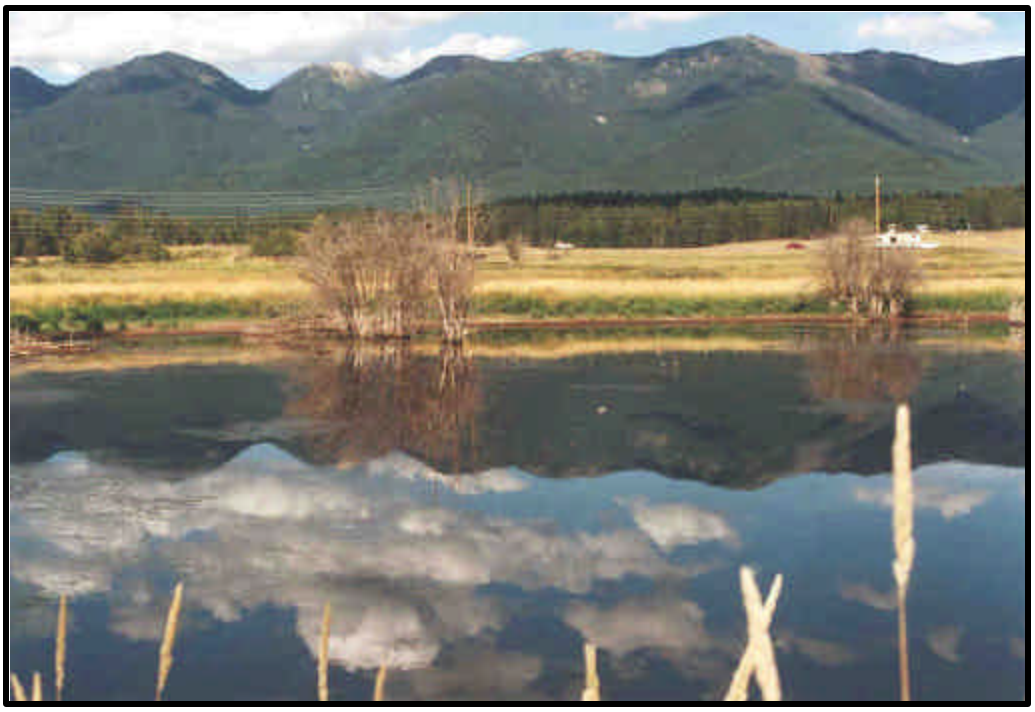
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2001

Creston Site
Creston, Montana



Prepared for:

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

Prepared by:

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P.O. Box 8254
Missoula, MT 59807

July 2002

Project No: 130091.007

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Completed 2001 Wetland Delineation Forms

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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 (amsl).

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.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on May 8th (spring) and July 25th and August 25th (mid-season) 2001. The primary purpose of the spring visit was to conduct a bird/general wildlife reconnaissance. The May 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.

