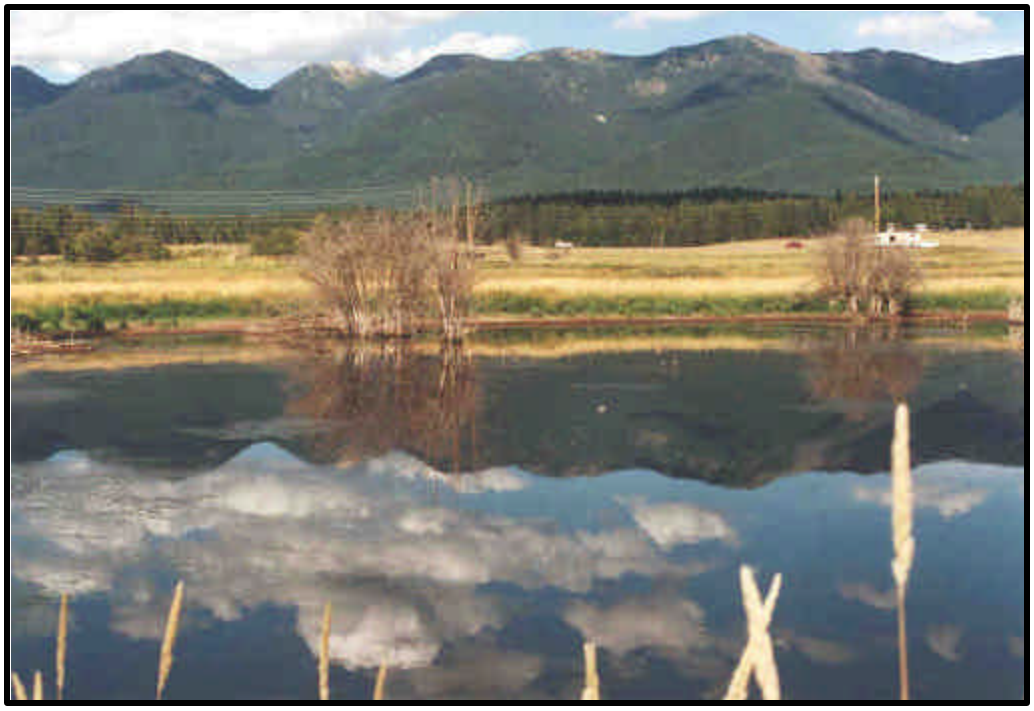
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2002

Creston Site
Creston, Montana



Prepared for:

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

Prepared by:

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

February 2003

Project No: 130091.007

MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND MITIGATION MONITORING REPORT:

YEAR 2002

Creston
Creston, Montana

Prepared for:

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

Prepared by:

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

February 2003

Project No: 130091.007

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

The Creston mitigation site was constructed in 1998 to mitigate wetland impacts associated with three Montana Department of Transportation (MDT) roadway projects; the Flathead River Bridge and Creston North and South projects. The site is located one mile south of the Creston Fish Hatchery adjacent to Highway 35 and Broeder Loop (**Figure 1**). The site consists of 20 acres located in Flathead County within the Flathead River Watershed (No. 4). The site elevation is 2,940 feet above mean sea level.

The site was designed to mitigate for riparian floodplain habitat, rooted emergent wetland, and ditches associated with previous highway construction. The mitigation goal was to enhance approximately two acres of existing wetland and create four acres of wetland. A formal wetland delineation and functional assessment were not performed prior to construction. The site was first monitored in 2001 and this is the second year of monitoring.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on June 2 (spring) and July 18 (mid-season) 2002. The primary purpose of the spring visit was to conduct a bird/general wildlife reconnaissance. The May/June period was selected for the spring visit because monitoring between mid-May and early June is likely to detect migrant and early nesting activities for a variety of avian species, as well as maximizing the potential for amphibian detection. In Montana, most amphibian larval stages are present by early June.

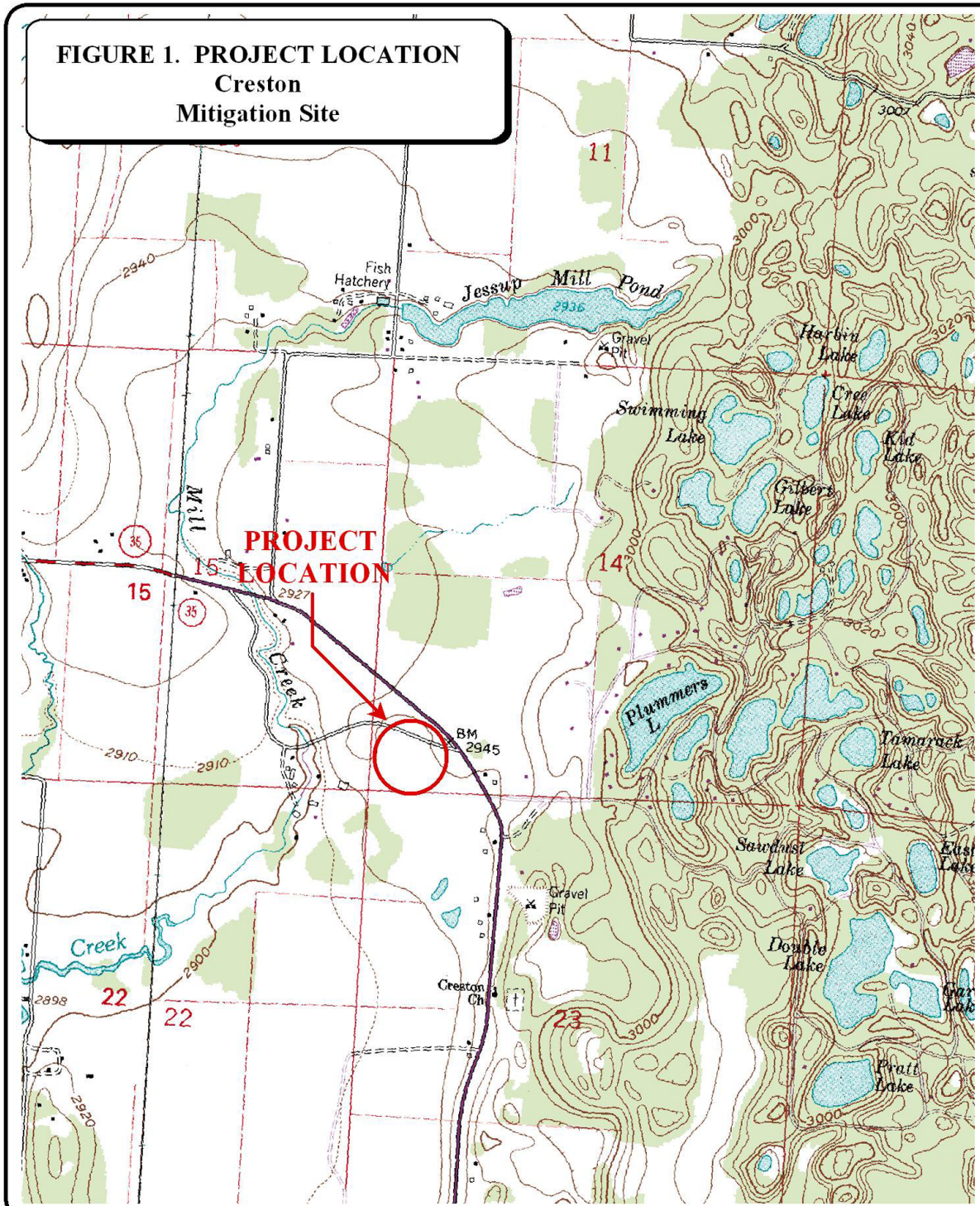
The mid-season visit was conducted between late July and August to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; GPS data points (no new points collected in 2002); functional assessment; and (non-engineering) examination of dike structures.

