MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2004

Kleinschmidt Creek
Ovando, Montana

Prepared for:

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

Prepared by:

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

June 2005

Project No: B43054.00 - 0112

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1.0 INTRODUCTION

This report documents the 2004 (third year) monitoring results at the Kleinschmidt Creek mitigation site. The site was developed to mitigate wetland impacts associated with two Montana Department of Transportation (MDT) projects, Clearwater Junction North and Helmville Junction, and to serve as a reserve for future MDT projects in the watershed. Kleinschmidt Creek is located in Powell County, MDT Watershed # 2, in the Upper Clark Fork River Basin. The mitigation site is located approximately six miles east of Ovando, Montana and is directly adjacent to MT Highway 200 (**Figure 1**). Elevations of the site range from 4,200 ft. at the eastern boundary to 4,180 ft. at the western boundary. Land and Water Consulting (LWC) conducted the baseline wetland delineations for the Kleinschmidt Creek proposed mitigation site in the summer of 1999. Marilyn Marler, contracted by U.S. Fish and Wildlife Service, conducted the functional assessments for the mitigation site in 1998 using the 1997 MDT forms.

The approximate site boundary is illustrated on **Figure 2** (**Appendix A**). The project was designed by LWC, and is located on property owned by Thomas Rue, within a 47-acre perpetual wetland conservation easement. Kleinschmidt Creek flows west until eventually draining into the North Fork of the Blackfoot River. The perennial creek is spring fed, which provides the primary hydrology source. Local groundwater systems serve as a secondary hydrology source, flowing through the deep alluvial substrate contained along the Kleinschmidt Flats and eventually discharging along Kleinschmidt Creek corridor.

Construction at the Kleinschmidt Creek Mitigation Site was completed during the summer of 2001. The overall goals of this project were the restoration, creation, and enhancement (high and low intensity) of heavily grazed and degraded creek/wetlands. Primary restoration objectives included channel reconstruction and fish habitat enhancement on approximately 5,000 ft of Kleinschmidt Creek and the creation of additional wetland areas along the spring fed corridor. Project objectives and task details are included in the following list:

Restoration

- Narrowing and deepening the existing manipulated stream channel, restoring the portion narrowed as wetland.
- Conversion of degraded channel/open water into wetland on approximately 6 acres.
- Planting woody vegetation at a density of 500 stems per acre.
- Eliminating the existing stock water channel under the highway.

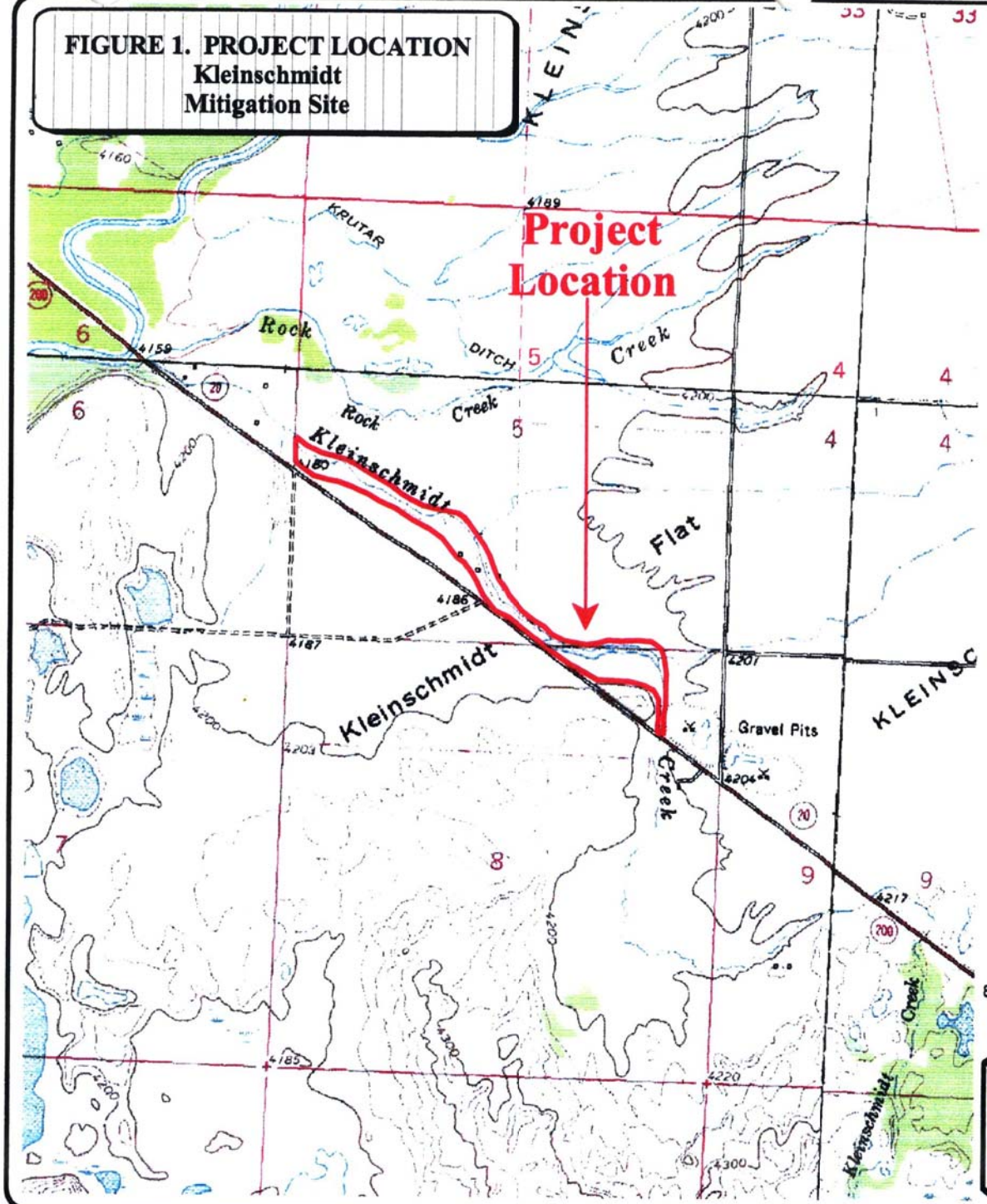
Creation

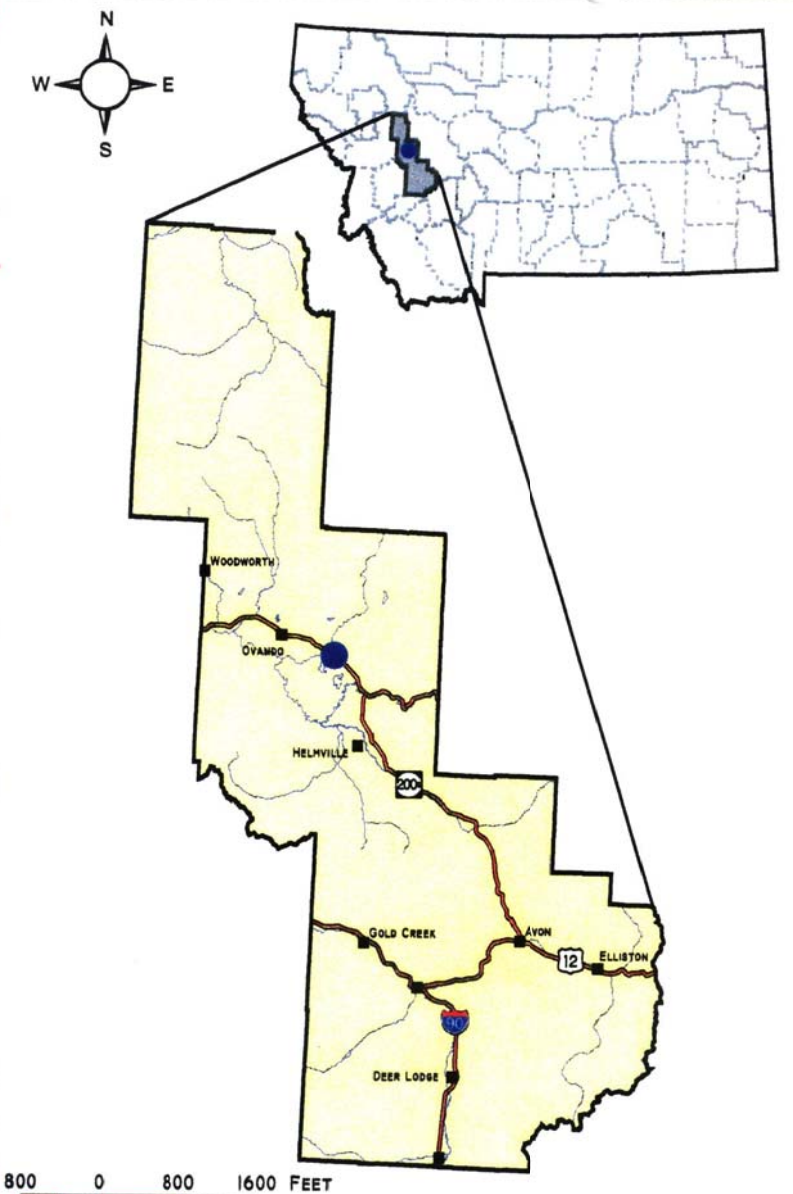
- Converting approximately 1.19 acres of upland area to wetland / shallow open water by adjusting the surface elevation.
- Planting woody vegetation at a density of 500 stems per acre along the perimeter of the shallow open water areas.

High Intensity Enhancements

- Planting woody vegetation on approximately 8.05 acres of existing degraded wetlands at a density of 1,500 stems per acre.

FIGURE 1. PROJECT LOCATION
Kleinschmidt
Mitigation Site





800 0 800 1600 FEET

1: 24,000

PROJECT #: 110174
DATE: FEB 2004
LOCATION:
PROJECT MANAGER: J. BERGLUND
DRAWN BY: B. STEINEBACH

LAND & WATER CONSULTING, INC.

1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

Low Intensity Enhancements

- Planting woody vegetation on the remaining 3.43 acres of existing degraded wetlands at a density of 500 stems per acre (clumped).

The site was designed to mitigate for specific wetland functions impacted by MDT roadway projects, including: storm water retention, roadway runoff filtration, sediment and nutrient retention, water quality, groundwater recharge, and wildlife habitat.

Mitigation credit goals and credit ratios, approved by the Corps of Engineers (Steinle 2001), are as follows:

Project Component	Total Estimated Acres	Credit Ratio	Credit Acres
Restoration	6.0	1:1	6.0
Creation	1.19	1:1	1.19
High-Intensity Enhancement	8.05	1:2	4.02
Low-Intensity Enhancement	3.43	1:3	1.14
75-Foot Upland Buffer Preservation	12.69	1:4	3.17
Totals	31.36		15.52

The Kleinschmidt Creek site will be monitored once per year over four to five years to document wetland and other biological attributes. If the vegetation is sufficiently robust and meets the performance goals for the project after four years, of if there is no significant change in wetland size or species composition, the fifth year of monitoring may be waived by the Corps (Steinle 2001). The monitoring area is illustrated in **Figure 2** (**Appendix A**).

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on August 8th (mid-season), 2004. Monitoring activities were conducted on both the "upstream" (top half of **Figures 2 and 3, Appendix A**) and "downstream" (bottom half of **Figures 2 and 3, Appendix A**) mitigation sections. The mid-season visit was conducted to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; wetland/open water aquatic habitat boundary mapping; vegetation community mapping; vegetation transect; soils data; hydrology data; bird and general wildlife use; macroinvertebrate sampling; GPS data points; and functional assessment.

2.2 Hydrology

Wetland hydrology indicators were recorded during the mid-season visit using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). Additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). No groundwater monitoring wells were installed at the site.

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Carex/Phalaris*) 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 do not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the site monitoring form (**Appendix B**).

A 10-foot wide belt transect was established during the mid-season monitoring event to represent the range of current vegetation conditions. Percent cover was estimated for each vegetative species within each successive vegetative community encountered within the "belt" using the following values: T (few plants); P (1-5%); 1 (5-15%); 2 (15-25%); 3 (25-35%); 4 (35-45%); 5 (45-55%) and so on to 9 (85-95%). The transect location is illustrated on **Figure 2** (**Appendix A**). The transect will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the air photo and all data were recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with the GPS unit in 2002. A photo was taken from both ends of the transect looking along the transect path.

A comprehensive plant species list for the site was compiled and will be updated as new species are encountered. Ultimately, observations from past years will be compared with new data to document vegetation changes over time. Revegetation enhancements were implemented in the spring of 2002. Survival rates for planted species were recorded during the 2004 monitoring visit.

2.4 Soils

Soils were evaluated during the mid-season site visit using the 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 Forms (**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 during the mid-season visit according to 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 information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was originally delineated on the air photo during the 2002 monitoring and recorded with a resource grade GPS unit using the procedures outlined in **Appendix E**. Modifications to these boundaries in 2004 were accomplished by hand-mapping onto the 2002 aerial photograph. The wetland/upland boundary in combination with the wetland/open water boundary was used to calculate the final wetland acreage.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during the 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. Observations from past years will ultimately be compared with new data.

2.7 Birds

Bird observations were also recorded during the mid-season visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. Observations were recorded incidental to other monitoring activities and were categorized by species, activity code, and general habitat association.

2.8 Macroinvertebrates

Macroinvertebrate samples were collected during the mid-season site visit at two locations. Samples were collected along Kleinschmidt Creek and the created pond on the upstream sections (**Figure 2**). Macroinvertebrate sampling procedures are provided in **Appendix F**. Samples were preserved as outlined in the sampling procedure and sent to Rhithron Analytical for analysis.

2.9 Functional Assessment

A functional assessment form was completed using the 1999 MDT Montana Wetland Assessment Method (**Appendix B**). Field data necessary for this assessment were collected during the mid-season visit.

2.10 Photographs

Photographs were taken illustrating current land uses surrounding the site, the upland buffer, the monitored area and the vegetation transects. Each photograph point location was recorded with a resource grade GPS in 2002. The location of photo points is shown on **Figure 2**, **Appendix A**. All photographs were taken using a digital camera during the 2003 and 2004 visit and standard 35mm film camera during the 2002 visit.

