MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2004

Fourchette Creek Reservoir Complex
Phillips County, Montana

Prepared for:

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

Prepared by:

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

June 2005

Project No: B43054.00 - 0408

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TABLE OF CONTENTS

1.0 INTRODUCTION.....1

2.0 METHODS.....3

2.1 Monitoring Dates and Activities.....3

2.2 Hydrology.....3

2.3 Vegetation.....4

2.4 Soils.....4

2.5 Wetland Delineation.....4

2.6 Mammals, Reptiles, and Amphibians.....4

2.7 Birds.....5

2.8 Macroinvertebrates.....5

2.9 Functional Assessment.....5

2.10 Photographs.....5

2.11 GPS Data.....5

2.12 Maintenance Needs.....6

3.0 RESULTS.....6

3.1 Hydrology.....6

3.2 Vegetation.....7

3.3 Soils.....9

3.4 Wetland Delineation.....9

3.5 Wildlife.....10

3.6 Macroinvertebrates.....11

3.7 Functional Assessment.....13

3.8 Photographs.....14

3.9 Maintenance Needs/Recommendations.....14

3.10 Current Credit Summary.....15

4.0 REFERENCES.....16

TABLES

Table 1 *2001- 2004 Fourchette Creek vegetation species list.*

Table 2 *Estimated percent wetland species canopy coverage in 2004.*

Table 3 *Fish and wildlife species observed on the Fourchette Creek Mitigation Complex during 2001-2004.*

Table 4 *Summary of 2004 wetland function/value ratings and functional points at the Fourchette Creek Mitigation Project.*

FIGURES

Figure 1 *Project Site Location Map*

Figure 2 *Monitoring Activity Locations*

Figure 3 *Mapped Site Features 2004*

CHARTS

Chart 1 *Fourchette Creek Reserve bioassessment scores from 2001-2004.*

APPENDICES

Appendix A *Figures 2 & 3*

Appendix B *2004 Wetland Mitigation Site Monitoring Form*

2004 Bird Survey Forms

2004 Wetland Delineation Forms

2004 Functional Assessment Forms

Appendix C *Representative Photographs*

2001-2004 Aerial Photographs

Appendix D *Conceptual Site Layouts*

Appendix E *Bird Survey Protocol*

GPS Protocol

Appendix F Macroinvertebrate Sampling Protocol and Data

1.0 INTRODUCTION

The Fourchette Creek Reservoir Complex was constructed in the Missouri River Breaks in 1997 and is considered the first attempted wetland mitigation bank in Montana (Urban pers. comm.). The project was enacted to mitigate wetland impacts associated with several Montana Department of Transportation (MDT) projects constructed between 1992 and 1995 that resulted in the cumulative loss of 9.84 wetland acres. These include Stanford East & West, Geyser-North, Eddies Corner-South, Ross Fork Creek – Judith Basin County, Judith River – 6 miles NW of Moore, and Ross Fork Creek – 5 Miles NW of Moore. Constructed in Watershed #9 (Middle Missouri) within the MDT Glendive District, the site is located approximately 15 miles southwest of Sun Prairie (50 miles south of Malta) in Phillips County (**Figure 1**). The site occurs on Bureau of Land Management (BLM) lands roughly 2 miles west and 1.5 miles north of the Charles M. Russell National Wildlife Refuge.

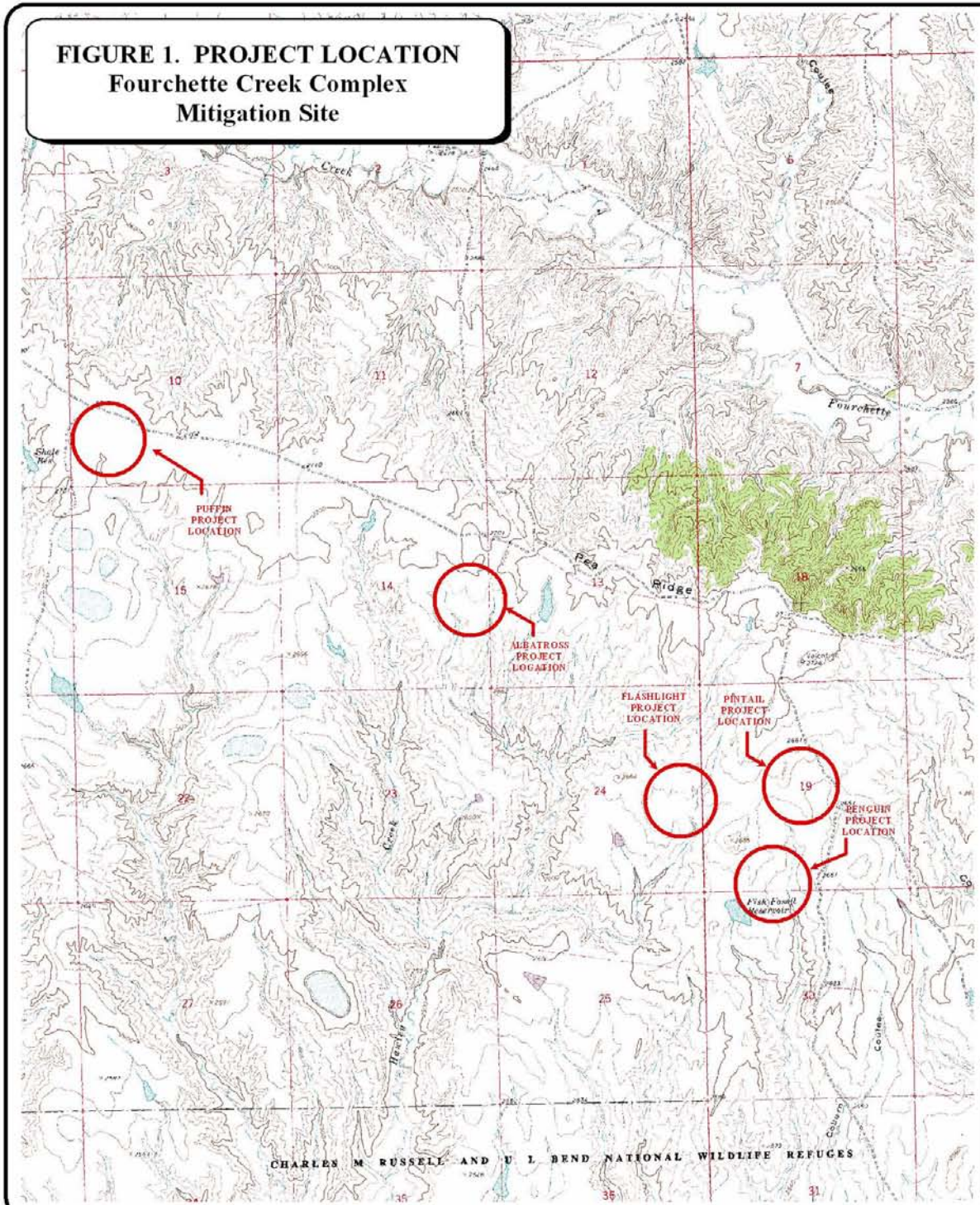
In conjunction with the BLM, MDT's intent was to construct five 2.6 to 6-acre shallow reservoirs at the mitigation site: Puffin, Albatross, Flashlight, Pintail, and Penguin (**Figure 1**). Spaced over approximately four linear miles, these structures were designed to maximize surface area with water depths less than 3 feet, maximizing the potential for establishment of emergent vegetation. The reservoirs were constructed in intermittent drainages to collect surface runoff during spring snowmelt and rainstorm events. No wetlands were present in these areas prior to construction (MDT undated).

The primary objectives at the mitigation site are to provide waterfowl pair and brood habitat and promote greater distribution and use of available habitat for additional wildlife species by providing water sources, food, and cover. Specifically, MDT and BLM seek to provide approximately 10 to 22 acres of emergent wetlands with semi-permanent, fresh-mixosaline water regimes at the mitigation site. Primary wetland functions to be provided include streambank stabilization; nutrient detention/removal/transformation; sediment detention/reduction; intra/inter ecosystem integrity maintenance; and provision of a setting for recreational activities (MDT undated).

Final general success criteria at each reservoir include provision of: waterfowl pair and brood habitat (open water interspersed with emergent vegetation); a mosaic of emergent wetland vegetation communities; and adequate hydrology (maximization of areas three feet in depth) (MDT undated). Again, the goal was to create between 10 and 22 wetland acres between the five ponds.

Specific performance criteria identified in the monitoring plan contained within the project prospectus (MDT undated) address percent cover of emergent species and wetland functions. The plan states that the goal is to provide Type 3 and/or Type 4 wetlands according to the U.S. Fish & Wildlife Service (USFWS) Circular 39 definition of wetland types, with the provision of 10 to 20 percent emergent species cover within 5 years of construction. According to the monitoring plan, primary functions to be

FIGURE 1. PROJECT LOCATION
Fourchette Creek Complex
Mitigation Site



PROJECT #: 130091.023
DATE: APRIL 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

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evaluated using the MDT method include wildlife use, enhanced biodiversity, water retention, silt retention, recreational opportunity, and erosion control.

Monitoring methods outlined in the plan include: estimation of percent canopy cover of wetland vegetation; mapping of vegetation zones and open water; annual photograph points; water quality sampling; and macroinvertebrate sampling. With the exception of water quality sampling, which will be conducted separately by MDT (Urban pers. comm.), each of these methods was employed during 2001 - 2004 monitoring.

The complex was first monitored in 2001, and was also monitored in 2002-2004. This report documents the results of the 2004 monitoring effort, which is considered the final monitoring year at the site. The specific monitoring areas for each of the five impoundments are illustrated in **Figure 2** for each site (**Appendix A**).

2.0 METHODS

2.1 Monitoring Dates and Activities

Each of the five reservoirs was visited on July 26, 2004. 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; mapping of wetland/open water aquatic habitat boundaries; vegetation community mapping; soils data; hydrology data; bird and general wildlife use; photograph points; macroinvertebrate sampling; functional assessment; and (non-engineering) examination of dike structures. Vegetation transects were not required at this site (Urban pers. comm.).

2.2 Hydrology

Hydrologic indicators were evaluated at each impoundment during the mid-season visit. Predicted high-water lines for each impoundment are presented on plan sheets in **Appendix D**. Wetland hydrology indicators were recorded using procedures outlined in the Army Corps (COE) 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**).

All additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). The boundary between wetlands and open water aquatic habitats (no rooted vegetation present) was mapped on the aerial photograph and an estimate of the average water depth at this boundary was recorded.

No groundwater monitoring wells occur at the site. If located within 18 inches of the ground surface (soil pit depth for purposes of delineation), groundwater depths were documented on the routine wetland delineation data form at each data point.

2.3 Vegetation

At each impoundment, general dominant species-based vegetation community types (e.g., *Typha latifolia/Scirpus acutus*) 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**). Establishment of permanent vegetation transects was not required at this mitigation site (Urban pers. comm.).

A comprehensive plant species list started in 2001 was updated as new species were encountered in 2002-2004. No woody species were planted at any of the impoundments. Consequently, no monitoring relative to the survival of such species was conducted.

2.4 Soils

Soils were evaluated during the mid-season visit according to hydric soils determination procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current terminology used by NRCS was used to describe hydric soils (USDA 1998).

2.5 Wetland Delineation

Wetland delineation was conducted at each impoundment 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: North Plains Region 4 (Reed 1988). The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary delineated and recorded with a resource grade GPS unit in 2001 was modified by hand as necessary on 2002 and 2003 aerial photos. The wetland/upland boundary in combination with the wetland/open water habitat boundary was used to calculate the jurisdictional wetland area developed at each impoundment.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during each mid-season visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. These 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 species list for the entire site was compiled.

2.7 Birds

Bird observations were recorded during the mid-season visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. Using the bird survey protocol (**Appendix E**) as general guidance, species were recorded as an observer traversed each impoundment during the mid-season visit. In general, bird observations were recorded incidental to other monitoring activities. Observations were categorized by species, activity code, and general habitat association (see data forms in **Appendix B**).

2.8 Macroinvertebrates

Macroinvertebrate samples were collected during the mid-season site visit and data recorded on the wetland mitigation monitoring form. Per MDT instruction, a single sample was collected at Puffin, Albatross, Flashlight, and Penguin reservoirs (Urban pers. comm.). Macroinvertebrate sampling procedures are included in **Appendix F**. The approximate locations of these sample points are shown on **Figure 2** for each site (**Appendix A**). Samples were preserved as outlined in the sampling procedure and sent to Rhithron Associates, Inc. for analysis.

2.9 Functional Assessment

Functional assessments were completed at each wetland impoundment using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were 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. The remainder of the functional assessment was completed in the office.

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the upland buffer, the monitored area, and macroinvertebrate sampling locations. Each photograph point location was recorded with a resource grade GPS in 2001. The approximate location of these photo points is shown on **Figure 2** for each site (**Appendix A**). All photographs were taken using a 50 mm lens. A description and compass direction for each photo was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2001 monitoring season, survey points were collected with a resource grade GPS unit at all photograph locations and along wetland boundaries. No GPS data were collected during 2002, 2003, or 2004.

2.12 Maintenance Needs

Dike structures were examined during the site visit for obvious signs of breaching, damage, or other problems. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented.

3.0 RESULTS

3.1 Hydrology

According to the Western Regional Climate Center, Malta (50 miles north of site) yearly precipitation totals for 2001 (8.57 inches), 2002 (11.72 inches), 2003 (11.54 inches), and 2004 (11.61 inches) were 68%, 92%, 91%, and 91% of the total annual mean precipitation (12.68 inches) in this area. In 2004, the approximate precipitation total at Malta was about 7.95 inches from January through July, which is slightly below the yearly mean of 8.7 inches for this period. Thus, precipitation was likely slightly below average at the site during 2004 monitoring activities.

Inundation was present at each of the five impoundments, and in 2004 inundation extents were the largest observed at all impoundments during the four-year monitoring period. Overall, water depths at open water/rooted vegetation interfaces ranged between approximately zero inches (the water's edge) and approximately three feet. All sites were inundated to greater extents than were observed during 2003. Open water areas are shown on **Figure 3** for each site (**Appendix A**). Specific recorded values are provided for each impoundment on the attached data forms.

Penguin and Flashlight were nearly 100 percent inundated, with average depths of one to two feet and a range of depths from zero to six+ feet. Deepest areas were located in the center of the impoundments, which were as yet unvegetated.

Pintail and Albatross were approximately 85 to 90 percent inundated, with an average depth of one to two feet and a range of depths from zero to about three feet. Both sites were inundated to a greater extent than observed during 2003. Deepest areas were located in the center of the impoundments. Pintail experienced significant emergent wetland plant growth between 2003 and 2004 monitoring episodes. Based on observations recorded from 2001-2003, surface water at Pintail may be of sufficient duration to kill upland plants, but of insufficient duration to support hydrophytes every year or throughout a given growing season. Consequently, this area may be considered a "problem area" (seasonal wetland) for purposes of delineation. Water was extremely turbid at both Pintail and Albatross in all four years, which could be indicative of an upstream erosion problem, recent cattle use, or chemical or other problems.

The excavated portion of Puffin was about 90 percent inundated, but the intended mitigation area was only about 30 percent inundated and, for the first time in four years, supported a thin fringe of emergent wetland plants. Excessive depths and steep slopes in the excavated area at the dike face likely contribute to an often unvegetated condition. Water needs to climb several feet from the bottom of the excavated area in order to back upstream (upgradient) as designed. Based on a

lack of watermarks, driftlines, etc. upgradient of the excavated area, this has probably not occurred with any frequency, if at all, over the project life.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. Three wetland community types were identified and mapped on the mitigation area in 2001 (**Figure 3**, **Appendix A**). These included Type 1: *Hordeum jubatum*/*Eleocharis*, Type 2: *Myriophyllum/Potamogeton*, and Type 3: *Hordeum jubatum*/*Agropyron*. Two additional wetland types were mapped in 2002 that had established in drawdown areas at Albatross. These were Type 4: *Scirpus maritimus/Typha latifolia* and Type 5: *Xanthium strumarium*.

In 2004, only Types 1, 2, and 3 were present at the mitigation site. Types 2 and 3 remained consistent over the four-year monitoring period, while Type 1 shifted to a greater dominance of *Eleocharis palustris* over *Hordeum jubatum* in 2003 at Penguin, Flashlight, and Pintail reservoirs. By 2004, *Hordeum* was no longer included in the Type 1 community title. Type 5 had been replaced with Type 4 at Albatross due to increased inundation / saturation in 2003, and Type 4 had been replaced by Type 1 in 2004, indicating wetter site conditions. Dominant species within each of these communities are listed on the attached data form (**Appendix B**).

Type 1 occurs in emergent habitats surrounding impoundments at all five impoundments. Type 2 occurs in aquatic bed habitats at Penguin and Flashlight. Type 3 occurs primarily around the impoundment perimeter at Pintail.

Upland communities (Type 6) are dominated by upland grasslands and shrub-steppe habitats. Common species include big sage (*Artemisia tridentata*), fringed sage (*Artemisia frigida*), curlycup gumweed (*Grindelia squarrosa*), broom snakeweed (*Gutierrezia sarothrae*), prickly pear cactus (*Opuntia sp.*), rubber rabbitbrush (*Chrysothamnus nauseosus*), blue gramma (*Bouteloua gracilis*), quackgrass (*Agropyron repens*), prairie junegrass (*Koeleria pyramidata*), and western wheatgrass (*Agropyron smithii*).

No vegetation transects were required or conducted at these impoundments. However, the estimated percent canopy cover of each site by emergent and aquatic bed vegetation is presented in **Table 2**.

Table 1: ***2001-2004 Fourchette Creek vegetation species list.***

Scientific Name	Region 4 (North Plains) Wetland Indicator	Penguin	Pintail	Flashlight	Albatross	Puffin
Agropyron dasystachyum	FAC		x	x		x
Agropyron repens	FAC	x	x	x	x	x
Agropyron smithii	--	x	x		x	x
Alisma plantago-aquatica	OBL			x		
Alisma gramineum	**OBL**			x		
Artemisia cana	FACU					x
Artemisia frigida	--	x	x	x	x	x
Artemisia tridentate	--	x	x	x	x	x
Atriplex argentea	FACU			x		

Table 1: ***2001-2004 Fourchette Creek vegetation species list.***

Scientific Name	Region 4 (North Plains) Wetland Indicator	Penguin	Pintail	Flashlight	Albatross	Puffin
Beckmannia syzigachne	OBL	x	x			
Bouteloua gracilis	--		x		x	x
Chenopodium album	FAC	x	x	x	x	x
Chrysothamnus nauseosus	--	x	x	x		
Cirsium arvense	FACU	x	x	x	x	
Distichlis spicata	FACW		x	x	x	
Echinochloa crusgalli	FACW		x		x	
Eleocharis acicularis	OBL	x	x	x	x	
Eleocharis palustris	OBL	x	x	x	x	x
Elodea Canadensis	OBL	x				
Erodium cicutarium	--		x	x		x
Grindelia squarrosa	--	x	x	x	x	x
Gutierrezia sarothrae	--	x	x		x	x
Helianthus annuus	FACU	x	x		x	x
Hordeum jubatum	FAC+	x	x	x	x	x
Iva axillaries	**FACU**	x	x			
Juncus balticus	OBL	x			x	
Koeleria pyramidata	--			x		
Lepidium densiflorum	FACU					x
Marsilea vestita	OBL				x	
Medicago lupulina	FACU					x
Melilotus officinalis	FACU-	x	x	x	x	x
Myriophyllum spicatum	OBL	x		x		
Nasturtium officinale	OBL			x		
Opuntia sp.	--	x	x	x		x
Polygonum lapathifolium	OBL	x	x	x	x	
Polygonum sp. (upland)	?		x	x	x	
Potamogeton foliosus	OBL	x		x	x	
Puccinellia nuttalliana	OBL	x	x	x		
Ranunculus aquatilis	**OBL**			x		
Rumex crispus	FACW	x	x	x	x	
Sagittaria cuneata	OBL	x		x	x	
Salix exigua	FACW+				x	x
Sarcobatus vermiculatus	**FACU**	x				
Schizachyrium scoparium	--	x				
Scirpus acutus	OBL	x		x	x	
Scirpus americanus	OBL		x	x		
Scirpus maritimus	NI			x	x	
Spergularia rubra	--			x		
Thlaspi arvense	NI				x	x
Typha latifolia	OBL	x		x	x	
Xanthium strumarium	FAC	x	x	x	x	x

Bolded species indicate those documented in the analysis area for the first time in 2003.

Table 2: ***Estimated Percent Wetland Species Canopy Coverage in 2004.***

Site	Estimated % Cover of Total Site by Emergent and Aquatic Bed Wetland Vegetation
Penguin	89
Pintail	70
Flashlight	85
Albatross	50
Puffin	14

3.3 Soils

A published soil survey does not exist for Phillips County. However, soils have been mapped for the Penguin (Bascovey clay) and Albatross (Sunburst clay) sites. Generally, soils at all of the impoundments consist of poorly drained clays. Soils sampled in wetland areas at Penguin were consistently comprised of clays with a matrix color of 10YR4/2 and distinct, abundant mottles in the range of 10YR5/8, indicating a fluctuating water table. All were inundated or saturated within 12" of the surface.

Soils at Flashlight were comprised of clays with a matrix color of 2.5Y4/2 to 2.5Y or 10YR 4/3 and often contained faint mottles at 2.5Y5/6. These soils were inundated or saturated to the surface throughout the site. Because the soils support dominant vegetation species that have an indicator status of OBL or FACW and the wetland/upland border is abrupt, hydric soils are assumed to be present under application of the 1987 delineation manual (Environmental Laboratory 1987).

Soils at both Pintail and Albatross were comprised of clays with a matrix color of 10YR4/2 and faint to distinct mottles at 10YR5/6 to 10YR5/8. Gleyed 5GY4/1 soils were observed in drawdown areas of Pintail towards the center of the impoundment. Darker soils (2.5Y4/1) were observed in drawdown areas of Albatross. These soils were inundated or saturated to within 12 inches of the surface at both sites. Soils adjacent to the impoundment at Puffin were saturated within 12 inches of the surface, and were comprised of clays with a matrix color of 10YR4/1 and faint mottles at 10YR4/6.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated for each site on **Figure 3** (**Appendix A**). Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Wetland perimeters increased over 2003 at all sites due to increased inundation. 2004 delineation results are as follows:

Penguin: 0 wetland acres pre-existing.
2.21 wetland acres created (emergent, aquatic bed).
0.27 acre open water.
2.48 acres total

Flashlight: 0 wetland acres pre-existing.
1.49 wetland acres created (emergent, aquatic bed).
0.27 acre open water.
1.76 acres total

Pintail: 0 wetland acres pre-existing.
1.43 wetland acres created (emergent).
0.60 acre open water (at max pool).
2.03 acres total

Albatross: 0 wetland acres pre-existing.
0.51 wetland acre created (emergent).
0.53 acre open water.
1.04 acres total

Puffin: 0 wetland acres pre-existing.
0.08 wetland acre created.
0.48 acre open water.
0.56 acre total

Inclusive of open water areas, approximately 7.87 acres of aquatic habitat have been created on the Fourchette Creek mitigation site to date. This is a 1.74-acre increase from the 6.13 acres delineated during 2003, apparently due to increased inundation during 2004.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2001-2004 monitoring efforts are listed in **Table 3**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. Five mammal, two amphibian, and 11 bird species were noted using portions of the mitigation site during the July 2004 visit. Consistent with past years, greatest use again appeared to occur at Penguin and Flashlight reservoirs, which both support large frog populations and also support painted turtles (*Chrysemys picta*), although turtles were not observed in 2003 or 2004.

More avian species were observed in the project area in 2003 and 2004 than in previous years, presumably due to increased inundation at most sites. The degree of seasonal use that these impoundments receive likely varies from year to year in proportion to water availability.

