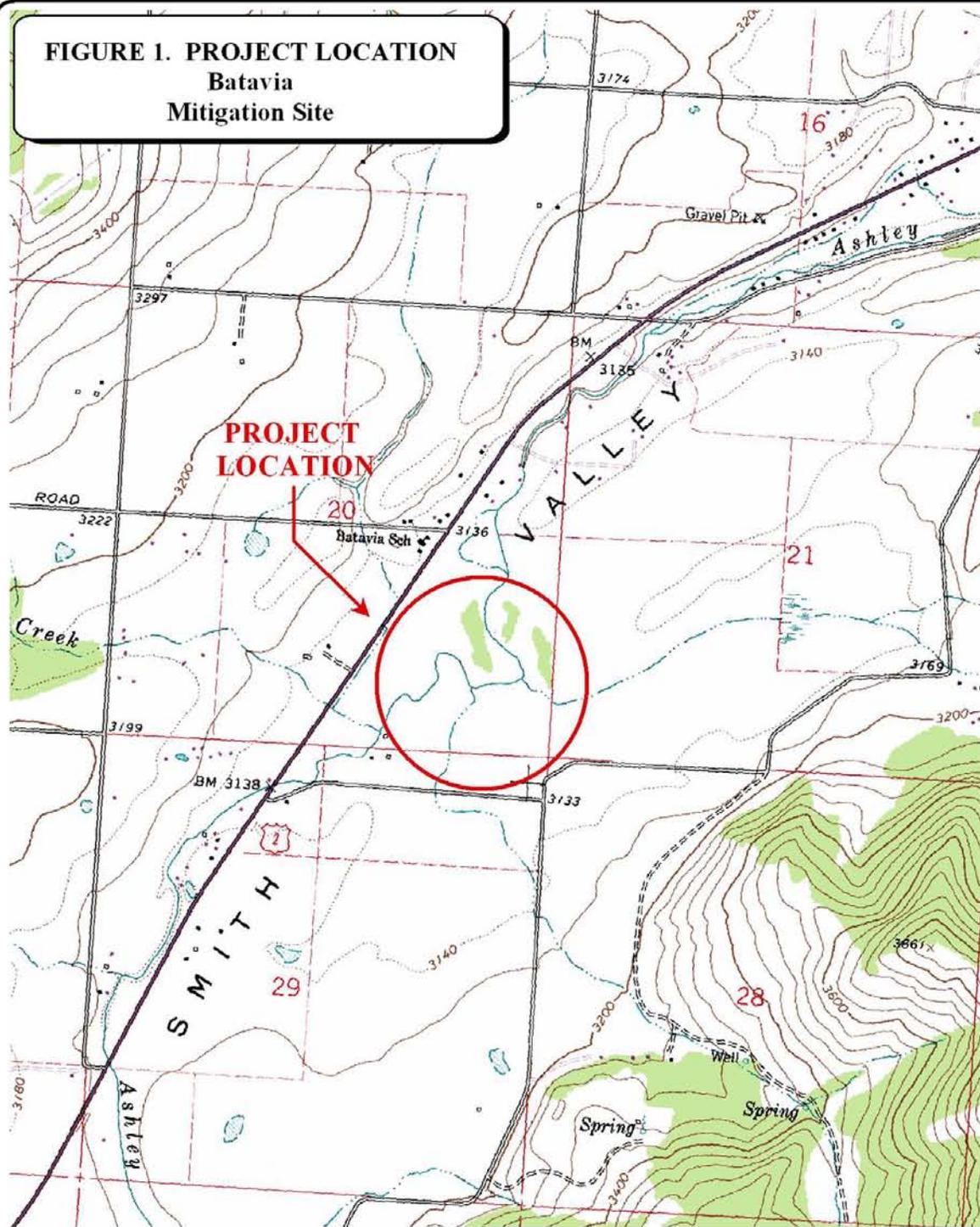
The entire WPA is influenced by a high groundwater table and by surface water diverted out of nearby Ashley Creek. Over time, the existing dike structure and water delivery system became degraded to a point where the dike was no longer holding water at the desired elevation. The intent of the project was to raise the water level approximately 2 feet to increase the area of inundation. This was to be achieved by reconstructing the degraded dike system. Construction was completed in January 1998 with the goal of creating and enhancing wetlands. In addition to reconstructing the dike, several defunct culverts were removed, three new control devices were installed, and open water was restored in the vicinity of several small islands, essentially enhancing the site by creating habitat diversity.

According to MDT project files, mitigation credits were determined by assigning credit ratios for creation and enhancement across the entire site. A total of 28.72 acres of credit was agreed upon by MDT, the USFWS, and Army Corps of Engineers (COE), with the potential for an additional 6.8 acres to be credited following post-project monitoring. Credits were broken down as follows:

Wetland Creation minus impacts from new dike:	18.2 acres credited at 2:1 =	9.10 acres
North Cell enhancement:	76.8 acres credited at 8:1 =	9.60 acres
South Cell enhancement:	60.0 acres credited at 6:1 =	<u>10.0 acres</u>
		Total =28.72 acres

The WPA encompasses two primary hydrologic areas referred to as the North Cell (76.8 acres) and South Cell (60.3 acres). Due to the immense size of the WPA and the enormous effort required to monitor the entire site, three monitoring areas were selected by MDT to serve as representations of the larger site. The three monitoring areas are located: 1) at the southwest corner of the South Cell (Wetland D); 2) between the North Cell and South Cell on the western end (Wetlands B and C); and 3) on the northwest side of the North Cell (Wetland A) (**Figure 2, Appendix A**). Borrow material was removed from each of these areas for construction of the new dike and wetland creation was expected at each location.

**FIGURE 1. PROJECT LOCATION**  
**Batavia**  
**Mitigation Site**



PROJECT #: 130091.006  
 DATE: MAY 2001  
 LOCATION:  
 PROJECT MANAGER: B. DUTTON  
 DRAWN BY: B. NOECKER

**LAND & WATER CONSULTING, INC.**  
 1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

## 2.0 METHODS

### 2.1 Monitoring Dates and Activities

The site was visited on May 27<sup>th</sup> (spring) and July 28<sup>th</sup> (mid-season) 2004. The late-May to early-June period was selected for the spring visit because monitoring between mid-May and early June is likely to detect migrant as well as early nesting activities for a variety of avian species (Carlson pers. comm.), as well as maximizing the potential for amphibian detection. In Montana, most amphibian larval stages are present by early June (Werner pers. comm.).

The mid-season visit was conducted between mid-July and mid-August to document vegetation, soil, and hydrologic conditions. All of the information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at Wetland D per the direction of MDT. Activities and information conducted/collected at Wetland D included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transect; soils data; hydrology data; bird and general wildlife use; photograph points; functional assessment; and (non-engineering) examination of dike structures.