2.11 GPS Data

During the 2002 monitoring season, point data were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations and at all photograph locations. Wetland boundaries were also recorded with a resource grade GPS unit in 2002, but were modified via hand mapping onto aerial photographs in 2004. The method used to collect these points is described in the GPS protocol in **Appendix E**.

2.12 Maintenance Needs

Observations were made of existing structures and of erosion/sediment problems to identify maintenance needs. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented on the monitoring form.

3.0 RESULTS

3.1 Hydrology

The main source of hydrology for this site is numerous springs that feed Kleinschmidt Creek, a perennial flowing stream that eventually drains into the North Fork of the Blackfoot River. Kleinschmidt Creek does not experience a large peak flow, which results from snowmelt. The spring fed source of hydrology at this site is augmented by the persistent movement of groundwater across the glacial outwash materials of Kleinschmidt Flats. Higher water flows are usually observed at Kleinschmidt Creek during mid summer after the groundwater levels have been recharged from snowmelt, stream flow and irrigation diversion (DNRC 1999).

The newly constructed channel consisting of rock bottom occurred on 1.85 acres within the mitigation site (**Figure 3**). Depths of the perennial creek varied, ranging from 0.5 ft in the straight segments to 2 - 5 ft deep around the bends and meanders. All other wetlands were inundated or saturated during the mid-season visit.

Banks have remained stable since construction and lateral channel migration has not been observed. As Kleinschmidt Creek is a spring creek with a stable hydrologic regime, major channel adjustments are not anticipated. A sample of as-built baseline channel cross sections established in 2001 will be surveyed again in 2005 to ascertain channel stability.

3.2 Vegetation

Sixty-four plant species were identified at the site and are listed in **Table 1**. The majority of these species are herbaceous, found in saturated wetland meadow complexes and the newly constructed wetland pads along the reconstructed channel. These wet meadows are seasonally inundated from a ground water-fed hydrology source. A few small groups of mature Pacific willow (*Salix lasiandra*) are present and are limited in distribution to near the heads of the springs. Also, a few random Bebbs willow (*Salix bebbiana*) and shrubby potentilla (*Potentilla fruticosa*) are found throughout some of the wet meadow complexes, but for the most part are very limited in distribution due to the historic livestock grazing.

Seven wetland and four upland community types were identified and mapped at the mitigation site (**Figure 3**, **Appendix A**). The seven wetland community types include Type 3: *Phleum/Agrostis,* Type 4: *Juncus/Carex,* Type 5: *Phalaris/Agrostis,* Type 6: *Juncus/Agrostis,* Type 7: *Carex/Juncus,* Type 9: *Salix,* and Type 10: *Salix/Alnus.* The four upland community types include Type 1: *Medicago/Centaurea,* Type 2: *Phleum/Melilotus* and Type 8:

Table 1: ***2002, 2003, and 2004 Kleinschmidt Creek vegetation species list.***

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agrostis alba	Redtop	FAC+
Agrostis exarata	spike bentgrass	FACW
Agropyron cristatum	crested wheatgrass	--
Agropyron repens	quack grass	FACU
Agropyron smithii	western wheatgrass	FACU
Alnus incana	thin leaved alder	FACW
Beckmannia syzigachne	American sloughgrass	OBL
Betula glandulosa	Birch	OBL
Bidens cernua	nodding beggars-ticks	FACW+
Bromus inermis	smooth brome	--
Bromus tectorum	Cheatgrass	--
Calamagrostis canadensis	bluejoint reedgrass	FACW+
Carex aquatilis	water sedge	OBL
Carex lanuginosa	wooly sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Carduus nutans	musk thistle	--
Carex utriculata	beaked sedge	OBL
Centaurea maculosa	spotted knapweed	--
Chenopodium album	Lambsquarter	FAC
Chrysanthemum leucanthemum	oxeye daisy	--
Cirsium arvense	Canada thistle	FACU+
Cynoglossum officinale	Hounds tongue	--
Deschampsia cespitosa	tufted hairgrass	FACW
Eleocharis palustris	creeping spike rush	OBL
Epilobium ciliatum	hairy willow-herb	FACW+
Equisetum arvense	field horsetail	FAC
Equisetum hyemale	scouring rush	FACW
Geum macrophyllum	big leafed avens	OBL
Glyceria elata	tall mannagrass	FACW+
Habenaria dilatata	bog orchid	--
Hyoscyamus niger	black henbane	--
Juncus balticus	Baltic rush	FACW
Juncus ensifolius	three-stamen rush	FACW
Juncus mertensianus	Merten's rush	OBL
Linaria vulgaris	butter and eggs	--
Lychnis alba	white campion	--
Medicago sativa	Alfalfa	--
Melilotus officinalis	yellow sweet clover	FACU
Mentha arvensis	field mint	FAC
Mimulus guttatus	common monkey-flower	OBL
Pedicularis groenlandica	Elephant's-head lousewort	OBL
Phalaris arundinacea	reed canarygrass	FACW
Phleum pratense	Timothy	FACU
Plantago spp.	Plaintain	--
Poa pratensis	Kentucky bluegrass	FACU+
Polygonum amphibium	water smartweed	OBL
Potentilla anserina	Silverweed	OBL
Potentilla fruticosa	shrubby potentilla	FAC-
Ranunculus spp.	Buttercup	--
Ranunculus aquatilis var. hispidulus	whitewater buttercup	OBL

Table 1 (continued): ***2002, 2003, and 2004 Kleinschmidt Creek vegetation species list.***

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
Rumex crispus	curly dock	FACW
Salix bebbiana	Bebb's willow	FACW
Salix boothii	Booths willow	OBL
Salix drummondiana	Drummond willow	FACW
Salix geyeriana	Geyer willow	FACW+
Salix lasiandra	pacific willow	FACW+
Sisymbrium altissimum	tall tumble mustard	FACU-
Solidago missouriensis	Missouri goldenrod	--
Taraxacum officinale	common dandelion	FACU
Thlaspi arvense	Pennycress	NI
Triglochin maritimum	seaside arrowgrass	OBL
Trifolium pratense	red clover	FACU
Typha latifolia	common cattail	OBL
Veronica americana	American speedwell	OBL

[1] **Bolded** species indicate those documented in the analysis area for the first time in 2004.

Centaurea/Carduus and Type 11: *Bromus/Phleum.* Plant species observed within each of these communities are listed on the attached data form (**Appendix B**).

Wetland types 4, 9 & 10 were present before reconstruction of the channel. Pre-construction wetland delineation mapped the majority of the site as emergent wetlands. Type 4 is a remnant wetland with heavy past alterations due to livestock grazing. Type 4 occurs in saturated to shallow water conditions. Vegetation is dominated by Baltic rush (*Juncus balticus*) and Nebraska sedge (*Carex nebrascensis*). Type 9 consists of a small group of several mature Pacific willows found near the heads of the larger springs located at this site. Type 10 is located along the upper most reaches of the mitigation site; vegetation is dominated by Bebbs willow and thin leaved alder (*Alnus incana*) with a herbaceous layer of wetter grass species such as reed canarygrass (*Phalaris arundinacea*) and redtop (*Agrostis alba*).

The remaining wetland types were created during the channel reconstruction and wetland creation. Community Type 3: *Phleum/Agrostis* is located in the upstream section, around the created open water fringes and was inundated during the mid season visit. Community Type 5 is located within the reconstructed channel and adjacent created wetland pads. Type 5 includes the vegetation along the streambanks that were lined with transplanted wetland sod from within the site. Streambank vegetation is dominated by the transplanted Baltic rush and Nebraska sedge that was removed from within Community Type 4 of the wet meadows. The streambank and adjacent wetlands were sprigged with several willows species and also planted with variety of 10T cubic inch sized seedlings (**Appendix G**).

The remaining area of Type 5 includes the created wetland pads dominated by reed canarygrass, dagger-leaved rush (*Juncus ensifolius*) and redtop. During the 2002 monitoring these created wetlands had minor distributions of some invasive species such as lambs quarter (*Chenopodium album*), white campion (*Lychnis alba*), spotted knapweed (*Centaurea maculosa*) and Canada thistle (*Cirsium arvense*). Observations during the 2004 season showed little evidence of these invasive species being present. It is possible that extended late season inundation and high groundwater table ultimately drowned out the invasive species and also was a more suitable water regime for the development of wetland species that now occupy these niches. The site is dominated by the aggressive reed canarygrass. The potential does exist that this species could

eventually dominate the entire wetland pads and ultimately decrease the high diversity of wetland grasses and forbs present on the site.

Community Type 6 is located around the edge of the excavated wetland on the lower, downstream section of the mitigation site. Vegetation surrounding the wetland fringe is dominated by dagger leaf rush, redtop and nodding beggars-ticks (*Bidens cernua*). The remaining wetland Community Type 7, which also is located exclusively within the downstream reach of the mitigation site, is dominated by Nebraska sedge and dagger leaf rush.

Extensive revegetation efforts to re-establish woody plant species were implemented during 2001 and 2002 seasons. Revegetation included planting of 10T cubic inch seedlings and sprigging of willows in community types 2, 3, 4, 5, 6, and 7. Larger, more mature shrubs were transplanted along the channel banks in Community 5. Refer to **Appendix G** for specific details on revegetation.

Pasture crops and non-native grass species mainly dominate adjacent upland vegetation communities. Type 1 consists of an alfalfa field with a minor infestation of spotted knapweed. Alfalfa is still being cultivated and hayed for livestock feed. Type 2 is located within the upstream section of the mitigation project adjacent to Type 1 and excavated wetlands. This community type on the south and eastern fringes of the excavated wetlands consists of mostly upland species, but also was planted with a variety of woody-stemmed plants (**Appendix G**). Type 8 is an upland community type located in the downstream section near the western end of the mitigation site. Type 8 is located along two cut slopes of an old rail grade that historically crossed this lower section of the mitigation site. These dry slopes are outside the saturated zone of the wetland area and are dominated by several aggressive invasive and noxious species. Type 8 is dominated by spotted knapweed and musk thistle (*Carduus nutans*). The remaining upland community, Type 11, covers the majority of the upland areas. Type 11 is dominated by mostly non-native grasses used for livestock grazing. Type 11 is found on the outer fringes of the wetland corridor in both the upstream and downstream sections.

Several noxious weeds were observed throughout the Kleinschmidt Creek Mitigation Site. These plants include spotted knapweed, Canada thistle, hounds tongue (*Cynoglossum officinale*) and Oxeye daisy (*Chrysanthemum leucanthemum*). Other invasive or non-native species include common dandelion (*Taraxacum officinale*), lambsquarter, clasping pepper-grass (*Lepidium perfoliatum*), butter and eggs (*Linaria vulgaris*), black henbane (*Hyoscyamus niger*), musk thistle, pennycress (*Thlaspi arvense*), tall tumbleweed mustard (*Sisymbrium altissimum*) and quackgrass (*Agropyron repens*).

Vegetation transect results are detailed in the attached data forms and are graphically summarized in **Charts 1** and **2**. A tabular transect summary is presented in **Table 2**.

Table 2: ***Transect 1 data summary for 2002 – 2004.***

Monitoring Year	2002-2003	2004
Transect Length (feet)	222	222
# Vegetation Community Transitions along Transect	4	4
# Vegetation Communities along Transect	4	4
# Hydrophytic Vegetation Communities along Transect	3	3
Total Vegetative Species	25	23
Total Hydrophytic Species	17	17
Total Upland Species	8	6
Estimated % Total Vegetative Cover	95	95
% Transect Length Comprised of Hydrophytic Vegetation Communities	93	93
% Transect Length Comprised of Upland Vegetation Communities	7	7
% Transect Length Comprised of Unvegetated Open Water	0	0
% Transect Length Comprised of Bare Substrate	0	0

Chart 1: ***Transect maps showing vegetation types from the start of transect (0 feet) to the end of transect (222 feet) for each year monitored.***

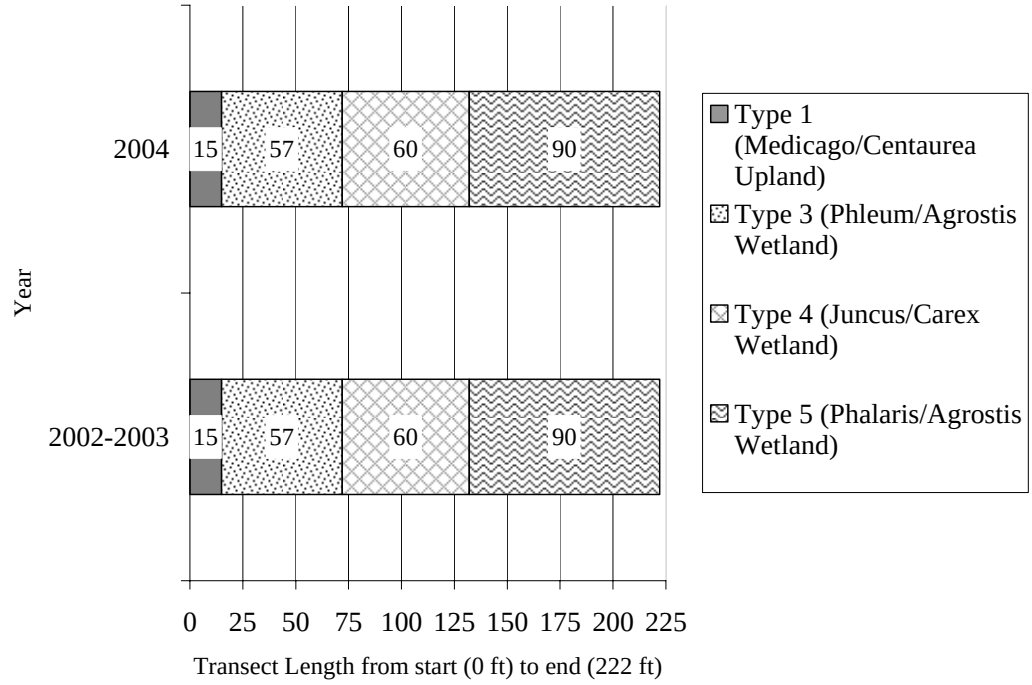
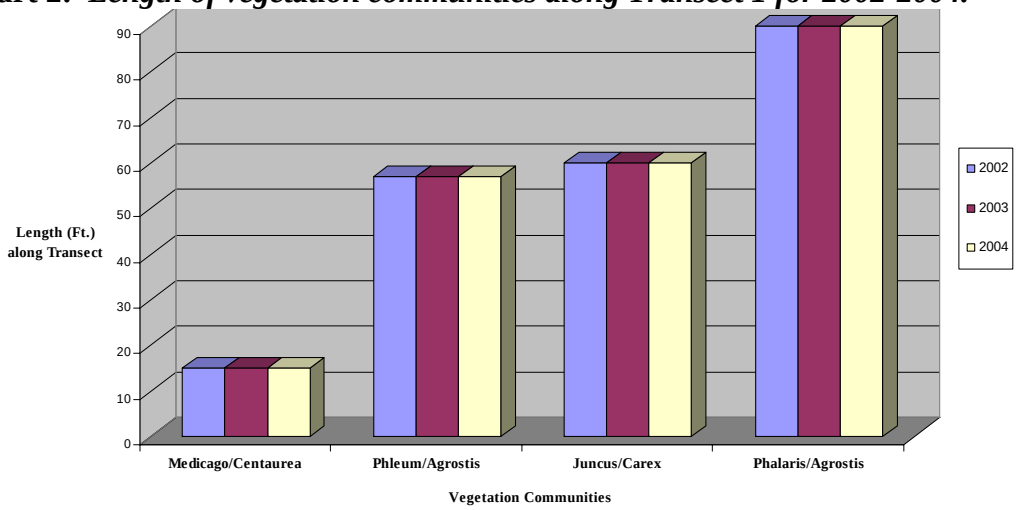