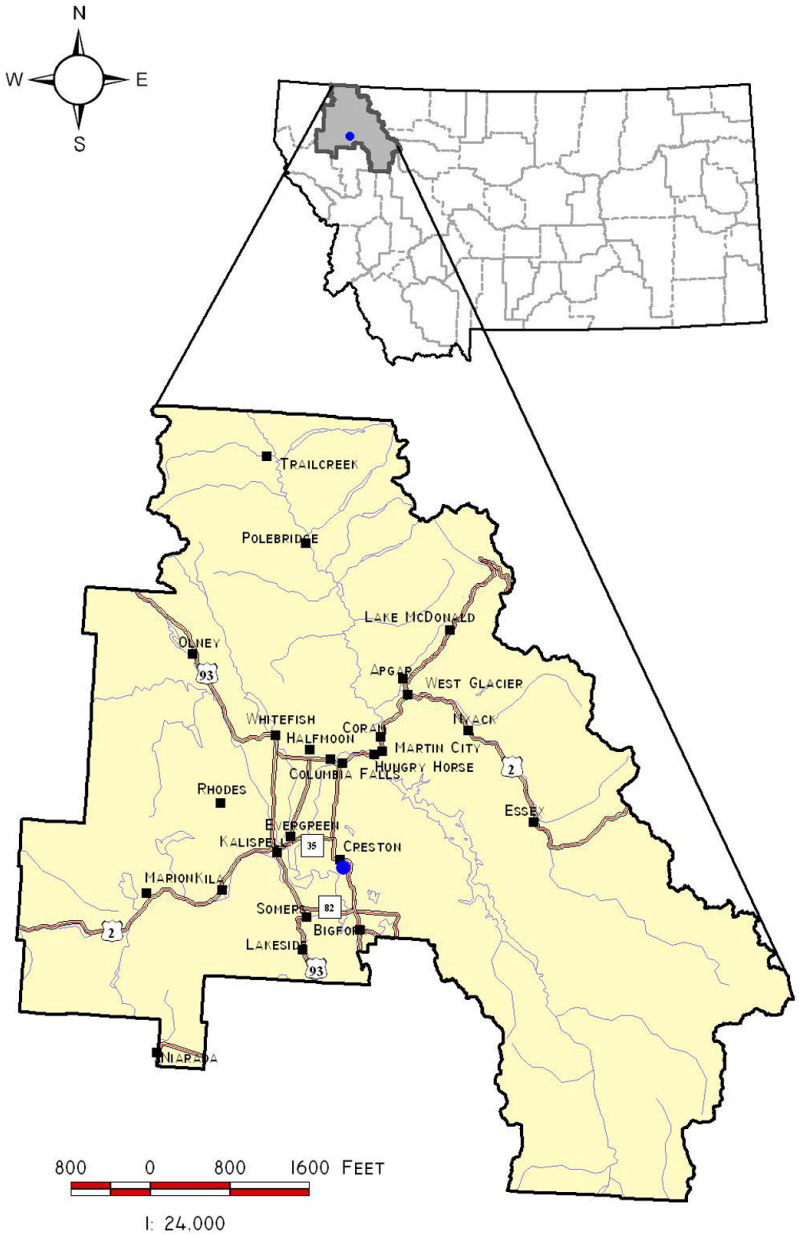
2.2 Hydrology

Hydrologic indicators were evaluated at the site during the mid-season visit. Wetland hydrology indicators were recorded using procedures outlined in the Army Corps (COE) 1987 Wetland Delineation Manual. Hydrology data was 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.

FIGURE 1. PROJECT LOCATION
Creston
Mitigation Site





PROJECT #: 130091.007
DATE: MAY 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

LAND & WATER CONSULTING, INC.

1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

Three groundwater-monitoring wells are present on site and groundwater elevations were obtained during the mid-season visit. Groundwater located within 18 inches of the ground surface (soil pit depth for purposes of delineation), was documented on the routine wetland delineation data form at each data point.

2.3 Vegetation

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

The 10-foot wide belt transect that was established in 2001 was evaluated for the second time **Figure 2 (Appendix A)**. Percent cover was estimated for each vegetative species encountered within the "belt" using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%). The purpose of the transect is to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the air photo and all data recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with the GPS unit in 2001. Metal stakes were installed in 2001 to physically mark the transect ends. One stake was missing in 2002 and will be replaced in 2003 using GPS to correctly replace the stake.

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 planted at this mitigation site. Monitoring relative to the survival of such species was conducted for the second time, and recorded on the Planted Woody Vegetation Survival Form in **Appendix B**.

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 was 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

The wetland delineation conducted during 2001 on the 20-acre mitigation site during the mid-season visit according the 1987 COE Wetland Delineation Manual was verified and changes made, if necessary. Wetland and upland areas within the monitoring area 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 was delineated on the air

photo and recorded with a resource grade GPS unit in 2001. No changes to the wetland boundary were visually noted in 2002, and GPS was not used to redefine the wetland boundary. The wetland/upland boundary in combination with the wetland/open water habitat boundary was used to calculate the wetland area developed at each impoundment.

2.6 Mammals, Reptiles, and Amphibians

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

2.7 Birds

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

2.8 Macroinvertebrates

One macroinvertebrate sample was collected from the main impoundment during the mid-season site visit and data recorded on the wetland mitigation monitoring form. Macroinvertebrate sampling procedures are included in **Appendix E**. The approximate location of the sample point is shown on **Figure 2**, **Appendix A**. The sample was preserved as outlined in the sampling procedure and sent to a laboratory for analysis.

2.9 Functional Assessment

A functional assessment form was completed for the site using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were generally collected during the mid-season site visit. An abbreviated field data sheet for the 1999 MDT Montana Wetland Assessment Method was compiled to facilitate rapid collection of field information (**Appendix B**). The remainder of the functional assessment was completed in the office and is compared to the 2001 functional assessment.

2.10 Photographs

Photographs were taken during the mid-season visit showing the current land use surrounding the site and the monitored area. Each photograph point location was initially recorded with a

resource grade GPS in 2001. The approximate location of photo points is shown on **Figure 2**, **Appendix A**. All photographs were taken using a 50 mm lens. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2001 monitoring season, point data 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 recorded with a resource grade GPS unit. The method used to collect these points is described in the GPS protocol in **Appendix D**. No new GPS data were collected during the 2002 monitoring year.

2.12 Maintenance Needs

The dike structure was examined during site visits for obvious signs of breaching, damage, or other problems. This did not constitute an engineering-level structural inspection, but rather a cursory examination. No problems were documented. Bird boxes were also inspected and appeared to be in good condition.

3.0 RESULTS

3.1 Hydrology

Inundation was present in the two large depressions and was estimated to be 15% of the mitigation site (see **Figure 3**, **Appendix A**). This area was slightly greater than the 2001 estimate of 10 to 15%. Emergent vegetation was observed throughout the inundated areas. The water table was depressed relative to previous years due to drought conditions, however, there appeared to be slightly more water in 2002 than in 2001. According to the Western Regional Climate Center, Creston yearly precipitation totals for 2000 (13.91 inches) and 2001 (15.7 inches) were 70 and 79 percent, respectively, of the total annual mean precipitation (19.84 inches) in this area. Data for 2002 is not yet available; however, according to NOAA precipitation records for the Kalispell area, 11.0 inches of rain had fallen as of October 28, 2002, and rainfall appears to be similar to 2001 and below the historic average.

The upper pond was again nearly dry in mid-July. The artesian well that discharges to the upper pond was flowing but the discharge rate was low and estimated at approximately one-gallon per minute. Three groundwater wells are located on the site and were measured during the mid-season visit. Static water levels are presented in **Table 1** and in the monitoring data form provided in **Appendix A**. Static water levels ranged from approximately 5.1 to 5.6-feet below the ground surface.