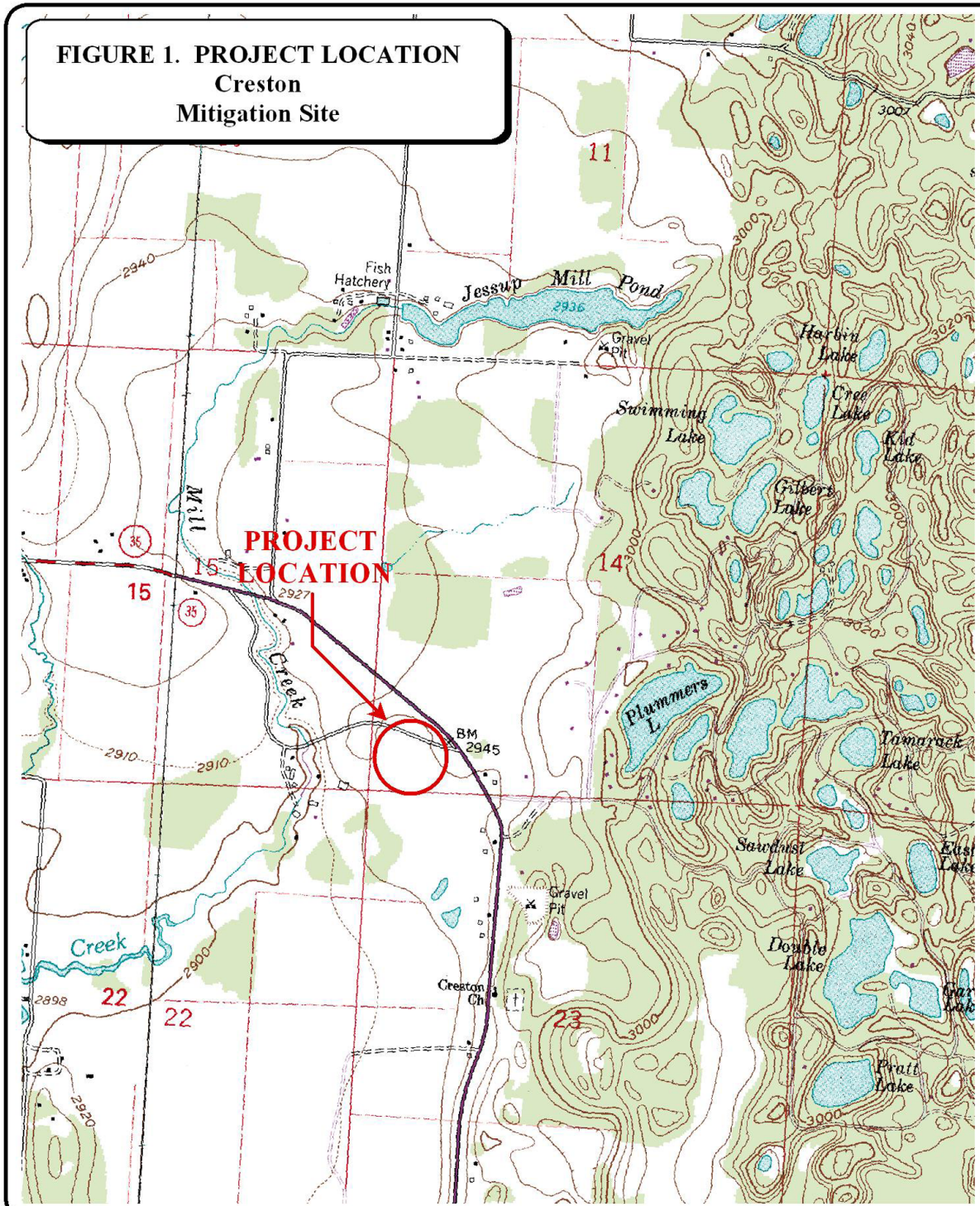
The mid-season visit was conducted between late July and August to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information 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; functional assessment; and (non-engineering) examination of dike structures.