Chart 2: ***Length of vegetation communities along Transect 1 for 2002-2004.***



3.3 Soils

The soils located at the Kleinschmidt Creek site are mapped as Tetonview Loam and Perma Gravelly Loam. Tetonview Loam is listed on the Powell County Hydric Soils list and covers a majority of the mitigation site. These soils have a 0 to 4 percent slope and are classified as a stream terrace type landform with alluvial parent materials. The majority of the site was mapped as the Tetonview loam, which includes all of the upstream sections and a portion of the downstream sections. The remaining downstream section includes Perma Gravelly Loam. These soils have 8 to 15 percent slopes and are classified as an alluvial fan type landform with parent materials consisting of alluvium. Perma Gravelly loam is considered somewhat excessively drained. Soil profiles examined during monitoring visits revealed similar soil types to those mapped in this area. Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly peat, loams, or clays with very low chromas (1 or 2). Mottles were present in one profile. Soil profiles in the grass and sedge-dominated areas mostly consisted of deep A horizons of peat or mucky mineral textured materials with an underlying clay layer.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3** in **Appendix A**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. The 1999 pre-construction wetland delineation documented 13.78 acres of wetland and 7.59 acres of over-excavated open water channel on the mitigation site (**Table 3** and see **Figure 4** in **Appendix A)**. Wetland conditions identified in 1999 and from 2002 to 2004 monitoring are presented in **Table 3**.

Table 3: ***Wetland conditions within Kleinschmidt Creek Wetland Mitigation Site.***

Condition	Monitoring Area 2004	Monitoring Area 2002-2003	Pre-Project 1999
Gross Wetland Area	25.80 ac.	25.99 ac.	21.38 ac.
Open Water Area	2.72 ac.	2.69 ac.	7.59 ac.
Net Wetland Area	**23.08 ac.**	**23.30 ac.**	**13.78 ac.**

Approximately 23.08 wetland acres and 2.72 restored channel/open water acres are currently within the monitoring area (**Figure 3**). The pre-construction wetland delineation reported 13.78 wetland and 7.59 over-excavated open water channel acres. The net increase in gross wetland acres for 2004 was 23.08– 13.78 = 9.3 acres, while the open water of 7.59 (degraded channel) acres decreased to 2.72 acres, consisting of restored sinuous stream channel (1.89 acres) and portions of two excavated shallow wetlands (0.83 acre).

Differences between pre-and post-project net wetlands were due to the decrease in degraded channel/open-water, active restoration of wetlands, addition of two excavated shallow wetland areas that were created in upland areas, and "passive", or incidental, wetland restoration. Incidental wetland restoration occurred outside of enhancement areas within portions of intended upland buffer areas. Slight refinements / corrections to upland / wetland boundary locations on the lower section in 2004 resulted in a minor decrease in wetland area from that delineated during 2003 monitoring.

3.5 Wildlife

Wildlife species and evidence of wildlife, observed on the site during 2002 - 2004 monitoring visits are listed in **Table 4**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the completed monitoring form in **Appendix B**.

This site provides habitat for a variety of wildlife species, although this was not necessarily reflected in the 2002 - 2004 monitoring data. Indications of three mammal, one amphibian and four bird species were noted at the mitigation site during the 2004 site visits. Deer frequent the site and occasionally the property owner has observed elk on the site. Deer are thought to be responsible for much of the browse disturbance to planted woody vegetation.

The newly constructed channel offers habitat for five types of fish species. These species include low numbers of westslope cutthroat, bull trout, brown trout, rainbow trout and brook trout (FWP, 2003). The Montana Department of Fish Wildlife and Parks conducted pre-project and post-project surveys during the 1998, 2000 and 2003 season.

Table 4: ***Wildlife species observed at the Kleinschmidt Creek Mitigation Site 2002-2004.***

FISH
Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)
Brook Trout (*Salvelinus fontinalis*)
Brown Trout (*Salmo trutta linnaeus*)
Bull Trout (*Salvelinus confluentus*)
Rainbow (*Oncorhynchus mykiss*)
AMPHIBIANS
Spotted Frog (*Rana luteiventris*)
REPTILES
None
BIRDS
American Crow (*Corvus brachyrhynchos*)
Brewers Blackbird (*Euphagus cyanocephalus*)
Bluebird (*Sialia mexicana*)
Canada Goose (*Branta canadensis*)
Mallard (*Anas platyrhynchos*)
Killdeer (*Charadrius vociferus*)
MAMMALS
Coyote (*Canis latrans*)
Deer (*Odocoileus sp.*)
Elk (*Cervus elaphus*)

Bolded species were observed during 2004 monitoring.

3.6 Macroinvertebrates

Complete 2004 results from the macroinvertebrate sampling locations (**Figure 2**) are presented in **Appendix F.** Two points were sampled at this mitigation site during 2004. The two 2004 sampling locations are along the creek and pond on the upstream section of the site. The following analysis was provided by Rhithron Associates (Bollman 2004).

Shallow Open Water - 2004

The low biotic index value and high taxa richness suggest that biotic conditions at the Kleinschmidt open water site were optimal. Some flow probably existed in this system, since single individuals of the mayfly Drunella sp. and the salmonfly Pteronarcella sp. were taken in the sample. Damselflies and snails were abundant, suggesting that macrophytes added complexity to habitats. Excellent water quality is implied by the low biotic index value, which was well below the median value for sites in this study.

Stream - 2004

Optimal conditions were indicated by the bioassessment score at this site in 2004. The biotic index value was very low, suggesting excellent water quality. As in 2003, naiad worms were the dominant taxon, suggesting that bacterial films were the dominant energy source. There may have been some flow influence here; several creatures associated with flowing water, including the stonefly Kogotus sp. and the mayfly Baetis tricaudatus, were collected here. It does not appear that macrophytes provided significant habitat space. Most creatures in the sample were benthic or water-column inhabitants.

3.7 Functional Assessment

Completed 2002 - 2004 functional assessment forms are included in **Appendix B**. The two assessment areas (AA's) evaluated at Kleinschmidt Creek, separated into the channel

corridor/wetlands and excavated wetland areas, both rated Category II (high value) and Category III (moderate value) areas, respectively.

The channel corridor/wetland area received a moderate rating for T&E species habitat, and MNHP species habitat (documented secondary habitat for Westslope cutthroat trout [*Oncorhynchus clarki lewisi*] based on MFWP surveys.), surface water storage, production export/food chain support and groundwater discharge/recharge. The variable for T&E species habitat rated moderate due to documented secondary bull trout (*Salvelinus confluentus*) habitat in the project area (FWP 2003). The surface water storage variable rated high due to the acre-feet of water contained within the channel and adjacent wetlands. The site received a high sediment/shoreline stabilization rating due to the dominant percent cover of sedges and rushes with deep binding roots along the channel. Willow sprigged along the banks will also develop into larger, more robust shrubs with extensive deep binding roots systems.

Category III ratings for excavated wetlands were primarily due to low ratings for T&E species habitat and MHNP species habitat, and uniqueness. General wildlife habitat, sediment/shoreline stabilization, sediment/nutrient removal and production export rated as moderate. Other factors contributing to this score were high ratings for surface water storage and groundwater discharge/recharge.

Based on functional assessment results (**Table 5)**, approximately 207.53 functional units occur at the Kleinschmidt Creek mitigation site. Baseline functional assessment results are also provided in **Table 5** for general comparative purposes. Marilyn Marler completed the original functional assessment forms during the summer of 1998. However, it should be noted that direct comparison between the baseline and 2002 - 2004 functional assessments is not possible as they were completed using different versions of the MDT functional assessment methods. The baseline assessment was completed using the 1997 version, while the 2002 - 2004 assessments were conducted using the most current (1999) version. Nonetheless, functional units appear to have generally doubled at the site since construction.

3.8 Photographs

Representative photographs taken from photo-points and transect ends are presented in **Appendix C**. A copy of the 2004 aerial photograph is also provided in **Appendix C**.

Table 5: ***Summary of 1998 (baseline), 2002, 2003, and 2004 wetland function/value ratings and functional points at the Kleinschmidt Creek Mitigation Project.***[1]

Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method[1]	1998 Channel & Wetlands Lower Section (MDT/USFWS)	1998 Channel & Wetlands Upper Section (MDT/USFWS)	2002 - 2003 Channel & Wetlands (LWC)	2002 - 2003 Ponds (LWC)	2004 Channel & Wetlands[2] (LWC)	2004 Ponds[2] (LWC)
Listed/Proposed T&E Species Habitat	Low (0.2)	Low (0.2)	Mod (0.8)	Low (0.2)	Mod (0.8)	Low (0.2)
MNHP Species Habitat	Low (0.1)	Low (0.1)	Mod (0.7)	Low (0.1)	Mod (0.7)	Low (0.1)
General Wildlife Habitat	Mod (0.5)	Mod (0.5)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.2)	Low (0.2)	Mod (0.7)	NA	Mod (0.7)	NA
Flood Attenuation	NA	NA	NA	NA	NA	NA
Short and Long Term Surface Water Storage	Mod (0.5)	Mod (0.5)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment, Nutrient, Toxicant Removal	Mod (0.5)	High (1.0)	High (0.9)	Mod (0.7)	High (0.9)	Mod (0.7)
Sediment/Shoreline Stabilization	Mod (0.4)	Mod (0.4)	High (1.0)	Mod (0.7)	High (1.0)	Mod (0.7)
Production Export/Food Chain Support	High (0.8)	High (0.8)	High (0.8)	Mod (0.7)	High (0.8)	Mod (0.6)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.3)	Low (0.2)	Low (0.3)	Low (0.3)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Actual Points/Possible Points	4.5/11	5/11	8.2/11	5.6/10	8.2/11	5.6/10
% of Possible Score Achieved	41%	45%	75%	56%	75%	56%
Overall Category	III	III	II	III	II	III
Total Acreage of Assessed Wetlands and Open Water within Easement (acre)	**10.40**	**12.90**	**24.35**	**1.64**	**24.25**	**1.55**
Functional Units (acreage x actual points) (fu)	**46.8**	**64.5**	**199.67**	**9.18**	**198.85**	**8.68**
Total Functional Units At Site (fu)	**111.30**		**208.85**		**207.53**	
Total Functional Unit "Increase"[1] (fu)	**NA**		**97.55**		**96.23**	

[1] The baseline assessment was performed using the 1997 MDT Assessment Method. Several parameters were substantially revised in the 1999 MDT Assessment method, which was used to evaluate 2002 - 2004 monitoring conditions. Thus, direct comparison of pre- and post-project functions is not possible; although, some general trends can be noted.

[2] See completed 2004 MDT functional assessment forms **Appendix B** for further detail.

3.9 Revegetation

Upon completion of the new channel, adjacent wetlands, and excavated wetlands, revegetation efforts were conducted to enhance riparian habitat throughout the mitigation site. Approximately 6,000 willow cuttings were sprigged and 12,800 10 cubic inch container woody shrub seedlings were planted throughout the entire site in the varying mitigation work areas. Planting quantities and locations were based on a stem per acre requirement for each type of mitigation work. **Table 6** describes the type of mitigation work and stems per acre requirement.

Table 6: ***Mitigation type and stems per acre.***

Type of Mitigation Work	Planting Areas	Required Stems per Acre for Credit
Restoration	Channel, streambank, and wetland pads	500
Creation	Fringes around shallow open water	500
High-intensity enhancement	Emergent wetlands	1,000
Low-intensity enhancement	Emergent wetlands	500

Twelve species were chosen for planting at this mitigation site (**Table 7**). Species selection was based on observation of similar wetlands in the Ovando area and species historically know to occur in this region. Refer to **Appendix G** for a list of species and their associated quantities.

Table 7: ***Planted species at mitigation site*****.**

Common Name	Scientific Name
aspen	*Populus tremuloides*
alder	*Alnus incana*
black cottonwood	*Populus trichocarpa*
dogwood	*Cornus stolonifera*
bog birch	*Betula glandulosa*
Booths willow	*Salix boothii*
yellow willow	*Salix lutea*
Geyer willow	*Salix geyeriana*
Bebb willow	*Salix bebbiana*
Drummonds willow	*Salix drummondiana*
hawthorn	*Crataegus douglasii*
woods rose	*Rosa woodsii*

Planting survival ratings and stem counts were conducted during the 2003 and 2004 monitoring season. Planting totals within each mitigation type were counted using a belt transect method. The larger mitigation areas such as the restoration and high intensity enhancement zones were evaluated with more transects. A one meter wide belt transect with varying lengths was used to evaluate plantings throughout the site. The length of transect was based on the mitigation type being evaluated. Areas along the channel were walked in segments based on the length of the meanders and distance across wetland pads.