Table 1: July 2002 - Static Water Levels

Well ID (USGS label)	Static Water Level (from top of steel casing)	Stick-up*	Static Water Level (from ground surface)
West-1 (C94-11)	8.17	3.05	5.12
West-2 (C94-12)	8.41	2.77	5.64
East (C94-10)	7.11	1.98	5.13

* Stick-up was initially measured by the USGS and is recorded on the well cover; this measurement was field checked for accuracy in 2002.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 2** and on the attached data form. Six community types were identified and mapped on the mitigation area (**Figure 3**, **Appendix A**). These included Type 1: *Elymus repens*/*Phleum pratense;* Type 2: *Typha latifolia;* Type 3: *Typha latifolia* with mixed grasses; Type 4: *Phalaris arundinacea;* Type 5: *Potamogeton pectinatus;* and Type 6: *Alopecurus pratensis*. Dominant species within each of these communities are listed on the attached data form (**Appendix B**).

Type 1 occurred in the upland and consisted primarily of *Elymus repens* with an even distribution of *Phleum pratense*, *Agrostis stolonifera*, and *Cirsium arvense*. This community type was weedy and included a trace of *Cynoglossum officinale* (common hound's tongue), which is classified as a noxious weed in Flathead County. This community type was relatively unchanged from the previous year, except that *Elymus repens* increased from 20% to 40% cover. Type 2 was present around the pond edges, particularly the upper pond and consisted primarily of *Typha latifolia*, *Ceratophyllum demersum* and *Phalaris arundinacea*. *Scirpus acutus* was observed for the first time in this type in 2002.

Type 3 was present in small depressions with less frequent inundation and consisted of *Typha latifolia* mixed with weedy grasses. Small changes were observed in this type, such as a slight decrease in *Typha latifolia* from 15% to 10% and an increase in *Agrostis stolonifera* cover from 10% to 20%. It appeared that *Typha latifolia* was not reproducing well in this community. Type 4 was dominated by *Phalaris arundinacea* and was present adjacent to the large pond and in some of the small depressions. The common hound's tongue was observed in Type 4 during the 2002 monitoring season, indicating that the noxious weed was increasing in extent.

Type 5 consisted of emergent vegetation and was dominated by *Potamogeton pectinatus*. This community was unchanged in composition, however, its lateral extent decreased due to the encroachment of the *Phalaris arundinacea* (Type 4) as is illustrated in the vegetation transect. Type 6 was a minor upland community that was dominated by *Alopecurus pratensis*. It appeared unchanged from the previous monitoring year. Vegetation transect results are detailed in the attached data form, and are summarized graphically below.

2001	**VT Start**	***Type 1 Upland (195')***	***Type 2 (80')***	***Type 3 (63')***	***Type 4 (100')***	***Type 5 (25')***	**Total: 463'**	**VT End**
2002	**VT Start**	***Type 1 Upland (192')***	***Type 2 (79')***	***Type 3 (55')***	***Type 4 (132')***	***Type 5 (8')***	**Total: 466'**	**VT End**

Table 2: ***2001 and 2002 Creston Vegetation Species List***

Species	Region 9 (Northwest) Wetland Indicator	Observed in 2001	Observed in 2002
Agrostis stolonifera	FAC+	X	X
Alopecurus pratensis	FACW	X	X
Amelanchier alnifolia	FACU		X
Artemesia absinthium	--		X
Arctium minus	--		X
Astragalus cicer	--		X
Barbarea vulgaris	FAC-	X	X
Beckmannia syzigachne	OBL	X	X
Bromus inermis	--	X	X
Carex arcta	FACW+	X	X
Carex bebbii	OBL	X	X
Carex aurea	FACW+		X
Carex flava	OBL	X	X
Carex lasiocarpa	OBL		X
Carex microptera	FAC		X
Centaurea maculosa	--		X
Ceratophyllum demersum	OBL	X	X
Chenopodium album	FAC	X	
Chrysanthemum leucanthemum	--		X
Chenopodium rubrum	FACW+	X	
Cirsium arvense	FAC-	X	X
Cirsium vulgare	FACU	X	X
Cynoglossum officinale	FACU	X	X
Dactylis glomerata	FACU	X	X
Elaeagnus commutata	NI		X
Eleocharis palustris	OBL	X	X
Elymus repens	FACU	X	X
Elymus smithii	--		X
Epilobium ciliatum	FACW-	X	X
Equisetum arvense	FAC	X	X
Erigeron acris	FACW	X	X
Festuca arundinacea	FAC-		X
Galium aparine	FACU		X
Gnaphalium palustre	FAC+	X	
Juncus articulatus	OBL	X	X
Juncus balticus	FACW+		X
Juncus regelii	FACW	X	X
Juncus tenuis	FAC	X	X
Lactuca serriola	FACU	X	X
Lamium amplexicaule	--		X
Linum perenne	--	X	X
Lotus corniculatus	FACW+		X
Medicago lupulina	FAC	X	X
Melilotus alba	FACU	X	X
Melilotus officinale	FACU	X	X
Myosotis laxa	OBL	X	
Phalaris arundinacea	FACW	X	X
Phleum pratense	FAC-	X	X
Plantago lanceolatum	FACU+	X	
Plantago major	FAC+	X	X
Poa compressa	FACU+		X
Poa palustris	FAC		X
Poa pratensis	FAC	X	X
Polygonum convolvulus	FACU-	X	

Table 2: ***2001 and 2002 Creston Vegetation Species List (continued)***

Species	Region 9 (Northwest) Wetland Indicator	Observed in 2001	Observed in 2002
Populus balsamifera	FAC	X	X
Potamogeton natans	OBL	X	X
Potamogeton pectinatus	OBL	X	X
Potentilla anserina	OBL	X	
Prunella vulgaris			X
Ranunculus aquatilis	OBL	X	X
Ranunculus sceleratus	OBL	X	X
Rumex crispus	FACW	X	X
Salix bebbiana	FACW		X
Scirpus acutus	OBL		X
Silene latifolia	--	X	X
Sitanion hystrix	FACU-		X
Sparganium emersum	OBL	X	X
Stipa nelsonii	--		X
Taraxacum officinale	FACU	X	X
Thlaspi arvense	NI	X	X
Tragopogon dubius	UPL	X	X
Trifolium hybridum	FACU+	X	X
Trifolium pratense	FACU	X	X
Typha latifolia	OBL	X	X
Verbascum thapsus	UPL	X	X
Veronica americana	OBL	X	

3.3 Soils

According to the Upper Flathead Valley Area soil survey (Soil Conservation Service 1960), soils in the mitigation site are classified as poorly drained alluvial land and (Aa) and the Swims silt loam (So). The poorly drained alluvial land soil has poor surface and internal drainage, mottling in the subsurface and typically consists of loam or silty loam. The Swims soil consists of silt loam and tends to occupy low terraces occupying the Flathead River.

These characteristics were generally confirmed during monitoring. Three test pits were excavated and described in 2002 using the ACE routine wetland monitoring form. The TP1 located adjacent to the pond consisted of 16-inches of organic detritus overlying a mottled silt loam. Hydric soil characteristics were well developed including a histic epipedon. TP2 was classified as a poorly developed hydric soil. A thin (1-inch) layer of organic detritus was present. A low-chroma (7.5 YR 2.5/2) A-horizon was present from 1 to 9-inches and mottles were observed below 9-inches. These soil characteristics indicated an oxygen-depleted environment with a fluctuating water table. TP3 was a loam representative of the upland soil, which did not exhibit hydric characteristics in the A horizon (7.5 YR 2.5/2) or B horizon (7.5 YR 4/3). Test pits were dug in 2002 and compared to observations made in 2001; no significant changes were noted.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding

sections. Delineation results indicated acreage that was unchanged from 2001, with a total of 5.2 acres of wetland.

The original mitigation goal was to enhance two acres of existing wetland and create four acres for a total of six acres. As of 2001, it appeared likely that the area within the Type 3 Community and within the ditches will develop hydric soil characteristics with continued inundation. Based on 2002 observations, which indicated that *Typha latifolia* was not successfully reproducing in these areas, it is apparent that wetland attributes will not be enhanced until the hydrology is restored to pre-drought conditions.

