MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2003

Camp Creek
Sula, Montana

Prepared for:

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

Prepared by:

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

March 2004

Project No: 130091.039

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1.0 INTRODUCTION

The Camp Creek Mitigation Site was developed to mitigate wetland impacts associated with the Montana Department of Transportation (MDT) proposed Sula-North and South project, and to possibly function as a mitigation reserve to be applied against future MDT projects in the Bitterroot Valley. Camp Creek is located in Ravalli County, MDT Watershed # 3, in the Lower Clark Fork region. The mitigation site is located approximately three miles south of Sula, Montana (**Figure 1**). Elevations of the site range from 4,600 ft at the north boundary to 4,730 ft at the south boundary. Turnstone Biological conducted the original wetland delineation and functional assessments for the Camp Creek proposed mitigation site in the summer of 2001.

The approximate site boundary is illustrated on **Figure 2** (**Appendix A**), and the original site plans are included in **Appendix D**. The project is located within the Sula Basin and along the historic Camp Creek floodplain. Camp Creek flows across the valley bottom, until eventually draining into East Fork of the Bitterroot River. Seasonal flooding and perennial creek flow provide the primary hydrology source within the new channel/floodplain margins. Local groundwater systems serve as a secondary hydrology source, flowing through the deep alluvial substrate contained within the Sula Basin. Two smaller creeks drain into Camp Creek within the project limits: Andrews and Praine creeks.

Construction at the Camp Creek mitigation site was completed during the spring of 2002. The overall goals of this project were the functional restoration/enhancement of 42.7 acres of wetland, enhancement of 24 acres of heavily grazed and cleared riparian vegetation, and creation and restoration of about 16.5 acres of channel bottom and floodplain margins. MDT is currently developing a credit allocation scheme for this site in cooperation with the Corps of Engineers. Construction diagrams are presented in **Appendix D**. Project details for each of the three main goals are included in the following list:

Functional Restoration

- Return Camp Creek to its historic channel and establish new channel.
- Restore hydrology and vegetation, recreating high value wetland habitat along Camp Creek riparian corridor.
- Fill existing drainage ditches.

Enhancements

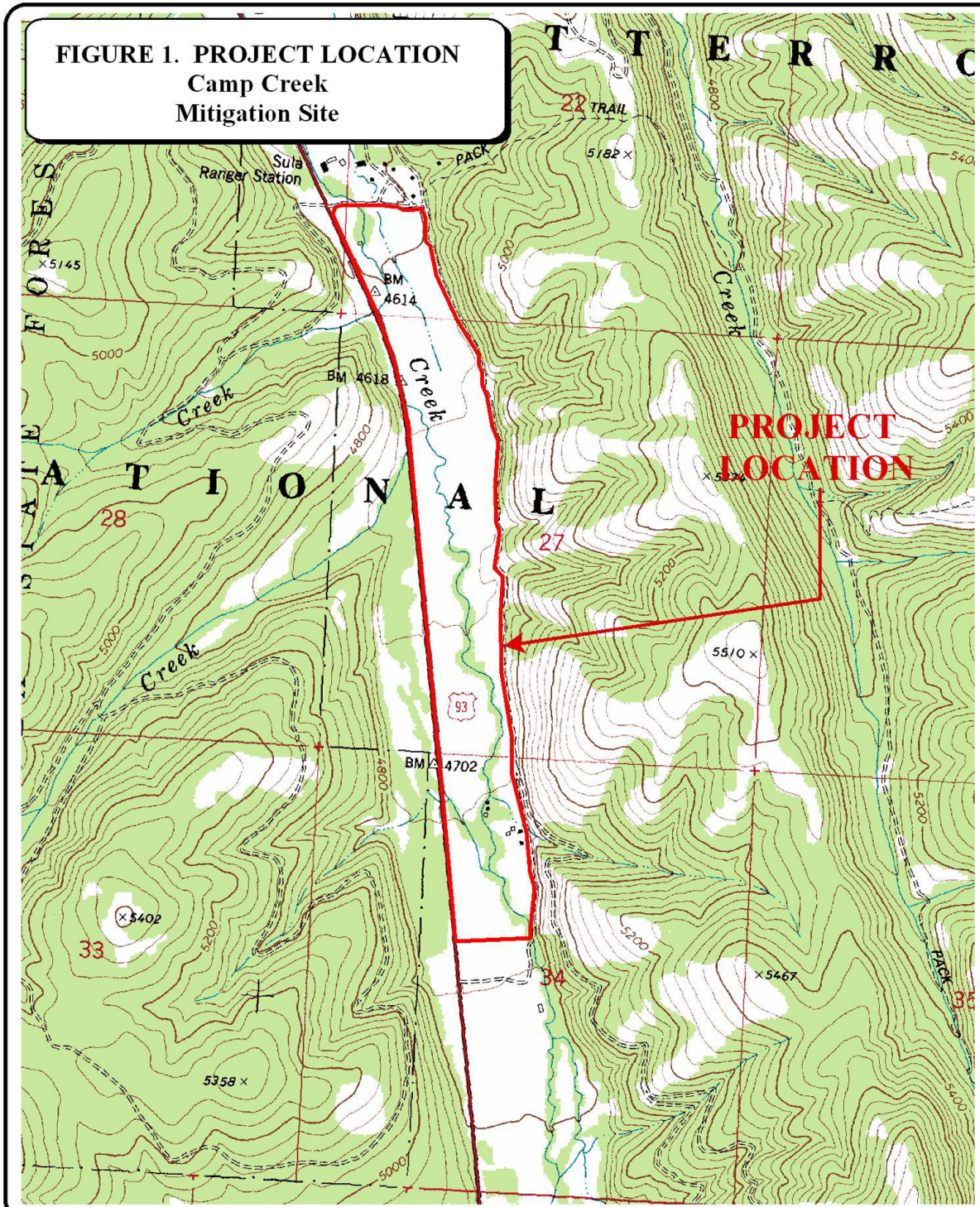
- Riparian shrub and tree plantings throughout the created floodplain margins.
- Drier upland species planting in areas of created upland slopes.

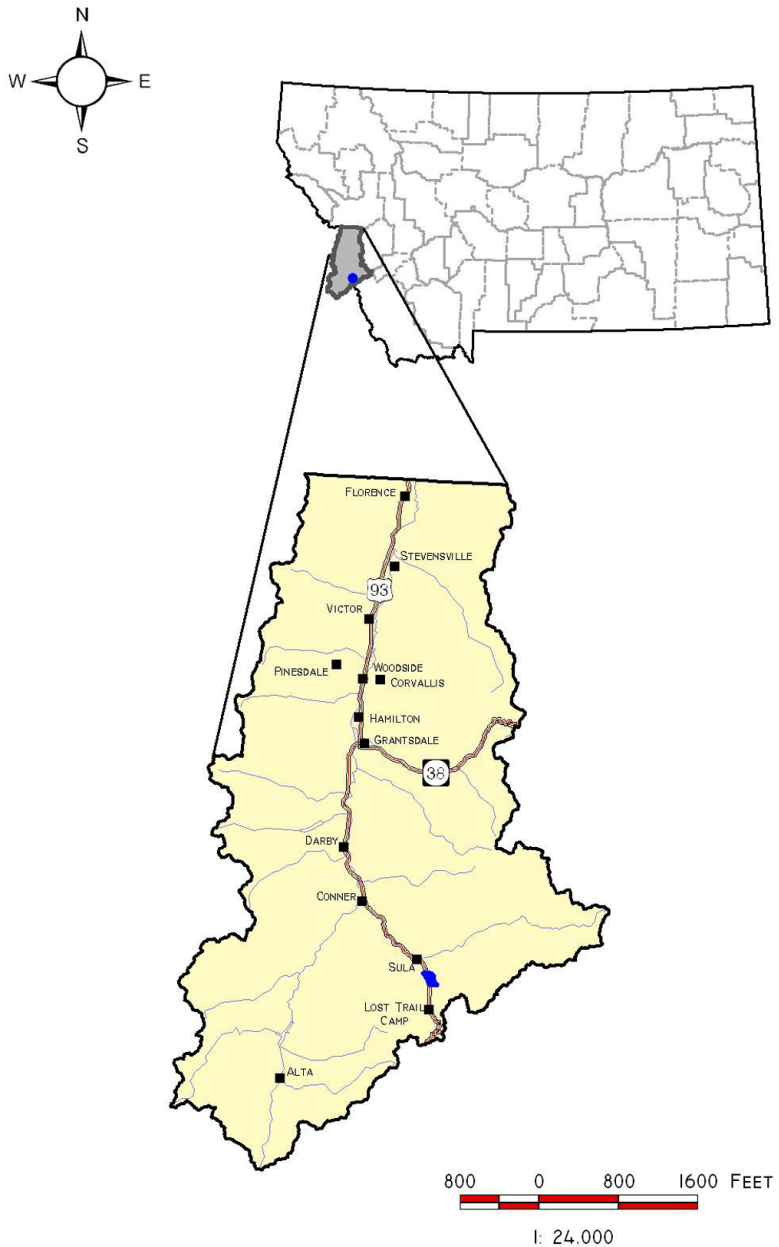
Creation

- Creation of emergent/scrub shrub wetlands along the floodplain margins of the new channel.

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. The Camp Creek site will be monitored once per year over the 3-year contract period to document wetland and other biological attributes. The monitoring area is illustrated in **Figure 2** (**Appendix A**).

FIGURE 1. PROJECT LOCATION
Camp Creek
Mitigation Site





PROJECT #: 130091.038
DATE: DEC 2002
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

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2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on August 7th (mid-season) and September 11, 2003 (early fall season). Monitoring activities were conducted on the MDT-owned portion of the site, as well as within the fenced portion of the adjacent Grasser property. 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; photograph points; macroinvertebrate sampling; GPS data points; functional assessment; and (non-engineering) examination of topographic features. The fall season visit was conducted to collect stream cross section data at two established transects.

2.2 Hydrology

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

Two cross section locations were established and surveyed across Camp Creek on the MDT-owned parcel: one upstream and one downstream of the Praine Creek confluence with Camp Creek. These are designated “XS 3-A” and “XS 4A” on **Figure 2, Appendix A**. The cross sections will be used to monitor potential lateral and vertical channel migration over time.

2.3 Vegetation

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

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

recorded with the GPS unit in 2002. A photo was taken from both ends of the transect looking along the transect path.

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

2.4 Soils

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

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was originally delineated on the air photo and recorded with a resource grade GPS unit using the procedures outlined in **Appendix E**. Modifications to these boundaries in 2003 were accomplished by hand-mapping onto the 2002 aerial photograph. The wetland/upland boundary in combination with the wetland/open water boundary was used to calculate the final wetland acreage.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during the mid-season visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. These observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not implemented. A comprehensive species list for the entire site was compiled. Observations from past years will ultimately be compared with new data.

2.7 Birds

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

2.8 Macroinvertebrates

Macroinvertebrate samples were collected during the mid-season site visit at one location along Camp Creek (**Figure 2**). Macroinvertebrate sampling procedures are provided in **Appendix F**. Samples were preserved as outlined in the sampling procedure and sent to Rhithron Associates for analysis.

2.9 Functional Assessment

A functional assessment form was completed using the 1999 MDT Montana Wetland Assessment Method (**Appendix B**). Field data necessary for this assessment were collected during the mid-season visit. Turnstone Biological completed functional assessment forms during the baseline wetland delineation in 2001.

2.10 Photographs

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

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 2003. The method used to collect these points is described in the GPS protocol in **Appendix E**.

2.12 Maintenance Needs

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

3.0 RESULTS

3.1 Hydrology

The main source of hydrology for this site is Camp Creek, a perennial flowing stream draining out of the south end of the Bitterroot Range. Seasonal flooding of Camp Creek occurs during spring runoff. Secondary sources of hydrology include runoff from ephemeral drainages east of the site and the persistent movement of groundwater through course alluvium materials located throughout the valley bottom. The location of this mitigation site is within the historic Camp

Creek floodplain. The site consists of a newly constructed main channel, streambanks and floodplain terraces. Depressional wetlands are present, supported by seasonal overland flooding of Camp Creek and groundwater flows. Where it enters Grasser's parcel south of the MDT-owned parcel, the creek once was diverted into a channel running along the edge of Hwy 93. Several ditches designed to drain the wetland meadow complex were filled and closed in recent construction activities. Removal of drain ditches will now allow for groundwater systems to recharge and provide possible higher storage functions. Average high water levels were recorded at 222 cfs (Turnstone Biological, 2001). Lower water flows are on average 10 cfs.

Rock bottom occurred across approximately 2.15 acres or 5% of the current 46-acre mitigation site (**Figure 3**). Depths of the creek varied, ranging from 0.5 ft in the straight segments to 2 - 3 ft deep around the bends and meanders.

Cross section results are presented in **Figure 5** (**Appendix G**). These cross sections represent, in essence, post-project "baseline" (2002) and current (2003) channel conditions. Cross section results measured during the 2003 monitoring show significant changes in channel locations and depths.

Cross Section 3-A is located below the Praine Creek confluence. During the runoff of 2003 this cross-section changed shape somewhat but remained in the same location. Vertically there was no change. The channel cross-sectional area remained the same.

Cross Section 4-A is located above the Praine Creek confluence. This cross section also remained in the same location from the 2002 to the 2003 survey but widened substantially. The right bank retreated nearly 15 ft. towards the east. Cross section monitoring will continue to ascertain stability and develop corrective measures, if necessary.

3.2 Vegetation

Seventy-four plant species were identified at the site and are listed in **Table 1**. The majority of these species are herbaceous, found in wetland meadow complexes with minor tree or shrub coverage. Several remnant shrub patches exist along dry oxbows of historic Camp Creek. With the reintroduction of hydrology into the old channels, these shrub patches are now receiving water again and should flourish over time. Several mature black cottonwood (*Populus trichocarpa*) stands are also located amongst shrub patches. Large areas of wet meadows exist within the areas of lower topography. These wet meadows are seasonally inundated and groundwater-fed.

Three wetland types and three upland community types were identified and mapped at the mitigation site (**Figure 3**, **Appendix A**). The three wetland community types include Type 2: *Carex/Phalaris*, Type 3: *Agrostis/Deschampsia* and Type 6: *Populus/Salix.* The three upland community types include Type 1: *Agropyron/Trifolium*, Type 5: *Agropyron/Centaurea* and Type 7: *Phalaris / Centaurea.* Plant species observed within each of these communities are listed on the attached data form (**Appendix B**).

Wetland types 2 & 6 were present before construction of the main channel. Pre-construction wetland delineation mapped the majority of the site as emergent wetlands. Type 2 is a remnant

wetland with heavy past alterations due to livestock grazing and historic clearing of riparian vegetation. Type 2 is the wettest community and occurs as emergent wetlands in saturated to shallow water conditions. Type 6 consists of several shrubs such as willow (*Salix*), alder (*Alnus*) and birch (*Betula*), found along the old dry oxbows and depressions. Higher on the banks, just above the streambed, mature cottonwoods are present along the old terraces.

The remaining wetland type was created during the channel reconstruction, and includes the geo-textile fabric wrapped streambanks and floodplain areas. Community Type 4: *Salix/Agropyron* mapped during the 2002 monitoring was included within the Type 3: *Agrostis/Deschampsia* community during 2003 monitoring. Community type classification for Type 4 was based on the dominant grass species and willow sprigging used during construction efforts. During the 2003 monitoring the Type 4 grasses had changed from wheatgrass (*Agropyron*) to the now dominant redtop (*Agrostis alba*) and tufted hairgrass (*Deschampsia cespitosa*). Revegetation efforts were implemented along the streambanks and floodplain margins during 2002 construction. These included planting of 10-cubic gallon shrubs, trees and sprigging of willows. Species planted for riparian enhancement included cottonwood, willows, dogwood (*Cornus stolonifera*) and aspen (*Populus tremuloides*). Survival data is presented in **Appendix B** and describes specific details on each species.