Of special interest were observations of northern leopard frogs (*Rana pipiens*) at Pintail and Flashlight reservoirs (none were noted at Penguin in 2004). Leopard frogs are considered "species of special concern" by the Montana Natural Heritage Program (MNHP) due largely to their apparent extirpation from the portion of their historic distribution west of the Continental Divide. This species has been assigned a rank of S3 east of the Divide by the MNHP. Due to the hundreds of leopard frogs observed at Penguin and Flashlight reservoirs during 2001, dozens observed during 2002 and 2003, and dozens again at Flashlight in 2004, these sites were

classified as Category II wetlands (using the 1999 MDT Wetland Assessment Method) based on sensitive species habitat.

3.6 Macroinvertebrates

Macroinvertebrate sampling results are provided in **Appendix F** and were summarized by Rhithron Associates (Bollman 2004) in the italicized sections below. Bioassessment scores are presented in **Chart 1** (Bollman 2004).

Puffin Reservoir. *The overall bioassessment score improved significantly in 2004 at this site; this was mainly due to a dramatic increase in taxa richness. Dominant habitat usage may have shifted from a predominantly water-column association to greater colonization of macrophyte surfaces and the benthic substrates. The profound dominance of non-insect taxa in 2003 was replaced by greater richness in the midge fauna and the appearance of 2 mayfly taxa. Biotic index values declined slightly, but there were taxonomic signals that water quality may have improved at this site since 2003.*

Flashlight Reservoir. *Functional characteristics of the invertebrate assemblage remained fairly stable at this site; an increase in bioassessment score in 2004 reflected increasing taxa richness and the addition of relatively sensitive taxa. This suggests that habitats were increasingly complex. There was a slight increase in the biotic index value, likely attributable to the increased importance of midges in the taxonomic mix.*

Penguin Reservoir. *Biotic conditions were rated optimal at this site in 2003, but scores diminished in 2004, indicating sub-optimal biotic conditions in that year. The tolerant amphipod Hyalella sp. increased in dominance, and taxa richness fell in 2004. The biotic index value increased since 2003, perhaps due to increased water temperature. However, the functional mix remained gatherer-dominated, which is consistent with expectations for a stable wetland.*

Albatross Reservoir. *Bioassessment scores remained very stable at this site in the 4 years of this study; they indicated sub-optimal conditions in all years. Taxa richness and assemblage sensitivity have slowly increased between 2001 and 2004 at this site. Paradoxically, however, the functional mix has shifted from a diversity of feeding groups to a profound dominance by gatherers. The abundant filter-feeders of 2003 were not apparent in the sampled assemblage of 2004, and shredders diminished significantly between the 2 years. The biotic index value increased in 2004, perhaps reflecting increased water temperatures.*

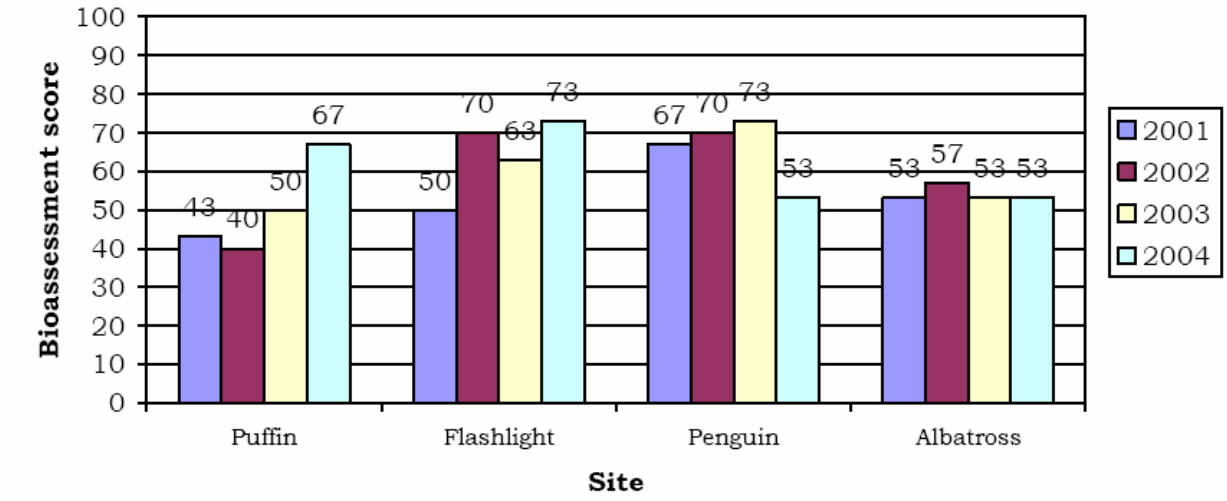
Pintail Reservoir: Macroinvertebrates were not sampled at Pintail Reservoir.

Table 3: ***Fish and wildlife species observed on the Fourchette Creek Mitigation Complex from 2001 to 2004.***

FISH	**Penguin**	**Flashlight**	**Pintail**	**Albatross**	**Puffin**
Unidentified Minnow Species *(Hybognathus* sp.*)*		X			
AMPHIBIANS					
	X	**X**		**X**	
Western Chorus Frog (*Pseudacris triseriata*)	X	**X**	**X**		
Northern Leopard Frog (*Rana pipiens*)	X				
Woodhouse's Toad (*Bufo woodhousii*)					X
Short-horned Lizard (*Phrynosoma hernandesi*)					
REPTILES					
	X	X			
Painted Turtle (*Chrysemys picta*)	X	X	X		
Plains Garter Snake (*Thamnophis radix*)					
BIRDS					
	X		**X**	**X**	
Blue-winged Teal (*Anas discors*)	X	X	X	X	
Eastern Kingbird (*Tyrannus tyrannus*)		X			**X**
Northern Harrier (*Circus cyaneus*)	**X**	**X**	**X**	X	
Killdeer (*Charadrius vociferous*)	X	X	X	X	
Spotted Sandpiper (*Actitis macularia*)	**X**	X	X		
Gadwall (*Anas strepera*)			X	X	
American Avocet (*Recurvirostra americana*)				X	
Savannah Sparrow (*Passerculus sandwichensis*)	**X**	**X**	**X**		
Willet (*Catoptrophorus semipalmatus*)	X			**X**	
Mourning Dove (*Zenaida macroura*)	**X**				
Northern Pintail (*Anas acuta*)	**X**				
Marbled Godwit (*Limosa fedoa*)		**X**		**X**	
Vesper Sparrow (*Pooecetes gramineus*)			X		
Northern Shoveler (*Anas clypeata*)			X		
Grebe (*Podiceps sp.*)	**X**		X		
Wilson's Phalarope (*Phalaropus tricolor*)			X		
Canada Goose (*Branta canadensis*)	**X**	**X**			
American Coot (*Fulica americana*)					
MAMMALS					
				X	X
Elk (*Cervus elaphus*)	X				
Coyote (*Canis latrans*)		**X**	X	**X**	X
Mule Deer (*Odocoileus hemionus*)					X
Raccoon *(Procyon lotor)*			X		
Red Fox (*Vulpes vulpes*)				**X**	
Muskrat (*Ondatra zibethicus*)				**X**	
Pronghorn (*Antilocapra americana*)		**X**			
Black-tailed Jack Rabbit (*Lepus californicus*)					

Bolded species were observed during 2004 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2004.

Chart 1: ***Fourchette Creek reserve bioassessment scores from 2001-2004.***



3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B**. Functional assessment results are summarized in **Table 4** and are similar to 2001-2003 results. Penguin and Flashlight rated as Category II wetlands, primarily due to high sensitive species habitat (northern leopard frog) ratings (see discussion under **Section 3.5**). These sites would have achieved higher scores, but for the high disturbance associated with grazing. Each of these sites provides habitat for a variety of wildlife species, particularly amphibians. Penguin and Flashlight both support emergent and aquatic bed communities, and, based on MDT observations (Urban pers. comm.), Flashlight provides a degree of fish habitat. Wildlife habitat, surface water storage, sediment/nutrient/toxicant removal, shoreline stabilization, and food chain support are prominent functions at these sites.

Pintail rated as a Category III site in 2004 due to its increased size, while Albatross again rated as a Category IV site. These lower ratings were primarily due to low vegetative diversity, high disturbance (grazing), and low acreage of actual wetlands present within the assessment areas. Surface water storage is a prominent function at both sites. It should be noted that sediment/nutrient/toxicant removal received a low rating due to the extreme turbidity (impairment) and lack of wetland vegetation at these sites.

As wetlands occurred at Puffin for the first time in 2004, a functional assessment form was completed. This site rated as a Category IV site due to low vegetative diversity, high disturbance (grazing), and low acreage of actual wetlands present within the assessment area. According to MDT (Urban pers. comm.) the site is periodically used as an elk wallow, but contained a dozen cattle during 2002 and 2003 monitoring efforts.

Based on functional assessment results (**Table 4)**, approximately 34.17 functional units have been gained thus far at the Fourchette Creek mitigation site, a gain of 9.17 functional units since 2003.

Table 4: ***Summary of 2004 wetland function/value ratings and functional points [1] at the Fourchette Creek Mitigation Project.***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	Wetland Sites				
	Penguin Reservoir	Flashlight Reservoir	Pintail Reservoir	Albatross Reservoir	Puffin Reservoir
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.0)
MNHP Species Habitat	High (1.0)	High (1.0)	Low (0.2)	Low (0.2)	Low (0.0)
General Wildlife Habitat	High (0.8)	High (0.8)	Mod (0.7)	Low (0.3)	Low (0.1)
General Fish/Aquatic Habitat	NA	Mod (0.5)	NA	NA	NA
Flood Attenuation	Mod (0.5)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Short and Long Term Surface Water Storage	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Low (0.3)
Sediment, Nutrient, Toxicant Removal	Mod (0.5)	Mod (0.5)	Low (0.3)	Low (0.3)	Low (0.3)
Sediment/Shoreline Stabilization	Mod (0.6)	Mod (0.6)	Low (0.2)	Low (0.2)	NA
Production Export/Food Chain Support	Mod (0.7)	Mod (0.7)	Mod (0.6)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
Actual Points/Possible Points	5.4 / 11	5.6 / 12	3.5 / 11	2.8 / 11	1.6 / 10
% of Possible Score Achieved	49%	47%	32%	25%	16%
Overall Category	II	II	III	IV	IV
Total Acreage of Assessed Aquatic Habitats within Easement (ac)	**2.48**	**1.76**	**2.03**	**1.04**	**0.56**
Functional Units (acreage x actual points) (fu)	**13.39**	**9.86**	**7.11**	**2.91**	**0.90**
Net Acreage Gain (ac)	**2.48**	**1.76**	**2.03**	**1.04**	**0.56**
Net Functional Unit Gain (fu)	**13.39**	**9.86**	**7.11**	**2.91**	**0.90**
Total Functional Unit Gain (fu)	**34.17 Total Functional Units**				

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

3.8 Photographs

Representative photographs taken from photo-points in 2004 are provided in **Appendix C**. A presentation of 2001-2004 aerial photographs for each impoundment is also provided in **Appendix C**.

3.9 Maintenance Needs/Recommendations

All dikes were in good condition during the mid-season visit.

Puffin Reservoir has only developed nominal fringe wetlands, presumably due to the depth of excavation and steep gradient of side slopes. As discussed in the 2001-2003 reports, it is our recommendation that MDT/BLM re-visit the design of this site, which could involve filling in a portion of the pit excavated along the dike face and minor upstream excavation. This may allow water to back further upgradient, reduce water depths and side slope gradients, and increase surface area of the reservoir. This would also likely result in a more undulating shoreline, as opposed to the largely rectangular shoreline that currently exists.

All sites were impacted to some extent by grazing, primarily through trampling. MDT/BLM may want to consider fencing these areas and providing water gaps to deeper areas in order to allow cattle access while confining associated impacts.

3.10 Current Credit Summary

Target performance criteria included provision of 10 to 20 percent emergent species cover within 5 years of construction. In 2004, this was achieved substantively at Penguin, Flashlight, Pintail, and Albatross reservoirs, and minimally at Puffin reservoir (**Table 2**).

Primary target wetland functions included wildlife use, enhanced biodiversity, water retention, silt retention, recreational opportunity, and erosion control. Highest quality wildlife habitat is provided at Penguin and Flashlight, as are biodiversity, silt retention, and erosion control. Other reservoirs provide silt retention, but in excessive quantities that impair them. A degree of erosion control is also provided at these sites, but is limited by scant vegetation. All sites provide water retention, and none of the sites were perceived to provide substantial recreational opportunities.

As the project stands, inclusive of open water areas, approximately 7.87 acres of aquatic habitat have been created on the Fourchette Creek mitigation site to date. This is a 1.74-acre increase from the 6.13 acres delineated during 2003, apparently due to increased inundation during 2004. Approximately 34.17 functional units have been created at the site to date. The maximum assignable credit at this site as of 2004, inclusive of all open water areas, is approximately 7.87 acres.

4.0 REFERENCES

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Reed, P.B. 1988. *National list of plant species that occur in wetlands: North Plains (Region 4).* Biological Report 88(26.4), May. U.S. Fish and Wildlife Service, Washington, D.C.

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Urban, L. 2001. Wetland Mitigation Specialist, Montana Department of Transportation. Helena, Montana. January 2002 telephone conversations.

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Appendix A

FIGURES 2 & 3

MDT Wetland Mitigation Monitoring
Fourchette Creek
Phillips County, Montana

Figure 2 - Monitoring Activity Locations

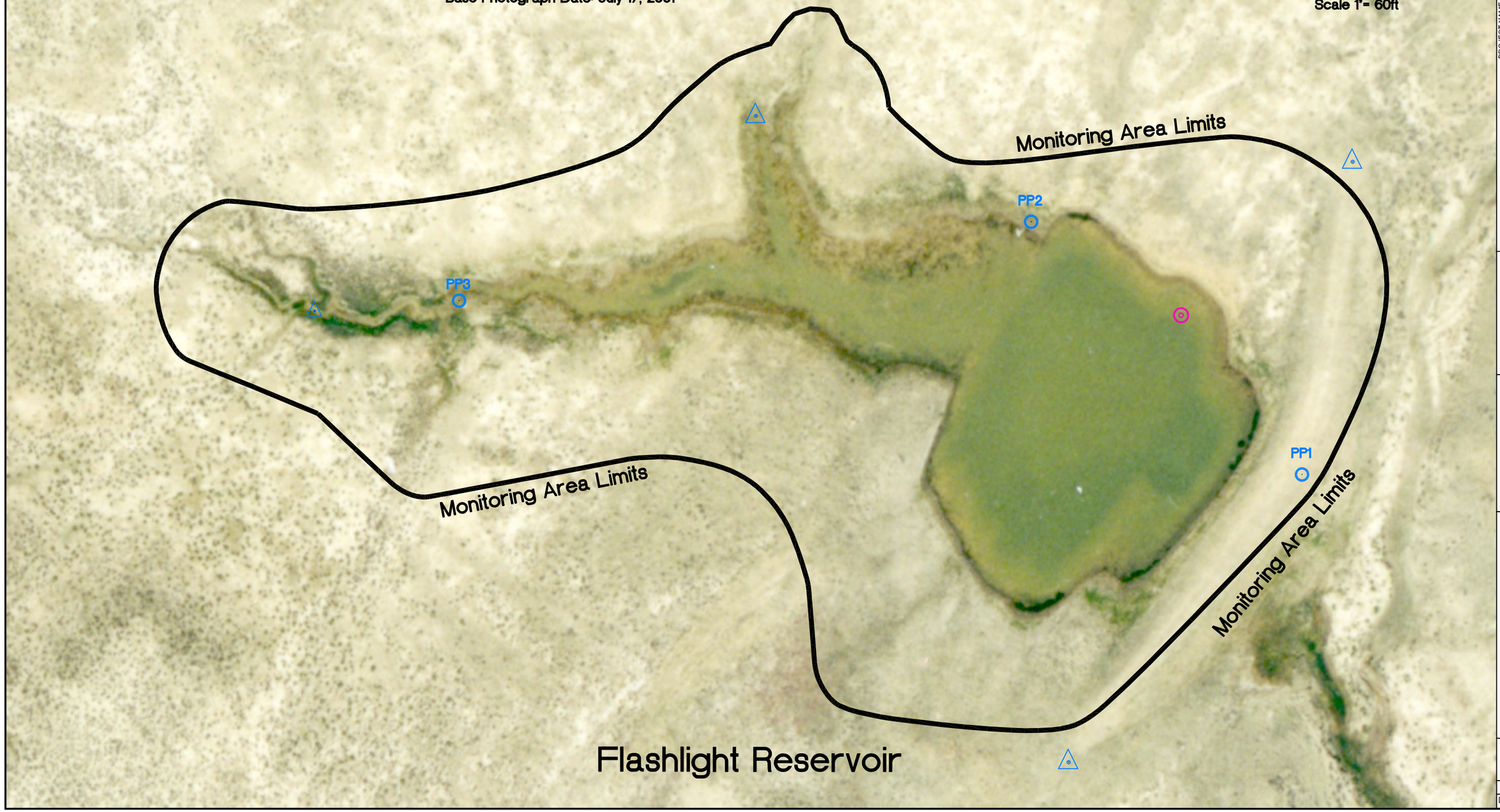
Legend

- Monitoring Area Limits
- Photograph Point
- Aerial Reference Point
- Macro-invertebrate Sample Point

Base Photograph Date: July 17, 2001

N
W E
S

Scale 1"= 60ft



PROJECT NAME
MDT Fourchette CreekWetland Mitigation

DRAWING TITLE
Monitoring Activity Locations

DRAWN: RAA
CHECKED:
APPVD: JB
PROJ MGR: BD

PROJ NO: B43054.407
FILE NAME: Task23Flashlight
SCALE: 1"=60ft
LOCATION: Fourchette Creek

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

FIGURE 2 OF

REV -
DATE: 6-1-05

Figure 3 - Mapped Site Features 2004

Legend

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

Base Photograph Date: July 17, 2001

2004 Wetland Area:

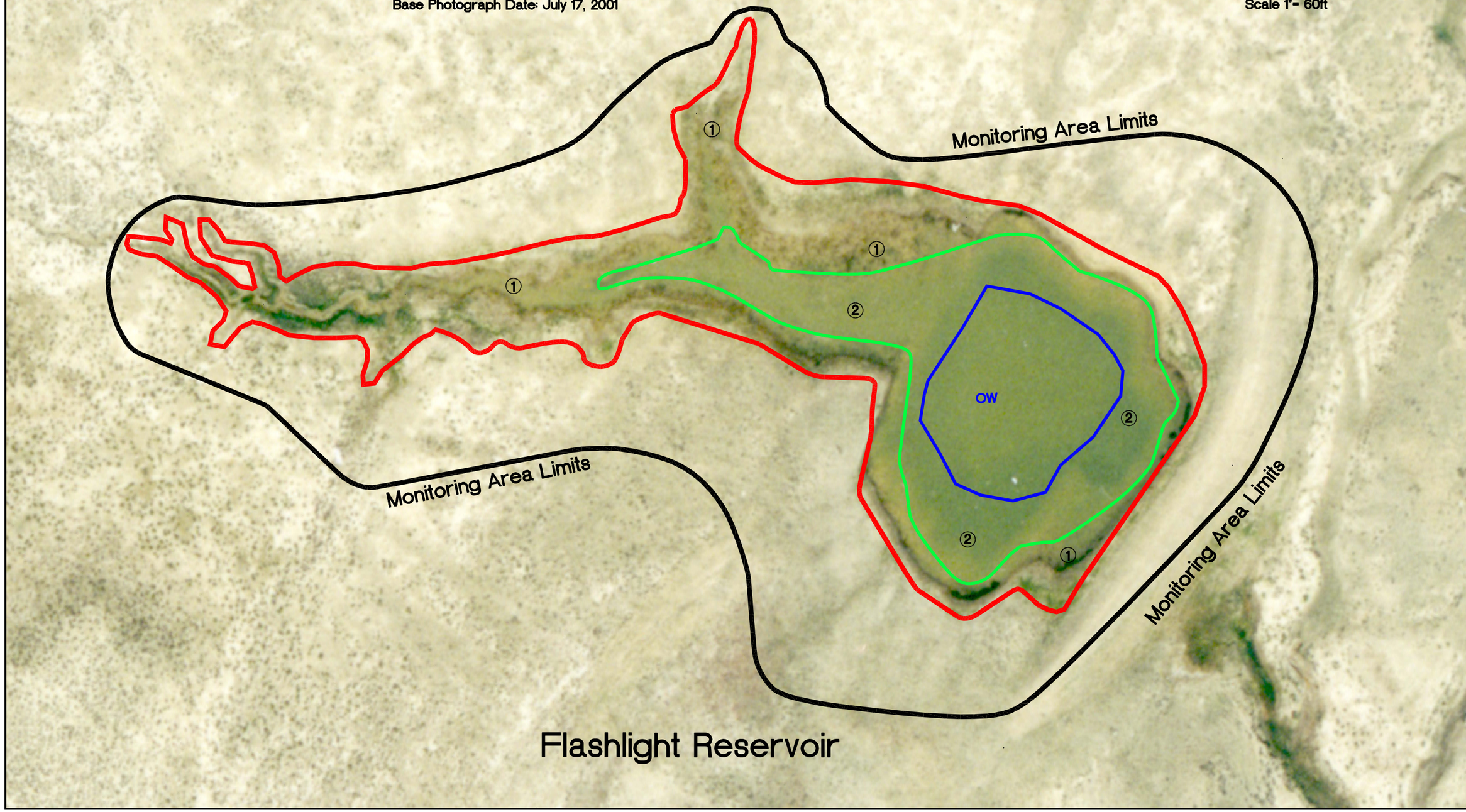
Gross Area	1.76 Acres
Open Water	0.27 Acres
Net Area	1.49 Acres

Vegetation Types:

① Eleocharis
② Potomogeton/Myriophyllum

N
W E
S

Scale 1"= 60ft



PROJECT NAME: MDT Fourchette Creek Wetland Mitigation
DRAWING TITLE: Mapped Site Features 2004

DRAWN: RAA
CHECKED:
APPV'D: JB
PROJ MGR: BD

PROJ NO: B430054.407
FILE NAME: Task23Flashlight
SCALE: 1"= 60ft
LOCATION: Fouchette Creek