The results from the belt transect evaluations for each mitigation type are presented in **Table 8**. The "percent of 1 acre" figures listed in **Table 8** are based on combined total for all transects walked for each mitigation type. **Table 8** also lists the area sampled (square feet) for each type and the total number of actual stems counted within the transects. Individual species survival is not listed; counts are based on the number of live stems present within each mitigation type.

Table 8: ***Stem density count for each mitigation type.***

Year	Creation (perimeter)			Restoration (throughout)			High Intensity Enhancement (throughout)			Low Intensity Enhancement (throughout)		
	Sq. Ft.	% of Acre	# of Stems	Sq. Ft.	% of Acre	# of Stems	Sq. Ft.	% of Acre	# of Stems	Sq. Ft.	% of Acre	# of Stems
2004	2,610	6	173	4,396	10	343	4,623	10.61	221	0	0	0
2002-2003	1,554	3.57	58	5,900	13.55	311	6,079	13.95	354	792	1.82	48

During 2003, a small number of transects were evaluated in the low intensity area due to lack of available woody vegetation to evaluate. These areas had been planted during the initial revegetation efforts, but were later disturbed by intensive livestock grazing. During the 2004 monitoring, no woody plants were observed in this low intensity area, and the results represent these findings. The low intensity sites currently lack woody plants, except for a few larger transplanted shrubs.

Ultimately, the cover of woody species throughout the site can be estimated based on transect data. **Table 9** lists the estimated number of stems per acre based purely on the extrapolation of sampled transect count data to the larger treatment areas. These figures likely over-estimate stem density as planting locations and densities were often concentrated (clumped), rather than uniformly distributed across the various treatment areas. Woody plantings were distributed in clumps of varying size, and in some instances were planted at a higher density in locations that were more accessible. Areas such as the restored pads were covered with an even distribution of clump plantings across the entire area. Plantings in the high intensity enhancement areas were more sporadic and concentrated in locations with bare ground or areas with scalped sod.

Preliminary results show increased stem density for creation and restoration, a slight decrease for high intensity enhancement, and a 2004 density of zero stems/acre for the low intensity enhancement area. Stem density numbers varied between monitoring years for several reasons, including increase in sampling area for the creation zones and placement of transects that captured higher density planting areas in the other mitigation zones.

Table 9: ***Extrapolated woody stem densities for each mitigation zone.***

Mitigation Zone	2003 Estimated Density Per Acre	2004 Estimated Density Per Acre	Required Stem Density Per Acre
Creation	1,625	2,883	500 (along perimeter)
Restoration	2,295	3,430	500 (throughout)
High Intensity Enhancement	2,537	2,083	1,000 (throughout)
Low Intensity Enhancement	2,637	0	500 (throughout)

Current methods for stem density calculation are likely over-estimating actual stem densities at the site. However, as these estimates are currently six times greater than the performance requirement in creation areas, seven times greater than the performance requirement in restoration areas, and twice the requirement in high-intensity enhancement areas, the 2004 stem

densities are likely still meeting the required density agreed to by the Army Corps of Engineers (Land and Water 2001) for all categories except low intensity enhancement. Stem density estimate methods will continue to be refined to increase accuracy.

3.10 Maintenance Needs/Recommendations

Although the landowner treated weeds near upper excavated shallow open water area and other areas in 2004, several noxious weeds are present including Canada thistle, hounds tongue, oxeye daisy and spotted knapweed, which should be controlled. Several other aggressive species are present on the site. These include the non-native musk thistle and native wetland species, reed canarygrass. A weed management plan for this site should be considered to control noxious weeds.

Areas disturbed by livestock grazing in the low intensity sections should be revegetated with woody plants. Areas outside the perimeter of the excavated wetlands, which are currently dominated by mostly invasive species, should be treated via mechanical and cultural weed control activities to control invasive species. These include mowing or hand whipping of taller weed species and seeding of bare ground with an appropriate mix suited for the hydrological regime. Mechanical weed control is recommended due to the woody vegetation already installed in this area. Areas where aggressive reed canarygrass is encroaching on planted woody species should be mechanically controlled to limit disturbance to plantings. Heavy browse from local wildlife has been observed across the entire site. Control measure such as chemical browse repellants should be considered to avoid further browse damage or eventual mortality to shrub and tree species.

A new jackleg fence was installed at the site in 2004. Bird boxes installed by MDT at the site were in good condition.

3.11 Current Credit Summary

As of 2004, approximately 23.08 acres of wetland and 2.72 acres of open water (restored stream channel/portions of excavated wetlands) occur at the Kleinschmidt Creek mitigation site. This represents an approximate increase of 9.3 wetland acres and a 4.87 acre decrease of over-excavated, straightened open water channel as compared to baseline conditions. Open water on the site is currently comprised of 1.89 acres of restored sinuous channel and 0.83 acre of excavated shallow water as a component of wetland creation. Functional units at the site have essentially doubled to over 208 since project construction.

Table 10 summarizes the maximum credit that could be assigned to the site as of 2004. Target mitigation credit ratios and acres were agreed upon prior to site construction, with the exception of incidental wetland restoration within proposed upland buffer areas, for which no performance standards or ratios were discussed. As these areas are restoring naturally within the easement, a 1:1 credit ratio was assumed.

Table 10: ***Maximum Kleinschmidt Creek mitigation site credit as of 2004.***

Mitigation Type	Current Acres	Ratio	Current Maximum Credit Acres	Target Credit Acres	Comments
Designed Restoration	6.0	1:1	6.0	6.0	Does not include 1.89 acres of open water stream channel. Calculated stem density (3,430) is exceeding performance standard (500).
Designed Creation	1.19	1:1	1.19	1.19	Includes 0.83 acre of designed shallow open water. Calculated stem density along upland / wetland border (2,883) is exceeding performance standard (500).
Designed High-Intensity Enhancement	8.05	1:2	4.02	4.02	Calculated stem density (2,083) is exceeding performance standard (1,000)
Designed Low-Intensity Enhancement	3.43	1:3	0.0	1.14	Plantings were destroyed by grazing. Calculated stem density (0) is no longer meeting performance standard (500). No credit likely at this time. Recommend re-planting this area.
Incidental Restoration	5.24	1:1	5.24	0.0	5.24 acres of intended 12.69-acre upland buffer within easement reverted to emergent wetland. 1:1 ratio is assumed and has not been verified with the Corps of Engineers.
Designed Upland Buffer	7.45	4:1	1.86	3.17	5.24 acres of intended 12.69-acre upland buffer reverted to wetland.
Grand Total	**31.36**	**--**	**18.31**	**15.52**	**118% of goal**

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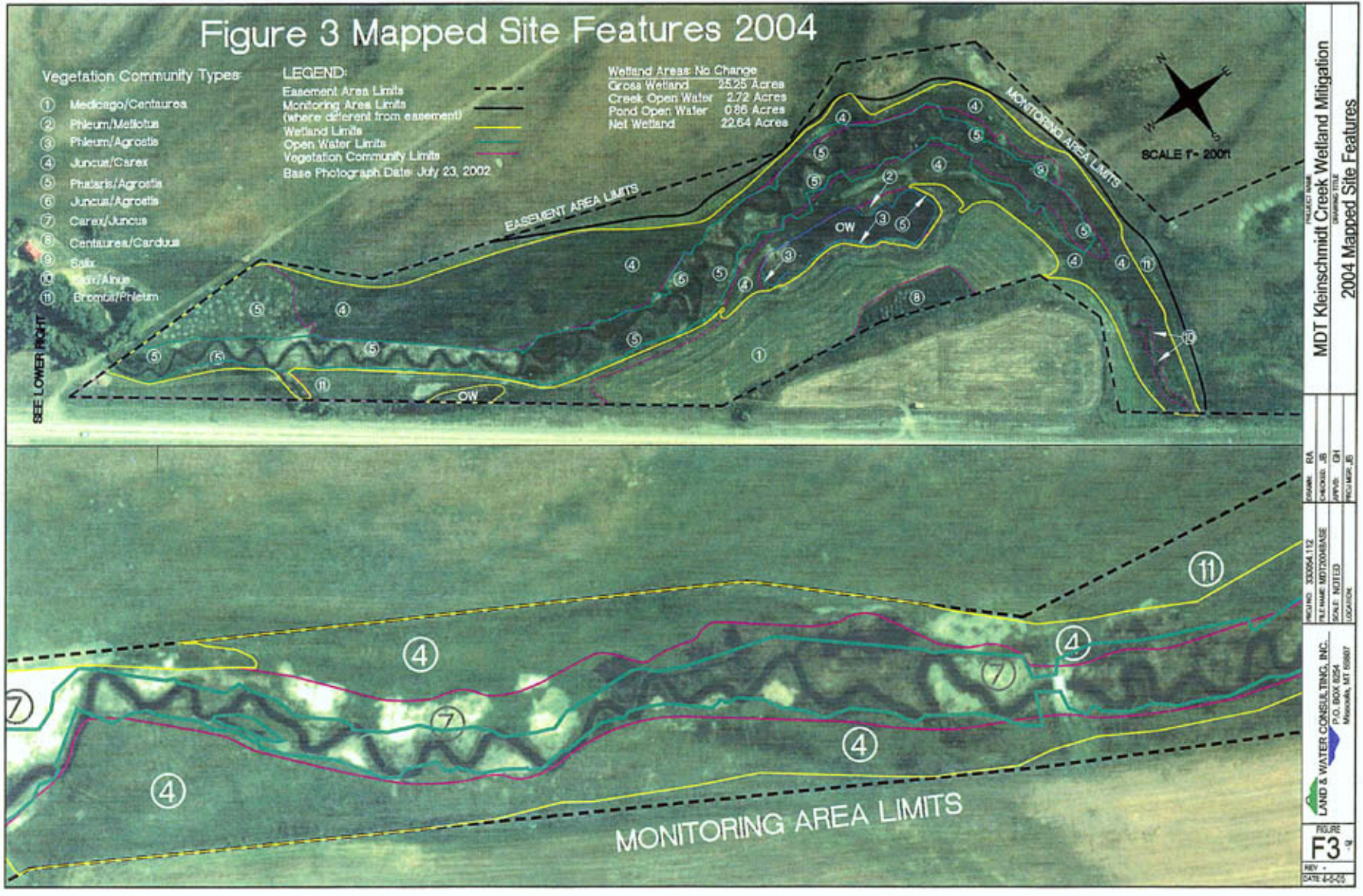
Appendix A

FIGURES 2, 3, AND 4

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana


Figure 2 Monitoring Activity Locations
LEGEND:
Easement Area Limits
Monitoring Area Limits (where different from easement)
Bird Box
Photo Point
Soil Sample
Vegetation Transect
Macro-invertebrate Sample Point
Base Photograph Date: July 23, 2002
EASEMENT AREA LIMITS
MONITORING AREA LIMITS
SCALE 1"= 200ft
SEE LOWER RIGHT
SCALE 1"= 200ft
MONITORING AREA LIMITS
SEE UPPER LEFT
MDT Kleinschmidt Creek Wetland Mitigation
2004 Monitoring Activity Locations
LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807
FIGURE
F2
REV -
DATE 6-13-05

Figure 3 Mapped Site Features 2004



MDT Kleinschmidt Creek Wetland Mitigation

2004 Mapped Site Features

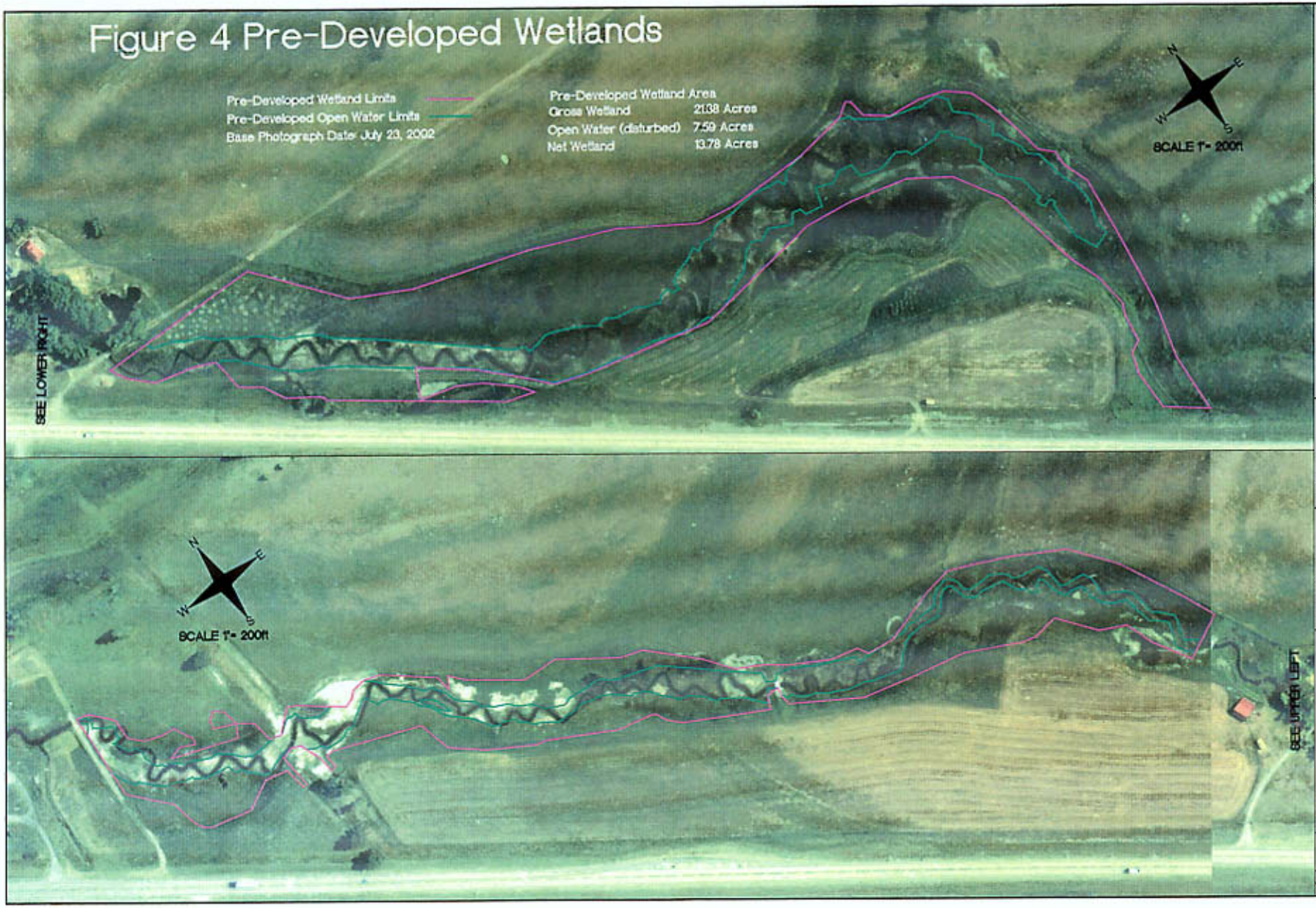
LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807

