MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2007

Batavia
Kalispell, Montana

Prepared for:

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

Prepared by:

POST, BUCKLEY, SCHUH, AND JERNIGAN
801 North Last Chance Gulch, Suite 101
Helena, MT 59601-3360

December 2007

PBS&J Project No: B43088.00 - 0102

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1.0 INTRODUCTION

This reports documents the seventh and final year of monitoring at the Batavia mitigation site. The Batavia Waterfowl Production Area (WPA) mitigation project is located in Smith Valley, approximately 5 miles southwest of Kalispell in Watershed 4 (**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, Kalispell Bypass, and future projects within the northern section of Missoula District.

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.

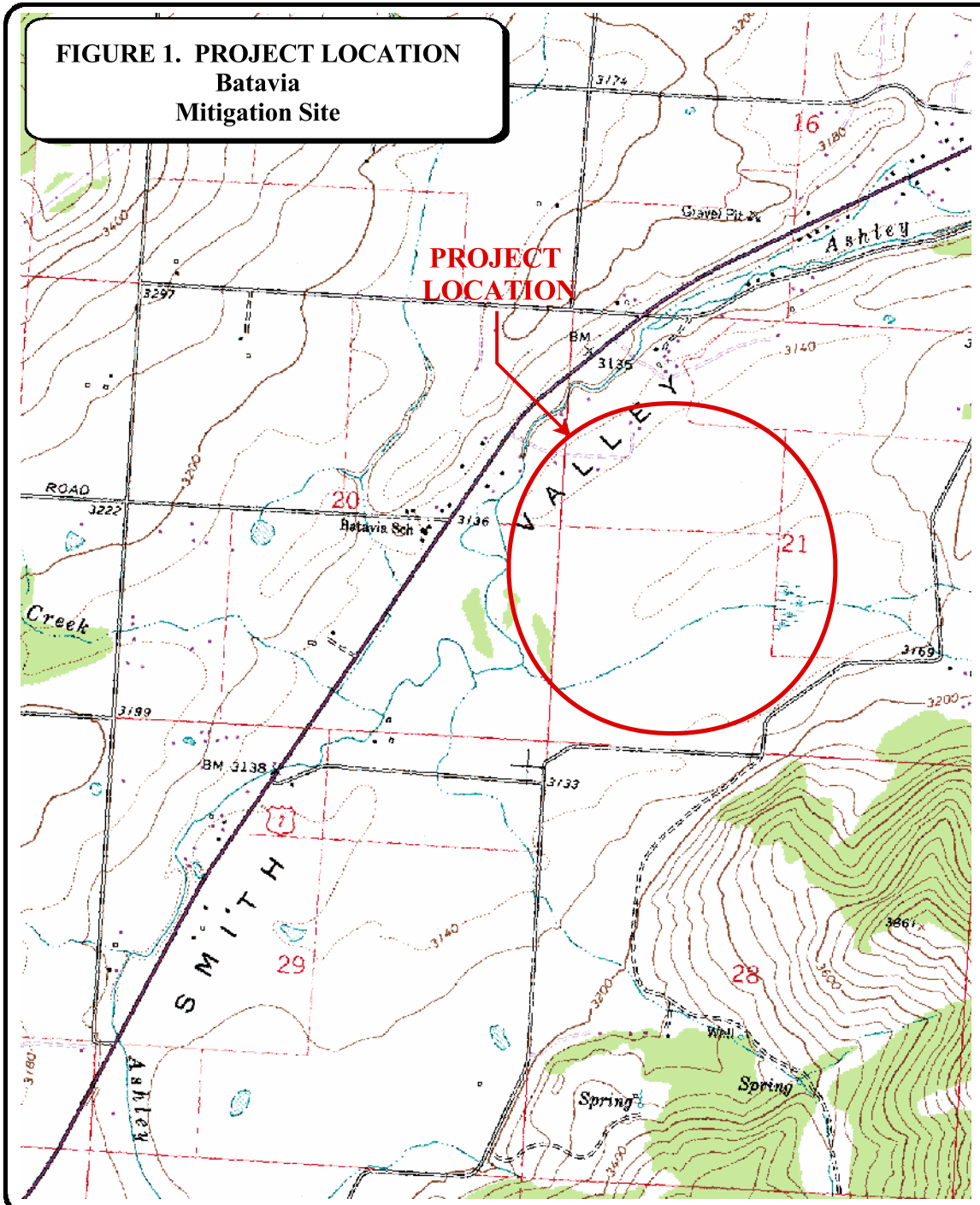
According to MDT project files, mitigation credits were determined by assigning credit ratios for creation and enhancement across the entire site. A total of 28.72 acres of credit was agreed upon by MDT, the USFWS, and Army Corps of Engineers (COE), with the potential for an additional 6.8 acres to be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

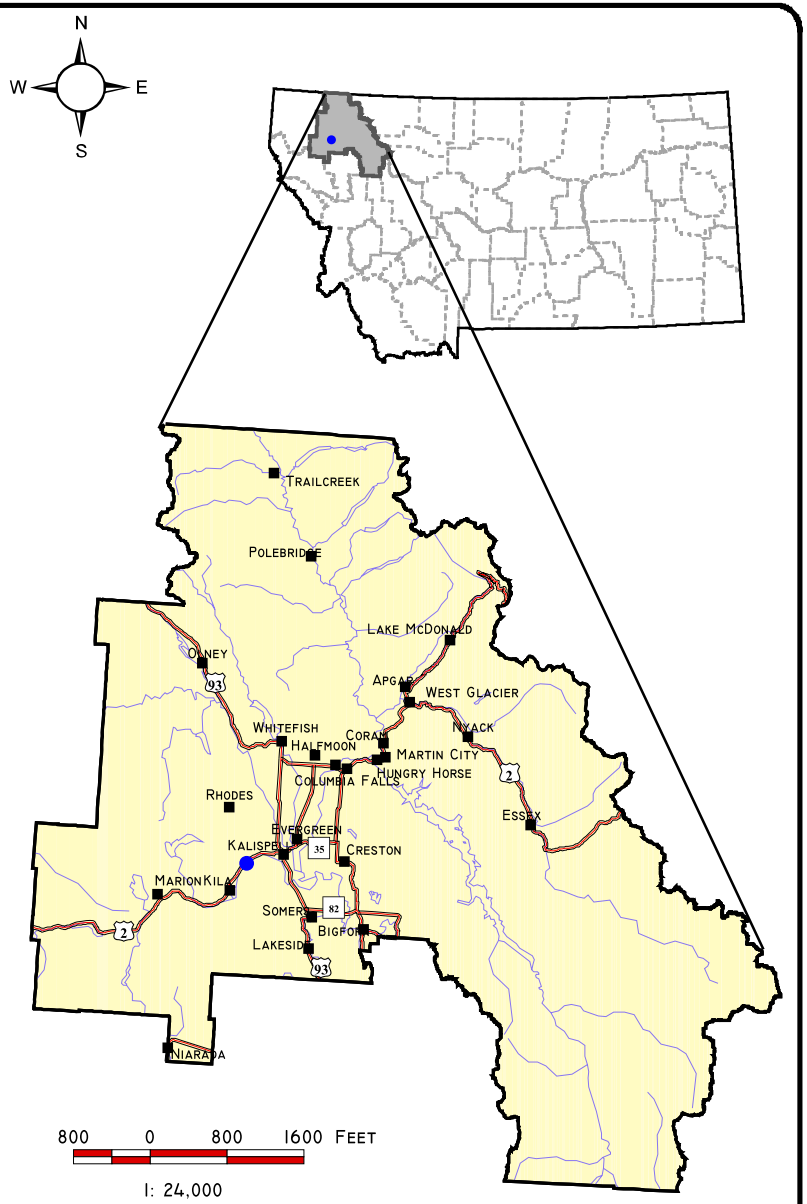
Wetland Creation minus impacts from new dike:	18.2 acres credited at 2:1	=	9.10 acres
North Cell enhancement:	76.8 acres credited at 8:1	=	9.60 acres
South Cell enhancement:	60.0 acres credited at 6:1	=	10.00 acres
	Total	=	28.72 acres

The WPA encompasses two primary hydrologic areas referred to as the North Cell and South Cell. 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 wetland creation. 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** in **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.

Monitoring of this site between 2001 and 2004 revealed an overall lack of wetland establishment in the borrow areas due to lack of hydrology. In March of 2005, Ducks Unlimited lowered the four borrow areas through excavation to ensure inundation and future wetland establishment in these areas. The excavated material was deposited in the adjacent upland areas and seeded.

FIGURE 1. PROJECT LOCATION
Batavia
Mitigation Site





PROJECT #: 330054.006
DATE: DECEMBER 2006
LOCATION: KALISPELL, MT
PROJECT MANAGER: B. DUTTON
DRAWN BY: BN/LL

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 July 25th (mid-season) 2007. 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 PBS&J 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.