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

FIGURE 3 OF

REV -
DATE: 6-09-05

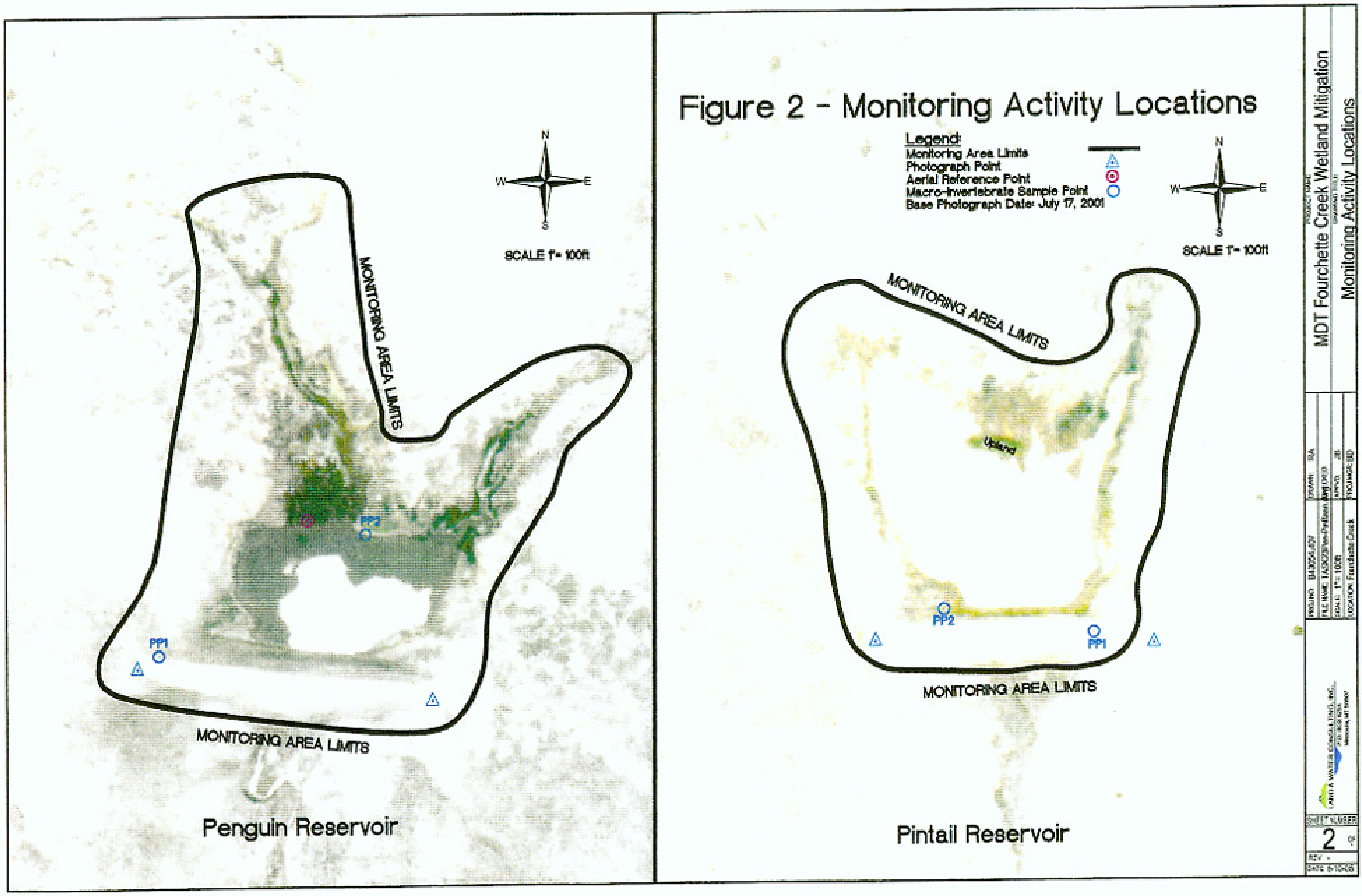
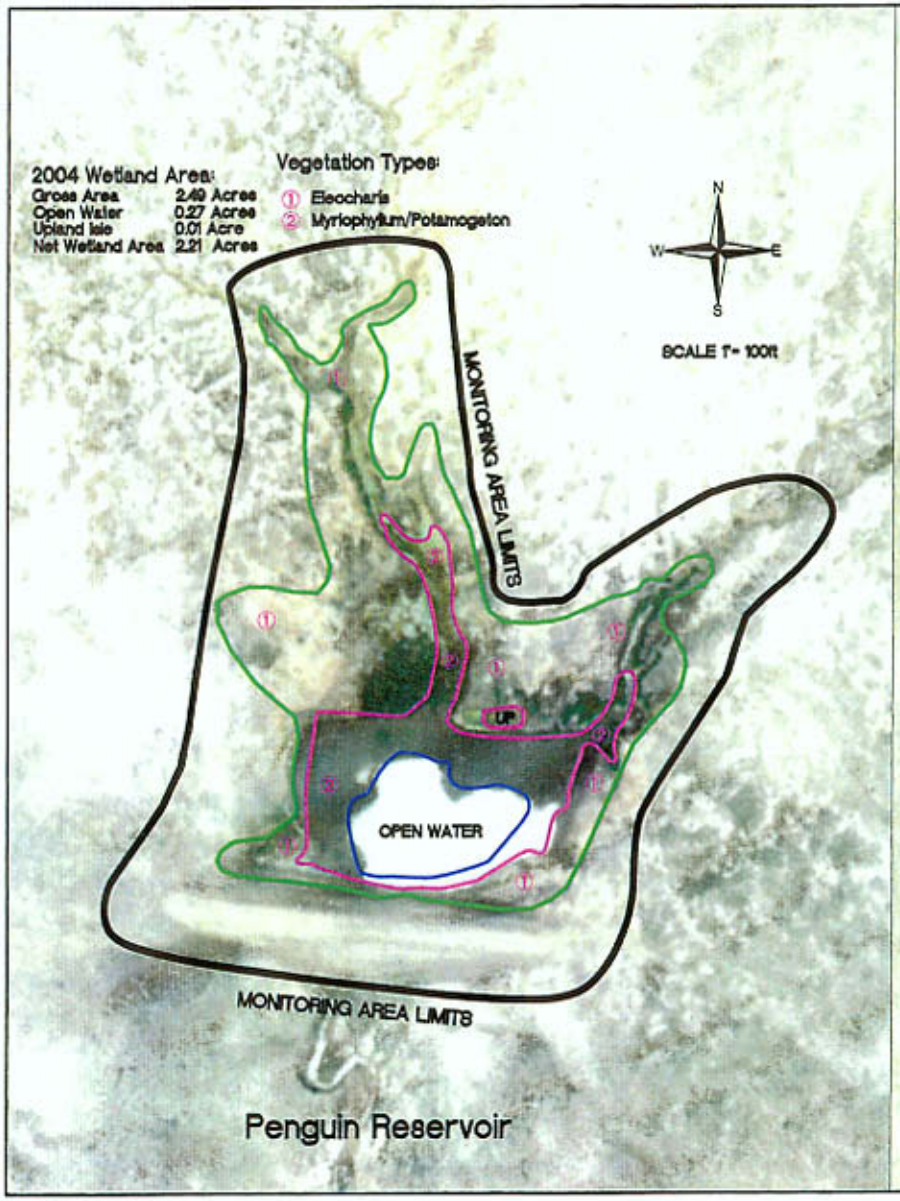
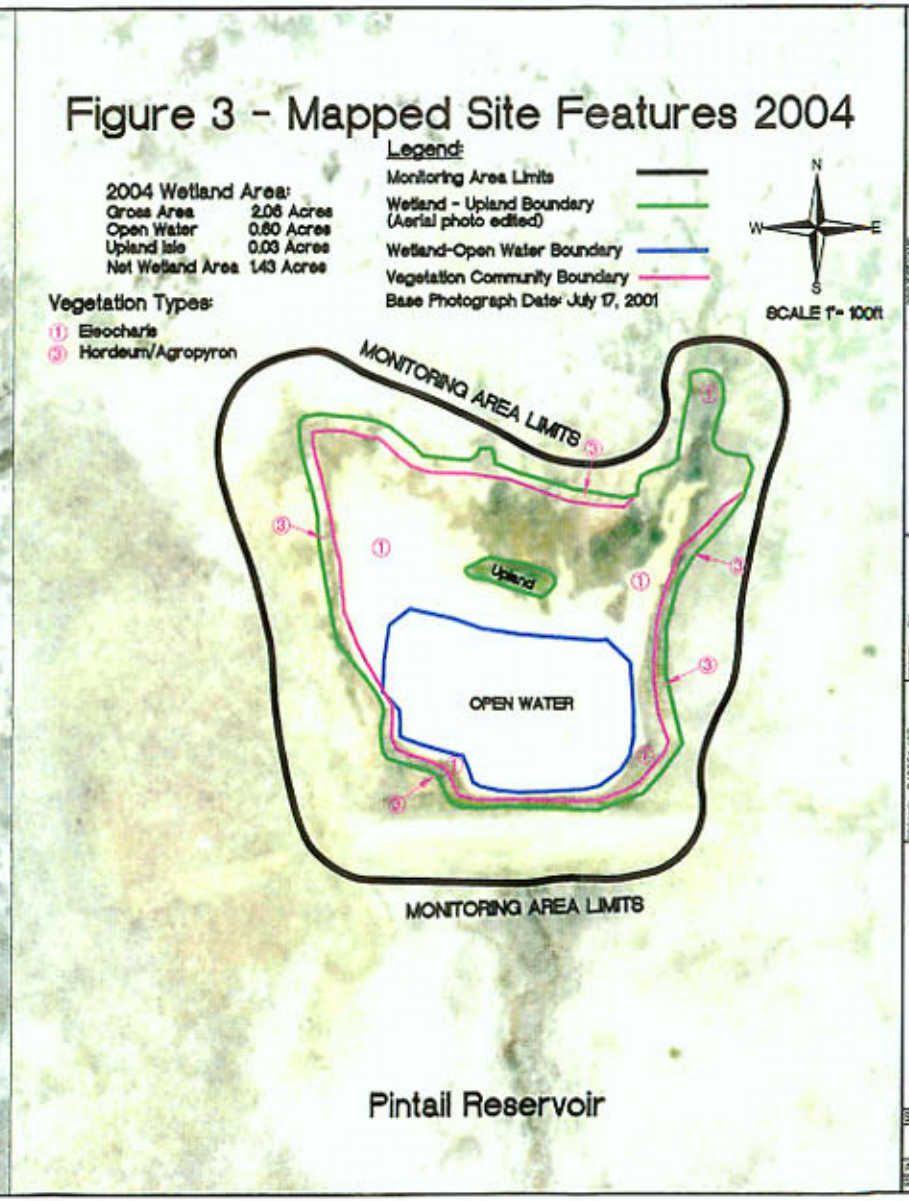


Figure 2 - Monitoring Activity Locations
Legend:
Monitoring Area Limits
Photograph Point
Aerial Reference Point
Macro-invertebrate Sample Point
Base Photograph Date: July 17, 2001
N
S
E
W
SCALE 1"= 100ft
MONITORING AREA LIMITS
PP1
PP2
Upland
Penguin Reservoir
Pintail Reservoir
MDT Fourchette Creek Wetland Mitigation
Monitoring Activity Locations
SCALE 1"= 100ft
LOCATION Fourchette Creek
SHEET NUMBER
2
REV -

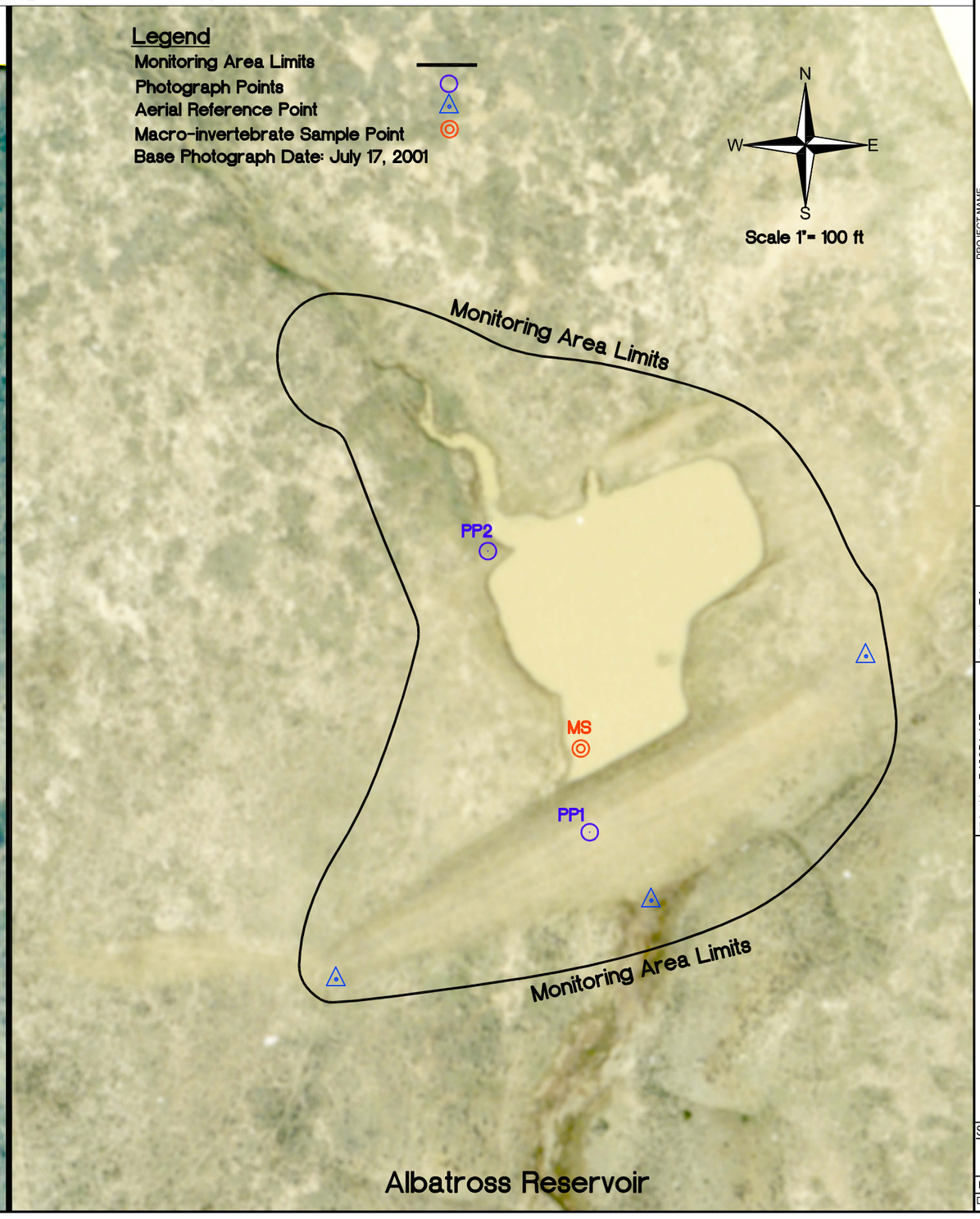
Figure 3 - Mapped Site Features 2004





MDT Fourchette Creek Wetland Mitigation
Mapped Site Features 2004

Figure 2 - Monitoring Activity Locations



PROJECT NAME: MDT Fourchette Creek Wetland Mitigation

DRAWING TITLE: Monitor Activity Locations

PROJ NO: B43054.407
FILE NAME: Task23Alb-PuffBase.dwg
SCALE: as noted
LOCATION: Fourchette Creek

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

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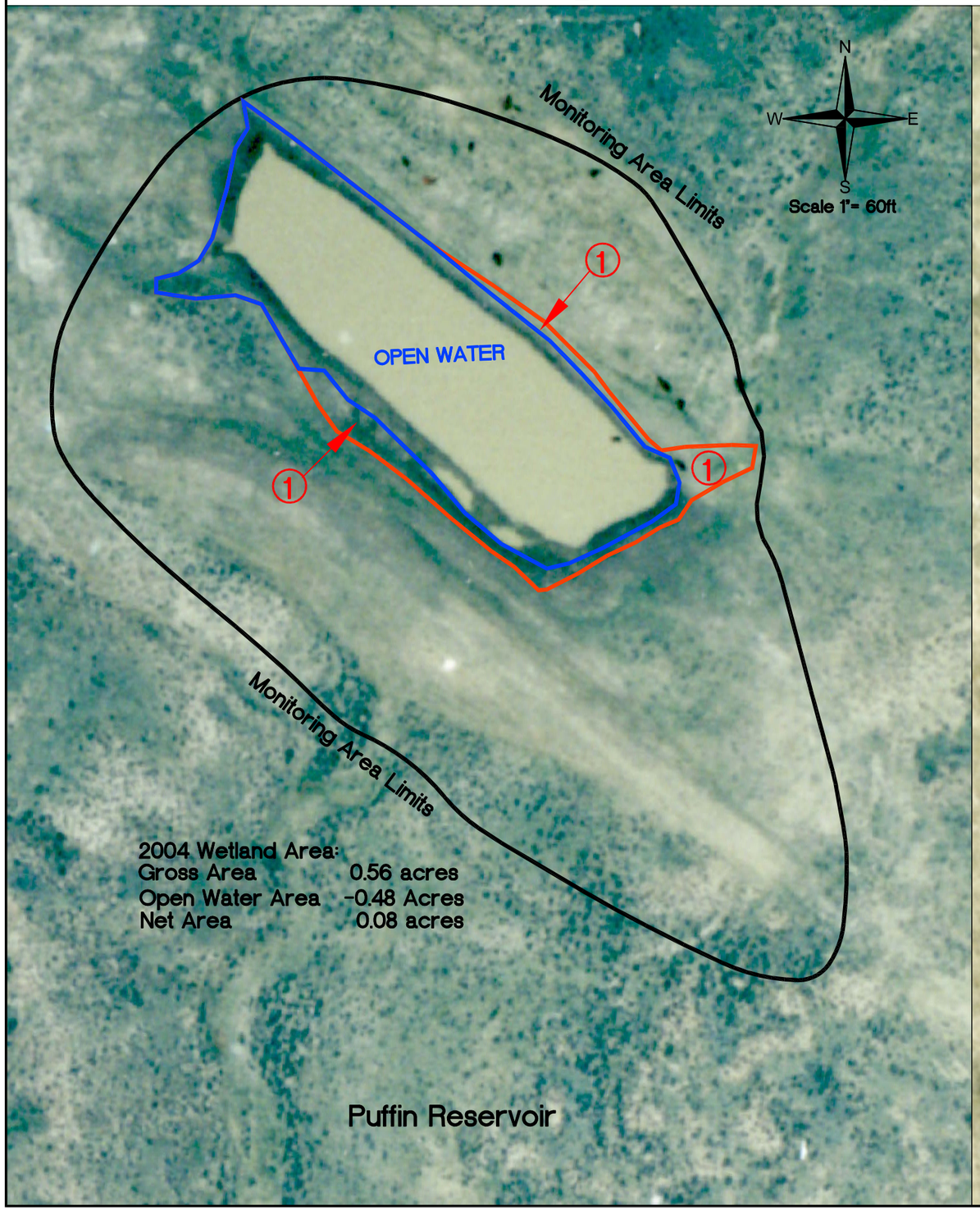
P.O. BOX 8254
Missoula, MT 59807

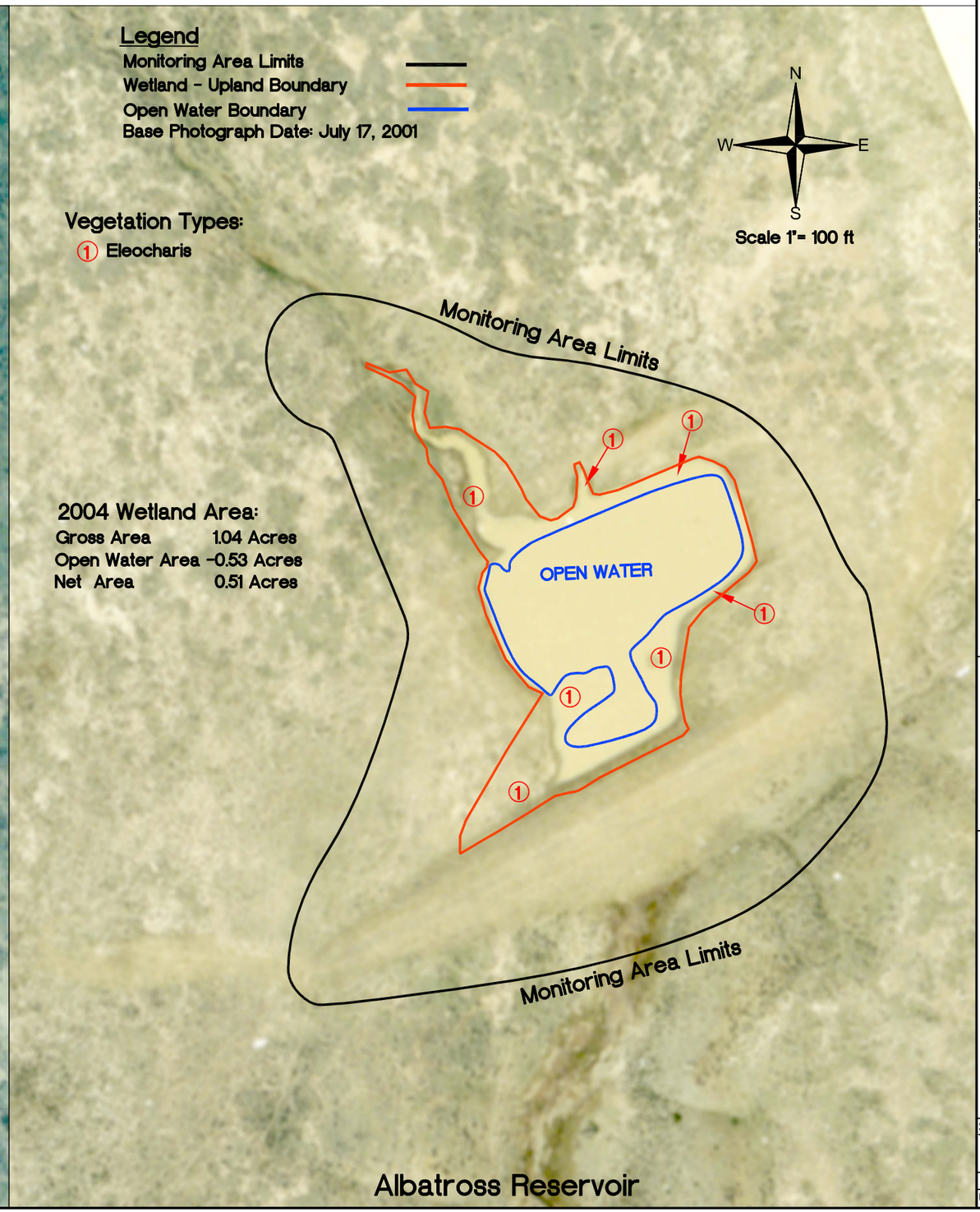
SHEET NUMBER 2 OF -

REV -

DATE: 6-13-05

Figure 3 - Mapped Site Features 2004





PROJECT NAME: MDT Fourchette Creek Wetland Mitigation

DRAWING TITLE: Mapped Site Features 2004

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

PROJ NO: B43054.407
FILE NAME: Task23Alb-PuffBase
SCALE: as noted
LOCATION: Fourchette Creek

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Missoula, MT 59807

SHEET NUMBER 3 OF

REV -

DATE: 6-09-05

Appendix B

2004 WETLAND MITIGATION SITE MONITORING FORM
2004 BIRD SURVEY FORMS
2004 WETLAND DELINEATION FORMS
2004 FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Fourchette Creek
Phillips County, Montana

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:_Fourchette Creek__ Project Number:__Task 23_____ Assessment Date:_7__/_26_/_04_
Location:**PENGUIN RESERVOIR**_____ MDT District: Glendive___ Milepost:_NA_____
Legal description: T__22NR_30E Section_19_ Time of Day:___0700-0800
Weather Conditions:_dry, cloudy_____ Person(s) conducting the assessment:_____Berglund
Initial Evaluation Date:__8_/_30_/_01_ Visit #:__4___ Monitoring Year:__4 (2004)_
Size of evaluation area:__2.5____acres Land use surrounding wetland:__Rangeland_____

HYDROLOGY

Surface Water Source:___Precipitation_____
Inundation**:** Present__X Absent____ Average depths:__1.5FT Range of depths:_2”_-__5_ft
Assessment area under inundation:__100%
Depth at emergent vegetation-open water boundary:_2__ft
If assessment area is not inundated are the soils saturated w/in 12” of surface**:** Yes_X__No_____
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): ___water marks and drift lines

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

Well #	Depth	Well #	Depth	Well #	Depth

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

COMMENTS/PROBLEMS: _Grazed site. Inundation extent substantially larger than observed in 2001 through 2003

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:_Fourchette Creek__ Project Number:__Task 23_____ Assessment Date:_7__/_26_/_04_
Location:____**FLASHLIGHT RESERVOIR**____ MDT District: Glendive___ Milepost:_NA_____
Legal description: T22N_ R29E_ Section_24_ Time of Day:___8:00-9:00
Weather Conditions:_dry, cloudy_____ Person(s) conducting the assessment:_____Berglund
Initial Evaluation Date:__8_/_30_/_01_ Visit #:___4___ Monitoring Year:__4 (2004)_
Size of evaluation area:__2-3__acres Land use surrounding wetland:____Rangeland_____

HYDROLOGY

Surface Water Source:___Precipitation_____
Inundation**:** Present_X_ Absent____ Average depths:_2__ft Range of depths:_0__-__6_ft
Assessment area under inundation:_100_%
Depth at emergent vegetation-open water boundary:__3_ft
If assessment area is not inundated are the soils saturated w/in 12" of surface**:** Yes_X__No_____
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): ___water marks, drift lines

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

Well #	Depth	Well #	Depth	Well #	Depth

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

COMMENTS/PROBLEMS: _Grazed site. Inundation extent larger than observed in 2001-2003

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:_Fourchette Creek__ Project Number:__Task 23_____ Assessment Date:_7__/_26_/_04_
Location:**PINTAIL RESERVOIR**_____ MDT District: Glendive___ Milepost:_NA_____
Legal description: T22N_ R30E_ Section_19_ Time of Day:9:00-10:00
Weather Conditions:_dry, cloudy_____ Person(s) conducting the assessment:_____Berglund
Initial Evaluation Date:__8_/_30_/_01_ Visit #:___4___ Monitoring Year:__4 (2004)_
Size of evaluation area:_2-3___acres Land use surrounding wetland:____Rangeland_____

HYDROLOGY

Surface Water Source:___Precipitation_____
Inundation**:** Present__X_ Absent____ Average depths:_1-2ft Range of depths:_0__-_3__ft
Assessment area under inundation:_100_%
Depth at emergent vegetation-open water boundary:_6”_ft
If assessment area is not inundated are the soils saturated w/in 12” of surface**:** Yes_X__No_____
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): _DRIFT LINES_____

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

Well #	Depth	Well #	Depth	Well #	Depth

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

COMMENTS/PROBLEMS: _Grazed site. Surface water extent greater than observed in 2001-2003.

