MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2007

Kleinschmidt Creek
Ovando, Montana

Prepared for:

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

Prepared by:

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

December 2007

PBS&J Project No: B43088.00

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1.0 INTRODUCTION

This report documents the 2007 (sixth and final year) monitoring results at the Kleinschmidt Creek Wetland Mitigation Site. The site was privately designed and constructed, and the Montana Department of Transportation (MDT) agreed to purchase 12 acres of credit at the site to mitigate wetland impacts associated with two 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 within the Upper Clark Fork River Basin (watershed #2). 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 delineation for the Kleinschmidt Creek proposed mitigation site in the summer of 1999. A U.S. Fish and Wildlife Service contractor conducted the baseline functional assessments for the site in 1998.

The approximate site boundary is illustrated on **Figure 2** in **Appendix A**. The project is located on private property within a 47-acre perpetual wetland conservation easement. Kleinschmidt Creek originates south of Highway 200 and flows west through the project site before 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 Kleinschmidt Flats and eventually discharging along the Kleinschmidt Creek corridor outside and within the easement area.

Construction at the Kleinschmidt Creek Mitigation Site was completed during the summer of 2001. The overall goals of this project were the restoration and enhancement (high and low intensity) of a heavily grazed and degraded stream/wetland complex. 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.
- Conversion of degraded channel/open water into wetland on approximately 6 acres.
- Planting woody vegetation at a density of 500 stems per acre in portions of the site.
- Eliminating the existing stock water channel under the highway.

Creation

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

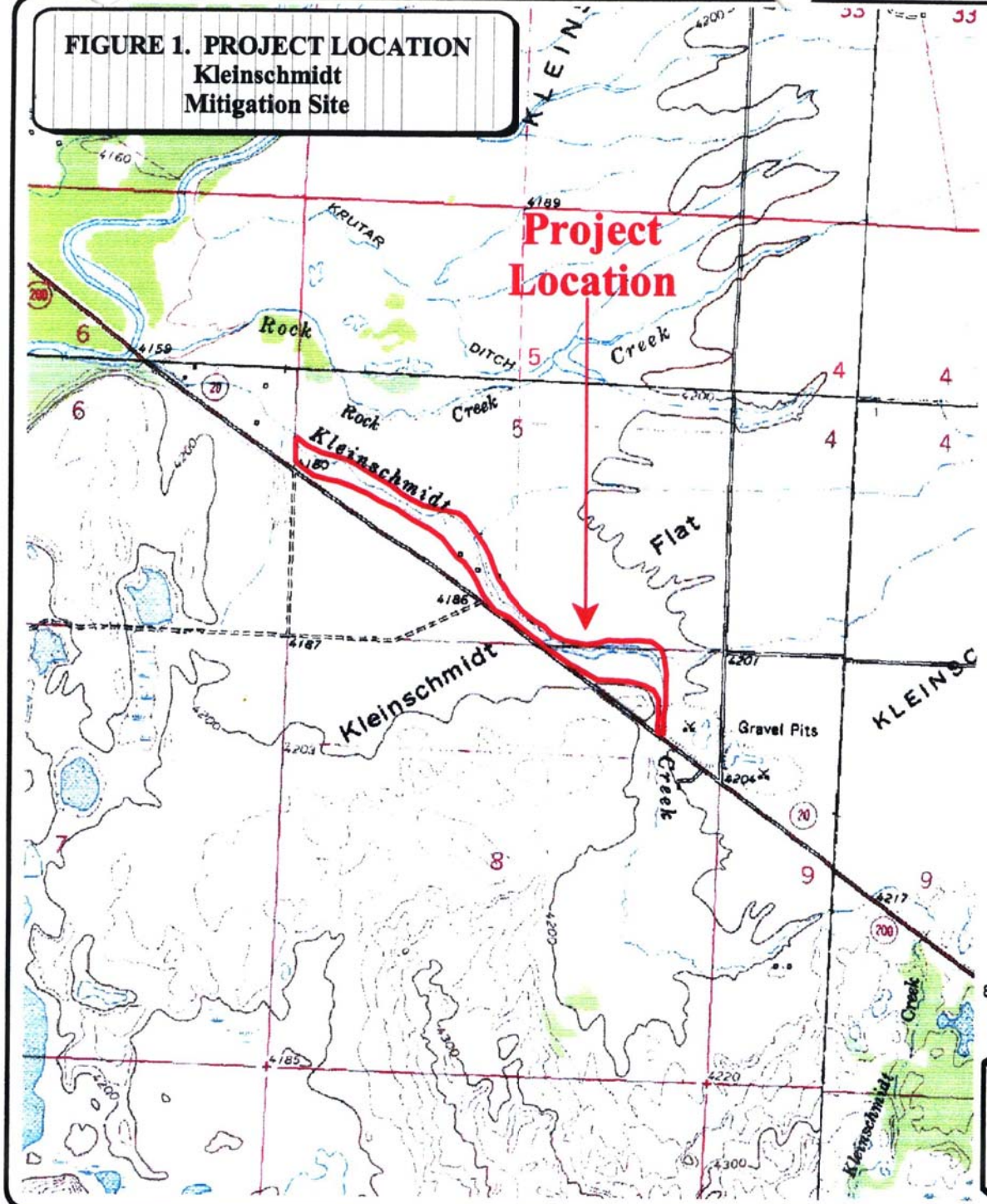
High Intensity Enhancement

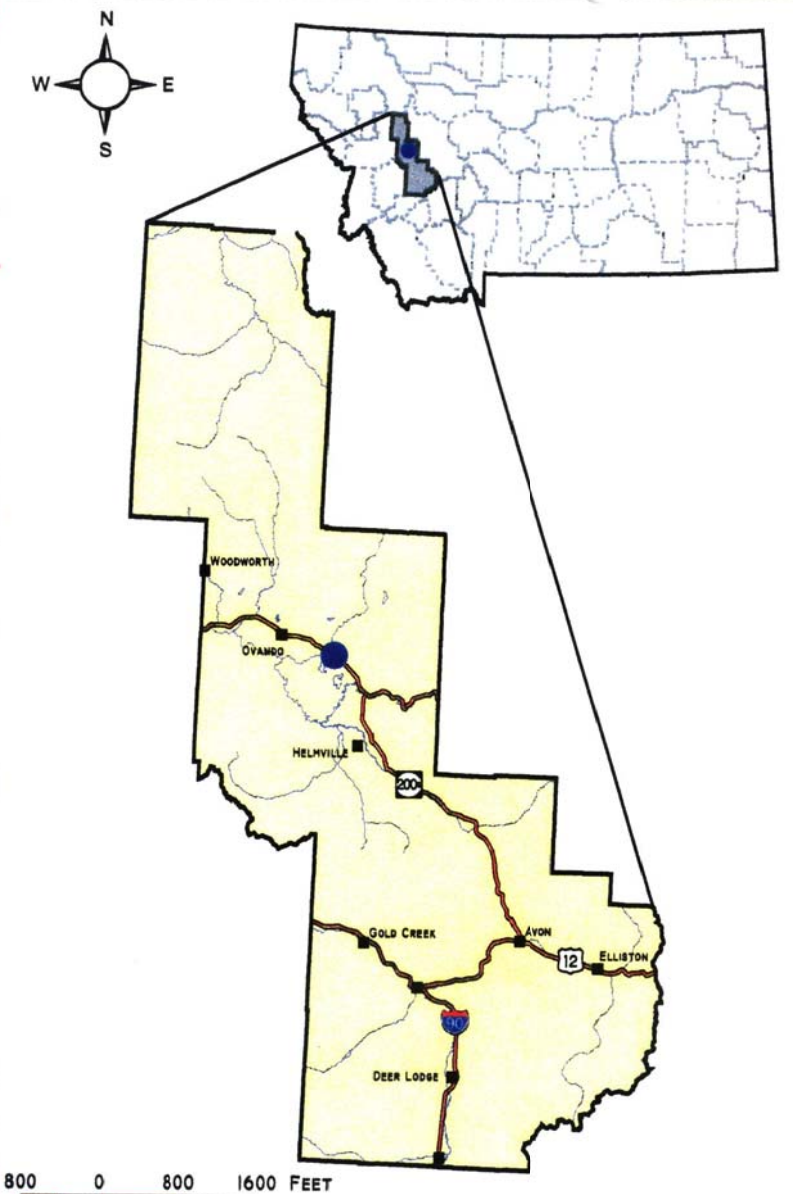
- Planting woody vegetation on approximately 8.05 acres of existing degraded wetlands at a density of 1,500 stems per acre.

Low Intensity Enhancement

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

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

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.

Overall mitigation credit goals and credit ratios approved by the Corps of Engineers (COE) (Steinle 2001) are contained in **Table 1**. MDT agreed to purchase 12 acres of credit from the site.

Table 1: ***Mitigation credit goals and credit ratios for the Kleinschmidt Creek Wetland Mitigation Site.***

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
Total	**31.36**	**--**	**15.52**[a]

[a] MDT agreed to purchased 12 acres of credit from the site.

The Kleinschmidt Creek site is monitored once per year to document wetland and other biological attributes. The monitoring area is illustrated in **Figure 2** in **Appendix A**.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on August 21st (mid-season) of 2007. Monitoring activities were conducted on both the "upstream" (top half of **Figures 2** and **3** in **Appendix A**) and "downstream" (bottom half of **Figures 2** and **3** in **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 Wetland Mitigation Site Monitoring Form (**Appendix B**). No groundwater monitoring wells were installed at the site.

Channel cross sections established on January 8, 2002 were re-sampled on December 1, 2006 (**Appendix A**).

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 Wetland Mitigation 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** in **Appendix A**. The transect is used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the aerial 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 was updated as new species were encountered. All noxious weed locations observed on-site were mapped and illustrated on **Figure 3**.

Revegetation enhancements were implemented in the spring of 2002. Planting survival ratings and stem counts were conducted during the 2003 - 2007 monitoring seasons. Live 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. One meter-wide belt transects of varying lengths were used to evaluate plantings throughout the site. The lengths of transects were 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.

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 aerial 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 2007 were accomplished by hand-mapping

onto the 2007 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 Mitigation 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 (**Appendix B**).

2.7 Birds

Bird observations were recorded during the mid-season visit on the Wetland Mitigation Monitoring Site Form (**Appendix B**). No formal protocol, census plot, spot mapping, point count, or strip transect 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** in **Appendix A**). The Macroinvertebrate Sampling Protocol was used (**Appendix F**). Samples were preserved as outlined in the sampling procedure and sent to Rhithron Associates, Inc. in Missoula, Montana for analysis (**Appendix F**).

2.9 Functional Assessment

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

2.10 Photographs

The July 14, 2007 aerial photograph was used for **Figures 2** and **3** (**Appendix A**). 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 was mapped onto **Figure 2** in **Appendix A**. All photographs were taken using a digital camera during the 2003 to 2007 visits.

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 2007. Procedures used for GPS mapping and aerial photography referencing are included 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 groundwater flowing from numerous springs that feed Kleinschmidt Creek, a perennial flowing stream that is a tributary to the North Fork of the Blackfoot River. Kleinschmidt Creek does not experience a large peak flow resulting 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 1.75 acres within the mitigation site (**Figure 3** in **Appendix A**). 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.

Channel cross sections established on January 8, 2002 were re-sampled on December 1, 2006 and the results are presented on **Figure 5** in **Appendix A**. 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 were not anticipated and have not been observed to date.

3.2 Vegetation

Seventy-eight plant species were identified at the site and are listed in **Table 2**. The majority of these species are herbaceous, occurring in saturated wetland meadow complexes and the 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 Bebb willow (*Salix bebbiana*) and shrubby potentilla

Table 2: ***2002 - 2007 vegetation species list at the Kleinschmidt Creek Wetland Mitigation Site.***

Scientific Name[1]	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
Allium brevistylum	short-style onion	--
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 crawei	Crawe sedge	FACW
Carex flava	yellow sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Carduus nutans	musk thistle	--
Carex utriculata	beaked sedge	OBL
Carex simulata	short-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
Eriophorum viridicarinatum	green-keeled cottongrass	OBL
Geum macrophyllum	big leafed avens	OBL
Glyceria elata	tall mannagrass	FACW+
Glyceria striata	fowl mannagrass	OBL
Habenaria dilatata	bog orchid	--
Hyoscyamus niger	black henbane	--
Hypericum perforatum	St. John's-wort	---
Juncus balticus	Baltic rush	FACW
Juncus ensifolius	three-stamen rush	FACW
Juncus mertensianus	Merten's rush	OBL
Juncus nodosus	tuberous rush	OBL
Lemna minor	common duckweed	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

[1] **Bolded** species indicate those documented in the analysis area for the first time in 2007.

Table 2 (continued): ***2002 - 2007 vegetation species list at the Kleinschmidt Creek Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Najas flexilis	wavy water nymph	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
Rumex crispus	Curly dock	FACW
Sagittaria latifolia	broadleaf arrowhead	OBL
Salix bebbiana	Bebb willow	FACW
Salix boothii	Booths willow	OBL
Salix drummondiana	Drummond willow	FACW
Salix geyeriana	Geyer willow	FACW+
Salix lasiandra	pacific willow	FACW+
Scirpus acutus	hardstem bulrush	OBL
Scirpus spp.	bulrush	--
Sisymbrium altissimum	tall tumble mustard	FACU-
Sisyrinchium angustifolium	blue-eyed grass	FACW-
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 2007.

(*Potentilla fruticosa*) occur throughout some of the wet meadow complexes, but for the most part are very limited in distribution due to the historic livestock grazing.

Nine wetland and four upland community types were identified and mapped at the mitigation site (**Figure 3** in **Appendix A**). The nine 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*, Type 10: *Salix/Alnus*, Type 12: *Phalaris/Typha* and Type 13: *Ranunculus/Juncus.* The four upland community types include Type 1: *Medicago/Centaurea*, Type 2: *Phleum/Melilotus*, Type 8: *Centaurea/Carduus*, and Type 11: *Bromus/Phleum.* Plant species observed within each of these communities are listed on the **Monitoring Forms** (**Appendix B**).