In this the final year of monitoring, wetland delineation was conducted in the entire north and south cells to determine the extent of wetland creation that resulted from the project. A resource grade GPS was used to record the wetland boundaries in both cells and the results of the delineation are shown on **Figure 4** in **Appendix A**.

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 (Environmental Laboratory 1987). 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 Wetland Mitigation Site Monitoring Form (**Appendix B**).

The 10-foot wide belt transect that was established in Wetland D during 2001 was partially located in the area excavated during March 2005 and some of the transect was converted to

shallow open water. The location of the transect is shown in **Figure 2** in **Appendix A**. 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.

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 Post, Buckley, Schuh, and Jernigan (PBS&J) that a full wetland delineation of the entire WPA was not warranted at that time. Therefore, for the first six years of monitoring, wetland delineation was conducted only at Wetlands A, B, C and D according the 1987 COE Wetland Delineation Manual. In this the final year of monitoring, MDT and PBS&J decided to conduct a full wetland delineation, incorporating the entire north and south cells, to determine the extent of wetland creation that resulted from the project.

Wetland and upland areas within the four monitoring areas and across the entire site 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 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 the site 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 (**Appendix B**).

2.7 Birds

Bird observations were recorded during the July monitoring visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the site visit, bird observations were recorded according to the established protocol while conducting the other monitoring activities and are shown in **Appendix E**. Observations were categorized by species, activity code, and general habitat association (**Bird Survey Form** 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**) (Berglund 1999). 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. Photo point locations were recorded with a resource grade GPS in 2001, and are shown on **Figure 2** in **Appendix A**. All photographs were taken using a digital camera. A description and compass direction for each photograph was recorded on the wetland monitoring form. Photo points were revisited in 2007, including the seven new photo point locations which were added in 2005 in order to better document wetland establishment in the newly excavated areas. As this is the final year of monitoring, a seven year aerial photograph comparison of the site is included in **Appendix C**.

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. During the 2007 monitoring season, resource grade GPS was used to record wetland boundaries around the perimeter of the north and south cells as well as for recording the photo point locations established in 2005.

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 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 PBS&J.

It appears as though the desired full pool elevation of 3128.5 has never been met at this site because the diversion structure appears to be limited to a full pool elevation of about 3126.0 to 3126.5. Water elevation was at 3125.7 during the mid-season visit in 2007. Drought conditions in the Flathead Valley are also having an 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), 2004 (16.87 inches), 2005 (17.38 inches), and 2006 (17.28 inches) were 67, 79, 82, 79, 107, 110, and 110 percent, respectively, of the total annual mean precipitation (15.75 inches) in this area. Total precipitation totals for 2007 are not yet available; however, January–July 2007 precipitation totaled 7.4 inches, or 78% of the mean total (9.49 inches) for this period. Lower than average groundwater levels and a diversion structure set two feet lower than the original proposal are thought to be the primary reasons for the site not reaching its full potential. Continued above-average precipitation as shown between 2004 and 2006 could serve to relieve drought conditions in the region and improve conditions at the Batavia WPA.

During close examination of the project site in 2004 and as a result of 2001-2004 monitoring reports, DU determined that the four 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 spring of 2005 as previously discussed. Each of the four excavated areas was inundated with water during the 2007 mid-season visit, with water depths ranging between one and 24 inches.

3.2 Vegetation

Vegetation species identified on the site within Wetland D are presented in **Table 1** and on the attached data form. Eight community types were identified and mapped on the mitigation area in 2007 which is one more than what was recorded in 2006. A new aquatic bed community is developing within the areas excavated in 2005, essentially converting this area from open water to wetland (**Figure 3** in **Appendix A**). Community types 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*; Type 7 *Eleocharis palustris*; and Type 8: *Myriophyllum/Alisma/Potamogeton*. Dominant species within each of these communities are listed on the attached COE Form (**Appendix B**).

Table 1: ***2001 - 2007 Batavia vegetation species list.***

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

Table 1 (Continued): ***2001 - 2007 Batavia vegetation species list.***

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

Type 1 consists of upland grasses dominated by *Agropyron smithii*, and accompanied by *Elymus cinereus, Koeleria cristata, Spartina gracilis,* and *Agropyron repens*. Type 2 consists primarily of *Hordeum jubatum, Eleocharis palustris* and *Puccinellia nuttalliana*. Type 3 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. Type 8 is an aquatic community that is gradually becoming established within the area excavated in 2005.

As previously discussed, much of the area within the established vegetation transect was converted from marginal wetland and upland habitat to shallow open water in 2005 after excavation of this area took place. Emergent wetland vegetation began to establish around the perimeter of the excavated areas in 2006, generally creating a narrow (1'-4') fringe. In 2007, the excavated area previously identified as shallow open water began to show a dominance of aquatic vegetation. Transect results are detailed in the attached COE Form (**Appendix B**), and are summarized in **Table 2** and **Charts 1** and **2**.

Spoil piles created in 2005 were generally well vegetated in 2007 with native upland grasses seeded in these areas. However, the spoil pile adjacent to wetland "A" contained significant weed infestation in 2007. Spotted knapweed and thistle are common in this area and are out-competing the seeded grasses. According to the USFWS, weed mapping at the Batavia WPA in 2005 showed 60 acres of musk thistle at a low density, 13 acres of Canada thistle at a low density, and 10 acres of spotted knapweed at a low density (USFWS 2006). Approximately 8 acres of Canada thistle were sprayed using a mixture of curtail and milestone on 6/6/06. Evidence of continued weed spraying in 2007 was noted during the site monitoring visit.

Table 2: ***2001 - 2007 vegetation transect data summary.***

Monitoring Year	2001	2002	2003	2004	2005	2006	2007
Transect Length (feet)	318	318	318	318	318	318	318
# Vegetation Community Transitions along Transect	4	4	4	4	2	3	4
# Vegetation Communities along Transect	4	4	4	4	2	3	4
# Hydrophytic Vegetation Communities along Transect	3	3	3	3	1	2	3
Total Vegetative Species	29	22	22	22	4	5	8
Total Hydrophytic Species	21	13	13	13	1	2	5
Total Upland Species	8	9	9	9	3	3	3
Estimated % Total Vegetative Cover	75	75	75	75	20	20	75
% Transect Length Comprised of Hydrophytic Vegetation Communities	79	81	81	81	19	19	80
% Transect Length Comprised of Upland Vegetation Communities	21	19	19	19	1	1	1
% Transect Length Comprised of Unvegetated Open Water	0	0	0	0	80	80	19
% Transect Length Comprised of Bare Substrate	0	0	0	0	0	0	0