Wetlands A, B, and C were also visited in July and delineated based on vegetation, hydrology and soil characteristics; however, monitoring forms were not completed. This monitoring approach was established by MDT and Land & Water in August 2001 because it was determined that conducting the full assessment at Wetlands A, B, and C would not aid in determining wetland development across the entire WPA.

### 2.2 Hydrology

Hydrologic indicators were evaluated at the site during the mid-season visit. Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual. Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**).

All additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). The boundary between wetlands and open water (no rooted vegetation) aquatic habitats was mapped on the aerial photograph and an estimate of the average water depth at this boundary was recorded. Groundwater located within 18 inches of the ground surface (soil pit depth for purposes of delineation), was documented on the wetland delineation form at each data point.

### 2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Juncus balticus/Phalaris arundinacea*) were delineated on an aerial photograph during the mid-season visit. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation and may not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the site monitoring form (**Appendix B**).

The 10-foot wide belt transect that was established in Wetland D during 2001 was evaluated for the fourth time **Figure 2 (Appendix A)**. Percent cover was estimated for each successive vegetative species encountered within the “belt” using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%). The purpose of the transect is to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the air photo and all data recorded on the mitigation site monitoring form. Transect endpoint locations were initially recorded in 2001 with the GPS unit. Photos along the transect were taken from both ends during the mid-season visit.

A comprehensive plant species list for the site was first compiled in 2001 and has been updated with new species encountered. Ultimately, observations from past years will be compared with new data to document vegetation changes over time. Woody species were not planted at this mitigation site and therefore, monitoring relative to the survival of planted species was not conducted.

## **2.4 Soils**

Soils were evaluated during the mid-season visit according to hydric soils determination procedures 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 (USDA 1998).

## **2.5 Wetland Delineation**

Prior to initiating monitoring efforts at this site, it was agreed upon by MDT and Land & Water that a full wetland delineation of the entire WPA was not warranted at that time. Therefore, wetland delineation was conducted only at Wetlands A, B, C and D according the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the four monitoring areas were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary that was delineated on the air photo and recorded with a resource grade GPS unit in 2001 was checked again in 2004. The wetland/upland boundary in combination with the wetland/open water habitat boundary was used to calculate the developed wetland area.

## **2.6 Mammals, Reptiles, and Amphibians**

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during each visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. Observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not implemented. A comprehensive list of observed species was compiled for comparison to previous monitoring events.

## 2.7 Birds

Bird observations were recorded during both the spring and summer monitoring visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the mid-season visit, bird observations were recorded according to the established protocol while conducting the other monitoring activities and are shown in **Appendix D**. Observations were categorized by species, activity code, and general habitat association (see field and office data forms in **Appendix B**). Observations from past years are compared with new data.

## 2.8 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Batavia site per the request of MDT.

## 2.9 Functional Assessment

A functional assessment form was completed for all wetlands encompassed by the WPA using the 1999 MDT Montana Wetland Assessment Method (**Appendix B**). The entire site was included for functional assessment in order to compare with the pre-project functional assessment, which was completed using the 1996 MDT Montana Wetland Field Evaluation Form. Field data necessary for this assessment were generally collected during each mid-season site visit. The remainder of the functional assessment was completed in the office and is compared to the 1999 baseline functional assessment.

## 2.10 Photographs

Photographs were taken during the mid-season visit showing the current land use surrounding the site, the monitored area, and the vegetation transect. Each photo point location was recorded with a resource grade GPS in 2001, and are shown on **Figure 2, Appendix A**. All photographs were taken using a 50 mm lens. A description and compass direction for each photograph was recorded on the wetland monitoring form. Photo points were revisited in 2004.

## 2.11 GPS Data

During the 2001 monitoring season, survey points were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations, and at all photograph locations. Wetland boundaries were also surveyed with a resource grade GPS unit. No new GPS data were collected during the 2004 monitoring year.

## 2.12 Maintenance Needs

The dike and water control structures were examined during each site visit for obvious signs of breaching, damage, or other problems. This did not constitute an engineering-level structural inspection, but rather a cursory examination.

### 3.0 RESULTS

#### 3.1 Hydrology

The Batavia WPA is influenced by a high groundwater table and also receives water that is diverted out of Ashley Creek. Pre-project notes found in MDT files indicate that maximum water levels prior to construction of the new dike occurred at 3126.2 feet elevation, with adjacent wetland habitat delineated up to elevation 3127. The newly proposed dike and water delivery system were designed to bring water levels within both the north and south cells to elevation 3128.5. The original delineation and pre-construction information is provided in the 2001 monitoring report prepared by Land & Water Consulting.

It appears as though the desired full pool elevation of 3128.5 has never been met at this site. Possible reasons include extended drought conditions in the Flathead Valley, water control structures originally set at the wrong elevations, and possible interruption of water delivery from Ashley Creek by local landowners. Drought conditions in the Flathead Valley are likely having the greatest influence on water levels at Batavia. According to the Western Regional Climate Center, Kalispell yearly precipitation totals for 2000 (10.5 inches), 2001 (12.47 inches), 2002 (12.92), 2003 (12.48), and 2004 (16.87 inches) were 67, 79, 82, 79, and 107 percent, respectively, of the total annual mean precipitation (15.75 inches) in this area. Lower than average groundwater levels and the inability of the USFWS to divert water from Ashley Creek while still maintaining minimum in-stream flows are thought to be the primary reasons for the site not reaching its full potential.

Another possible reason for the site not reaching full pool is due to interruption of water delivery from Ashley Creek by local landowners. Though not confirmed, it is thought that one or more landowners are responsible for pulling boards out of the instream flow diversion on Ashley Creek. Adjacent landowners are perhaps motivated to do so by concern that their own property will be flooded by raising the water table on the WPA and/or that they will not receive their full water right allotment from Ashley Creek.

During field investigations, the pond area in Wetland D was inundated and the depressional areas at Wetlands B and C were significantly wetter in 2004 than in 2003. Wetland A displayed saturated soil conditions, but was not inundated (see **Figure 3, Appendix A**). Designed open water areas surrounding the numerous small islands in both cells contained surface water, but at low levels.

During close examination of the project site in 2004, DU determined that the three excavated areas being monitored were not originally excavated to the design elevation, thus preventing these areas from becoming saturated and developing wetland characteristics. Corrective measures were taken in the fall of 2004 and are discussed later in this report.

#### 3.2 Vegetation

Vegetation species identified on the site within Wetland D are presented in **Table 1** and on the attached data form. Seven community types were identified and mapped on the mitigation area

in 2004 which is the same as what was recorded in 2003 (**Figure 3, Appendix A**). These included Type 1: *Agropyron smithii*/mixed grass upland; Type 2: *Hordeum jubatum*/*Eleocharis palustris*; Type 3: *Juncus balticus*/*Phalaris arundinacea*; Type 4: *Scirpus acutus*; Type 5: *Agropyron smithii*/*Potentilla anserina*; Type 6: *Ceratophyllum demersum*; and Type 7 *Eleocharis palustris*. Dominant species within each of these communities are listed on the attached data form (**Appendix B**).