Wetland Types 4, 9, and 10 were present before reconstruction of the channel. 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*). During the 2005 monitoring, Crawe sedge (*Carex crawei*), rated S2 by the Montana Natural Heritage Program, and green-keeled cottongrass

(*Eriophorum viridicarinatum*), formerly rated as S3, were identified in this type. Type 9 consists of a small group of several mature Pacific willows found near the heads of the larger springs located near the east end of the site. Type 10 is located along the upper most reaches of the mitigation site; vegetation is dominated by Bebb 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. Type 3 *Phleum/Agrostis*, formerly located in the upstream section of the project around the shallow water fringes of the excavated wetland, was replaced by Type 12 during 2005. Type 12 is dominated by reed canarygrass, cattails and aquatic vegetation. 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 (*Juncus balticus*) and Nebraska sedge (*Carex nebrascensis*) that was removed from within Type 4. The streambank and adjacent wetlands were sprigged with several willow species and also planted with variety of 10T cubic inch 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 2007 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.

Type 6 is located around the fringe of excavated wetland on the lower, downstream section of the mitigation site. Vegetation surrounding the excavated wetland fringe is dominated by dagger leaf rush, redtop and nodding beggars-ticks (*Bidens cernua*). Type 13 was added during the 2005 monitoring. Areas considered as open water within the smaller excavated wetland were mapped as shallow water with emergent and aquatic bed vegetation types. The shallow waters are dominated by whitewater buttercup (*Ranunculus aquatilis var. hispidulus*) and other aquatic vegetation. The remaining wetland 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, 7 and 12. Larger, more mature shrubs were transplanted along the channel banks in Type 5. Refer to **Sections 3.9** and **3.10** and **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 (*Medicago sativa*) 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 planned 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 weed species. Type 8 is dominated by spotted knapweed and musk thistle (*Carduus nutans*). Type 8 populations of musk thistle showed obvious signs of weed control efforts with dead or damaged stems and leaves during the 2007 monitoring. 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.

Noxious weed locations observed during the 2007 field visit were mapped and are illustrated on **Figure 3** in **Appendix A**. These were individual noxious weed locations or small patches not mapped as a community type. These include the following species: Canada thistle and St. John's-wort (*Hypericum perforatum*). Weed species distributions were also captured in the community types which have detailed information regarding cover values for each species (**Monitoring Forms** in **Appendix B**). Several other noxious weed species were recorded only at the community level and therefore not mapped as an individual plant or patch. These included oxeye daisy (*Chrysanthemum leucanthemum*), butter and eggs (*Linaria vulgaris*), and spotted knapweed. Other invasive or non-native species included musk thistle, common dandelion (*Taraxacum officinale*), lambsquarter, clasping pepper-grass (*Lepidium perfoliatum*), black henbane (*Hyoscyamus niger*), 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 3**.

Table 3: ***Transect 1 data summary for 2002 – 2007.***

Monitoring Year	2002-2003	2004	2005	2006	2007
Transect Length (feet)	222	222	222	222	222
# Vegetation Community Transitions along Transect	4	4	4	4	4
# Vegetation Communities along Transect	4	4	4	4	4
# Hydrophytic Vegetation Communities along Transect	3	3	3	3	3
Total Vegetative Species	25	23	22	22	20
Total Hydrophytic Species	17	17	18	17	18
Total Upland Species	8	6	4	5	2
Estimated % Total Vegetative Cover	95	95	88	86	93
% Transect Length Comprised of Hydrophytic Vegetation Communities	93	93	93	93	93
% Transect Length Comprised of Upland Vegetation Communities	7	7	7	7	7
% Transect Length Comprised of Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprised of Bare Substrate	0	0	0	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.***

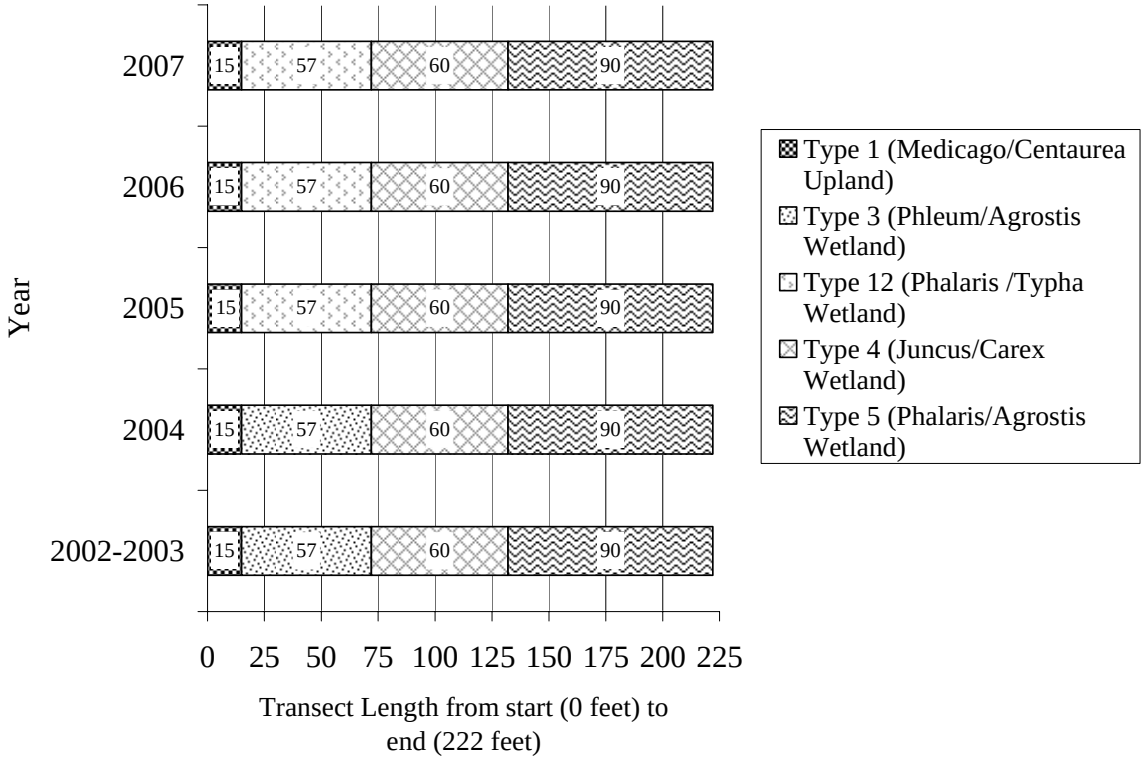
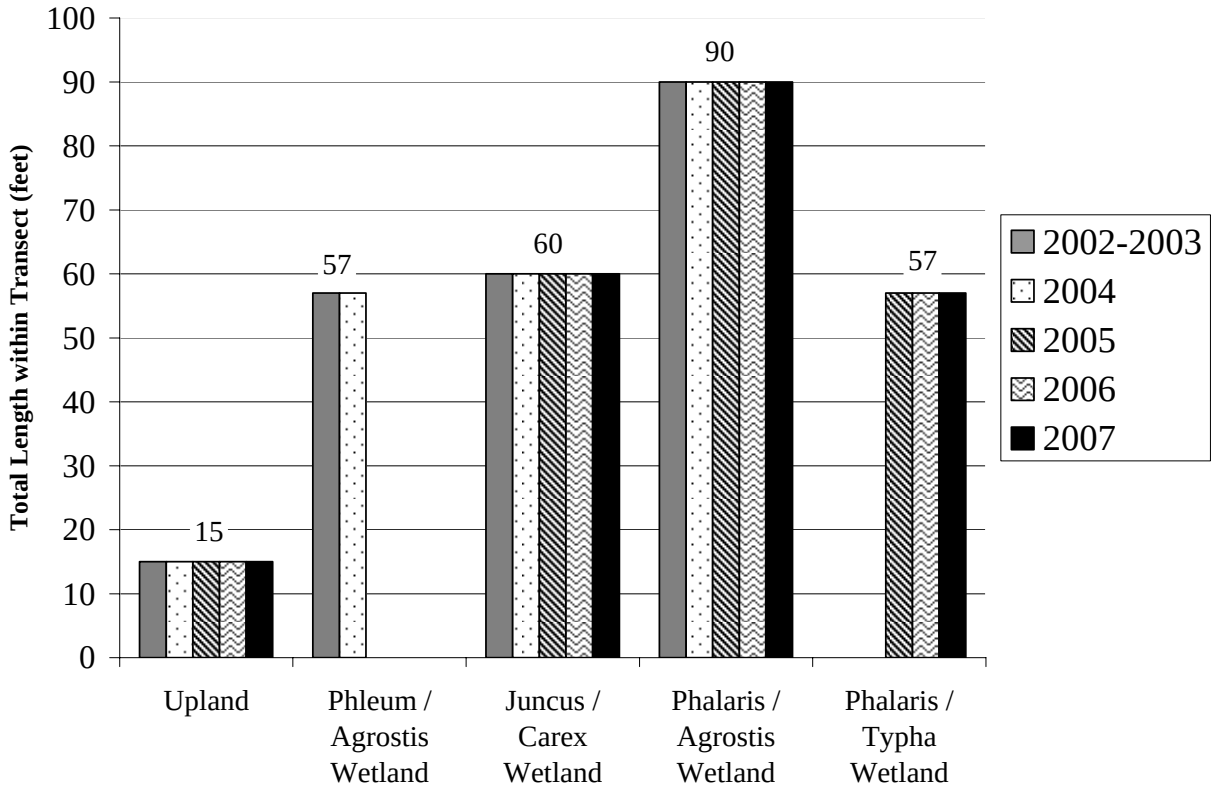


Chart 2: ***Length of vegetation communities along Transect 1 for each year monitored.***



3.3 Soils

The soils located at the Kleinschmidt Creek site are mapped as Tetonview Loam and Perma Gravelly Loam (NRCS 2004). 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 COE Routine Wetland Delineation Data 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 4**; **Figure 4** in **Appendix A**). Wetland conditions identified in 1999 and from 2002 to 2007 monitoring are presented in **Table 4**.

Table 4: ***Wetland conditions within the Kleinschmidt Creek Wetland Mitigation Site.***

Condition	2007 (acre)	2006 (acre)	2005 (acre)	2004 (acre)	2002-2003 (acre)	Pre-Project 1999 (acre)
Gross Wetland Area	25.12	25.41	25.25	25.25	25.99	21.38
Open Water Area	2.41	2.41	2.43	2.72	2.60	7.59
Net Wetland Area	**22.71**	**23.00**	**22.82**	**22.53**	**23.30**	**13.78**

Approximately 22.71 wetland acres and 2.41 restored channel/open water acres are currently within the monitoring area (**Figure 3** in **Appendix A**). 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 2007 was 22.71 – 13.78 = 8.93 acres, while the open water of 7.59 (degraded channel) acres decreased to 2.41 acres, consisting of restored sinuous stream channel (1.75 acres) and portions of one excavated shallow wetland (0.66 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.

3.5 Wildlife

Wildlife species and evidence of wildlife, observed on the site during the 2002 to 2007 monitoring visits are listed in **Table 5**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the completed **Monitoring Form** in **Appendix B**. Nine of 13 bird boxes exhibited signs of use in 2007.

Table 5: ***2002-2007 fish and wildlife species observed at the Kleinschmidt Creek Wetland Mitigation Site.***

FISH	
Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)	Bull Trout (*Salvelinus confluentus*)
Brook Trout (*Salvelinus fontinalis*)	Rainbow (*Oncorhynchus mykiss*)
Brown Trout (*Salmo trutta linnaeus*)	Sculpins (*Cottus* spp.)
AMPHIBIAN	
Spotted Frog (*Rana luteiventris*)	
REPTILE	
None	
BIRD	
American Dipper (*Cinclus mexicanus*)	Killdeer (*Charadrius vociferus*)
American Crow (*Corvus brachyrhynchos*)	**Mallard (*Anas platyrhynchos*)**
Bald Eagle (*Haliaeetus leucocephalus)*	**Marsh wren (*Cistothorus palustris*)**
Barn swallow (*Hirundo rustica*)	**Northern pintail (*Anas acuta*)**
Brewers Blackbird (*Euphagus cyanocephalus*)	**Red-tailed hawk (*Buteo jamaicensis*)**
Bluebird (*Sialia mexicana*)	**Sandhill crane (*Grus canadensis*)**
Blue-winged teal (*Anas discors*)	Savannah Sparrow (*Passerculus sandwichensis*)
Bufflehead (*Bucephala albeola*)	Solitary Sandpiper (*Tringa solitaria*)
Canada Goose (*Branta canadensis*)	Sparrows (*Spizella* spp.)
Common snipe (*Gallinago gallinago*)	**Tree swallow (*Tachycineta bicolor*)**
Eastern kingbird (*Tyrannus tyrannus*)	**Vesper sparrow (*Pooecetes gramineus*)**
Grasshopper Sparrow (*Ammodramus savannarum*)	**Western meadowlark (*Sturnella neglecta*)**
Great blue heron (*Ardea herodias*)	Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)
Great horned owl (*Bubo virginianus*)	
MAMMAL	
Coyote (*Canis latrans*)	Elk (*Cervus elaphus*)
Deer (*Odocoileus sp.*)	**Striped Skunk (*Mephitis mephitis*)**

Bolded species were observed during 2007 monitoring.

This site provides habitat for a variety of wildlife species, although this was not necessarily reflected in the 2002 - 2007 monitoring data. Indications of one fish, one amphibian, and fourteen bird species were noted at the mitigation site during the 2007 site visits (**Table 5**). Deer frequent the site and occasionally the property owner has observed elk on the site. Deer are thought to be partially responsible for browse disturbance to planted woody vegetation, although livestock broke into a portion of the site in 2004.