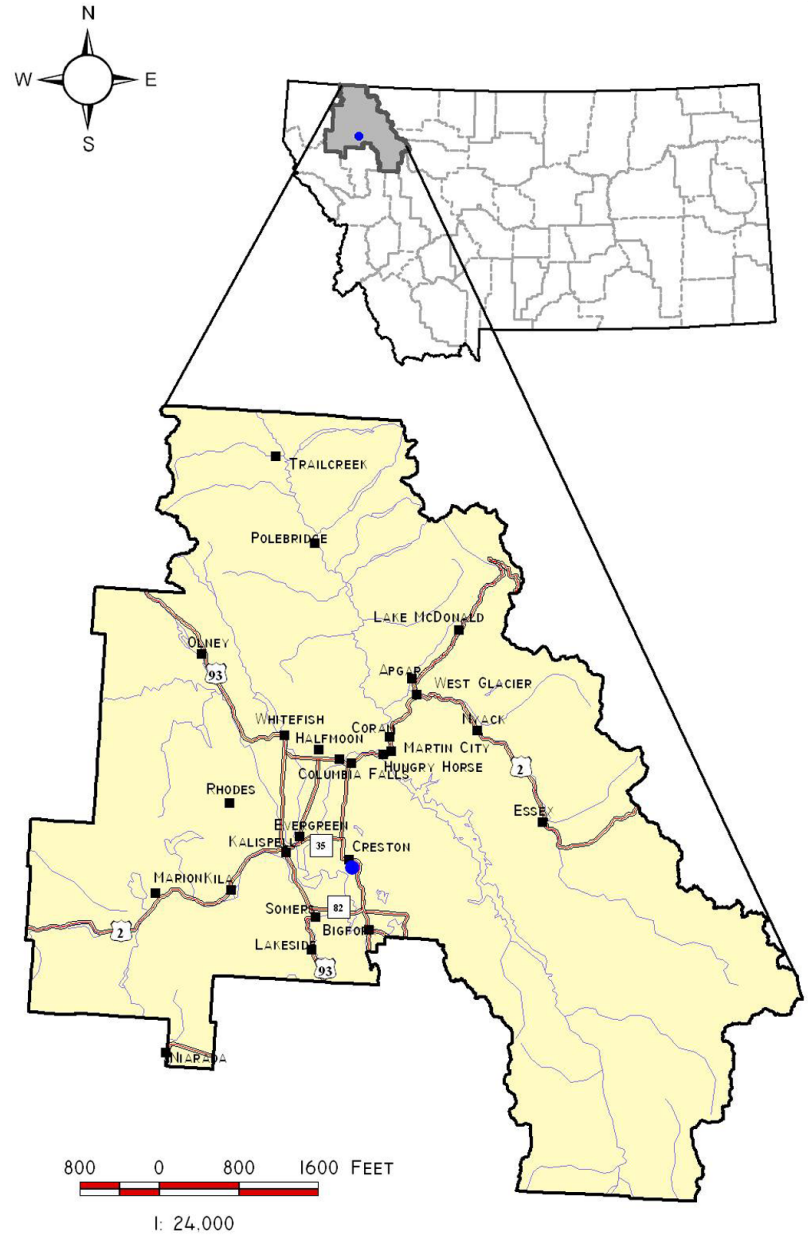
2.2 Hydrology

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; however, Land & Water personnel were not able to obtain the correct key to access the wells. 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**).

One 10-foot wide belt transect was established during the mid-season monitoring event to represent the range of current vegetation conditions **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 transect will be used 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. Photos along each transect were taken from both ends during the mid-season visit.

A comprehensive plant species list for the site was compiled and will be updated as new species are 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 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

Wetland delineation was conducted on the 20-acre mitigation site during the mid-season visit according the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The 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. 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. Observations from past years will ultimately be compared with new data.

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

Macroinvertebrate sampling was not conducted during the 2001 monitoring year. Sampling will be conducted during the spring and summer of 2002 and in future monitoring events, according to the established protocol provided in **Appendix D**.

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 each 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.

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 transects. Each photograph point location was recorded with a resource grade GPS. 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**.

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 10 to 15% of the mitigation site (see **Figure 3**, **Appendix A**). Emergent vegetation was observed throughout the inundated areas. The water table was depressed relative to previous years due to drought conditions. 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.

The upper pond was virtually dry in mid-July. The artesian well that discharges to the upper pond was flowing but the discharge rate was estimated to be less than one-gallon per minute. Three groundwater wells are located on the site; however, Land & Water was unable to obtain the correct key to access the wells. The wells will be monitored in subsequent monitoring years.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. Six wetland 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 occurs in the upland and consists primarily of *Elymus repens* with an even distribution of *Phleum pratense*, *Agrostis stolonifera*, and *Cirsium arvense*. This community type is weedy and included a trace of *Cynoglossum officinale* (common hound's tongue), which is classified as a noxious weed in Flathead County. Type 2 is present around the pond edges, particularly the upper pond and consists primarily of *Typha latifolia*, *Ceratophyllum demersum* and *Phalaris arundinacea*. Type 3 is present in small depressions with less frequent inundation and consists of *Typha latifolia* mixed with weedy grasses. Type 4 is dominated by *Phalaris arundinacea* and

is present adjacent to the large pond and in some of the small depressions. Type 5 is the emergent vegetation and is dominated by *Potamogeton pectinatus*. Type 6 is a minor upland community that is dominated by *Alopecurus pratensis*. Vegetation transect results are detailed in the attached data form, and are summarized graphically below.

VT Start	*Type 1 Upland (195')*	*Type 2 (80')*	*Type 3 (63')*	*Type 4 (100')*	*Type 5 (25')*	Total: 463'	VT End