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:_Fourchette Creek__ Project Number:__Task 23_____ Assessment Date:_7__/_26_/_04_
Location:**ALBATROSS RESERVOIR**_____ MDT District: Glendive___ Milepost:_NA_____
Legal description: T22N_ R29E_ Section_14_ Time of Day:10:00-11:00
Weather Conditions:_dry, cloudy_____ Person(s) conducting the assessment:_____Berglund
Initial Evaluation Date:__8_/_30_/_01_ Visit #:__4___ Monitoring Year:__4 (2004)_
Size of evaluation area:__2____acres Land use surrounding wetland:____Rangeland_____

HYDROLOGY

Surface Water Source:___Precipitation_____
Inundation**:** Present_X__ Absent____ Average depths:_1.5ft Range of depths:_0-3____ft
Assessment area under inundation:_85_%
Depth at emergent vegetation-open water boundary:_6"_ft
If assessment area is not inundated are the soils saturated w/in 12" of surface**:** Yes__X_No_____
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): ___water marks, drift lines

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

Well #	Depth	Well #	Depth	Well #	Depth

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

COMMENTS/PROBLEMS: _Grazed site. Water levels similar to those observed in 2001 and 2003, although slightly greater inundation area over 2003.

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:_Fourchette Creek__ Project Number:__Task 23_____ Assessment Date:_7__/_26_/_04_
Location:**PUFFIN RESERVOIR**_____ MDT District: Glendive___ Milepost:_NA_____
Legal description: T22N_ R29E_ Section_10_ Time of Day:11:00-12:00
Weather Conditions:_dry, cloudy_____ Person(s) conducting the assessment:_____Berglund
Initial Evaluation Date:__8_/_30_/_01_ Visit #:___4___ Monitoring Year:__4 (2004)_
Size of evaluation area:_2_____acres Land use surrounding wetland:____Rangeland_____

HYDROLOGY

Surface Water Source:___Precipitation_____
Inundation**:** Present__X_ Absent____ Average depths:_1__ft Range of depths:_0_-__2_ft
Assessment area under inundation:_40_%
Depth at emergent vegetation-open water boundary:__2"ft
If assessment area is not inundated are the soils saturated w/in 12" of surface**:** Yes____NoX
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): _____

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

Well #	Depth	Well #	Depth	Well #	Depth

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

COMMENTS/PROBLEMS: _Grazed site; thin fringe of emergent wetland developing adjacent to pond. As noted in 2001-2003, site was over-excavated and would need to flood to about 10 feet or more in depth to flood uplands to the north.

VEGETATION COMMUNITIES

Community No.:_1_ Community Title (main species):_~~HOR JUB /~~ ELE PAL_____

Dominant Species	% Cover	Dominant Species	% Cover
ELE PAL	>5020	ALI GRA	1-5
TYP LAT	11-20	JUN BAL	1-5
ELE ACI	11-20	HOR JUB	1-5
SAG CUN	1-5		

COMMENTS/PROBLEMS: __Eleocharis greatly increased in 2003, dominating this community type. HOR JUB dropped from this community title as ELE PAL has taken over in 2004. TYP LAT also starting to appear with other aquatic species.

Community No.:_2_ Community Title (main species):_MYR SPI / POT FOL_____

Dominant Species	% Cover	Dominant Species	% Cover
MYR SPI	>50		
POT FOL	>50		
ELO CAN	11-20		
SAG CUN	1-5		

COMMENTS/PROBLEMS: _Similar to 2001- 2003_____

Community No.:_3__ Community Title (main species):_HOR JUB / AGR _____

Dominant Species	% Cover	Dominant Species	% Cover
HOR JUB	>50		
AGR DAS	>50		
AGR REP	21-50		
ELE PAL	1-5		

COMMENTS/PROBLEMS: ___Similar to 2001 - 2003._____

Additional Activities Checklist:
_X__Record and map vegetative communities on air photo

VEGETATION COMMUNITIES (continued)

Community No.:_4__ Community Title (main species):_SCI MAR / TYP LAT_____

Dominant Species	% Cover	Dominant Species	% Cover
~~SCI MAR~~	~~21-50~~		
~~TYP LAT~~	~~11-20~~		
~~ELE ACI~~	~~11-20~~		
~~XAN STR~~	~~6-10~~		

COMMENTS/PROBLEMS: __New in 2002 - at Albatross only in 2002 and 2003. Eliminated from all sites in 2004 (replaced by Type 1).

Community No.:_5__ Community Title (main species):_XAN STR__(2002 only)_____

Dominant Species	% Cover	Dominant Species	% Cover
~~XAN STR~~	~~>50~~		
~~CHE ALB~~	~~21-50~~		
~~RUM CRI~~	~~6-10~~		
~~HOR JUB~~	~~6-10~~		
~~AGR REP~~	~~6-10~~		

COMMENTS/PROBLEMS: ___ New in 2002 at Albatross only; absent in 2003 (replaced by Type 4). Absent from all sites in 2004.

Community No.:__6_ Community Title (main species):_UPLAND_____

Dominant Species	% Cover	Dominant Species	% Cover
ART TRI	21-50	BOU GRA	11-20
HEL ANN	6-10	MEL OFF	11-20
GRI SQU	11-20		
AGR SMI	11-20		
AGR REP	11-20		

COMMENTS/PROBLEMS: ___varies site to site._____

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Agropyron dasystachyum	3, 6	*Polygonum sp. (upland)*	6
Agropyron repens	3, 6	*Populus deltoids (seedlings)*	6
Agropyron smithii	6	*Potamogeton foliosus*	2
Alisma plantago-aquatica	2	*Puccinellia nuttalliana*	1, 3
Alisma gramineum	1, 2	*Ranunculus aquatilis*	2
Artemisia cana	6	*Rumex crispus*	1
Artemisia frigida	6	*Sagittaria cuneata*	1, 2
Artemisia tridentate	6	*Salix exigua*	1, 6
Atriplex argentea	3, 6	*Sarcobatus vermiculatus*	6
Beckmannia syzigachne	2	*Schizachyrium scoparium*	6
Bouteloua gracilis	6	*Scirpus acutus*	1
Chenopodium album	6	*Scirpus americanus*	1
Chrysothamnus nauseosus	6	*Scirpus maritimus*	1
Cirsium arvense	6	*Spergularia rubra*	6
Distichlis spicata	3	*Thlaspi arvense*	6
Echinochloa crusgalli	3	*Typha latifolia*	1
Eleocharis acicularis	1	*Xanthium strumarium*	1
Eleocharis palustris	1, 2		
Elodea canadensis	2		
Erodium cicutarium	6		
Grindelia squarrosa	6		
Gutierrezia sarothrae	6		
Helianthus annuus	6		
Hordeum jubatum	1, 3		
Iva axillaris	1, 3		
Juncus balticus	1		
Koeleria pyramidata	6		
Lepidium densiflorum	6		
Marsilea vestita	1		
Medicago lupulina	6		
Melilotus officinalis	6		
Myriophyllum spicatum	2		
Nasturtium officinale	2		
Opuntia sp.	6		
Polygonum lapathifolium	2		

COMMENTS/PROBLEMS: _Only sparse vegetation surrounding Puffin Reservoir_____
____Communities 4 and 5 replaced by 1.

PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed	Mortality Causes
No woody species planted			

COMMENTS/PROBLEMS: _____

WILDLIFE

BIRDS

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes____ No__X_Type:_____ How many?_____ Are the nesting structures being utilized? Yes____ No____ Do the nesting structures need repairs? Yes____ No____

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
deer (Flashlight, Albatross)	0	yes			
western chorus frog (Flashlight)	20				
northern leopard frog (Pintail, Flashlight, Albatross)	40-50				
jack rabbit (Flashlight)	1				
pronghorn (Albatross)	1				
muskrat (Albatross)	1				

Additional Activities Checklist:
_X___Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: _N**o** frogs observed at Penguin in 2004. No painted turtles observed in 2004.

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
_NA__ One photo from each end of vegetation transect showing transect

Location	Photo Frame #	Photograph Description	Compass Reading
A		see photo sheets	
B			
C			
D			
E			
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:

_NA__ Jurisdictional wetland boundary
_NA__4-6 landmarks recognizable on the air photo
_NA__ Start and end points of vegetation transect(s)
_NA__ Photo reference points
_NA__ Groundwater monitoring well locations

COMMENTS/PROBLEMS: __No GPS data recorded in 2004 – adjustments made on aerial photo.

WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

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

COMMENTS/PROBLEMS: __See data forms_____

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS: _See data forms_____

MAINTENANCE

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

Were man-made structures 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: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **No Transects at this site** Date: _____ Examiner: _____ Transect # _____

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

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

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

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

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

Indicator Class:

+ = Obligate
- = Facultative/Wet
0 = Facultative

Source:

P = Planted
V = Volunteer

Percent of perimeter _____ % 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: No transects at this site

3/01 rev

BIRD SURVEY – FIELD DATA SHEET

Page__1_of_1__
Date:7/26/04

SITE: Fourchette Reserve

Survey Time: 0700-1200

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Penguin Reservoir							
Killdeer	6	F	MA				
Gadwall	1	F	MA				
Northern Pintail	1	F	MA				
Willet	3	F	MA				
American Coot	1	F	MA				
Wilson's Phalarope	2	F	MA				
Marbled Godwit	1	F	MA				
Pintail Reservoir							
Blue-Wing Teal	11	Broods	MA				
Willet	4	F	MA				
Killdeer	6	F	MA				
Flashlight Reservoir							
American coot	4	Brood	OW				
Willet	4	F	MA				
Killdeer	8	F	US				
Vesper Sparrow	2	F	UP				
Albatross Reservoir							
Mourning Dove	2	F	UP				
Blue-wing teal	5	F	OW				
Vesper Sparrow	3	F	UP				
Puffin Reservoir							
Northern Harrier	1	F	UP				

Notes:
Several leopard frogs at Pintail Reservoir.
Several dozen northern leopard frogs and chorus frogs, jackrabbit, deer tracks observed at Flashlight Reservoir.
Few leopard frogs observed at Albatross, plus deer tracks, pronghorn, and muskrat.
No wildlife observed at Puffin.

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

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

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM / AB
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** NA
Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes (No)	**Field Location:** Flashlight Reservoir

VEGETATION (USFWS Region No. 4)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Hordeum jubatum	Herb	FACW	*Myriophyllum spicatum*	Herb	OBL
Barley,Fox-Tail			Water-Milfoil,Eurasian		
Eleocharis palustris	Herb	OBL	*Scirpus acutus*	Herb	OBL
Spikerush,Creeping			Bulrush,Hard-Stem		
Potamogeton foliosus	Herb	OBL	*Xanthium strumarium*	Herb	FAC
Pondweed,Leafy			Cockle-Bur,Rough		
Distichlis spicata	Herb	NI	*Nasturtium officinale*	Herb	OBL
Saltgrass,Inland			Water-Cress,True		
Eleocharis acicularis	Herb	OBL	*Puccinellia nuttalliana*	Herb	OBL
Spikerush,Least			Grass,Nuttall's Alkali		
Sagittaria cuneata	Herb	OBL	*Rumex crispus*	Herb	FACW
Arrow-Head,Northern			Dock,Curly		
Scirpus maritimus	Herb	NI	*Scirpus americanus*	Herb	OBL
Bulrush,Saltmarsh			Bulrush,Olney's		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 12/12 = 100.00%
FAC Neutral: 11/11 = 100.00%
Numeric Index: 16/12 = 1.33

Remarks:

HYDROLOGY

YES **Recorded Data(Describe in Remarks):**
- NO Stream, Lake or Tide Gauge
- YES Aerial Photographs
- NO Other

NO **No Recorded Data**

Field Observations

Depth of Surface Water:	= 48 *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- YES Inundated
- YES Saturated in Upper 12 Inches
- NO Water Marks
- NO Drift Lines
- YES Sediment Deposits
- YES Drainage Patterns in Wetlands

Secondary Indicators
- NO Oxidized Root Channels in Upper 12 Inches
- NO Water-Stained Leaves
- NO Local Soil Survey Data
- YES FAC-Neutral Test
- NO Other(Explain in Remarks)

Remarks:
Soils along edge saturated to surface; pond inundated.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 1

SOILS

Map Unit Name (Series and Phase): Unmapped
Map Symbol: NA **Drainage Class:** Unknown
Taxonomy (Subgroup): Unknown
Mapped Hydric Inclusion?
Field Observations Confirm Mapped Type? Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
10	B	2.5Y4/2	N/A	N/A	N/A	Clay
10	B	2.5Y4/3	2.5Y5/6	Common	Faint	Clay
10	B	2.5Y4/2	2.5Y5/6	Few	Faint	Clay

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

Remarks:
Clear wetland border; soils support obligate species. Soils are clays and are likely poorly to very poorly drained.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland?	(Yes) No
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	(Yes) No		

Remarks:
Emergent / aquatic bed communities surrounding and within Flashlight Reservoir.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM/AB
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** NA
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Penguin Reservoir

VEGETATION (USFWS Region No. 4)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Hordeum jubatum	Herb	FACW	*Elodea canadensis*	Herb	OBL
Barley,Fox-Tail			Water-Weed,Broad		
Xanthium strumarium	Herb	FAC	*Myriophyllum spicatum*	Herb	OBL
Cockle-Bur,Rough			Water-Milfoil,Eurasian		
Eleocharis palustris	Herb	OBL	*Sagittaria cuneata*	Herb	OBL
Spikerush,Creeping			Arrow-Head,Northern		
Eleocharis acicularis	Herb	OBL	*Rumex crispus*	Herb	FACW
Spikerush,Least			Dock,Curly		
Beckmannia syzigachne	Herb	OBL	*Juncus balticus*	Herb	OBL
Sloughgrass,American			Rush,Baltic		
Polygonum lapathifolium	Herb	OBL	*Typha latifolia*	Herb	OBL
Willow-Weed			Cattail,Broad-Leaf		
Potamogeton foliosus	Herb	OBL			
Pondweed,Leafy					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 13/13 = 100.00%
FAC Neutral: 12/12 = 100.00%
Numeric Index: 17/13 = 1.31

Remarks:
Typha new in 2004

HYDROLOGY

YES **Recorded Data(Describe in Remarks):**
- NO **Stream, Lake or Tide Gauge**
- YES **Aerial Photographs**
- NO **Other**

NO **No Recorded Data**

Field Observations

Depth of Surface Water:	= 48 *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- YES **Inundated**
- YES **Saturated in Upper 12 Inches**
- YES **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- YES **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Inundated in pond, saturated at edges.

WetForm[tm]

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 2

SOILS

Map Unit Name (Series and Phase): Bascovey clay
Map Symbol: 250E **Drainage Class:** PD (?)
Taxonomy (Subgroup): Unknown
Mapped Hydric Inclusion?
Field Observations Confirm Mapped Type? (Yes) No

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
10	B	10YR4/2	10YR5/8	Common Distinct	Clay

Hydric Soil Indicators:

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

Remarks:
Sample at wetland edge.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
EM / AB communities at Penguin Reservoir.

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LAND & WATER

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 3

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

VEGETATION (USFWS Region No. 4)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Hordeum jubatum	Herb	FACW	*Polygonum lapathifolium*	Herb	OBL
Barley,Fox-Tail			Willow-Weed		
Echinochloa crusgalli	Herb	FACW	*Scirpus americanus*	Herb	OBL
Grass,Barnyard			Bulrush,Olney's		
Eleocharis palustris	Herb	OBL	*Alisma gramineum*	Herb	OBL
Spikerush,Creeping			Water-Plantain,Narrow-Leaf		
Distichlis spicata	Herb	NI	*Sagittaria cuneata*	Herb	OBL
Saltgrass,Inland			Arrow-Head,Northern		
Agropyron dasystachyum	Herb	FAC	*Typha latifolia*	Herb	OBL
Wheatgrass,Thick-Spike			Cattail,Broad-Leaf		
Agropyron repens	Herb	FAC			
Quackgrass					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 10/10 = 100.00%
FAC Neutral: 8/8 = 100.00%
Numeric Index: 16/10 = 1.60

Remarks:
Great dominance of ELE PAL in 2004

HYDROLOGY

YES **Recorded Data(Describe in Remarks):**
- NO **Stream, Lake or Tide Gauge**
- YES **Aerial Photographs**
- NO **Other**

NO **No Recorded Data**

Field Observations

Depth of Surface Water:	= 3 *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

Wetland Hydrology Indicators
Primary Indicators
- YES **Inundated**
- YES **Saturated in Upper 12 Inches**
- YES **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Inundated to much greater extent than was observed during 2002, even greater than 2003.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 3

SOILS

Map Unit Name (Series and Phase): Unmapped
Map Symbol: NA **Drainage Class:** Unknown
Taxonomy (Subgroup): Unknown
Mapped Hydric Inclusion?
Field Observations Confirm Mapped Type? Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
10	B	10YR4/2	10YR5/8	Common Distinct	Clay
10	B	10YR4/2	10YR5/6	Few Faint	Clay
10	A/B	5GY4/1	N/A	N/A N/A	Clay

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

Remarks:
First 2 Samples along fringe area. Third in drawdown zone with wetland veg.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
EM community at Pintail Reservoir. Wetland veg increasing in main impoundment area. Water extremely turbid.

Explanation for response to: Normal Circumstances? Atypical Situation ? Potential Problem Area ?
The site is likely a seasonal wetland (Problem Area Type b); hydrology may sometimes be present during early growing season, but is reduced or lacking during later growing season. Site was much more inundated than it appeared in 2002.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 4

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

VEGETATION (USFWS Region No. 4)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Eleocharis palustris	Herb	OBL	*Typha latifolia*	Herb	OBL
Spikerush,Creeping			Cattail,Broad-Leaf		
Hordeum jubatum	Herb	FACW	*Rumex crispus*	Herb	FACW
Barley,Fox-Tail			Dock,Curly		
Xanthium strumarium	Herb	FAC	*Eleocharis acicularis*	Herb	OBL
Cockle-Bur,Rough			Spikerush,Least		
Marsilea vestita	Herb	OBL	*Cirsium arvense*	Herb	FACU
Fern,Hairy Water			Thistle,Creeping		
Scirpus maritimus	Herb	NI	*Alisma gramineum*	Herb	OBL
Bulrush,Saltmarsh			Water-Plantain,Narrow-Leaf		

Percent of Dominant Species that are OBL, FACW or FAC: 8/9 = 88.89% (excluding FAC-)
FAC Neutral: 7/8 = 87.50%
Numeric Index: 16/9 = 1.78

Remarks:
1 salix exigua seedling. Wetland veg is emerging along fring. No aquatic veg in impoundment.

HYDROLOGY

YES **Recorded Data(Describe in Remarks):**
- NO Stream, Lake or Tide Gauge
- YES Aerial Photographs
- NO Other

NO **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 12 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO Inundated
- YES Saturated in Upper 12 Inches
- YES Water Marks
- NO Drift Lines
- NO Sediment Deposits
- NO Drainage Patterns in Wetlands

Secondary Indicators
- NO Oxidized Root Channels in Upper 12 Inches
- NO Water-Stained Leaves
- NO Local Soil Survey Data
- YES FAC-Neutral Test
- NO Other(Explain in Remarks)

Remarks:
Impoundment inundated, shallow areas dominated by wetland veg. Water very turbid. Water levels about 2.5 feet higher than observed during 2002.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 4

SOILS

Map Unit Name (Series and Phase): Sunburst
Map Symbol: 925C **Drainage Class:** PD (?)
Taxonomy (Subgroup): Unknown
Mapped Hydric Inclusion?
Field Observations Confirm Mapped Type? Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
10	B	10YR4/2	10YR5/8	Few	Distinct	Clay
10	B	2.5Y4/1	10YR4/6	N/A	N/A	Clay

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

Remarks:
1st Sample in NW "arm". Second in drawdown zone.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Wetland fringe occurs along entire shoreline and in drawdown area. Greater inundation than 2001-2003.

Explanation for response to: Normal Circumstances? Atypical Situation ? Potential Problem Area ?
The site is possibly a seasonal wetland (Problem Area Type b); hydrology may be present during early growing season, but may be reduced or lacking during later growing season.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 5

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** OW
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** NA
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Puffin Reservoir

VEGETATION (USFWS Region No. 4)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Eleocharis palustris	Herb	OBL	*Scirpus maritimus*	Herb	NI
Spikerush,Creeping			Bulrush,Saltmarsh		
Alisma gramineum	Herb	OBL	*Salix exigua*	Herb	FACW+
Water-Plantain,Narrow-Leaf			Willow,Sandbar		
Sagittaria cuneata	Herb	OBL			
Arrow-Head,Northern					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 4/4 = 100.00%
FAC Neutral: 4/4 = 100.00%
Numeric Index: 5/4 = 1.25

Remarks:
Narrow wetland fringe along shore in SE half. First year wetland vegetation observed.

HYDROLOGY

YES Recorded Data(Describe in Remarks):
- NO Stream, Lake or Tide Gauge
- YES Aerial Photographs
- NO Other

NO No Recorded Data

Field Observations
- Depth of Surface Water: = 48 *(in.)*
- Depth to Free Water in Pit: N/A *(in.)*
- Depth to Saturated Soil: N/A *(in.)*

Wetland Hydrology Indicators
Primary Indicators
- YES Inundated
- YES Saturated in Upper 12 Inches
- YES Water Marks
- NO Drift Lines
- NO Sediment Deposits
- NO Drainage Patterns in Wetlands

Secondary Indicators
- NO Oxidized Root Channels in Upper 12 Inches
- NO Water-Stained Leaves
- NO Local Soil Survey Data
- YES FAC-Neutral Test
- NO Other(Explain in Remarks)

Remarks:
Impoundment inundated, perimeter saturated. Small, rectangular pond just above dike.

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

Project/Site:	Fourchette Creek Reserve	**Project No:** Task 23	**Date:** 26-Jul-2004
Applicant/Owner:	Montana Department of Transportation		**County:** Phillips
Investigators:	Berglund		**State:** Montana
			Plot ID: 5

SOILS

Map Unit Name (Series and Phase): Unmapped
Map Symbol: NA **Drainage Class:** Unknown
Taxonomy (Subgroup): Unknown
Mapped Hydric Inclusion?
Field Observations Confirm Mapped Type? Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
10	B	10YR4/1	10YR4/6	Few	Faint	Clay

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

Remarks:
Sample along perimeter; saturated to surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Puffin Reservoir and wetland fringe. Wetland vegetation present for the first time since monitoring commencementin 2001. Water extremely turbid. Heavy cattle use.