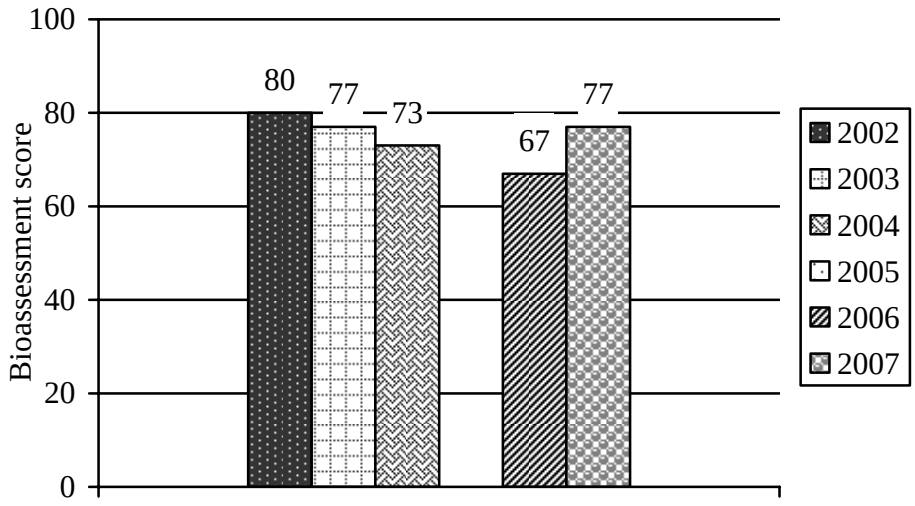
The newly constructed channel offers habitat for three fish species. These include low numbers of brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta linnaeus*), and sculpins (*Cottus* spp.) (FWP 2006). Final 2007 survey results are not yet available. Montana Fish, Wildlife and Parks conducted pre-project and post-project surveys during 1998, 2000, 2003, 2004, 2006, and 2007.

3.6 Macroinvertebrates

Complete 2007 results from the macroinvertebrate sampling locations (**Figure 2** in **Appendix A**) are presented in **Appendix F**. Two points were sampled at this mitigation site during 2007. The two 2007 sampling locations are along the creek and shallow open water on the upstream section of the site. There was a slight decline in the stream bioassessment score between the years 2002 and 2007; however, the reason for this decline is not clear. In this spring-fed system, the banks and bed are extremely stable through the site (e.g., no sediment concerns), indicating that the decline may be related to an unidentified upstream water quality problem causing a dominance of filamentous algae in the stream. The following macroinvertebrate analysis was summarized below in italics by Rhithron Associates, Inc. and graphically (**Charts 3** and **4**) illustrated (Bollman 2007).

Shallow Open Water – 2007
Biotic conditions at this site were optimal in 2007; nearly all metric indicators of habitat complexity and water quality showed improvement since 2006. Macrocrustaceans were common, and macrophyte-associated taxa such as Enallagma *sp. and* Anax *sp. were abundant. These findings suggest that vegetation was well-developed at the site. Aquatic habitat complexity was augmented by benthic substrates and open-water. Thermal preference for the invertebrate assemblage was calculated as 16.9ºC, suggesting temperatures cooler than the median value for mitigated sites in this study.*

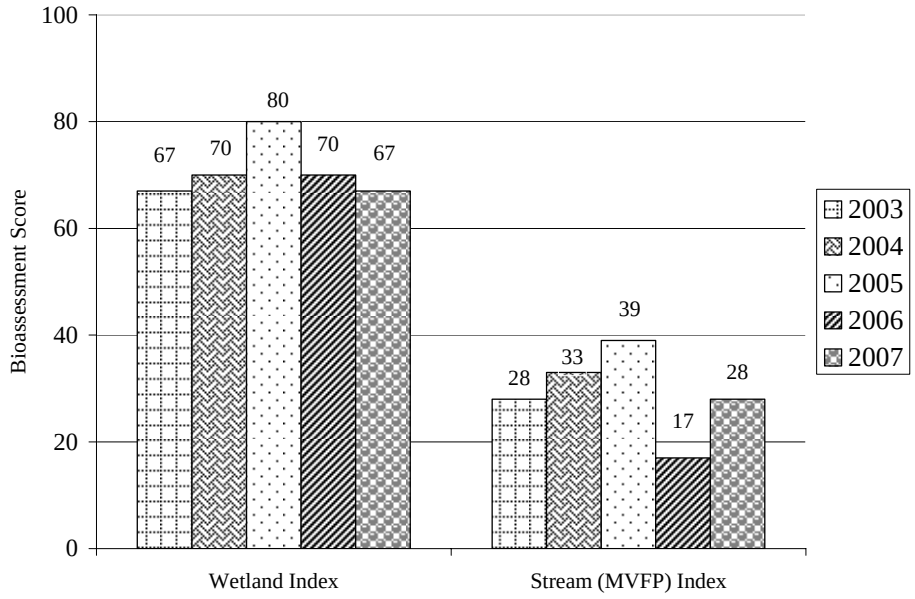
Chart 3: ***Bioassessment scores for Kleinschmidt Creek Wetland Mitigation Shallow Open Water Site.***



Stream - 2007

Both lentic and lotic flow conditions were evident at the stream site; many taxa collected here were rheophilic. Neither the wetland (lentic) index nor the stream (lotic) index appears to be appropriate to assess biological conditions here. While the wetland index indicates optimal conditions, moderate impairment is indicated by the lotic index. Naidid worms dominated the 2007 sample; together with the caddisfly Hydroptila *sp. and the midges* Cricotopus *sp., these animals suggest the presence of filamentous algae. Instream habitats were probably limited to the algae, cobbly substrates, and open water. Macrophyte-associated taxa were not common.*

Chart 4: ***Bioassessment scores for Kleinschmidt Creek Wetland Mitigation Stream Site.***



3.7 Functional Assessment

Functional Assessment Forms were completed for wetlands in 2007 (**Appendix B**). The two assessment areas (AAs) evaluated at Kleinschmidt Creek were separated into channel corridor/wetlands (23.57 acres) and excavated wetlands (1.55 acres) and rated as Category II (high value) and Category III (moderate value), respectively.

The channel corridor/wetland area received moderate to high ratings for threatened and endangered (T&E) species habitat, Montana Natural Heritage Program (MTNHP) species habitat, 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 variable for MTNHP species habitat rated high due to the identification in 2005 of an S2 plant species, Crawe sedge. A formerly-listed S3 species, green-keeled cottongrass, was also noted. Also contributing to this higher rating was the presence of secondary habitat for westslope cutthroat trout (*Oncorhynchus clarki lewisi*) based on Montana Fish, Wildlife & Parks surveys in 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.

The Category III rating for excavated wetlands was 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 6**), approximately 209 functional units occur at the Kleinschmidt Creek mitigation site. Baseline functional assessment results are also provided in **Table 6** for general comparative purposes. However, it should be noted that direct comparison between the baseline and 2002 – 2007 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 – 2007 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 were taken from photo-points and transect ends (**Appendix C**).

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/tree 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 7** describes the type of mitigation work and stems per acre requirement.

Table 6: ***Summary of 1998 (baseline) and 2002 to 2007 wetland function/value ratings and functional points at the Kleinschmidt Creek Wetland Mitigation Project.***[1]

Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method[1]	1998 Channel & Wetlands Lower Section (MDT/USFWS[3])	1998 Channel & Wetlands Upper Section (MDT/USFWS[3])	2002 – 2003 Channel & Wetlands (LWC[3])	2002 – 2003 Ponds (LWC[3])	2004 Channel & Wetlands (LWC[3])	2004 Ponds (LWC[3])	2005 Channel & Wetlands (LWC[3])	2005 Ponds (LWC[3])	2006 Channel & Wetlands[2] (PBS&J[3])	2006 Ponds[2] (PBS&J[3])	2007 Channel & Wetlands[2] (PBS&J[3])	2007 Ponds[2] (PBS&J[3])
Listed/Proposed T&E Species Habitat	Low (0.2)	Low (0.2)	Mod (0.8)	Low (0.2)	Mod (0.8)	Low (0.2)	Mod (0.8)	Low (0.5)	Mod (0.8)	Low (0.5)	Mod (0.8)	Low (0.0)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Mod (0.7)	Low (0.1)	Mod (0.7)	Low (0.1)	High (1.0)	Low (0.1)	High (1.0)	Low (0.1)	High (1.0)	Low (0.2)
General Wildlife Habitat	Mod (0.5)	Mod (0.5)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	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	Mod (0.7)	NA	Mod (0.7)	NA	Mod (0.7)	NA
Flood Attenuation	NA	NA	NA	NA	NA	NA	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)	High (1.0)	High (1.0)	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)	High (0.9)	Mod (0.7)	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)	High (1.0)	Mod (0.7)	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)	High (0.8)	Mod (0.7)	High (0.8)	Mod (0.7)	High (0.8)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	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)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	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)	Low (0.3)	Low (0.3)	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	8.5/11	6.0/10	8.5/11	6.0/10	8.5/11	5.6/10
% of Possible Score Achieved	41%	45%	75%	56%	75%	56%	77%	60%	77%	60%	77%	56%
Overall Category	III	III	II	III	II	III	II	III	II	III	II	III
Total Acreage of Assessed Wetlands and Open Water within Easement (acre)	**10.40**	**12.90**	**24.35**	**1.64**	**23.70**	**1.55**	**23.70**	**1.55**	**23.86**	**1.55**	**23.57**	**1.55**
Functional Units (acreage x actual points) (fu)	**46.8**	**64.5**	**199.67**	**9.18**	**194.34**	**8.68**	**201.45**	**9.3**	**202.81**	**9.3**	**200.34**	**8.68**
Total Functional Units At Site (fu)	**111.30**		**208.85**		**203.02**		**210.75**		**212.11**		**209.02**	
Total Functional Unit "Increase"[1] (fu)	**NA**		**97.55**		**91.72**		**99.45**		**100.81**		**97.72**	

[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 - 2007 monitoring conditions. Thus, direct comparison of pre- and post-project functions is not possible; although, some general trends can be noted.

[2] See completed 2007 MDT functional assessment forms **Appendix B** for further detail.

[3] Assessment completed as indicated by Montana Department of Transportation (MDT), U.S. Fish & Wildlife Service (USFWS), or Post, Buckley, Schuh, and Jernigan (PBSJ), which was formally Land & Water Consulting (LWC).

Table 7: ***Type of mitigation work and required stems per acre for the Kleinschmidt Creek Wetland Mitigation Site.***

Type of Mitigation Work	Planting Area	Required Stems per Acre for Credit[1]
Restoration	Channel, streambank, and wetland pads	500
Creation	Fringes around shallow open water	500[2]
High-intensity enhancement	Emergent wetlands	1,000
Low-intensity enhancement	Emergent wetlands	500

[1] As presented in LWC (2001) and confirmed in Steinle (2001); [2] Not specifically stated as success criterion in LWC (2001).

Twelve species were planted at this mitigation site (**Table 8**). Species selection was based on observation of similar wetlands in the Ovando area and species historically known to occur in this region. Refer to **Appendix G** for a list of species and their associated quantities.

Table 8: ***Planted species at Kleinschmidt Creek Wetland 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*

3.10 Woody Species Survival and Performance Success

Results from the belt transects were calculated using extrapolated stem densities. The results from the belt transect evaluations for each mitigation type are presented in **Table 9**. The "percent of 1 acre" figures listed in **Table 9** are based on a combined total for all transects walked for each mitigation type. **Table 9** 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 9: ***Stem density count for each mitigation type for the Kleinschmidt Creek Wetland Mitigation Site.***

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
2007	2,376	5	85	5,950	14	225	2,673	6	115	1,188	3	38
2006	3,396	8	109	6,395	15	212	3,168	7	153	1,040	2	46
2005	2,495	6	108	3,614	8	256	3,218	7	254	426	1	21
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 unintentional livestock grazing. During the 2004 monitoring, no woody plants were observed in this low intensity area, and the results represent these findings. During the 2006 – 2007 monitoring a few woody plants were located in this area. The low intensity site still lacks significant amounts of woody plants, except for a few larger transplanted shrubs and a resurgence of volunteer shrubby potentilla.

Ultimately, the cover of woody species throughout the site can be estimated based on transect data. **Table 10** 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 grossly 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 for 2007 show an increased stem density for creation and restored mitigation areas, while the low and high intensity zones decreased. Stem density numbers varied between monitoring years for several reasons, including slight variability in transect locations and transect length. All mitigation areas had less area (sq. ft.) assessed than in 2006, except for the low intensity zones.

Table 10: ***Extrapolated woody stem densities for each mitigation zone at the Kleinschmidt Wetland Mitigation Site.***

Mitigation Zone	2003 Estimated Density Per Acre	2004 Estimated Density Per Acre	2005 Estimated Density Per Acre	2006 Estimated Density Per Acre	2007 Estimated Density Per Acre	Target Stem Density Per Acre
Creation	1,625	2,883	1,800	1,363	1,700	500 (along perimeter)
Restoration	2,295	3,430	3,200	1,413	1,607	500 (throughout)
High Intensity Enhancement	2,537	2,083	3,629	2,185	1,917	1,000 (throughout)
Low Intensity Enhancement	2,637	0	2,100	2,300	1,267	500 (throughout)

Current methods for stem density calculation are likely grossly over-estimating actual stem densities at the site. However, as these estimates are currently three times greater than the performance requirements in creation and restoration areas and two times greater than the performance requirement in the high-intensity enhancement areas, the 2007 stem densities are likely still meeting the target density agreed to by the Army Corps of Engineers (LWC 2001) for all categories except low intensity enhancement. The estimated stem count for the low-intensity area is likely exaggerated. Woody stems counted in this area were recorded from a single location that most likely received less grazing pressure than the other areas of the low-intensity enhancement area.

3.11 Maintenance Needs/Recommendations

Although the landowner treated weeds near the upper excavated shallow open water area and other areas in 2004 and 2007, several noxious weeds are present, but at much lower quantities. These included Canada thistle, hounds tongue, oxeye daisy and spotted knapweed. Significant progress has been made during the 2007 season to eradicate weeds from the site. The continued spread of noxious weeds within the dry portion of upland areas within the mitigation areas is still possible and annual control efforts should continued to eliminate this spread.

Areas outside the perimeter of the excavated wetlands, which are currently dominated by mostly invasive species, could 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 would be recommended due to the woody vegetation already installed in this area. Areas where aggressive reed canarygrass is encroaching on planted woody species could be mechanically controlled to limit disturbance to plantings. Heavy browse from local wildlife has been observed across the entire site. Control measures 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. To achieve credit in the low intensity sections, the areas impacted by livestock grazing would likely need to be revegetated with woody plants.