FIGURE F3

REV -

DATE 4-5-05

Figure 4 Pre-Developed Wetlands



PROJECT NAME: MDT Kleinschmidt Creek Wetland Mitigation
DRAWING TITLE: Pre-Developed Wetlands

PROJ NO. 330654.18
FILE NAME: MDT2006ESE
SCALE: NOTED
LOCATION:
DRAWN: RA
CHECKED: JB
APPVD: GH
PROJ MGR: JB

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

FIGURE F4
REV: -
DATE: 6-24-0

Appendix B

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

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Kleinschmidt Creek Project Number: 330054.1112 Assessment Date: 8/18/04
Location: SE. of Ovando MDT District: Upper Clark Fork Milepost:__
Legal description: T 14 N R 11 W Section 5 & 8 Time of Day: Morning to Afternoon
Weather Conditions: Clear & sunny Person(s) conducting the assessment: G. Howard
Initial Evaluation Date: 9/03/02 Visit #: 3 Monitoring Year: 3
Size of evaluation area: 36 acres Land use surrounding wetland: Agriculture

HYDROLOGY

Surface Water Source: Hydrology source is spring feed, perennial Kleinschmidt Creek.
Inundation**:** Present x Absent____ Average depths: 2.5 ft Range of depths: 0-5 ft
Assessment area under inundation: 30 %
Depth at emergent vegetation-open water boundary: 1.0ft (Created ponds)
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.): Large area of saturated wet-meadow for later part of summer months. Hydrology influenced by groundwater.

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.)
___GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: During mid summer visit inundation present on both created pads and excavated wetlands. Native shrub plantings inundated in many areas. Shrub & tree plantings heavily grazed by either cattle or wildlife.

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Medicago/Centaurea

Dominant Species	% Cover	Dominant Species	% Cover
Medicago sativa	60		
Centaurea maculosa	10		
Phleum pretense	10		

COMMENTS/PROBLEMS: Upland area adjacent to created pond # 2, vegetation dominated by mainly alfalfa, timothy and spotted knapweed. Transect # 1 begins at the boundary between the upland field and created wetland slopes.

Community No.: 2 Community Title (main species): Phleum/Melilotus

Dominant Species	% Cover	Dominant Species	% Cover
Phleum pratense	40	Plantings	P
Centaurea maculosa	P	*Poa pratensis*	T
Carduus nutans	T	*Trifolium spp.*	P
Melilotus officinalis	20	*Phalaris arundinacea*	T
Chrysanthemum leucanthemum	10	*Cirsium arvense*	P
Linaria vulgare	T	*Agropyron smithii*	P

COMMENTS/PROBLEMS: Slopes adjacent to pond # 2. Area mostly dominated by *Phleum pratense* and *Melilotus officinalis*. The remaining species are mostly invasive and include several state listed noxious weeds such as *Centaurea maculosa*, *Cirsium arvense* and *Chrysanthemum leucanthemum*. Native grasses seeded during construction have established a minor presence.

Community No.: 3 Community Title (main species): Phleum/Agrostis

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	10		
Phleum pratense	20		
Agrostis alba	10		

COMMENTS/PROBLEMS: Emergent vegetation growing along the pond fringe in standing water to depth of 6 inches. Transect # 1 bisects the west side of created pond.

VEGETATION COMMUNITIES (continued)

Community No.: 4 Community Title (main species): Juncus/Carex

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	30	*Solidago missouriensis*	T
Carex nebrascensis	20	*Trifolium spp.*	P
Agrostis alba	10	*Phleum pratense*	10
Phalaris arundinacea	10	*Epilobium ciliatum*	P
Glyceria elata	P	*Carex utriculata*	P

COMMENTS/PROBLEMS: Wet meadow dominated by wetland grass species. Areas located along outer edges of constructed wetland pads along creek.

Community No.: 5 Community Title (main species): Phalaris/Agrostis

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	50	*Carex nebrascensis*	10
Juncus ensifolius	10	*Epilobium ciliatum*	P
Agrostis alba	30	*Typha latifolia*	T
Deschampsia cespitosa	P	*Carex utriculata*	T
Mimulus guttatus	P	*Plantings*	T

COMMENTS/PROBLEMS: Wetlands adjacent to creek. Areas inundated during monitoring visit. Observed increase in wetland type vegetation.

Community No.: 6 Community Title (main species): Juncus/Agrostis

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	20	*Agropyron repens*	P
Trifolium pratense	10	*Bidens cernua*	20
Agrostis alba	20	*Juncus ensifolius*	30
Typha latifolia	P	*Ranunculus aquatilis var. hispidulus*	50
Melilotus officinalis	P		

COMMENTS/PROBLEMS: Pond located on the lower section of Kleinschmidt Creek project area below house and barn. Emergent type vegetation dominates pond fringes.

VEGETATION COMMUNITIES (continued)

Community No.: 7 Community Title (main species): Carex/Juncus

Dominant Species	% Cover	Dominant Species	% Cover
Juncus ensifolius	20	*Potentilla anserina*	T
Agrostis alba	10		
Carex nebrascensis	40		
Cirsium arvense	T		
Poa pratensis	10		

COMMENTS/PROBLEMS: Area of emergent vegetation located below house and barn on lower section. Area heavily grazed in past.

Community No.: 8 Community Title (main species): Centaurea/Carduus

Dominant Species	% Cover	Dominant Species	% Cover
Carduus nutans	40	*Bromus inermis*	P
Hyoscyamus niger	P	*Cirsium arvense*	10
Centaurea maculosa	20	*Cynoglossum officinale*	P
Agropyron repens	P	*Linaria vulgare*	P
Medicago sativa	T	*Agropyron cristatum*	T

COMMENTS/PROBLEMS: Area near the bottom of the lowest section adjacent to old railroad grade. Upland area dominated by invasive species; *Carduus nutans*, *Centaurea maculosa* and *Cirsium arvense*.

Community No.: 9 Community Title (main species): Salix

Dominant Species	% Cover	Dominant Species	% Cover
Salix lasiandra	70		
Phleum pratense	10		
Bromus inermis	10		

COMMENTS/PROBLEMS: Small group of several mature pacific willows located near springs.

Community No.: 10 Community Title (main species): Salix/Alnus

Dominant Species	% Cover	Dominant Species	% Cover
Salix bebbiana	30		
Alnus incana	10		
Phalaris arundinacea	30		
Agrostis alba	20		

COMMENTS/PROBLEMS: Small group of several Bebbs willow and alder located near the beginning of the upstream section. Understory dominated by herbaceous species.

Community No.: 11 Community Title (main species): Bromus/Phleum

Dominant Species	% Cover	Dominant Species	% Cover
Agropyron repens	20		
Phleum pratense	20		
Bromus inermis	40		
Sisymbrium altissimum	P		
Potentilla fruticosa	10		

COMMENTS/PROBLEMS: Upland areas dominated by grass species.

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Achillea millefolium	2,11	*Lychnis alba*	5
Agrostis alba	3,4,5,6,7,10,11	*Medicago sativa*	1
Agrostis exarata	5	*Melilotus officinalis*	2,6,8
Agropyron cristatum	8	*Mentha arvensis*	4,5
Agropyron repens	6,8	*Mimulus guttatus*	5
Agropyron smithii	5	*Phalaris arundinacea*	2,3,4,5,6,10
Alnus incana	10	*Phleum pratense*	1,2,3,4,9,11
Beckmannia syzigachne	5	*Plantago spp.*	5
Betula glandulosa	5,7	*Poa pratensis*	2,7
Bidens cernua	5	*Polygonum amphibium*	5,6
Bromus inermis	8,9,11	*Potentilla anserina*	7
Bromus tectorum	1	*Potentilla fruticosa*	4
Calamagrostis canadensis	4,5	*Ranunculus spp.*	5
Carex aquatilis	4,7	*Ranunculus aquatilis var. hispidulus*	6
Carex lanuginosa	4,5,7	*Rumex crispus*	2,5,7
Carex nebrascensis	4,5,7	*Salix bebbiana*	4,5,7,10
Carduus nutans	2,8	*Salix boothii*	2,3,4,5,6,7
Carex utriculata	4,5	*Salix drummondiana*	2,3,4,5,6,7
Centaurea maculosa	1,2,8	*Salix geyeriana*	2,3,4,5,6,7
Chenopodium album	5	*Salix lasiandra*	9
Chrysanthemum leucanthemum	2	*Sisymbrium altissimum*	11
Cirsium arvense	7	*Solidago missouriensis*	4
Cynoglossum officinale	8	*Taraxacum officinale*	1,2,4,5,7,11
Deschampsia cespitosa	5	*Thlaspi arvense*	1,2,4,5,7,11
Eleocharis palustris	4,5,6,7	*Triglochin maritimum*	4,5
Epilobium ciliatum	4,5	*Trifolium pratense*	2,4,6
Equisetum arvense	3,4,5,6,7	*Typha latifolia*	5,6
Equisetum hyemale	5	*Veronica americana*	5,6,7
Geum macrophyllum	4,5,7		
Glyceria elata	4		
Habenaria dilatata	4,5		
Hyoscyamus niger	8		
Juncus balticus	4		
Juncus ensifolius	5,6,7		
Juncus mertensianus	4,5,6,7		
Linaria vulgaris	4		

COMMENTS/PROBLEMS:

_____

_____

_____

_____

PLANTED WOODY VEGETATION SURVIVAL

Pond #	Species	Number Originally Planted	Number Observed	Mortality Causes

COMMENTS/PROBLEMS: __Due to the large number of woody plants installed at this mitigation site only stem density was counted. Survival for each species was not calculated. Refer to the revegetation section of report (Section 3.9) for survival data and summaries.

WILDLIFE

BIRDS

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes x No___Type: Boxes How many? 12 Are the nesting structures being utilized? Yes x No____ Do the nesting structures need repairs? Yes___ No x

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Deer		X	X		
Coyote			X		
Elk					X
Spotted Frog	2				

Additional Activities Checklist:

__X_ Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Macroinvertebrates sample were collected at two locations. These include the creek and pond along upper section during 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
_X_ One photo from each end of vegetation transect showing transect

Location	Photo Frame #	Photograph Description	Compass Reading
1	1	Looking north along transect.	0 ^{o}
1	2	Looking west across upland pasture.	270 ^{o}
2	3	Looking east across pond.	90 ^{o}
2	4	Looking south at transect	180 ^{o}
3	5-9	Panoramic looking west to east, upper section of site.	270 ^{o} - 90 ^{o}
4	10	Looking north along end of transect.	0 ^{o}
5	11	Panoramic looking south at transect end.	180 ^{o}
6	12-13	Looking west across upper end of site	270 ^{o}
7	14	Looking northwest across created wetland pond on lower section.	270 ^{o}
8	15	Looking northwest along channel.	270 ^{o}
9	16	Looking southeast along channel.	135 ^{o}
9	17	Looking northwest along channel.	315 ^{o}
10	18-19	Looking northwest upland areas.	315 ^{o}
11	20-21	Looking northwest at emergent wetlands and channel.	315 ^{o}
11	22-23	Looking southeast along channel.	135 ^{o}

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:

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

COMMENTS/PROBLEMS:

_____
_____

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
___ Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS:

MAINTENANCE

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

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

COMMENTS/PROBLEMS: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Kleinschmidt Creek Date: 8/18/04 Examiner: G. Howard Transect # 1

Approx. transect length: 222ft. Compass Direction from Start (Upland): 0°

Vegetation type 1:	Medicago/Centaurea	
Length of transect in this type:	15	feet
Species:		Cover:
Phleum pretense		50
Poa pratensis		10
Agropyron repens		P
Agrostis alba		10
Phalaris arundinacea		P
Medicago sativa		P
Alnus incana (Planted)		T
Centaurea maculosa		T
Total Vegetative Cover:		80%

Vegetation type 2:	Phleum/Agrostis	
Length of transect in this type:	57	feet
Species:		Cover:
Phleum pratense		20
Agrostis alba		40
Typha latifolia		P
Epilobium ciliatum		T
Poa pratensis		T
Salix boothii (Planted)		P
Phalaris arundinacea		10
Agropyron repens		T
Alnus incana (Planted)		T
Salix geyeriana (Sprigged)		T
Total Vegetative Cover:		75%

Vegetation type 3:	Juncus/Carex	
Length of transect in this type:	60	feet
Species:		Cover:
Phalaris arundinacea		30
Juncus balticus		30
Poa pratensis		P
Carex nebrascensis		10
Triglochin maritimum		T
Juncus ensifolius		P
Equisetum hyemale		T
Phleum pretense		P
Agrostis alba		20
Carex utriculata		P
Total Vegetative Cover:		95%

Vegetation type 4:	Phalaris/Agrostis	
Length of transect in this type:	90	feet
Species:		Cover:
Phalaris arundinacea		40
Agrostis alba		30
Phleum pratense		P
Agropyron repens		T
Epilobium ciliatum		10
Beckmannia syzigachne		T
Plantings		P
Polygonum amphibium		P
Deschampsia cespitosa		T
Juncus ensifolius		20
Carex lanuginosa		T
Total Vegetative Cover:		100%

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate		**Indicator Class:**	**Source:**
+ = <1%	3 = 11-20%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = >50%	0 = Facultative	

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:

3

BIRD SURVEY – FIELD DATA SHEET

Date: 8/18/04

SITE: Kleinschmidt Creek

Survey Time: 0800-1200

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Killdeer	1	F	WM				
Mallard	3	F	OW				
Western Bluebirds	3	L	WM				
Brewers Blackbirds	10	L	WM				

Notes:

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

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

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 08/18/04
Applicant/Owner: MDT	County: Powell
Investigator: Greg Howard	State: MT
Do Normal Circumstances exist on the site: x Yes ___ No	Community ID: Upland
Is the site significantly disturbed (Atypical Situation)? ___ Yes ___ No	Transect ID: 1
Is the area a potential Problem Area? ___ Yes ___ No	Plot ID: 1
(If needed, explain on reverse.)	