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PBS&J

LAND & WATER

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

1. Project Name: Fourchette Creek Wetland Mitigation Reserve **2. Project #:** 130091-023 **Control #:** NA

3. Evaluation Date: 7/26/2004 **4. Evaluator(s):** Berglund **5. Wetland / Site #(s):** Albatross Reservoir

6. Wetland Location(s) i. T: 22 N **R:** 29 E **S:** 14 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: NA

iii. Watershed: 10040104 **GPS Reference No. (if applies):** NA

Other Location Information: 50 miles south of Malta, 1.5 miles north of CM Russell NWR, Middle Missouri Watershed (#9)

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

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

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

Comments: Albatross Reservoir

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Depression	Palustrine	None	Emergent Wetland	Seasonally Flooded	Impounded	45
Depression	Palustrine	None	Unconsolidated Bottom	Seasonally Flooded	Impounded	55
---	---	---	---	---	---	
---	---	---	---	---	---	

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Grazing

ii. Prominent weedy, alien, & introduced species: CIR ARV

iii. Briefly describe AA and surrounding land use / habitat: Albatross Reservoir - Impoundment with emergent and open water components - surrounding land use is undeveloped rangeland.

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

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

Comments: _____

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

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

Primary or Critical habitat **(list species)**	☐ D ☐ S	_____
Secondary habitat **(list species)**	☐ D ☐ S	_____
Incidental habitat **(list species)**	☐ D ☒ S	Piping plover (incidental migration)
No usable habitat	☐ D ☐ S	_____

ii. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14A(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	---	.3 (L)	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.
Do not include species listed in 14A(i).

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

Primary or Critical habitat **(list species)**	☐ D ☐ S	_____
Secondary habitat **(list species)**	☐ D ☐ S	_____
Incidental habitat **(list species)**	☒ D ☐ S	Northern Leopard Frog
No usable habitat	☐ D ☐ S	_____

iii. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14B(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL:	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	.2 (L)	---	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: NUMEROUS UNIDENTIFIED TADPOLES OBSERVED 2003; SUSPECT WESTERN CHORUS FROGS (OBS. 2001). ONLY 1 LEOPARD FROG OBSERVED AT THIS SITE IN 4 YEARS.

14C. General Wildlife Habitat Rating

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

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

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

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

II. WILDLIFE HABITAT FEATURES **(WORKING FROM TOP TO BOTTOM, SELECT APPROPRIATE AA ATTRIBUTES TO DETERMINE THE EXCEPTIONAL (E), HIGH (H), MODERATE (M), OR LOW (L) RATING. STRUCTURAL DIVERSITY IS FROM #13. FOR CLASS COVER TO BE CONSIDERED EVENLY DISTRIBUTED, VEGETATED CLASSES MUST BE WITHIN 20% OF EACH OTHER IN TERMS OF THEIR PERCENT COMPOSITION IN THE AA (SEE #10). DURATION OF SURFACE WATER: P/P = PERMANENT/PERENNIAL; S/I = SEASONAL/INTERMITTENT; T/E = TEMPORARY/EPHEMERAL; A= ABSENT.**

Structural Diversity (from #13)	☐High								☐Moderate								☒Low			
Class Cover Distribution (all vegetated classes)	☐Even				☐Uneven				☐Even				☐Uneven				☒Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	L	--	--

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ Exceptional	☐ High	☐ Moderate	☒ Low
Substantial	--	--	--	--
Moderate	--	--	--	.3 (L)
Low	--	--	--	--

Comments: Few waterfowl / shorebirds observed; numerous unidentified tadpoles observed 2003; suspect western chorus frogs (obs. 2001).

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

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity **or** is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support**?**
☐ **Y** ☐ **N** If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

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

Types of Fish Known or Suspected Within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ Exceptional	☐ High	☐ Moderate	☐ Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: NA

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)
Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

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

Estimated wetland area in AA subject to periodic flooding	☐ ≥ 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**	--	--	--	--	--	--	--	--	.2 (L)
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)
Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

i. Rating (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)
Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >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**	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)
Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☐ < 70%		☐ ≥ 70%		☒ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☒ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	.3 (L)	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Nutrient loading from cattle use; water very turbid.

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

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 that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	*Duration of Surface Water Adjacent to Rooted Vegetation*		
	☐Permanent / Perennial	☒Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	.2 (L)	--

Comments: Wave action.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function. **A** = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☒ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☒ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.3L	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. ☐ **Discharge Indicators**

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

ii. ☐ **Recharge Indicators**

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

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

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	--
No Discharge/Recharge indicators present	0.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	☐rare	☐common	☐abundant	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	.2L	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Ownership	Disturbance at AA from #12(i)		
	☐ Low	☐ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: Extremely remote

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	Low	0.2	1	
C. General Wildlife Habitat	Low	0.30	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Low	0.20	1	
F. Short and Long Term Surface Water Storage	Moderate	0.60	1	
G. Sediment/Nutrient/Toxicant Removal	Low	0.30	1	
H. Sediment/Shoreline Stabilization	Low	0.20	1	
I. Production Export/Food Chain Support	Low	0.30	1	
J. Groundwater Discharge/Recharge	Low	0.10	1	
K. Uniqueness	Low	0.20	1	
L. Recreation/Education Potential	Low	0.10	1	
	Totals:	**2.80**	**11.00**	
		Percent of Total Possible Points:	**25%** (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not proceed to Category II.)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)
- ☐ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish / Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, proceed to Category III.)
- ☒ "Low" rating for Uniqueness; **and**
- ☒ "Low" rating for Production Export / Food Chain Support; **and**
- ☒ Percent of total possible points is < 30%.

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

☐ **I** ☐ **II** ☐ **III** ☒ **IV**

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

1. Project Name: Fourchette Creek Wetland Mitigation Reserve **2. Project #:** 130091-023 **Control #:** NA

3. Evaluation Date: 7/26/2004 **4. Evaluator(s):** Berglund **5. Wetland / Site #(s):** Flashlight Reservoir

6. Wetland Location(s) i. T: 22 N **R:** 29 E **S:** 24 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: NA

iii. Watershed: 10040104 **GPS Reference No. (if applies):** NA

Other Location Information: 50 miles south of Malta, 1.5 miles north of CM Russell NWR, Middle Missouri Watershed (#9)

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

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

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

Comments: Flashlight Reservoir

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Depression	Palustrine	None	Emergent Wetland	Seasonally Flooded	Impounded	45
Depression	Palustrine	None	Aquatic Bed	Semipermanently Flooded	Impounded	40
Depression	Palustrine	None	Unconsolidated Bottom	Semipermanently Flooded	Impounded	15
---	---	---	---	---	---	

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Grazing

ii. Prominent weedy, alien, & introduced species: CIR ARV

iii. Briefly describe AA and surrounding land use / habitat: Flasklight Reservoir - Impoundment with emergent, aquatic bed, and open water components - surrounding land use is undeveloped rangeland.

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

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

Comments: _____

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

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

Primary or Critical habitat **(list species)**	☐ D	☐ S	_____
Secondary habitat **(list species)**	☐ D	☐ S	_____
Incidental habitat **(list species)**	☐ D	☒ S	Piping plover (incidental migration)
No usable habitat	☐ D	☐ S	_____

v. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14A(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	---	.3 (L)	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.
Do not include species listed in 14A(i).

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

Primary or Critical habitat **(list species)**	☒ D	☐ S	Northern Leopard Frog
Secondary habitat **(list species)**	☐ D	☐ S	_____
Incidental habitat **(list species)**	☐ D	☐ S	_____
No usable habitat	☐ D	☐ S	_____

vi. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14B(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL:	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	1 (H)	---	---	---	---	---	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: **NUMEROUS NORTHERN LEOPARD FROGS OBSERVED AT SITE IN 2001, 2002, 2003, 2004.**

14C. General Wildlife Habitat Rating

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

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

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

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

II. WILDLIFE HABITAT FEATURES (WORKING FROM TOP TO BOTTOM, SELECT APPROPRIATE AA ATTRIBUTES TO DETERMINE THE EXCEPTIONAL (E), HIGH (H), MODERATE (M), OR LOW (L) RATING. STRUCTURAL DIVERSITY IS FROM #13. FOR CLASS COVER TO BE CONSIDERED EVENLY DISTRIBUTED, VEGETATED CLASSES MUST BE WITHIN 20% OF EACH OTHER IN TERMS OF THEIR PERCENT COMPOSITION IN THE AA (SEE #10). DURATION OF SURFACE WATER: P/P = PERMANENT/PERENNIAL; S/I = SEASONAL/INTERMITTENT; T/E = TEMPORARY/EPHEMERAL; A= ABSENT.

Structural Diversity (from #13)	☐High								☒Moderate								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☐Uneven				☒Even				☐Uneven				☐Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	M	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ Exceptional	☐ High	☒ Moderate	☐ Low
Substantial	--	--	.8 (H)	--
Moderate	--	--	--	--
Low	--	--	--	--

Comments: leopard frogs, painted turtles observed over the years

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

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity **or** is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support**?**
☐ **Y** ☒ **N** If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☒ M ☐ L

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

Types of Fish Known or Suspected Within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ Exceptional	☐ High	☒ Moderate	☐ Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	.5 (M)	--
No fish	--	--	--	--

Comments: LWC observers never documented fish at this site, but MDT indicates that fish have been observed (Urban pers. comm).

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)
Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

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

Estimated wetland area in AA subject to periodic flooding	☐ ≥ 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**	--	--	--	--	--	--	--	--	.2 (L)
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)
Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

i. Rating (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)
Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >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**	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)
Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☐ < 70%		☒ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☐ Yes	☐ No	☒ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	.5 (M)	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Nutrient loading from cattle use.

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

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 that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☐Permanent / Perennial	☒Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	.6 (M)	--
< 35 %	--	--	--

Comments: Wave action.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☒ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	.7M	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

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

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

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

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	--
No Discharge/Recharge indicators present	0.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	☐rare	☐common	☐abundant	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	.2L	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Ownership	Disturbance at AA from #12(i)		
	☐ Low	☐ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: Extremely remote

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	High	1.00	1	
C. General Wildlife Habitat	High	0.80	1	
D. General Fish/Aquatic Habitat	Moderate	0.50	1	
E. Flood Attenuation	Low	0.20	1	
F. Short and Long Term Surface Water Storage	Moderate	0.60	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.50	1	
H. Sediment/Shoreline Stabilization	Moderate	0.60	1	
I. Production Export/Food Chain Support	Moderate	0.70	1	
J. Groundwater Discharge/Recharge	Low	0.10	1	
K. Uniqueness	Low	0.20	1	
L. Recreation/Education Potential	Low	0.10	1	
	Totals:	**5.6**	**12.00**	
	Percent of Total Possible Points:		**47%** (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not proceed to Category II.)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)
- ☒ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish / Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, proceed to Category III.)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

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

1. Project Name: Fourchette Creek Wetland Mitigation Reserve **2. Project #:** 130091-023 **Control #:** NA

3. Evaluation Date: 7/26/2004 **4. Evaluator(s):** Berglund **5. Wetland / Site #(s):** Penguin Reservoir

6. Wetland Location(s) i. T: 22 N **R:** 30 E **S:** 19 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: NA

iii. Watershed: 10040104 **GPS Reference No. (if applies):** NA

Other Location Information: 50 miles south of Malta, 1.5 miles north of CM Russell NWR, Middle Missouri Watershed (#9)

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

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

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

Comments: Penguin Reservoir

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Depression	Palustrine	None	Emergent Wetland	Seasonally Flooded	Impounded	50
Depression	Palustrine	None	Aquatic Bed	Semipermanently Flooded	Impounded	35
Depression	Palustrine	None	Unconsolidated Bottom	Semipermanently Flooded	Impounded	15
---	---	---	---	---	---	

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Grazing

ii. Prominent weedy, alien, & introduced species: CIR ARV

iii. Briefly describe AA and surrounding land use / habitat: Penguin Reservoir - Impoundment with emergent, aquatic bed, and open water components - surrounding land use is undeveloped rangeland.

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

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

Comments: _____

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

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

Primary or Critical habitat **(list species)** ☐ D ☐ S _____
Secondary habitat **(list species)** ☐ D ☐ S _____
Incidental habitat **(list species)** ☐ D ☒ S Piping plover (incidental migration)
No usable habitat ☐ D ☐ S _____

viii. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14A(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	---	.3 (L)	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.
Do not include species listed in 14A(i).

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

Primary or Critical habitat **(list species)** ☒ D ☐ S Northern Leopard Frog
Secondary habitat **(list species)** ☐ D ☐ S _____
Incidental habitat **(list species)** ☐ D ☐ S _____
No usable habitat ☐ D ☐ S _____

ix. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14B(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL:	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	1 (H)	---	---	---	---	---	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: **NUMEROUS NORTHERN LEOPARD FROGS OBSERVED AT SITE IN 2001, 2002, 2003.**

14C. General Wildlife Habitat Rating

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

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

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

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

II. WILDLIFE HABITAT FEATURES **(WORKING FROM TOP TO BOTTOM, SELECT APPROPRIATE AA ATTRIBUTES TO DETERMINE THE EXCEPTIONAL (E), HIGH (H), MODERATE (M), OR LOW (L) RATING. STRUCTURAL DIVERSITY IS FROM #13. FOR CLASS COVER TO BE CONSIDERED EVENLY DISTRIBUTED, VEGETATED CLASSES MUST BE WITHIN 20% OF EACH OTHER IN TERMS OF THEIR PERCENT COMPOSITION IN THE AA (SEE #10). DURATION OF SURFACE WATER: P/P = PERMANENT/PERENNIAL; S/I = SEASONAL/INTERMITTENT; T/E = TEMPORARY/EPHEMERAL; A= ABSENT.**

Structural Diversity (from #13)	☐High				☒Moderate				☐Low								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☐Uneven				☒Even				☐Uneven				☐Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	M	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ Exceptional	☐ High	☒ Moderate	☐ Low
Substantial	--	--	.8 (H)	--
Moderate	--	--	--	--
Low	--	--	--	--

Comments: leopard frogs, Woodhouse's toad, chorus frogs, painted turtles, and numerous shorebirds & waterfowl observed during 2001-2004

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

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity **or** is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support**?**
☐ **Y** ☐ **N** If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

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

Types of Fish Known or Suspected Within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ Exceptional	☐ High	☐ Moderate	☐ Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: NA

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)
Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

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

Estimated wetland area in AA subject to periodic flooding	☐ ≥ 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**	--	--	--	--	--	.5 (M)	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)
Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

i. Rating (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)
Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >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**	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)
Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☐ < 70%		☒ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☐ Yes	☐ No	☒ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	.5 (M)	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Nutrient loading from cattle use.

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

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 that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	*Duration of Surface Water Adjacent to Rooted Vegetation*		
	☐Permanent / Perennial	☒Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	.6 (M)	--
< 35 %	--	--	--

Comments: Wave action.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function. **A** = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☒ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	.7M	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. ☐ **Discharge Indicators**

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

ii. ☐ **Recharge Indicators**

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

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

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	--
No Discharge/Recharge indicators present	0.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	☐rare	☐common	☐abundant	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	.2L	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Ownership	Disturbance at AA from #12(i)		
	☐ Low	☐ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: Extremely remote

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	High	1.00	1	
C. General Wildlife Habitat	High	0.80	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Moderate	0.50	1	
F. Short and Long Term Surface Water Storage	Moderate	0.60	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.50	1	
H. Sediment/Shoreline Stabilization	Moderate	0.60	1	
I. Production Export/Food Chain Support	Moderate	0.70	1	
J. Groundwater Discharge/Recharge	Low	0.10	1	
K. Uniqueness	Low	0.20	1	
L. Recreation/Education Potential	Low	0.10	1	
	Totals:	**5.40**	**11.00**	
		Percent of Total Possible Points:	**49%** (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not proceed to Category II.)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)
- ☒ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish / Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, proceed to Category III.)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

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

1. Project Name: Fourchette Creek Wetland Mitigation Reserve **2. Project #:** 130091-023 **Control #:** NA

3. Evaluation Date: 7/26/2004 **4. Evaluator(s):** Berglund **5. Wetland / Site #(s):** Pintail Reservoir

6. Wetland Location(s) i. T: 22 N **R:** 30 E **S:** 19 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: NA

iii. Watershed: 10040104 **GPS Reference No. (if applies):** NA

Other Location Information: 50 miles south of Malta, 1.5 miles north of CM Russell NWR, Middle Missouri Watershed (#9)

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

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

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

Comments: Pintail Reservoir

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Depression	Palustrine	None	Emergent Wetland	Seasonally Flooded	Impounded	60
Depression	Palustrine	None	Unconsolidated Bottom	Seasonally Flooded	Impounded	40
---	---	---	---	---	---	
---	---	---	---	---	---	

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Grazing

ii. Prominent weedy, alien, & introduced species: CIR ARV

iii. Briefly describe AA and surrounding land use / habitat: Pintail Reservoir - Impoundment with emergent and open water components - surrounding land use is undeveloped rangeland.

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

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

Comments: _____

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

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

Primary or Critical habitat **(list species)** ☐ D ☐ S _____
Secondary habitat **(list species)** ☐ D ☐ S _____
Incidental habitat **(list species)** ☐ D ☒ S Piping plover (incidental migration)
No usable habitat ☐ D ☐ S _____

xi. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14A(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	---	.3 (L)	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.
Do not include species listed in 14A(i).

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

Primary or Critical habitat **(list species)** ☐ D ☐ S _____
Secondary habitat **(list species)** ☐ D ☐ S _____
Incidental habitat **(list species)** ☒ D ☐ S Northern Leopard Frog
No usable habitat ☐ D ☐ S _____

xii. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14B(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL:	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	.2 (L)	---	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: **3 NORTHERN LEOPARD FROGS OBSERVED AT SITE IN 2001; NONE OBSERVED 2002 OR 2003. 6 IN 2004**

14C. General Wildlife Habitat Rating

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

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

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

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

II. WILDLIFE HABITAT FEATURES **(WORKING FROM TOP TO BOTTOM, SELECT APPROPRIATE AA ATTRIBUTES TO DETERMINE THE EXCEPTIONAL (E), HIGH (H), MODERATE (M), OR LOW (L) RATING. STRUCTURAL DIVERSITY IS FROM #13. FOR CLASS COVER TO BE CONSIDERED EVENLY DISTRIBUTED, VEGETATED CLASSES MUST BE WITHIN 20% OF EACH OTHER IN TERMS OF THEIR PERCENT COMPOSITION IN THE AA (SEE #10). DURATION OF SURFACE WATER: P/P = PERMANENT/PERENNIAL; S/I = SEASONAL/INTERMITTENT; T/E = TEMPORARY/EPHEMERAL; A= ABSENT.**

Structural Diversity (from #13)	☐High					☐Moderate					☒Low							
Class Cover Distribution (all vegetated classes)	☐Even				☐Uneven				☐Even				☐Uneven				☒Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	L	--	--

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ Exceptional	☐ High	☐ Moderate	☒ Low
Substantial	--	--	--	.7 (M)
Moderate	--	--	--	--
Low	--	--	--	--

Comments: Blue-winged teal broods observed in 2003 and 2004, plus additional waterfowl and shorebirds.

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

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity **or** is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support**?**
☐ **Y** ☐ **N** If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

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

Types of Fish Known or Suspected Within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ Exceptional	☐ High	☐ Moderate	☐ Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: NA

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)
Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

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

Estimated wetland area in AA subject to periodic flooding	☐ ≥ 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**	--	--	--	--	--	--	--	--	.2 (L)
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)
Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

i. Rating (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)
Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >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**	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)
Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☐ < 70%		☐ ≥ 70%		☒ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☒ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	.3 (L)	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Nutrient loading from cattle use; water very turbid.

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

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 that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☐Permanent / Perennial	☒Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	.2 (L)	--

Comments: Wave action.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function. **A** = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☒ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	.6M	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. ☐ **Discharge Indicators**

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

ii. ☐ **Recharge Indicators**

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

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

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	--
No Discharge/Recharge indicators present	0.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	☐rare	☐common	☐abundant	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	.2L	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Ownership	Disturbance at AA from #12(i)		
	☐ Low	☐ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: Extremely remote

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	Low	0.20	1	
C. General Wildlife Habitat	Moderate	0.70	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Low	0.20	1	
F. Short and Long Term Surface Water Storage	Moderate	0.60	1	
G. Sediment/Nutrient/Toxicant Removal	Low	0.30	1	
H. Sediment/Shoreline Stabilization	Low	0.20	1	
I. Production Export/Food Chain Support	Moderate	0.60	1	
J. Groundwater Discharge/Recharge	Low	0.10	1	
K. Uniqueness	Low	0.20	1	
L. Recreation/Education Potential	Low	0.10	1	
	Totals:	**3.5**	**11.00**	
		Percent of Total Possible Points:	**32%** (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not proceed to Category II.)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)
- ☐ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish / Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, proceed to Category III.)
- ☒ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

Appendix C

REPRESENTATIVE PHOTOGRAPHS
2001-2004 AERIAL PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Fourchette Creek
Phillips County, Montana

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2004 FOURCHETTE CREEK

Penguin, photo point 1, 60 degrees NE

Penguin, photo point 2, 344 degrees NW, but from 150 feet north as the photo point marker was under water.