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

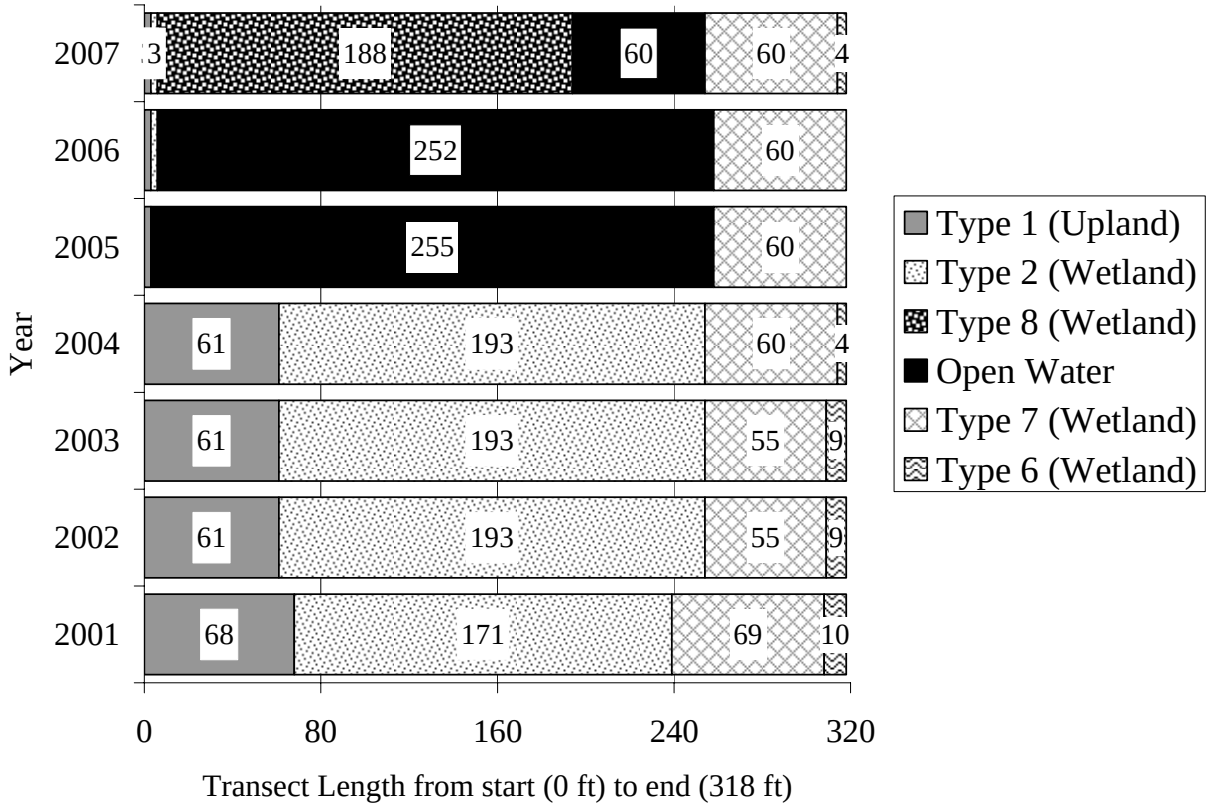
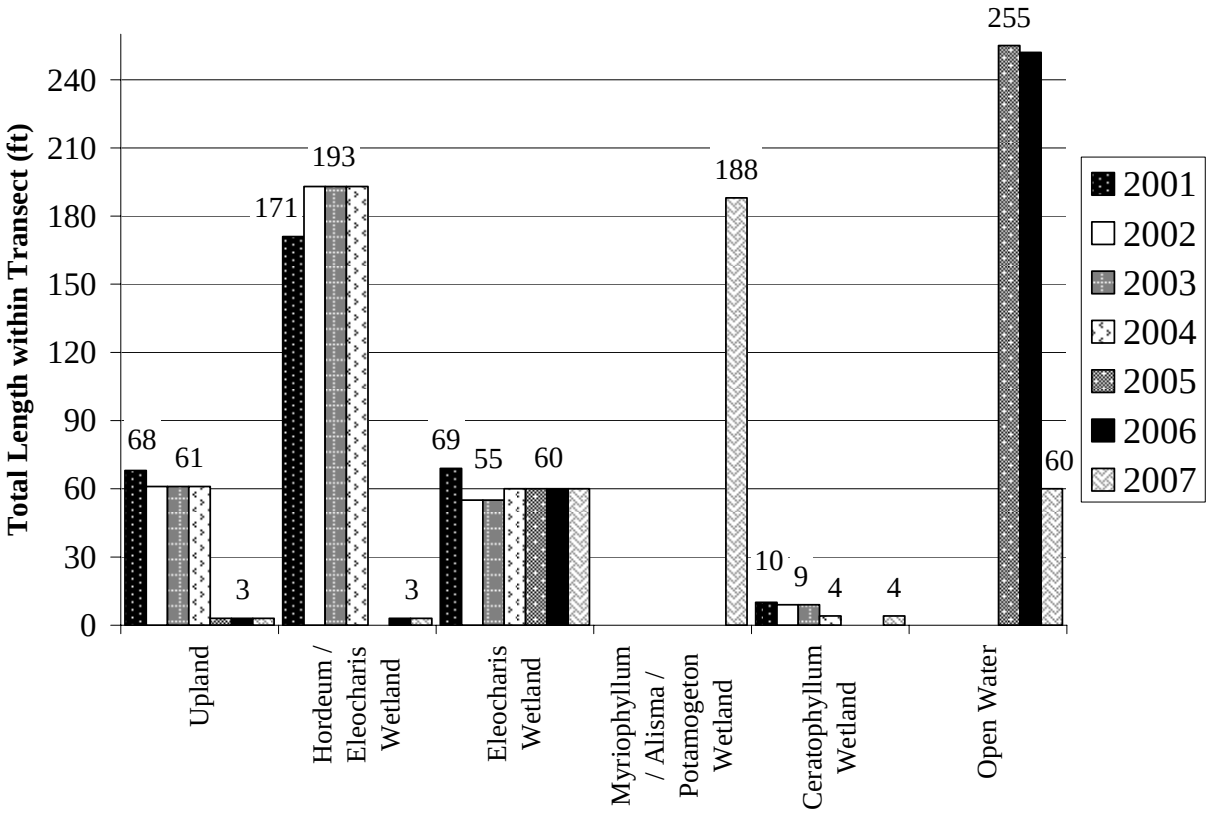


Chart 2: ***Length of vegetation communities within Transect 1 for each year monitored.***



3.3 Soil

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, presumably because these areas were excavated in uplands. During the first four years of monitoring, three test pits (TP) were excavated along the vegetation transect and described using the COE routine wetland determination forms. During 2005, the upper 12 – 36 inches of soil was removed from two of the three test pit locations to allow for inundation in these areas. Soil characteristics were not examined at the test pit locations in 2007 as each was inundated with at least 12 inches of standing water and one location with 24 inches of water. As an alternative this year, soils were sampled in undisturbed upland and wetland habitat within the Wetland "D" monitoring area. As expected, soil characteristics were similar to those previously recorded along the transect and are documented on the COE Forms in **Appendix B**.

3.4 Wetland Delineation

As discussed in the Methods Section of this report, wetland delineation was completed for the entire north and south cells in 2007 to determine total wetland acreage for the site (see map in **Appendix D**). Delineated wetland boundaries for both cells are illustrated on **Figure 4**. Site specific delineation was also completed in 2007 at the three previously identified monitoring locations shown on **Figure 3**. Completed COE Wetland Delineation Forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. The delineated areas in 2007 are similar to those observed in 2006, except in the areas excavated in 2005, where aquatic vegetation began to establish. In 2006, only scattered plants were noted, whereas the open water areas filled in significantly with various aquatic plants in 2007.

In order to determine the acreage of wetland creation in the three monitoring areas, the original pre-project wetland delineation was overlaid onto the 2007 delineation for direct comparison. When comparing the preconstruction delineation to current conditions, delineation boundaries at Wetland A showed a gain of 2.22 acres. Further comparison of the pre and post-project delineations show a gain of 0.84 acre at Wetland B, 1.35 acres at Wetland C, and 1.91 acres at Wetland D. Total wetland creation for the four wetlands is 6.32 acres (1.60 in 2006), which is a gain of 4.72 acres over the 2006 delineation. The conversion of open water to wetland accounted for the large wetland increase over 2006 acreages. While standing water still occurs in each area, the amount of unvegetated open water was virtually eliminated at Wetland A, C, and D, with 0.36 acre of open water remaining at Wetland B. Combined aquatic habitat creation for the four areas is 6.68 acres.

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. The full delineation completed in 2007 shows a net gain of 9.63 acres of aquatic habitat across the entire site, of which 6.68 acres occurs within the borrow areas. The remaining 2.95 acres was likely gained around the periphery of the north and south cells due to an improved and more efficient water delivery and storage system, not as a result of any significant water level increase across the site. In total, the project is 8.57 acres of creation short of the intended goal because of the inability to raise water levels to the desired 3128.5 elevation. However, it is important to note that, due to the credit ratios involved, this only equates to a 4.3- acre *credit* shortfall. For a full discussion of wetland crediting for the site see Section 3.10, Current Credit Summary.

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 canarygrass, 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 2007 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 mammals, one reptile, and numerous bird species have been noted using the mitigation site. Observations in 2007 were similar to previous years. Of interest in 2005, but not in 2006 or 2007 was the return of Black Terns to the Batavia WPA. This species of concern was documented pre-project, but had been absent since monitoring began. This species may have been present in 2007 but was not documented during the July monitoring visit.