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Phleum pratense*	H	FACU	9			
2	*Medicago sativa*	H	--	10			
3	*Centaurea maculosa*	H	--	11			
4	*Agropyron repens*		FACU	12			
5	*Agrostis alba*		FAC+	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 1/5 = 20%

Area dominated by upland vegetation.

HYDROLOGY

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

X No Recorded Data Available

Field Observations:

Depth of Surface Water: ___ - ___ (in.)

Depth to Free Water in Pit: ___ - ___ (in.)

Depth to Saturated Soil: ___ - ___ (in.)

Wetland Hydrology Indicators:

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

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

Remarks:
No hydrology indicators present.

SOILS

Map Unit Name (Series and Phase): Tetonview Loam
Drainage Class: Poorly-drained
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? _____ Yes X No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 10+	A	10 YR 2/1	--	--	Loam

Hydric Soil Indicators:

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

Soil pit located in area of upland. Low-chroma colors present, but no direct evidence of hydric influence.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within an upland.

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 08/18/04
Applicant/Owner: MDT	County: Powell
Investigator: Greg Howard	State: MT

Do Normal Circumstances exist on the site:	X	Yes		No	Community ID: Emergent
Is the site significantly disturbed (Atypical Situation)?		Yes		No	Transect ID: 1
Is the area a potential Problem Area?:		Yes		No	Plot ID: 2
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Phleum pratense*	H	FACU	9			
2	*Agrostis alba*	H	FAC+	10			
3	*Typha latifolia*	H	OBL	11			
4	*Phalaris arundinacea*	H	FACW	12			
5	*Salix boothii*	S	OBL	13			
6			--	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 5/5= 100%

Area dominated by hydrophytic vegetation.

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- X No Recorded Data Available

Field Observations:

- Depth of Surface Water: ____ (in.)
- Depth to Free Water in Pit: ____ (in.)
- Depth to Saturated Soil: 10 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- X Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- ____ Sediment Deposits
- ____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- ____ Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

Remarks:

Hydrology indicator present with saturated soils.

SOILS

Map Unit Name (Series and Phase): Tetonview Loam
Taxonomy (Subgroup): _____
Drainage Class: Poorly-drained
Field Observations
Confirm Mapped Type? _____ Yes X No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2.5	A	10 YR 2/1	--	--	Loam
2 – 5+	B	Gley 1 7Y / Gley 1 10Y			Sandy Clay

Hydric Soil Indicators:

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

Hydric soils present with low-chroma colors.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point is considered within a wetland. Wetland area consisting of an emergent vegetation type around the pond fringe.

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 08/18/04
Applicant/Owner: MDT	County: Powell
Investigator: Greg Howard	State: MT

Do Normal Circumstances exist on the site:	X	Yes	___	No
Is the site significantly disturbed (Atypical Situation)?	___	Yes	___	No
Is the area a potential Problem Area?:	___	Yes	___	No
(If needed, explain on reverse.)				

Community ID: Emergent
Transect ID: 1
Plot ID: 3

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Carex nebrascensis*	H	OBL	9			
2	*Phalaris arundinacea*	H	FACW	10			
3	*Carex utriculata*	H	OBL	11			
4	*Juncus ensifolius*	H	FACW	12			
5	*Phleum pratense*	H	FACU	13			
6	*Juncus balticus*	H	FACW	14			
7	*Triglochin maritimum*	H	OBL	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 6/7 = 86%

Area dominated hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: 3 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
Hydrology indicator present with free water in pit. Groundwater influenced hydrology.

SOILS

Map Unit Name (Series and Phase): Tetonview Loam
Drainage Class: Poorly-drained
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? _____ Yes X No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 8+	B	10 YR 2/1	--	--	Loam with large cobbles

Hydric Soil Indicators:

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

Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within a wetland.

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 08/18/04
Applicant/Owner: MDT	County: Powell
Investigator: Greg Howard	State: MT

Do Normal Circumstances exist on the site:	X	Yes	___	No
Is the site significantly disturbed (Atypical Situation)?	___	Yes	___	No
Is the area a potential Problem Area?:	___	Yes	___	No
(If needed, explain on reverse.)				

Community ID: Emergent
Transect ID: 1
Plot ID: 4

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Carex nebrascensis*	H	OBL	9			
2	*Phalaris arundinacea*	H	FACW	10			
3	*Agrostis alba*	H	FAC+	11			
4	*Juncus ensifolius*	H	FACW	12			
5	*Phleum pratense*	H	FAC	13			
6	*Polygonum amphibium*	H	OBL	14			
7	*Deschampsia cespitosa*	H	FACW	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 7/7 = 100%

Area dominated by hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: 8 (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
Hydrology indicator present with free water in pit.

SOILS

Map Unit Name (Series and Phase): Tetonview Loam
Drainage Class: Poorly-drained
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? _____ Yes X No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 12+	A	10 YR 2/1	--	--	Sandy loam with cobbles and gravels

Hydric Soil Indicators:

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

Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within a wetland. Wetland area consisting of emergent type vegetation.

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

1. Project Name: Kleinschmidt Creek **2. Project #:** 330054.1112 **Control #:** AA-1

3. Evaluation Date: 8/18/2004 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** Channel and adjacent wetlands

6. Wetland Location(s) i. T: 14 N **R:** 11 E **S:** 5 & 8 **T:** ___ N **R:** ___ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 2 **GPS Reference No. (if applies):** _____ **Other Location Information:** _____

7. A. Evaluating Agency MDT

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

B. Purpose of Evaluation:

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

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

Comments:

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	MODIFIER [2]	% OF AA
Riverine	Riverine	Upper Perennial	Unconsolidated Bottom	Permanently Flooded	Excavated	20
Riverine	Palustrine	---	Emergent Wetland	Semipermanently Flooded	Excavated	80
---	---	---	---	---	---	
---	---	---	---	---	---	

[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)

Abundant **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.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

Comments: (types of disturbance, intensity, season, etc.) Livestock grazing and hay production.

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, Canada thistle, Oxeye daisy, black henbane, pennycress, musk thistle, pepper grass, butter & eggs and lambsquaters.

iii. Briefly describe AA and surrounding land use / habitat: AA is a riparian corridor with spring fed Kleinschmidt creek and adjacent emergent wetlands. Surrounding land use include livestock grazing and hay fields. AA located along HWY 200, 5 miles E. of Ovando.

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	Bull Trout
Incidental habitat **(list species)**	☒ D ☐ S	Bald Eagle
No usable habitat	☐ D ☒ S	Grizzly Bear, Lynx

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	---	---	.8 (M)	---	---	---	---

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

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	Westslope Cutthroat Trout
Incidental habitat **(list species)**	☐ D ☒ S	Common Loon
No usable habitat	☐ D ☒ S	Missoula Phlox

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	---	---	.7 (M)	---	---	---	---

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

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)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

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

Comments: _____

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

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

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

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

Duration of Surface Water in AA	☒ 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	--	--	.7 (M)	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: _____

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

Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not 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**	--	--	--	--	--	--	--	--	--
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**	1 (H)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with 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**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	.9 (H)	--	--	--	--	--	--	--

Comments: _____

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 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A	☒ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☒ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	.8H	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	1 (H)
No Discharge/Recharge indicators present	--
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)	--	--	--	--	--	--	--	.3L	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?
☐ **Yes** [Proceed to 14L (ii) and then 14L(iv).] ☒ **No** [Rate as low in 14L(iv)]

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

Ownership	Disturbance at AA from #12(i)		
	☐ Low	☒ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	.3(L)	--

Comments: _____

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	Mod	0.80	1	
B. MT Natural Heritage Program Species Habitat	Mod	0.70	1	
C. General Wildlife Habitat	Mod	0.70	1	
D. General Fish/Aquatic Habitat	Mod	0.70	1	
E. Flood Attenuation	NA	0.00	--	
F. Short and Long Term Surface Water Storage	High	1.00	1	
G. Sediment/Nutrient/Toxicant Removal	High	0.90	1	
H. Sediment/Shoreline Stabilization	High	1.00	1	
I. Production Export/Food Chain Support	High	0.80	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.30	1	
L. Recreation/Education Potential	Low	0.3	1	
	Totals:	**8.20**	**11.00**	
		Percent of Total Possible Points:	**75%** (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: Kleinschmidt Creek **2. Project #:** 330054.1112 **Control #:** AA-2

3. Evaluation Date: 8/18/2004 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** Excavated wetlands and fringe

6. Wetland Location(s) i. T: 14 N **R:** 11 E **S:** 5 & 8 **T:** ____ N **R:** ____ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 2 **GPS Reference No. (if applies):** _____

Other Location Information: _____

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)
1.55 (measured, e.g. GPS)

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

Comments:

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Riverine	Palustrine	None	Unconsolidated Bottom	Permanently Flooded	Excavated	
Riverine	Palustrine	None	Emergent Wetland	Intermittently Exposed	Excavated	
---	Palustrine	None	Unconsolidated Shore	Intermittently Exposed	Excavated	

[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.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

Comments: (types of disturbance, intensity, season, etc.) Livestock grazing and hay production.

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, Canada thistle, Oxeye daisy, black henbane, pennycress, musk thistle, pepper grass, butter & eggs and lambsquaters.

iii. Briefly describe AA and surrounding land use / habitat: AA is a riparian corridor with spring fed Kleinschmidt creek and adjacent emergent wetlands. Surrounding land use includes livestock grazing and hay production. AA located along HWY 200, 5 miles E. of Ovando.

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

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	Bull Trout
Incidental habitat **(list species)**	☒ D	☐ S	Bald Eagle
No usable habitat	☐ D	☒ S	Grizzly Bear, Lynx

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	---	---		---	.2(L)	---	---

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

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	_____
Secondary habitat **(list species)**	☐ D	☐ S	_____
Incidental habitat **(list species)**	☐ D	☒ S	Common Loon
No usable habitat	☐ D	☒ S	Missoula Phlox

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(L)	---

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

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)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

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

Comments: _____

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

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

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

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

Duration of Surface Water in AA	☐ 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: _____

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**	--	--	--	--	--	--	--	--	--
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**	1 (H)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with 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**	--	--	.7 (M)	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: _____

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 %	.7 (M)	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☒ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☒N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	.6M	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	1 (H)
No Discharge/Recharge indicators present	--
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)	--	--	--	--	--	--	--	0.3	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Ownership	Disturbance at AA from #12(i)		
	☐ Low	☒ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	.3(L)	--

Comments: _____

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	0.20	1	
B. MT Natural Heritage Program Species Habitat	Low	0.10	1	
C. General Wildlife Habitat	Mod	0.70	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	NA	0.00	--	
F. Short and Long Term Surface Water Storage	High	1.00	1	
G. Sediment/Nutrient/Toxicant Removal	Mod	0.70	1	
H. Sediment/Shoreline Stabilization	Mod	0.70	1	
I. Production Export/Food Chain Support	Mod	0.60	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.30	1	
L. Recreation/Education Potential	Low	0.30	1	
	Totals:	**5.60**	**10.00**	
		Percent of Total Possible Points:	**56%** (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
2004 AERIAL PHOTOGRAPH

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

Photo Point No. 1: View looking north along vegetation transect. Vegetation community types along transect include upland, open-water and emergent wetlands.

Photo Point No. 1: View looking west towards upland vegetation adjacent to wetland corridor.

Photo Point No. 2: View looking east across excavated wetland and outer fringe. Pond fringe planted with riparian shrubs and trees. Pond fringe currently dominated mostly by aggressive and/or invasive species.

Photo Point No. 2: View looking southeast at the start of vegetation transect. Emergent vegetation developing in shallow water.

Photo Point No. 4: View looking north at end of transect. Enhanced wetland pads dominated by herbaceous wetland species. Reconstructed channel in the background.

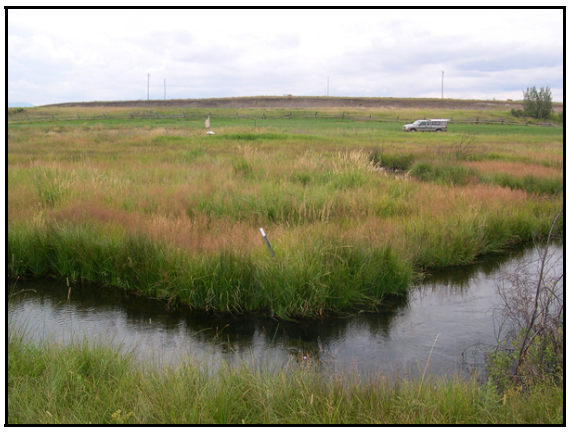


Photo Point No. 5: View looking south at the end of transect from opposite side of the reconstructed creek.

Photo Point No. 6: View looking west across the mitigation site. Mitigation types include reconstructed channel, enhanced wetlands and excavated wetlands.

Photo Point No. 7: View looking northwest across smaller excavated wetland on lower section of site.

Photo Point No. 8: View looking northwest along reconstructed channel on lower section.

Photo Point No. 9: View looking southeast along channel and adjacent wetland dominated by emergent vegetation.

Photo Point No. 9: View looking northwest along the channel and emergent vegetation on lower section.

Photo Point No. 10: View looking northwest towards bottom end of mitigation site. Dry side slope dominated by invasive musk thistle. Area heavily disturbed from livestock grazing. Area originally planted with riparian shrubs and tree, now devoid of any woody materials.

Photo Point No. 11: View looking northwest towards the bottom end of mitigation site. Area dominated by emergent vegetation.