Flashlight, photo point 1, 290 degrees NW

Flashlight, photo point 2, 270 degrees W

Flashlight, photo point 3, 90 degrees E

Pintail, photo point 1, 350 degrees N/NW

PBSJ

LAND & WATER

2004 FOURCHETTE CREEK

Pintail, photo point 1, 284 degrees NW

Pintail, photo point 2, 330 degrees NW

Puffin, photo point 1, 340 degrees N/NW

Puffin, photo point 2, 315 degrees W/NW

Albatross, photo point 1, 0 degrees N

Albatross, photo point 2, 60 degrees E/NE

FOURCHETTE RESERVE

PENGUIN RESERVOIR (LEFT) AND PINTAIL RESERVOIR (RIGHT)


Photo 1: July 17, 2001

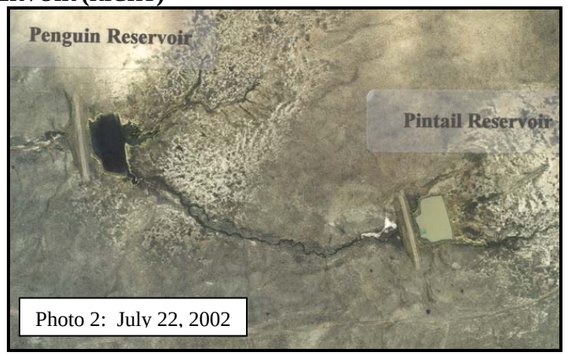


Photo 2: July 22, 2002


Photo 3: July 28, 2003


Photo 4: July 25, 2004

FLASHLIGHT RESERVOIR


Photo 5: July 17, 2001


Photo 6: July 22, 2002


Photo 7: July 28, 2003

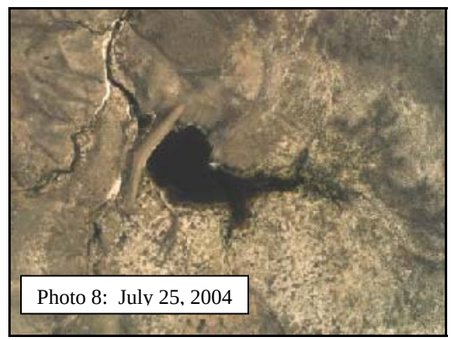


Photo 8: July 25, 2004

ALBATROSS RESERVOIR


Photo 9: July 17, 2001


Photo 10: July 22, 2002


Photo 11: July 28, 2003


Photo 12: July 25, 2004

PUFFIN RESERVOIR


Photo 13: July 17, 2001

Photo 14: July 22, 2002


Photo 15: July 28, 2003


Photo 16: July 25, 2004

PBS&J

LAND & WATER

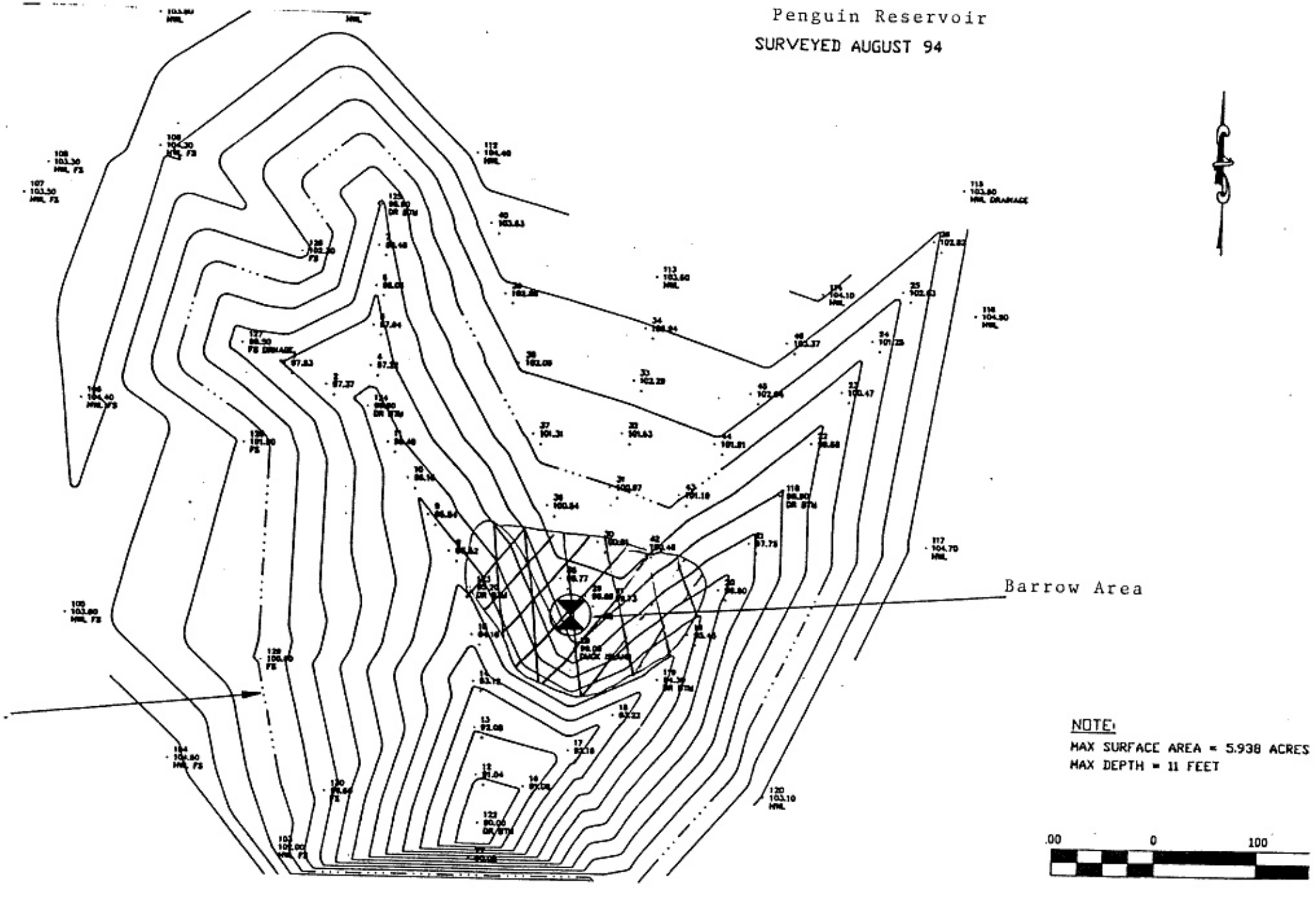
Appendix D

CONCEPTUAL SITE LAYOUTS

MDT Wetland Mitigation Monitoring
Fourchette Creek
Phillips County, Montana

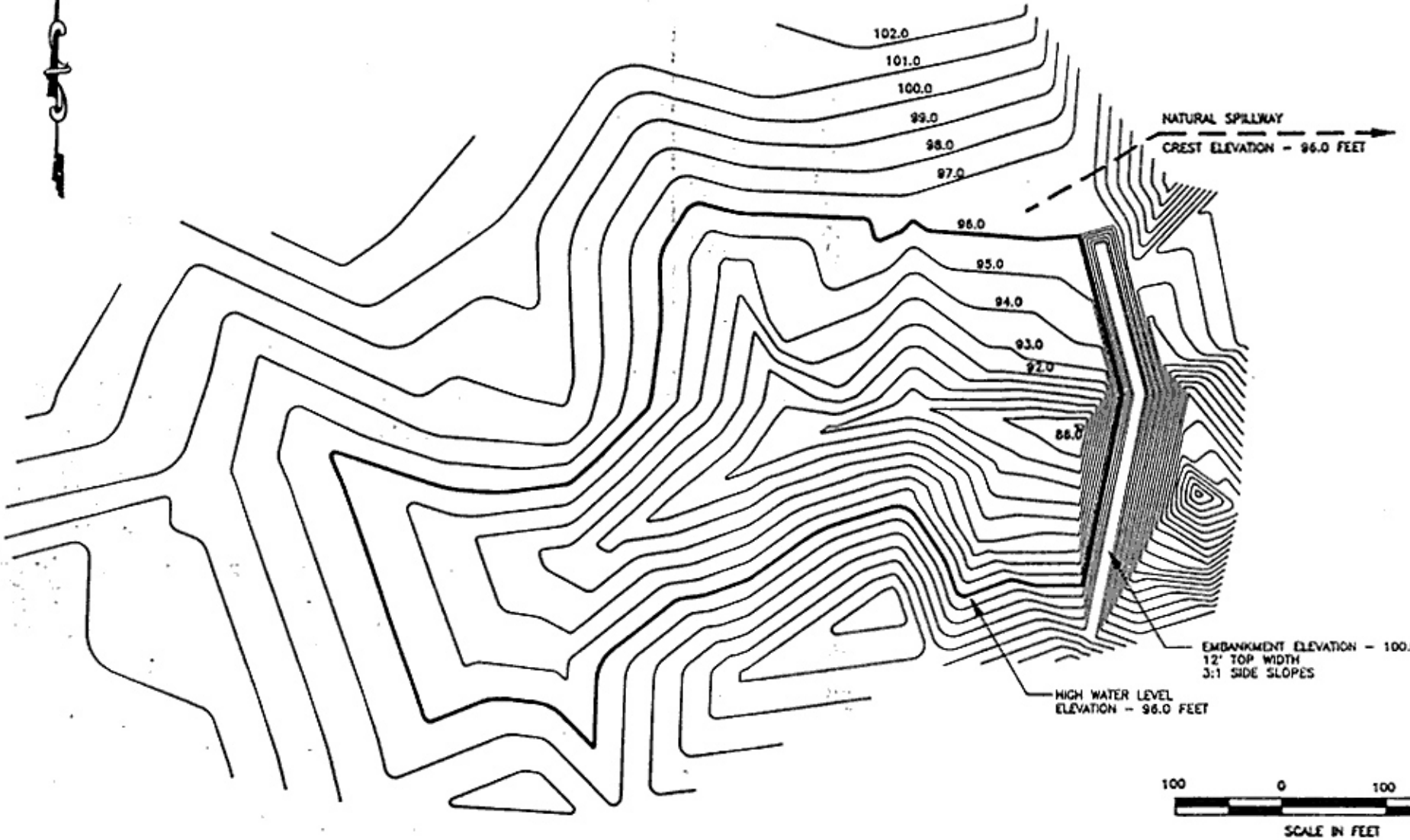
Penguin Reservoir

SURVEYED AUGUST 94



NOTE:
MAX SURFACE AREA = 5.938 ACRES
MAX DEPTH = 11 FEET

.00 0 100



NOTES

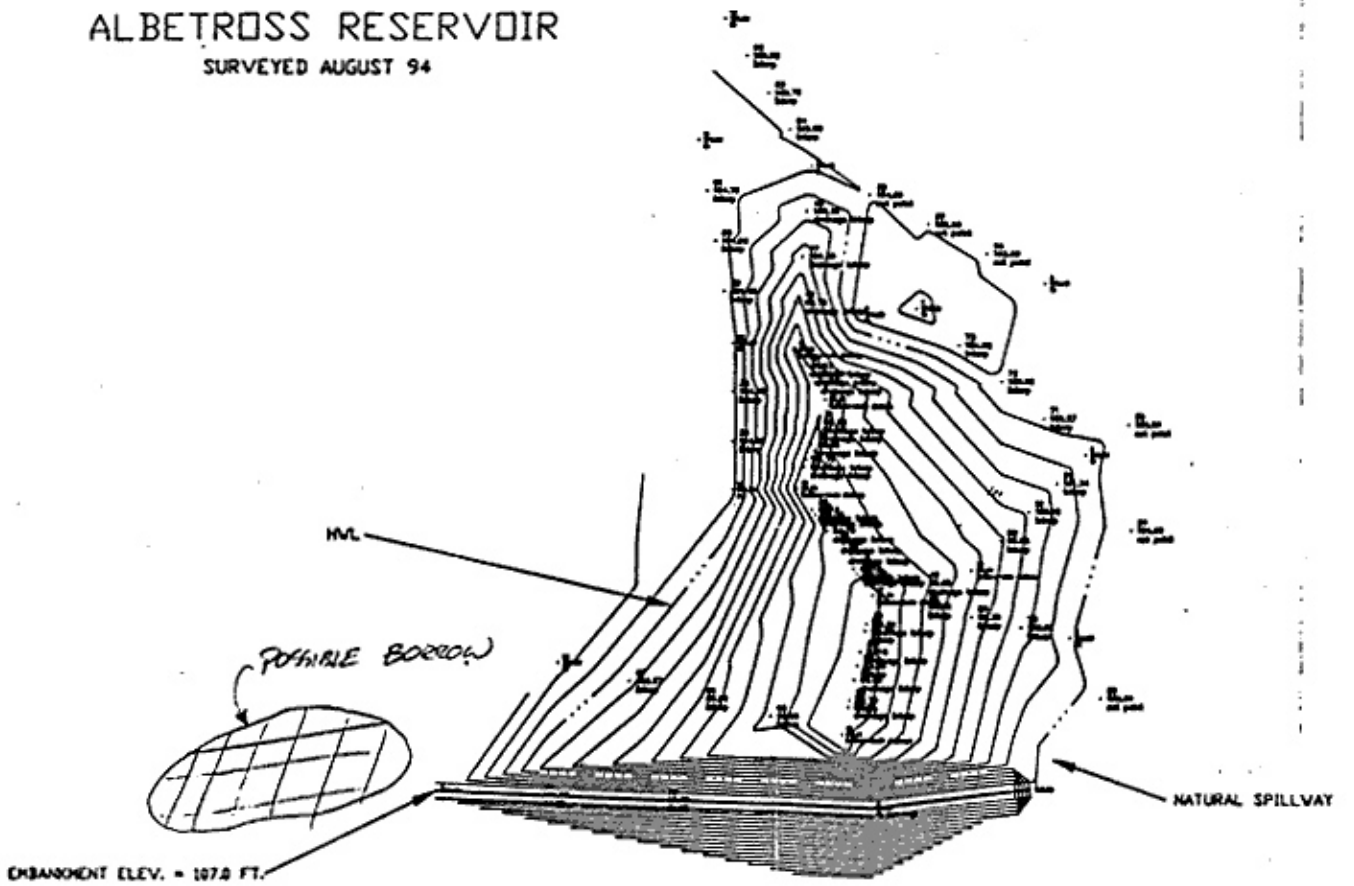
MAXIMUM SURFACE AREA = 4.56 ACRES
MAXIMUM DEPTH = 10 FEET
MAXIMUM STORAGE (INCLUDING BORROW AREA) = 15.6 ACRE FEET

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT	TITLE FLASHLIGHT RESERVOIR
DRAWING NO. FLASHLT.DWG	DATE 10-23 SHEET 1 of 1 DRAWN TAS
DESIGNED	REVIEWED APPROVED

LAND & WATER D-3

ALBETROSS RESERVOIR

SURVEYED AUGUST 94



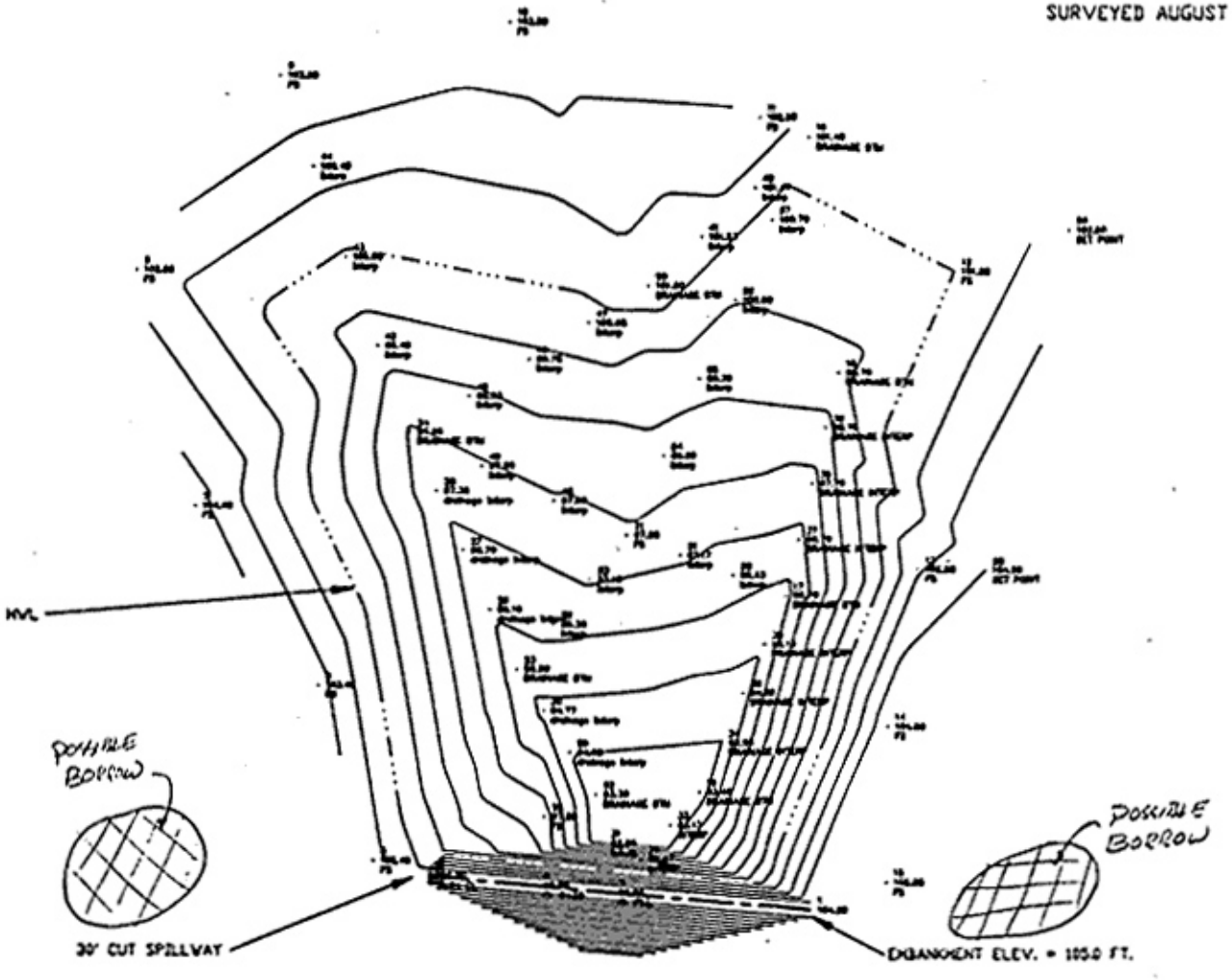
NOTE:
MAX SURFACE AREA = 2.60 ACRES
MAX DEPTH = 10 FEET

100 0 100 200
SCALE IN FEET
CONTOUR INTERVAL = 1 FT.

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT	TITLE ALBETROSS RESERVOIR DATE 10-12-94 DRAWN HAC
DRAWING NO. ALBETRES.DWG	SHEET 1 of 1 REVIEWED

PINTAILS RESERVOIR

SURVEYED AUGUST 94



NOTE:
MAX SURFACE AREA = 5.209 ACRES
MAX DEPTH = 8 FEET

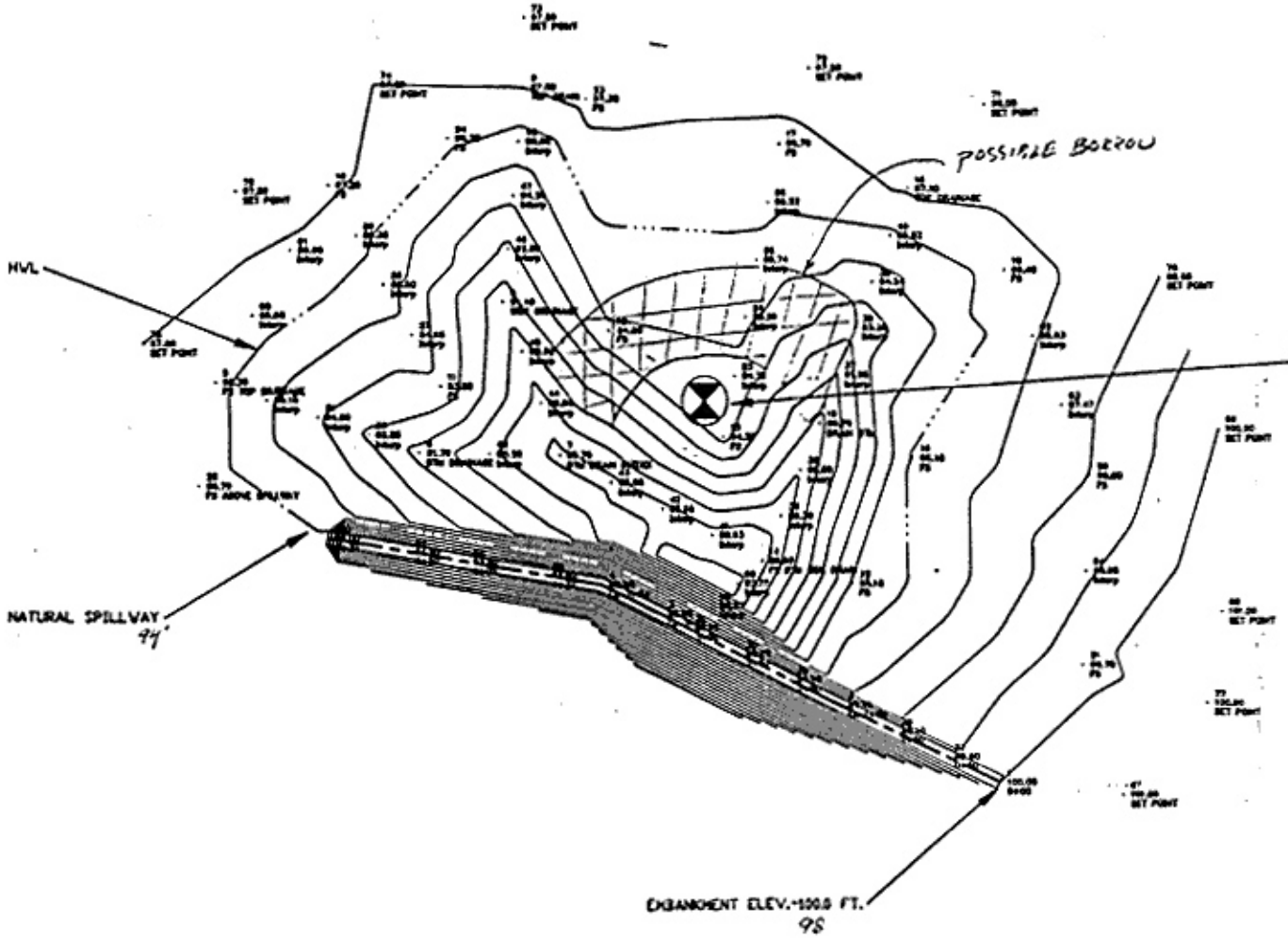
100 0 100 200
SCALE IN FEET
CONTOUR INTERVAL = 1 FT.

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT	TITLE PINTAILS RESERVOIR DATE 10-13-94 DRAWN HAC SHEET 1 of 1 REVIEWED
DRAWING NO. PINTARES.DXG	

PUFFIN RESERVOIR

SURVEYED AUGUST 94

LAND & WATER D-5



NOTE:
MAX SURFACE AREA = 4.05 ACRES
MAX DEPTH = 9 FEET

100 0 100 200

SCALE IN FEET

CONTOUR INTERVAL = 1 FT.

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT	TITLE PUFFIN RESERVOIR DATE 10-17-94 DRAWN HAC
DRAWING NO. PUFFNRES.DWG	SHEET 1 of 1 REVIEWED

Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Fourchette Creek
Phillips County, Montana

PBSJ

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.

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.

Appendix F

MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

MDT Wetland Mitigation Monitoring
Fourchette Creek
Phillips County, Montana

PBSJ

LAND & WATER

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.

MDT Wetland Mitigation Monitoring Project
Aquatic Invertebrate Monitoring
Summary 2001 - 2004

METHODS

Among other monitoring activities, aquatic invertebrate assemblages were collected at a number of mitigation wetlands throughout Montana. This report summarizes data generated from four years of collection.

The method employed to assess these wetlands is based on constructing an index using a battery of 12 bioassessment metrics or attributes (Table1) tested and recommended by Stribling et al. (1995) in a report to the Montana Department of Health and Environmental Science. In that study, it was determined that some of the metrics were of limited use in some geographic regions, and for some wetland types. Despite that finding, all 12 metrics are used in this evaluation of mitigated wetlands, since detailed geographic information and wetland classifications were unavailable.

Scoring criteria for metrics were developed by generally following the tactic used by Stribling et al. Boxplots were generated using a statistical software package, and distributions, median values, ranges, and quartiles for each metric were examined. All sites in all years of sampling were used. Camp Creek, which was sampled in 2002, 2003, and 2004, was assessed using the tested metric battery developed for montane streams of Western Montana (Bollman 1998).The fauna at the Camp Creek site was different from that of the other sites, and suggested montane stream conditions rather than wetland conditions. For the wetlands, “optimal” scores were generally those that fell above the 75th percentile (for those metrics that decrease in value in response to stress) or below the 25th percentile (for metrics that respond to stress by an increase in value) of all scores. Additional scoring ranges were established by bisecting the range below the 75th percentile for decreasing scores (or above the 25th percentile for increasing scores) into “sub-optimal” and “poor” assessment categories. A score of 5, 3, or 1 was assigned to optimal, sub-optimal, and poor metric performance, respectively. In this way, metric values were translated into normalized metric scores, and scores for all metrics were summed to produce a total bioassessment score. Total bioassessment scores were classified according to a similar process, using the ranges and distributions of total scores for all sites studied in all years.

The purpose of constructing an index from biological attributes or metrics is to provide a means of integrating information to facilitate the determination of whether management action is needed. The nature of the action needed is not determined solely by the index score, however, but by consideration of an analysis of the component metrics, the taxonomic composition of the assemblages, and other issues. The diagnostic functions of the metrics and taxonomic data need more study; our understanding of the interrelationships of natural environmental factors and anthropogenic disturbances are tentative. Thus, the further interpretive remarks accompanying the raw taxonomic and metric data are offered cautiously.

Sample processing

Aquatic invertebrate samples were collected at mitigation wetland sites in the summer months of 2001, 2002, 2003, and 2004 by personnel of Land and Water Consulting, Inc. Sampling procedures utilized were based on the protocols developed by the Montana Department of Environmental Quality (MT DEQ). Sampling consisted of D-frame net sweeps through emergent vegetation (when present), the water column, over the water surface, and included disturbing and scraping substrates at each sampled sites. Samples were preserved in ethanol at each wetland site and subsequently delivered to Rhithron Associates, Inc. for processing, taxonomic determinations, and data analysis.

At Rhithron's laboratory, Caton subsamplers and stereomicroscopes with 10X magnification were used to randomly select a minimum of 100 organisms, when possible, from each sample. In some cases, the entire sample contained fewer than 100 organisms; in these cases, all organisms from the sample were taken. Taxa were identified in general accordance with the taxonomic resolution standards set out in the MT DEQ Standard Operating Procedures for Sampling and Sample Analysis (Bukantis 1998). All samples were re-identified by a second taxonomist for quality assurance purposes. The identified samples have been archived at Rhithron's laboratory. Taxonomic data and organism counts were entered into an Excel 2000 spreadsheet, and metrics were calculated and scored using spreadsheet formulae.