Adjacent upland vegetation communities are mainly dominated by rangeland and/or aggressive weedy species. Type 1 consists of several spoil piles created for upland vegetation enhancement. These areas were planted with a mix of 5-cubic gallon plantings and weed matting. Upland plantings included Douglas fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*) ponderosa pine (*Pinus ponderosa*), serviceberry (*Amelanchier alnifolia*), shrubby potentilla (*Potentilla fruticosa*), snowberry (*Symphoricarpos albus*) and woods rose (*Rosa woodsii*). Dominant species included pasture grasses and mostly weedy disturbance species such as quackgrass (*Agropyron repens*), pennycress (*Thlaspi arvensis*), dandelion (*Taraxacum officinale*), and tumble mustard (*Sisymbrium altissimum*). During the time of monitoring, plantings did not contribute enough coverage to be considered significant in determining them as dominant in the community type.

Type 5 consists of upland areas historically grazed, dominated with pasture grasses such as quackgrass, meadow foxtail (*Alopecurus pratensis*) and smooth brome (*Bromus inermis*). Type 5 also has a high distribution of spotted knapweed (*Centaurea maculosa*), located in the transition zone between wetland bottoms and open forest slopes.

Several noxious weeds were observed throughout the Camp Creek Mitigation Site. These plants include spotted knapweed, Canada thistle (*Cirsium arvense*), Oxeye daisy (*Chrysanthemum leucanthemum*) and hound's-tongue (*Cynoglossum officinale*). Other weedy or non-native species include curly dock (*Rumex crispus*), common dandelion, lambsquarters (*Chenopodium album*), clasping pepper-grass (*Lepidium perfoliatum*), pennycress, tumbleweed and quackgrass.

Vegetation transect results are detailed in the attached data forms (**Appendix B**) and are summarized below in the transect maps, **Table 2**, and **Chart 1**. The previous years transect data is included to compare changes between monitoring periods.

2003 Transect Map

Start	***Type 1 – Agropyron/ Trifolium Upland (111')***	***Type 2 – Carex/ Phalaris Wetland (102')***	***Type 1 – Agropyron/ Trifolium Upland (63')***	***Type 3 – Agrostis/ Deschampsia Wetland (6')***	***Channel Open Water (20')***	***Type 3– Agrostis/ Deschampsia Wetland (169')***	**Total: 471'**	**End**

2002 Transect Map

Start	***Type 1 – Agropyron/ Chenopodium Upland (111')***	***Type 2 – Carex/ Phalaris Wetland (102')***	***Type 1 – Agropyron/ Chenopodium Upland (63')***	***Type 3 – Alopecurus/ Carex Wetland (6')***	***Channel Open Water (20')***	***Type 3 – Alopecurus/ Carex Wetland (169')***	**Total: 471'**	**End**

Table 1: ***2002 - 2003 Camp Creek Vegetation Species List***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	Common Yarrow	FACU
Agropyron repens	Quackgrass	FAC-
Agrostis alba	Redtop	FAC+
Alnus incana	Thin leaved alder	FACW
Alopecurus pratensis	Meadow foxtail	FACW
Amelanchier alnifolia	Service-berry	FACU
Betula occidentalis	Water birch	FACW
Bromus inermis	Smooth brome	--
Bromus tectorum	Cheatgrass	--
Calamagrostis Canadensis	Bluejoint reedgrass	FACW+
Carex aquatilis	Water sedge	OBL
Carex bebbii	Bebb's sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Carex praegracilis	Clustered field sedge	FACW
Carex utriculata	Beaked sedge	OBL
Centaurea maculosa	Spotted Knapweed	--
Cercocarpus ledifolius	Mountain-mahogany	--
Chenopodium album	White Goosefoot	FAC
Chrysanthemum leucanthemum	Oxeye daisy	--
Cirsium arvense	Canada Thistle	FACU+
Cornus stolonifera	Red-osier dogwood	FACW
Crataegus douglasii	Douglas Hawthorn	FAC
Crepis tectorum	Annual hawksbeard	--
Cynoglossum officinale	Hound's tongue	FACU
Danthonia spp.	Oatgrass	--
Deschampsia cespitosa	Tufted hairgrass	FACW
Epilobium ciliatum	Hairy willow-herb	FACW+
Epilobium paniculatum	Willow-herb	--
Equisetum arvense	Field horsetail	FAC
Equisetum laevigatum	Smooth scouring-rush	FACW
Geum macrophyllum	Big leafed avens	OBL
Glyceria elata	Tall mannagrass	FACW+
Gnaphalium palustre	Cudweed	FAC+
Juncus balticus	Baltic rush	FACW
Juncus bufonius	Toad rush	FACW
Juncus ensifolius	Three-stamen Rush	FACW
Lepidium perfoliatum	Clasping pepper-grass	FACU+

Table 1: ***2002 - 2003 Camp Creek Vegetation Species List (continued)***

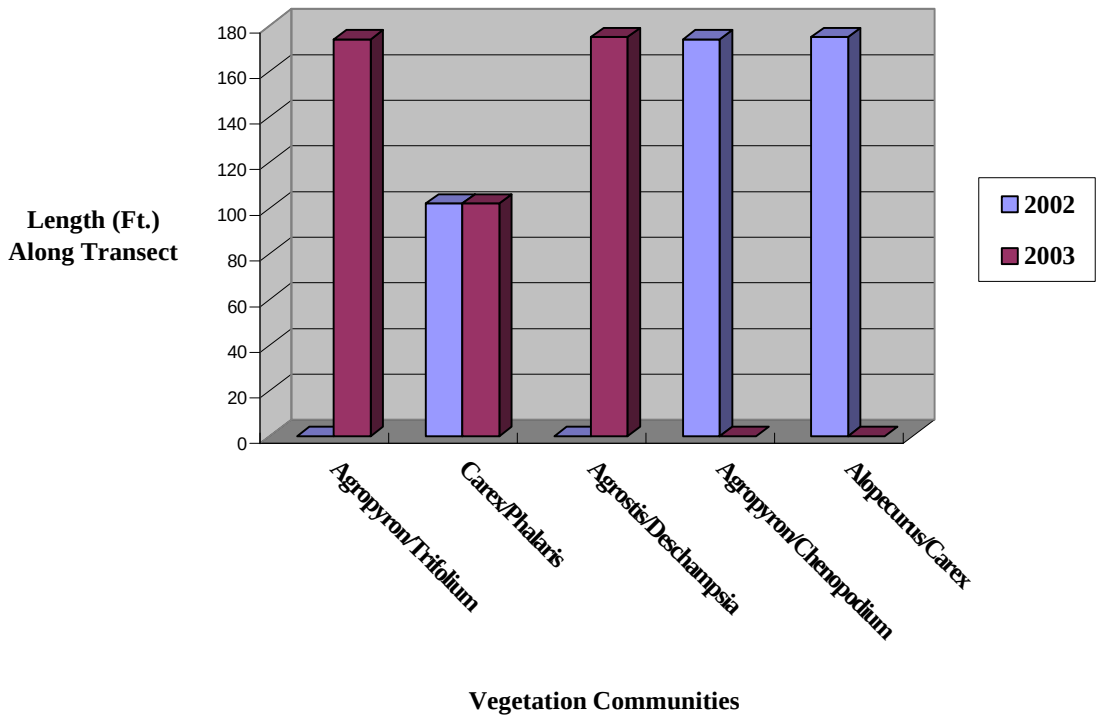
Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Linaria vulgaris	Butter and eggs	--
Lonicera involucrate	Honeysuckle	FAC+
Lupinus wyethii	Wyeth's lupine	NI
Lychnis alba	White campion	--
Matricaria matricarioides	Pineapple-weed	FACU
Melilotus officinalis	Yellow Sweet clover	FACU
Mentha arvensis	Field mint	FAC
Phalaris arundinacea	Canary Reed Grass	FACW
Phleum pretense	Timothy	FACU
Pinus ponderosa	Ponderosa pine	--
Plantago major	Plantain	FACU+
Poa pratensis	Kentucky Bluegrass	FACU+
Polygonum amphibium	Water smartweed	OBL
Populus tremuloides	Quaking aspen	FAC+
Populus trichocarpa	Cottonwood	FAC
Potentilla fruticosa	Shrubby cinquefoil	FAC-
Potentilla gracilis	Northwest cinquefoil	FAC
Pseudotsuga menziesii	Douglas fir	FACU
Ranunculus repens	Buttercup	FACW
Rosa woodsii	Woods rose	FACU
Rubus idaeus	Wild raspberry	FACU
Rumex crispus	Curly Dock	FACW
Salix bebbiana	Bebb's willow	FACW
Salix drummondiana	Drummond willow	FACW
Salix exigua	Sandbar Willow	OBL
Salix geyeriana	Geyer willow	FACW+
Salix lutea	Yellow willow	OBL
Senecio vulgaris	Common groundsel	FACU
Sisymbrium altissimum	Tall tumble mustard	FACU-
Smilacina stellata	Starry false-Solomon's-seal	FAC-
Symphoricarpos albus	Snowberry	FACU
Tanacetum vulgare	Common tansy	NI
Taraxacum officinale	Common dandelion	FACU
Thlaspi arvensis	Pennycress	NI
Trifolium pratense	Red clover	FACU
Verbascum thapsus	Common mullein	--
Veronica Americana	American speedwell	OBL

[1] **Bolded** species indicate those documented in the analysis area for the first time in 2003.

Table 2: ***Transect 1 Data Summary***

Monitoring Year	2002	2003
Transect Length	471 feet	471 feet
# Vegetation Community Transitions along Transect	4	4
# Vegetation Communities along Transect	3	3
# Hydrophytic Vegetation Communities along Transect	2	2
Total Vegetative Species	28	27
Total Hydrophytic Species	15	16
Total Upland Species	9	8
Estimated % Total Vegetative Cover	85%	95%
% Transect Length Comprised of Hydrophytic Vegetation Communities	59%	59%
% Transect Length Comprised of Upland Vegetation Communities	37%	37%
% Transect Length Comprised of Unvegetated Open Water	4%	4%
% Transect Length Comprised of Bare Substrate	0%	0%

Chart 1: ***Length of Vegetation Communities Along Transect 1***



3.3 Soils

The soils located at the Camp Creek site are mapped as Gallatin-shallow muck complex, gently sloping. Soil characteristics at each wetland determination point were compared with those of the Gallatin-shallow muck complex and generally matched this classification. Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly peat, loams, sandy loams, or sands with very low chromas (1 or 2). Mottles or oxidized rhizospheres (redoximorphic features) were not present any of the profiles. Soil profiles in the wetlands meadow mostly consisted of deep A horizons of peat or loamy materials with a sandy/gravelly layer underneath. Several profiles had large cobbles, gravels and stones below a 6-8 inch A horizon with matrix colors of 10YR 2/1. Created upland slopes were constructed with fill materials removed from channel excavation. Upland soil pits consisted of a mixture of large cobbles and loamy soil, with matrix colors of 10YR 2/2.

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. Pre-construction wetland delineation documented 63 acres of wetlands throughout the current mitigation site (Turnstone Biological, 2001). Pre-project wetland locations are shown on **Figure 4** in **Appendix A**. Monitoring in 2003 identified the following conditions:

	Monitoring Area 2003	Monitoring Area 2002
Gross Wetland Area	48.41	50.64
Open Water Area	2.15	2.15
Upland Islands	2.11	2.11
Net Wetland Area	**44.15**	**46.38**

Approximately 44.15 wetland acres and 2.15 open water acres are currently within the monitoring area (**Figure 3, Appendix A**). The pre-construction wetland delineation reported 63.17 wetland and no open water acres. The continued net decrease in wetland acres was 44.15 – 63.17 = (-19.02) acres, while the open water of 2.15 acres (stream channel) remained the same as observed in 2002.

During the initial 2002 monitoring, a net decrease in wetland acres was observed at this mitigation site. The pre-project and post-project wetland delineation boundaries were significantly different along the western side of the mitigation site on the MDT owned parcels. Several areas mapped during pre-project delineation as emergent wetlands are currently delineated as uplands. This could be attributable to the dry year, short-term construction-related disturbance (haul routes, drive-through areas, staging areas, etc.), longer-term construction-related disturbance, differences in pre- and post-construction delineation approaches, or a combination of all factors.

Final plan designs were based on a preliminary 2000 wetland delineation conducted before the "final" 2001 delineation conducted by Turnstone Biological. The preliminary 2000 baseline wetland delineation was substantially smaller in acres than the final 2001 baseline delineation submitted by Turnstone Biological. Consequently, some areas ultimately depicted as wetlands in the final delineation were heavily disturbed during construction efforts and were also designated as areas to deposit fill materials. However, some upland areas were not created as specified in the construction plans, but were larger or in different locations. Several areas mapped during the pre-project delineation as uplands became spoil piles two to three times larger then the original size of the mapped upland.

A continued decrease in wetland acreage was also observed during the 2003 monitoring period. Wetland boundaries had little to no change on the MDT owned parcels, but significant changes were observed along the floodplain margins on the Grasser owned parcel. The decrease of wetlands in this area is due to the change in vegetation from mostly wetland species to high abundance of weeds and upland species. Floodplain margins dominated by mostly wetland species were mapped as wetlands during 2002 monitoring. Stream incision may be contributing to the decrease of floodplain wetlands observed in 2003.

During the 2003 year monitoring a dramatic resurgence of spotted knapweed and other upland species has lead to the change in community type descriptions. Areas of heavy spotted knapweed coverage are located adjacent to and throughout the site. Disturbance from construction activities to the pre-existing seed bank, likely spreading of seed by heavy equipment, and lack of pre-project weed control could have contributed to the overall increase. It is likely that other factors such as lack of hydrology along the floodplains may be leading to the ultimate conversion of floodplains to a drier vegetation type. Thus, a combination of

numerous construction, environmental, and baseline mapping factors likely resulted in the wetland "loss" observed at the site.

3.5 Wildlife

Wildlife species or evidence of wildlife, observed on the site during 2002 and 2003 monitoring efforts are listed in **Table 2**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the completed monitoring form in **Appendix B**.

This site provides habitat for a variety of wildlife species, although this was not necessarily reflected in the 2003 monitoring data. Two mammal and three bird species were noted at the mitigation site during the 2003 site visits; MDST recorded some additional observations. Moose, elk, and deer frequent the site, were observed by local contractors on several occasions, and are thought to be responsible for much of the observed damage to planted shrubs.

The newly constructed channel offers habitat for several fish species, including westslope cutthroat and brook trout. Pre-project and post-project surveys along Camp Creek were conducted by the Montana Fish Wildlife and Parks during 1999 and 2003. The 2003 surveys found 300 westslope cutthroat trout ranging is size from 3 to 12 inches and also several small sized brook trout. A comparison between the 1999 and 2003 surveys is presented in **Chart 2**. The majority of fish observed were in the 3 to 6 inch size class, which is expected for new habitat because smaller fish usually colonize these areas first (MFWP 2003).