3.12 Current Credit Summary

As of 2007, approximately 22.71 acres of wetland and 2.41 acres of open water (restored stream channel/portions of excavated wetlands) occur at the Kleinschmidt Creek mitigation site. This represents an approximate increase of 8.93 wetland acres and, per the design, a 5.18-acre decrease of over-excavated, straightened open water channel as compared to baseline conditions. Open water on the site is currently comprised of 1.75 acres of restored sinuous channel and 0.66 acre of excavated shallow water as a component of wetland creation. Functional units at the site have essentially doubled to over 209 since project construction.

Table 11 summarizes the maximum credit that could be assigned to the site as of 2007. 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 11: ***Maximum 2007 credit for the Kleinschmidt Creek Wetland Mitigation Site.***

Mitigation Type	Current Acres	Ratio	Current Maximum Credit Acres	Overall Target Credit Acres	Comments
Designed Restoration	6.00	1:1	6.0	6.0	Does not include 1.75 acres of open water stream channel. Extrapolated stem density (1,607) is exceeding performance standard (500).
Designed Creation	1.19	1:1	1.19	1.19	Includes 0.66 acre of designed shallow open water. Extrapolated stem density along upland / wetland border (1,700) is exceeding assumed performance standard (500).
Designed High-Intensity Enhancement	8.05	1:2	4.02	4.02	Extrapolated stem density (1,917) is exceeding performance standard (1,000)
Designed Low-Intensity Enhancement	3.43	1:3	0.0	1.14	Plantings were destroyed by grazing. Actual stem density (38) is not meeting performance standard (500). No credit likely at this time. Recommend re-planting this area if credit is desired.
Incidental Restoration	4.70	1:1	4.70	0.0	4.70 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	7.99	4:1	1.99	3.17	7.99 acres of intended 12.69-acre upland buffer.
Grand Total	**31.36**	**--**	**17.90**	**15.52**[a]	**115% of 15.52-acre overall goal, 149% of 12-acre MDT goal**

[a] MDT agreed to purchase 12 acres of credit at the site.

Extrapolated stem densities are likely greater than actual densities; however, the site has developed 4.7 acres of unanticipated wetland and shown substantive functional and habitat improvement. Consequently, although a maximum of 17.9 acres of "potential credit" is

estimated, it is recommended that 12 acres of actual credit be certified at this time by the Corps to account for the estimation (an approximate 1.5:1 adjustment), and monitoring be discontinued. Additional credit could be sought from the Corps by the landowner / MDT should the low-intensity area at some point be re-planted with woody vegetation to account for incidental grazing impacts.

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Appendix A

FIGURES 2, 3, 4, & 5

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

Figure 2 - 2007 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
- Aerial Imagery July 14 2007

EASEMENT AREA LIMITS

MONITORING AREA LIMITS

Vegetation Transect

SEE LOWER RIGHT

SEE UPPER LEFT

200' 100' 0 100' 200'
1"=200ft

SCALE 1"= 200ft

PROJECT NAME
MDT Kleinschmidt Creek Wetland Mitigation

DRAWING TITLE
2007 Monitoring Activity Locations

PROJ NO: B43054.112	DRAWN: LL/RAA
LOCATION:	PROJ MGR: JB
SCALE: 1"=200'	CHECKED: APP'D:
FILE NAME:L:\330054.112\Kleinschmidt\dwg\MDT2007.dwg	

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
2

REV -
Dec/04/2007

Figure 3 - 2007 Mapped Site Features

Vegetation Community Types:

1. Medicago/Centaurea
2. Phleum/Melilotus
3. Phleum/Agrostis
4. Juncus/Carex
5. Phalaris/Agrostis
6. Juncus/Agrostis
7. Carex/Juncus
8. Centaurea/Carduus
9. Salix
10. Salix/Alnus
11. Bromus/Phleum
12. Phalarus/Typha
13. Ranunculus/Juncus

LEGEND:

- Easement Area Limits
- Monitoring Area Limits (where different from easement)
- Wetland Limits
- Open Water Limits
- Vegetation Community Limits

Base Photograph Date: July 14, 2007

Weed Mapping

- Cirsium arvense
- Hypericum perforatum

Wetland Areas: No Change

Gross Wetland	25.12 Acres
Creek Open Water	1.75 Acres
Pond Open Water	0.66 Acres
Net Wetland	22.71 Acres

EASEMENT AREA LIMITS

MONITORING AREA LIMITS

OW

SEE LOWER RIGHT

SEE UPPER LEFT

200' 100' 0 100' 200'

1"=200ft

SCALE 1"= 200ft

N E S W

PROJECT NAME: MDT Kleinschmidt Creek Wetland Mitigation

DRAWING TITLE: 2007 Mapped Site Features

PROJ NO:	B43054.112
LOCATION:	
SCALE:	1"=200'
DRAWN:	LL/RAA
PROJ MGR:	J.Berglund
CHECKED:	GH
APPVD:	JB
FILE NAME:	L:\330054.112\Kleinschmidt\dwg\MDT2007.dwg

PBSJ

1120 Cedar
Missoula, MT 59802

FIGURE 3

REV -

Nov/28/2007

Figure 4 Pre-Developed Wetlands

Pre-Developed Wetland Limits
Pre-Developed Open Water Limits
Base Photograph Date: July 23, 2002

Pre-Developed Wetland Area	
Gross Wetland	21.38 Acres
Open Water (disturbed)	7.59 Acres
Net Wetland	13.78 Acres

N E W S

SCALE 1"= 200ft

SEE LOWER RIGHT

N E W S

SCALE 1"= 200ft

SEE UPPER LEFT

PROJECT NAME
MDT Kleinschmidt Creek Wetland Mitigation

DRAWING TITLE
Pre-Developed Wetlands

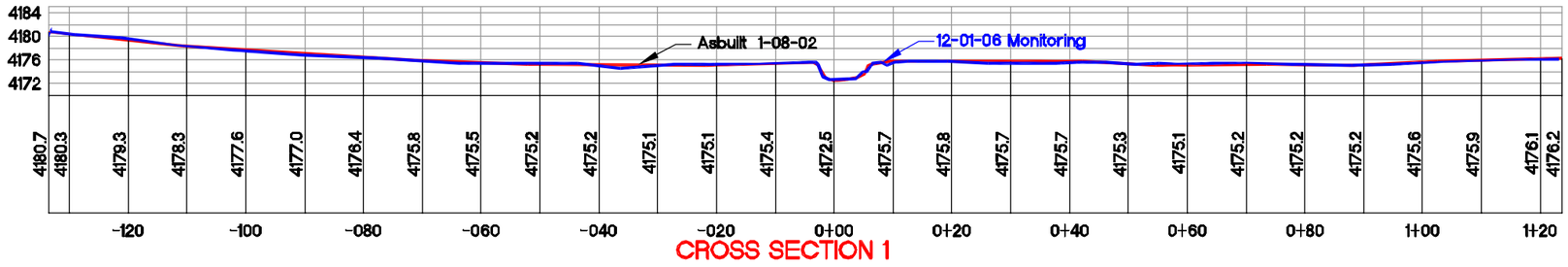
PROJ NO: 3300054.11	DRAWN: RA
FILE NAME: MDT2004BASE	CHECKED: JB
SCALE: NOTED	APPVD: GH
LOCATION:	PROJ MGR: JB

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

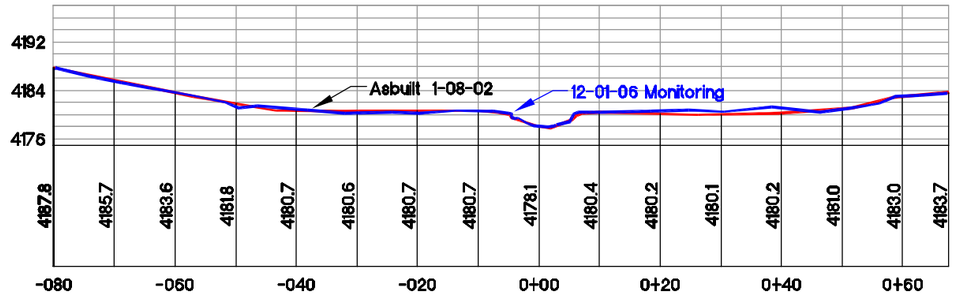
FIGURE
F4 OF -

REV -
DATE: 6-24-0

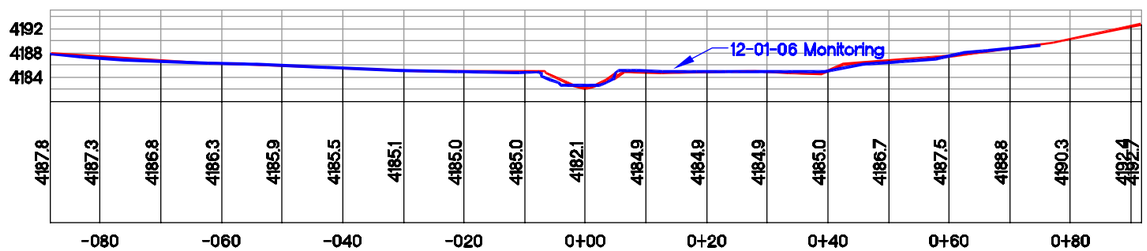
Figure 5- Channel Cross Sections



CROSS SECTION 1

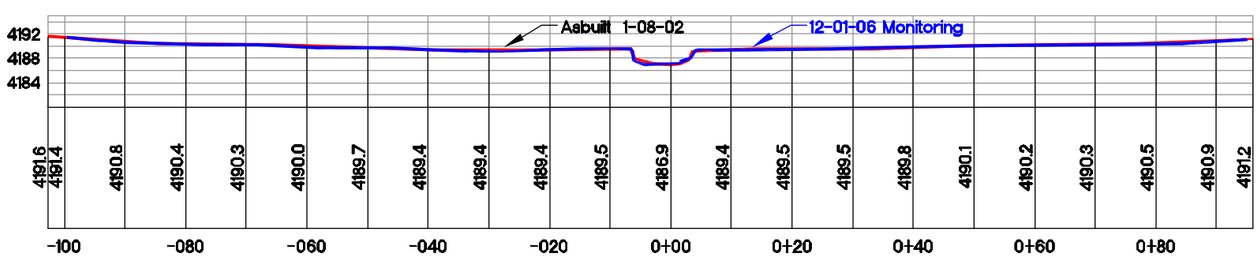


CROSS SECTION 2

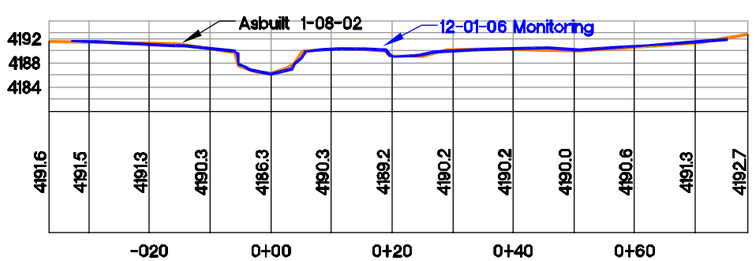


CROSS SECTION 3

Existing Surface 1-08-02
Existing Surface 12-01-06



CROSS SECTION 4



CROSS SECTION 5

PROJECT NAME: MDT Kleinschmidt Creek Wetland Mitigation
DRAWING TITLE: Channel Cross Sections
DRAWN: RAA
PROJ MGR: JB
CHECKED:
APP'D:
PROJ NO: B43054.112
LOCATION:
SCALE: 1"=25ft
FILE NAME: L:\3300054.112\Kleinschmidt\dwg\MDT2006.dwg
A division of PBS
LAND & WATER CONSULTING
P.O. BOX 8254
Missoula, MT 59807
FIGURE
5
OF
REV -
Dec/08/2006

Appendix B

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

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Kleinschmidt Creek Project Number: B43088.00 Assessment Date: 8/21/07
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: overcast Person(s) conducting the assessment: G. Howard
Initial Evaluation Date: 9/03/02 Visit #: 6 Monitoring Year: 6
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: 0.6 ft (excavated wetlands)
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: Similar site conditions observed during 2006 mid-summer visit. Inundation presents at both the created pads and excavated wetlands. Weed control has been conducted with blanket spraying across the site and spot spraying for thistles. Some herbicide damaged noticed on woody plantings.

VEGETATION COMMUNITIES

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

Dominant Species	% Cover	Dominant Species	% Cover
Medicago sativa	80		
Phleum pretense	10		
Festuca spp.	P		

COMMENTS/PROBLEMS: Upland area adjacent to created pond # 2, vegetation dominated by mainly alfalfa, and timothy. Spotted knapweed removed from the vegetation list for this community type. Several seasons of weed control efforts have greatly reduced spotted knapweed coverage. 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	30	*Agrostis alba*	20
Centaurea maculosa	P	*Poa pratensis*	10
Carduus nutans	T	*Trifolium spp.*	P
Melilotus officinalis	30	*Phalaris arundinacea*	P
Chrysanthemum leucanthemum	T	*Agropyron smithii*	T
Linaria vulgare	T		

COMMENTS/PROBLEMS: Slopes adjacent to pond # 2. Area mostly dominated by *Phleum pratense* and *Melilotus officinalis*. Weed control efforts observed throughout this area. Some minor weed coverage including *Carduus nutans*, *Centaurea maculosa* and *Chrysanthemum leucanthemum* still exist at low levels. Some damage to woody plants by herbicide application.

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

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

COMMENTS/PROBLEMS: Emergent vegetation growing along the west side of excavated wetland. Transect # 1 bisects the west side of excavated wetland. During the 2005 mapping CT# 3 was changed to CT # 12 and removed from the Figure 3.

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*	P
Mimulus guttatus	P	*Plantings*	T
Carex lanuginosa	P		

COMMENTS/PROBLEMS: Wetlands adjacent to creek. Areas inundated during monitoring visit.

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

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	30	*Agropyron repens*	P
Trifolium pratense	10	*Bidens cernua*	10
Agrostis alba	20	*Juncus ensifolius*	30
Typha latifolia	10	*Lemna minor*	P

COMMENTS/PROBLEMS: Excavated wetland located on the lower section of Kleinschmidt Creek project area. Emergent type vegetation dominates excavated wetland and fringes. During the 2005 mapping CT # 13 was added in place of the shallow open water category. A new species was observed for this community type that includes *Lemna minor*.