Bioassessment metrics

An index based on the performance of 12 metrics was constructed, as described above. Table 1 lists those metrics, describes their calculation and the expected response of each to increased degradation or impairment of the wetland.

In addition to the summed scores of each metric and the associated impairment classification described above, each individual metric informs the bioassessment to some degree. The four richness metrics (Total taxa, POET, Chironomidae taxa, and Crustacea taxa + Mollusca taxa) can be interpreted to express habitat complexity as well as water quality. Complex, diverse habitats consist of variable substrates, emergent vegetation, variable water depths and other factors, and are potential features of long-established stable wetlands with minimal human disturbance. In the study conducted by Stribling et al. (1995), all four richness metrics were found to be significantly associated with water quality parameters including conductance, salinity, and total dissolved solids.

Four composition metrics (%Chironomidae, %Orthocladiinae of Chironomidae, %Crustacea + %Mollusca, and %Amphipoda) measure the relative contributions of certain taxonomic groups that may have significant responses to habitat and/or water quality impacts. For example, amphipods have been demonstrated to increase in abundance in alkaline conditions. Short-lived, relatively mobile taxa such as chironomids dominate ephemeral environments; many are hemoglobin-bearers capable of tolerating de-oxygenated conditions.

Two tolerance metrics (the Hilsenhoff Biotic Index and %Dominant taxon) were included in the bioassessment battery. The HBI indicates the overall invertebrate assemblage tolerance to nutrient enrichment, warm water, and/or low dissolved oxygen conditions. The percent

abundance of the dominant taxon has been demonstrated to be strongly associated with pH, conductance, salinity, total organic carbon, and total dissolved solids.

Two trophic measures (%Collector-gatherers and %Filterers) may be helpful in expressing functional integrity of the invertebrate assemblage, which can be impacted by poor water quality or habitat degradation. High proportions of filtering organisms suggest nutrient and/or organic enrichment, while abundant collectors suggest more positive functional conditions and well-developed wetland morphology. These organisms graze periphyton growing on stable surfaces such as macrophytes.

RESULTS

In 2001, 29 sites were sampled statewide. Nineteen of these sites were revisited in 2002, and 13 new sites were sampled. In 2003, 17 sites that had been visited in both 2001 and 2002 were re-sampled, and 11 sites sampled for the first time in 2001 were re-visited. In addition, 2 new sites were sampled. In 2004, 25 sites were re-visited, and 6 new sites were sampled. Thus, the 2004 database contains data for 122 sampling events at 50 unique sites. Table 2 summarizes sites and sampling years.

Metric scoring criteria were re-developed each year as new data was added. For 2004, all 122 records were utilized. Ranges of individual metrics, as well as median metric values remained remarkably consistent in each of the 4 years; minimal changes resulted from the addition of new data in 2004. The summary metric values and scores for the 2004 samples are given in Tables 3a-3d.

Literature cited

Bollman, W. 1998. Montana Valleys and Foothill Prairies Ecoregion. Master's Thesis. (M.S.) University of Montana. Missoula, Montana.

Bukantis, R. 1998. Rapid bioassessment macroinvertebrate protocols: Sampling and sample analysis SOP's. Working draft. Montana Department of Environmental Quality. Planning Prevention and Assistance Division. Helena, Montana.

Stribling, J.B., J. Lathrop-Davis, M.T. Barbour, J.S. White, and E.W. Leppo. 1995. Evaluation of environmental indicators for the wetlands of Montana: the multimetric approach using benthic macroinvertebrates. Report to the Montana Department of Health and Environmental Science. Helena, Montana.

Table 1. Aquatic invertebrate metrics employed in the MTDT mitigation wetland monitoring study, 2001- 2004.

Metric	Metric Calculation	Expected Response to Degradation or Impairment
Total taxa	Count of unique taxa identified to lowest recommended taxonomic level	Decrease
POET	Count unique Plecoptera, Trichoptera, Ephemeroptera, and Odonata taxa identified to lowest recommended taxonomic level	Decrease
Chironomidae taxa	Count unique midge taxa identified to lowest recommended taxonomic level	Decrease
Crustacea taxa + Mollusca taxa	Count unique Crustacea taxa and Mollusca taxa identified to lowest recommended taxonomic level	Decrease
% Chironomidae	Percent abundance of midges in the subsample	Increase
Orthocladiinae/Chironomidae	Number of individual midges in the sub-family Orthocladiinae / total number of midges in the subsample.	Decrease
%Amphipoda	Percent abundance of amphipods in the subsample	Increase
%Crustacea + %Mollusca	Percent abundance of crustaceans in the subsample plus percent abundance of molluscs in the subsample	Increase
HBI	Relative abundance of each taxon multiplied times that taxon's modified Hilsenhoff Biotic Index value. These numbers are summed over all taxa in the subsample.	Increase
%Dominant taxon	Percent abundance of the most abundant taxon in the subsample	Increase
%Collector-Gatherers	Percent abundance of organisms in the collector-gatherer functional group	Decrease
%Filterers	Percent abundance of organisms in the filterer functional group	Increase

Table 2. Montana Department of Transportation Mitigated Wetlands Monitoring Project sites. 2001 – 2004.

2001	2002	2003	2004
Beaverhead 1	Beaverhead 1	Beaverhead 1	Beaverhead 1
Beaverhead 2	Beaverhead 2		
Beaverhead 3	Beaverhead 3		Beaverhead 3
Beaverhead 4	Beaverhead 4	Beaverhead 4	
Beaverhead 5	Beaverhead 5	Beaverhead 5	Beaverhead 5
Beaverhead 6	Beaverhead 6	Beaverhead 6	Beaverhead 6
Big Sandy 1			
Big Sandy 2			
Big Sandy 3			
Big Sandy 4			
Johnson-Valier			
VIDA			
Cow Coulee	Cow Coulee	Cow Coulee	
Fourchette – Puffin	Fourchette - Puffin	Fourchette - Puffin	Fourchette - Puffin
Fourchette – Flashlight	Fourchette – Flashlight	Fourchette – Flashlight	Fourchette – Flashlight
Fourchette – Penguin	Fourchette – Penguin	Fourchette – Penguin	Fourchette – Penguin
Fourchette – Albatross	Fourchette – Albatross	Fourchette – Albatross	Fourchette – Albatross
Big Spring	Big Spring	Big Spring	Big Spring
Vince Ames			
Ryegate			
Lavinia			
Stillwater	Stillwater	Stillwater	Stillwater
Roundup	Roundup	Roundup	Roundup
Wigeon	Wigeon	Wigeon	Wigeon
Ridgeway	Ridgeway	Ridgeway	Ridgeway
Musgrave – Rest. 1	Musgrave – Rest. 1	Musgrave – Rest. 1	Musgrave – Rest. 1
Musgrave – Rest. 2	Musgrave – Rest. 2	Musgrave – Rest. 2	Musgrave – Rest. 2
Musgrave – Enh. 1	Musgrave – Enh. 1	Musgrave – Enh. 1	Musgrave – Enh. 1
Musgrave – Enh. 2			
	Hoskins Landing	Hoskins Landing	Hoskins Landing
	Peterson - 1	Peterson – 1	Peterson – 1
	Peterson – 2		Peterson – 2
	Peterson – 4	Peterson – 4	Peterson – 4
	Peterson – 5	Peterson – 5	Peterson – 5
	Jack Johnson - main	Jack Johnson - main	
	Jack Johnson - SW	Jack Johnson - SW	
	Creston	Creston	Creston
	Lawrence Park		
	Perry Ranch		
	SF Smith River	SF Smith River	SF Smith River
	Camp Creek	Camp Creek	Camp Creek
	Kleinschmidt	Kleinschmidt – pond	Kleinschmidt – pond
		Kleinschmidt – stream	Kleinschmidt – stream
		Ringling - Galt	
			Circle
			Cloud Ranch Pond
			Cloud Ranch Stream
			Colloid
			Jack Creek
			Norem

Table 3a.

	BEAVER HEAD #1	BEAVER HEAD #3	BEAVER HEAD #5	BEAVER HEAD #6	BIG SPRING CREEK	CIRCLE	CLOUD RANCH POND	CLOUD RANCH STREAM	COLLOID	CRESTON
Total taxa	27	12	21	18	25	16	16	20	8	18
POET	3	0	2	3	4	2	2	4	2	3
Chironomidae taxa	7	5	5	5	8	5	6	11	1	2
Crustacea + Mollusca	7	3	4	6	7	1	6	1	1	7
% Chironomidae	0.33636	0.18888	0.39285	0.57547	0.44329	0.55855	0.41666	0.84	0.09090	0.06087
Orthocladiinae/Chir	0.05405	0.35294	0.06818	0.36065	0.27907	0.69354	0.4	0.16666	0	0
%Amphipoda	0.03636	0	0.01785	0.05660	0.05154	0	0.00925	0	0	0
%Crustacea + %Mollusca	0.31818	0.73333	0.05357	0.12264	0.18556	0.03603	0.36111	0.01	0.09090	0.73913
HBI	7.97169	7.88888	8.36363	8.15789	7.61855	7.19090	7.32291	4.84	6	6.92173
%Dominant taxon	0.2	0.57777	0.23214	0.25471	0.23711	0.38738	0.13888	0.38	0.27272	0.37391
%Collector-Gatherers	0.40909	0.75555	0.51785	0.62264	0.78350	0.05405	0.67592	0.74	0.18181	0.29565
%Filterers	0.12727	0	0	0	0.01030	0.15315	0.09259	0.17	0	0.06087
Total taxa	5	1	5	3	5	3	3	3	1	3
POET	3	1	1	3	5	1	1	5	1	3
Chironomidae taxa	5	3	3	3	5	3	3	5	1	1
Crustacea + Mollusca	5	1	3	5	5	1	5	1	1	5
% Chironomidae	3	3	3	1	1	1	1	1	5	5
Orthocladiinae/Chir	1	3	1	3	3	5	3	1	1	1
%Amphipoda	5	5	5	3	3	5	5	5	5	5
%Crustacea + %Mollusca	5	1	5	5	5	5	3	5	5	1
HBI	1	1	1	1	1	3	3	5	5	3
%Dominant taxon	5	1	5	5	5	3	5	3	5	3
%Collector-Gatherers	1	3	3	3	3	1	3	3	1	1
%Filterers	1	3	3	3	3	1	1	1	3	1
	40	26	38	38	44	32	36	38	34	32
	0.666667	0.433333	0.633333	0.633333	0.733333	0.533333	0.6	0.633333	0.566667	0.533333
	sub-optimal	poor	sub-optimal	sub-optimal	optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal	sub-optimal

Table 3b.

	FOURCHETTE CREEK ALBATROSS RESERVOIR	FOURCHETTE CREEK FLASHLIGHT RESERVOIR	FOURCHETTE CREEK PENGUIN RESERVOIR	FOURCHETTE CREEK PUFFIN RESERVOIR	JACK CREEK	MDT CAMP CREEK	MDT HOSKINS LANDING	MDT KLEINSCHMIDT CREEK	MDT KLEINSCHMIDT POND
Total taxa	18	23	19	22	23	35	25	19	19
POET	3	5	4	3	5	12	4	4	6
Chironomidae taxa	6	9	6	4	8	14	4	6	4
Crustacea + Mollusca	3	4	5	8	7	1	6	2	4
% Chironomidae	0.135135	0.265306	0.066116	0.247934	0.352113	0.37963	0.036697	0.438776	0.047619
Orthocladiinae/Chir	0.2	0.346154	0.625	0.3	0.52	0.585366	0.5	0.627907	0.8
%Amphipoda	0.126126	0.336735	0.578512	0.041322	0.028169	0	0.018349	0.010204	0.009524
%Crustacea + %Mollusca	0.684685	0.387755	0.77686	0.371901	0.380282	0.111111	0.541284	0.061224	0.190476
HBI	7.972973	7.216495	7.7	6.950413	7.647059	4.570093	6.59633	6.561224	6.67619
%Dominant taxon	0.495495	0.336735	0.561983	0.140496	0.15493	0.111111	0.366972	0.316327	0.552381
%Collector-Gatherers	0.873874	0.816327	0.702479	0.38843	0.394366	0.416667	0.091743	0.683673	0.114286
%Filterers	0	0.010204	0.132231	0.008264	0.042254	0.12037	0.018349	0.153061	0.047619
Total taxa									
POET	3	5	3	5	5	5	5	3	3
Chironomidae taxa	3	5	5	3	5	5	5	5	5
Crustacea + Mollusca	3	5	3	3	5	5	3	3	3
% Chironomidae	1	3	3	5	5	1	5	1	3
Orthocladiinae/Chir	5	3	5	3	3	3	5	1	5
%Amphipoda	3	3	5	3	5	5	5	5	5
%Crustacea + %Mollusca	3	1	1	3	5	5	5	5	5
HBI	1	3	1	3	3	5	3	5	5
%Dominant taxon	1	3	1	3	1	5	5	5	5
%Collector-Gatherers	1	5	1	5	5	5	3	5	1
%Filterers	5	5	3	1	1	1	1	3	1
	3	3	1	3	3	1	3	1	3
	32	44	32	40	46	46	48	42	44
	0.533333	0.733333	0.533333	0.666667	0.766667	0.766667	0.8	0.7	0.733333
	sub-optimal	optimal	sub-optimal	optimal	optimal	optimal	optimal	optimal	optimal

Table 3d.

	ROUNDUP	SOUTH FORK SMITH RIVER	STILLWATER	WIGEON
Total taxa	9	20	23	16
POET	0	5	4	3
Chironomidae taxa	4	7	9	5
Crustacea + Mollusca	3	3	4	3
% Chironomidae	0.55	0.482143	0.466667	0.314815
Orthocladiinae/Chir	0.072727	0.055556	0.244898	0.647059
%Amphipoda	0	0.071429	0.12381	0.481481
%Crustacea + %Mollusca	0.42	0.116071	0.180952	0.574074
HBI	8.89	6.589286	6.47619	7.534653
%Dominant taxon	0.28	0.294643	0.133333	0.481481
%Collector-Gatherers	0.56	0.839286	0.628571	0.657407
%Filterers	0.14	0	0	0.083333
Total taxa				
POET	1	3	5	3
Chironomidae taxa	1	5	5	3
Crustacea + Mollusca	3	5	5	3
% Chironomidae	1	1	3	1
Orthocladiinae/Chir	1	1	1	3
%Amphipoda	1	1	3	5
%Crustacea + %Mollusca	5	3	3	1
HBI	3	5	5	3
%Dominant taxon	1	5	5	3
%Collector-Gatherers	5	5	5	3
%Filterers	3	5	3	3
	1	3	3	1
	26	42	46	32
	0.433333	0.7	0.766667	0.533333
	poor	optimal	optimal	Sub-optimal

Aquatic Invertebrate Taxonomic Data

Site Name FOURCHETTE CREEK PUFFIN RESERVOIR **Date Collected** 7 /28/2004

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
		Ostracoda	17	14.05%	Yes	8	CG
		Copepoda	1	0.83%	Yes	8	CG
Amphipoda							
	Talitridae						
		Hyalella	5	4.13%	Yes	8	CG
Arhynchobdellida							
	Erpobdellidae						
		Erpobdellidae	1	0.83%	Yes	8	PR
Basommatophora							
	Lymnaeidae						
		Fossaria	17	14.05%	Yes	6	SC
		Lymnaeidae	1	0.83%	Yes	6	SC
	Physidae						
		Physidae	1	0.83%	Yes	8	SC
	Planorbidae						
		Planorbella	2	1.65%	Yes	6	SC
Coleoptera							
	Hydrophilidae						
		Berosus	1	0.83%	Yes	5	PR
Diplostraca							
		Cladocera	1	0.83%	Yes	8	CF
Diptera							
	Ceratopogonidae						
		Ceratopogoninae	1	0.83%	Yes	6	PR
	Chironomidae						
		Cricotopus (Isocladius)	4	3.31%	Yes	7	SH
		Endochironomus	9	7.44%	Yes	10	SH
		Paratanytarsus	12	9.92%	Yes	6	CG
		Psectrocladius	5	4.13%	Yes	8	CG
Ephemeroptera							
	Baetidae						
		Callibaetis	3	2.48%	Yes	9	CG
	Caenidae						
		Caenis	3	2.48%	Yes	7	CG
Heteroptera							
	Corixidae						
		Sigara	1	0.83%	Yes	5	PH
	Notonectidae						
		Notonecta	16	13.22%	Yes	5	PR
Rhynchobdellida							
	Glossiphoniidae						
		Glossiphoniidae	10	8.26%	Yes	9	PR
Trichoptera							
	Leptoceridae						
		Mystacides	1	0.83%	Yes	4	CG
Trombidiformes							
		Acari	9	7.44%	Yes	5	PR
Grand Total			**121**				

Aquatic Invertebrate Data Summary

Project ID: MDT04LW
Activity ID:
STORET Station ID:
Station Name: FOURCHETTE CREEK PUFFIN RESERVOIR
Sample Date: 7/28/2004

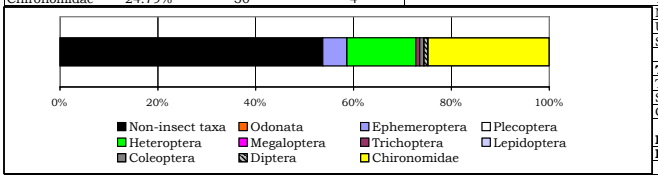
Sample type	
SUBSAMPLE TOTAL ORGANISMS	121
Portion of sample used	80.00%
Estimated number in total sample	151
Conversion factor	1.681
Estimated number in 1 square meter	203
Sampling effort	
Habitat type	
EPT abundance	7
Taxa richness	22
Number EPT taxa	3
Percent EPT	5.79%

TAXONOMIC COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Non-insect taxa	53.72%	65	11
Odonata	0.00%	0	0
Ephemeroptera	4.96%	6	2
Plecoptera	0.00%	0	0
Heteroptera	14.05%	17	2
Megaloptera	0.00%	0	0
Trichoptera	0.83%	1	1
Lepidoptera	0.00%	0	0
Coleoptera	0.83%	1	1
Diptera	0.83%	1	1
Chironomidae	24.79%	30	4

TAXONOMIC RATIOS

METRIC	VALUE
EPT/Chironomidae	0.23
Baetidae/Ephemeroptera	0.50
Hydropsychidae/Trichopt	0.00

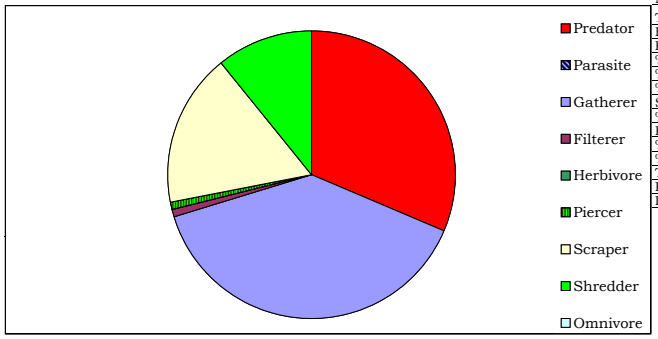


FUNCTIONAL COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Predator	31.40%	38	6
Parasite	0.00%	0	0
Gatherer	38.84%	47	8
Filterer	0.83%	1	1
Herbivore	0.00%	0	0
Piercer	0.83%	1	1
Scraper	17.36%	21	4
Shredder	10.74%	13	2
Omnivore	0.00%	0	0
Unknown	0.00%	0	0

FUNCTIONAL RATIOS

METRIC	VALUE
Scraper/Filterer	21.00
Scraper/Scraper + Filtere	0.95



COMMUNITY TOLERANCES

Sediment tolerant taxa	3
Percent Sediment tolerant	16.53%
Sediment sensitive taxa	0
Percent sediment sensitive	0.00%
Metals tolerance index (McGuire)	3.43
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	3
Percent hemoglobin bearers	22.31%
Air-breather richness	1
Percent air-breathers	0.83%
Burrower richness	1
Percent burrowers	0.83%
Swimmer richness	4
Percent swimmers	17.36%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Fossaria	17	14.05%
Ostracoda	17	14.05%
Notonecta	16	13.22%
Paratanytarsus	12	9.92%
Glossiphoniidae	10	8.26%
SUBTOTAL 5 DOMINANTS	72	59.50%
Acari	9	7.44%
Endochironomus	9	7.44%
Hyalella	5	4.13%
Psectrocladius	5	4.13%
Cricotopus (Isocladius)	4	3.31%
TOTAL DOMINANTS	104	85.95%

TOLERANCE/CONDITION INDICES

Community Tolerance Quotient (CTQa)	93.27
Hilsenhoff Biotic Index	6.95

DIVERSITY

Shannon H (loge)	4.10
Shannon H (log2)	2.84
Margalef D	4.37
Simpson D	0.08
Evenness	0.13

VOLTINISM

TYPE	ABUNDANCE	# TAXA	PERCENT
Multivoltine	61	9	50.41%
Univoltine	56	10	46.28%
Semivoltine	1	1	0.83%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	9	34.71%
Sensitive	0	0.00%
Clinger	1	3.31%

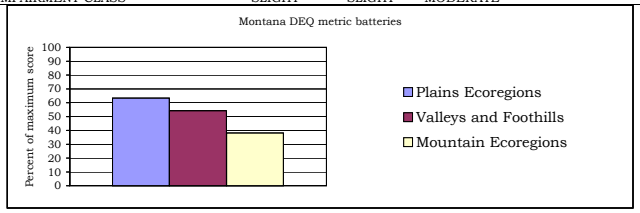
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE
Taxa richness	22	3
E richness	2	1
P richness	0	1
T richness	1	1
Long-lived	1	1
Sensitive richness	0	1
%tolerant	34.71%	3
%predators	31.40%	5
Clinger richness	1	1
%dominance (3)	41.32%	5
TOTAL SCORE	22	44%

MONTANA DEQ INDICES (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	22	2	2	1
EPT richness	3	1	0	0
Biotic Index	6.95	1	0	0
%Dominant taxon	14.05%	3	3	3
%Collectors	39.67%	3	3	3
%EPT	5.79%	0	0	0
Shannon Diversity	2.84	2		
%Scrapers +Shredder	28.10%	2	2	1
Predator taxa	6	3		
%Multivoltine	50.41%	2		
%H of T	0.00%		3	
TOTAL SCORES		19	13	8
PERCENT OF MAXIMUM		63.33	54.17	38.10
IMPAIRMENT CLASS		SLIGHT	SLIGHT	MODERATE



Montana Valleys and Foothills revised index (Bollman 1998)

Percent max.	27.78%	Impairment class	MODERATE

Montana Plains ecoregions metrics (Bramblett and Johnson 2002)

Riffle		*Pool*	
EPT richness	3	E richness	2
Percent EPT	5.79%	T richness	1
Percent Oligochaetes and Leeches	9.09%	Percent EPT	5.79%
Percent 2 dominants	28.10%	Percent non-insect	53.72%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.00%	Univoltine richness	10
Univoltine richness	10	Percent supertolerant	43.80%
Percent clingers	3.31%		
Swimmer richness	4		