**Table 1: 2001 - 2004 Batavia vegetation species list.**

Scientific Name	Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	FACU
<i>Agropyron smithii</i>	FACU
<i>Agropyron repens</i>	FACU
<i>Agrostis alba</i>	FAC
<i>Agrostis stolonifera</i>	FAC
<i>Alisma plantago-aquatica</i>	OBL
<i>Alopecurus pratensis</i>	FACW
<i>Antennaria spp.</i>	--
<i>Aster hesperius</i>	OBL
<i>Carex diandra</i>	OBL
<i>Carex parryana</i>	FAC+
<i>Carduus nutans</i>	(Status NX)
<i>Ceratophyllum demersum</i>	OBL
<i>Chenopodium album</i>	FAC
<i>Cirsium arvense</i>	FACU+
<i>Cirsium vulgare</i>	FACU
<i>Cynoglossum officinale</i>	FACU
<i>Deschampsia cespitosa</i>	FACW
<i>Distichlis stricta</i>	FAC+
<i>Eleocharis palustris</i>	OBL
<i>Elymus cinereus</i>	FAC
<i>Epilobium watsonii</i>	FACW
<i>Erigeron lonchophyllus</i>	FACW
<i>Gnaphalium palustre</i>	FAC+
<i>Hippuris vulgaris</i>	OBL
<i>Hordeum jubatum</i>	FAC
<i>Juncus balticus</i>	FACW+
<i>Juncus castaneus</i>	FACW
<i>Juncus nevadensis</i>	FACW
<i>Koeleria cristata</i>	--
<i>Lotus corniculatus</i>	FAC
<i>Melilotus alba</i>	FACU
<i>Melilotus officinalis</i>	FACU
<i>Mentha arvensis</i>	FACW-
<i>Monolepis nuttalliana</i>	FAC-
<i>Muhlenbergia asperifolia</i>	FACW
<i>Phalaris arundinacea</i>	FACW
<i>Phleum pratense</i>	FAC-
<i>Poa juncifolia</i>	FACU+
<i>Poa pratensis</i>	FAC
<i>Polygonum amphibium</i>	OBL
<i>Polypogon monspeliensis</i>	FACW

**Table 1 (continued): 2001 - 2004 Batavia vegetation species list.**

Scientific Name	Region 9 (Northwest) Wetland Indicator
<i>Potamogeton natans</i>	OBL
<i>Potentilla anserina</i>	OBL
<i>Puccinellia nuttalliana</i>	OBL
<i>Ranunculus cymbalaria</i>	OBL
<i>Rumex crispus</i>	FAC+
<i>Scirpus acutus</i>	OBL
<i>Sisymbrium altissimum</i>	--
<i>Sisyrinchium angustifolium</i>	FACW-
<i>Smilacina stellata</i>	--
<i>Spartina gracilis</i>	FACW
<i>Stachys palustris</i>	FACW+
<i>Taraxacum officinale</i>	FACU
<i>Tragopogon dubius</i>	--
<i>Triglochin maritimum</i>	OBL
<i>Typha latifolia</i>	OBL

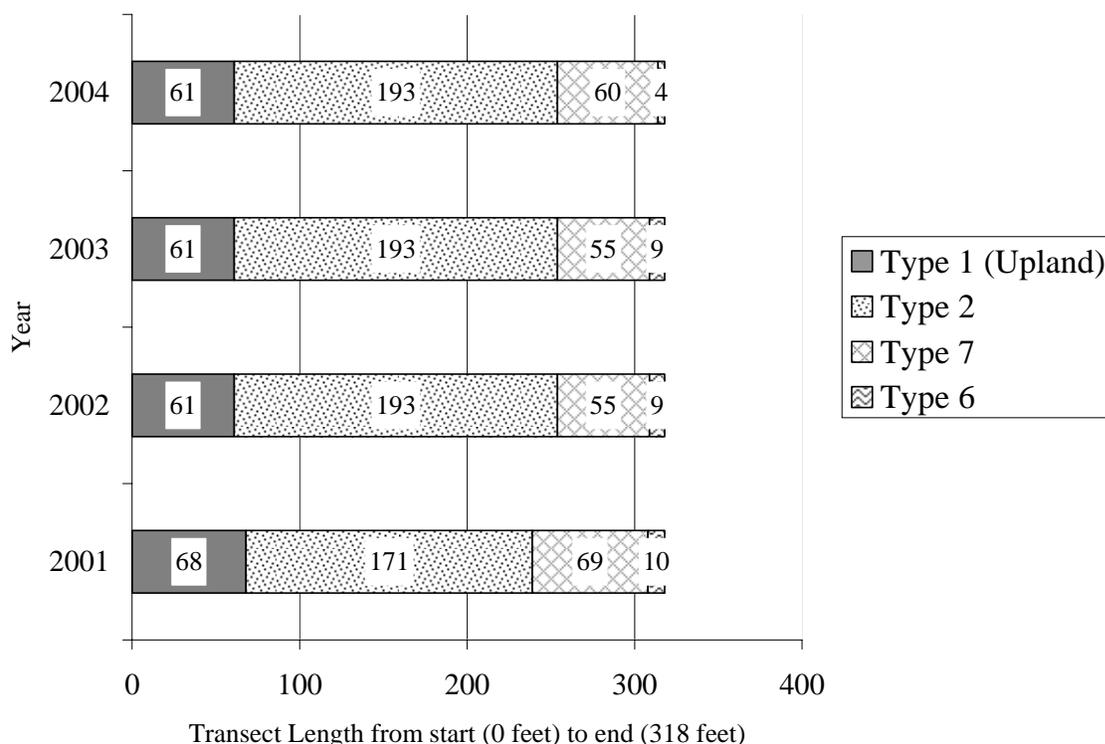
Type 1 occurs in the upland southeast of the mudflat and consists of upland grasses dominated by *Agropyron smithii*, and accompanied by *Elymus cinereus*, *Koeleria cristata*, *Spartina gracilis*, and *Agropyron repens*. Type 2 is present on the mud flat and consists primarily of *Hordeum jubatum*, *Eleocharis palustris* and *Puccinellia nuttalliana*. Type 3 is present west of the mudflat and consists of *Juncus balticus* and *Phalaris arundinacea*. Type 4 is dominated by *Scirpus acutus* and is present throughout the South Cell. Type 5 is a disturbed upland community present on the island, and is dominated by *Potentilla anserina*, *Agropyron smithii*, and bare ground. Type 6 is an aquatic community dominated by *Ceratophyllum demersum*. Type 7 is similar and occurs in close proximity to Type 2 except that *Eleocharis palustris* is dominant in this type instead of *Hordeum jubatum*, thus warranting a differentiation between the two types.