Chart 2: Westslope Cutthroat Trout Survey – Camp Creek (MFWP 2003)

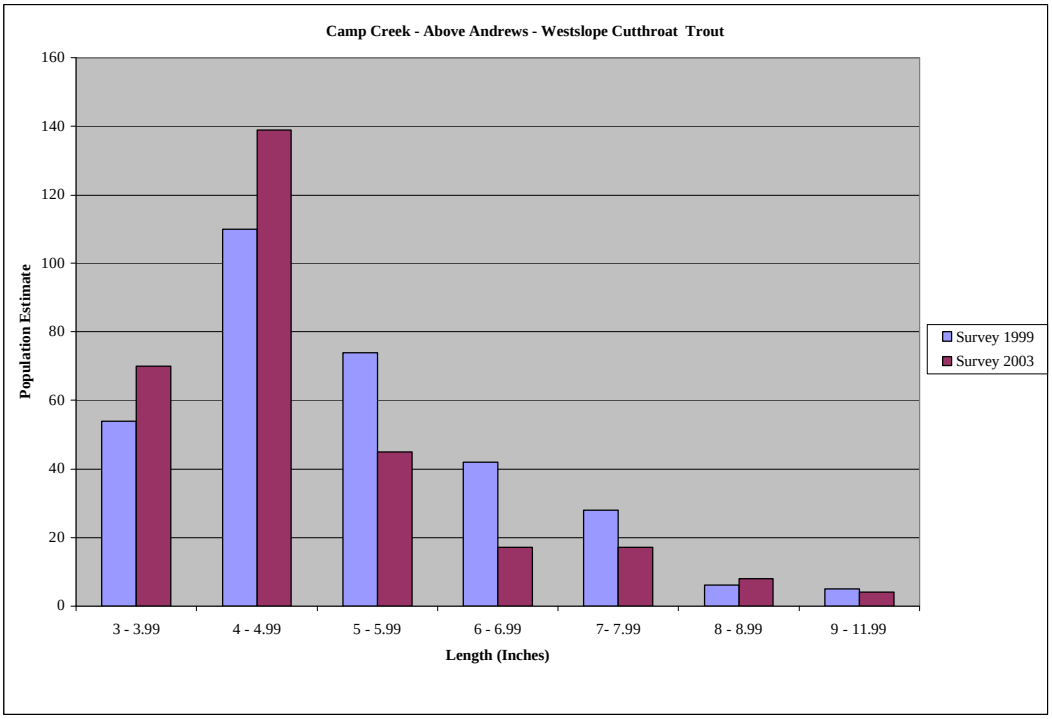


Table 3: ***Wildlife Species Observed at the Camp Creek Mitigation Site During 2002-2003Monitoring***

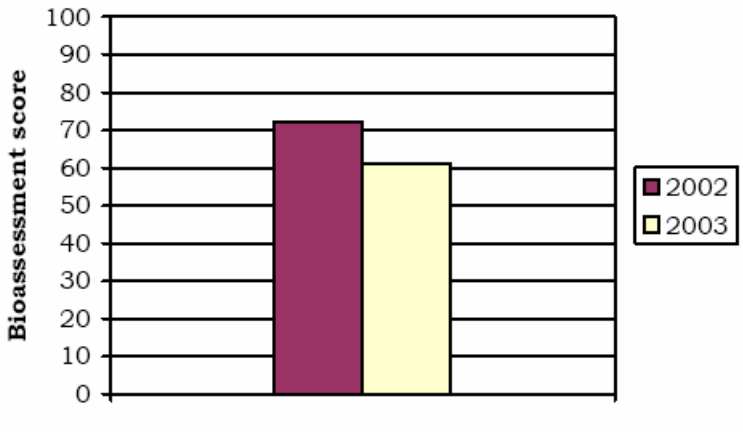
FISH
Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)*
Brook Trout (*Salvelinus fontinalis*)*
AMPHIBIANS
None
REPTILES
None
BIRDS
American Crow (*Corvus brachyrhynchos*)
Canada Goose (*Branta canadensis*)
Killdeer (*Charadrius vociferus*)
Red-tail Hawk (*Buteo jamaicensis*)
Mallard (*Anas platyrhynchos*)**
Grasshopper Sparrow (*Ammodramus savannarum*)**
American Robin (*Turdus migratorius*)**
American Dipper (*Cinclus mexicanus*)**
American Goldfinch (*Carduelis tristis*)**
Cedar Waxwing (*Bombycilla cedrorum*)**
Black-billed Magpie (*Pica pica*)**
Common Raven (*Corvus corax)**
European Starling (*Sturnus vulgaris*)**
Brewer's Blackbird (*Euphagus cyanocephalus*)**
MAMMALS
Bobcat (*Felis rufus*)
Coyote (*Canis latrans*)
Deer (*Odocoileus spp.*)
Elk (*Cervus elaphus*)
Moose (*Alces alces*)
*Survey conducted by Montana Fish, Wildlife & Parks.
****Observed by MDT May 2003
Bolded species were observed during 2003 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2003.

3.6 Macroinvertebrates

Complete results from the macroinvertebrate sampling location (**Figure 2**) are presented in **Appendix F.** Sampling points were located along one area of the creek. The following analysis was provided by Rhithron Associates (Bollman 2003). Influx of sediments from the 2000 fires may still be influencing species assemblage in Camp Creek.

The assemblage present at the Camp Creek site was characteristic of a cold-water foothill or montane stream with cobble substrate; it did not resemble a wetland fauna. For both years, the bioassessment method developed for montane streams of western Montana (Bollman 1998) was used to evaluate biotic conditions here. Slight impairment in both years was indicated by this method. Water quality appeared to be good here, but some habitat impairment was suggested by the low stonefly tax richness. The dominance of filter-feeders suggests that the quantity of suspended sediments may have been greater than expected.

Chart 3: ***Bioassessment Scores for Camp Creek***



3.7 Functional Assessment

Completed 2003 functional assessment forms are included in **Appendix B**. Camp Creek was separated into two assessment areas (AA's) for the purpose of functional assessment. The two assessment areas evaluated for Camp Creek rated as Category II (high value) and Category III (moderate value) sites. Assessment areas were separated into the new channel/floodplain and emergent wetland not disturbed by construction. Category II ratings for the new channel/floodplain were primarily due to moderate ratings for wildlife/fish habitat, flood attenuation, and sediment/nutrient removal, and a high rating for production export / food chain support. Other factors contributing to this score were low to moderate ratings for sediment/shoreline stabilization, uniqueness, and recreation/education ratings.

The area received a moderate rating for T&E species habitat, and high ratings for MNHP species habitat (documented primary habitat for westslope cutthroat trout [*Oncorhynchus clarki lewisi*] based on 2003 fish survey conducted by Montana Department of Fish, Wildlife and Parks), 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 Camp Creek reach in approximately 1985 (MFISH 2002). The surface water storage variable rated high due to the acre-feet of water contained within the floodplain during seasonal flooding.

The site received a low sediment/shoreline stabilization rating due to the lack of species with deep binding roots along the streambank. Shoreline species during evaluation consisted mostly of grasses and willow sprigs; at this current cover value these species were not observed to have substantial deep binding roots. Over time, willow sprigs should develop into larger, more robust shrubs with extensive deep binding roots systems. Enhancement of both wetland and upland vegetation should increase wildlife usage throughout the site.

Category III ratings for emergent wetlands were primarily due to moderate ratings for T&E species habitat, flood attenuation, surface water storage and production export/food chain support. Other factors contributing to this score were low to moderate ratings for wildlife/fish habitat, MNHP species habitat, sediment/shoreline stabilization, uniqueness and

recreation/education ratings. The site received a high rating for sediment/nutrient removal and groundwater discharge/recharge. The variable for sediment/nutrient removal rated high due to the high vegetation cover in the emergent wetlands, seasonal flooding of the area and restricted nature of the outlet. The site had no fish rating due to the general habitat deficiencies. The site received a moderate surface water storage rating due to the amount of acre-feet water contained within the floodplain and the frequency of flooding.

Pre-project and post-project wetland assessment scores are presented in **Table 4**. Turnstone Biological conducted the initial wetland delineation and functional assessments for the Camp Creek Mitigation Site. Category ratings remained the same between the different assessments. Individual scores were higher during post-project evaluation than with the initial evaluation completed during 2001. Turnstone Biological separated the site into three assessment areas: emergent, scrub-shrub emergent and rock bottom wetland classifications. During the 2002 and 2003 evaluations, two of these areas were grouped into one assessment area; the scrub-shrub, emergent and rock bottom types formed the channel/floodplain assessment area.

Post-project assessments for the channel/floodplain area resulted in higher scores for several of the parameters. Pre-project assessment Type III was considered the most similar to the new channel/floodplain areas and was used for comparison. Comparing these two assessments areas, Land & Water observed higher ratings in MNHP species habitat, wildlife habitat, fish/aquatic habitat, flood attenuation, surface water storage, production export/food chain support, uniqueness, and recreation / education potential.

Pre-project assessment area Type I (see **Table 4**) was considered similar to the post-project emergent wetland evaluated during 2002 and 2003. Post-project assessment scored higher, with increases in scores for wildlife habitat, surface water storage, sediment/nutrient/toxicant removal, uniqueness, and recreation/education potential. Although ratings for several functions have increased, approximately 9.45 functional units (score x wetland acreage) have been lost thus far at the Camp Creek mitigation site due to the overall decrease in wetland acres between pre-project and post-project assessments.

3.8 Photographs

Representative photographs taken from photo-points and transect ends are presented in **Appendix C**.

3.9 Revegetation

Upon completion of the new channel and floodplain construction, revegetation efforts were conducted in 2002 to enhance riparian and upland habitat. The streambanks were seeded with a grass mix designed by an MDT botanist and 20,480 willow cuttings were sprigged through the fabric work. Floodplain areas were planted with a mixture of native shrubs & trees associated with local riparian corridors. These included aspen, alder, black cottonwood, dogwood and willows. Upland slopes were planted with Douglas fir, lodgepole pine, ponderosa pine, serviceberry, shrubby potentilla, snowberry, and woods rose.

Table 4: ***Summary of Baseline 2001, 2002 and 2003 Wetland Function/Value Ratings and Functional Points*** [1] ***at the Camp Creek Mitigation Project***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	2001 Type I (Turnstone)	2001 Type II (Turnstone)	2001 Type III (Turnstone)	2002 Channel & Floodplain (LWC)	2002 Emergent Wetlands (LWC)	2003 Channel & Floodplain (LWC)	2003 Emergent Wetlands (LWC)
Listed/Proposed T&E Species Habitat	Mod (0.8)	Mod (0.8)	Mod (0.8)	Mod (0.8)	Mod (0.8)	Mod (0.8)	Mod (0.8)
MNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	High (0.8)	Low (0.1)	High (0.8)	Low (0.1)
General Wildlife Habitat	Low (0.3)	Mod (0.5)	Mod (0.5)	Mod (0.7)	Mod (0.5)	Mod (0.7)	Mod (0.5)
General Fish/Aquatic Habitat	Low (0.1)	Low (0.1)	Mod (0.5)	Mod (0.7)	NA	Mod (0.7)	NA
Flood Attenuation	Mod (0.6)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.6)	Mod (0.5)	Mod (0.6)
Short and Long Term Surface Water Storage	Low (0.3)	Low (0.3)	High (0.8)	High (1.0)	Mod (0.6)	High (1.0)	Mod (0.6)
Sediment, Nutrient, Toxicant Removal	Mod (0.7)	Mod (0.7)	Mod (0.6)	Mod (0.6)	High (1.0)	Mod (0.6)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.2)	Mod (0.6)	Low (0.3)	Low (0.3)	NA	Low (0.3)	NA
Production Export/Food Chain Support	Mod (0.7)	Mod (0.7)	High (0.9)	High (1.0)	Mod (0.7)	High (1.0)	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)
Uniqueness	Low (0.1)	Low (0.3)	Low (0.2)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)
Recreation/Education Potential	Low (0.2)	Low (0.3)	Low (0.1)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
Actual Points/Possible Points	5.1/12	5.9/12	6.2/12	8.3/12	6.1/10	8.5/12	6.1/10
% of Possible Score Achieved	42%	49%	52%	69%	61%	71%	61%
Overall Category	III	III	III	II	III	II	III
Total Acreage of Assessed Wetlands and Open Water within Easement	57.72 ac	1.59 ac	3.86 ac	19	30	16	30
Functional Units (acreage x actual points)	294.37 fu	9.38 fu	24.70 fu	157.7 fu	183 fu	136fu	183 fu
Net Acreage Gain	NA	NA	NA	0 ac	0 ac	0 ac	0 ac
Total Functional Units At Site	328.45			340.7		319	
Total Functional Unit "Decrease"	Approximately 9.45						

[1] See completed 2003 MDT functional assessment forms Appendix B for further detail.

Species survival data is presented in **Appendix B**. The belt transect used for vegetation monitoring was also used as the survival transect. A second survival transect was added to the south of the vegetation transect across the created and planted upland berms. A third survival transect was added in 2003 to assess the channel and floodplain vegetation enhancements.

In general, most the species planted had good survival. Eleven of thirteen species planted had survival rates ranging from 70% to 100% success. The two remaining species Douglas-fir and red-osier dogwood had a much lower survival and exhibited a higher mortality rate. Almost all the Douglas-fir observed had died after initial planting; mortality is likely due to weak planting stock and lack of irrigation. Areas planted with the following upland species such as shrubby potentilla had a survival rate of approximately 70% and ponderosa pine had a 74% survival rate. Willows sprigged along the banks had an 83% success rate in the areas assessed. Other deciduous species located on floodplains such as aspen, cottonwood, alder, and birch had great success with averages near 100% survival.

This high survival rate is based on a low number of total observations and might misrepresent the true survival rate. The overall collection of survival data is based on live or dead observations, if planted materials were pulled from the ground by wildlife or stems broke off and than washed away during high water it is difficult to determine the number of dead species. This lack of dead stems to be included within the total number of species planted along the belt transect ultimately affects the survival rate.

Heavy wildlife grazing was observed on the site. Several shrubs and trees planted in the riparian corridor were extensively browsed and have been rubbed against enough to damaging the main stem. Additionally, several cottonwoods and aspen were pulled completely out of the ground. The higher mortality rate of red osier dogwood can be contributed to heavy browse observed on these shrubs. The 2002 planting specifications are presented in **Appendix G**.

3.10 Maintenance Needs/Recommendations

Several noxious weeds are present on both MDT and Grasser parcels including Canada thistle, hound's-tongue and spotted knapweed, which must be controlled under the Montana County Noxious Weed Control Act [7-22-2151]. Weed control and re-vegetation of disturbed sites is needed to prevent further weed spread, reduce the risk of new weeds invading, reduce wind and water erosion and reduce sediment input to surface waters. Survival of plantings will continue to be monitored, and supplemental planting may need to be implemented if success of current plantings is low.

The MDT parcel has the least amount of invasive species and distribution is limited to upland areas not affected during construction efforts. Control measure for these areas should be implemented to avoid potential spread of invasive species into the wetland areas. Planted upland areas within the MDT parcel which were observed to have a low survival rates should be replanted with appropriate stock.

The Grasser parcel has the majority of the noxious weed species with extensive distribution along the floodplain corridor. A weed management plan for this site should be developed and

implemented to control noxious weeds. Areas of invading spotted knapweed located along floodplain margins should be controlled and reseeded or planted with appropriate wetland species to help control further spread of invasive species.

3.11 Current Credit Summary

As of 2003, approximately 44.15 acres of wetland and 2.15 acres of open water (stream channel) occur on the MDT parcel and within the fenced portion of the Grasser parcel. This represents an approximate decrease of 19.02 wetland acres and an increase of 2.15 open water (stream channel) acres from baseline conditions. Functional units have decreased from 328.45 (pre-construction) to 319, an overall decrease in 9.45 functional points. A method of credit allocation for this site is being worked out between MDT and COE. As such, the current amount of credit applicable to this site is unknown.