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	*Centaurea maculosa*	30
Phleum pratense	10		
Bromus inermis	20		
Sisymbrium altissimum	P		
Potentilla fruticosa	10		

COMMENTS/PROBLEMS: Upland areas dominated by grass species. Increase in noxious weed cover values recorded during 2006 monitoring.

Community No.: 12 Community Title (main species): Phalaris/Typha

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	30	Aquatic vegetation	20
Phleum pratense	P	*Juncus ensifolius*	P
Agrostis alba	20	*Carex lanuginosa*	T
Typha latifolia	20		
Eleocharis palustris	P		

COMMENTS/PROBLEMS: Emergent vegetation growing along the west side of excavated wetland. Transect # 1 bisects the west side of excavated wetland. Some areas mapped as OW in 2004 are now considered as emergent and aquatic bed vegetation types.

Community No.: 13 Community Title (main species): Ranunculus/Juncus

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	20	*Carex lanuginosa*	P
Trifolium pratense	P	*Bidens cernua*	10
Agrostis alba	30	*Juncus ensifolius*	30
Typha latifolia	P	*Ranunculus aquatilis var. hispidulus*	70
Melilotus officinalis	T	*Carex nebrascensis*	P
Sagittaria latifolia	P		

COMMENTS/PROBLEMS: Excavated wetland located on the lower section of Kleinschmidt Creek project area. Emergent and aquatic type vegetation dominates wetland and fringes. Increase in aquatic vegetation cover value. New species identified within this area including broadleaf arrowhead (*Sagittaria latifolia*).

Community No.: Community Title (main species):

Dominant Species	% Cover	Dominant Species	% Cover

COMMENTS/PROBLEMS:

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Achillea millefolium	2,11	*Juncus ensifolius*	5,6,7
Agrostis alba	3,4,5,6,7,10,11	*Juncus mertensianus*	4,5,6,7
Agrostis exarata	5	*Juncus nodosus*	4,5,7
Agropyron cristatum	8	*Lemna minor*	6
Agropyron repens	6,8	*Linaria vulgaris*	4
Agropyron smithii	5	*Lychnis alba*	5
Allium brevistylum	4,5,7	*Medicago sativa*	1
Alnus incana	10	*Melilotus officinalis*	2,6,8
Beckmannia syzigachne	5	*Mentha arvensis*	4,5
Betula glandulosa	5,7	*Mimulus guttatus*	5
Bidens cernua	5	*Najas flexilis*	12, 13
Bromus inermis	8,9,11	*Pedicularis groenlandica*	4,5,7
Bromus tectorum	1	*Phalaris arundinacea*	2,3,4,5,6,10
Calamagrostis canadensis	4,5	*Phleum pratense*	1,2,3,4,9,11
Carduus nutans	2,8	*Plantago spp.*	5
Carex aquatilis	4,7	*Poa pratensis*	2,7
Carex crawei	4,7	*Polygonum amphibium*	5,6
Carex flava	4,5,7	*Potentilla anserina*	7
Carex lanuginosa	4,5,7	*Potentilla fruticosa*	4
Carex nebrascensis	4,5,7	*Ranunculus spp.*	5
Carex utriculata	4,5	*Ranunculus aquatilis var. hispidulus*	6
Carex simulata	4,5,7	*Rumex crispus*	2,5,7
Centaurea maculosa	1,2,8	*Sagittaria latifolia*	13
Chenopodium album	5	*Salix bebbiana*	4,5,7,10
Chrysanthemum leucanthemum	2	*Salix boothii*	2,3,4,5,6,7
Cirsium arvense	7	*Salix drummondiana*	2,3,4,5,6,7
Cynoglossum officinale	8	*Salix geyeriana*	2,3,4,5,6,7
Deschampsia cespitosa	5	*Salix lasiandra*	9
Eleocharis palustris	4,5,6,7	*Scirpus acutus*	12,13
Epilobium ciliatum	4,5	*Sisymbrium altissimum*	11
Equisetum arvense	3,4,5,6,7	*Sisyrinchium angustifolium*	4,5,7
Equisetum hyemale	5	*Solidago missouriensis*	4
Eriophorum viridicarinatum	4,7	*Taraxacum officinale*	1,2,4,5,7,11
Geum macrophyllum	4,5,7	*Thlaspi arvense*	1,2,4,5,7,11
Glyceria elata	4	*Triglochin maritimum*	4,5
Glyceria striata	4,5,7	*Trifolium pratense*	2,4,6
Habenaria dilatata	4,5	*Typha latifolia*	5,6
Hyoscyamus niger	8	*Veronica americana*	5,6,7
Juncus balticus	4		

COMMENTS/PROBLEMS: One new plant was identified in 2007: common duckweed (*Lemna minor).*

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		
Coyote					
Elk					
Spotted Frog	1				
Striped Skunk					

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 2007.

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: 8/21/07 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 pratense		50
Poa pratensis		30
Agropyron repens		P
Agrostis alba		10
Phalaris arundinacea		P
Total Vegetative Cover:		95%

Vegetation type 2:	Phalaris/Typha	
Length of transect in this type:	57	feet
Species:		Cover:
Phleum pratense		P
Agrostis alba		10
Typha latifolia		30
Epilobium ciliatum		T
Juncus ensifolius		10
Salix boothii (Planted)		P
Phalaris arundinacea		40
Eleocharis palustris		P
Alnus incana (Planted)		T
Salix geyeriana (Sprigged)		T
Total Vegetative Cover:		95%

Vegetation type 3:	Juncus/Carex	
Length of transect in this type:	60	feet
Species:		Cover:
Phalaris arundinacea		20
Juncus balticus		40
Poa pratensis		P
Carex nebrascensis		20
Triglochin maritimum		T
Juncus ensifolius		P
Equisetum hyemale		T
Phleum pratense		P
Agrostis alba		P
Carex utriculata		10
Total Vegetative Cover:		90%

Vegetation type 4:	Phalaris/Agrostis	
Length of transect in this type:	90	feet
Species:		Cover:
Phalaris arundinacea		40
Agrostis alba		20
Beckmannia syzigachne		T
Plantings		P
Carex nebrascensis		P
Deschampsia cespitosa		T
Juncus ensifolius		10
Carex lanuginosa		P
Carex utriculata		20
Total Vegetative Cover:		95%

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

Page__1_of_1__
Date: 8/21/07

SITE: Kleinschmidt Creek

Survey Time: 9:00-4:00

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
mallard	2		OW				
marsh wren	3		MA				
western meadowlark	2		UP				
sandhill crane	1		UP				
eastern kingbird	5		MA				
great horned owl	1		FO				
great blue heron	2		MA				
northern pintail	1		OW				
blue-wing teal	3		OW				
common snipe	3		MA				
tree swallow	6		MA				
vesper swallow	2		UP				
barn swallow	12		MA				
red tailed hawk	1		FO				

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: 8/21/07
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	*Agropyron repens*	H	FACU	11			
4	*Agrostis alba*	H	FAC+	12			
5	*Poa pratensis*	H	FACU+	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 area.

Approved by HQUSACE 2/92

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 8/21/07
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: 3 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X 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 inundation and soils saturated to ground surface.

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	A	10 YR 2/1	--	--	Mucky mineral
2 – 12+	B	Gley 1 7Y / Gley 1 10Y			Sandy Clay

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 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 excavated wetlands fringe.

Approved by HQUSACE 2/92

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 8/21/07
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: 0 (in.)

Depth to Saturated Soil: 0 (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 the sampling pit to the top.

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 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.

Approved by HQUSACE 2/92

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Kleinschmidt Creek	Date: 8/21/07
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: 1 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
X 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 inundation and soils saturated to the ground surface.

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.

Approved by HQUSACE 2/92

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

1. Project Name: Kleinschmidt Creek **2. Project #:** B43088.00 **Control #:** AA 1

3. Evaluation Date: 8/21/2007 **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 - Upper Clark Fork **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): 23.86 (visually estimated)
_____ (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): 23.86 (visually estimated)
_____ (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)
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, and butter & eggs.

iii. Briefly describe AA and surrounding land use / habitat: AA is a riparian corridor with spring fed Kleinschmidt creek and adjacent wetlands. Surrounding land use includes 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	_____
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 & 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	Crawe sedge (S2) & green-keeled cottongrass (S3)
Secondary habitat **(list species)**	☒ D ☐ S	Westslope cutthroat trout
Incidental habitat **(list species)**	☒ D ☒ S	Bald eagle (D) & common loon (S)
No usable habitat	☐ D ☒ S	Missoual phlox

ii. Rating: Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	1(H)	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.)**:** FWP & plants identified at the site during 2005

14C. GENERAL WILDLIFE HABITAT RATING

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

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

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

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

ii. Wildlife Habitat Features: Working from top to bottom, select the AA attribute to determine the exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from 13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see 10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A= absent.

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

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
Substantial	--	--	--	--
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 or excessive gradient, then check the NA box above.
Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [*e.g.* fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (*e.g.* fish use within an irrigation canal], then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

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

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

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

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

Types of Fish Known or Suspected within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ **Exceptional**	☐ **High**	☒ **Moderate**	☐ **Low**
Native game fish	--	--	.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 flood from in-channel or overbank flow, then check NA.

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

Estimated wetland area in AA subject to periodic flooding	☐ **≥ 10 acres**			☐ **<10, >2 acres**			☐ **≤2 acres**		
% of flooded wetland classified as forested, scrub/shrub, or both	**75%**	**25-75%**	**<25%**	**75%**	**25-75%**	**<25%**	**75%**	**25-75%**	**<25%**
AA contains **no outlet or restricted outlet**	--	--	--	--	--	--	--	--	--
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, then check NA above.

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding**.**	☒ **>5 acre feet**			☐ **<5, >1 acre feet**			☐ **≤1 acre foot**		
Duration of surface water at wetlands within the AA	**P/P**	**S/I**	**T/E**	**P/P**	**S/I**	**T/E**	**P/P**	**S/I**	**T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1 (H)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of flooding or ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
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 of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, then check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	☐ Permanent / Perennial	☐ Seasonal / Intermittent	☐ Temporary / Ephemeral
≥ 65 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: Sedges, rushes and willows along shoreline.

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 (DR) (Check the indicators in i & ii below that apply to the AA.)

i. ☒ **Discharge Indicators**

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

ii. ☐ **Recharge Indicators**

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

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

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

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	moderate	0.80	1	
B. MT Natural Heritage Program Species Habitat	high	1.00	1	
C. General Wildlife Habitat	moderate	0.70	1	
D. General Fish/Aquatic Habitat	moderate	0.70	1	
E. Flood Attenuation	N/A	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	0.30	1	
	Total:	**8.50**	**11.00**	____
		Percent of Total Possible Points:	**77%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

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

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

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

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

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

1. Project Name: Kleinschmidt Creek **2. Project #:** B43088.00 **Control #:** AA 2

3. Evaluation Date: 8/21/2007 **4. Evaluator(s):** G.Howard **5. Wetland / Site #(s):** Excavated wetland & emergent 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 - Upper Clark Fork **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): _____ (visually estimated)
1.55 (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)
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	60
Riverine	Palustrine	None	Emergent Wetland	Intermittently Exposed	Excavated	25
Riverine	Palustrine	None	Unconsolidated Shore	Intermittently Exposed	Excavated	10
Riverine	Palustrine	None	Aquatic Bed	Permanently Flooded	Excavated	5

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

iii. Briefly describe AA and surrounding land use / habitat: AA is a riparian corridor with spring fed Kleinschmidt creek and adjacent wetlands. Surrounding land use includes 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	---	Moderate	---

Comments: _____

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

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

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

ii. Rating (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	---	---	0 (L)

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

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

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

Primary or Critical habitat **(list species)**	☐ D ☐ S	_____
Secondary habitat **(list species)**	☐ D ☐ S	_____
Incidental habitat **(list species)**	☒ D ☒ S	Bald eagle (D) & Common loon (S)
No usable habitat	☐ D ☐ S	_____

ii. Rating: Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	.2 (L)	---	---

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 the AA attribute to determine the exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from 13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see 10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A= absent.

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

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
Substantial	--	--	--	--
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 or excessive gradient, then check the NA box above.
Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [*e.g.* fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (*e.g.* fish use within an irrigation canal], then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

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

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

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

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

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

Comments: _____

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

Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA do not flood from in-channel or overbank flow, then check NA.

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

Estimated wetland area in AA subject to periodic flooding	☐ **≥ 10 acres**			☐ **<10, >2 acres**			☐ **≤2 acres**		
% of flooded wetland classified as forested, scrub/shrub, or both	**75%**	**25-75%**	**<25%**	**75%**	**25-75%**	**<25%**	**75%**	**25-75%**	**<25%**
AA contains **no outlet or restricted outlet**	--	--	--	--	--	--	--	--	--
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, then check NA above.

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding**.**	☒ **>5 acre feet**			☐ **<5, >1 acre feet**			☐ **≤1 acre foot**		
Duration of surface water at wetlands within the AA	**P/P**	**S/I**	**T/E**	**P/P**	**S/I**	**T/E**	**P/P**	**S/I**	**T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1 (H)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of flooding or ponding in AA	☐ **Yes**	☐ **No**	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	--	--	.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 of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, then check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐**Permanent / Perennial**	☐**Seasonal / Intermittent**	☐**Temporary / Ephemeral**
≥ 65 %	--	--	--
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	--	--	--	--	--	--	--	--	--	.7M	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. ☒ **Discharge Indicators**

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

ii. ☒ **Recharge Indicators**

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

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

Criteria	**Functional Point and Rating**
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

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	low	0.00	1	
B. MT Natural Heritage Program Species Habitat	low	0.2	1	
C. General Wildlife Habitat	moderate	0.70	1	
D. General Fish/Aquatic Habitat	N/A	0.00	--	
E. Flood Attenuation	N/A	0.00	--	
F. Short and Long Term Surface Water Storage	high	1.00	1	
G. Sediment/Nutrient/Toxicant Removal	moderate	0.70	1	
H. Sediment/Shoreline Stabilization	moderate	0.70	1	
I. Production Export/Food Chain Support	moderate	0.70	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	low	0.30	1	
L. Recreation/Education Potential	low	0.30	1	
	Total:	**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 satisfied, proceed to Category II.)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

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

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

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

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

Appendix C

2007 REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

KLEINSCHMIDT CREEK WETLAND MITIGATION SITE 2007

Photo Point No. 1: View looking north near vegetation transect. Vegetation community types include upland, emergent and aquatic bed. types

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 fringes. Fringe planted with riparian shrubs and trees. Excavated wetland dominated by emergent wetlands.