3.5 Wildlife

Wildlife species (or evidence of wildlife) observed on the site during the 2001 and 2002 monitoring efforts are listed in **Table 3**. Specific evidence observed and activity codes pertaining to birds are provided on the completed monitoring form in **Appendix B**. Five mammal and numerous bird species have been noted using the mitigation site. Of special note was a family of mergansers (female and seven chicks) observed utilizing the upper impoundment during the early spring 2002 monitoring event.

Table 3: ***Fish and Wildlife Species Observed at the Creston Mitigation Site***

FISH none	
AMPHIBIANS None observed	
REPTILES None observed	
BIRDS American robin (*Turdus migratorius*) **Bohemian waxwing (*Bombycilla garrulus*) Canada goose (*Branta Canadensis*) *Cinnamon teal (*Anas cyanoptera*) **Cliff swallow (*Petrochelidon pyrrhonota*) *Common goldeneye (*Bucephala clangula*) **Common raven (*Corvus corax*) **Common snipe (*Gallinago gallinago*) **Great blue heron (*Ardea herodias*) **Hooded merganser (*Lophodytes cucullatus*) **Hummingbird (*Selasphorus* sp.) *Killdeer (*Charadrius vociferous*) Mallard (*Anas platyrhynchos*)	**Northern flicker (*Colaptes auratus*) **Northern rough-winged swallow (*Stelgidopteryx serripennis*) *Northern shoveler (*Anas clypeata*) Osprey (*Pandion haliaetus*) Pintail (*Anas acuta*) *Red-winged blackbird (*Agelaius phoeniceus)* Ring-necked duck (*Aythya collaris*) *Ring-necked pheasant (*Phasianus colchicus*) *Spotted Sandpiper (*Actitis macularia*) *Tree swallow (*Tachycineta bicolor*) Wood duck (*Aix sponsa*) **Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)
MAMMALS **Coyote (*Canis latrans*) or dog sign Meadow vole (*Microtus pennsylvanicus*) **Muskrat (*Ondatra zibethicus*) **Northern pocket gopher (*Thomomys talpoides*) *White-tailed Deer (*Odocoileus virginianus*)	

* denotes observed in 2002 in addition to previous years
** denotes observed in 2002 for the first time

3.6 Macroinvertebrates

Macroinvertebrate sampling results are provided in **Appendix B** and summarized here. Sampling indicated that near-optimal biologic conditions appear to characterize this site. The rich invertebrate fauna suggested diverse habitats; habitat complexity was likely enhanced by the presence of abundant macrophytes. Only a few midge taxa were collected, which may indicate monotonous substrates. Water quality appeared to be better than at most sites in this study, since the biotic index value (7.37) was slightly lower than the median value.

3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B**. Functional assessment results are summarized in **Table 4**. The site was evaluated as a single assessment area and rated as a Category II wetland. Wildlife habitat and groundwater discharge were the primary functions of the site. The site provided a total of 35.9 functional units and achieved 77% of possible points. This was essentially unchanged from the 2001 assessment. A functional assessment was not conducted prior to site construction and therefore cannot be used for comparison.

3.8 Photographs

Representative photos taken from photo-points, and the 2002 MDT aerial photograph are provided in **Appendix C**.

3.9 Maintenance Needs/Recommendations

The berm was in good condition during the spring and mid-season visits. We have no recommendations at this time. The bird boxes also appeared to be in good condition. As stated previously, the vegetation transect stake was missing from the lower transect end and will be replaced during the 2003 monitoring season.

3.10 Current Credit Summary

Approximately 5.2 acres of wetlands were present on the mitigation site. Based on pre-construction goals, two acres were to be enhanced and four acres created for a total of 6 acres. The existing acreage is close to the goal. Based on current site conditions, it is expected that additional wetland acres will develop in the future if hydrology is restored to pre-drought conditions. If precipitation patterns remain similar to 2001/2002 conditions, wetland development is unlikely.

Table 4: ***Summary of 2001/2002 Wetland Function/Value Ratings and Functional Points*** [1] ***at the Creston Mitigation Project***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	Wetland Site Rating
Listed/Proposed T&E Species Habitat	Mod (0.7)
MNHP Species Habitat	Low (0.1)
General Wildlife Habitat	High (0.9)
General Fish/Aquatic Habitat	NA
Flood Attenuation	NA
Short and Long Term Surface Water Storage	High (0.8)
Sediment, Nutrient, Toxicant Removal	Mod (0.7)
Sediment/Shoreline Stabilization	NA
Production Export/Food Chain Support	High (1.0)
Groundwater Discharge/Recharge	High (1)
Uniqueness	Mod (0.6)
Recreation/Education Potential	High (1)
Actual Points/Possible Points	6.9 / 9
% of Possible Score Achieved	77%
Overall Category	II
Total Acreage of Assessed Wetlands within Easement	5.2 ac (calculated)
Functional Units (acreage x actual points)	35.9 fu
Net Acreage Gain	NA
Net Functional Unit Gain	NA
Total Functional Unit "Gain"	NA

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

4.0 REFERENCES

Carlson, J. Program Zoologist, Montana Natural Heritage Program. Helena, MT. April 2001 conversation with Jeff Berglund.

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

Ralph, C.J., Geupel, G.R., Pyle, P., Martin, T.E., and D.F. DeSante. 1993. *Handbook of field methods for monitoring landbirds*. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. of Agriculture. 41 p.

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

Soil Conservation Service. 1960. Soil survey of Upper Flathead Valley Area, Montana. Series 1946, No. 4.

USDA Natural Resources Conservation Service. 1998. *Field Indicators of Hydric Soils in the US*, Version 4. G. Hurt, P. Whited and R. Pringle (eds.). USDA, NRCS Fort Worth, TX.

Werner, K. Herpetologist, Salish-Kootenai Community College. Pablo, MT. May 1998 instructional presentation (per Jeff Berglund).

Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Creston
Creston, Montana

LAND & WATER

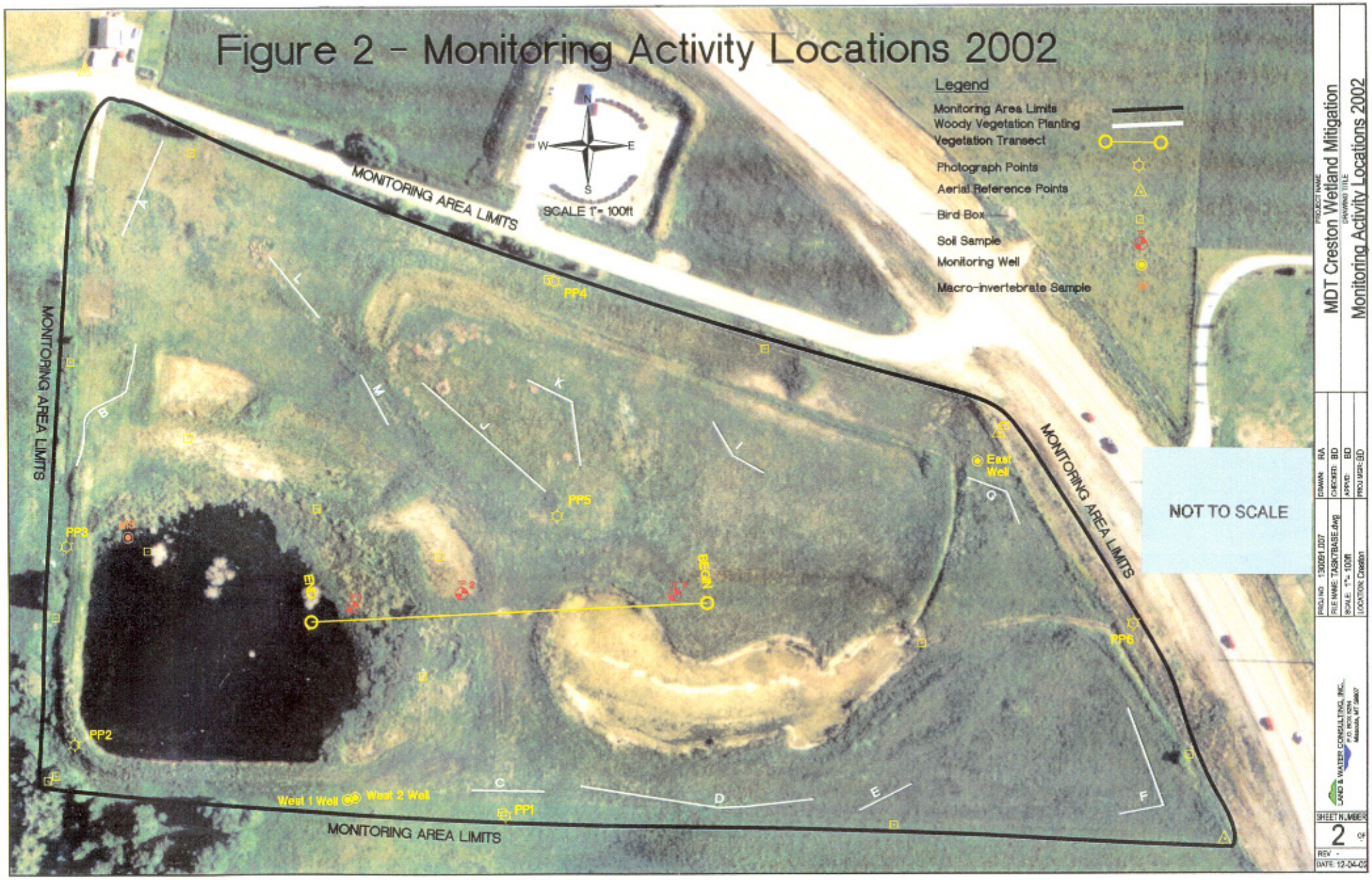
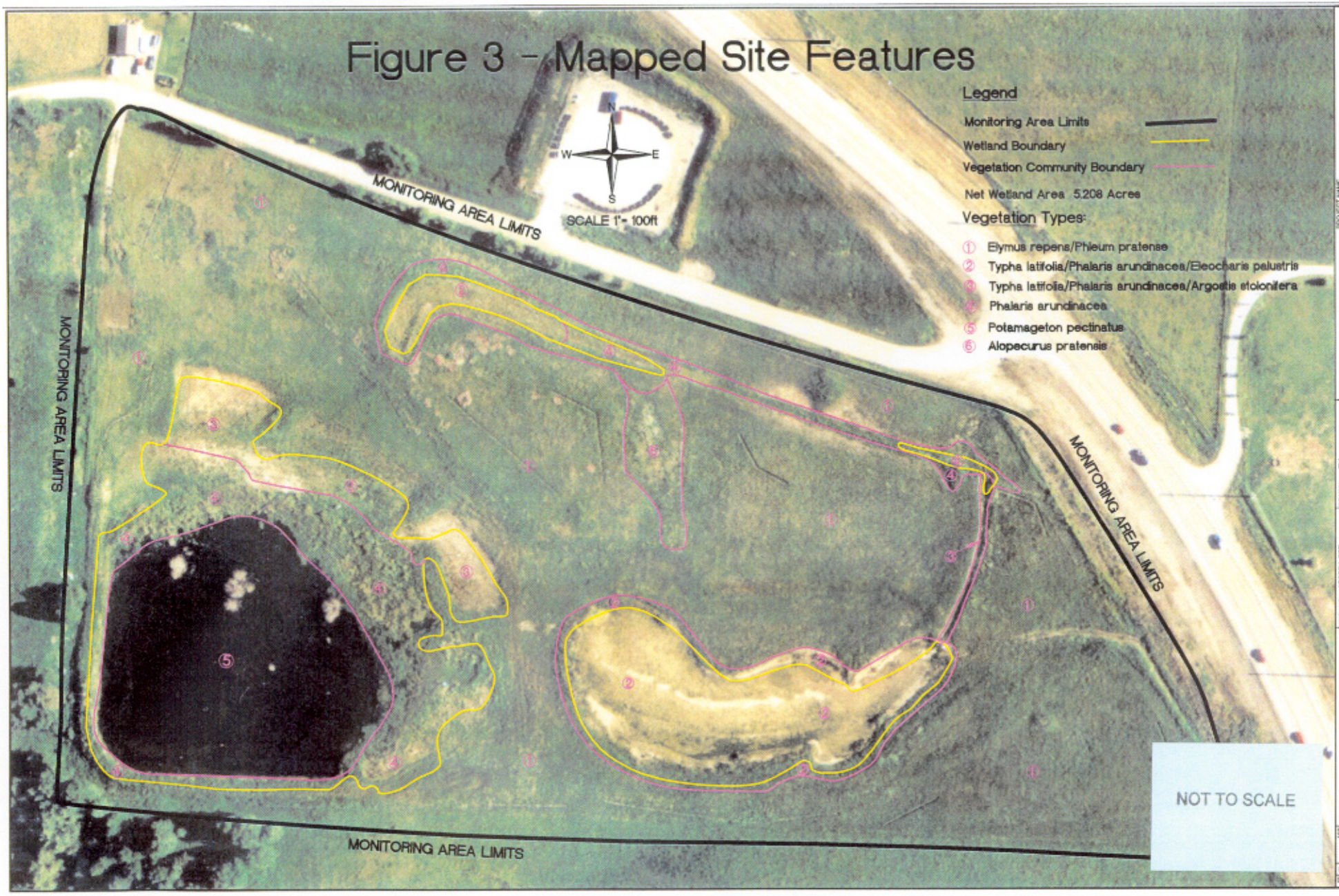


Figure 2 - Monitoring Activity Locations 2002
Legend
Monitoring Area Limits
Woody Vegetation Planting
Vegetation Transect
Photograph Points
Aerial Reference Points
Bird Box
Soil Sample
Monitoring Well
Macro-invertebrate Sample
N
W
E
S
SCALE 1"= 100ft
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
PP1
PP2
PP3
PP4
PP5
PP6
East Well
West 1 Well
West 2 Well
NOT TO SCALE
PROJECT NAME
MDT Creston Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2002
PROJ NO: 130051.007
FILE NAME: TASKTBASE.dwg
SCALE: 1"= 100ft
LOCATION: Creston
DRAWN: RA
CHECKED: BD
APPVD: BD
PROJ MGR: BD
LAND & WATER CONSULTING, INC.
SHEET NUMBER
2
REV -
DATE: 12-04-02

Figure 3 – Mapped Site Features



PROJECT NAME: MDT Creston Wetland Mitigation
DRAWING TITLE: Mapped Site Features

PROJ NO.: 130091.007 | DRAWN: RA
FILE NAME: TASK7BASE.dwg | CHECKED: BD
SCALE: 1" = 100ft | APPVD: BD
LOCATION: Creston | PROJ MGR: BD

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

SHEET NUMBER: 3
REV: -
DATE: 12-04-02

Appendix B

COMPLETED 2002 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2002 BIRD SURVEY FORMS
COMPLETED 2002 MACROINVERTEBRATE SUMMARY
COMPLETED 2002 WETLAND DELINEATION FORMS
COMPLETED 2002 FIELD AND FULL FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Creston
Creston, Montana

LAND & WATER

DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Creston Project Number: 130091-007 Assessment Date: 7/18/02
Location: Creston MDT District: _____ Milepost: _____
Legal description: T____ R____ Section____ Time of Day: 10am - 3pm
Weather Conditions: sunny + warm Person(s) conducting the assessment: A. Kuhle, J. Ashbrook
Initial Evaluation Date: 7/25/01 Visit #: 2 Monitoring Year: 2002
Size of assessment area: 20 acres Land use surrounding wetland: rural agriculture + urban

HYDROLOGY

Surface Water

Inundation: Present X Absent____ Average depths: 2-3 ft Range of depths: 0 - 8? ft
Assessment area under inundation: 15 %
Depth at ~~emergent~~ vegetation-open water boundary: ____ ft – water has rooted veg throughout
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.): _____
drift lines ~~are~~ are present in depressions, however, weed cover appears to be encroaching on typha. Typha are not successfully reproducing well