Vegetation transect results are detailed in the attached data form (**Appendix B**), and are summarized in the transect maps (**Table 2** and **Charts 1 and 2**). The transect begins in the upland above the mudflat and extends to the water, crossing four vegetation communities.

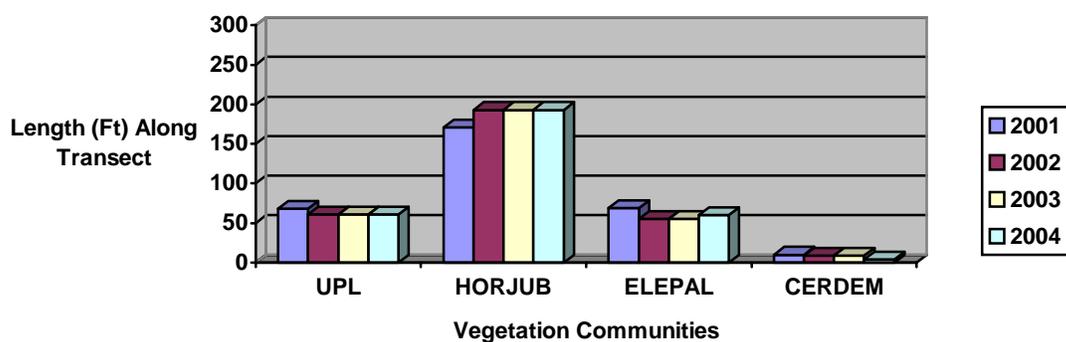
**Table 2: Vegetation transect data summary.**

Monitoring Year	2001	2002	2003	2004
<b>Transect Length (feet)</b>	318	318	318	318
<b># Vegetation Community Transitions along Transect</b>	4	4	4	4
<b># Vegetation Communities along Transect</b>	4	4	4	4
<b># Hydrophytic Vegetation Communities along Transect</b>	3	3	3	3
<b>Total Vegetative Species</b>	29	22	22	22
<b>Total Hydrophytic Species</b>	21	13	13	13
<b>Total Upland Species</b>	8	9	9	9
<b>Estimated % Total Vegetative Cover</b>	75	75	75	75
<b>% Transect Length Comprised of Hydrophytic Vegetation Communities</b>	79	81	81	81
<b>% Transect Length Comprised of Upland Vegetation Communities</b>	21	19	19	19
<b>% Transect Length Comprised of Unvegetated Open Water</b>	0	0	0	0
<b>% Transect Length Comprised of Bare Substrate</b>	0	0	0	0

**Chart 1: Transect maps showing vegetation types from start of transect (0 feet) to the end of transect (318 feet).**



**Chart 2: Length of vegetation communities along Transect 1.**



### 3.3 Soils

According to the Upper Flathead Valley Area soil survey (Soil Conservation Service 1960), soils in the mitigation site are classified as Muck and Peat. The mapping unit consists of mosses, rushes, grasses, sedges, cattails, trees and other woody vegetation in various stages of decomposition. Organic accumulations typically range from one-foot to four-feet thick. The soil remains moist or saturated most or all of the year unless artificially drained.

The muck and peat characteristics described above were present in the main cells but were not found within the monitoring areas. Three test pits (TP) were excavated along the vegetation transect and described using the COE routine wetland determination form. TP1 located along the vegetation transect in the upland consisted of a silt loam (10YR 3/2) in the A Horizon overlying a silty clay loam (10YR 7/1) in the B Horizon. No hydric characteristics were observed. TP2 was located in the mudflat along the vegetation transect. Hydric soil characteristics were marginally developed. A low-chroma (10YR 3/1) silt loam A-horizon was present from 1 to 2-inches and overlies a B-Horizon consisting of a mottled silty clay loam. These soil characteristics indicated an oxygen-depleted environment with a fluctuating water table. TP3 was located near the water and showed hydric characteristics well developed in a remnant upland soil. The A-Horizon consisted of a silty loam (10YR 2/1). The B-Horizon consisted of a silty clay loam (10YR 7/1) with many highly contrasting mottles (2.5YR 5/6). No changes in the soil profile were observed in the 2004 monitoring season.

### 3.4 Wetland Delineation

As discussed in the Methods Section of this report, wetland delineation was not completed for the entire WPA, but rather focused on the four borrow areas where wetland creation was anticipated. Delineated wetland boundaries are illustrated on **Figure 3**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. The delineated areas are similar to those observed in 2003.

In order to determine the acreage of wetland creation in the three monitoring areas, the original pre-project wetland delineation was overlaid onto the 2004 delineation for direct comparison. When comparing the preconstruction delineation to current conditions, delineation boundaries at Wetland A were nearly identical, with a very slight gain of 0.06 acre. It should be noted that this is likely attributed to mapping/scale error, and is not the result of wetland expansion in the area. The borrow area in this monitoring site has clearly not established any wetland characteristics. Further comparison of the pre and post-project delineations show a gain of 0.50 acre at Wetland B, 0.69 acre at Wetland C, and 0.54 acre at Wetland D. Total wetland creation for the four wetlands is 1.73 acres. Due to the very low water elevations on the site, the results of the delineation were to be expected.

The original goal of the project was to create approximately three acres of wetland in the borrow areas and 5.9 acres up to the designed full pool elevation in the north and south cells combined. It was also anticipated that an additional 13.6 acres of wetland would develop beyond the full pool elevation through capillary action in the soil. When added together, a gross total of 22.5 acres of creation was expected across the site. Subtract from this the 4.3 acres of impact from the new dike structure and the net wetland gain was to be 18.2 acres. A full delineation of the north and south cells would need to be conducted in order to determine if the anticipated periphery wetlands have developed. This was originally planned for the 2004 monitoring season, but was postponed by MDT until further notice.

In addition to the wetland creation, the project was also intended to enhance existing wetlands for wildlife habitat and species diversification. Several of the existing islands were enlarged and the open water component surrounding them increased also to improve waterfowl breeding and

nesting success on the site. It was also anticipated that the improved water delivery and retention on the site would result in minor changes in plant community composition away from monotypic stands of reed canary grass, cattail, and bulrush that dominate the site. With monitoring activities focused on the three borrow areas, it is difficult to quantify enhancements that have occurred across the entire site; however, with ten different species of breeding and/or nesting waterfowl and numerous other bird species documented at Batavia since the inception of monitoring, it would appear that wetland enhancements have been successful.

### 3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2004 monitoring efforts are listed in **Table 3**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the completed monitoring form in **Appendix B**. Five mammal and numerous bird species have been noted using the mitigation site. Observations in 2004 were similar to previous years.