Table 1: ***2001 Creston Vegetation Species List***

Species	Region 9 (Northwest) Wetland Indicator
Agrostis stolonifera	FAC+
Alopecurus pratensis	FACW
Barbarea vulgaris	FAC-
Beckmannia syzigachne	OBL
Bromus inermis	--
Carex arcta	FACW+
Carex bebbii	OBL
Carex flava	OBL
Ceratophyllum demersum	OBL
Chenopodium album	FAC
Chenopodium rubrum	FACW+
Cirsium arvense	FAC-
Cirsium vulgare	FACU
Cynoglossum officinale	FACU
Dactylis glomerata	FACU
Eleocharis palustris	OBL
Elymus repens	FACU
Epilobium ciliatum	FACW-
Equisetum arvense	FAC
Erigeron lonchophyllus?	FACW
Gnaphalium palustre	FAC+
Juncus articulatus	OBL
Juncus regelii	FACW
Juncus tenuis	FAC
Lactuca serriola	FACU
Linum perenne	
Medicago lupulina	FAC
Melilotus alba	FACU
Melilotus officinale	FACU
Myosotis laxa	OBL
Phalaris arundinacea	FACW
Phleum pratense	FAC-
Plantago lanceolatum	FACU+
Plantago major	FAC+
Poa pratensis	FAC
Polygonum convolvulus	FACU-
Populus balsamifera	FAC
Potamogeton natans	OBL
Potamogeton pectinatus	OBL
Potentilla anserina	OBL
Ranunculus aquatilis	OBL
Ranunculus sceleratus	OBL
Rumex crispus	FACW
Silene latifolia	
Sparganium emersum	OBL
Taraxacum officinale	FACU
Thlaspi arvense	NI
Tragopogon dubius	UPL
Trifolium hybridum	FACU+
Trifolium pratense	FACU
Typha latifolia	OBL
Verbascum thapsus	UPL
Veronica americana	OBL

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 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 are well developed including a histic epipedon. TP2 is 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 is present from 1 to 9-inches and mottles were observed below 9-inches. These soil characteristics indicate an oxygen-depleted environment with a fluctuating water table. TP3 is 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).

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 indicate 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. It is likely that area within the Type 3 Community and within the ditches will develop hydric soil characteristics with continued inundation.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2001 monitoring efforts are listed in **Table 2**. Specific evidence observed and activity codes pertaining to birds are provided on the completed monitoring form in **Appendix B**. Two mammal and numerous bird species were noted using the mitigation site.

Table 2: ***Fish and Wildlife Species Observed on the Creston Mitigation Site***

FISH none	
AMPHIBIANS None observed	
REPTILES None observed	
BIRDS American Robin (*Turdus migratorius*) Canada Goose (*Branta Canadensis*) Cinnamon Teal (*Anas cyanoptera*) Common Goldeneye (*Bucephala clangula*) Killdeer (*Charadrius vociferous*) Mallard (*Anas platyrhynchos*) Northern Shoveler (*Anas clypeata*)	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*) Osprey (*Pandion haliaetus*)
MAMMALS White-tailed Deer (*Odocoileus virginianus*) Meadow vole (*Microtus pennsylvanicus*)	

3.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted due to lack of sampling equipment, but will be conducted in May and July of 2002 and in subsequent monitoring years.

3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B**. Functional assessment results are summarized in **Table 3**. The site was evaluated as a single assessment area and rated as a Category II wetland. Wildlife habitat and groundwater discharge are the primary functions of the site. The site provides a total of 35.4 functional units and achieved 76% of possible points.

A functional assessment was not conducted prior to site construction and therefore cannot be used for comparison. Future assessments will be compared to the 2001 functional assessment.

3.8 Photographs

Representative photos taken from photo-points and transect ends 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.

3.10 Current Credit Summary

Approximately 5.2 acres of wetlands are currently 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 site conditions it is expected that additional wetland acres will develop in the future with continued inundation.

Table 3: ***Summary of 2001 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 Numbers
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 (0.9)
Groundwater Discharge/Recharge	High (1)
Uniqueness	Mod (0.6)
Recreation/Education Potential	High (1)
Actual Points/Possible Points	6.8 / 9
% of Possible Score Achieved	76%
Overall Category	II
Total Acreage of Assessed Wetlands within Easement	5.2 ac (calculated)
Functional Units (acreage x actual points)	35.4 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

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USDA Natural Resources Conservation Service. 1998. *Field Indicators of Hydric Soils in the United States*, 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

Figure 3 - Mapped Site Features
Legend
Monitoring Area Limits
Wetland Boundary
Vegetation Community Boundary
Net Wetland Area 5.208 Acres
Vegetation Types:
① Elymus repens/Phleum pratense
② Typha latifolia/Phalaris arundinacea/Eleocharis palustris
③ Typha latifolia/Phalaris arundinacea/Argostis stolonifera
④ Phalaris arundinacea
⑤ Potamageton pectinatus
⑥ Alopecurus pratensis
N
W
E
S
SCALE 1"= 100ft
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
MONITORING AREA LIMITS
NOT TO SCALE
PROJECT NAME
MDT Creston Wetland Mitigation
DRAWING TITLE
Mapped Site Features
PROJ NO: 130091.007
FILE NAME: TASK7BASE.dwg
SCALE: 1"= 100ft
LOCATION: Creston
DRAWN: RA
CHECKED: BD
APPVD: BD
PROJ MGR: BD
LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807
SHEET NUMBER
3
REV -
DATE:

Appendix B

COMPLETED 2001 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2001 BIRD SURVEY FORMS
COMPLETED 2001 WETLAND DELINEATION FORMS
COMPLETED 2001 FIELD AND FULL FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Creston
Creston, Montana

LAND & WATER

DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: MDT Monitoring Project Number: 130091.008 Assessment Date: 7 /25 /01
Location: Creston MDT District: _____ Milepost: _____
Legal description: T____ R____ Section____ Time of Day: afternoon
Weather Conditions: clear 80°, 5mph to east Person(s) conducting the assessment: A. Kuhle
Initial Evaluation Date: 5 /8 /01 Visit #: 2 Monitoring Year: 2001
Size of evaluation area: 20 acres Land use surrounding wetland: agriculture + urban

HYDROLOGY

Surface Water
Inundation: Present X Absent____ Average depths: ____ft Range of depths: ____-____ft
Assessment area under inundation: 10-15%
Depth at ~~emergent~~ rooted vegetation-open water boundary: > 1 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.): _____

Groundwater
Monitoring wells: Present X Absent_____ - Did not have key as of 7/25/01
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.)
X GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: Obtained key from Larry Urban and visited site again on 8-25-01. Key did not fit. I wrote down lock # and KWX will attempt to order a key.

VEGETATION COMMUNITIES

LAND & WATER B-2

Community No.: 1 Community Title (main species): upland

Dominant Species	% Cover	Dominant Species	% Cover
ELYREP		Legume	
PHLPRA		DACGLO	
POAPRA		TAROFF	
LINPER		MEDLUP	
CIRARV			

COMMENTS/PROBLEMS:

Community No.: 2 Community Title (main species): TYPLAT

Dominant Species	% Cover	Dominant Species	% Cover
TYPLAT	50%	CERDEM (in water)	50%
PHAARU	30%	SPA (in water)	1%
ALOPRA	5%	JUN (2)	1%
ELEPAL	10%	EPICIL	T
AGRSTO	5%		

COMMENTS/PROBLEMS:

Community No.: 3 Community Title (main species): depressions

Dominant Species	% Cover	Dominant Species	% Cover
TYPLAT			

COMMENTS/PROBLEMS:

Additional Activities Checklist:

X Record and map vegetative communities on air photo

VEGETATION COMMUNITIES - CRESTON

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

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	20%	Linum perenne	5%
Phleum pratense	10%	Trifolium hybridum	5%
Agrostis stolonifera	10%	Taraxacum officinale	5%
Cirsium arvense	10%	Medicago lupulina	5%
Yellow and purple legumes combined	10%	Poa pratensis	2%

COMMENTS/PROBLEMS: _____

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

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	50%	Juncus articulatus	1%
Phalaris arundinacea	30%	Epilobium ciliatum	Trace
Eleocharis palustris	10%	Ceratophyllum demersum (in water)	50%
Alopecurus pratensis	5%	Sparganium emersum (in water)	1%
Agrostis stolonifera	5%		

COMMENTS/PROBLEMS: _____

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

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	15%	Medicago lupulina	3%
Phalaris arundinacea	10%	Populus balsamifera	2%
Agrostis stolonifera	10%	Plantago major	2%
Alopecurus pratensis	5%	Cirsium arvense	1%
Eleocharis palustris	5%	Juncus tenuis	1%

COMMENTS/PROBLEMS: _____

Additional Activities Checklist:

X **Record and map vegetative communities on air photo**

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

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	95%	Juncus articulatus	trace
Agrostis stolonifera	trace	Chenopodium rubrum	trace
Equisetum arvense	trace	Cirsium arvense	trace
Carex bebbii	trace	Veronica americana	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 aquatilis	trace	Chenopodium rubrum	1%
Sparganium emersum	trace	Phalaris arundinacea	5%
Barbarea vulgaris	trace		
Eleocharis palustris	trace		

COMMENTS/PROBLEMS: _____

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

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

COMMENTS/PROBLEMS: _____

Additional Activities Checklist:

X Record and map vegetative communities on air photo

PLANTED WOODY VEGETATION SURVIVAL

LAND & WATER B-5

Species	Number Originally Planted	Number Observed	Mortality Causes
#8 ~~willow~~ silverberry (brown dots)	27	15	unknown/ competition w/ weeds
#9 ~~willow~~ silverberry	61	27	unknown/ competition w/ weeds, lack of moisture
#10 willow silverberry	27	~~23~~ 13	same as above
#15 willow silverberry	153	~~85~~ 80	browsing + thistle competition
rose	2		
serated leaf ~~sto~~ chokecherry			
# 11	24	23	severe browsing
# 12 + 13 Chokecherry ~~[illegible]~~	184	141	browsing, weed competition
#14 37	29		opportunistic hawthorne
26 chokecherry			
#1 Apple trees	16	14	browsing
# 2 Apple trees	20	6	browsing
# 3 Woods rose	55	45	weed competition
# 4 Woods rose	25	23	weed competition / browsing
# 6 Woods rose	113	113	none - weeds are competition
#7 Silverberry	85	78	unknown

COMMENTS/PROBLEMS:

Houndstooth - noxious weed

LAND & WATER B-6

BIRD SURVEY - FIELD DATA SHEET

Page 1 of 1
Date: 5-8-01 + 5-9-01
Survey Time: 3:40 pm ~ 7am

SITE: Creston

Bird Species	Behavior	Habitat Type
Wood Duck	Pair	
Cinnamon Teal	Pair	
Common Goldeneye	Pair	
Northern Shoveler	2 Pair	
Canada Goose	BP	
tree swallows		FO
American Robin		
starlings		
killdeer		
mallards		
Goldeneye	Pair	
Red-winged black birds		
wood duck		
osprey		
cinnamon teal		
pheasent (ring-neck)		

Bird Species	Behavior	Habitat Type

NOTES: Mark + Andrita visited site on afternoon of 5-8-01
Mark returned to site on morning of 5-9-01.

This form was not yet developed and therefore observations were recorded in field notebooks.

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

F:/clients/215/data/birddatasheets

BIRD SURVEY - FIELD DATA SHEET

Date: 7-25-01

Survey Time: Afternoon

SITE: Creston

Bird Species	Behavior	Habitat Type
Killdeer	F	MA
red-winged blackbird	L	OW/MA
Swallow (sp)	FO	UP

Bird Species	Behavior	Habitat Type

NOTES:

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

CRESTON WETLAND MITIGATION SITE
MONITORING INFORMATION

Bird Species observed since 1997:
(B) Nest observed on site
(BB) broods and/or young observed

Bird Species Observed:	Pre - Monitor 1997	Monitor 1998	Monitor 1999	Monitor 2000
American Robin	X	X	X	X
Common snipe	X	X (B)	X (B)	X(B)
Magpie	X	X	X	X
Barn swallow	X	X	X	X
Killdeer	X	X(BB)	X(BB)	X
Vesper sparrow	X	X	X(B)	X
Song sparrow	X	X	X	
Eastern kingbird	X	X	X	X(B)
Goldfinch	X	X	X	
Wood duck	X	X(BB)	X(BB)	X(BB)
Grt. horned owl	X			
Mallard	X	X(BB)	X(BB)	X(BB)
RW blackbird	X	X(B)	X(B)	X(B)
Sol. sandpiper		X(B)	X(B)	X(B)
Spot. sandpiper		X(BB)	X(BB)	X(B)
YH blackbird			X(B)	X(B)
Bank swallows		X	X	X
Goldeneye		X	X	X(B)
Bufflehead		X(BB)	X(BB)	X(BB)
Redhead duck			X	X
Wls phalarope		X(B)	X	X(BB)
Sav. Sparrow		X(B)		X
ViGr.swallows		X	X	
Gr. winged teal			X	X
Cinnamon teal			X(BB)	X
Blue-winged teal			X	X
Canada goose			X(BB)	X(BB)
Pintails			X	X
Wigeon			X	
Marsh wrens			X(B)	X(B)
Ruddy duck			X	X
Sora rail			X	X
American coot			X(BB)	X(BB)
AM. Shovellers			X	X
Brw. blackbirds			X	X
Bobolink				X
Turkey				X

WILDLIFE

LAND & WATER B-9

BIRDS

Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating	Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating

NA

Were man made nesting structures installed? Yes X No____ Type: Wood Duck + Bluebird How many? 14 Are the nesting structures being utilized? Yes____ No____ Not determined Do the nesting structures need repairs? Yes____ No X