Groundwater

Monitoring wells: Present X Absent_____
Record depth of water below ground surface

	Well #	Depth	~~Well #~~	~~Depth~~	~~Well #~~	~~Depth~~
W2 2.85	C94-12	8.41 / 7.77	above LSD =	5.64 bgs	5.56	
W1 1.91	C94-11	8.17 / 3.05	above LSD =	5.12 bgs	5.2	
E 1.95	C94-10	7.11 / 1.98	above LSD =	5.13 bgs	5.16	

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..)
N/A GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: _____

VEGETATION COMMUNITIES - CRESTON

Community No.: 1 Community Title (main species): Elymus repens/Phleum pratense weedy upland

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	40%	Linum perenne	3%
Phleum pratense	10%	Trifolium hybridum	5%
Agrostis stolonifera	10%	Taraxacum officinale	10%
Cirsium arvense	10%	Medicago lupulina	5%
Astragalus cicer & purple legume combined	15%	Poa pratensis	2%

COMMENTS/PROBLEMS: _____

Community No.: 2 Community Title (main species): Typha latifolia – pond edges

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia (also in water)	50%	Juncus articulatus (also in water)	2%
Phalaris arundinacea	30%	Epilobium ciliatum	Trace
Eleocharis palustris (also in water)	20%	Ceratophyllum demersum (in water)	50%
Alopecurus pratensis	5%	Sparganium emersum (in water)	1%
Agrostis stolonifera	1%	Scirpus acutus (in water)	1%

COMMENTS/PROBLEMS: _____

Community No.: 3 Community Title (main species): Depressions: mixed Typha latifolia and weedy grasses

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	10%	Medicago lupulina	10%
Phalaris arundinacea	10%	Populus balsamifera	4%
Agrostis stolonifera	20%	Taraxacum officinale	2%
Alopecurus pratensis	5%	Trifolium hybridum	15%
Eleocharis palustris	5%	Juncus tenuis & J. articulatus & J. regelii	5%

COMMENTS/PROBLEMS: _____

Additional Activities Checklist:

X **Record and map vegetative communities on air photo** - unchanged from 2001

VEGETATION COMMUNITIES - CRESTON

LAND & WATER B-3

Community No.: 4 Community Title (main species): Phalaris arundinacea

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	95%	Juncus articulatus & J. tenuis	1%
Agrostis stolonifera	1%	Alopecurus pratensis	trace
Equisetum arvense	trace	Cirsium arvense	trace
Carex bebbii	trace	Carex lasiocarpa	trace
Eleocharis palustris	1%	Plantago major	trace

COMMENTS/PROBLEMS: _____

Community No.: 5 Community Title (main species): Potamageton pectinatus

Dominant Species	% Cover	Dominant Species	% Cover
Potamageton pectinatus	98%	Plantago major	trace
Ranunculus scleratus	trace	Phalaris arundinacea	5%
Potamageton natans	trace		
Barbarea vulgaris	trace		
Ceratophyllum demersum	1%		

COMMENTS/PROBLEMS: _____

Community No.: 6 Community Title (main species): Alopecurus pratensis

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus pratensis	70%	Agrostis stolonifera	2%
Phalaris arundinacea	10%	Taraxacum officinale	trace
Cirsium arvense	2%	Lactuca serriola	1%
Medicago lupulina	trace	Trifolium hybridum	trace
Trifolium pratensis	trace	Erigeron acris	trace

COMMENTS/PROBLEMS: _____

Additional Activities Checklist:

___ Record and map vegetative communities on air photo

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Elymus repens	1,2,3	Juncus articulatus	2,3,4
Astragalus cicer	1,3	Juncus regelii	3
Linum perenne	1	Ranunculus scleratus	5
Poa pratensis	1,3,4	Beckmannia syzigachne	2
Rumex crispus	1	Ceratophyllum demersum	2,5
Cirsium arvense	1,2,3,4,6	Carex bebbii	3,4
Taraxacum officinale	1,2,3,6	Erigeron acris	3,6
Phleum pratense	1,3	Scirpus acutus	2,3
Dactylis glomerata	1	Populus balsamifera	3
Chrysanthemum leucanthemum	1	Equisetum arvense	3,4
Alopecurus pratensis	1,2,3,4,6	Poa palustris	2,4
Silene latifolia	1	Galium aparine	1
Melilotus alba	1,3	Lamium amplexicaule	1
Melilotus officinale	1,3	Carex flava	3,6
Agrostis stolonifera	1,2,3,4,6	Ranunculus aquatilis	5
Poa spp.	1	Barbarea vulgaris	5
Medicago lupulina	1,3,4,6	Sparganium emersum	2
Trifolium hybridum	1,3,6	Potamageton pectinatus	5
Lactuca serriola	1,2,3,4,6	Lotus corniculatus	1
Trifolium pratense	1,3,6	Carex arcta	3
Verbascum thapsus	1,4	Potamageton natans	5
Tragopogon dubius	1	Poa compressa	1,3,4
Bromus inermis	1	Arctium minus	1
Cynoglossum officinale	1,4	Carex aurea	3
Thlaspi arvense	1	Carex lasiocarpa	3,4
Cirsium vulgare	1,3	Artemesia absinthium	3
Centaurea maculosa	1	Amelanchier alnifolia	4
Plantago major	1,2,3,4,5	Prunella vulgaris	4
Purple legume (Astragalus?)	1	Stipa nelsonii	1
Phalaris arundinacea	1,2,3,4,5,6	Elymus smithii	1
Epilobium ciliatum	1,2,3,4	Salix bebbiana	3,4
Typha latifolia	2,3	Carex microptera	4
Eleocharis palustris	2,3,4,5	Juncus balticus	3
Juncus tenuis	2,3,4	Festuca arundinacea	3
Elcagnus commutata	1	Elymus elymoides	3

COMMENTS/PROBLEMS: _____

PLANTED WOODY VEGETATION SURVIVAL LAND & WATER B-5

Species	Number Originally Planted	Number Observed	Mortality Causes
#1A Apple tree	16	11	browsing
#2B Apple tree	26	6	
#3C silver berry	27	17	all look unhealthy
#15, 16 D	162/153	77	browsing & competition
E	23	9	
F silverberry & rose	143	35	browsing & competition
#10 G silverberry	27	13	
#9 H silverberry	61	24	
I ~~woods rose~~	27	16	
J Woods rose	113	111	growing beyond plantings limit
K Silverberry	74	70	look healthy, some browsing
L Woods rose	55	37	getting outcompeted by clover + orch grass
M Woods rose	26	22	clover is out competing

COMMENTS/PROBLEMS: Labeled vegetation plantings A - M so that comparison can be made more easily in future monitoring seasons.

BIRD SURVEY - FIELD DATA SHEET

Date: June 2, 2002

Survey Time: 8:40 - 9:30

SITE: Creston

Bird Species	Behavior	Habitat Type
humming bird	FO	
Red-winged blackbird	L/N	
Common snipe	L	
northern shoveler	F/L	
Common goldeneye	L/F	
Northern flicker	L	
Spotted sandpiper	F	
Cinnamon teal	F	
Northern rough-winged swallow	FO	
Ringnecked pheasant	L	
Tree swallow	N - in duck box	
Killdeer	N	
Raven	FO	
cliff swallow	F	
hooded merganser	N w/ 7 chicks	
Yellow-headed blackbirds	L	
Great blue heron	FO	

Bird Species	Behavior	Habitat Type

NOTES:

Pocket Gopher

Deer pellets

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

WILDLIFE

July - 2002

BIRDS

Scientific Name	Common Name	Number Observed	Nesting or Breeding	Living on site	Feeding	Migrating
	northern flicker					
	tree swallow					
	red-winged blackbirds					
	killdeer					
	waxwings (bohemian)					

Were man made nesting structures installed: Yes X No ___ Type: ___ How many? ___ Are the nesting structures being utilized: Yes X No ___ Do the nesting structures need repairs: Yes ___ No X

4 by swallows

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
coyote		X			
deer		X			X ~~tracks~~
muskrat ?					X tracks