4.0 REFERENCES

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Appendix A

FIGURES 2, 3, AND 4

MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER

Figure 2 - Monitoring Activity Locations

PROJECT NAME: MDT Camp Creek Wetland Mitigation

DRAWING TITLE: Monitoring Activity Locations

PROJ NO	130091
FILE NAME	TASK38BASE
SCALE	1"=300ft
LOCATION	Sula, Mt.
DRAWN	R.A.
CHECKED	B.D.
APPVD	B.D.
PROJ MGR	B.Dutton

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

FIGURE F2

REV -

DATE 9-10-02

Figure 3 - Mapped Site Features 2003

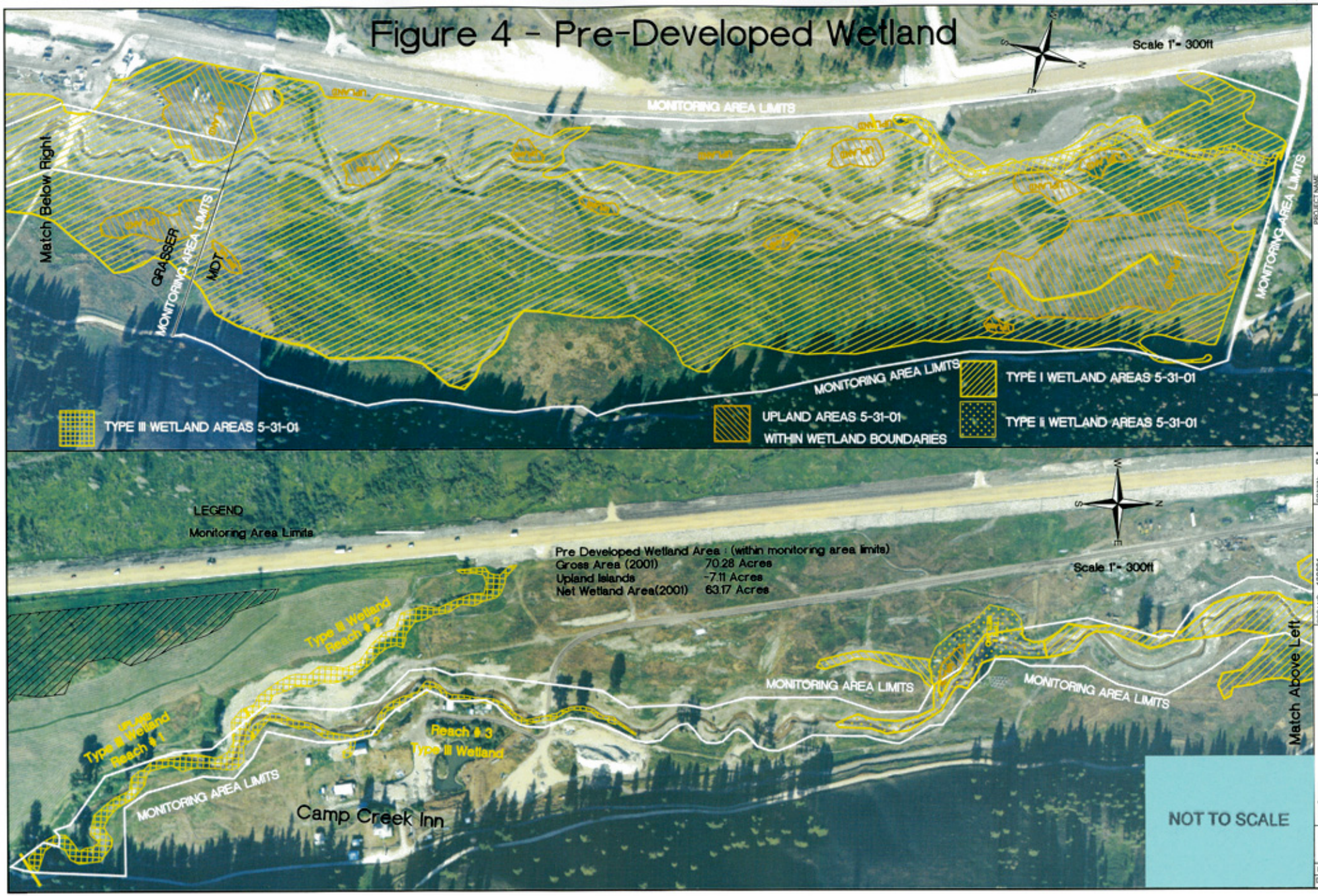
PROJECT NAME: MDT Camp Creek Wetland Mitigation
DRAWING TITLE: Mapped Site Features 2003

PROJ NO: 130091 | DRAWN: R.A.
FILE NAME: TASK38BASE | CHECKED: B.D.
SCALE: 1"=300ft | APPVD: G.H.
LOCATION: Sula, MT. | PROJ MGR: B.Dutton

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

FIGURE F3
REV -
DATE: 10-28-03

Figure 4 - Pre-Developed Wetland



PROJECT NAME: MDT Camp Creek Wetland Mitigation

DRAWING TITLE: Pre-Developed Wetland

DRAWN: R.A.
CHECKED: B.D.
APPVD: B.D.
PROJ MGR: B.Dutton

PROJ NO: 130091
FILE NAME: TASK38BASE
SCALE: 1"=300ft
LOCATION: Stella, MT.

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

FIGURE F4

REV: -
DATE: 3-04-04

Appendix B

COMPLETED 2003 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2003 BIRD SURVEY FORM
COMPLETED 2003 WETLAND DELINEATION FORMS
COMPLETED 2003 FUNCTIONAL ASSESSMENT FORM

MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Camp Creek Project Number: 130091.039 Assessment Date: 08/07/03
Location: Sula Valley MDT District: Lower Clark Fork Milepost:_____
Legal description: T 1 N R 19 W Section 27 & 34 Time of Day: Morning to early afternoon
Weather Conditions: Cloudy & overcast Person(s) conducting the assessment: Greg Howard
Initial Evaluation Date: 09/05/02 Visit #: 2 Monitoring Year: 2003
Size of evaluation area: 200 acres Land use surrounding wetland: Agriculture; livestock grazing & pasture

HYDROLOGY

Surface Water Source: Camp Creek
Inundation**:** Present____ Absent X Average depths: _-_ft Range of depths:___-____ft
Assessment area under inundation:____%
Depth at emergent vegetation-open water boundary:____ft
If assessment area is not inundated are the soils saturated w/in 12" of surface**:** Yes X No
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Hydrology on this site comes from Camp Creek. Surface and groundwater flows in areas of lower topography, observed in undisturbed wetland meadows.

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: Second year of monitoring at the Camp Creek site. Along the streambanks several areas of obvious changes in channel width and depth. The channel has areas of banks, previously covered with fabric, disturbed by scouring during high water events. Vegetation cover along streambanks and floodplains changing from drier to wetter sedge, rushes and grasses species.

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Agropyron / Trifolium (Created upland)

Dominant Species	% Cover	Dominant Species	% Cover
Agropyron repens	60	Planted Species	10
Thlaspi arvensis	P	*Trifolium pratense*	10
Rumex crispus	P	*Centaurea maculosa*	10
Lychnis alba	P	*Alopecurus pratensis*	P
Chenopodium album	T		

COMMENTS/PROBLEMS: Created uplands, planted with several drier species: Pinus ponderosa, Pseudotsuga menziesii, Symphoricarpos albus, Rosa woodsii, Potentilla fruticosa, and Amelanchier alnifolia. Browse protection needs to be removed on planted shrub species.

Community No.: 2 Community Title (main species): Carex / Phalaris (Undisturbed wetland)

Dominant Species	% Cover	Dominant Species	% Cover
Carex aquatilis	P	*Alopecurus pratensis*	P
Phalaris arundinacea	20	*Phleum pratense*	P
Carex utriculata	20	*Agrostis alba*	P
Carex nebrascensis	50	*Sisymbrium altissimum*	10
Geum macrophyllum	P		

COMMENTS/PROBLEMS: Open wetland meadow with extensive sedges, intermixed with a few drier grass species.

Community No.: 3 Community Title (main species): Agrostis / Deschampsia (Floodplain / Streambank)

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus pratensis	P	*Carex nebrascensis*	P
Populus trichocarpa - Planted	P	*Phalaris arundinacea*	10
Populus tremuloides - Planted	P	*Phleum pratense*	T
Epilobium ciliatum	P	*Salix* – sprigged	20
Agrostis alba	30		
Deschampsia cespitosa	30		

COMMENTS/PROBLEMS: Vegetation community's along streambanks and floodplain areas transitioning from drier to wetter grass and sedge species. Coverage in general has increased, many wetland species appearing along floodplain. Seeded wheatgrass species replaced by tufted hairgrass. Majority of willow sprigging successful, coverage increasing in many areas along bank. Streambank and floodplain vegetation types being combined into one type. The distinct vegetation line found the first year between upland species seeded under fabric and native vegetation of the adjacent floodplain has disappeared.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

VEGETATION COMMUNITIES (continued)

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

Dominant Species	% Cover	Dominant Species	% Cover

COMMENTS/PROBLEMS: Vegetation Community No. 4 combined with No. 3

Community No.: 5 Community Title (main species): Agropyron / Centaurea

Dominant Species	% Cover	Dominant Species	% Cover
Centaurea maculosa	40	*Agropyron repens*	20
Sisymbrium altissimum	P		
Bromus inermis	30		
Bromus tectorum	10		
Alopecurus pratensis	P		

COMMENTS/PROBLEMS: Upland slopes observed on both the east and west sides of site. On the east side, slopes running down from the tree line, into lower wetland basin and floodplain. On the west side, upland slopes disturbed during construction efforts. Area dominated by spotted knapweed and several other pasture grasses such as smooth brome and quackgrass.

Community No.: 6 Community Title (main species): Populus / Salix

Dominant Species	% Cover	Dominant Species	% Cover
Populus trichocarpa	30	*Rosa woodsii*	10
Salix bebbiana	P	*Symphoricarpos albus*	P
Alnus incana	P	*Salix drummondiana*	P
Salix geyeriana	10	*Salix exigua*	P
Cornus stolonifera	T		

COMMENTS/PROBLEMS: Mature cottonwood and shrub communities found along the old channel.

Community No.: 7 Community Title (main species): Centaurea / Phalaris

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	30	*Taraxacum officinale*	T
Centaurea maculosa	40	*Chrysanthemum leucanthemum*	T
Verbascum thapsus	T	*Trifolium pratense*	P
Bromus inermis	T	*Rumex crispus*	T
Agropyron repens	10	Plantings	P

COMMENTS/PROBLEMS: Vegetation type found along the upland fringes of constructed floodplain on mostly Grasser-owned parcels. Community No. 7 located near areas dominated by spotted knapweed. Noxious weed invasion in these areas due to nearby location of pre-existing high density weed patches and spreading of these weed seeds during construction. Aggressive reed canarygrass also invading in many areas with spotted knapweed. Floodplain margins unable to support wetland species due lack of hydrology.

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Achillea millefolium	1,5	*Lonicera involucrata*	6
Agropyron repens	1,3,5,7	*Lupinus wyethii*	1
Agrostis alba	2,3	*Lychnis alba*	1
Alnus incana	6	*Matricaria matricarioides*	1
Alopecurus pratensis	2,3,5	*Melilotus officinalis*	1,5
Amelanchier alnifolia	1	*Mentha arvensis*	2,3
Betula occidentalis	3	*Phalaris arundinacea*	2,3,7
Bromus inermis	5,7	*Phleum pratense*	2,3
Bromus tectorum	1,5	*Pinus ponderosa*	1
Calamagrostis canadensis	2	*Plantago major*	1,3
Carex aquatilis	2	*Poa pratensis*	1,5
Carex bebbii	2	*Polygonum amphibium*	2
Carex nebrascensis	2,3	*Populus tremuloides*	3,4
Carex praegracilis	2	*Populus trichocarpa*	3,6
Carex utriculata	2	*Potentilla fruticosa*	1
Centaurea maculosa	1,5,7	*Potentilla gracilis*	1
Cercocarpus ledifolius	1	*Pseudotsuga menziesii*	1
Chenopodium album	1,3	*Ranunculus repens*	2
Chrysanthemum leucanthemum	1,5,7	*Rosa woodsii*	1,6
Cirsium arvense	1	*Rubus idaeus*	6
Cornus stolonifera	3,6	*Rumex crispus*	1,2,3,7
Crataegus douglasii	1	*Salix bebbiana*	6
Crepis tectorum	1	*Salix drummondiana*	4
Cynoglossum officinale	1	*Salix exigua*	2,3,4
Danthonia spp.	1	*Salix geyeriana*	4,6
Deschampsia cespitosa	2,3	*Salix lutea*	3
Epilobium ciliatum	2,3	*Senecio vulgaris*	1
Epilobium paniculatum	2,3	*Sisymbrium altissimum*	1,5
Equisetum arvense	2,3	*Smilacina stellata*	2
Equisetum laevigatum	2,3	*Symphoricarpos albus*	1,5
Geum macrophyllum	2,3	*Tanacetum vulgare*	2,3
Glyceria elata	2	*Taraxacum officinale*	1,2,3,4,5,7
Gnaphalium palustre	1	*Thlaspi arvensis*	1,3,5
Juncus balticus	2	*Trifolium pratense*	1,7
Juncus bufonius	2,3	*Verbascum thapsus*	1,3,5,7
Juncus ensifolius	2,3	*Veronica americana*	2
Lepidium perfoliatum	1		
Linaria vulgaris	1,7		

COMMENTS/PROBLEMS: Two new species added to the list for 2003, these include oxeye daisy (*Chrysanthemum leucanthemum)* and butter and eggs *(Linaria vulgaris).* Both species considered weeds, oxeye daisy is a Montana State listed noxious weed.

PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed Alive	Mortality Causes
Rosa woodsii	8	8	
Pinus ponderosa	19	14	
Pseudotsuga menziesii	17	0	Weak plant stock
Symphoricarpos albus	17	14	
Potentilla fruticosa	30	21	
Populus trichocarpa	55	50	
Populus tremuloides	11	11	
Salix lutea	3	3	
Willow sprigs	225	186	
Cornus stolonifera	22	11	Heavy browse
Amelanchier alnifolia	4	4	
Alnus incana	4	4	
Betula occidentalis	6	6	

COMMENTS/PROBLEMS: Three transects were used to assess overall survival. Transect 1 was located along the same line as the vegetation monitoring transect, using the same belt width. The transect no. 2, starts at the beginning of transect no. 1, running towards the east (45^{o}), approximately 165 ft long. Transect no. 2 bisects an area of created uplands and associated drier species plantings. Plantings were counted and tallied for either being dead or alive. Transect 3 was located along floodplain margins near vegetation transect.

WILDLIFE

BIRDS

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

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Deer*		X	X		
Elk		X	X		
Bobcat		X			
Moose*		X			X
Coyote		X	X		

* Observed during both 2002 and 2003 monitoring.

Additional Activities Checklist:
_X_ Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Macroinvertebrate samples taken at one location along the main creek.

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	Frame #	Photograph Description	Compass Reading
1	R1 16	Looking north at transect end.	0°
1	R1 17	Looking south, uplands w/plantings.	180°
1	R1 18	Looking west, Hwy 93 and created uplands.	270°
1	R1 19	Looking northwest, upland and floodplain.	315°
2	R1 20	Looking southwest at start of vegetation transect.	225°
3	R1 21-22	Looking north along transect line.	0°
4	R1 23	Looking northwest, downstream along channel.	315°
4	R1 24	Looking south, upstream along channel.	180°
4	R1 25	Looking north, curve in creek, fabric failure.	0°
5	R1 26-31	Looking south to north, panoramic of channel & floodplain.	180° – 0°
6	R1 32	Looking east along survival transect.	45°
7	R1 34-35	Looking south, lower section, creek leaving MDT parcel.	180°
8	R2 1-5	Looking east, panoramic from west side.	180° – 0°
9	R2 6-8	Looking north, main channel entering culvert.	270° – 0°
9	R2 9-12	Looking south, main channel entering culvert.	135° – 225°
10	R2 13-14	Looking south, channel and floodplain.	180° – 225°
10	R2 15	Looking north, channel and floodplain.	0°
11	R2 16-19	Looking north, channel and floodplain, upper culvert.	0° – 315°
12	R2 20	Looking south, channel and floodplain, Grasser parcel.	180° – 225°
13	R2 21	Looking south, channel & floodplain.	180°
14	R2 22	Looking north, creek entering Grasser parcel.	225°

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:

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

COMMENTS/PROBLEMS: GPS surveying completed during first year monitoring.

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: Functional assessments similar to 2002 monitoring. No dramatic changes or difference between monitoring periods, similar conditions exist.