Table 3: ***2001 – 2007 fish and wildlife species observed at the Batavia Wetland Mitigation Site.***

FISH, AMPHIBIAN, AND REPTILE	
Spotted Frog (*Rana luteiventris*)	Western Terrestrial Garter Snake (*Thamnophis elegans*)
BIRD	
American Bittern (*Botaurus lentiginosus*)	Lesser Scaup (*Aythya affinis*)
American Coot (*Fulica americana*)	**Mallard (*Anas platyrhynchos*)**
American Crow (*Corvus brachyrhynchos*)	Northern Flicker (*Colaptes auratus*)
American Robin (*Turdus migratorius*)	**Northern Harrier (*Circus cyaneus*)**
American Wigeon (*Anas americana*)	Northern Shoveler (*Anas clypeata*)
Black-billed Magpie (*Pica pica*)	Osprey (*Pandion haliaetus*)
Black Tern (*Chlidonias niger*)	Redhead (*Aythya americana*)
Blue-winged Teal (*Anas discors*)	**Red-winged Blackbird (*Agelaius phoeniceus*)**
Bufflehead (*Bucephala albeola*)	Ring-necked Duck (*Aythya collaris*)
Canada Goose (*Branta canadensis*)	Ring-necked Pheasant (*Phasianus colchicus*)
Cinnamon Teal (*Anas cyanoptera*)	Rock Dove (*Columba livia*)
Cliff Swallow (*Petrochelidon pyrrhonota*)	**Sandhill Crane (*Grus canadensis*)**
Common Goldeneye (*Bucephala clangula*)	Song Sparrow (*Melospiza melodia*)
Common Raven (*Corvus corax)*	Sora (*Porzana Carolina*)
Common Snipe (*Gallinago gallinago*)	Spotted Sandpiper (*Actitis macularia*)
European Starling (*Sturnus vulgaris*)	Three-toed Woodpecker (*Picoides tridactylus*)
Gadwall (*Anas strepera*)	**Tree Swallow (*Tachycineta bicolor*)**
Gray Partridge (*Perdix perdix*)	Turkey Vulture (*Cathartes aura*)
Great Blue Heron (*Ardea herodias*)	**Violet-green Swallow (*Tachycineta thalassina*)**
Gull (*Larus* spp.)	Wilson's Phalarope (*Phalaropus tricolor*)
Hooded Merganser (*Lophodytes cucullatus*)	Yellow Warbler (*Dendroica petechia*)
House Sparrow (*Passer domesticus*)	**Yellow-headed Blackbird**
Killdeer (*Charadrius vociferous*)	**(*Xanthocephalus xanthocephalus*)**
MAMMAL	
Coyote (*Canis latrans*)	Weasel (*Mustela* spp.)
Raccoon (*Procyon lotor*)	White-tailed Deer (*Odocoileus virginianus*)
Striped Skunk (*Mephitis mephitis*)	

Bolded species were documented during the 2007 monitoring. All other species have been documented during one or more of the previous monitoring seasons.

3.6 Macroinvertebrates

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

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 [past USFWS observations] and black terns [2005 observations]), 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 2006. Total acreage for the north and south cells has been updated in the table below to reflect the 2007 acreage.

Table 4: ***Summary of baseline and 2007 wetland function/value ratings and functional points at the Batavia Wetland Mitigation Project.***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method [1]	1996 Baseline[2]	2007 Post-Project
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)	Exc (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**	**146.73**
Functional Units (acreage x actual points)	**1069**	**1408**
Net Acreage Gain (ac)	NA	**9.73**
Net Functional Unit Gain (fu)	NA	**340**
Total Functional Unit Gain (fu)	NA	**340**

[1] See completed MDT functional assessment forms in **Appendix B** for further detail.

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

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), using the 1996 functional assessment form, prior to onset of this activity.

3.8 Photographs

Representative photos taken from photo-points and transect ends are provided in **Appendix C**. Also provided in **Appendix C** is a seven year aerial photograph comparison of the project site.

3.9 Maintenance Needs/Recommendations

The berm and associated water control structures were in good condition during the monitoring visit. Excavated soils were deposited in adjacent upland areas during the spring of 2005 and as previously mentioned, some of these areas were infested with weedy species, primarily thistle and spotted knapweed. Weed control, as proposed by the USFWS, should continue in these areas until desired species become established.

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.

Pre-project 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	=	10.00 acres
	Total	=	28.72 acres

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. The full delineation completed in 2007 shows a net gain of 9.63 acres (13.93 acres gained minus the 4.3 acres of impact) across the entire site, of which 6.68 acres occurs within the borrow areas. The remaining 2.95 acres was likely gained around the periphery of the north and south cells due to an improved

and more efficient water delivery and storage system, not as a result of any significant water level increase across the site. In total, the project was 8.57 acres of creation short of the intended goal because of the inability to raise water levels to the desired 3128.5 elevation.

Factoring in the appropriate ratios listed above, approximately 19.6 acres of enhancement credit has been gained 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.

Post-project credits as of 2007 are broken down as follows:

Wetland Creation minus impacts from new dike:	9.63 acres credited at 2:1	=	4.82 acres
North Cell enhancement:	76.8 acres credited at 8:1	=	9.60 acres
South Cell enhancement:	60.0 acres credited at 6:1	=	10.00 acres
	Total	=	24.42 acres

The total credits to date are 4.3 acres short of the intended 28.72-acre goal for the project because of the inability to raise water levels to the desired 3128.5 elevation. While the project fell short of the anticipated goal, the resulting increase in wetland acreage across the site (9.63 acres) and overall benefit of the project to the Batavia WPA is substantial. Unless MDT, the USFWS, and Ducks Unlimited are able to formulate a plan to raise water levels to the desired elevation, no additional mitigation credits beyond those that have been achieved are likely possible at this site.

4.0 REFERENCES

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Appendix A

FIGURES 2, 3, & 4

MDT Wetland Mitigation Monitoring
Batavia
Kalispell, Montana

Figure 2 - Monitoring Activity Locations

Monitoring Area Limits

Vegetation Transect

Photograph Point

Aerial Reference Point

Soil Sample

Base Photograph Date: July 05, 2007

Fence Cor.

Photo Point #1
1000 ft East

Photo Point #2
1000 ft East

MONITORING AREA LIMITS

MONITORING AREA LIMITS

MONITORING AREA LIMITS

MONITORING AREA LIMITS

MONITORING AREA LIMITS

Begin

End

N E S W

250 125 0 125 250

1"=250ft

PROJECT NAME
MDT Batavia Wetland Mitigation

DRAWING TITLE
Monitoring Activity Locations

PROJ NO: B33054.104
LOCATION: Batavia
SCALE: 1"=250ft
FILE NAME:L:\3330054.104Batavia\dwg\TASK104BASE2007.dwg

DRAWN: RAA
PROJ MGR: JB
CHECKED: MT | APP'D: JB

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
2.0
REV -
Nov/19/2007

Figure 3 - Mapped Site Features 2007

Legend:

- Monitoring Area Limits
- Wetland Boundary
- Vegetation Community Boundary
- Open Water 2007

Base Photograph Date: July 05 2007

Net Wetland Area Within Monitoring Limits:

Wetland "A"	3.34 Acres
Wetland "B"	0.76 Acres
Wetland "C"	1.86 Acres
Wetland "D"	4.40Acres

Net Open Water Area Within Monitoring Limits:

Wetland "A"	0.00 Acres
Wetland "B"	0.36 Acres
Wetland "C"	0.00 Acres
Wetland "D"	0.00 Acres

Vegetation Types:

1. Agropyron smithii
2. Hordeum jubatum/Eleocharis palustris
3. Juncus balticus/Phalaris arundinacea
4. Scirpus acutus/Typha latifolia
5. Agropyron smithii/Potentilla anserina
6. Ceratophyllum demersum
7. Eleocharis palustris
8. Myriophyllum/Alisma/Potamogeton

N E S W

250 125 0 125 250

1"=250ft

6 Fringe

MONITORING AREA LIMITS

Upland

Wetland "A"

MONITORING AREA LIMITS

Wetland "B"

5 Fringe

5 Fringe

OW

Upland

MONITORING AREA LIMITS

Wetland "C"

Wetland "D"