Aquatic Invertebrate Taxonomic Data

Site Name FOURCHETTE CREEK FLASHLIGHT RESERVOIR **Date Collected** 7 /28/2004

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
		Ostracoda	3	3.06%	Yes	8	CG
		Copepoda	1	1.02%	Yes	8	CG
Amphipoda							
	Talitridae						
		Hyalella	33	33.67%	Yes	8	CG
Basommatophora							
	Physidae						
		Physidae	1	1.02%	Yes	8	SC
Coleoptera							
	Haliplidae						
		Haliplus	1	1.02%	Yes	5	PH
Diptera							
	Ceratopogonidae						
		Ceratopogoninae	4	4.08%	Yes	6	PR
	Chironomidae						
		Ablabesmyia	5	5.10%	Yes	8	CG
		Apedilum	1	1.02%	Yes	11	CG
		Cladotanytarsus	1	1.02%	Yes	7	CG
		Corynoneura	4	4.08%	Yes	7	CG
		Cricotopus (Cricotopus)	2	2.04%	Yes	7	SH
		Cryptochironomus	1	1.02%	Yes	8	PR
		Psectrocladius	3	3.06%	Yes	8	CG
		Pseudochironomus	8	8.16%	Yes	5	CG
		Tanytarsus	1	1.02%	Yes	6	CF
Ephemeroptera							
	Baetidae						
		Baetidae	1	1.02%	Yes	4	CG
	Caenidae						
		Caenis	19	19.39%	Yes	7	CG
Heteroptera							
	Corixidae						
		Corixidae	1	1.02%	Yes	10	PH
	Notonectidae						
		Notonecta	1	1.02%	Yes	5	PR
Odonata							
	Coenagrionidae						
		Coenagrionidae	1	1.02%	Yes	7	PR
	Libellulidae						
		Libellulidae	3	3.06%	Yes	9	PR
Trichoptera							
	Leptoceridae						
		Leptoceridae	1	1.02%	Yes	4	CG
Trombidiformes							
		Acari	2	2.04%	Yes	5	PR
Grand Total			**98**				

Aquatic Invertebrate Data Summary

Project ID: MDT04LW
Activity ID:
STORET Station ID:
Station Name: FOURCHETTE CREEK FLASHLIGHT RESERVOIR
Sample Date: 7/28/2004

Sample type	
SUBSAMPLE TOTAL ORGANISMS	98
Portion of sample used	13.33%
Estimated number in total sample	735
Conversion factor	10.088
Estimated number in 1 square meter	989
Sampling effort	
Habitat type	
EPT abundance	21
Taxa richness	23
Number EPT taxa	3
Percent EPT	21.43%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Hyalella	33	33.67%
Caenis	19	19.39%
Pseudochironomus	8	8.16%
Ablabesmyia	5	5.10%
Ceratopogoninae	4	4.08%
SUBTOTAL 5 DOMINANTS	69	70.41%
Corynoneura	4	4.08%
Ostracoda	3	3.06%
Libellulidae	3	3.06%
Psectrocladius	3	3.06%
Acari	2	2.04%
TOTAL DOMINANTS	84	85.71%

TAXONOMIC COMPOSITION

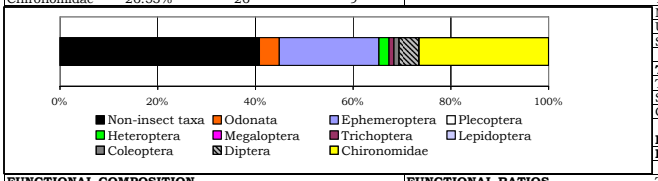
GROUP	PERCENT	ABUNDANCE	#TAXA
Non-insect taxa	40.82%	40	5
Odonata	4.08%	4	2
Ephemeroptera	20.41%	20	2
Plecoptera	0.00%	0	0
Heteroptera	2.04%	2	2
Megaloptera	0.00%	0	0
Trichoptera	1.02%	1	1
Lepidoptera	0.00%	0	0
Coleoptera	1.02%	1	1
Diptera	4.08%	4	1
Chironomidae	26.53%	26	9

TAXONOMIC RATIOS

METRIC	VALUE
EPT/Chironomidae	0.81
Baetidae/Ephemeroptera	0.05
Hydropsychidae/Trichopt	0.00

TOLERANCE/CONDITION INDICES

Community Tolerance Quotient (CTQa)	99.60
Hilsenhoff Biotic Index	7.22



DIVERSITY

Shannon H (loge)	3.31
Shannon H (log2)	2.30
Margalef D	4.79
Simpson D	0.16
Evenness	0.10

VOLTINISM

TYPE	ABUNDANCE	# TAXA	PERCENT
Multivoltine	33	13	33.67%
Univoltine	61	8	62.24%
Semivoltine	4	2	4.08%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	9	35.71%
Sensitive	0	0.00%
Clinger	2	3.06%

FUNCTIONAL COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Predator	12.24%	12	6
Parasite	0.00%	0	0
Gatherer	81.63%	80	12
Filterer	1.02%	1	1
Herbivore	0.00%	0	0
Piercer	2.04%	2	2
Scraper	1.02%	1	1
Shredder	2.04%	2	1
Omnivore	0.00%	0	0
Unknown	0.00%	0	0

FUNCTIONAL RATIOS

METRIC	VALUE
Scraper/Filterer	1.00
Scraper/Scraper + Filtere	0.50

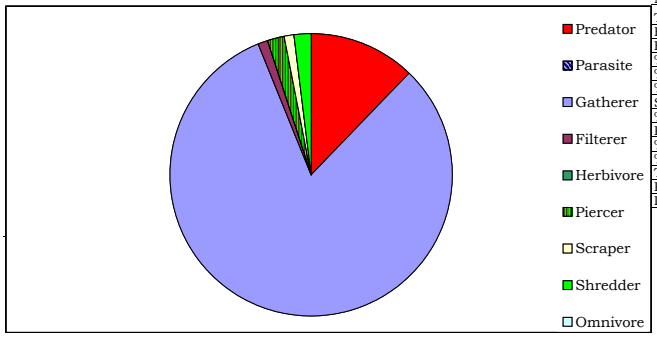
BIOASSESSMENT INDICES

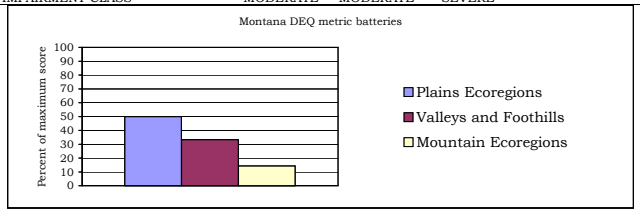
B-IBI (Karr et al.)

METRIC	VALUE	SCORE
Taxa richness	23	3
E richness	2	1
P richness	0	1
T richness	1	1
Long-lived	2	1
Sensitive richness	0	1
%tolerant	35.71%	3
%predators	12.24%	3
Clinger richness	2	1
%dominance (3)	61.22%	3
	TOTAL SCORE	18 36%

MONTANA DEQ INDICES (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	23	2	2	1
EPT richness	3	1	0	0
Biotic Index	7.22	0	0	0
%Dominant taxon	33.67%	2	2	2
%Collectors	82.65%	1	1	0
%EPT	21.43%	1	0	0
Shannon Diversity	2.30	1		
%Scrapers +Shredde	3.06%	1	0	0
Predator taxa	6	3		
%Multivoltine	33.67%	3		
%H of T	0.00%		3	
TOTAL SCORES		15	8	3
PERCENT OF MAXIMUM		50.00	33.33	14.29
IMPAIRMENT CLASS		MODERATE	MODERATE	SEVERE





COMMUNITY TOLERANCES

Sediment tolerant taxa	0
Percent sediment tolerant	0.00%
Sediment sensitive taxa	0
Percent sediment sensitive	0.00%
Metals tolerance index (McGuire)	3.29
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

Montana Valleys and Foothills revised index (Bollman 1998)

Percent max.	22.22%	Impairment class	MODERATE

Montana Plains ecoregions metrics (Bramblett and Johnson 2002)

Riffle		*Pool*	
EPT richness	3	E richness	2
Percent EPT	21.43%	T richness	1
Percent Oligochaetes and Leeches	0.00%	Percent EPT	21.43%
Percent 2 dominants	53.06%	Percent non-insect	40.82%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.00%	Univoltine richness	8
Univoltine richness	8	Percent supertolerant	53.06%
Percent clingers	3.06%		
Swimmer richness	3		

HABITUS MEASURES

Hemoglobin bearer richness	3
Percent hemoglobin bearers	10.20%
Air-breather richness	0
Percent air-breathers	0.00%
Burrower richness	2
Percent burrowers	12.24%
Swimmer richness	3
Percent swimmers	3.06%

Aquatic Invertebrate Taxonomic Data

Site Name FOURCHETTE CREEK ALBATROSS RESERVOIR **Date Collected** 7 /28/2004

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
		Ostracoda	55	49.55%	Yes	8	CG
		Copepoda	7	6.31%	Yes	8	CG
Amphipoda							
	Talitridae						
		Hyalella	14	12.61%	Yes	8	CG
Arhynchobdellida							
	Erpobdellidae						
		Erpobdella	1	0.90%	Yes	8	PR
		Erpobdellidae	4	3.60%	No	8	PR
Coleoptera							
	Haliplidae						
		Haliplus	1	0.90%	Yes	5	PH
Diptera							
	Ceratopogonidae						
		Ceratopogoninae	2	1.80%	Yes	6	PR
	Chironomidae						
		Ablabesmyia	7	6.31%	Yes	8	CG
		Chironomus	3	2.70%	Yes	10	CG
		Cricotopus (Cricotopus)	1	0.90%	Yes	7	SH
		Cricotopus (Isocladius)	1	0.90%	Yes	7	SH
		Nanocladius	1	0.90%	Yes	3	CG
		Paratanytarsus	2	1.80%	Yes	6	CG
Ephemeroptera							
	Baetidae						
		Callibaetis	7	6.31%	Yes	9	CG
	Caenidae						
		Caenis	1	0.90%	Yes	7	CG
Heteroptera							
	Corixidae						
		Cenocorixa	1	0.90%	Yes	8	PR
Odonata							
	Libellulidae						
		Libellulidae	1	0.90%	Yes	9	PR
Rhynchobdellida							
	Glossiphoniidae						
		Glossiphoniidae	2	1.80%	Yes	9	PR
Grand Total			**111**				

Aquatic Invertebrate Data Summary

Project ID: MDT04LW
Activity ID:
STORET Station ID:
Station Name: FOURCHETTE CREEK ALBATROSS RESERVOIR
Sample Date: 7/28/2004

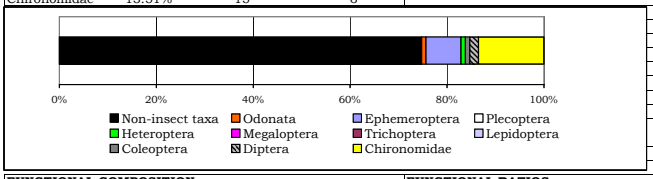
Sample type	
SUBSAMPLE TOTAL ORGANISMS	111
Portion of sample used	26.67%
Estimated number in total sample	416
Conversion factor	5.044
Estimated number in 1 square meter	560
Sampling effort	
Habitat type	
EPT abundance	8
Taxa richness	17
Number EPT taxa	2
Percent EPT	7.21%

TAXONOMIC COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Non-insect taxa	74.77%	83	6
Odonata	0.90%	1	1
Ephemeroptera	7.21%	8	2
Plecoptera	0.00%	0	0
Heteroptera	0.90%	1	1
Megaloptera	0.00%	0	0
Trichoptera	0.00%	0	0
Lepidoptera	0.00%	0	0
Coleoptera	0.90%	1	1
Diptera	1.80%	2	1
Chironomidae	13.51%	15	6

TAXONOMIC RATIOS

METRIC	VALUE
EPT/Chironomidae	0.53
Baetidae/Ephemeroptera	0.88
Hydropsychidae/Trichopt	#DIV/0!

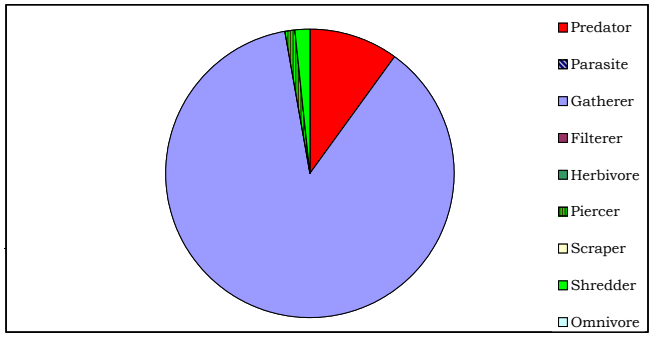


FUNCTIONAL COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Predator	9.91%	11	6
Parasite	0.00%	0	0
Gatherer	87.39%	97	9
Filterer	0.00%	0	0
Herbivore	0.00%	0	0
Piercer	0.90%	1	1
Scraper	0.00%	0	0
Shredder	1.80%	2	2
Omnivore	0.00%	0	0
Unknown	0.00%	0	0

FUNCTIONAL RATIOS

METRIC	VALUE
Scraper/Filterer	#DIV/0!
Scraper/Scraper + Filtere	#DIV/0!



COMMUNITY TOLERANCES

Sediment tolerant taxa	0
Percent sediment tolerant	0.00%
Sediment sensitive taxa	0
Percent sediment sensitive	0.00%
Metals tolerance index (McGuire)	2.91
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	1
Percent hemoglobin bearers	2.70%
Air-breather richness	0
Percent air-breathers	0.00%
Burrower richness	2
Percent burrowers	4.50%
Swimmer richness	3
Percent swimmers	8.11%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Ostracoda	55	49.55%
Hyalella	14	12.61%
Copepoda	7	6.31%
Callibaetis	7	6.31%
Ablabesmyia	7	6.31%
SUBTOTAL 5 DOMINANTS	90	81.08%
Erpobdellidae	4	3.60%
Chironomus	3	2.70%
Glossiphoniidae	2	1.80%
Ceratopogoninae	2	1.80%
Paratanytarsus	2	1.80%
TOTAL DOMINANTS	103	92.79%

TOLERANCE/CONDITION INDICES

Community Tolerance Quotient (CTQa)	92.25
Hilsenhoff Biotic Index	7.97

DIVERSITY

Shannon H (loge)	2.55
Shannon H (log2)	1.77
Margalef D	3.60
Simpson D	0.27
Evenness	0.10

VOLTINISM

TYPE	ABUNDANCE	# TAXA	PERCENT
Multivoltine	84	9	75.68%
Univoltine	21	6	18.92%
Semivoltine	2	2	1.80%

TAXA CHARACTERS	#TAXA	PERCENT
Tolerant	6	18.02%
Sensitive	0	0.00%
Clinger	2	1.80%

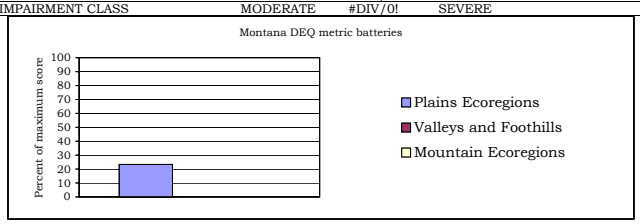
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE
Taxa richness	17	1
E richness	2	1
P richness	0	1
T richness	0	1
Long-lived	2	1
Sensitive richness	0	1
%tolerant	18.02%	5
%predators	9.91%	1
Clinger richness	2	1
%dominance (3)	68.47%	3
	TOTAL SCORE	16 32%

MONTANA DEQ INDICES (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	17	1	1	0
EPT richness	2	0	0	0
Biotic Index	7.97	0	0	0
%Dominant taxon	49.55%	1	1	0
%Collectors	87.39%	1	1	0
%EPT	7.21%	0	0	0
Shannon Diversity	1.77	0		
%Scrapers +Shredder	1.80%	0	0	0
Predator taxa	6	3		
%Multivoltine	75.68%	1		
%H of T	#DIV/0!		#DIV/0!	
TOTAL SCORES		7	#DIV/0!	0
PERCENT OF MAXIMUM		23.33	#DIV/0!	0.00
IMPAIRMENT CLASS		MODERATE	#DIV/0!	SEVERE



Montana Valleys and Foothills revised index (Bollman 1998)

Percent max.	27.78%	Impairment class	MODERATE

Montana Plains ecoregions metrics (Bramblett and Johnson 2002)

Riffle		*Pool*	
EPT richness	2	E richness	2
Percent EPT	7.21%	T richness	0
Percent Oligochaetes and Leeches	6.31%	Percent EPT	7.21%
Percent 2 dominants	62.16%	Percent non-insect	74.77%
Filterer richness	0	Filterer richness	0
Percent intolerant	0.00%	Univoltine richness	6
Univoltine richness	6	Percent supertolerant	91.89%
Percent clingers	1.80%		
Swimmer richness	3		

Aquatic Invertebrate Taxonomic Data

Site Name FOURCHETTE CREEK PENGUIN RESERVOIR **Date Collected** 7 /28/2004

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
		Ostracoda	7	5.79%	Yes	8	CG
Amphipoda							
	Gammaridae						
		Gammarus	2	1.65%	Yes	4	SH
	Talitridae						
		Hyalella	68	56.20%	Yes	8	CG
Basommatophora							
	Physidae						
		Physidae	1	0.83%	Yes	8	SC
Diplostraca							
		Cladocera	16	13.22%	Yes	8	CF
Diptera							
	Ceratopogonidae						
		Ceratopogoninae	9	7.44%	Yes	6	PR
	Chaoboridae						
		Chaoborus	1	0.83%	Yes	7	PR
	Chironomidae						
		Acricotopus	1	0.83%	Yes	10	CG
		Apedilum	1	0.83%	Yes	11	CG
		Corynoneura	1	0.83%	Yes	7	CG
		Cricotopus (Cricotopus)	1	0.83%	Yes	7	SH
		Parakiefferiella	2	1.65%	Yes	6	CG
		Pseudochironomus	2	1.65%	Yes	5	CG
Ephemeroptera							
	Baetidae						
		Callibaetis	1	0.83%	Yes	9	CG
	Caenidae						
		Caenis	2	1.65%	Yes	7	CG
Odonata							
	Libellulidae						
		Leucorrhinia	1	0.83%	Yes	9	PR
		Libellulidae	3	2.48%	No	9	PR
Rhynchobdellida							
	Glossiphoniidae						
		Glossiphoniidae	1	0.83%	Yes	9	PR
Trombidiformes							
		Acari	1	0.83%	Yes	5	PR
Grand Total			**121**				

Aquatic Invertebrate Data Summary

Project ID: MDT04LW
Activity ID:
STORET Station ID:
Station Name: FOURCHETTE CREEK PENGUIN RESERVOIR
Sample Date: 7/28/2004

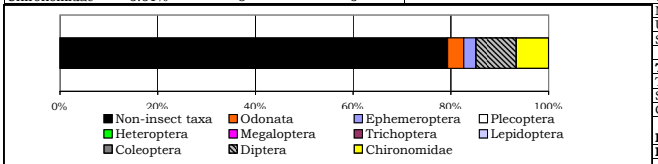
Sample type	
SUBSAMPLE TOTAL ORGANISMS	121
Portion of sample used	2.50%
Estimated number in total sample	4840
Conversion factor	53.800
Estimated number in 1 square meter	6510
Sampling effort	
Habitat type	
EPT abundance	3
Taxa richness	18
Number EPT taxa	2
Percent EPT	2.48%

TAXONOMIC COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Non-insect taxa	79.34%	96	7
Odonata	3.31%	4	2
Ephemeroptera	2.48%	3	2
Plecoptera	0.00%	0	0
Heteroptera	0.00%	0	0
Megaloptera	0.00%	0	0
Trichoptera	0.00%	0	0
Lepidoptera	0.00%	0	0
Coleoptera	0.00%	0	0
Diptera	8.26%	10	2
Chironomidae	6.61%	8	6

TAXONOMIC RATIOS

METRIC	VALUE
EPT/Chironomidae	0.38
Baetidae/Ephemeroptera	0.33
Hydropsychidae/Trichopt	#DIV/0!

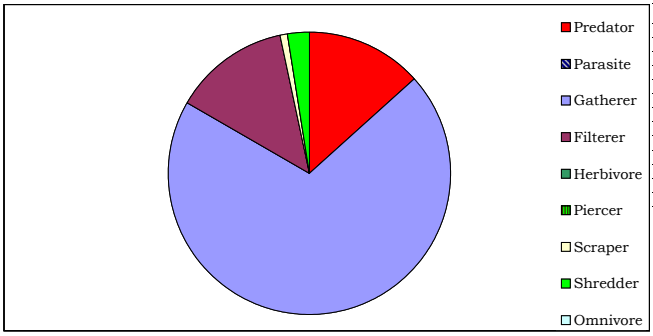


FUNCTIONAL COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Predator	13.22%	16	6
Parasite	0.00%	0	0
Gatherer	70.25%	85	9
Filterer	13.22%	16	1
Herbivore	0.00%	0	0
Piercer	0.00%	0	0
Scraper	0.83%	1	1
Shredder	2.48%	3	2
Omnivore	0.00%	0	0
Unknown	0.00%	0	0

FUNCTIONAL RATIOS

METRIC	VALUE
Scraper/Filterer	0.06
Scraper/Scraper + Filtere	0.06



COMMUNITY TOLERANCES

Sediment tolerant taxa	0
Percent sediment tolerant	0.00%
Sediment sensitive taxa	0
Percent sediment sensitive	0.00%
Metals tolerance index (McGuire)	3.10
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	1
Percent hemoglobin bearers	1.65%
Air-breather richness	0
Percent air-breathers	0.00%
Burrower richness	2
Percent burrowers	9.09%
Swimmer richness	1
Percent swimmers	0.83%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Hyalella	68	56.20%
Cladocera	16	13.22%
Ceratopogoninae	9	7.44%
Ostracoda	7	5.79%
Libellulidae	3	2.48%
SUBTOTAL 5 DOMINANTS	103	85.12%
Gammarus	2	1.65%
Caenis	2	1.65%
Parakiefferiella	2	1.65%
Pseudochironomus	2	1.65%
Glossiphoniidae	1	0.83%
TOTAL DOMINANTS	112	92.56%

TOLERANCE/CONDITION INDICES

Community Tolerance Quotient (CTQa)	101.45
Hilsenhoff Biotic Index	7.70

DIVERSITY

Shannon H (loge)	2.21
Shannon H (log2)	1.54
Margalef D	3.75
Simpson D	0.34
Evenness	0.08

VOLTINISM

TYPE	ABUNDANCE	# TAXA	PERCENT
Multivoltine	33	10	27.27%
Univoltine	85	8	70.25%
Semivoltine	3	1	2.48%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	5	7.44%
Sensitive	0	0.00%
Clinger	1	0.83%

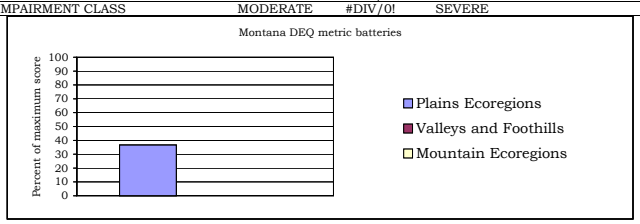
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE
Taxa richness	18	1
E richness	2	1
P richness	0	1
T richness	0	1
Long-lived	1	1
Sensitive richness	0	1
%tolerant	7.44%	5
%predators	13.22%	3
Clinger richness	1	1
%dominance (3)	76.86%	1
	TOTAL SCORE	16 32%

MONTANA DEQ INDICES (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	18	2	1	0
EPT richness	2	0	0	0
Biotic Index	7.70	0	0	0
%Dominant taxon	56.20%	1	0	0
%Collectors	83.47%	1	1	0
%EPT	2.48%	0	0	0
Shannon Diversity	1.54	0		
%Scrapers +Shredde	3.31%	1	0	0
Predator taxa	6	3		
%Multivoltine	27.27%	3		
%H of T	#DIV/0!		#DIV/0!	
TOTAL SCORES		11	#DIV/0!	0
PERCENT OF MAXIMUM		36.67	#DIV/0!	0.00
IMPAIRMENT CLASS		MODERATE	#DIV/0!	SEVERE



Montana Valleys and Foothills revised index (Bollman 1998)

Percent max.	22.22%	Impairment class	MODERATE

Montana Plains ecoregions metrics (Bramblett and Johnson 2002)

Riffle		*Pool*	
EPT richness	2	E richness	2
Percent EPT	2.48%	T richness	0
Percent Oligochaetes and Leeches	0.83%	Percent EPT	2.48%
Percent 2 dominants	69.42%	Percent non-insect	79.34%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.00%	Univoltine richness	8
Univoltine richness	8	Percent supertolerant	82.64%
Percent clingers	0.83%		
Swimmer richness	1		