Additional Activities Checklist:

X Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: _____

Montana Department of Transportation				
Wetland Mitigation Monitoring Project				
Rhithron Associates, Inc.				
for Land and Water Consulting		Project Name	Creston	
2001 and 2002				
		Date	7/18/2002	
Gastropoda	Lymnaeidae	*Fossaria*	11	
	Physidae	*Physa*	58	
	Planorbidae	*Gyraulus*	5	
		Planorbella	3	
Crustacea	Cladocera	Cladocera	1	
		Hyalella azteca	75	
Odonata	Aeshnidae	*Anax junius*	2	
		Sympetrum	11	
	Lestidae	*Lestes*	48	
		Callibaetis	3	
	Notonectidae	*Notonecta*	4	
		Ceraclea	1	
		Dytiscidae - early instar larvae	4	
		Hygrotus	2	
	Haliplidae	*Haliplus*	1	
	Chaoboridae	*Chaoborus*	1	
	Chironomidae	*Ablabesmyia*	1	
		Chironomus	2	
		Paratanytarsus	1	
		Tanypus	1	
		Theinemanniella	2	
		Total	237	
		Total taxa	21	
		POET	5	
		Chironomidae taxa	5	
		Crustacea taxa + Mollusca taxa	6	
		% Chironomidae	2.95%	
		Orthocladiinae/Chironomidae	0.29	
		%Amphipoda	31.65%	
		%Crustacea + %Mollusca	64.56%	
		HBI	7.37	
		%Dominant taxon	31.65%	
		%Collector-Gatherers	64.56%	
		%Filterers	0.42%	
		Scores (2002 criteria)		
		Total taxa	5	
		POET	5	
		Chironomidae taxa	3	
		Crustacea taxa + Mollusca taxa	5	
		% Chironomidae	5	
		Orthocladiinae/Chironomidae	3	
		%Amphipoda	1	
		%Crustacea + %Mollusca	3	
		HBI	3	
		%Dominant taxon	3	
		%Collector-Gatherers	3	
		%Filterers	1	
		Total score	40	

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

Location	Photo Frame #	Photograph Description	Compass Reading
A 3	1, 2	East toward pond, West away from pond	
B 2	3, 4	NE - toward pond, SW - property corner	
C 1	5, 6	North - between ponds South - away from property	
D 6	7, 8	West to tall upper pond, East to hwy	
E 5	9, 10, 11, 12	N - to dump to W - along veg line N-S btwn ponds, E - E to hwy	
F			
G			
H			

COMMENTS/PROBLEMS: _____

GPS SURVEYING

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

Checklist: N/A

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

computed in 2001

COMMENTS/PROBLEMS: _____

WETLAND DELINEATION

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
N/A Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

Collect information to complete MDT Function and Values Assessment in the office.

See forms

COMMENTS/PROBLEMS: _____

MAINTENANCE

Were man-made nesting structures installed at this site? YES X NO____
If yes, do they need to be repaired? YES____ NO X
If yes, describe problems below and indicate if any actions were taken to remedy the problems.

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

COMMENTS/PROBLEMS: _____

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

Checked in 2002; no changes

Project/Site: Creston Applicant/Owner: MDT Investigator: A. Kuhle	Date: 8-24-01 County: Flathead State: MT
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: 5 Transect ID: _____ Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Potamogeton pectinatus	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: Dead tree observed in standing water

HYDROLOGY

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

___ No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	0	(in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name (Series and Phase): Muck + Peat (1960) Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16	O	5YR 2.5/1	NA		muck
7/16	B	7.5YR 6/1	7.5YR 6/3	common/distinct	silt loam

Hydric Soil Indicators:

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

Remarks:
This area is typically inundated, low water year has decreased surface water elevation.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks:
Soil pit is located along vegetation transect immediately adjacent to reed-canary grass + pond boundary

Approved by HQUSACE 3/92

checked in 2002; no changes

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

Project/Site: Custom Applicant/Owner: MDT Investigator: A. Kuhle	Date: 8-24-01 County: Flathead State: MT
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: 4 Transect ID: Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. reed canary grass	+1	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

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

Remarks:

HYDROLOGY

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

___ No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	>16	(in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name (Series and Phase): Aa (poorly drained Alluvial land) 1960

Drainage Class: _____

Taxonomy (Subgroup): _____

Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O				
1-9	A	7.5YR 2.5/2	NA	NA	loam
9+16	B	7.5YR 5/1	7.5YR 5/3	Common/dist.	silt loam

Hydric Soil Indicators:

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

Remarks: Hydric soil is not well developed

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks:

Approved by HQUSACE 3/92

* Soil in low area w/ sparse vegetation is similar soil however, lacking organic accumulation

checked in 2002; no changes

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

Project/Site: Creston	Date: 8-24-01
Applicant/Owner: MDT	County: Flathead
Investigator: A. Kuhle	State: MT
Do Normal Circumstances exist on the site: X Yes ___ No	Community ID: 1
Is the site significantly disturbed (Atypical Situation)? ___ Yes X No	Transect ID:
Is the area a potential Problem Area?: ___ Yes X No	Plot ID: 3
(If needed, explain on reverse.)	

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	Elymus Repens	H	FACU	9			
2	Phleum pratense	H	FAC-	10			
3	Agrostis sblonifera	H	FAC+	11			
4	Cirsium arvense	H	FACU+	12			
5	legumes (sp?)	H	?	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 25%

Remarks: legume species (yellow + purple) are planted and not identified.

HYDROLOGY

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

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: >16 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:

SOILS

Map Unit Name (Series and Phase): Swims silt loam
Taxonomy (Subgroup): _____
Drainage Class: _____
Field Observations
Confirm Mapped Type? ____ Yes X No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O				
1-5	A	7.5YR 2.5/2	N/A	N/A	loam
5->16	B	7.5YR 4/3	N/A	N/A	loam

Hydric Soil Indicators:

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

Remarks: soil is very dry; shows signs of oxidation below ~ 10'

WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes ____ No
Wetland Hydrology Present? ____ Yes X No
Hydric Soils Present? ____ Yes X No

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

Remarks:

Field Data Sheet for 1999 MDT Wetland Assessment Form Site: Creston Date: 7-18-02 By: ADC

Estimated AA Size (Circle Ac.): <1 1-5 >5 Brief Description:

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

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

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

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

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

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

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

*Evidence of groundwater discharge or recharge? Y N List: _____

HABITAT

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

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

Primary or critical habitat (**list species**)	D S	T/E: _____	D S	MNHP: _____
Secondary habitat (**list species**)	D S	T/E: _____	D S	MNHP: _____
Incidental habitat (**list species**)	D S	T/E: _____	D S	MNHP: _____
No usable habitat	D S	T/E: _____	D S	MNHP: _____

Wildlife observations? _____

Fish observations? _____

OTHERS

Do wetlands have potential to receive excess sediments, nutrients, or toxicants? Y N From: _____

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

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

List: _____

Is AA a known recreation / education site? Y N Type: _____

Does AA offer strong potential for use as recreation / education site? Y N Type: _____

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

1. Project Name: Creston 2. Project #: 130091.007 Control #:

3. Evaluation Date: Mo. 7 Day 18 Yr. 02 4. Evaluator(s): A. Kuhle 5. Wetlands/Site #(s) Creston

6. Wetland Location(s): i. Legal: T ___ N or S; R ___ E or W; S ___ ; T N or S; R ___ E or W; S ___ ;
ii. Approx. Stationing or Mileposts:
iii. Watershed: Flathead - 04 GPS Reference No. (if applies):
Other Location Information:

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

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

9. Assessment area: (AA, tot., ac., see instructions on determining AA) 20 (visually estimated)
___ (measured, e.g. by GPS [if applies])

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

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
Depression (open groundwater)	Palustrine	N/A	AB	H	EI	15
Depression (open groundwater)	Palustrine	N/A	EM	G	EI	15
Mineral Soil Flat	Palustrine	N/A	SS	C	E	70