### 3.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Batavia site per the direction of MDT.

**Table 3: Fish and wildlife species observed at the Batavia Mitigation Site 2001-2004.**

<b>FISH, AMPHIBIANS, AND REPTILES</b>	
None	
<b>BIRDS</b>	
<b>American Coot</b> ( <i>Fulica americana</i> ) American Robin ( <i>Turdus migratorius</i> ) <b>American Wigeon</b> ( <i>Anas americana</i> ) <b>Blue-winged Teal</b> ( <i>Anas discors</i> ) <b>Canada Goose</b> ( <i>Branta canadensis</i> ) <b>Cinnamon Teal</b> ( <i>Anas cyanoptera</i> ) Cliff Swallow ( <i>Petrochelidon pyrrhonota</i> ) <b>Common Goldeneye</b> ( <i>Bucephala clangula</i> ) <b>Common Raven</b> ( <i>Corvus corax</i> ) <b>Common Snipe</b> ( <i>Gallinago gallinago</i> ) Gray Partridge ( <i>Perdix perdix</i> ) <b>Great Blue Heron</b> ( <i>Ardea herodias</i> ) <b>Gull</b> ( <i>Larus sp.</i> ) <b>Hooded Merganser</b> ( <i>Lophodytes cucullatus</i> ) House Sparrow ( <i>Passer domesticus</i> )	<b>Killdeer</b> ( <i>Charadrius vociferous</i> ) <b>Mallard</b> ( <i>Anas platyrhynchos</i> ) <b>Northern Harrier</b> ( <i>Circus cyaneus</i> ) <b>Northern Shoveler</b> ( <i>Anas clypeata</i> ) Osprey ( <i>Pandion haliaetus</i> ) Redhead ( <i>Aythya americana</i> ) <b>Red-winged Blackbird</b> ( <i>Agelaius phoeniceus</i> ) Ring-necked Duck ( <i>Aythya collaris</i> ) <b>Sandhill Crane</b> ( <i>Grus canadensis</i> ) Song Sparrow ( <i>Melospiza melodia</i> ) Spotted Sandpiper ( <i>Actitis macularia</i> ) <b>Tree Swallow</b> ( <i>Tachycineta bicolor</i> ) <b>Turkey Vulture</b> ( <i>Cathartes aura</i> ) Yellow Warbler ( <i>Dendroica petechia</i> ) <b>Yellow-headed Blackbird</b> ( <i>Xanthocephalus xanthocephalus</i> )
<b>MAMMALS</b>	
Coyote ( <i>Canis latrans</i> ) Raccoon ( <i>Procyon lotor</i> ) Striped Skunk ( <i>Mephitis mephitis</i> ) Weasel ( <i>Mustela sp.</i> ) <b>White-tailed Deer</b> ( <i>Odocoileus virginianus</i> )	

**Bolded** species were documented during the 2004 monitoring. All other species have been documented during one or more of the previous monitoring seasons.

### 3.7 Functional Assessment

The completed functional assessment form is presented in **Appendix B**. Functional assessment results are summarized in **Table 4**. In order to compare pre and post project functional assessment, the entire site was considered including the active Ashley Creek channel. Although direct comparisons cannot be made between the two assessments because different versions of the form were used, general comparisons can be made. A comparison of the two assessments shows similarities, although the most recent functional assessment produced higher ratings based on MNHP species habitat (Forster's and black terns), groundwater discharge/recharge, and recreation/education potential. The original functional assessment rated the wetland as a Category II with 65% of possible points, while the current assessment rated the wetland as a Category II with 80% of possible points. This assessment is unchanged from 2003.

Incorrect ratings on the original functional assessment for MNHP species habitat and groundwater recharge/discharge likely resulted in a lower percent of possible points attributed to the site at that time.

When baseline functional scores are compared to post-project functional scores, the site appears to have changed little since completion of the project. This is, in part, due to the application of differing pre- and post-project functional assessment methods and the assignment of very high scores for most functions in the baseline condition. Once a site rates the highest possible score for a given function, it is difficult to document further functional improvement. For example, enhancement activities were carried out on the project, including the excavation of numerous small open water areas interspersed throughout the marsh. While the excavation of these areas has increased habitat diversity at the site, functional assessment has not been able to quantify these enhancements because the site was (correctly) assigned the highest possible score for wildlife habitat (1.0) prior to onset of this activity.

### 3.8 Photographs

Representative photos taken from photo-points and transect ends are provided in **Appendix C** in addition to the 2003 MDT aerial photograph.

### 3.9 Maintenance Needs/Recommendations

The berm and associated water control structures were in good condition during the mid-season visit.

In order for this site to reach its full potential, it is critical that the designed water elevation of 3128.5 be attained, especially during the spring and early growing season. During years of average or above average runoff, enough water should be available to successfully recharge the site through diversion out of Ashley Creek. As managers of the Batavia WPA, it would seem that the USFWS would be responsible for this management activity. During February 2004, MDT personnel met with representatives from Ducks Unlimited (DU) and the USFWS to discuss corrective actions. In the fall of 2004 (after monitoring was completed) DU completed corrective actions to lower the previously mentioned borrow areas to their design elevation. The

**Table 4: Summary of 2004 wetland function/value ratings and functional points <sup>1</sup> at the Batavia Mitigation Project.**

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	1996 Baseline Assessment <sup>2</sup>	2004 Assessment
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)
MNHP Species Habitat	Low (0.1)	High (1)
General Wildlife Habitat	High (1.0)	Exceptional (1.0)
General Fish/Aquatic Habitat	Mod (0.7)	Low (0.3)
Flood Attenuation	Mod (0.5)	Mod (0.6)
Short and Long Term Surface Water Storage	High (1.0)	High (1.0)
Sediment, Nutrient, Toxicant Removal	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	High (1.0)	High (0.9)
Production Export/Food Chain Support	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	Low (0.1)	High (1.0)
Uniqueness	Mod (0.5)	Mod (0.6)
Recreation/Education Potential	Mod (0.7)	High (1.0)
Actual Points/Possible Points	7.8/12	9.6 / 12
% of Possible Score Achieved	65%	80 %
Overall Category	II	II
Total Acreage of Assessed Wetlands within Easement (north and south cells)	137.00	138.73
Functional Units (acreage x actual points)	1069	1332
Net Acreage Gain (ac)	NA	1.73
Net Functional Unit Gain (fu)	NA	263
Total Functional Unit Gain (fu)	NA	263

<sup>1</sup> See completed MDT functional assessment forms in Appendix B for further detail.

<sup>2</sup> Baseline assessment was performed by MDT using the Montana Field Evaluation Form (Revised 7/1/96).

areas will be monitored closely beginning in 2005 to document the establishment of wetland habitat in these areas.

### 3.10 Current Credit Summary

According to MDT project files, mitigation credits were determined by assigning credit ratios for creation and enhancement across the entire site. A total of 28.72 acres of credit was agreed upon by MDT, the USFWS, and COE, with the potential for an additional 6.8 acres to be credited following post-project monitoring.