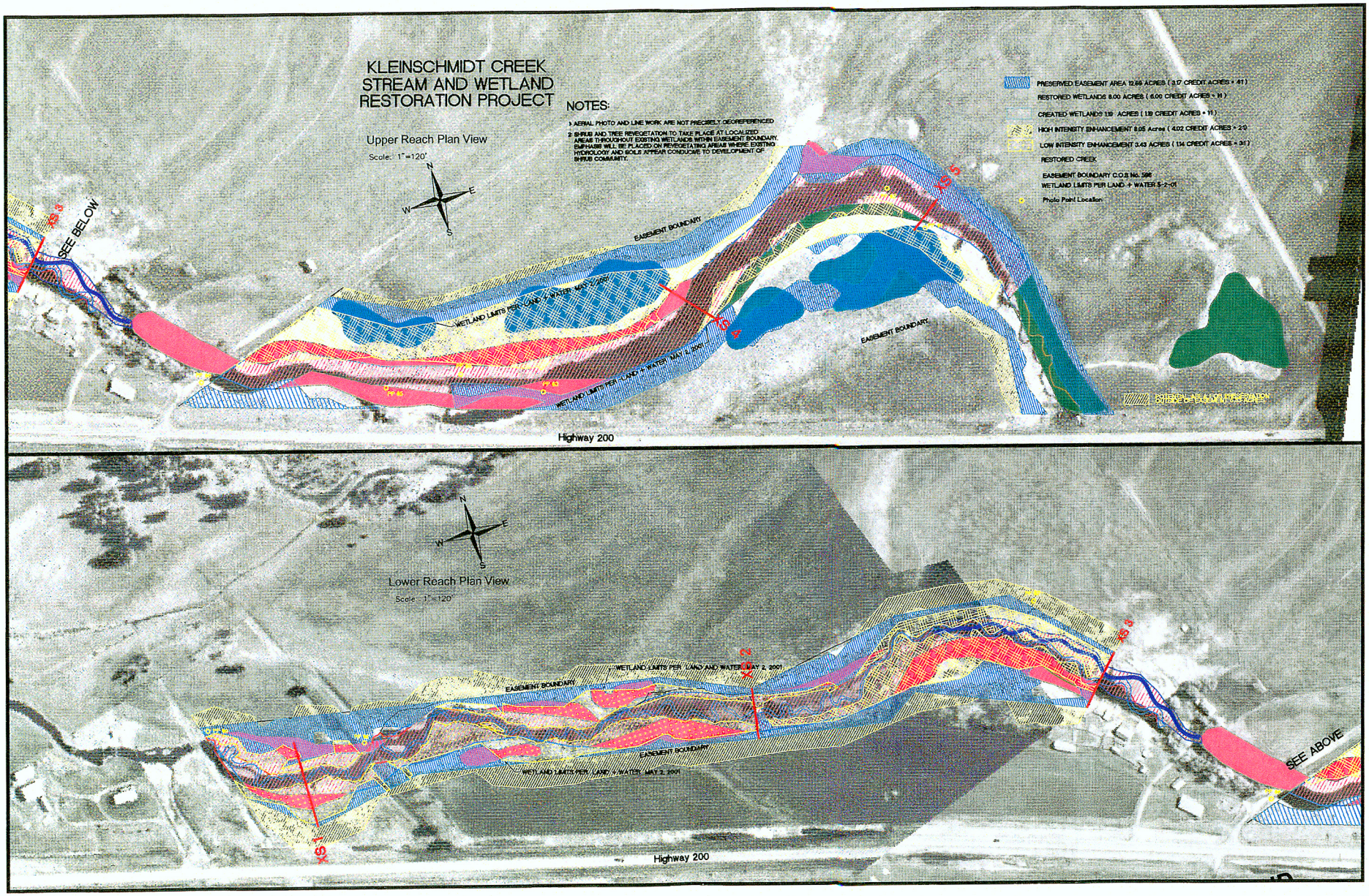
Photo Point No. 3: Panoramic view looking from west to east. Upper reaches of most recent mitigation work. Area includes upland, excavated wetland, reconstructed channel and enhancement of wetlands.

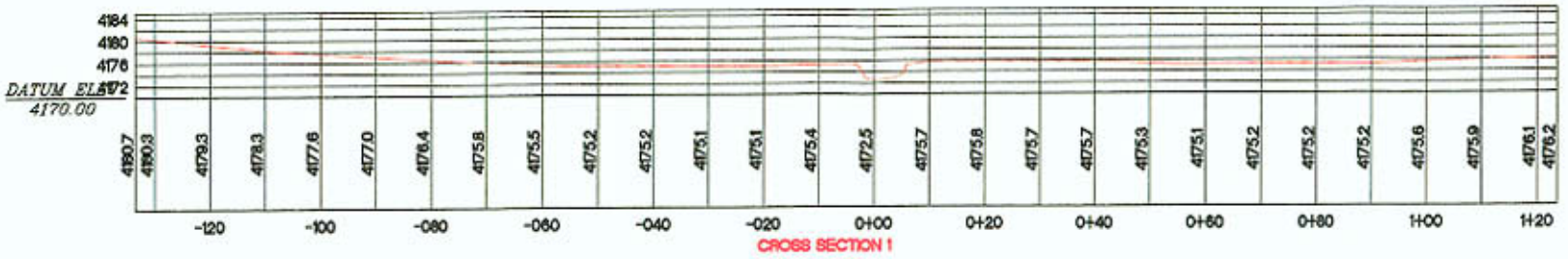
2004 KLEINSCHMIDT CREEK AERIAL PHOTOGRAPH

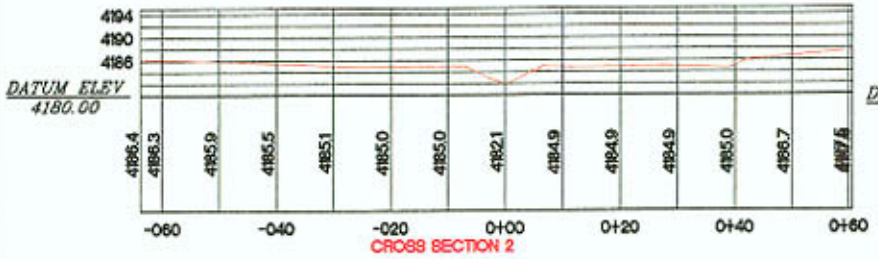
Appendix D

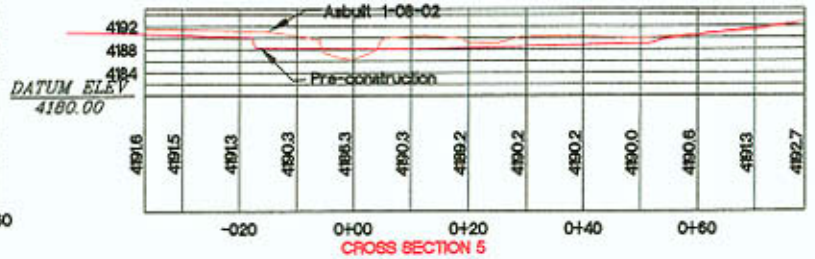
ORIGINAL SITE PLAN

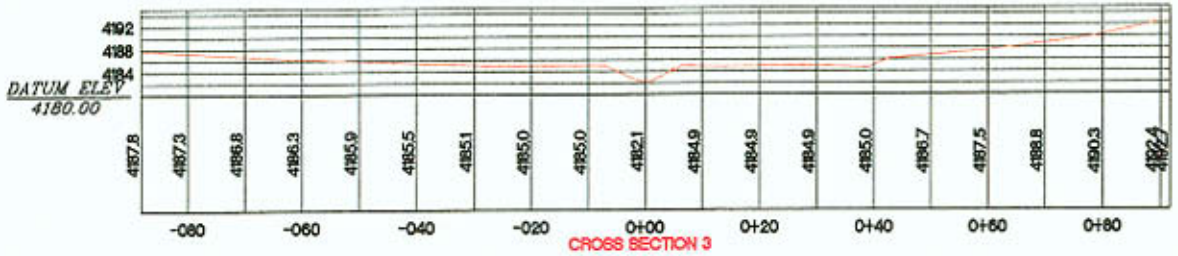
MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

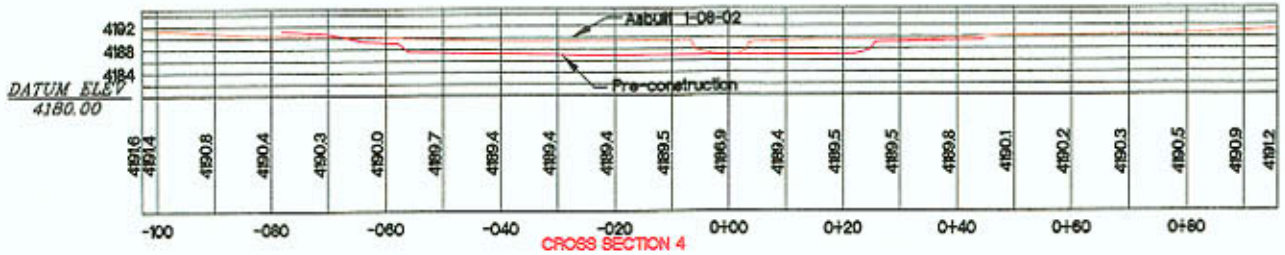

KLEINSCHMIDT CREEK
STREAM AND WETLAND
RESTORATION PROJECT
NOTES:
1. AERIAL PHOTO AND LINE WORK ARE NOT PRECISELY GEOREFERENCED
2. SHRUB AND TREE REVEGETATION TO TAKE PLACE AT LOCALIZED AREAS THROUGHOUT EXISTING WETLANDS WITHIN EASEMENT BOUNDARY. EMPHASIS WILL BE PLACED ON REVEGETATING AREAS WHERE EXISTING HYDROLOGY AND SOILS APPEAR CONDUCIVE TO DEVELOPMENT OF SHRUB COMMUNITY.
Upper Reach Plan View
Scale: 1"=120'
N
E
W
S
PRESERVED EASEMENT AREA 12.66 ACRES (3.7 CREDIT ACRES * 4:1)
RESTORED WETLANDS 8.00 ACRES (8.00 CREDIT ACRES * 1)
CREATED WETLANDS 3.19 ACRES (1.9 CREDIT ACRES * 1:1)
HIGH INTENSITY ENHANCEMENT 8.05 Acres (4.02 CREDIT ACRES * 2:1)
LOW INTENSITY ENHANCEMENT 3.43 ACRES (1.14 CREDIT ACRES * 3:1)
RESTORED CREEK
EASEMENT BOUNDARY C.O.E No. 596
WETLAND LIMITS PER LAND + WATER 5-2-01
Photo Point Location
SEE BELOW
SEE ABOVE
EASEMENT BOUNDARY
WETLAND LIMITS PER LAND + WATER MAY 2, 2001
Highway 200
Lower Reach Plan View
Scale: 1"=120'
N
E
W
S
EASEMENT BOUNDARY
WETLAND LIMITS PER LAND AND WATER MAY 2, 2001
Highway 200











Klienschmidt Creek Enhancement

Klienschmidt Creek Cross Sections

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

PROJECT NO: 2001195.174
FILE NAME: enhancement.dwg
SCALE: 1"=20'
LOCATION: Osando, MT

DESIGN: RAA
CHECKED:
APPVD:
DRAWN BY: Kristi P. Callahan

FIGURE

REV: 0
DATE: 1-09-02

Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

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

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

GPS Mapping and Aerial Photo Referencing Procedure

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

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

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

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

Appendix F

2004 MACROINVERTEBRATE PROTOCOL SAMPLE AND DATA ANALYSES

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

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 MDT KLEINSCHMIDT CREEK **Date Collected** 8 /18/2004

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
		Turbellaria	3	3.06%	Yes	4	PR
Amphipoda		Copepoda	5	5.10%	Yes	8	CG
	Talitridae	*Hyalella*	1	1.02%	Yes	8	CG
Diptera	Ceratopogonidae	Ceratopogoninae	1	1.02%	Yes	6	PR
	Chironomidae	*Cricotopus (Cricotopus)*	1	1.02%	Yes	7	SH
		Orthocladius	23	23.47%	Yes	6	CG
		Parakiefferiella	2	2.04%	Yes	6	CG
		Psectrocladius	1	1.02%	Yes	8	CG
		Radotanypus	1	1.02%	Yes	7	PR
		Tanytarsus	15	15.31%	Yes	6	CF
	Tipulidae	*Tipula*	1	1.02%	Yes	4	SH
Ephemeroptera	Baetidae	*Baetis tricaudatus*	1	1.02%	Yes	4	CG
	Ephemerellidae	*Ephemerella inermis*	1	1.02%	Yes	4	SH
Haplotaxida	Naididae	*Nais*	31	31.63%	Yes	8	CG
	Tubificidae	Tubificidae	1	1.02%	Yes	10	CG
Lumbriculida	Lumbriculidae	*Eclipidrilus*	2	2.04%	Yes	4	CG
Plecoptera	Perlodidae	*Kogotus*	1	1.02%	Yes	1	PR
Trichoptera	Hydroptilidae	*Hydroptila*	1	1.02%	Yes	6	PH
Trombidiformes		Acari	6	6.12%	Yes	5	PR
Grand Total			**98**				

Aquatic Invertebrate Data Summary

Project ID: MDT04LW
Activity ID:
STORET Station ID:
Station Name: MDT KLEINSCHMIDT CREEK
Sample Date: 8/18/2004

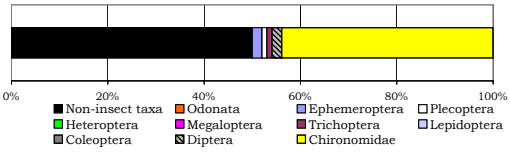
Sample type	
SUBSAMPLE TOTAL ORGANISMS	98
Portion of sample used	36.67%
Estimated number in total sample	267
Conversion factor	3.668
Estimated number in 1 square meter	359
Sampling effort	
Habitat type	
EPT abundance	4
Taxa richness	19
Number EPT taxa	4
Percent EPT	4.08%

TAXONOMIC COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Non-insect taxa	50.00%	49	7
Odonata	0.00%	0	0
Ephemeroptera	2.04%	2	2
Plecoptera	1.02%	1	1
Heteroptera	0.00%	0	0
Megaloptera	0.00%	0	0
Trichoptera	1.02%	1	1
Lepidoptera	0.00%	0	0
Coleoptera	0.00%	0	0
Diptera	2.04%	2	2
Chironomidae	43.88%	43	6

TAXONOMIC RATIOS

METRIC	VALUE
EPT/Chironomidae	0.09
Baetidae/Ephemeroptera	0.50
Hydropsychidae/Trichopt	0.00