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

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

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 the project. Shallow water dominated by aquatic and emergent vegetation.

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

Photo Point No. 9: View looking southeast along channel and adjacent wetlands 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 the end of mitigation site. Dry side slope area with increasing spotted knapweed cover values.

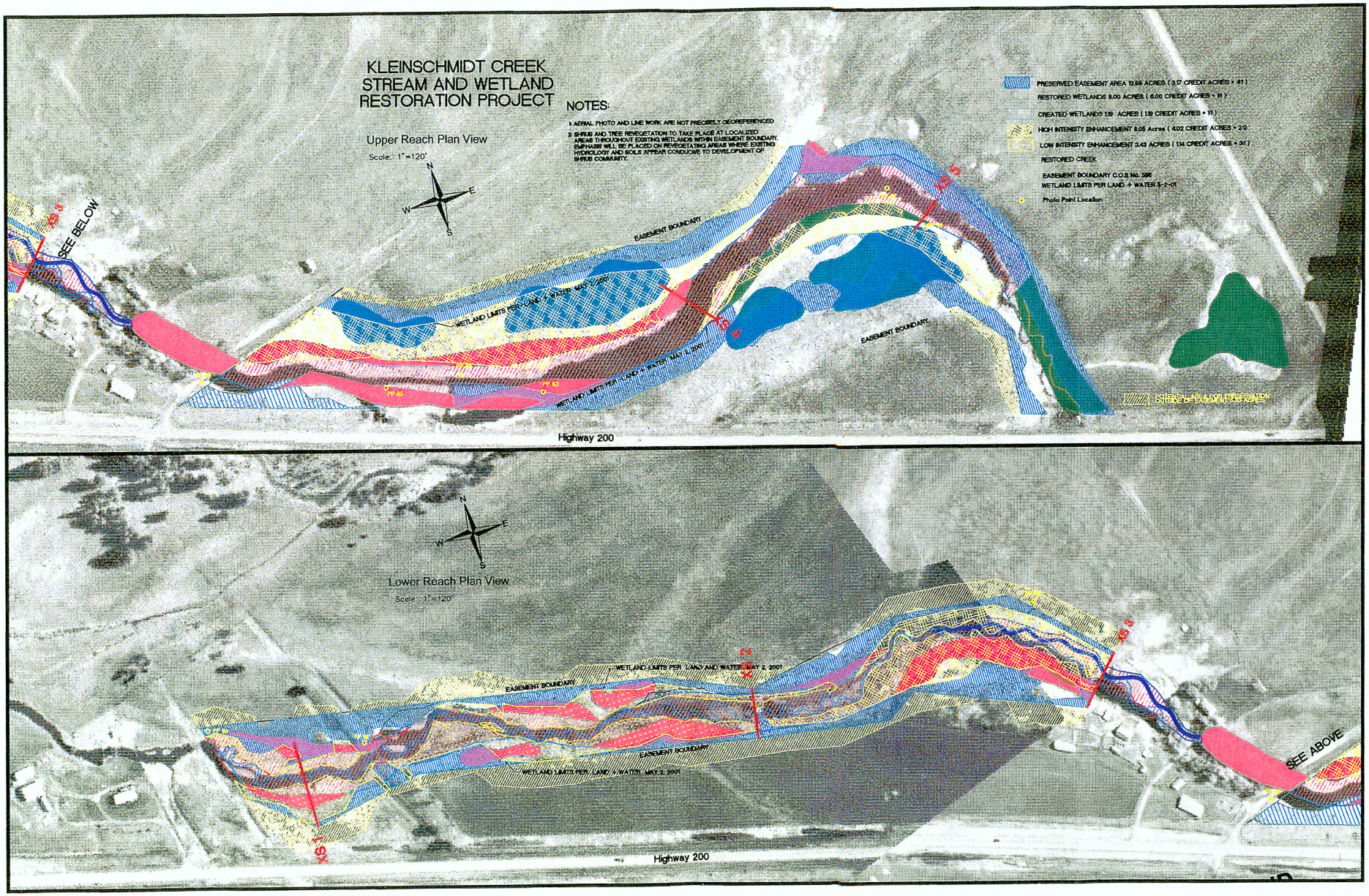
Photo Point No. 11: View looking northwest near lowest sections of mitigation site. Area dominated by emergent vegetation type.

Photo Point No. 3: Split panoramic view looking from west to east. Upper reaches of mitigation work. Area includes upland, excavated wetland, reconstructed channel and enhanced wetlands.

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

Appendix E

GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

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

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

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

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

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

Appendix F

2007 MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

MDT Wetland Mitigation Monitoring
Kleinschmidt Creek
Montana

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

- D-frame sampling net with 1 mm mesh.
- 1-liter, wide-mouth, plastic sample jars provided by Rhithron Associates, Inc. (Quart sized, wide-mouthed canning jars can be substituted.)
- 95% ethanol (alternatively isopropyl alcohol).
- Pre-printed sample labels (printed on rite-in-the-rain paper); two labels per sample.
- Pencil.
- Clear packaging tape.
- 3-5 gallon plastic pail.
- Large tea strainer or framed screen.
- Cooler with ice for storing sample.

Site Selection

Select a site that is accessible with hip waders or rubber boots. If the substrate is too soft, place a wide board down to walk on. Choose a site that is representative of the overall condition of the wetland. Annual sampling should occur at the same site within the wetland.

Sampling Procedure

Wetland invertebrates (macroinvertebrates) inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. At the given location, each habitat type is sampled and combined into a single 1-liter sample jar. Pre-cautions are made to minimize disturbing the sample site in order to maximize the number of animals collected.

Fill the pail with approximately 1 gallon of wetland water. Ideally, sample the water column from near-shore outward to a depth of 3 feet. Sample the water column using a long sweep of the net, keeping the net at about half the depth of the water. Sample the water surface with a long sweep of the net. Aquatic vegetation is sampled by pulling the net beneath the water surface, for at least a meter in distance. The substrate is sampled by pulling the net along the bottom, bumping it against the substrate several times as you pull. Be sure to place some muck, mud, and/or vegetation into the jar. After sampling a habitat, rinse the net in the bucket and look for insects, crustaceans, and other aquatic invertebrates. It is not necessary to sample habitats in any specific order, but all habitats, if present, are to be sampled. Habitats can be sampled more than once.

Fill about 1 cup of ethanol into the sample jar. Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar. Top off the jar with enough ethanol to cover all the material and leave as little headroom as possible. Alternatively, sampled materials can be lifted out of the net and put directly into the jar. Be sure to include some muck, mud, and/or vegetation into the jar. Each macroinvertebrate sampling site should have only one sampling jar.

Using pencil, complete two labels with the required information: project name, project number, date, collector's name, and habitats sampled. Do not complete the label with ink as it will dissolve in ethanol. For wetlands with at least two macroinvertebrate sampling sites, number the site consecutively followed by the total number of sites (e.g. Sample 2 of 3 sites). Place one label into the jar and seal the jar. Dry the jar off, if necessary, and tape the second label to the outside of the jar.

Photograph each macroinvertebrate sampling site.

Sample Handling/Delivery

In the field, keep sample jars cool by placing in a cooler with a small amount of ice.
Deliver samples to the PBS&J office in Missoula, where they will be inventoried and delivered to Rhithron Associates, Inc.

MDT Mitigated Wetland Monitoring Project: Aquatic Invertebrate Monitoring
Summary 2001 – 2007

Prepared for Post, Buckley, Schuh, and Jernigan (PBS&J)
Prepared by W.Bollman, Rhithron Associates, Inc.

INTRODUCTION

Aquatic invertebrate assemblages were collected at a number of mitigated wetlands throughout Montana. This report summarizes data generated from seven years of collection. Over all years of sampling, a total of 182 invertebrate samples were collected. Table 1 lists the currently monitored sites at which aquatic invertebrates were collected in 2007, and summarizes the sampling history of each.

METHODS

Sample processing

Aquatic invertebrate samples were collected at mitigated wetland sites in the summer months of 2001, 2002, 2003, 2004, 2005, 2006 and 2007 by personnel of PBS&J. Sampling procedures utilized were based on the protocols developed by the Montana Department of Environmental Quality (MT DEQ) for wetland sampling. Sampling consisted of D-frame net sweeps through emergent vegetation (when present), the water column, and over the water surface, and included disturbing and scraping substrates at each sampled site. These sample components were composited and preserved in ethanol at each wetland site. Samples were delivered to Rhithron Associates, Inc. for processing, taxonomic determinations, and data analysis.

Standard sorting protocols were applied to achieve representative subsamples of a minimum of 100 organisms. Caton sub-sampling devices (Caton 1991), divided into 30 grids, each approximately 5 cm by 6 cm, were used. Grid contents were examined under stereoscopic microscopes using 10x-30x magnification. All aquatic invertebrates from each selected grid were sorted from the substrate, and placed in 95% ethanol for subsequent identification. Grid selection, examination, and sorting continued until at least 100 organisms were sorted. A large/rare search was conducted to collect any taxa not found in the subsampling procedure.

Organisms were individually examined using 10x – 80x stereoscopic dissecting scopes (Leica S8E and S6E) and identified to the lowest practical taxonomic levels using appropriate published taxonomic references. Identification, counts, life stages, and information about the condition of specimens were recorded on bench sheets. To obtain accuracy in richness measures, organisms that could not be identified to the target level specified in MDEQ protocols were designated as “not unique” if other specimens from the same group could be taken to target levels. Organisms designated as “unique” were those that could be definitively distinguished from other organisms in the sample. Identified organisms were preserved in 95% ethanol in labeled vials, and archived at the Rhithron laboratory. Midges were morphotyped using 10x – 80x stereoscopic dissecting microscopes (Leica S8E and S6E) and representative specimens were slide mounted and examined at 200x – 1000x magnification using an Olympus BX 51 compound microscope. Slide mounted organisms were also archived at the Rhithron laboratory.

Quality assurance systems

Quality control procedures for initial sample processing and subsampling involved checking sorting efficiency. These checks were conducted on 96% of the samples by independent observers who microscopically re-examined 20% of sorted substrate from each sample. All organisms that were missed were counted and this number was added to the total number obtained in the original sort. Sorting efficiency was evaluated by applying the following calculation:

$$SE = \frac{n_1}{n_{1+2}} \times 100$$

where: SE is the sorting efficiency, expressed as a percentage, n_1 is the total number of specimens in the first sort, and n_{1+2} is the total number of specimens in the first and second sorts combined.

Quality control procedures for taxonomic determinations of invertebrates involved checking accuracy, precision and enumeration. At least 10% of samples are targeted for quality assurance procedures. For this project, three samples were randomly selected and all organisms re-identified and counted by an independent taxonomist. Taxa lists and enumerations were compared by calculating a Bray-Curtis similarity statistic (Bray and Curtis 1957) for each

selected sample. Routinely, discrepancies between the original identifications and the QC identifications are discussed among the taxonomists, and necessary rectifications to the data are made. Discrepancies that cannot be rectified by discussions are routinely sent out to taxonomic specialists for identification. However, taxonomic certainty for identifications in this project was high, and no external verifications were necessary.

Assessment

The method employed to assess these wetlands is based on an index incorporating a battery of 12 bioassessment metrics or attributes (Table 1) 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 the 12 metrics were developed specifically for this project, since mitigated wetlands were not included in original criteria development.

Scoring criteria for wetland metrics were developed by generally following the tactic used by Stribling et al. (1995). Boxplots were generated using a statistical software package (Statistica™), and distributions, median values, ranges, and quartiles for each metric were examined. For the wetland sites, "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, which is expressed as a percentage of the maximum possible score (60). 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. Data from a total of 167 samples were used to develop criteria.

Several sites in this study supported aquatic fauna characteristic of lotic habitats rather than lentic wetland habitats; these sites were excluded from mitigated wetland scoring criteria development, and were evaluated with a metric battery specific to flowing water habitats. In 2007, the lotic sites were Camp Creek (2 sites), Cloud Ranch stream, Kleinschmidt stream, Jack Creek, and Woodson Creek-Ringling stream. Invertebrate assemblages at these sites were generally characteristic of montane or foothill stream conditions and were assessed using the tested metric battery developed for montane streams of Western Montana (Bollman 1998).

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. However, the nature of the action needed is not determined solely by the index score or impairment classification, 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 since our understanding of the interrelationships of natural environmental factors and anthropogenic disturbances is tentative. Thus, the further interpretive remarks accompanying the raw taxonomic and metric data in this summary are offered cautiously. Year-to-year comparisons depend on an assumption that specific sites were revisited in each year, and that equivalent sampling methods were utilized at each site revisit.

Bioassessment metrics - wetlands

An index based on the performance of 12 metrics was constructed, as described above. Table 2 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.

Summary metric values and scores for the 2007 samples are given in Tables 4a-4c and 5.

In 2007, thermal preference of the invertebrate assemblages was calculated when possible, using the tool developed by Brandt 2001.

Bioassessment metrics – lotic habitats

For sites supporting rheophilic invertebrate assemblages, bioassessment was based on a metric battery and scoring criteria developed for montane regions of Montana (MVFP index: Bollman 1998). The six metrics constituting the bioassessment index used for MVFP sites in this study were selected because, both individually and as an integrated metric battery, they are robust at distinguishing impaired sites from relatively unimpaired sites (Bollman 1998). They have been demonstrated to be more variable with anthropogenic disturbance than with natural environmental gradients (Bollman 1998). Each of the six metrics, and their expected responses to various stressors is described below.