Credits were broken down as follows:

Wetland Creation minus impacts from new dike:	18.2 acres credited at 2:1 =	9.10 acres
North Cell enhancement:	76.8 acres credited at 8:1 =	9.60 acres
South Cell enhancement:	60.0 acres credited at 6:1 =	<u>10.0 acres</u>
		Total =28.72 acres

Little wetland habitat has been created either in the borrow areas (1.73 acres) or around the periphery of the site. Lack of water is the primary influencing factor. Approximately 19.6 acres of enhancement has occurred in the north and south cells through the creation of more open

water habitat around the many small islands. The COE has concurred with this determination. Creating habitat diversity by adding open water areas has likely attracted more wildlife species and potentially encouraged the establishment different emergent and submergent plant communities. These areas would be even further enhanced with increased water levels across the site.

Current credit that has developed at the site consists of 1.73 acres creation + 19.6 acres = 21.33 acres. Subtracting 4.3 acres from dike construction leaves 17.03 acres of net wetland credit.

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## Appendix A

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### FIGURES 2 & 3

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*MDT Wetland Mitigation Monitoring  
Batavia  
Kalispell, Montana*

# Figure 2 - Monitoring Activity Locations



**LEGEND**  
 Monitoring Area Limits  
 Vegetation Transect  
 Photograph Point  
 Aerial Reference Point  
 Soil Sample  
 Base Photograph Date: July 16, 2001



D ROLL:000 SCALE:1:6000 FLT:03 07/16/2001 11:25:55

PROJ NO: 130091.006	DRAWN: RA	PROJECT NAME: MDT Batavia Wetland Mitigation
FILE NAME: TASKBASE.dwg	CHECKED: AK	DRAWING TITLE: Monitoring Activity Locations
SCALE: 1"= 300ft	APPROV: JB	
LOCATION: Batavia	PROJ MGR: BD	
SHEET NUMBER		
F2		
REV -		
DATE:		

0 FF1.0 EC 0 SP1 v/h.08600 60% dt813.6 ds087 26.9V -59mb EI

# Figure 3 - Mapped Site Features 2004



**LEGEND**  
 Monitoring Area Limits ———  
 Wetland Boundary ———  
 Vegetation Community Boundary ———  
 Base Photograph Date: July 16, 2001

**Net Wetland Area Within Monitoring Limits:**  
 Wetland "A" 0.925 Acres  
 Wetland "B" 0.58 Acres  
 Wetland "C" 1.20 Acres  
 Wetland "D" 3.030 Acres

- Vegetation Types:**
- ① Agropyron smithii
  - ② Hordeum jubatum/Eleocharis palustris
  - ③ Juncus balticus/Phalaris arundinacea
  - ④ Scirpus acutus
  - ⑤ Agropyron smithii/Potentilla anserina
  - ⑥ Ceratophyllum demersum
  - ⑦ Eleocharis palustris



PROJECT NAME MDT Batavia Wetland Mitigation	
DRAWING TITLE Mapped Site Features 2004	
PROJ. NO: 130091.006	DRAWN: RA
FILE NAME: TASKBASE.dwg	CHECKED:
SCALE: 1" = 300ft	APPVD: BD
LOCATION: Batavia	PROJ MGR: BD
SHEET NUMBER <b>3</b> of 5	
DATE: 6-1-05	

## **Appendix B**

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**COMPLETED 2004 WETLAND MITIGATION SITE MONITORING  
FORM**

**COMPLETED 2004 BIRD SURVEY FORMS**

**COMPLETED 2004 WETLAND DELINEATION FORMS**

**COMPLETED 2004 FUNCTIONAL ASSESSMENT FORMS**

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*MDT Wetland Mitigation Monitoring*

*Batavia*

*Kalispell, Montana*

# LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Batavia Project Number: B43054.00 - 0104 Assessment Date: 7/28/04  
 Location: Batavia WPA - Kalispell MDT District: Missoula Milepost: \_\_\_\_\_  
 Legal description: T28N R22W Section 20, 21 Time of Day: 1900  
 Weather Conditions: Partly cloudy & warm - 75 degrees Person(s) conducting the assessment: Traxler  
 Initial Evaluation Date: 7 / 12 / 01 Visit #: 2 Monitoring Year: 2004 (year 4)  
 Size of evaluation area:     Land use surrounding wetland: Rural Residential, Agriculture

## HYDROLOGY

**Surface Water** Source: Ashley Creek, groundwater  
 Inundation: Present  Absent  Average depths: 1-2ft Range of depths: 0 - 4 ft  
 Assessment area under inundation: 50%  
 Depth at emergent vegetation-open water boundary: 1-2 ft  
 If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes  No   
 Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Each of the wetland sites monitored had varying degrees of inundation and evidence of inundation ranging from drift lines to stained vegetation.

### Groundwater

Monitoring wells: Present  Absent   
 Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

### Additional Activities Checklist:

- Map emergent vegetation-open water boundary on air photo
- Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
- NA GPS survey groundwater monitoring wells locations if present

### COMMENTS/PROBLEMS:

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## VEGETATION COMMUNITIES: BATAVIA

Community No.:   1   Community Title (main species): Elymus smithii/Elymus repens

Dominant Species	% Cover	Dominant Species	% Cover
Elymus smithii	25	Distichlis stricta	3
Elymus cinereus	5	Achillea millefolium	5
Koeleria macrantha	3	Elymus repens	25
Juncus balticus	3	Aster ascendens	20
Poa pratensis	10	Poa juncifolia	10

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Community No.:   2   Community Title (main species): Hordeum jubatum/Eleocharis palustris

Dominant Species	% Cover	Dominant Species	% Cover
Hordeum jubatum	40	Distichlis stricta	5-10%
Puccinellia nuttalliana	10	Juncus balticus	2
Eleocharis palustris	35	Deschampsia cespitosa	1
Phalaris arundinacea	3	Potentilla anserina	trace
Scirpus acutus	1	Typha latifolia	trace

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Community No.:   3   Community Title (main species): Phalaris arundinacea/Juncus balticus

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	15-20	Deschampsia cespitosa	3
Phalaris arundinacea	40	Potentilla anserina	3
Carex lasiocarpa	15-20	Cirsium arvense	1
Mentha arvensis	5	Carduus nutans	Trace
Muhlenbergia asperifolia	5	Aster ascendens	1

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Additional Activities Checklist:**

         Record and map vegetative communities on air photo

## VEGETATION COMMUNITIES: BATAVIA

Community No.: 4 Community Title (main species): Scirpus acutus

Dominant Species	% Cover	Dominant Species	% Cover
Scirpus acutus	80	Mentha arvensis	1
Phalaris arundinacea	15	Polygonum amphibium	1
Juncus balticus	10	Potentilla anserina	trace
Carex lasiocarpa	10	Triglochin maritima	trace
Ceratophyllum demersum	5	Sium suave	trace