3 Fringe

3 Fringe

Upland

MONITORING AREA LIMITS

MONITORING AREA LIMITS

PROJECT NAME
MDT Batavia Wetland Mitigation

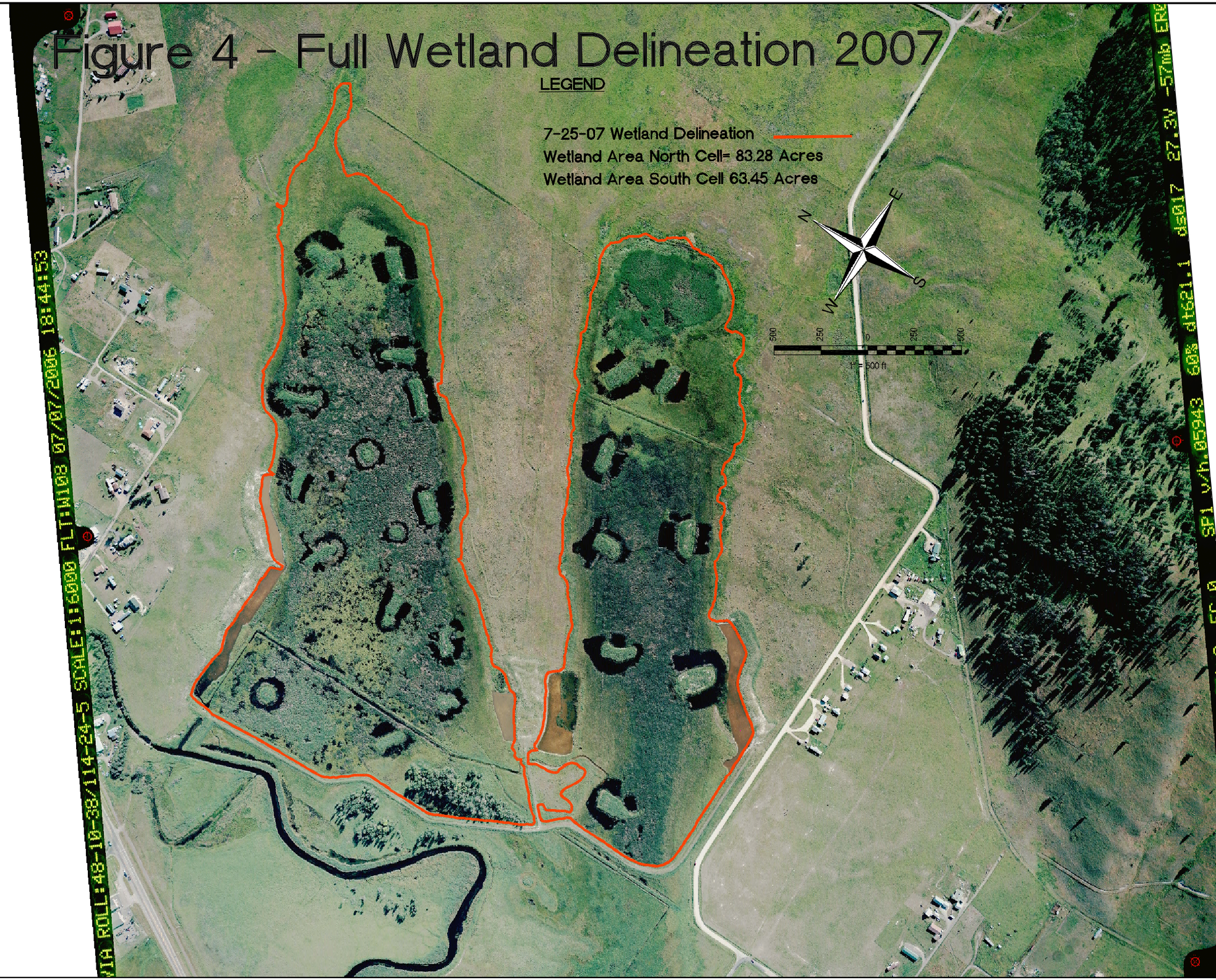
DRAWING TITLE
Mapped Site Features 2007

DRAWN: RA/LL
PROJ MGR: J.Berglund
CHECKED: APPVD:
SCALE: 1"=250'
FILE NAME:L:\9300054.104Batavia\dwg\TASK104BASE2007.dwg
PROJ NO: B43088.00 0104
LOCATION:

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
3 OF
REV -
Nov/14/2007

Figure 4 - Full Wetland Delineation 2007



PROJECT NAME
MDT Batavia Wetland Mitigation
DRAWING TITLE
Full Wetland Delineation 2007

PBSJ
1120 Cedar
Missoula, MT 59802

PROJ NO:	B43088.00 0104
LOCATION:	
SCALE:	1"=500'
FILE NAME:	L:\330054.104Batavia\dwg\TASK104BASE2007.dwg
DRAWN:	RA/LL
PROJ MGR:	J.Berglund
CHECKED:	
APPVD:	

FIGURE
4
OF
REV -
Nov/13/2007

Appendix B

2007 WETLAND MITIGATION SITE MONITORING FORM
2007 BIRD SURVEY FORMS
2007 COE WETLAND DELINEATION FORMS
2007 FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Batavia
Kalispell, Montana

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Batavia** Project Number**: B43088.00 - 0102** Assessment Date: **7/25/07**
Location: **Batavia WPA - Kalispell** MDT District: **Missoula** Milepost: _____
Legal description: T**28N** R**22W** Section **20, 21** Time of Day: **0800**
Weather Conditions: **Mostly sunny & Hot - 80 degrees** Person(s) conducting the assessment: **Traxler**
Initial Evaluation Date: **7 / 12 / 01** Visit #: **10** Monitoring Year: **2007 (year 7)**
Size of evaluation area: **150 acres** Land use surrounding wetland: **Rural Residential, Agriculture**

HYDROLOGY

Surface Water Source: **Ashley Creek, groundwater**
Inundation**:** Present **X** Absent____ Average depths: **1-2ft** Range of depths: **0 - 4** ft
Assessment area under inundation: **90%**
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 and standing water.**

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.)
NA GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS:

GPS was used in 2007 to delineate the entire boundaries of both the north and south cells. This is the first delineation of the entire site since monitoring began.

VEGETATION COMMUNITIES: BATAVIA

Community No.:__1__ Community Title (main species):_Elymus smithii/Elymus repens____

Dominant Species	% Cover	Dominant Species	% Cover
Elymus smithii	25	Centaurea maculosa	15
Elymus cinereus	5	Achillea millefolium	5
Koeleria macrantha	3	Elymus repens	25
Cirsium arvense	10	Aster ascendens	20
Poa pratensis	10	Poa juncifolia	10

COMMENTS/PROBLEMS: __Significant weed infestation in disturbed upland area adjacent to Wetland "A" – primarily thistle and spotted knapweed. Site is receiving weed treatment, which should continue into the near future to eliminate knapweed.

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: _____

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:

Community No.:__8__ Community Title (main species):__Myriophyllum/Alisma/Potamogeton_____

Dominant Species	% Cover	Dominant Species	% Cover
Myriophyllum spicatum	30		
Potamogeton natans	30		
Alisma plantago-aquatica	30		
Ceratophyllum demersum	10		

COMMENTS/PROBLEMS: ___borrow areas are beginning to establish a prevalence of aquatic wetland vegetation in the areas previously classified as open water.

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Achillea millefolium	1,3	Potamogeton pectinatus	6
Agrostis stolonifera	1,2,3	Potentilla anserina	2,3,4,5,7
Alisma plantago-aquatica	2,6,8	Puccinellia nuttalliana	1,2,3,7
Alopecurus pratensis	1,5	Scirpus acutus	2,4,5,6,7
Antennaria rosea	1	Sisymbrium altissimum	5
Aster ascendens	1,2,3,5	Sium suave	4,6
Aster hesperius	1,5	Smilacina stellata	5
Carduus nutans	1,3,5	Sonchus asper	5
Carex diandra	3,4	Sparganium emersum	3,4,6
Carex lasiocarpa		Spartina gracilis	1,2,3
Centaurea maculosa	1,5	Stachys palustris	3
Ceratophyllum demersum	2,6,8	Taraxacum officinale	5
Chenopodium album	5	Tragopogon dubius	1
Cirsium arvense	2,3,4,5	Triglochin maritima	2,3,4
Cirsium vulgare	3	Typha latifolia	2
Deschampsia cespitosa	2,3,5,7		
Distichlis stricta	1,2,5,7		
Eleocharis palustris	2,5,6,7		
Elymus cinereus	1		
Elymus repens	1,2,3		
Elymus smithii	1,2,3,5		
Epilobium watsonii	1		
Festuca campestris	1		
Hippuris vulgaris	6		
Hordeum jubatum	1,2,3,5,7		
Juncus balticus	1,2,3,4,5,6,7		
Juncus nodosus	4		
Koeleria macrantha	1		
Lactuca serriola	2		
Lotus corniculatus	5		
Melilotus alba	1,5		
Melilotus officinalis	5		
Muhlenbergia asperifolia	3		
Myriophyllum spicatum	8		
Phalaris arundinacea	2,3,4,5,7		
Phleum pratense	1		
Poa juncifolia	1		
Poa pratensis	1		
Polygonum amphibian	3,4		
Polypogon monspeliensis	2		
Potamogeton natans	6,8		

PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed	Mortality Causes
NA			

COMMENTS/PROBLEMS:

No plantings at this site, just reseeding of disturbed areas by DU.

WILDLIFE

BIRDS

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes ___ No __**XX**__ Type:_____ How many? _____ Are the nesting structures being utilized? Yes ___ No ___ Do the nesting structures need repairs? Yes __ No___

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
white-tailed deer	0	yes	yes		
coyote	0	yes	yes		
striped skunk	0	yes			
raccoon	0	yes			
dog	0	yes			
spotted frog	1				

Additional Activities Checklist:

__**NA**__Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Spotted frog observed for first time in Wetland "D".

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
1		See Figure 2 for locations	
2			
3			
4			
5			
6			
7			
8			
9			
10			
Transect			

COMMENTS/PROBLEMS: ___Seven new photo locations were added in 2005 to better document wetland establishment in the newly excavated areas. Each of these photo points were taken again in 2007.