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
deer		X			
dog - coyote		X			

Additional Activities Checklist:

_____Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Did not have Dnet to sample macro-invertebrates

PHOTOGRAPHS

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

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

Location	Photo Frame #	Photograph Description	Compass Reading
A 1	15, 16	Photopoint 1	N + S
B 2	17, 18	" 2	SW, NE
C 3	19, 20	" 3	E, W
D 4	21, 22	" 4	N, S
E 5	1, 12, 13, 14	" 5	N, S, E, W
F 6	9, 10	" 6	W, E
G			
H			

COMMENTS/PROBLEMS:
Vegetation transect F – 6a looking east
6b looking west
8a – looking west
9b – looking east

GPS SURVEYING

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

Checklist:

- X Jurisdictional wetland boundary
- X ~~4-6~~ 3 landmarks recognizable on the air photo
- X Start and end points of vegetation transect(s) — same points
- X Photo reference points
- X Groundwater monitoring well locations

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
_X_ 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_X_ NO___
If no, describe the problems below.

COMMENTS/PROBLEMS: _____

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

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: _____

Field Observations Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): _____

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?	(Yes) No	(Circle)

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

Approved by HQUSACE 3/92

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

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: 4 Transect ID: Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. reed canary grass	H	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:

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup):

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?	Yes No (Circle)	

Remarks:

Approved by HQUSACE 3/92

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

LAND & WATER B-16

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 stolonifera	H	FAC+	11			
4	Cirsium arvense	H	FACW+	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:** 8/24/01 **By:** ASK

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	Aquatic Bed		Perm Flood	Int Exp	Sem Perm Flood	Seas Flood	Sat	Tem Flood	Int Flood
Riverine (nonperennial)	Moss-Lichen		Perm Flood	Int Exp	Sem Perm Flood	Seas Flood	Sat	Tem Flood	Int Flood
Riverine (upper perennial)	Scrub-Shrub		Perm Flood	Int Exp	Sem Perm Flood	Seas Flood	Sat	Tem Flood	Int Flood
Riverine (lower perennial)	Forested		Perm Flood	Int Exp	Sem Perm Flood	Seas Flood	Sat	Tem Flood	Int Flood
Lacustrine Fringe	Unconsolidated Bottom		Perm Flood	Int Exp	Sem Perm Flood	Seas Flood	Sat	Tem Flood	Int Flood
Depression (closed)	Other:		Perm Flood	Int Exp	Sem Perm Flood	Seas Flood	Sat	Tem Flood	Int Flood
Depression (open, groundwater)	Total Estimated **% Vegetated**								
Depression (open, surface water)									
Slope									
Organic Soil Flats									

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

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

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

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

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

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

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

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. 8 Day 24 Yr. 01 4. Evaluator(s): Kuhle 5. Wetlands/Site #(s)

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)
___ (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) ___ (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 now minimal

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: fenced field w/ 2 open water areas. Adjacent to 2-lane Hwy, garbage transfer stn and ag land

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

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

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

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

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

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

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

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

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

Primary or critical habitat (list species)	D S	
Secondary habitat (list species)	D S	
Incidental habitat (list species)	D (S)	Western toad, N. leopard frog, peregrine falcon, black tern
No usable habitat	D S	

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

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

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

14C. General Wildlife Habitat Rating:

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

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

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

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

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

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

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

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

Comments:

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:

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

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

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

Comments:

14I. Production Export/Food Chain Support:

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

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

Comments:

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

i. Discharge Indicators

- X Springs are known or observed
- 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 – although area of inundation decreased
- ___ 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

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

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

Comments:

14K. Uniqueness:

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

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

Comments:

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

ii. Check categories that apply to the AA: ___ 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)

Comments:

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	128 (71%)

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**
___ 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-24

Site: Creston Date: 8/13/01 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:	195 (3 sections)	feet	
Elymus repens	4	Cirsium vulgare	+
yellow legume	4	Verbascum thapsus	+
Agrostis stolonifera	2	Phalaris arundinacea	+
Cirsium arvense	2	Stipa nelsonii	+
Medicago lupulina	1	Trifolium hybridum	+
Poa spp.	1		
Phleum pratense	1		
Poa pratensis	+		
Alopecurus pratensis	+		
Taraxacum officinale	+		
Rumex crispus	+		
Linum perenne	+		
Total Vegetative Cover:	75%		