MAINTENANCE

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

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

COMMENTS/PROBLEMS: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Camp Creek Date: 08/07/03 Examiner: Greg Howard Transect # 1

Approx. transect length: 471 ft Compass Direction from Start (Upland): 225°

Vegetation type 1:	Agropyron / Trifolium (Community No. 1)	
Length of transect in this type:	111	feet
Species:		Cover:
Agropyron repens		60
Thlaspi arvensis		T
Potentilla fruticosa		10
Chenopodium album		T
Cirsium vulgare		P
Trifolium pratense		P
Matricaria matricarioides		T
Rumex crispus		T
Epilobium ciliatum		P
Centaurea maculosa		P
Lychnis alba		T
	Total Vegetative Cover:	80%

Vegetation type 2:	Carex / Phalaris (Community No. 2)	
Length of transect in this type:	102	feet
Species:		Cover:
Carex nebrascensis		70
Carex utriculata		10
Phalaris arundinacea		P
Geum macrophyllum		T
Cirsium arvense		T
Epilobium ciliatum		P
Thlaspi arvensis		T
Salix exigua		P
Sisymbrium altissimum		P
Cirsium vulgare		P
Trifolium pratense		P
	Total Vegetative Cover:	90%

Vegetation type 3:	Agropyron / Trifolium (Community No. 1)	
Length of transect in this type:	63	feet
Species:		Cover:
Carex nebrascensis		P
Thlaspi arvensis		T
Epilobium ciliatum		P
Agropyron repens		20
Festuca pratensis		30
Phalaris arundinacea		T
Trifolium pratense		P
Lactuca serriola		T
Centaurea maculosa		T
Verbascum thapsus		T
Deschampsia cespitosa		20
	Total Vegetative Cover:	80%

Vegetation type 4:	Agrostis / Deschampsia (Community No. 3)	
Length of transect in this type:	6	feet
Species:		Cover:
Carex utriculata		T
Epilobium ciliatum		P
Agrostis alba		20
Centaurea maculosa		T
Alopecurus pratensis		P
Juncus ensifolius		T
Trifolium pratense		30
Carex nebrascensis		T
Deschampsia cespitosa		20
Plantings (Populus tremuloides & Populus trichocarpa)		P
Willow Sprigs		P
Phalaris arundinacea		P
	Total Vegetative Cover:	85%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Camp Creek Date: 08/07/03 Examiner: Greg Howard Transect # 1

Approx. transect length: 471 ft Compass Direction from Start (Upland): 225°

Vegetation type 5:	Open Water - Channel	
Length of transect in this type:	20	feet
Species:		Cover:

Vegetation type 6:	Agrostis / Deschampsia (Community No. 3)	
Length of transect in this type:	169	feet
Species:		Cover:
Carex utriculata		T
Epilobium ciliatum		P
Agrostis alba		20
Centaurea maculosa		T
Alopecurus pratensis		P
Juncus ensifolius		T
Trifolium pratense		30
Carex nebrascensis		T
Deschampsia cespitosa		20
Plantings (Populus tremuloides & Populus trichocarpa)		P
Willow Sprigs		P
Phalaris arundinacea		P
	Total Vegetative Cover:	85%

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

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

Indicator Class:

+ = Obligate
- = Facultative/Wet
0 = Facultative

Source:

P = Planted
V = Volunteer

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

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

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

Notes:

3

BIRD SURVEY – FIELD DATA SHEET

Date: 8/7/03

SITE: Camp Creek

Survey Time: 0800-1200

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Crow	1	FO	-				
Canada Goose	2	FO	-				
Killdeer	2	F	WM				

Notes:

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

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

LAND & WATER

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Camp Creek	Date: 08/07/03
Applicant/Owner: MDT/Grasser	County: Ravalli
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: Upland
Transect ID: 1
Plot ID: 1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Agropyron repens*	H	FAC-	9			
2	*Thlaspi arvensis*	H	--	10			
3	*Chenopodium album*	H	FAC	11			
4	*Trifolium pratense*	H	FACU	12			
5	*Centaurea maculosa*	H	--	13			
6	*Potentilla fruticosa*	S	FAC-	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 1/6 = 17%

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 present.

LAND & WATER

SOILS

Map Unit Name (Series and Phase): Gallatin-Shallow Muck Complex / Gallatin
Taxonomy (Subgroup): _____
Drainage Class: Imperfectly and Poorly-drained
Field Observations Confirm Mapped Type? X Yes ____ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 6+	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)

Soil pit located in area of created upland habitat, soils consisting of fill material excavated from channel reconstruction and removed from historic wetland. 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

LAND & WATER

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Camp Creek			Date:	08/07/03
Applicant/Owner:	MDT/Grasser			County:	Ravalli
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	*Carex nebrascensis*	H	OBL	9			
2	*Phalaris arundinacea*	H	FACW	10			
3	*Geum macrophyllum*	H	OBL	11			
4	*Agrostis alba*	H	FAC+	12			
5	*Epilobium ciliatum*	H	FACW	13			
6	*Thlaspi arvensis*	H	--	14			
7	*Salix exigua*	S	OBL	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 6/7 = 85%

Area dominated by hydrophytic vegetation.

HYDROLOGY

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

X No Recorded Data Available

Field Observations:

Depth of Surface Water: ___ (in.)

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

Depth to Saturated Soil: 8 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X 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:
Pit saturated within upper 12 inches of surface. Drainage patterns evident, depression of lower topography. Historic channels of Camp Creek floodplain.

SOILS

Map Unit Name (Series and Phase):	Gallatin-Shallow Muck Complex Gallatin	Drainage Class:	Imperfectly and Poorly-drained
Taxonomy (Subgroup):		Field Observations Confirm Mapped Type?	X Yes ____ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 3	O	10 YR 2/2	--	--	Roots & organics
3 – 6	A1	10 YR 2/1	--	--	Sandy loam & roots
6 – 8	A2	10 YR 2/1	--	--	Peat & sandy loam

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	X	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, low-chroma indicator and high organic content (peat).

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 an emergent wetland type. Areas of lower topography, depressions running throughout. Undisturbed wetlands mapped during initial delineation.

Approved by HQUSACE 2/92

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Camp Creek				Date:	08/07/03	
Applicant/Owner:	MDT/Grasser				County:	Ravalli	
Investigator:	Greg Howard				State:	MT	
Do Normal Circumstances exist on the site:		X	Yes	No	Community ID:	Emergent / Rock Bottom	
Is the site significantly disturbed (Atypical Situation)?			Yes	No	Transect ID:	1	
Is the area a potential Problem Area?: (If needed, explain on reverse.)			Yes	No	Plot ID:	3	

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Carex nebrascensis*	H	OBL	9	*Centaurea maculosa*	H	--
2	*Phalaris arundinacea*	H	FACW	10	*Veronica americana*	H	OBL
3	*Carex utriculata*	H	OBL	11	*Agrostis alba*	H	FAC+
4	*Alopecurus pratensis*	H	FACW	12			
5	*Epilobium ciliatum*	H	FACW	13			
6	*Juncus ensifolius*	H	FACW	14			
7	*Trifolium pratense*	S	FACU	15			
8	*Deschampsia cespitosa*	H	FACW	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 9/11 = 81%

Area consisting of streambank, creek and floodplain margins, dominated by hydrophytic vegetation. Emergent wetlands and unconsolidated bottom.

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: 6 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ____ Inundated
- X Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- X 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:
Flowing water through unconsolidated creek bottom. Floodplains with saturated soils with in upper 12 inches of surface. Sediment deposition along floodplain margins.

LAND & WATER

SOILS

Map Unit Name (Series and Phase):	Gallatin-Shallow Muck Complex Gallatin	Drainage Class:	Imperfectly and Poorly-drained
Taxonomy (Subgroup):		Field Observations Confirm Mapped Type?	X Yes ____ No

Profile Description:

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

Hydric Soil Indicators:

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

Hydric soils present, low-chroma indicator.

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 and also Waters of the US. Floodplains along Camp Creek developing into emergent and scrub-shrub wetland types.

Approved by HQUSACE 2/92

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Camp Creek	Date: 08/07/03
Applicant/Owner: MDT/Grasser	County: Ravalli
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	*Carex lanuginosa*	H	OBL	12			
5	*Chenopodium album*	H	FAC	13			
6				14			
7				15			
8				16			

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

Area dominated by hydrophytic vegetation.

HYDROLOGY

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

X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

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

Depth to Saturated Soil: 10 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- _____ Inundated
- X Saturated in Upper 12 Inches
- _____ Water Marks
- _____ Drift Lines
- _____ Sediment Deposits
- X 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:
Pit saturated within upper 12 inches of surface and drainage patterns evident.

SOILS

Map Unit Name (Series and Phase):	Gallatin-Shallow Muck Complex Gallatin	Drainage Class:	Imperfectly and Poorly-drained
Taxonomy (Subgroup):		Field Observations Confirm Mapped Type?	X Yes ____ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 3	O	10 YR 2/1	--	--	Roots & organics
3 – 5	A	10 YR 2/1	--	--	Sandy loam & roots
5 – 7	B	--	--	--	Sand with fine gravels
7 – 10+	A	10 YR 2/1	--	--	Sandy loam with fine to medium gravels

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	X	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, low-chroma indicator and high organic content in sandy soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	X	Yes	____	No	Is this Sampling Point Within a Wetland? X Yes ____ No
Wetland Hydrology Present?	X	Yes	____	No	
Hydric Soils Present?	X	Yes	____	No	

Remarks:
Sampling point is considered within an emergent wetland type. Located on upper terrace adjacent to created floodplain. Remnant wetlands not disturbed during construction efforts.

Approved by HQUSACE 2/92

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

1. Project Name: Camp Creek **2. Project #:** 130091.039 **Control #:** AA-1

3. Evaluation Date: 8/7/2003 **4. Evaluator(s):** Greg Howard **5. Wetland / Site #(s):** Channel/Floodplain

6. Wetland Location(s) i. T: 1 N **R:** 19 W **S:** 27 & 34 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 17010205 **GPS Reference No. (if applies):** _____

Other Location Information: Located in Sula Basin, newly constructed Camp Creek channel and floodplain.

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

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

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

9. Assessment Area (total acres): 30 (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	Rock Bottom	Permanently Flooded	---	30
Riverine	Palustrine	Upper Perennial	Emergent Wetland	Seasonally Flooded	---	60
Riverine	Palustrine	Upper Perennial	Scrub-Shrub Wetland	Seasonally Flooded	---	10
---	---	---	---	---	---	

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

Comments: _____

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

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Past disturbances include grazing, clearing and hydrologic alterations.

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, Canada thistle, hound's tongue, pennycress, common dandelion & tumble mustard.

iii. Briefly describe AA and surrounding land use / habitat: AA located in Sula Basin , historically heavily grazed. USFS lands & private ownership adjacent. Surrounding land use habitat include pasture, livestock grazing & logging.

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	High	---	---

Comments: _____

LAND & WATER

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	Bald eagle & bull trout
Incidental habitat **(list species)**	☐ D ☒ S	Gray wolf
No usable habitat	☐ D ☐ S	_____

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	.8 (M)	---	---	---	---

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	Western cutthroat
Secondary habitat **(list species)**	☐ D ☐ S	_____
Incidental habitat **(list species)**	☐ D ☒ S	Raptors & bats
No usable habitat	☐ D ☐ S	_____

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

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	1 (H)	---	---	---	---	.1 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Fish Wildlife & Parks

14C. General Wildlife Habitat Rating

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

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

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Types of Fish Known or Suspected Within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ Exceptional	☐ High	☒ Moderate	☐ Low
Native game fish	--	--	.7 (M)	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: Reconstructed channel supports native fish populations. Enhancement of habitat; pools, riffles and overhanging banks. Ratings will improve with establishment of woody vegetation.

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

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

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

Estimated wetland area in AA subject to periodic flooding	☒ ≥ 10 acres			☐ <10, >2 acres			☐ ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	--	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	.5 (M)	--	--	--	--	--	--

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:** USFS offices downstream, adjacent parcel with MDT boundary.

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☒ >5 acre feet			☐ <5, >1 acre feet			☐ ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond [3] **5 out of 10 years**	1 (H)	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: Channel flooplain margins have high capacity to hold large volumes of water during seasonal flooding.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☒ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	.6 (M)	--	--	--	--	--

Comments: Minor sedimentation due to logging & recent forest fires.

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

Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
[3] **65 %**	--	--	--
35-64 %	--	--	--
< 35 %	.3 (L)	--	--

Comments: Currently low woody plant density along streambank. Ratings will increase afte willow sp-rigs become more established.

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	1H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

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

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

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

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

Comments: Channel & floodplains located in Sula Basin, steep slopes on both sides of basin. Wetlands occuring along toe of slope.

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)	--	--	--	--	--	.4M	--	--	--
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	--	.5(M)	--
Private ownership	--	--	--

Comments: Good potential for rec/ed site, located along hwy 93.

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	Moderate	0.50	1	
F. Short and Long Term Surface Water Storage	High	1.00	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.60	1	
H. Sediment/Shoreline Stabilization	Low	0.30	1	
I. Production Export/Food Chain Support	High	1.00	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Moderate	0.40	1	
L. Recreation/Education Potential	Moderate	0.50	1	
	Totals:	**8.50**	**12.00**	
	Percent of Total Possible Points:		**71%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

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

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

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

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

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

1. Project Name: Camp Creek **2. Project #:** 130091.039 **Control #:** AA-2

3. Evaluation Date: 8/7/2003 **4. Evaluator(s):** Greg Howard **5. Wetland / Site #(s):** Emergent Wetlands

6. Wetland Location(s) i. T: 1 N **R:** 19 W **S:** 22,27 & 34 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 17010205 **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

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

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

9. Assessment Area (total acres): 16 (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	Palustrine	None	Emergent Wetland	Intermittently Flooded	Diked	100
---	---	---	---	---	---	
---	---	---	---	---	---	
---	---	---	---	---	---	

[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.)

	Predominant Conditions Adjacent (within 500 Feet) To AA		
Conditions Within 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.) Past alteration from historic grazing.

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, Canada thistle, hound's tongue, pennycress, common dandelion & tumble mustard.

iii. Briefly describe AA and surrounding land use / habitat: Wet meadow consisitng of emergent wetland type. Area of intensive grazing, Camp Creek flooplain cleared of riparian vegetation for conversion into pasture lands.

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: Extensive sedge and grass communities, no shrub components.

LAND & WATER

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	Bald eagle
Incidental habitat **(list species)**	☐ D ☒ S	Gray wolf
No usable habitat	☐ D ☐ S	_____

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	.8 (M)	---	---	---	---

If documented, list the source (e.g., observations, records, etc.)**:** Rob Harris, Camp Creek Wetland Delineation, USFS & FWP)

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

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

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

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

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	.1 (L)	---

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

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) during peak use periods
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area sources
- ☐ interviews with local biologists with knowledge of the AA with knowledge of AA

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

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

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

Structural Diversity (from #13)	☐High								☐Moderate								☒Lov		
Class Cover Distribution (all vegetated classes)	☐Even				☐Uneven				☐Even				☐Uneven				☒Eve		
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/
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	L	-

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

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

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

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

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

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

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

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

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

Comments: Lack of fish habitat in emergent wetland, no ponding or surface water.

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

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

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

Estimated wetland area in AA subject to periodic flooding	☒ ≥ 10 acres			☐ <10, >2 acres			☐ ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	--	--	.6 (M)	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond [3] **5 out of 10 years**	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: Surface water storage increased due to the addition of upland topography and restricting water flow along slopes.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	1 (H)	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Minor sediment source from nearby burned forest . Potential nutrient input due to heavy livestock grazing in Sula Basin

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

Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☐ Permanent / Perennial	☐ Seasonal / Intermittent	☐ Temporary / Ephemeral
[3] **65 %**	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

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

Comments: Riparian vegetation enhancement & return of hydrology would help increase rating.

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

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

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

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

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

Comments: _____

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	☐rare	☐common	☐abundant	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	.3L	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: Low structural diversity & common distribution throughout the region. High disturbance variable lowers overall rating.