**COMMENTS/PROBLEMS:** \_\_\_\_\_

Community No.: 5 Community Title (main species): Elymus smithii/Potentilla anserina disturbed

Dominant Species	% Cover	Dominant Species	% Cover
Elymus smithii	20	Lotus corniculatus	2
Potentilla anserina	20	Melilotus alba	3
Phalaris arundinacea	20	Alopecurus pratensis	trace
Cirsium arvense	15	Bare ground	25
Carduus nutans	3		

**COMMENTS/PROBLEMS:** \_\_\_\_\_

Community No.: 6 Community Title (main species): Ceratophyllum demersum

Dominant Species	% Cover	Dominant Species	% Cover
Ceratophyllum demersum	90		
Potamogeton natans	5		
Scirpus acutus	5		
Eleocharis palustris			
Potamogeton pectinatus	1		

**COMMENTS/PROBLEMS:** \_\_\_\_\_

Community No.: 7 Community Title (main species): Eleocharis palustris

Dominant Species	% Cover	Dominant Species	% Cover
Hordeum jubatum	20	Distichlis stricta	5-10%
Puccinellia nuttalliana	10	Juncus balticus	2
Eleocharis palustris	60	Deschampsia cespitosa	1
Phalaris arundinacea	2	Potentilla anserina	trace
Scirpus acutus	1		

COMMENTS/PROBLEMS:

**COMPREHENSIVE VEGETATION LIST**

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
<i>Poa pratensis</i>	1	<i>Chenopodium album</i>	5
<i>Elymus cinereus</i>	1	<i>Sisymbrium altissimum</i>	5
<i>Achillea millefolium</i>	1,3	<i>Distichlis stricta</i>	1,2,5,7
<i>Koeleria macrantha</i>	1	<i>Ceratophyllum demersum</i>	2,6
<i>Juncus balticus</i>	1,2,3,4,5,6,7	<i>Antennaria rosea</i>	1
<i>Elymus repens</i>	1,2,3	<i>Deschampsia cespitosa</i>	2,3,5,7
<i>Tragopogon dubius</i>	1	<i>Polypogon monspeliensis</i>	2
<i>Hordeum jubatum</i>	1,2,3,5,7	<i>Aster ascendens</i>	1,2,3,5
<i>Phleum pratense</i>	1	<i>Festuca campestris</i>	1
<i>Smilacina stellata</i>	5	<i>Lactuca serriola</i>	2
<i>Eleocharis palustris</i>	2,5,6,7	<i>Muhlenbergia asperifolia</i>	3
<i>Puccinellia nuttalliana</i>	1,2,3,7	<i>Stachys palustris</i>	3
<i>Spartina gracilis</i>	1,2,3	<i>Carex lasiocarpa</i>	
<i>Typha latifolia</i>	2	<i>Sium suave</i>	4,6
<i>Elymus smithii</i>	1,2,3,5	<i>Potamogeton pectinatus</i>	6
<i>Aster hesperius</i>	1,5	<i>Sonchus asper</i>	5
<i>Potentilla anserina</i>	2,3,4,5,7	<i>Poa juncifolia</i>	1
<i>Phalaris arundinacea</i>	2,3,4,5,7	<i>Juncus nodosus</i>	4
<i>Scirpus acutus</i>	2,4,5,6,7	<i>Carex diandra</i>	3,4
<i>Alisma plantago-aquatica</i>	2,6		
<i>Hippuris vulgaris</i>	6		
<i>Agrostis stolonifera</i>	1,2,3		
<i>Cirsium vulgare</i>	3		
<i>Carduus nutans</i>	1,3,5		
<i>Triglochin maritima</i>	2,3,4		
<i>Polygonum amphibian</i>	3,4		
<i>Cirsium arvense</i>	2,3,4,5		
<i>Lotus corniculatus</i>	5		
<i>Melilotus alba</i>	1,5		
<i>Melilotus officinalis</i>	5		
<i>Alopecurus pratensis</i>	1,5		
<i>Epilobium watsonii</i>	1		
<i>Taraxacum officinale</i>	5		
<i>Potamogeton natans</i>	6		
<i>Mentha arvensis</i>	3,4,5		

COMMENTS/PROBLEMS: \_\_\_\_\_

\_\_\_\_\_





## 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:

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

Location	Photo Frame #	Photograph Description	Compass Reading
1	18	See Figure 2 for locations	SW
2	17, 16		NE, SW
3	5, 4		S, SE
4	8		SW
5	11		NE
6	13, 12		SW, NE
7	15, 14		NE, SW
8	10, 8		
9	24, 23		E
10	22, 21		E, W
Transect	6-8	Taken along veg transect	

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## 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:

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

COMMENTS/PROBLEMS: GPS not used during 2003

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**WETLAND DELINEATION**

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:

- Delineate wetlands according to the 1987 Army Corps manual.
- Delineate wetland-upland boundary on the air photo
- Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: See attached completed delineation forms.

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**FUNCTIONAL ASSESSMENT**

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

COMMENTS/PROBLEMS: See attached completed functional assessment forms.

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**MAINTENANCE**

Were man-made nesting structures installed at this site? YES\_\_ NO

If yes, do they need to be repaired? YES \_\_\_ NO\_\_

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

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

YES  NO\_\_

If yes, are the structures working properly and in good working order? YES  NO\_\_

If no, describe the problems below.

COMMENTS/PROBLEMS: Wetland still not reaching maximum pool elevation - problem is being addressed by MDT and DU.

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**14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS AND ANIMALS**

i. AA is Documented (D) or Suspected (S) to contain (check box):

- Primary or Critical habitat (list species)  D  S
- Secondary habitat (list species)  D  S
- Incidental habitat (list species)  D  S Gray wolf, bald eagle
- No usable habitat  D  S

ii. **Rating** (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.): \_\_\_\_\_

**14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.**

**Do not include species listed in 14A(i).**

i. AA is Documented (D) or Suspected (S) to contain (check box):

- Primary or Critical habitat (list species)  D  S nesting black tern, forster's tern,
- Secondary habitat (list species)  D  S \_\_\_\_\_
- Incidental habitat (list species)  D  S \_\_\_\_\_
- No usable habitat  D  S \_\_\_\_\_

iii. **Rating** (Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	1 (H)	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): USFWS records (Ray Washtak)

**14C. General Wildlife Habitat Rating**

i. **Evidence of overall wildlife use in the AA:** (Check either substantial, moderate, or low)

- Substantial** (based on any of the following)
  - observations of abundant wildlife #s or high species diversity (during any period)
  - abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
  - presence of extremely limiting habitat features not available in the surrounding area
  - interviews with local biologists with knowledge of the AA
- Low** (based on any of the following)
  - 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 AA
- Moderate** (based on any of the following)
  - 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, select appropriate AA attributes to determine the 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 in the AA (see #10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A= absent.