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
_____ 4-6 landmarks recognizable on the air photo
_____ Start and end points of vegetation transect(s)
___x__ Photo reference points
_____ Groundwater monitoring well locations

COMMENTS/PROBLEMS: ___GPS was used in 2007 to delineate north and south cell wetland boundaries.

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: _See attached completed delineation forms._____

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.**_____

MAINTENANCE

Were man-made nesting structures installed at this site? YES__ NO__**X**__
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_**X**__ NO____
If yes, are the structures working properly and in good working order? YES __**X**_ NO___
If no, describe the problems below.

COMMENTS/PROBLEMS: __Spoil piles around the periphery of the excavated areas are severely weed infested in some locations. Weed spraying was noted in 2007 and should continue.

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Batavia: Wetland D Date: 7/25/07 Examiner: Traxler Transect # 1

Approx. transect length: 318 feet Compass Direction from Start (Upland):

Vegetation type A:	**ELE REP / ELE SMI**	
Length of transect in this type:	3	feet
Elymus repens	4	
Achillea millefolium	+	
Elymus smithii	2	
Total Vegetative Cover:	70%	

Vegetation type B:	**Type 7 ELE PAL**	
Length of transect in this type:	60	feet
Eleocharis palustris	5	
Total Vegetative Cover:		

Vegetation type C:	Open Water	
Length of transect in this type:	60	feet
Total Vegetative Cover:		

Vegetation type D:	Type 2 Hordeum/Eleocharis	
Length of transect in this type:	3	feet
Eleocharis palustris	4	
Hordeum jubatum	3	
Total Vegetative Cover:	50%	

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Batavia: Wetland D Date: 7/25/07 Examiner: Traxler Transect # 1

Approx. transect length: 318 feet Compass Direction from Start (Upland): _____

Vegetation type E:	**Type 8 MYR/ALI/POT**	
Length of transect in this type:	188	feet
Myriophyllum spicatum	4	
Alisma plantago-aquatilica	4	
Potamogeton natans	4	
Total Vegetative Cover:	70%	

Vegetation type F:	**Type 6 CER DEM**	
Length of transect in this type:	4	feet
Ceratophyllum demersum	3	
Total Vegetative Cover:	30%	

Vegetation type:		
Length of transect in this type:		feet
Total Vegetative Cover:		

Vegetation type:		
Length of transect in this type:		feet
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 _____ % 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:

Much of the vegetation transect was excavated in the spring of 2005 and converted to shallow open water. The perimeter of the excavated area began to establish Type 2 vegetation - approximately 3' fringe. In 2007, aquatic vegetation began to establish in the open water areas – thus the creation of veg. Type 8.

BIRD SURVEY – FIELD DATA SHEET

Page 1 of 1

Date: 7/25/07

SITE: Batavia

Survey Time: 0700

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Coot	13	F, L	MA, OW				
Blue-winged Teal	5	F, L	MA, OW				
Canada Goose	22	F,L	MA				
Cinnamon Teal	3	F, L	MA, OW				
Common Snipe	2	L	MA				
Killdeer	3	F	MA				
Mallard	8	L,N,F	OW, MA				
Northern Harrier	1	F	MA				
Red-winged Blackbird	6	L	MA				
Sandhill Crane	1	F	MA				
Tree Swallow	11	F	MA, OW				
Violet Green Swallow	6	F	MA, OW				
Yellow-headed blackbird	5	L	MA				

Notes: Conditions: Mostly sunny and hot, approximately 80 degrees.

Geese with young

Coyote, deer, skunk, dog, and raccoon tracks.

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)

Project / Site: **Batavia WPA**	Date: **July 25, 2007**
Applicant / Owner: **MDT**	County: **Flathead**
Investigator: **PBSJ - Traxler**	State: **Montana**

Do Normal Circumstances exist on the site? **Yes** Is the site significantly disturbed (Atypical Situation)? **No** Is the area a potential Problem Area? **No** (If needed, explain on reverse side)	Community ID: **Upland** Transect ID: _____ Plot ID: **1**

VEGETATION (USFWS Region 9: Northwest)

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. *Agropyron repens*	Herb	FACU	11.		
2. *Poa pratensis*	Herb	FACU+	12.		
3. *Achellia millefolium*	Herb	FACU	13.		
4. *Distichlis apicata*	Herb	FAC+	14.		
5. *Agropyron smithii*	Herb	FACU	15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): **1** / **5** = **20**%			FAC Neutral: **0** / **4** = **0**%		
Remarks: **Upland plot between Wetlands B & C. Unchanged from previous years.**					

HYDROLOGY

No Recorded Data (Describe in Remarks): **N/A** Stream, Lake, or Tide Gauge **No** Aerial Photographs **N/A** Other **No** No Recorded Data	Wetland Hydrology Indicators Primary Indicators: **NO** Inundated **NO** Saturated in Upper 12 Inches **NO** Water Marks **NO** Drift Lines **NO** Sediment Deposits **NO** Drainage Patterns in Wetland
Field Observations: Depth of Surface Water **N/A** ____ (in.) Depth to Free Water in Pit > **18** (in.) Depth to Saturated Soil > **18** (in.)	Secondary Indicators (2 or more required): **YES** Oxidized Root Channels in Upper 12 inches **NO** Water-Stained Leaves **NO** Local Soil Survey Data **NO** FAC-Neutral Test **NO** Other (Explain in Remarks)
Remarks:	

SOILS

Map Unit Name (Series and Phase): **na**
Map Symbol: **na** Drainage Class: **na** Mapped Hydric Inclusion? **_**
Taxonomy (Subgroup): **na** Field Observations confirm Mapped Type? **No**

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color(s) (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8	A	10 YR 3/2	/ /	N/A N/A	Silt Loam
16	B	7.5 YR 5/3	/ /	N/A N/A	Silty Clay Loam
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	

Hydric Soil Indicators:

- **NO** Histosol
- **NO** Histic Epipedon
- **NO** Sulfidic Odor
- **NO** Aquic Moisture Regime
- **NO** Reducing Conditions
- **NO** Gleyed or Low-Chroma Colors
- **NO** Concretions
- **NO** High Organic Content in Surface Layer in Sandy Soils
- **NO** Organic Streaking in Sandy Soils
- **NO** Listed on Local Hydric Soils List
- **NO** Listed on National Hydric Soils List
- **NO** Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? **NO**
Wetland Hydrology Present? **NO**
Hydric Soils Present? **NO**

Is this Sampling Point within a Wetland? **NO**

Remarks: **Much of this area was disturbed in 2005 when dredged material was placed here. Plot was maintained in undisturbed area.**

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

Project / Site: **Batavia WPA**	Date: **July 25, 2007**
Applicant / Owner: **MDT**	County: **Flathead**
Investigator: **PBSJ - Traxler**	State: **Montana**

Do Normal Circumstances exist on the site? **Yes** Is the site significantly disturbed (Atypical Situation)? **No** Is the area a potential Problem Area? **No** (If needed, explain on reverse side)	Community ID: **EM** Transect ID: _____ Plot ID: **2**

VEGETATION (USFWS Region 9: Northwest)

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. *Carex lasiocarpa*	Herb	OBL	11.		
2. *Carex diandra*	Herb	OBL	12.		
3. *Phalaris arundinacea*	Herb	FACW	13.		
4. *Deschampsia cespitosa*	Herb	FACW	14.		
5. *Triglichin maritimum*	Herb	OBL	15.		
6. *Alopecurus pratensis*	Herb	FACW	16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): **6** / **6** = **100**%			FAC Neutral: **6** / **6** = **100**%		
Remarks:					

HYDROLOGY

No Recorded Data (Describe in Remarks): **N/A** Stream, Lake, or Tide Gauge **Yes** Aerial Photographs **N/A** Other **No** No Recorded Data	Wetland Hydrology Indicators Primary Indicators: **NO** Inundated **YES** Saturated in Upper 12 Inches **YES** Water Marks **NO** Drift Lines **NO** Sediment Deposits **YES** Drainage Patterns in Wetland Secondary Indicators (2 or more required): **YES** Oxidized Root Channels in Upper 12 inches **NO** Water-Stained Leaves **NO** Local Soil Survey Data **YES** FAC-Neutral Test **NO** Other (Explain in Remarks)
Field Observations: Depth of Surface Water **N/A** ____ (in.) Depth to Free Water in Pit = **0** (in.) Depth to Saturated Soil = **0** (in.)	
Remarks:	

SOILS

Map Unit Name (Series and Phase): **na**
Map Symbol: **na** Drainage Class: **na** Mapped Hydric Inclusion? **_**
Taxonomy (Subgroup): **na** Field Observations confirm Mapped Type? **No**

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color(s) (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8	A	10 YR 2/1	/ /	N/A N/A	Loam roots
10	B	10 R 4/1	/ /	N/A N/A	Sandy Loam
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	