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	--	.5(M)	--
Private ownership	--	--	--

Comments: Good potential for rec/ed area, adjacent to HWY. 93 & state owned.

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	Low	0.10	1	
C. General Wildlife Habitat	Moderate	0.50	1	
D. General Fish/Aquatic Habitat			--	
E. Flood Attenuation	Moderate	0.60	1	
F. Short and Long Term Surface Water Storage	Moderate	0.60	1	
G. Sediment/Nutrient/Toxicant Removal	High	1.00	1	
H. Sediment/Shoreline Stabilization			--	
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	Moderate	0.50	1	
	Totals:	**6.10**	**10.00**	
	Percent of Total Possible Points:		**61%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

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

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

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

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

Appendix C

REPRESENTATIVE PHOTOGRAPHS
AERIAL PHOTOGRAPH

MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER

Photo Point No. 1: View looking northeast along vegetation transect, end point in foreground.

Photo Point No. 2: View looking southwest along vegetation transect, starting point in foreground, located in upland community type.

Photo Point No. 3: View looking northeast, constructed Camp Creek channel and floodplain margins.

Photo Point No. 4: View looking north, floodplain margins with emergent wetland and riparian vegetation enhancements. Large containerized cottonwood and aspen plantings.

Photo Point No. 5: View looking north, Camp Creek and floodplain margins.

Photo Point No. 7: View looking south; lowest section of Camp Creek channel, north boundary of MDT parcel.

Photo Point No. 8: View looking west across mitigation site, upland community type in foreground. Emergent wetland and main channel beyond upland areas.

Photo Point No. 9: View looking north, main channel just below second culvert. Example of fabric work along constructed streambanks.

Photo Point No. 10: View looking south, section of channel with remnant shrub communities present.

Photo Point No. 11: View looking north, mature cottonwoods located along the main channel. Floodplain margins planted with containerized shrub & trees.

Photo Point No. 12: View looking south, main channel running along Grasser structures, remnant shrub community present.

Photo Point No. 13: View looking south, straight sections of main channel running across upper portion of Grasser parcel.

Photo Point No. 5: Panoramic looking west across site. Representative photo of typical channel and floodplain section present at Camp Creek. Transect located towards right side of photo. Photo taken from atop created upland slopes.

Photo Point No. 11: View looking north along main creek, below upper road crossing and culvert near Grasser complex. Mature cottonwoods and remnant shrub communities present along creek. Floodplain areas with spotted knapweed infestations.


0828 163823 MAW318 P=-1.3 R=2.0 Y=3.4
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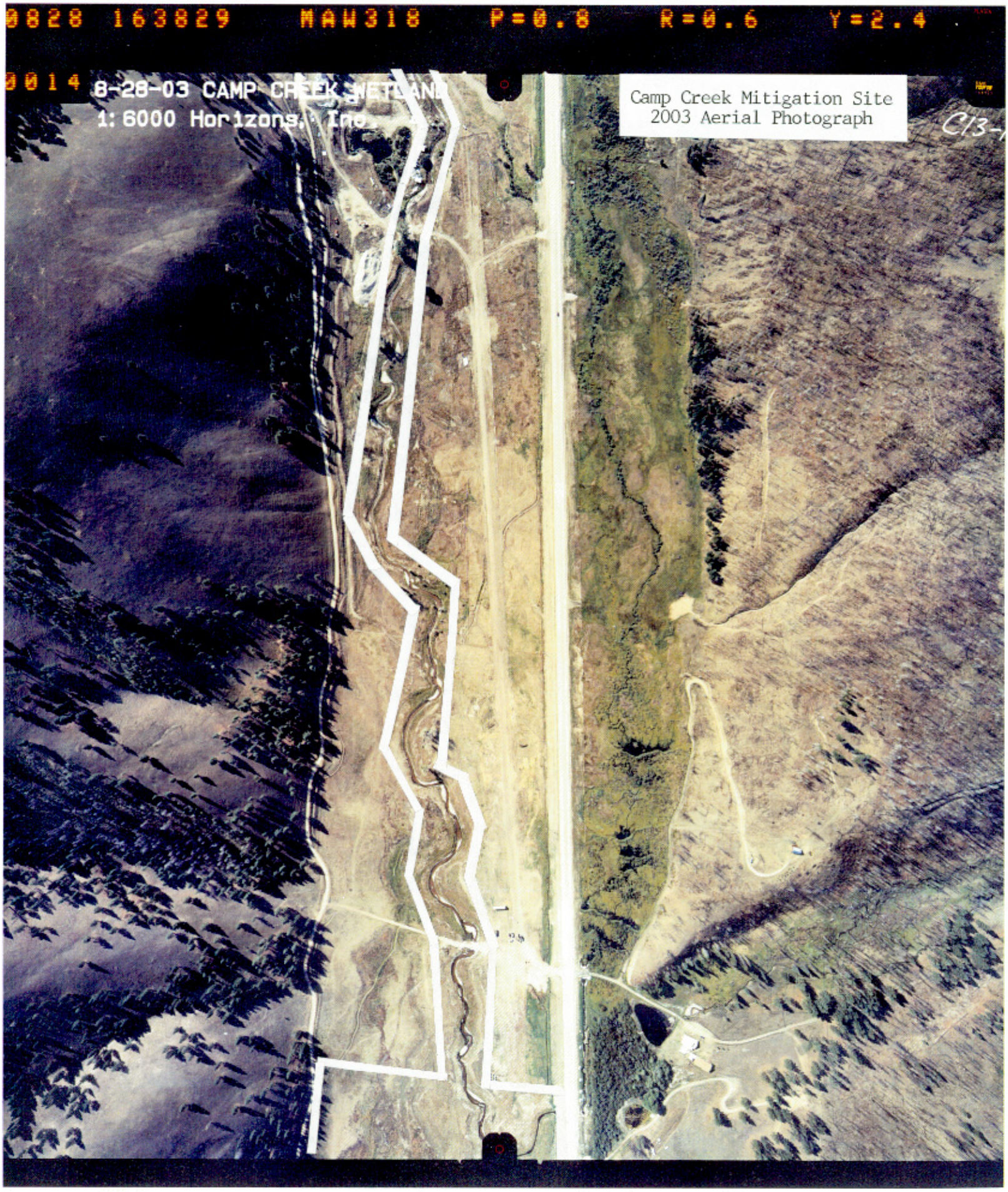
8-28-03 CAMP CREEK WETLAND
1:6000 Horizons, Inc.
Camp Creek Mitigation Site
2003 Aerial Photograph
C13-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1:6000 Horizons, Inc.
Camp Creek Mitigation Site
2003 Aerial Photograph
C13-


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0016 8-28-03 CAMP CREEK WETLAND
1:6000 Horizons, Inc. 6
Camp Creek Mitigation Site
2003 Aerial Photograph
C13-1

Appendix D

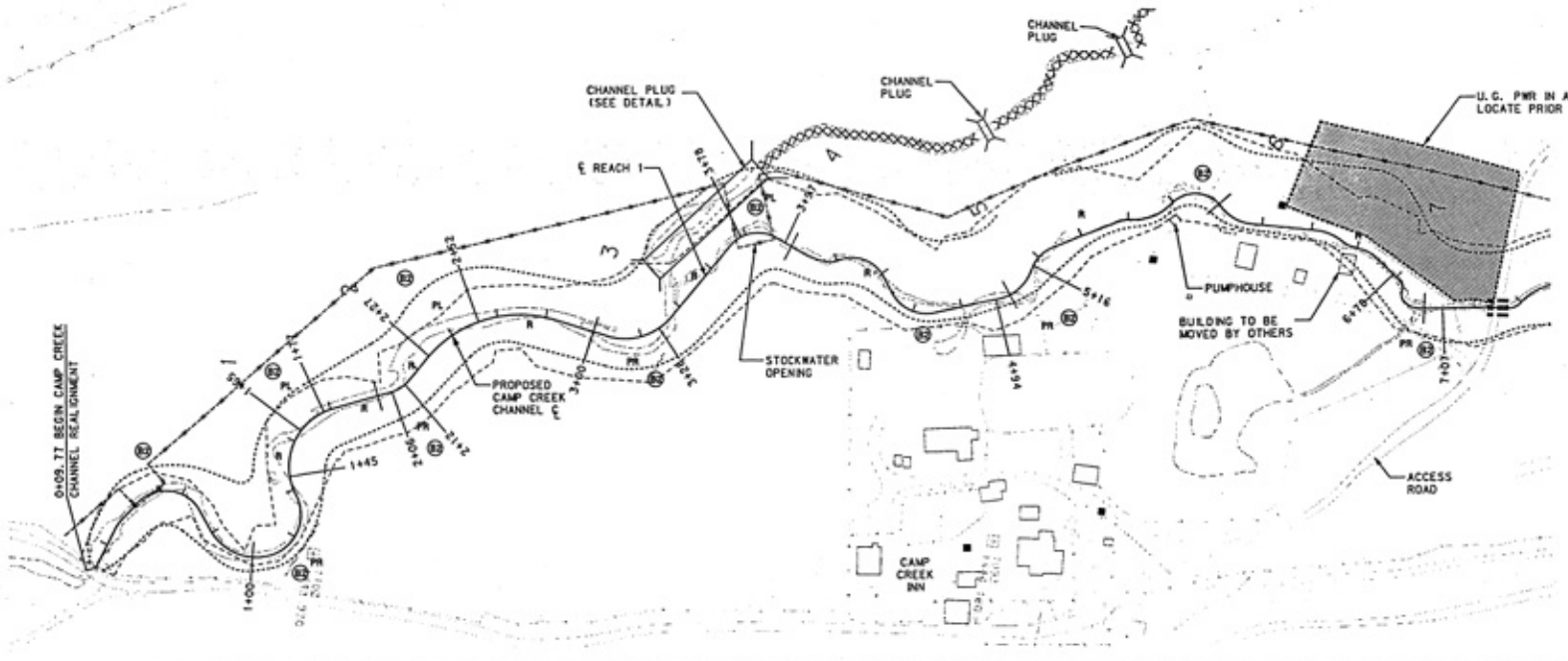
ORIGINAL SITE PLAN

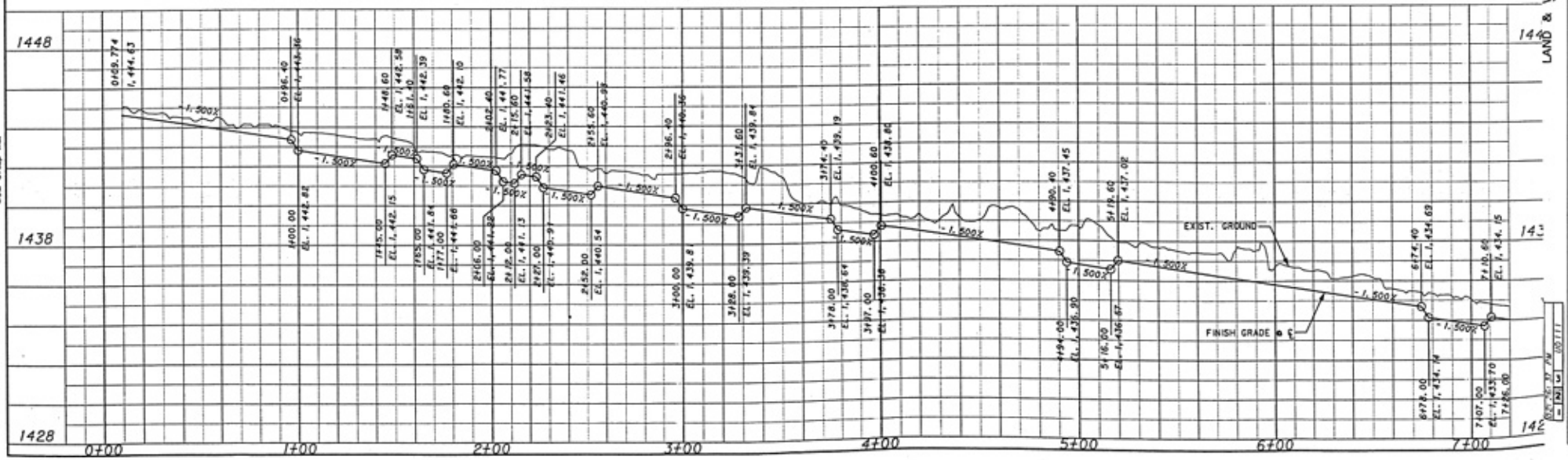
MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER

STATE	PROJECT NUMBER	SHEET
MONTANA	NH 41(24)	29

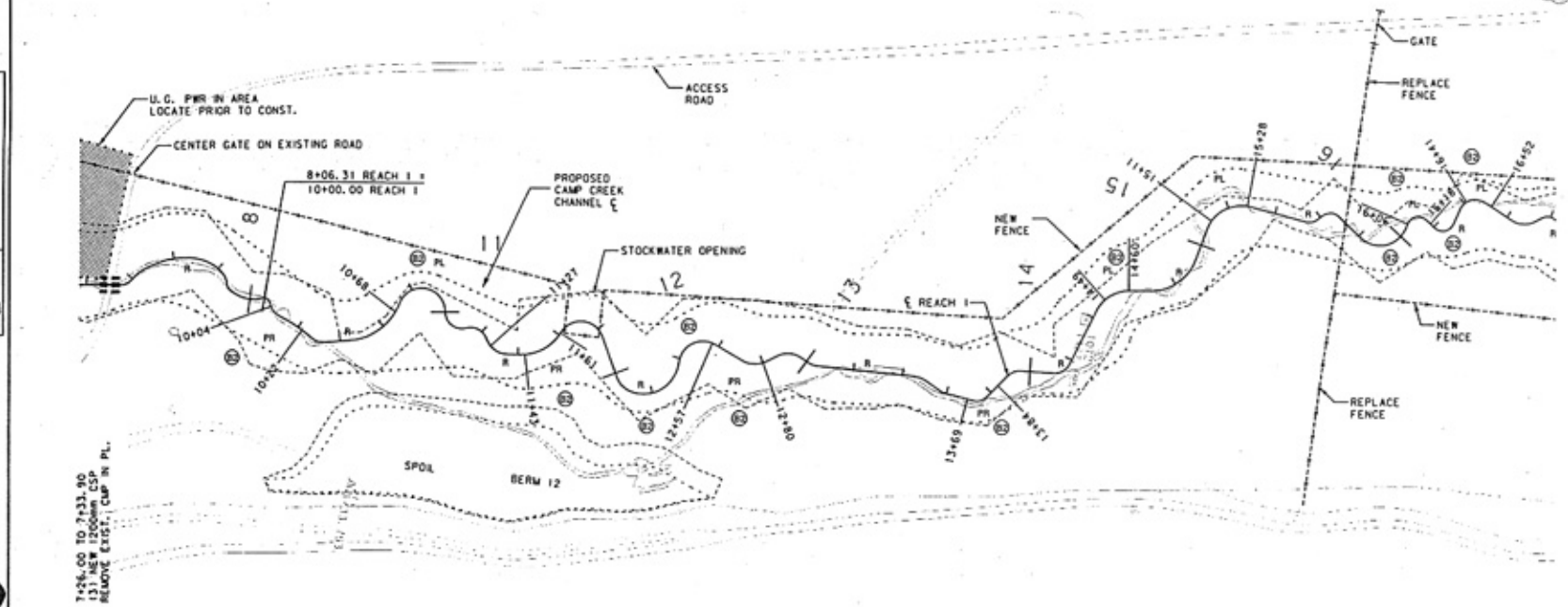
CAMP CREEK RESTORATION





STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 41(24)	30

CAMP CREEK RESTORATION



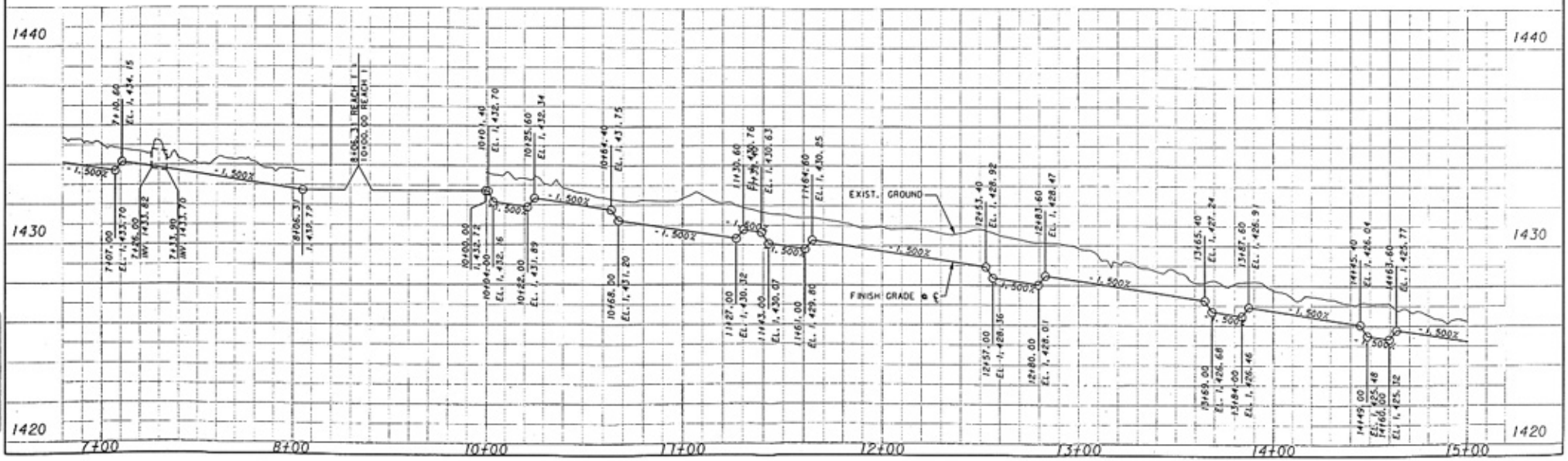
LEGEND

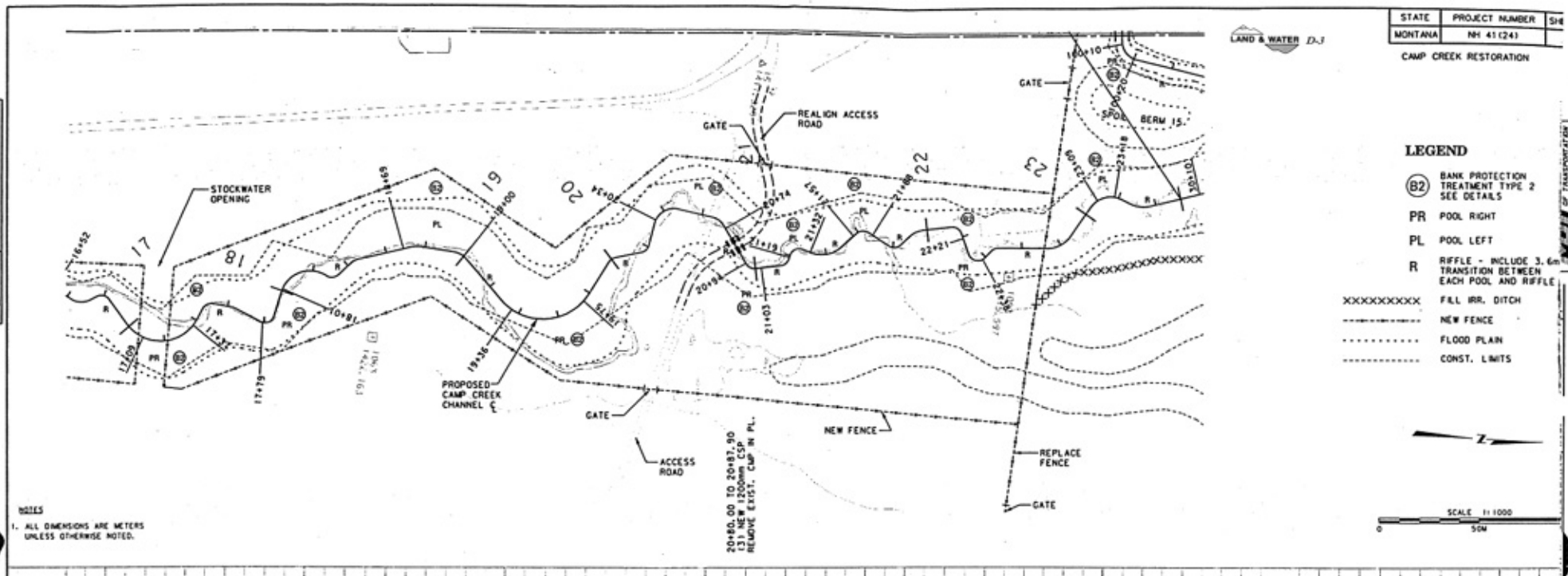
- (B2) BANK PROTECTION TREATMENT TYPE 2 SEE DETAILS
- PR POOL RIGHT
- PL POOL LEFT
- R RIFFLE - INCLUDE 3.6m TRANSITION BETWEEN EACH POOL AND RIFFLE
- XXXXXXXXX F&L WR, DITCH
- ---------- NEW FENCE
- . . . . . FLOOD PLAIN
- ---------- CONST. LIMITS

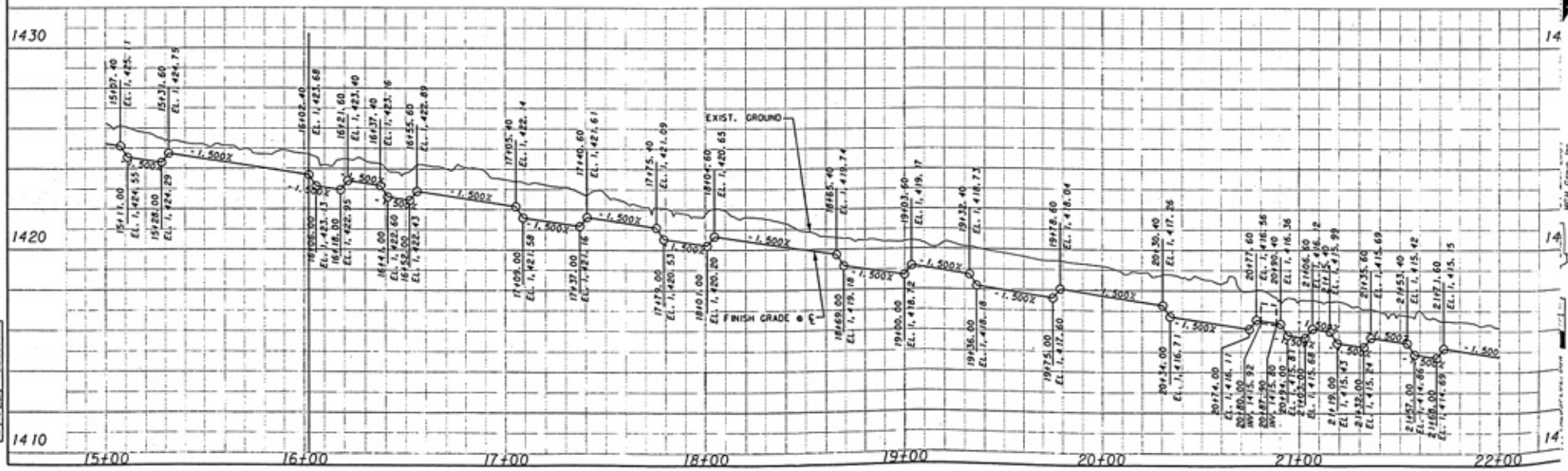
NOTES

1. ALL DIMENSIONS ARE METERS UNLESS OTHERWISE NOTED.

SCALE 1:1000



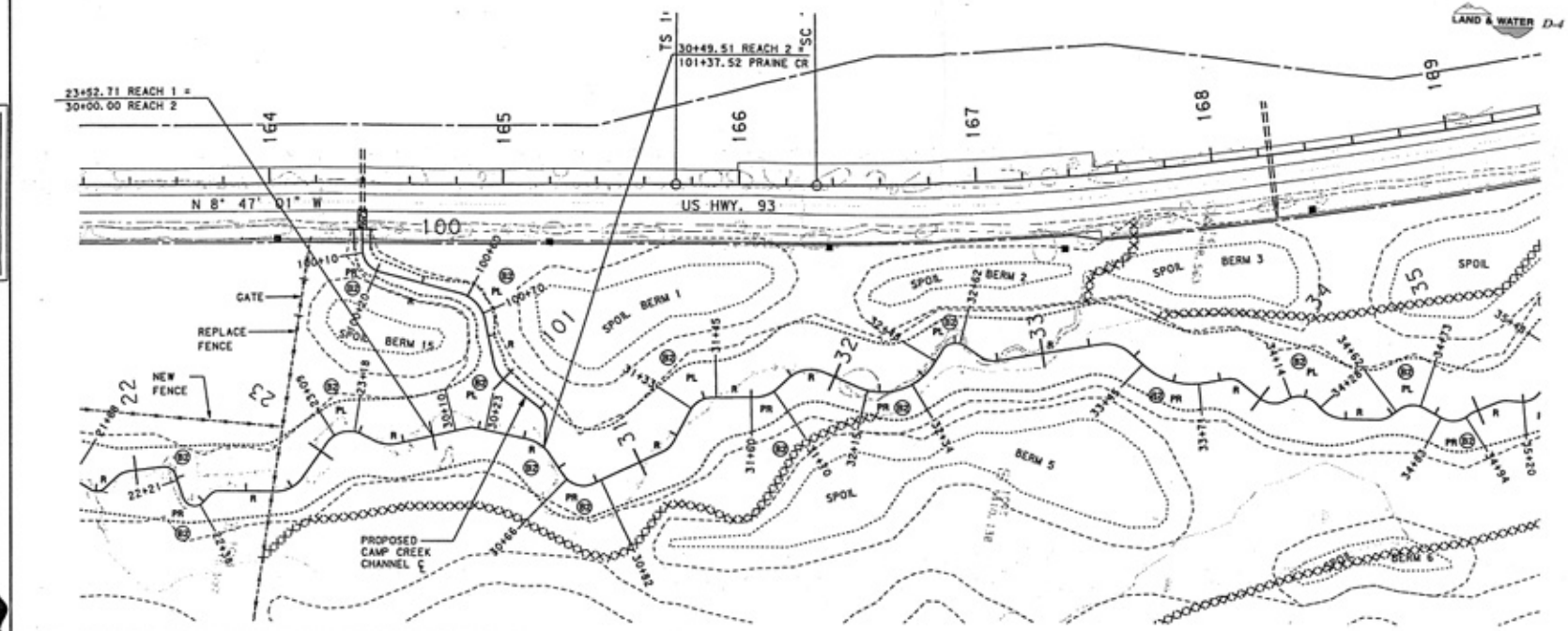




LAND & WATER CONSULTING, INC.
WGM GROUP, INC.
MONTANA DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 41 (24)	32

CAMP CREEK RESTORATION



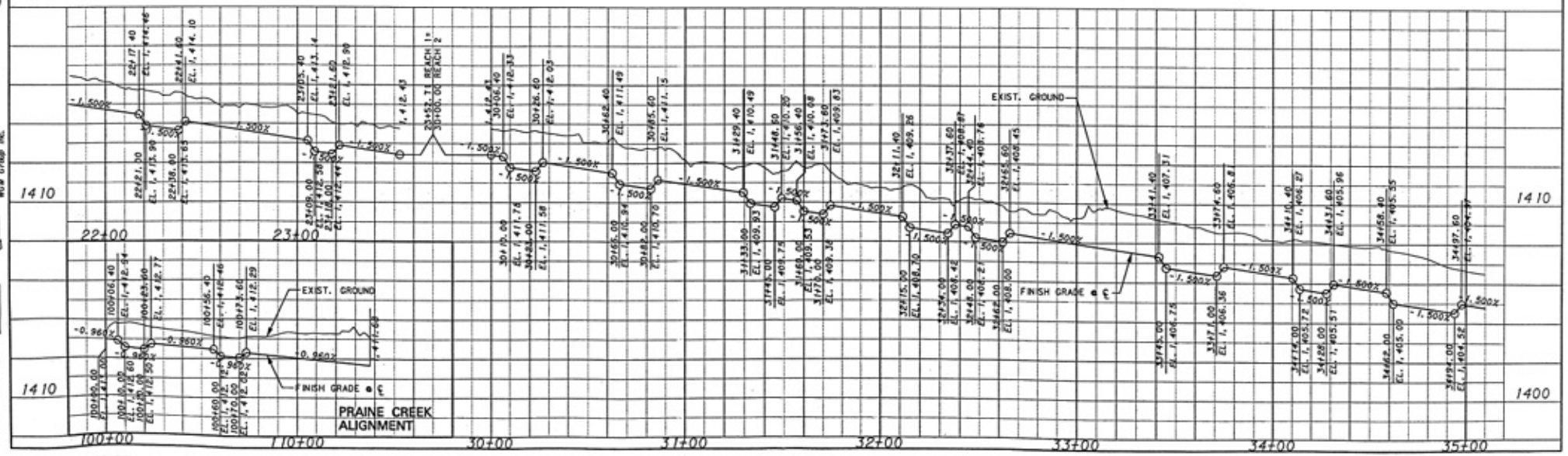
LEGEND

- (B2) BANK PROTECTION TREATMENT TYPE 2 SEE DETAILS
- PR POOL RIGHT
- PL POOL LEFT
- R RIFFLE - INCLUDE 3.6m TRANSITION BETWEEN EACH POOL AND RIFFLE
- XXXXXXXXX FILL BR. DITCH
- NEW FENCE
- FLOOD PLAIN
- CONST. LIMITS

NOTES

1. ALL DIMENSIONS ARE METERS UNLESS OTHERWISE NOTED.

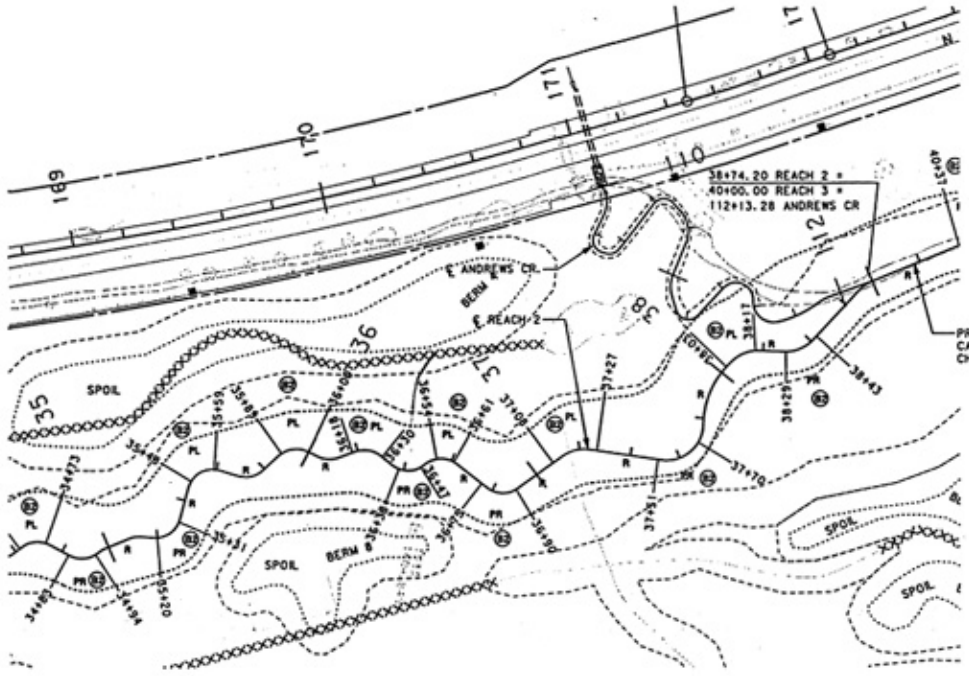
SCALE 1:1000



STATE	PROJECT NUMBER	SHEET NO
MONTANA	NH 41 (24)	33

CAMP CREEK RESTORATION

LAND & WATER D-5



LEGEND

- (B2) BANK PROTECTION TREATMENT TYPE 2 SEE DETAILS
- PR POOL RIGHT
- PL POOL LEFT
- R RIFFLE - INCLUDE 3.6m TRANSITION BETWEEN EACH POOL AND RIFFLE
- XXXXXXXXX FILL IRR. DITCH
- NEW FENCE
- FLOOD PLAIN
- CONST. LIMITS