Structural Diversity (from #13)	<input checked="" type="checkbox"/> High								<input type="checkbox"/> Moderate								<input type="checkbox"/> Low			
Class Cover Distribution (all vegetated classes)	<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> 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
<b>Low</b> disturbance at AA (see #12)	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Moderate</b> disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>High</b> disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. **Rating** (Using 14C(i) and 14C(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L) for this function.)

Evidence of Wildlife Use from 14C(i)	<b>Wildlife Habitat Features Rating from 14C(ii)</b>			
	<input checked="" type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	1 (E)	--	--	--
Moderate	--	--	--	--
Low	--	--	--	--

Comments: \_\_\_\_\_

**14D. GENERAL FISH/AQUATIC HABITAT RATING**  NA (proceed to 14E)

If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, then check the NA box above.

Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [e.g. fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (e.g. fish use within an irrigation canal), then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

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

Duration of Surface Water in AA	<input checked="" type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities	--	--	--	--	--	--	--	--	--
Shading - 50 to 75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--
Shading - < 50% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	M	--	--	--	--	--	--

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y  N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating:  E  H  M  L

iii. **Rating** (Use the conclusions from 14D(i) and 14D(ii) above and the matrix below to pick the functional point and rating of exceptional (E), high (H), moderate (M), or low (L).)

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	.3 (L)
No fish	--	--	--	--

Comments: Info based on preconstruction EA; the Ashley Creek reach near the WPA supports primarily nongame species. The WPA cells were not designed to support fish.

**14E. FLOOD ATTENUATION**  NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

i. **Rating** (Working from top to bottom, mark the appropriate attributes to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Estimated wetland area in AA subject to periodic flooding	<input checked="" type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains <b>no outlet or restricted outlet</b>	--	--	.6 (M)	--	--	--	--	--	--
AA contains <b>unrestricted outlet</b>	--	--	--	--	--	--	--	--	--

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

Y  N Comments: Homes located downstream

**14F. SHORT AND LONG TERM SURFACE WATER STORAGE**  NA (proceed to 14G)

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, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input checked="" type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
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)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: This rating assumes normal precip conditions. The site has received less water than planned.

**14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL**  NA (proceed to 14H)

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, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has 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 has 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.			
	<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
% cover of wetland vegetation in AA	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Evidence of flooding or ponding in AA	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
AA contains <b>no or restricted outlet</b>	1 (H)		--		--		--	
AA contains <b>unrestricted outlet</b>	--		--		--		--	

Comments: Ashley Creek is on DEQ impaired water body list, but most of WPA does not experience high nutrient or sediment load due to diversion.

**14H. SEDIMENT/ShORELINE STABILIZATION**

NA (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating exceptional (E), high (H), moderate (M), or low (L) for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input checked="" type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	.9 (H)	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments:

**14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT**

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A= temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input checked="" type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments:

**14J. GROUNDWATER DISCHARGE/RECHARGE (D/R)** (Check the indicators in i & ii below that apply to the AA)

i.  **Discharge Indicators**

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

ii.  **Recharge Indicators**

- Permeable substrate presents without underlying impeding layer.
- Wetland contains inlet but not outlet.
- Other

iii. **Rating:** Use the information from 14J(i) and 14J(ii) above and the table below to arrive at the functional point and rating of high (H) or low (L) for this function.

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: Groundwater recharge occurs in the two cells.

**14K. UNIQUENESS**

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) 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 MONTANANHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MONTANANHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	.6M	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments:

**14L. RECREATION / EDUCATION POTENTIAL**

i. Is the AA a known recreational or educational site?  Yes (Rate  High (1.0), then proceed to 14L(ii) only]  No [Proceed to 14L(iii)]

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- Yes [Proceed to 14L (ii) and then 14L(iv).]
- No [Rate as low in 14L(iv)]

iv. **Rating** (Use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Ownership	Disturbance at AA from #12(i)		
	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	1(H)	--	--
Private ownership	--	--	--

Comments: Area is open to public except during breeding season.

**FUNCTION, VALUE SUMMARY, AND OVERALL RATING**

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	0.30	1	
B. MONTANA Natural Heritage Program Species Habitat	H	1.00	1	
C. General Wildlife Habitat	E	1.00	1	
D. General Fish/Aquatic Habitat	L	0.30	1	
E. Flood Attenuation	M	0.60	1	
F. Short and Long Term Surface Water Storage	H	1.00	1	
G. Sediment/Nutrient/Toxicant Removal	H	1.00	1	
H. Sediment/Shoreline Stabilization	H	0.90	1	
I. Production Export/Food Chain Support	H	0.90	1	
J. Groundwater Discharge/Recharge	H	1.00	1	
K. Uniqueness	M	0.60	1	
L. Recreation/Education Potential	H	1.00	1	
<b>Totals:</b>		9.60	12.00	1325
<b>Percent of Total Possible Points:</b>			<b>80%</b> (Actual / Possible) x 100 [rd to nearest whole #]	

**Category I Wetland:** (Must satisfy **one** of the following criteria. If not proceed to Category II.)

Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**

Score of 1 functional point for Uniqueness; **or**

Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**

Percent of total Possible Points is > 80%.

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**Category II Wetland:** (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)

Score of 1 functional point for Species Rated S1, S2, or S3 by the MONTANA 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**

Percent of total possible points is > 65%.

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

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**Category IV Wetland:** (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, proceed to Category III.)

"Low" rating for Uniqueness; **and**

"Low" rating for Production Export / Food Chain Support; **and**

Percent of total possible points is < 30%.

**OVERALL ANALYSIS AREA (AA) RATING:** (Check appropriate category based on the criteria outlined above.)

I       II       III       IV

## Appendix C

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### REPRESENTATIVE PHOTOGRAPHS 2004 AERIAL PHOTOGRAPH

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*MDT Wetland Mitigation Monitoring  
Batavia  
Kalispell, Montana*

## 2004 BATAVIA



Photo Point No. 1: View looking southwest



Photo Point No. 2: View looking southwest



Photo Point No. 3: View looking southwest into Cell A.



Photo Point No. 4: View looking northeast into Cell A. The vegetation transect was conducted in the foreground.



Photo Point No. 5: View looking northeast between Cell A and Cell B.



Photo Point No. 6: View looking northeast into Cell B.

## 2004 BATAVIA



Photo Point No. 7: View looking southwest toward a depression present in Cell B.



Photo Point No. 9: View looking east into Cell C.



Photo Point No. 10: View looking west into Cell C.



Vegetation Transect: North (wetland) end looking away from transect



Vegetation Transect: North (wetland) end looking along transect.



Vegetation Transect: South (upland) end looking along transect.

# Batavia 2004 Aerial Photograph



## **Appendix D**

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### **BIRD SURVEY PROTOCOL GPS PROTOCOL**

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*MDT Wetland Mitigation Monitoring  
Batavia  
Kalispell, Montana*

## 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.

## **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.