Hydric Soil Indicators:

- **NO** Histosol
- **NO** Histic Epipedon
- **NO** Sulfidic Odor
- **NO** Aquic Moisture Regime
- **NO** Reducing Conditions
- **YES** Gleyed or Low-Chroma Colors
- **NO** Concretions
- **NO** High Organic Content in Surface Layer in Sandy Soils
- **NO** Organic Streaking in Sandy Soils
- **NO** Listed on Local Hydric Soils List
- **NO** Listed on National Hydric Soils List
- **NO** Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? **YES** Wetland Hydrology Present? **YES** Hydric Soils Present? **YES**	Is this Sampling Point within a Wetland? **YES**

Remarks: **Plot was taken in undisturbed wetland habitat adjacent to vegetation transect.**

MDT MONTANA WETLAND ASSESSMENT FORM (revised May 25, 1999)

1. Project Name: Batavia Waterfowl Production Area **2. Project #:** B43054.00.0104 **Control #:** _____

3. Evaluation Date: 7/25/2007 **4. Evaluator(s):** Traxler **5. Wetland / Site #(s):** Batavia WPA

6. Wetland Location(s) i. T: 28 N **R:** 22 W **S:** 20, 21 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 4 - Flathead **GPS Reference No. (if applies):** _____

Other Location Information: Smith Valley, 5 miles SW of Kalispell

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): _____ (visually estimated)
146 (measured, e.g. GPS)

B. Purpose of Evaluation:
- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

9. Assessment Area (total acres): _____ (visually estimated)
146 (measured, e.g. GPS)

Comments: _____

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	MODIFIER [2]	% OF AA
Riverine	Palustrine	None	Emergent Wetland	Permanently Flooded	---	25
Riverine	Palustrine	---	Emergent Wetland	Semipermanently Flooded	Excavated	50
Riverine	Palustrine	---	Scrub-Shrub Wetland	Semipermanently Flooded	---	20
Riverine	Palustrine	---	Aquatic Bed	Intermittently Exposed	Excavated	5

[1] = Smith et al. 1995. [2] = Cowardin et al. 1979.

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **Comments:** _____

12. GENERAL CONDITION OF AA

i. Regarding Disturbance: (Use matrix below to select appropriate response.)

Conditions Within AA	Predominant Conditions Adjacent (within 500 Feet) To 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, clearing, or hydrological alteration; high road or building density.
AA occurs and is managed in predominantly a natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	low disturbance	---	---
AA not cultivated, but moderately grazed or hayed or selectively logged or has been subject to relatively minor clearing, or fill placement, or hydrological alteration; contains few roads or buildings.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

Comments: (types of disturbance, intensity, season, etc.) aside from wetland construction activities, site is relative undisturbed.

ii. Prominent weedy, alien, & introduced species: Canada thistle, knapweed

iii. Briefly describe AA and surrounding land use / habitat: AA is within a waterfowl production area and is closed to public use during the nesting season. Surrounding land use is rural undeveloped land and low density housing.

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	≤ 1 Vegetated Class
Select Rating	High	---	---

Comments: _____

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	_____
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 & Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.)**:** Bald Eagle was previously listed but delisting in 2007 resulted in shift to sensitive species.

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
Secondary habitat **(list species)**	☐ D ☐ S	_____
Incidental habitat **(list species)**	☐ D ☒ S	Bald Eagle
No usable habitat	☐ D ☐ S	_____

ii. 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 & Rating	1 (H)	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.)**:** _____

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 the AA attribute 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)	☒**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 12)	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. Rating: Use 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)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☒ **Exceptional**	☐ **High**	☐ **Moderate**	☐ **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 or 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 determine the quality rating of exceptional (E), high (H), moderate (M), or low (L).

Duration of Surface Water in AA	☒**Permanent/Perennial**			☐**Seasonal / Intermittent**			☐**Temporary / Ephemeral**		
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 arrive at 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)			
	☐ **Exceptional**	☐ **High**	☐ **Moderate**	☐ **Low**
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	.3 (L)
No fish	--	--	--	--

Comments: _____

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 flood from in-channel or overbank flow, then check NA.

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	☒ **≥ 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**	--	--	.6 (M)	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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, then 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.
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**.**	☒ **>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)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the 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.			
% 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)	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Ashley Creek is on DEQ impaired waterbody list, but most of WPA does not experience high nutrient or sediment load.

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, then 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		
	☐ Permanent / Perennial	☒ Seasonal / Intermittent	☐ 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	☒ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☒ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

14J. GROUNDWATER DISCHARGE / RECHARGE (DR) (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 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**

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

iii. Rating: Use 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

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 MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from 11	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant	☐rare	☐common	☐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)		
	☒ Low	☐ Moderate	☐ High
Public ownership	1(H)	--	--
Private ownership	--	--	--

Comments: Area is open to public except during waterfowl nesting 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	low	0.0	1	
B. MT Natural Heritage Program Species Habitat	high	1.00	1	
C. General Wildlife Habitat	high	1.00	1	
D. General Fish/Aquatic Habitat	low	0.30	1	
E. Flood Attenuation	moderate	0.60	1	
F. Short and Long Term Surface Water Storage	high	1.00	1	
G. Sediment/Nutrient/Toxicant Removal	high	1.00	1	
H. Sediment/Shoreline Stabilization	high	0.90	1	
I. Production Export/Food Chain Support	high	0.90	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	moderate	0.60	1	
L. Recreation/Education Potential	high	1.00	1	
	Total:	**9.30**	**12.00**	1357.00
	Percent of Total Possible Points:		**78%** (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not satisfied, 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%.

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 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**
- ☒ Percent of total possible points is > 65%.

☐ **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 not satisfied, return 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

2007 Representative Photographs
Seven Year Aerial Photograph Comparison

MDT Wetland Mitigation Monitoring
Batavia
Kalispell, Montana

BATAVIA WETLAND MITIGATION SITE 2007

Photo Point No. 1: View facing southwest

Photo Point No. 2: View facing southwest

Photo Point No. 9: View facing east into Wetland A.

Photo Point No. 11: View facing east into Wetland A. Photo point established in 2005.

Photo Point No. 12: View facing west into Wetland A from east end of excavation. Photo point established in 2005.

Photo Point No. 7: View facing southwest into Wetland B.

Photo Point No. 17: View facing west into Wetland C. Photo point established in 2005 to show new excavation.

Photo Point No. 13: View facing east into Wetland C. Photo Point established in 2005.

Photo Point No. 14: View facing northeast into Wetland D. Photo Point established in 2005.

Vegetation Transect: View is N from start of transect. Transect excavated in 2005, mostly open water.

Photo Point No. 15: View facing southwest into Wetland D. Photo Point established in 2005.

Photo Point No. 16: View facing SW into Wetland D.