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

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

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

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

Comments: (types of disturbance, intensity, season, etc.): most plants are introduced, disturbance is minimal

ii. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) houndstooth

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

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

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

Comments:

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

4A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

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

Primary or critical habitat (list species)	D S	
Secondary habitat (list species)	D S	
Incidental habitat (list species)	D (S)	Bald eagle
No usable habitat	D S	

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

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

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

4B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species)	D S	
Secondary habitat (list species)	D (S)	
Incidental habitat (list species)	D (S)	Western toad, northern leopard frog, peregrine falcon, blacktail
No usable habitat	D S	

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

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

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

4C. General Wildlife Habitat Rating:

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

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

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

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

Wildlife habitat features (working from top to bottom, circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low .) 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 their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = easonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

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

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

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

omments:

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

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

Comments:

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

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

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

Comments:

4H Sediment/Shoreline Stabilization: (applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on e shoreline of a standing water body which is subject to wave action. If does not apply, circle NA here and proceed to next function)

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

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

omments:

4I. Production Export/Food Chain Support:

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

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

omments:

4J. Groundwater Discharge/Recharge: (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

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

ii. Recharge Indicators

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

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

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

omments:

4K. Uniqueness:

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

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

omments:

4L. Recreation/Education Potential: i. Is the AA a known rec./ed. site: (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

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

iii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use? (Y) N

(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

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

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

omments:

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units; (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	.7	1	
B. MT Natural Heritage Program Species Habitat	L	.1	1	
C. General Wildlife Habitat	H	.9	1	
D. General Fish/Aquatic Habitat	N/A	—	0	
E. Flood Attenuation	N/A	—	0	
F. Short and Long Term Surface Water Storage	H	.8	1	
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	
H. Sediment/Shoreline Stabilization	N/A	—	0	
I. Production Export/Food Chain Support	H	1	1	
J. Groundwater Discharge/Recharge	H	1	1	
K. Uniqueness	M	.6	1	
L. Recreation/Education Potential	H	1	1	
Totals:		6.8	9	136 - 76%

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

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)

___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
___ Score of 1 functional point for Uniqueness; **or**
___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)

___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
X Score of .9 or 1 functional point for General Wildlife Habitat; **or**
___ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
___ Score of .9 functional point for Uniqueness; **or**
X Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)

___ "Low" rating for Uniqueness; **and**
___ "Low" rating for Production Export/Food Chain Support; **and**
___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

MDT WETLAND MONITORING – VEGETATION TRANSECT

LAND & WATER B-23

Site: Creston Date: 7/18/02 Examiner: J. Asebrook Transect # 1

Approx. transect length: 465 feet Compass Direction from Start (Upland): _____

Vegetation type 1:	Weedy upland (see attached Table 1)		
Length of transect in this type:	192 (3 sections)	feet	
Elymus repens	4	Cirsium vulgare	+
Astragalus cicer	4	Dactylis glomerata	+
Agrostis stolonifera	2	Phalaris arundinacea	+
Cirsium arvense	2	Stipa nelsonii	+
Medicago lupulina	1	Trifolium hybridum	+
Poa spp.	+	Melilotus officinale	+
Phleum pratense	1	Silene latifolia	+
Poa pratensis	+	Tragopogon dubius	+
Alopecurus pratensis	+	Poa compressa	+
Taraxacum officinale	+	Elymus smithii	+
Rumex crispus	+	Arctium minus	+
Linum perenne	1	Lactuca serriola	+
Total Vegetative Cover:	85%		

Vegetation type 2:	Typha latifolia		
Length of transect in this type:	79	feet	
Typha latifolia	5	**Water's edge:**	
Phalaris arundinacea	4	Ceratophyllum demersum	5
Eleocharis palustris	3	Sparganium emersum	+
Alopecurus pratensis	1+	Eleocharis palustris	1
Agrostis stolonifera	+	Juncus articulatus	1-
Lactuca serriola	+	Beckmannia syzigachne	+
Epilobium ciliatum	+	Typha latifolia	1
Plantago major	+	Scirpus acutus	+
Juncus articulatus	+	Phalaris arundinacea	+
Cirsium arvense	+		
Juncus tenuis	+		
Elymus repens	+		
Total Vegetative Cover:	80%		

Vegetation type 3:	Depressions: mixed TYPLAT/grasses		
Length of transect in this type:	55	feet	
Typha latifolia	3	Erigeron acris	+
Agrostis stolonifera	3	Medicago lupulina	+
Eleocharis palustris	1+	Taraxacum officinale	+
Juncus tenuis	1+	Cirsium vulgare	+
Juncus regelii	1	Carex flava	+
Juncus articulatus	1	Carex aurea	+
Alopecurus pratensis	1	Salix bebbiana	+
Melilotus officinale	+	Phleum pratense	+
Cirsium arvense	+	Trifolium hybridum	+
Equisetum arvense	1-	Trifolium pratense	+
Phalaris arundinacea	1	Populus balsamifera	+
Plantago major	+		
Total Vegetative Cover:	50%		

Vegetation type 4:	Phalaris arundinacea		
Length of transect in this type:	132	feet	
Phalaris arundinacea	5	Amelanchier alnifolia	+
Eleocharis palustris	+	Verbascum thapsus	+
Equisetum arvense	+	Epilobium ciliatum	+
Agrostis stolonifera	+	Medicago lupulina	+
Plantago major	+		
Lactuca serriola	+		
Cirsium arvense	+		
Carex bebbii	+		
Juncus tenuis	+		
Salix bebbiana	+		
Poa pratensis	+		
Carex microptera	+		
Total Vegetative Cover:	85%		

MDT WETLAND MONITORING – VEGETATION TRANSECT

LAND & WATER B-24

Site: Creston Date: 8/13/2001 Examiner: J. Asebrook Transect # 1

Approx. transect length: 465 feet Compass Direction from Start (Upland): _____

Vegetation type 5:	Potamageton pectinatus	
Length of transect in this type:	8	feet
Phalaris arundinacea		2
Potamageton pectinatus		5
Barbarea vulgaris		+
* dead Crataegus douglasii in water		
Total Vegetative Cover:	100%	

Vegetation type 6:		
Length of transect in this type:		feet
Total Vegetative Cover:		

Vegetation type 7:		
Length of transect in this type:		feet
Total Vegetative Cover:		

Vegetation type 8:		
Length of transect in this type:		feet
Total Vegetative Cover:		

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

LAND & WATER B-25

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:

Appendix C

REPRESENTATIVE PHOTOGRAPHS
2002 AERIAL PHOTO

MDT Wetland Mitigation Monitoring
Creston
Creston, Montana

LAND & WATER

Photo Point No. 1: View looking north; the Flathead County green bins are located in the distance.

Photo Point No. 2: View looking northeast; Highway 35 is visible in the background.

Photo Point No. 3: View looking east. The photo is taken near the north perimeter of the impoundment.

Photo Point No. 5: View looking north across the mitigation site.

Photo Point No. 5: View looking south and taken from the center of the mitigation site.

Photo Point No. 6: View looking west; the shallow pond is present in the background.

Photo Point No. 1: View looking South.

Photo Point No. 6: View looking east.

Photo Point No. 2: View looking southwest.

Photo Point No. 3: View looking west.

Photo Point No. 5: View looking east.

Photo Point No. 5: View looking west.


JOB:CRESTON WETLAND ROLL:000 SCALE:1:6000 FLT:5 07/23/2002 12:04:13
CRESTON 2002
FS100 1/ 500 f/5.6 FF1.0 EC 0 SIN dt233.5 26.9V -56mb

Appendix D

BIRD SURVEY PROTOCOL
MACROINVERTEBRATE SAMPLING PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Creston
Creston, Montana

LAND & WATER

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

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

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

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

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

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

Site Selection

Select the sampling site with these considerations in mind:

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

Sampling

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

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

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

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

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

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

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

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

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

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

Photograph the sampled site.

Sample Handling/Shipping

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

GPS Mapping and Aerial Photo Referencing Procedure

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

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

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

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