Vegetation type 2:	Typha latifolia		
Length of transect in this type:	80	feet	
Typha latifolia	5	**Water's edge:**	
Phalaris arundinacea	4	Ceratophyllum demersum	5
Eleocharis palustris	2	Sparganium emersum	1
Alopecurus pratensis	1	Eleocharis palustris	1
Agrostis stolonifera	1	Juncus articulatus	+
Rumex crispus	+	Beckmannia syzigachne	+
Epilobium ciliatum	+	Ranunculus scleratus	+
Plantago major	+		
Juncus articulatus	+		
Cirsium arvense	+		
Juncus tenuis	+		
Total Vegetative Cover:	80%		

Vegetation type 3:	Depressions: mixed TYPLAT/grasses		
Length of transect in this type:	63	feet	
Typha latifolia	3	Erigeron lonchophyllus?	+
Agrostis stolonifera	1	Medicago lupulina	+
Eleocharis palustris	1	Taraxacum officinale	+
Juncus tenuis	1	Epilobium ciliatum	+
Juncus regelii	1	Potentilla anserina	+
Juncus articulatus	1		
Alopecurus pratensis	1		
Melilotus officinale	1		
Cirsium arvense	+		
Equisetum arvense	+		
Phalaris arundinacea	+		
Plantago major	+		
Total Vegetative Cover:	40%		

Vegetation type 4:	Phalaris arundinacea	
Length of transect in this type:	100	feet
Phalaris arundinacea	5	
Eleocharis palustris	+	
Equisetum arvense	+	
Agrostis stolonifera	+	
Plantago major	+	
Lactuca serriola	+	
Myosotis laxa	+	
Carex bebbii	+	
Juncus tenuis	+	
Juncus articulatus	+	
Total Vegetative Cover:	98%	

MDT WETLAND MONITORING – VEGETATION TRANSECT

LAND & WATER B-25

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:	25	feet
Phalaris arundinacea		1
Potamageton pectinatus		5
Barbarea vulgaris		+
Epilobium ciliatum		+
* dead Crataegus douglasii in water		
Total Vegetative Cover:	75%	

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:		

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Elymus repens	1,3	Juncus articulatus	2,3,4
Yellow legume	1,3	Juncus regelii	3
Linum perenne	1	Ranunculus scleratus	2
Poa pratensis	1	Beckmannia syzigachne	2
Rumex crispus	1,2,3	Ceratophyllum demersum	2
Cirsium arvense	1,2,3,4,6	Carex bebbii	3,4
Taraxacum officinale	1,3,6	Erigeron lonchophyllus?	3
Phleum pratense	1	Gnaphalium palustre	3
Dactylis glomerata	1	Populus balsamifera	3
Polygonum convolvulus	1	Equisetum arvense	3,4
Alopecurus pratensis	1,2,3,6	Chenopodium rubrum	4,5
Silene latifolia	1	Veronica americana	4
Melilotus alba	1	Myosotis laxa	4
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	1,3,6	Sparganium emersum	5
Trifolium hybridum	1,3	Potamageton pectinatus	5
Lactuca serriola	1,3,4,6	Potentilla anserina	3
Trifolium pratense	1,3,6	Carex arcta	3
Verbascum thapsus	1	Potamageton natans	5
Tragopogon dubius	1		
Bromus inermis	1		
Cynoglossum officinale	1		
Thlaspi arvense	1		
Cirsium vulgare	1,3		
Chenopodium album	1		
Plantago major	1,2,3,4,5		
Purple legume (Astragalus?)	1		
Phalaris arundinacea	1,2,3,4,5,6		
Epilobium ciliatum	1,2,3		
Typha latifolia	2,3		
Eleocharis palustris	2,3,4,5		
Juncus tenuis	2,3,4		
Plantago lanceolatum	1		

COMMENTS/PROBLEMS: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

LAND & WATER B-27

Cover Estimate

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

Indicator Class:

+ = Obligate
- = Facultative/Wet
0 = Facultative

Source:

P = Planted
V = Volunteer

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

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

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

Notes:

Appendix C

REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Creston
Creston, Montana

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. 4: View looking south across the mitigation site.

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

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

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

Photo Point No. 6: View looking north.

East end of vegetation transect looking east.

East end of vegetation transect looking west along the transect line.

West end of vegetation transect looking east along the transect line.

West end of vegetation transect looking west. Transect stake is present in the foreground.

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.