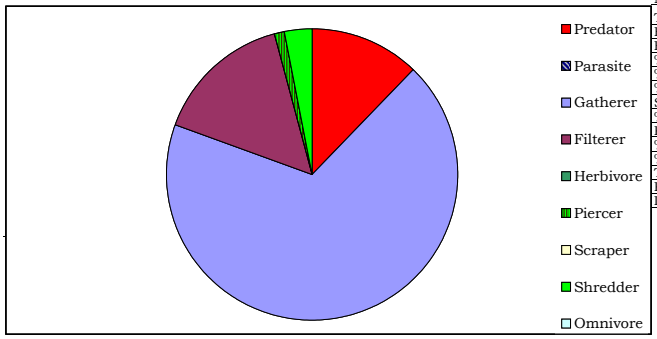


FUNCTIONAL COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Predator	12.24%	12	5
Parasite	0.00%	0	0
Gatherer	68.37%	67	9
Filterer	15.31%	15	1
Herbivore	0.00%	0	0
Piercer	1.02%	1	1
Scraper	0.00%	0	0
Shredder	3.06%	3	3
Omnivore	0.00%	0	0
Unknown	0.00%	0	0

FUNCTIONAL RATIOS

METRIC	VALUE
Scraper/Filterer	0.00
Scraper/Scraper + Filtere	0.00



COMMUNITY TOLERANCES

Sediment tolerant taxa	2
Percent sediment tolerant	2.04%
Sediment sensitive taxa	0
Percent sediment sensitive	0.00%
Metals tolerance index (McGuire)	4.24
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	2
Percent hemoglobin bearers	2.04%
Air-breather richness	1
Percent air-breathers	1.02%
Burrower richness	2
Percent burrowers	2.04%
Swimmer richness	1
Percent swimmers	1.02%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Nais	31	31.63%
Orthocladius	23	23.47%
Tanytarsus	15	15.31%
Acari	6	6.12%
Copepoda	5	5.10%
SUBTOTAL 5 DOMINANTS	80	81.63%
Turbellaria	3	3.06%
Eclipidrilus	2	2.04%
Parakiefferiella	2	2.04%
Tubificidae	1	1.02%
Hyalella	1	1.02%
TOTAL DOMINANTS	89	90.82%

TOLERANCE/CONDITION INDICES

Community Tolerance Quotient (CTQa)	90.80
Hilsenhoff Biotic Index	6.56

DIVERSITY

Shannon H (loge)	2.74
Shannon H (log2)	1.90
Margalef D	3.92
Simpson D	0.18
Evenness	0.10

VOLTINISM

TYPE	ABUNDANCE	# TAXA	PERCENT
Multivoltine	59	11	60.20%
Univoltine	39	8	39.80%
Semivoltine	0	0	0.00%

TAXA CHARACTERS	#TAXA	PERCENT
Tolerant	3	3.06%
Sensitive	0	0.00%
Clinger	5	19.39%

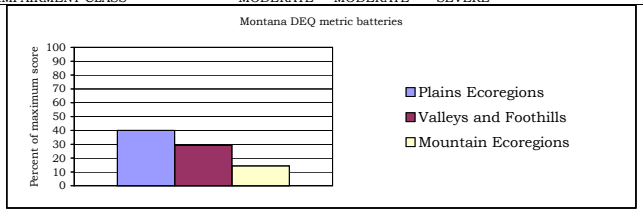
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE
Taxa richness	19	1
E richness	2	1
P richness	1	1
T richness	1	1
Long-lived	0	1
Sensitive richness	0	1
%tolerant	3.06%	5
%predators	12.24%	3
Clinger richness	5	1
%dominance (3)	70.41%	3
	TOTAL SCORE	18 36%

MONTANA DEQ INDICES (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	19	2	1	1
EPT richness	4	1	0	0
Biotic Index	6.56	1	0	0
%Dominant taxon	31.63%	2	2	2
%Collectors	83.67%	1	1	0
%EPT	4.08%	0	0	0
Shannon Diversity	1.90	1		
%Scrapers +Shredde	3.06%	1	0	0
Predator taxa	5	2		
%Multivoltine	60.20%	1		
%H of T	0.00%		3	
TOTAL SCORES		12	7	3
PERCENT OF MAXIMUM		40.00	29.17	14.29
IMPAIRMENT CLASS		MODERATE	MODERATE	SEVERE



Montana Valleys and Foothills revised index (Bollman 1998)

Percent max.	33.33%	Impairment class	MODERATE

Montana Plains ecoregions metrics (Bramblett and Johnson 2002)

Riffle		*Pool*	
EPT richness	4	E richness	2
Percent EPT	4.08%	T richness	1
Percent Oligochaetes and Leeches	34.69%	Percent EPT	4.08%
Percent 2 dominants	55.10%	Percent non-insect	50.00%
Filterer richness	1	Filterer richness	1
Percent intolerant	1.02%	Univoltine richness	8
Univoltine richness	8	Percent supertolerant	39.80%
Percent clingers	19.39%		
Swimmer richness	1		

Aquatic Invertebrate Taxonomic Data

Site Name MDT KLEINSCHMIDT POND **Date Collected** 8 /18/2004

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
Amphipoda							
	Talitridae						
		Hyalella	1	0.95%	Yes	8	CG
Basommatophora							
	Lymnaeidae						
		Lymnaeidae	10	9.52%	No	6	SC
		Stagnicola	4	3.81%	Yes	6	SC
Coleoptera							
	Dytiscidae						
		Dytiscidae	4	3.81%	Yes	5	PR
		Laccophilus	2	1.90%	Yes	5	PR
	Haliplidae						
		Haliplus	2	1.90%	Yes	5	PH
	Hydrophilidae						
		Tropisternus	1	0.95%	Yes	5	PR
Diplostraca							
		Cladocera	5	4.76%	Yes	8	CF
Diptera							
	Chironomidae						
		Ablabesmyia	1	0.95%	Yes	8	CG
		Cricotopus (Cricotopus)	1	0.95%	Yes	7	SH
		Cricotopus (Isocladius)	1	0.95%	Yes	7	SH
		Psectrocladius	2	1.90%	Yes	8	CG
Ephemeroptera							
	Baetidae						
		Baetidae	4	3.81%	Yes	4	CG
		Callibaetis	4	3.81%	Yes	9	CG
	Ephemerellidae						
		Drunella	1	0.95%	Yes	1	SC
Heteroptera							
	Notonectidae						
		Notonecta	1	0.95%	Yes	5	PR
Odonata							
	Coenagrionidae						
		Coenagrionidae	58	55.24%	Yes	7	PR
	Libellulidae						
		Libellulidae	2	1.90%	Yes	9	PR
Plecoptera							
	Pteronarcyidae						
		Pteronarcella	1	0.95%	Yes	4	SH
Grand Total			**105**				

Aquatic Invertebrate Data Summary

Project ID: MDT04LW
Activity ID:
STORET Station ID:
Station Name: MDT KLEINSCHMIDT POND
Sample Date: 8/18/2004

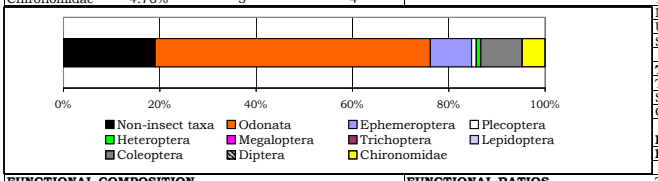
Sample type	
SUBSAMPLE TOTAL ORGANISMS	105
Portion of sample used	26.67%
Estimated number in total sample	394
Conversion factor	5.044
Estimated number in 1 square meter	530
Sampling effort	
Habitat type	
EPT abundance	10
Taxa richness	18
Number EPT taxa	4
Percent EPT	9.52%

TAXONOMIC COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Non-insect taxa	19.05%	20	4
Odonata	57.14%	60	2
Ephemeroptera	8.57%	9	3
Plecoptera	0.95%	1	1
Heteroptera	0.95%	1	1
Megaloptera	0.00%	0	0
Trichoptera	0.00%	0	0
Lepidoptera	0.00%	0	0
Coleoptera	8.57%	9	4
Diptera	0.00%	0	0
Chironomidae	4.76%	5	4

TAXONOMIC RATIOS

METRIC	VALUE
EPT/Chironomidae	2.00
Baetidae/Ephemeroptera	0.89
Hydropsychidae/Trichopt	#DIV/0!

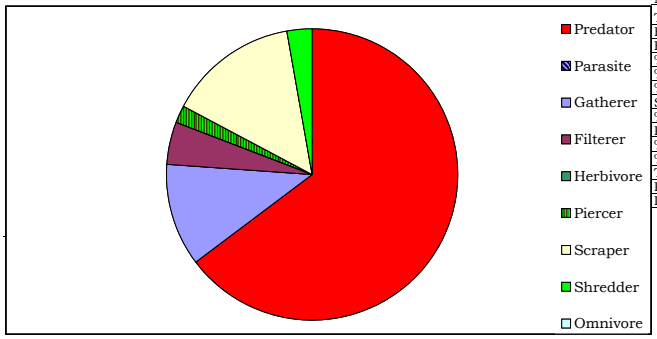


FUNCTIONAL COMPOSITION

GROUP	PERCENT	ABUNDANCE	#TAXA
Predator	64.76%	68	6
Parasite	0.00%	0	0
Gatherer	11.43%	12	5
Filterer	4.76%	5	1
Herbivore	0.00%	0	0
Piercer	1.90%	2	1
Scraper	14.29%	15	3
Shredder	2.86%	3	3
Omnivore	0.00%	0	0
Unknown	0.00%	0	0

FUNCTIONAL RATIOS

METRIC	VALUE
Scraper/Filterer	3.00
Scraper/Scraper + Filtere	0.75



COMMUNITY TOLERANCES

Sediment tolerant taxa	2
Percent sediment tolerant	13.33%
Sediment sensitive taxa	0
Percent sediment sensitive	0.00%
Metals tolerance index (McGuire)	3.11
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	1
Percent hemoglobin bearers	0.95%
Air-breather richness	3
Percent air-breathers	6.67%
Burrower richness	0
Percent burrowers	0.00%
Swimmer richness	5
Percent swimmers	9.52%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Coenagrionidae	58	55.24%
Lymnaeidae	10	9.52%
Cladocera	5	4.76%
Stagnicola	4	3.81%
Baetidae	4	3.81%
SUBTOTAL 5 DOMINANTS	81	77.14%
Callibaetis	4	3.81%
Dytiscidae	4	3.81%
Libellulidae	2	1.90%
Laccophilus	2	1.90%
Haliplus	2	1.90%
TOTAL DOMINANTS	95	90.48%

TOLERANCE/CONDITION INDICES

Community Tolerance Quotient (CTQa)	79.80
Hilsenhoff Biotic Index	6.68

DIVERSITY

Shannon H (loge)	2.51
Shannon H (log2)	1.74
Margalef D	3.86
Simpson D	0.32
Evenness	0.09

VOLTINISM

TYPE	ABUNDANCE	# TAXA	PERCENT
Multivoltine	18	7	17.14%
Univoltine	75	6	71.43%
Semivoltine	12	6	11.43%

TAXA CHARACTERS	#TAXA	PERCENT
Tolerant	9	82.86%
Sensitive	0	0.00%
Clinger	4	3.81%

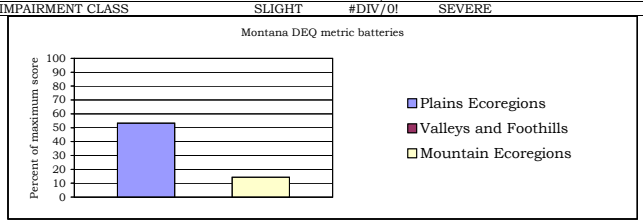
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE
Taxa richness	18	1
E richness	3	1
P richness	1	1
T richness	0	1
Long-lived	6	5
Sensitive richness	0	1
%tolerant	82.86%	1
%predators	64.76%	5
Clinger richness	4	1
%dominance (3)	69.52%	3
	TOTAL SCORE	20 40%

MONTANA DEQ INDICES (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	18	2	1	0
EPT richness	4	1	0	0
Biotic Index	6.68	1	0	0
%Dominant taxon	55.24%	1	0	0
%Collectors	16.19%	3	3	3
%EPT	9.52%	0	0	0
Shannon Diversity	1.74	0		
%Scrapers +Shredde	17.14%	2	1	0
Predator taxa	6	3		
%Multivoltine	17.14%	3		
%H of T	#DIV/0!		#DIV/0!	
TOTAL SCORES		16	#DIV/0!	3
PERCENT OF MAXIMUM		53.33	#DIV/0!	14.29
IMPAIRMENT CLASS		SLIGHT	#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	4	E richness	3
Percent EPT	9.52%	T richness	0
Percent Oligochaetes and Leeches	0.00%	Percent EPT	9.52%
Percent 2 dominants	64.76%	Percent non-insect	19.05%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.95%	Univoltine richness	6
Univoltine richness	6	Percent supertolerant	14.29%
Percent clingers	3.81%		
Swimmer richness	5		

Appendix G

PLANTING SPECIFICATIONS

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

Kleinschmidt Plantings Fall 2001, Spring & Fall 2002

Willow planting:

Fall 2001 sprigging
6000

Containerized seedlings:

Scientific name	Common Name	Fall 2001	Spring 20002	Fall 2002	Total
Alnus incana	Alder	250	1250	0	**1500**
Betula glandulosa	Bog birch	0	700	0	**700**
Cornus stolonifera	Dogwood	0	0	1250	**1250**
Crataegus douglasii	Hawthorne	250	0	1250	**1500**
Populus tremuloides	Quaking Aspen	0	1000	0	**1000**
Populus trichocarpa	Black cottonwood	0	500	0	**500**
Rosa woodsii	Woods rose	0	250	0	**250**
Salix boothii	Booth's willow	250	1000	0	**1250**
Salix lutea	Yellow willow	250	1250	0	**1500**
Salix bebbiana	Bebb's willow	0	1200	0	**1200**
Salix drummondia	Drummonds willow	0	1000	0	**1000**
Salix geyeriana	Geyer willow	0	1250	0	**1250**
		1000	9400	2500	**12900**