1. Ephemeroptera (mayfly) taxa richness. The number of mayfly taxa declines as water quality diminishes. Impairments to water quality which have been demonstrated to adversely affect the ability of mayflies to flourish include elevated water temperatures, heavy metal contamination, increased turbidity, low or high pH, elevated specific conductance and toxic chemicals. Few mayfly species are able to tolerate certain disturbances to instream habitat, such as excessive sediment deposition.
2. Plecoptera (stonefly) taxa richness. Stoneflies are particularly susceptible to impairments that affect a stream on a reach-level scale, such as loss of riparian canopy, streambank instability, channelization, and alteration of morphological features such as pool frequency and function, riffle development and sinuosity. Just as all benthic organisms, they are also susceptible to smaller scale habitat loss, such as by sediment deposition, loss of interstitial spaces between substrate particles, or unstable substrate.
3. Trichoptera (caddisfly) taxa richness. Caddisfly taxa richness has been shown to decline when sediment deposition affects habitat. In addition, the presence of certain case-building caddisflies can indicate good retention of woody debris and lack of scouring flow conditions.
4. Number of sensitive taxa. Sensitive taxa are generally the first to disappear as anthropogenic disturbances increase. The list of sensitive taxa used here includes organisms sensitive to a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others. Unimpaired streams of western Montana typically support at least four sensitive taxa (Bollman 1998).
5. Percent filter feeders. Filter-feeding organisms are a diverse group; they capture small particles of organic matter, or organically enriched sediment material, from the water column by means of a variety of adaptations, such as silken nets or hairy appendages. In forested montane streams, filterers are expected to occur in insignificant numbers. Their abundance increases when canopy cover is lost and when water temperatures increase and the accompanying growth of filamentous algae occurs. Some filtering organisms, specifically the Arctopsychid caddisflies (*Arctopsyche* spp. and *Parapsyche* spp.) build silken nets with large mesh sizes that capture small organisms such as chironomids and early-instar mayflies. Here they are considered predators, and, in this study, their abundance does not contribute to the percent filter feeders metric.
6. Percent tolerant taxa. Tolerant taxa are ubiquitous in stream sites, but when disturbance increases, their abundance increases proportionately. The list of taxa used here includes organisms tolerant of a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others.

Table 1. Montana Department of Transportation Mitigated Wetlands Monitoring Project sites: sampling history. Only those sites monitored in 2007 are included. An asterisk (*) indicates lotic sites.

Site Identifier	2001	2002	2003	2004	2005	2006	2007
Roundup	+	+	+	+	+	+	+
Ridgeway	+	+	+	+	+	+	+
Hoskins Landing MS-1		+	+	+	+		+
Hoskins Landing MS-2							+
Peterson Ranch pond 1		+	+	+	+	+	+
Peterson Ranch pond 2		+		+	+	+	+
Peterson Ranch pond 4		+	+	+	+	+	+
Peterson Ranch pond 5		+	+	+	+	+	+
Camp Creek MS-1*		+	+	+	+	+	+
Camp Creek MS-2*						+	+
Kleinschmidt		+	+	+	+	+	+
Kleinschmidt – stream*			+	+	+	+	+
Cloud Ranch Pond				+	+		+
Cloud Ranch Stream*				+			+
Jack Creek – pond				+	+		+
Jack Creek – McKee*							+
Norem				+	+	+	+
Rock Creek Ranch					+	+	+
Wagner Marsh					+	+	+
Alkali Lake 1						+	+
Charley Creek							+
Woodson pond MI 1							+
Woodson stream MI 2*							+
Little Muddy Creek							+
Selkirk Ranch							+
DH Ranch							+

Table 2. Aquatic invertebrate metrics employed for wetland (lentic) invertebrate assemblages in the MDT mitigated wetlands study, 2001 – 2007.

Metric	Metric calculation	Expected response to degradation or impairment
Total taxa	Count of unique taxa identified to lowest recommended taxonomic level	Decrease
POET	Count of unique Plecoptera, Trichoptera, Ephemeroptera, and Odonata taxa identified to lowest recommended taxonomic level	Decrease
Chironomidae taxa	Count of unique midge taxa identified to lowest recommended taxonomic level	Decrease
Crustacea taxa + Mollusca taxa	Count of 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 by that taxon's modified Hilsenhoff Biotic Index (tolerance) 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

RESULTS

(Note: Individual site discussions were removed from this report by PBS&J and are included in the macroinvertebrate section of individual project monitoring reports. Summary tables for lentic (4a – 4c) and lotic (5) sites and project specific taxa listings and metrics reports are provided on the following pages.)

Quality Assurance

Table 3 gives the results of quality assurance procedures for sample sorting efficiency (SE) and Bray-Curtis similarity statistics for comparisons of taxonomic determinations and enumeration. Sorting efficiency averaged 97.54% for the project, and taxonomic similarity averaged 97.44%.

Table 3. Results of quality control procedures for subsampling and taxonomic and enumeration similarity.

Site name	SE	Bray-Curtis similarity
Roundup	100.00%	
Ridgeway	100.00%	
Hoskins Landing MS-1	100.00%	
Hoskins Landing MS-2	93.40%	
Peterson Ranch pond 1	100.0%	95.38%
Peterson Ranch pond 2	96.64%	
Peterson Ranch pond 4	91.66%	
Peterson Ranch pond 5	96.64%	
Camp Creek MS-1	100.00%	
Camp Creek MS-2	100.00%	96.94%
Kleinschmidt – pond	100.00%	
Kleinschmidt – stream	99.10%	
Cloud Ranch Pond	95.65%	
Cloud Ranch Stream	91.61%	
Jack Creek – pond	n.a.	
Jack Creek - McKee	96.49%	
Norem	100.00%	100.00%
Rock Creek Ranch	100.00%	
Wagner Marsh	100.00%	
Alkali Lake 1	98.04%	
Charley Creek	100.00%	
Woodson pond	91.37%	
Woodson stream	100.00%	
Little Muddy Creek	92.31%	
Selkirk Ranch	95.56%	
DH Ranch	100.00%	

Table 4a. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2007 sampling.

	ROUNDUP	RIDGEWAY	HOSKINS LANDING MS-1	HOSKINS LANDING MS-2	PETERSON RANCH 1	PETERSON RANCH 2	PETERSON RANCH 4	PETERSON RANCH 5
Total taxa	7	13	18	21	17	18	26	18
POET	0	2	3	5	2	0	6	4
Chironomidae taxa	5	5	2	8	8	12	12	6
Crustacea + Mollusca	1	2	5	4	4	5	4	4
% Chironomidae	7.62%	30.00%	18.75%	52.68%	36.45%	51.79%	42.59%	14.78%
Orthocladiinae/Chir	0.38	0.17	0.00	0.03	0.08	0.16	0.09	0.12
%Amphipoda	0.00%	10.00%	0.00%	0.00%	0.93%	0.00%	21.30%	1.74%
%Crustacea + %Mollusca	89.52%	15.00%	26.79%	8.04%	10.28%	43.75%	28.70%	37.39%
HBI	8.02	7.11	7.23	6.55	7.42	7.76	6.53	7.23
%Dominant taxon	89.52%	30.00%	17.86%	35.71%	39.25%	23.21%	17.59%	30.43%
%Collector-Gatherers	92.38%	70.00%	78.57%	82.14%	49.53%	71.43%	38.89%	26.96%
%Filterers	0.00%	0.00%	0.89%	6.25%	9.35%	3.57%	1.85%	5.22%
Total taxa	1	1	3	5	3	3	5	3
POET	1	1	3	5	1	1	5	5
Chironomidae taxa	3	3	1	5	5	5	3	3
Crustacea + Mollusca	1	1	3	3	3	3	1	3
% Chironomidae	5	3	3	1	3	1	1	5
Orthocladiinae/Chir	3	1	1	1	1	1	3	1
%Amphipoda	5	3	5	5	5	5	5	5
%Crustacea + %Mollusca	1	5	5	5	5	3	5	3
HBI	1	3	3	5	3	1	5	3
%Dominant taxon	1	5	5	3	3	5	1	5
%Collector-Gatherers	5	3	3	5	3	3	3	1
%Filterers	3	3	3	1	1	3	5	3
Total score	**30**	**32**	**38**	**44**	**36**	**34**	**42**	**40**
Percent of maximum score	**50.00%**	**53.33%**	**63.33%**	**73.33%**	**60.00%**	**56.67%**	**70.00%**	**66.67%**
Impairment classification	**poor**	**sub-optimal**	**optimal**	**optimal**	**sub-optimal**	**sub-optimal**	**optimal**	**optimal**

Table 4b. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2007 sampling.

	KLEIN-SCHMIDT POND	CLOUD RANCH POND	JACK CREEK POND	NOREM	ROCK CREEK RANCH	WAGNER MARSH	ALKALI LAKE 1	CHARLEY CREEK
Total taxa	25	13	9	6	18	11	9	13
POET	5	2	0	1	2	2	0	0
Chironomidae taxa	8	11	5	2	4	4	2	3
Crustacea + Mollusca	8	1	4	1	4	0	2	3
% Chironomidae	18.63%	81.54%	92.79%	31.58%	4.76%	11.39%	1.96%	27.17%
Orthocladiinae/Chir	0.53	0.38	0.03	0.00	0.60	0.44	0.50	0.68
%Amphipoda	10.78%	3.08%	0.00%	0.00%	17.14%	0.00%	0.00%	22.83%
%Crustacea + %Mollusca	36.27%	3.08%	7.21%	21.05%	23.81%	0.00%	61.76%	53.26%
HBI	7.35	7.22	9.73	6.63	6.33	7.28	8.07	6.88
%Dominant taxon	13.73%	18.46%	62.16%	26.32%	29.52%	45.57%	60.78%	29.35%
%Collector-Gatherers	53.92%	84.62%	70.27%	57.89%	29.52%	15.19%	70.59%	32.61%
%Filterers	11.76%	9.23%	0.90%	0.00%	0.95%	0.00%	0.00%	0.00%
Total taxa	5	1	1	1	3	1	1	1
POET	5	1	1	1	1	1	1	1
Chironomidae taxa	5	5	3	1	3	3	1	3
Crustacea + Mollusca	5	1	3	1	3	1	1	1
% Chironomidae	3	1	1	3	5	5	5	3
Orthocladiinae/Chir	5	3	1	1	5	3	5	5
%Amphipoda	3	5	5	5	3	5	5	3
%Crustacea + %Mollusca	3	5	5	5	5	5	3	3
HBI	3	3	1	5	5	3	1	5
%Dominant taxon	5	5	1	5	5	3	1	5
%Collector-Gatherers	3	5	3	3	1	1	3	1
%Filterers	1	1	3	3	3	3	3	3
Total score	**46**	**36**	**28**	**34**	**42**	**34**	**30**	**34**
Percent of maximum score	**76.67%**	**60.00%**	**46.67%**	**56.67%**	**70.00%**	**56.67%**	**50.00%**	**56.67%**
Impairment classification	**optimal**	**sub-optimal**	**poor**	**sub-optimal**	**poor**	**sub-optimal**	**poor**	**sub-optimal**

Table 4c. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2007 sampling.

	WOODSON POND	LITTLE MUDDY CREEK	SELKIRK RANCH	DH RANCH
Total taxa	12	2	16	8
POET	0	0	2	1
Chironomidae taxa	9	0	8	4
Crustacea + Mollusca	1	1	2	2
% Chironomidae	85.71%	0.00%	77.27%	27.50%
Orthocladiinae/Chir	0.32	0.00	0.61	0.00
%Amphipoda	0.00%	0.00%	0.00%	0.00%
%Crustacea + %Mollusca	2.86%	75.00%	8.18%	64.17%
HBI	9.34	8.50	7.82	7.38
%Dominant taxon	33.33%	75.00%	46.36%	39.17%
%Collector-Gatherers	55.24%	75.00%	32.73%	27.50%
%Filterers	0.00%	0.00%	8.18%	17.50%
Total taxa	1	1	3	1
POET	1	1	1	1
Chironomidae taxa	5	1	5	3
Crustacea + Mollusca	1	1	1	1
% Chironomidae	1	5	1	3
Orthocladiinae/Chir	3	1	5	1
%Amphipoda	5	5	5	5
%Crustacea + %Mollusca	5	1	5	1
HBI	1	1	1	3
%Dominant taxon	5	1	3	3
%Collector-Gatherers	3	3	1	1
%Filterers	3	3	1	1
Total score	**34**	**24**	**32**	**24**
Percent of maximum score	**56.67%**	**40.00%**	**53.33%**	**40.00%**
Impairment classification	**sub-optimal**	**poor**	**sub-optimal**	**poor**

Table 5. Metric values and scores for stream (lotic) sites in the MDT mitigated wetland study – 2007 sampling.

	CAMP CREEK MS-1	CAMP CREEK MS-2	KLEIN-SCHMIDT STREAM	CLOUD RANCH STREAM	JACK CREEK - MCKEE	WOODSON STREAM
E Richness	6	6	0	2	1	1
P Richness	0	0	0	2	0	0
T Richness	4	6	2	4	4	0
Pollution Sensitive Richness	3	4	0	1	0	0
Filterer Percent	4.85%	5.56%	7.14%	3.57%	2.83%	16.67%
Pollution Tolerant Percent	32.04%	34.26%	9.82%	14.29%	58.49%	8.33%
E Richness	3	3	0	1	0	0
P Richness	0	0	0	2	0	0
T Richness	2	3	1	2	2	0
Pollution Sensitive Richness	2	3	0	1	0	0
Filterer Percent	3	2	2	3	3	1
Pollution Tolerant Percent	1	1	2	1	0	2
Total score	**11**	**12**	**5**	**10**	**5**	**3**
Percent of maximum score	**61.11%**	**66.67%**	**27.78%**	**55.56%**	**27.78%**	**16.67%**
Impairment classification	**slight**	**slight**	**moderate**	**slight**	**moderate**	**severe**

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Bray, J. R. and J. T. Curtis. 1957. An ordination of upland forest communities of southern Wisconsin. Ecological Monographs 27: 325-349.

Caton, L. W. 1991. Improving subsampling methods for the EPA's "Rapid Bioassessment" benthic protocols. Bulletin of the North American Benthological Society. 8(3): 317-319.

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.

Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ022

RAI No.: MDT07PBSJ022 **Sta. Name:** Kleinschmidt Stream
Client ID:
Date Coll.: 8/22/2007 **No. Jars:** 1 **STORET ID:**

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Acari	1	0.89%	Yes	Unknown		5	PR
Copepoda	1	0.89%	Yes	Unknown		8	CG
Lumbriculidae							
Lumbriculidae	1	0.89%	Yes	Unknown		4	CG
Lymnaeidae							
Stagnicola sp.	1	0.89%	Yes	Unknown		6	SC
Naididae							
Naididae	38	33.93%	Yes	Unknown		8	CG
Physidae							
Physa sp.	5	4.46%	Yes	Unknown		8	SC
Trichoptera							
Hydroptilidae							
Hydroptila sp.	3	2.68%	Yes	Larva		6	PH
Polycentropodidae							
Polycentropodidae	1	0.89%	Yes	Pupa		6	CF
Coleoptera							
Haliplidae							
Haliplus sp.	1	0.89%	Yes	Larva		5	PH
Chironomidae							
Chironomidae							
Chironomidae	1	0.89%	No	Pupa		10	CG
Cricotopus (Cricotopus) sp.	3	2.68%	Yes	Larva		7	SH
Eukiefferiella Gracei Gr.	1	0.89%	Yes	Larva		8	CG
Limnophyes sp.	1	0.89%	Yes	Larva		8	CG
Orthocladiinae	3	2.68%	No	Larva	Damaged	6	CG
Orthocladius sp.	8	7.14%	Yes	Larva		6	CG
Pagastia sp.	2	1.79%	Yes	Larva		1	CG
Parakiefferiella sp.	34	30.36%	Yes	Larva		6	CG
Tanytarsini	1	0.89%	No	Larva	Early Instar	6	CF
Tanytarsus sp.	6	5.36%	Yes	Larva		6	CF
Sample Count	**112**						

Metrics Report

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ022
Sta. Name: Kleinschmidt Stream
Client ID:
STORET ID:
Coll. Date: 8/22/2007

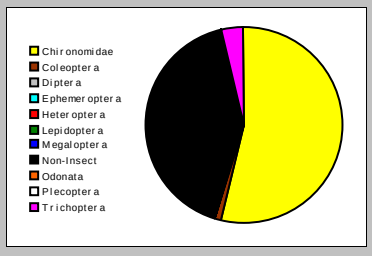
Abundance Measures

Sample Count: 112
Sample Abundance: 2,688.00 4.17% of sample used

Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	6	47	41.96%
Odonata			
Ephemeroptera			
Plecoptera			
Heteroptera			
Megaloptera			
Trichoptera	2	4	3.57%
Lepidoptera			
Coleoptera	1	1	0.89%
Diptera			
Chironomidae	7	60	53.57%

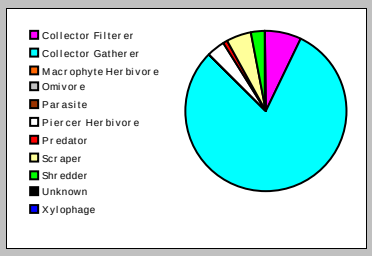


Dominant Taxa

Category	A	PRA
Naididae	38	33.93%
Parakiefferiella	34	30.36%
Orthocladius	8	7.14%
Tanytarsus	6	5.36%
Physa	5	4.46%
Orthocladiinae	3	2.68%
Hydroptila	3	2.68%
Cricotopus (Cricotopus)	3	2.68%
Pagastia	2	1.79%
Tanytarsini	1	0.89%
Stagnicola	1	0.89%
Polycentropodidae	1	0.89%
Copepoda	1	0.89%
Chironomidae	1	0.89%
Acari	1	0.89%

Functional Composition

Category	R	A	PRA
Predator	1	1	0.89%
Parasite			
Collector Gatherer	8	90	80.36%
Collector Filterer	2	8	7.14%
Macrophyte Herbivore			
Piercer Herbivore	2	4	3.57%
Xylophage			
Scraper	2	6	5.36%
Shredder	1	3	2.68%
Omivore			
Unknown			

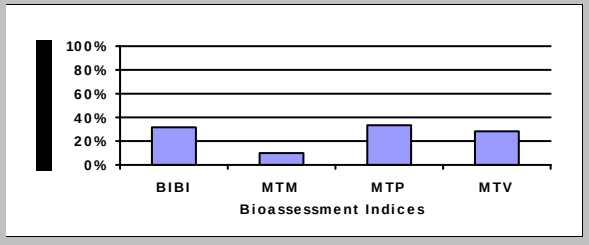


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
Composition					
Taxa Richness	16	1	1		0
Non-Insect Percent	41.96%				
E Richness	0	1		0	
P Richness	0	1		0	
T Richness	2	1		1	
EPT Richness	2		0		0
EPT Percent	3.57%		0		0
Oligochaeta+Hirudinea Percent	34.82%				
Baetidae/Ephemeroptera	0.000				
Hydropsychidae/Trichoptera	0.000				
Dominance					
Dominant Taxon Percent	33.93%		2		2
Dominant Taxa (2) Percent	64.29%				
Dominant Taxa (3) Percent	71.43%	3			
Dominant Taxa (10) Percent	91.96%				
Diversity					
Shannon H (loge)	1.855				
Shannon H (log2)	2.676		2		
Margalef D	3.210				
Simpson D	0.233				
Evenness	0.103				
Function					
Predator Richness	1		0		
Predator Percent	0.89%	1			
Filterer Richness	2				
Filterer Percent	7.14%			2	
Collector Percent	87.50%		1		0
Scraper+Shredder Percent	8.04%		1		0
Scraper/Filterer	0.750				
Scraper/Scraper+Filterer	0.429				
Habit					
Burrower Richness	0				
Burrower Percent	0.00%				
Swimmer Richness	1				
Swimmer Percent	0.89%				
Clinger Richness	3	1			
Clinger Percent	10.71%				
Characteristics					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness					
Hemoglobin Bearer Percent					
Air Breather Richness	0				
Air Breather Percent	0.00%				
Voltinism					
Univoltine Richness	5				
Semivoltine Richness	1	1			
Multivoltine Percent	58.04%		2		
Tolerance					
Sediment Tolerant Richness	2				
Sediment Tolerant Percent	1.79%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	4.783				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	9.82%	5		2	
Hilsenhoff Biotic Index	6.759		1		0
Intolerant Percent	1.79%				
Supertolerant Percent	41.96%				
CTQa	102.600				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	16	32.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	10	33.33%	Moderate
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	5	27.78%	Moderate
MTM	Montana DEQ Mountains (Bukantis 1998)	2	9.52%	Severe



Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ023

RAI No.: MDT07PBSJ023 **Sta. Name:** Kleinschmidt Pond
Client ID:
Date Coll.: 8/22/2007 **No. Jars:** 1 **STORET ID:**

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Cladocera	11	10.78%	Yes	Unknown		8	CF
Copepoda	1	0.98%	Yes	Unknown		8	CG
Ostracoda	9	8.82%	Yes	Unknown		8	CG
Enchytraeidae							
Enchytraeidae	1	0.98%	Yes	Unknown		4	CG
Hyalellidae							
Hyalella sp.	11	10.78%	Yes	Unknown		8	CG
Lymnaeidae							
Stagnicola sp.	1	0.98%	Yes	Unknown		6	SC
Naididae							
Naididae	8	7.84%	Yes	Unknown		8	CG
Physidae							
Physa sp.	1	0.98%	Yes	Unknown		8	SC
Planorbidae							
Gyraulus sp.	2	1.96%	Yes	Unknown		8	SC
Planorbidae	1	0.98%	No	Immature		6	SC
Odonata							
Aeshnidae							
Anax sp.	1	0.98%	Yes	Larva		8	PR
Coenagrionidae							
Coenagrionidae	14	13.73%	No	Larva	Early Instar	7	PR
Enallagma sp.	6	5.88%	Yes	Larva		7	PR
Libellulidae							
Libellulidae	1	0.98%	Yes	Larva	Early Instar	9	PR
Ephemeroptera							
Baetidae							
Callibaetis sp.	4	3.92%	Yes	Larva		9	CG
Heteroptera							
Corixidae							
Sigara sp.	1	0.98%	Yes	Adult		5	PH
Notonectidae							
Notonecta sp.	1	0.98%	Yes	Adult		5	PR
Coleoptera							
Dytiscidae							
Acilius sp.	1	0.98%	Yes	Adult		5	PR
Dytiscidae	1	0.98%	Yes	Larva		5	PR
Haliplidae							
Haliplidae	1	0.98%	No	Larva	Damaged	7	SH
Haliplus sp.	5	4.90%	Yes	Larva		5	PH
Diptera							
Dixidae							
Dixella sp.	1	0.98%	Yes	Larva		4	CG

Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ023

RAI No.: MDT07PBSJ023 **Sta. Name:** Kleinschmidt Pond
Client ID:
Date Coll.: 8/22/2007 **No. Jars:** 1 **STORET ID:**

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Chironomidae							
Chironomidae							
Chironomidae	1	0.98%	No	Pupa		10	CG
Chironomus sp.	1	0.98%	Yes	Larva		10	CG
Cricotopus (Cricotopus) sp.	8	7.84%	Yes	Larva		7	SH
Cricotopus (Isocladius) sp.	1	0.98%	Yes	Larva		7	SH
Orthocladiinae	1	0.98%	No	Larva	Early Instar	6	CG
Polypedilum sp.	1	0.98%	Yes	Larva		6	SH
Psectrocladius sp.	5	4.90%	Yes	Larva		8	CG
Tanytarsus sp.	1	0.98%	Yes	Larva		6	CF
Sample Count	**102**						

Metrics Report

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ023
Sta. Name: Kleinschmidt Pond
Client ID:
STORET ID:
Coll. Date: 8/22/2007

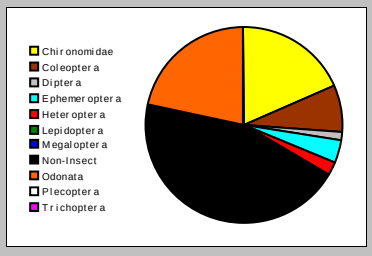
Abundance Measures

Sample Count: 102
Sample Abundance: 510.00 20.00% of sample used

Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	9	46	45.10%
Odonata	3	22	21.57%
Ephemeroptera	1	4	3.92%
Plecoptera			
Heteroptera	2	2	1.96%
Megaloptera			
Trichoptera			
Lepidoptera			
Coleoptera	3	8	7.84%
Diptera	1	1	0.98%
Chironomidae	6	19	18.63%

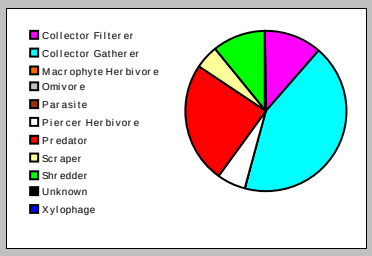


Dominant Taxa

Category	A	PRA
Coenagrionidae	14	13.73%
Hyalella	11	10.78%
Cladocera	11	10.78%
Ostracoda	9	8.82%
Naididae	8	7.84%
Cricotopus (Cricotopus)	8	7.84%
Enallagma	6	5.88%
Psectrocladius	5	4.90%
Haliplus	5	4.90%
Callibaetis	4	3.92%
Gyraulus	2	1.96%
Orthocladiinae	1	0.98%
Notonecta	1	0.98%
Libellulidae	1	0.98%
Haliplidae	1	0.98%

Functional Composition

Category	R	A	PRA
Predator	6	25	24.51%
Parasite			
Collector Gatherer	9	43	42.16%
Collector Filterer	2	12	11.76%
Macrophyte Herbivore			
Piercer Herbivore	2	6	5.88%
Xylophage			
Scraper	3	5	4.90%
Shredder	3	11	10.78%
Omivore			
Unknown			

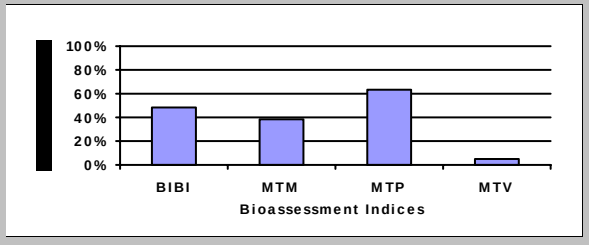


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
Composition					
Taxa Richness	25	3	3		2
Non-Insect Percent	45.10%				
E Richness	1	1		0	
P Richness	0	1		0	
T Richness	0	1		0	
EPT Richness	1		0		0
EPT Percent	3.92%		0		0
Oligochaeta+Hirudinea Percent	8.82%				
Baetidae/Ephemeroptera	1.000				
Hydropsychidae/Trichoptera	0.000				
Dominance					
Dominant Taxon Percent	13.73%		3		3
Dominant Taxa (2) Percent	24.51%				
Dominant Taxa (3) Percent	35.29%	5			
Dominant Taxa (10) Percent	79.41%				
Diversity					
Shannon H (loge)	2.769				
Shannon H (log2)	3.995		3		
Margalef D	5.417				
Simpson D	0.070				
Evenness	0.059				
Function					
Predator Richness	6		3		
Predator Percent	24.51%	5			
Filterer Richness	2				
Filterer Percent	11.76%			1	
Collector Percent	53.92%		3		3
Scraper+Shredder Percent	15.69%		2		0
Scraper/Filterer	0.417				
Scraper/Scraper+Filterer	0.294				
Habit					
Burrower Richness	1				
Burrower Percent	0.98%				
Swimmer Richness	6				
Swimmer Percent	12.75%				
Clinger Richness	4	1			
Clinger Percent	10.78%				
Characteristics					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	4				
Hemoglobin Bearer Percent	5.88%				
Air Breather Richness	2				
Air Breather Percent	1.96%				
Voltinism					
Univoltine Richness	10				
Semivoltine Richness	4	3			
Multivoltine Percent	43.14%		2		
Tolerance					
Sediment Tolerant Richness	2				
Sediment Tolerant Percent	3.92%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.291				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	37.25%	3		0	
Hilsenhoff Biotic Index	7.353		0		0
Intolerant Percent	0.00%				
Supertolerant Percent	54.90%				
CTQa	96.545				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	24	48.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	19	63.33%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	1	5.56%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	8	38.10%	Moderate



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**