SEVEN YEAR AERIAL PHOTOGRAPH COMPARISON – BATAVIA WETLAND MITIGATION SITE

July 2001

July 23, 2002

July 24, 2003

July 24, 2004

SEVEN YEAR AERIAL PHOTOGRAPH COMPARISON – BATAVIA WETLAND MITIGATION SITE

July 5, 2005

July 7, 2006

July 5, 2007

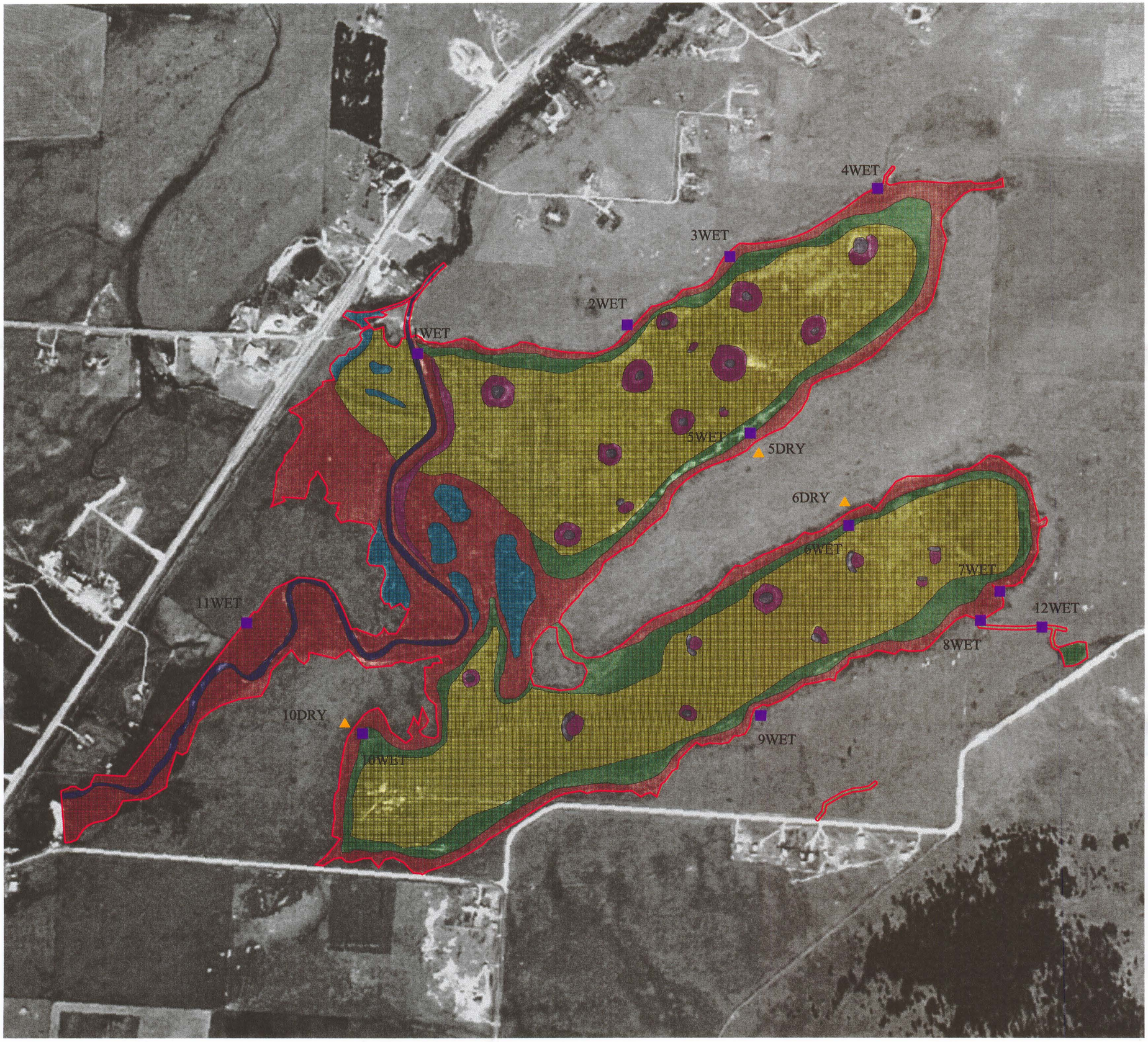
Appendix D

BASELINE WETLAND DELINEATION MAP

MDT Wetland Mitigation Monitoring
Batavia
Kalispell, Montana

BATAVIA WPA

WETLANDS MITIGATION SITE



SOIL SAMPLE LOCATIONS

- Wet
- Dry

HABITAT

- Temporarily Flooded
- Seasonally Flooded
- Semipermanently Flooded
- Push Up Islands
- Deep Water Excavations
- Seasonally Flooded Shrub/Scrub
- Creek
- Upland

Delineated Wetland Boundary

N

Carter Burgess

Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Batavia
Kalispell, Montana

BIRD SURVEY PROTOCOL

This protocol was developed by the Montana Department of Transportation (MDT) to monitor bird use within their Wetland Mitigation Sites. Though each wetland mitigation site is vastly different, the bird survey data collection methods were standardized to order to increase repeatability. The protocol uses an "area search within a restricted time frame" to collect data on bird species, density, behavior, and habitat-type use.

Survey Area

Sites that can be entirely walked: Sites where the entire perimeter or area can be walked include, but are not limited to: small ponds, enhanced historic river channels, and wet meadows. If the wetland is not uncomfortably inundated, walk several meandering transects to sufficiently cover the wetland. Meandering transects can be used, even if a small portion of the area is inaccessible (e.g. cannot cross due to inundation). Use binoculars to identify the bird species, to count the number of individuals, and to identify their behavior and habitat type. Data can be recorded directly onto the bird survey form or into a field notebook. The number of meandering transects and their direction (or location) should be recorded in the field notebook and/or drawn onto the aerial photograph or topographic map. Meandering transects are not formal and should not be staked. Each site should be walked and surveyed to the fullest extent within the set time limit.

Sites than cannot be entirely walked: Sites where the entire perimeter or area cannot be walked include, but are not limited to: very large sites (i.e. perimeter of 2-3 miles), and large-bodied waters (i.e. reservoirs), where deep water habitat (> 6 feet) is close to shore. For large-bodied waters where only one area was graded to create or enhance the development of wetland, bird surveys should be walked along meandering transects within or around the graded area (see above.). For sites that cannot be walked, bird surveys should be conducted from many lookout posts, established at key vantage points. The general location of lookout posts should be recorded in the field notebook or drawn onto the aerial photograph or topographic map. Lookout post locations do not need to be staked. Both binoculars and spotting scopes may be used in order to accurately identify and count the birds. Depending upon the size of the open water, more time may be spent viewing the mitigation area from lookout posts than is spent traveling between posts.

Survey Time

Ideally, bird surveys should be conducted in the morning hours when bird activity is often greatest (i.e. sunrise to no later than 11:00 am). Surveys can be completed before 11am if all transects have been walked or all lookout posts have been viewed with no new bird activity observed. For some sites bird surveys may need to be performed in the late afternoon or evening due to traveling constraints or weather. The overall limiting time factor will be the number of budgeted hours for the project.

Data Recording

Bird Species List: Record each bird species observed onto the Bird Survey-Field Data Sheet (or field notebook). Record the bird's common name using the appropriate 4-letter code. The 4-letter code uses the first two letters of the first two word's of the bird's common name or if one name, the first four letters. For example, Mourning Dove is coded as MODO while Mallard is coded as MALL. If an unknown individual is observed, use the 4-letter protocol, but define your

abbreviation at the bottom of the field data sheet. For example, unknown shorebird is UNSB; unknown brown bird is UNBR; unknown warbler is UNWA; and unknown waterfowl is 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 parenthesis; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded as UNBB / FO (25).

Bird Density: For each observation record the actual or estimated number of individuals observed per species and per behavior. Totals can be tallied in the office and entered onto the Bird Survey-Field Data Sheet.

Bird Behavior: Bird behavior must be identified by what is known. When a species is observed, the behavior that is immediately exhibited is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair (BP); foraging (F); flyover (FO); loafing (L), which is defined as sleeping, roosting, or floating with head tucked under wing; and nesting (N). If other behaviors that have a specific descriptive word are observed then it can be used and should later be added to the protocol. Descriptive words or phrases such as "migrating" or "living on site" are unknown behaviors.

Bird Species Habitat Use: When a species is observed, the habitat is also recorded. The following broad habitat categories are used:

- aquatic bed (AB), defined as rooted-floating, floating-leaved, or submergent vegetation.
- marsh (MA), defined as emergent (e.g. cattail, bulrush) vegetation with surface water.
- wet meadow (WM), defined as grasses, sedges, or rushes with little to no surface water.
- scrub-shrub (SS), defined as shrub covered wetland.
- forested (FO), defined as tree covered wetland.
- open water (OW), defined as unvegetated surface water.
- upland (UP), defined as the upland buffer.

Other categories can be used and defined on the data sheet and should later be added to the protocol.

Other Fields

Bird Visit: Each bird survey (i.e. spring, fall, and mid-season) should be completed on separate Bird Survey-Field Data Sheets.

Time: Record the start time and end time on the Bird Survey-Field Data Sheet.

Date: Record the date of the bird survey.

Weather: Record the weather conditions (i.e. temperature, wind, condition).

Notes: Note if a particular individual bird is using a constructed nest box and note the condition of constructed nest box(es). Also record any comments about the site, wildlife, wetland conditions, etc.

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

From 2001 through 2006, PBS&J mapped the vegetation community boundaries, photograph points, and other sampling locations in the field using the resource-grade Trimble GEO III GPS (Global Positioning System) unit. The data were collected with a minimum of three positions per feature using Course/Acquisition code. The collected data were then transferred to a personal computer (PC) and differentially corrected to the nearest operating Community Base Station. The corrected data were then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet.

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

In 2007, some sites continued to be mapped using the Trimble GEO III GPS unit while most sites were mapped using the resource-grade Magellan MobileMapper Office GPS unit. The Magellan GPS unit has a comparable accuracy level to the Trimble Geo III unit.

Each year, MDT photographs each mitigation site from the air. These aerial photographs are not geo-referenced, but serve as a visual aid to map wetland development and vegetation communities, and to show approximate locations for various monitoring activities (i.e. photograph points, transects, or macroinvertebrate sampling). Reference points that are observable on the aerial photo (i.e. road, stream channel, or fence) were also marked with the GPS unit in order to better position the aerial photograph. This positioning did not remove any of the distortion inherent to all photos. All mapped features and community boundaries were reviewed by the wetland biologist, to increase the figure's accuracy.

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.