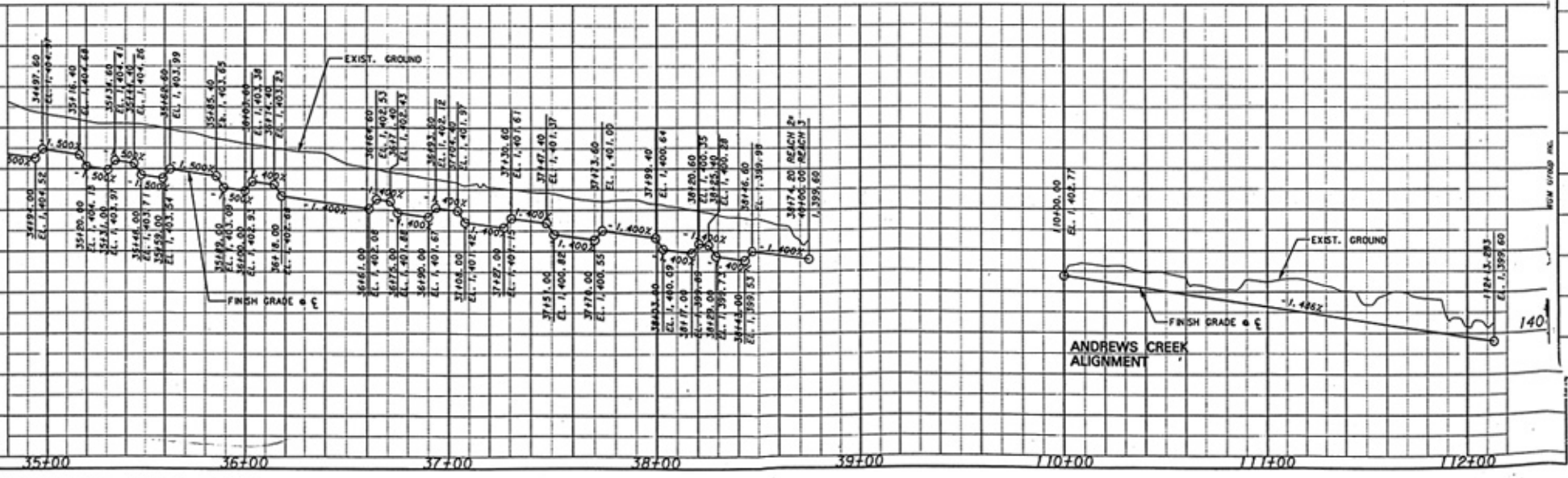
NOTES

1. ALL DIMENSIONS ARE METERS UNLESS OTHERWISE NOTED.

N

SCALE 1:1000

0 50M 100M



Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

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

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

GPS Mapping and Aerial Photo Referencing Procedure

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

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

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

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

Appendix F

MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

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

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

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

Site Selection

Select the sampling site with these considerations in mind:

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

Sampling

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

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

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

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

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

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

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

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

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

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

Photograph the sampled site.

Sample Handling/Shipping

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

MDT WETLAND MITIGATION MONITORING PROJECT
Aquatic Invertebrate Monitoring
Summary 2001, 2002, 2003

METHODS

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

The method employed to assess these wetlands is based on constructing an index using a battery of 12 bioassessment metrics or attributes (**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 metrics were developed by generally following the tactic used by Stribling et al. Boxplots were generated and distributions, ranges, and quartiles for each metric were examined. All sites were used except Camp Creek, which was sampled in 2002 and 2003. The fauna at that site was different from that of the other sites, and suggested montane stream conditions rather than wetland conditions. The Camp Creek site was assessed using the tested metric battery developed for montane streams of Western Montana (Bollman 1998). For the wetlands, "optimal" scores were generally those that fell above the 75th percentile (for those metrics that decrease in value in response to stress) or below the 25th percentile (for metrics that respond to stress by an increase in value) of all scores. Additional scoring ranges were established by bisecting the range below the 75th percentile for decreasing scores (or above the 25th percentile for increasing scores) into "sub-optimal" and "poor" assessment categories. A score of 5, 3, or 1 was assigned to optimal, sub-optimal, and poor metric performance, respectively. In this way, metric values were translated into normalized metric scores, and scores for all metrics were summed to produce a total bioassessment score. Total bioassessment scores were classified according to a similar process, using the ranges and distributions of total scores for all sites studied.

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

Sample Processing

Aquatic invertebrate samples were collected at mitigation wetland sites in the summer months of 2001, 2002, and 2003 by personnel of Wetlands West, Inc. and/or Land & Water Consulting, Inc. Sampling procedures utilized were based on the protocols developed by the Montana Department of Environmental Quality (MDEQ).

Sampling consisted of D-frame net sweeps through emergent vegetation (when present), the water column, over the water surface, and included disturbing and scraping substrates at each sampled sites. Samples were preserved in ethanol at each wetland site and subsequently delivered to Rhithron Associates, Inc. for processing, taxonomic determinations, and data analysis.

At Rhithron's laboratory, Caton subsamplers and stereomicroscopes with 10X magnification were used to randomly select a minimum of 200 organisms, when possible, from each sample. In some cases, the entire sample contained fewer than 200 organisms; in these cases, all organisms from the sample were taken. Taxa were identified in general accordance with the taxonomic resolution standards set out in the MDEQ Standard Operating Procedures for Sampling and Sample Analysis (Bukantis 1998). Ten percent of samples were re-identified by a second taxonomist

for quality assurance purposes. The identified samples have been archived at Rhithron's laboratory. Taxonomic data and organism counts were entered into an Excel 2000 spreadsheet, and metrics were calculated and scored using spreadsheet formulae.

Bioassessment Metrics

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

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

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

Two tolerance metrics (the Hilsenhoff Biotic Index and %Dominant taxon) were included in the bioassessment battery. The HBI indicates the overall invertebrate assemblage tolerance to nutrient enrichment, warm water, and/or low dissolved oxygen conditions. The percent abundance of the dominant taxon has been demonstrated to be strongly associated with pH, conductance, salinity, total organic carbon, and total dissolved solids.

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

RESULTS

In 2001, 29 sites were sampled statewide. Nineteen of these sites were revisited in 2002, and 13 new sites were sampled. In 2003, 17 sites that had been visited in both 2001 and 2002 were re-sampled, and 11 sites sampled for the first time in 2001 were re-visited. In addition, 2 new sites were sampled. Thus, the 2003 database contains records for 90 sampling events at 44 unique sites. **Table 2** summarizes sites and sampling dates.

Metric scoring criteria were re-developed each year as new data was added. For 2003, 88 records were utilized. Because of the addition of data, scoring criteria changed for several metrics in 2003; thus, biotic condition classifications assigned in 2002 for some sites also changed. However, ranges of individual metrics, as well as median metric values remained remarkably consistent in each of the three years.

Table 1. Aquatic invertebrate metrics employed in the MTDT mitigation wetland monitoring study, 2001- 2003.

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

LITERATURE CITED

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

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

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

Table 2. Sampled MDT Mitigation Sites by Year

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

Aquatic Invertebrate Taxonomic Data

Site Name CAMP CREEK **Date Collected** 8/ 7/2003

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
Basommatophora							
	Planorbidae						
		Helisoma	1	0.86%	Yes	6	SC
Coleoptera							
	Dytiscidae						
		Oreodytes	1	0.86%	Yes	5	PR
	Elmidae						
		Heterlimnius	1	0.86%	Yes	3	CG
Diptera							
	Athericidae						
		Atherix	1	0.86%	Yes	5	PR
	Chironomidae						
		Eukiefferiella Brehmi Gr.	2	1.72%	Yes	8	CG
		Pagastia	2	1.72%	Yes	1	CG
		Parametriocnemus	1	0.86%	Yes	5	CG
		Polypedilum	2	1.72%	Yes	6	SH
		Radotanypus	2	1.72%	Yes	7	PR
		Tanytarsus	20	17.24%	Yes	6	CF
		Thienemannimyia Gr.	3	2.59%	Yes	5	PR
	Simuliidae						
		Simulium	6	5.17%	Yes	6	CF
Ephemeroptera							
	Baetidae						
		Baetis tricaudatus	1	0.86%	Yes	4	CG
		Callibaetis	4	3.45%	Yes	9	CG
		Diphetor hageni	1	0.86%	Yes	5	CG
	Ephemerellidae						
		Attenella margarita	1	0.86%	Yes	3	CG
		Drunella grandis	11	9.48%	Yes	2	SC
		Timpanoga hecuba	2	1.72%	Yes	2	CG
	Heptageniidae						
		Nixe	1	0.86%	Yes	4	SC
	Leptophlebiidae						
		Paraleptophlebia	15	12.93%	Yes	1	CG
Haplotaxida							
	Tubificidae						
		Limnodrilus	10	8.62%	Yes	10	CG
Plecoptera							
	Perlodidae						
		Skwala	3	2.59%	Yes	3	PR
	Pteronarcyidae						
		Pteronarcys princeps	3	2.59%	Yes	0	SH
Trichoptera							
	Apataniidae						
		Apatania	7	6.03%	Yes	3	SC
	Brachycentridae						
		Brachycentrus americanus	3	2.59%	Yes	1	CF
		Micrasema	1	0.86%	Yes	1	SH
	Glossosomatidae						
		Glossosoma	5	4.31%	Yes	0	SC
	Hydropsychidae						
		Arctopsyche grandis	3	2.59%	Yes	2	PR
		Hydropsyche	2	1.72%	Yes	5	CF
	Lepidostomatidae						
		Lepidostoma (sand case)	1	0.86%	Yes	1	SH
Grand Total			**116**				

Aquatic Invertebrate Data Summary

Project ID: MDT03LW
STORET Station ID:
Station Name: CAMP CREEK

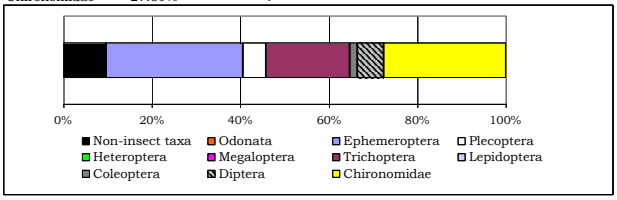
Activity ID:

Sample Date: 8/7/2003

Sample type	
SUBSAMPLE TOTAL ORGANISMS	116
Portion of sample used	36.67%
Estimated number in total sample	316
Sampling effort	
Time	
Distance	
Jabs	
Habitat type	
EPT abundance	64
Taxa richness	30
Number EPT taxa	17
Percent EPT	55.17%

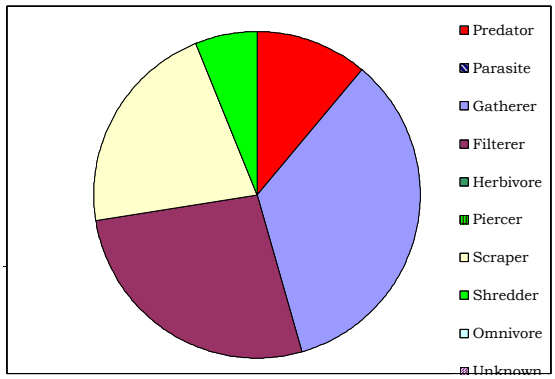
TAXONOMIC COMPOSITION

GROUP	PERCENT	#TAXA
Non-insect taxa	9.48%	2
Odonata	0.00%	0
Ephemeroptera	31.03%	8
Plecoptera	5.17%	2
Heteroptera	0.00%	0
Megaloptera	0.00%	0
Trichoptera	18.97%	7
Lepidoptera	0.00%	0
Coleoptera	1.72%	2
Diptera	6.03%	2
Chironomidae	27.59%	7



FUNCTIONAL COMPOSITION

GROUP	PERCENT	#TAXA
Predator	11.21%	6
Parasite	0.00%	0
Gatherer	34.48%	11
Filterer	26.72%	4
Herbivore	0.00%	0
Piercer	0.00%	0
Scraper	21.55%	5
Shredder	6.03%	4
Omnivore	0.00%	0
Unknown	0.00%	0



COMMUNITY TOLERANCES

Sediment tolerant taxa	0
Percent sediment tolerant	0.00%
Sediment sensitive taxa	2
Metals tolerance index (McGuire)	4.08
Cold stenotherm taxa	2
Percent cold stenotherms	8.62%

HABITUS MEASURES

Hemoglobin bearer richness	4
Percent hemoglobin bearers	12.93%
Air-breather richness	1
Percent air-breathers	0.86%
Burrower richness	1
Percent burrowers	0.86%
Swimmer richness	2
Percent swimmers	56.90%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Tanytarsus	20	17.24%
Paraleptophlebia	15	12.93%
Drunella grandis	11	9.48%
Limnodrilus	10	8.62%
Apatania	7	6.03%
SUBTOTAL 5 DOMINANTS	63	54.31%
Simulium	6	5.17%
Glossosoma	5	4.31%
Callibaetis	4	3.45%
Skwala	3	2.59%
Pteronarcys princeps	3	2.59%
TOTAL DOMINANTS	84	72.41%

SAPROBITY

Hilsenhoff Biotic Index	3.97

DIVERSITY

Shannon H (loge)	4.79
Shannon H (log2)	3.32
Margalef D	6.10
Simpson D	0.07
Evenness	0.11

VOLTINISM

TYPE	# TAXA	PERCENT
Multivoltine	10	32.76%
Univoltine	15	57.76%
Semivoltine	5	9.48%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	2	4.31%
Intolerant	3	18.10%
Clinger	15	58.62%

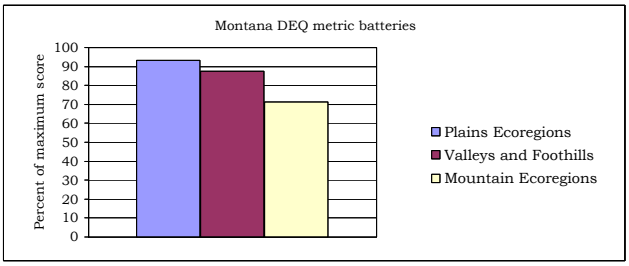
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE	
Taxa richness	30	3	
E richness	8	3	
P richness	2	1	
T richness	7	3	
Long-lived	5	5	
Sensitive richness	3	3	
%tolerant	4.31%	5	
%predators	11.21%	3	
Clinger richness	15	3	
%dominance (3)	39.66%	5	
	TOTAL SCORE	34	68%

MONTANA DEQ METRICS (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	30	3	3	3
EPT richness	17	3	3	2
Biotic Index	3.97	3	3	2
%Dominant taxon	17.24%	3	3	3
%Collectors	61.21%	2	2	2
%EPT	55.17%	3	2	2
Shannon Diversity	3.32	3		
%Scrapers +Shredders	27.59%	2	2	1
Predator taxa	6	3		
%Multivoltine	32.76%	3		
%H of T	22.73%		3	
TOTAL SCORES		28	21	15
PERCENT OF MAXIMUM		93.33	87.50	71.43
IMPAIRMENT CLASS		NON	NON	SLIGHT



Montana Plains ecoregions metrics (Bramblett and Johnson)

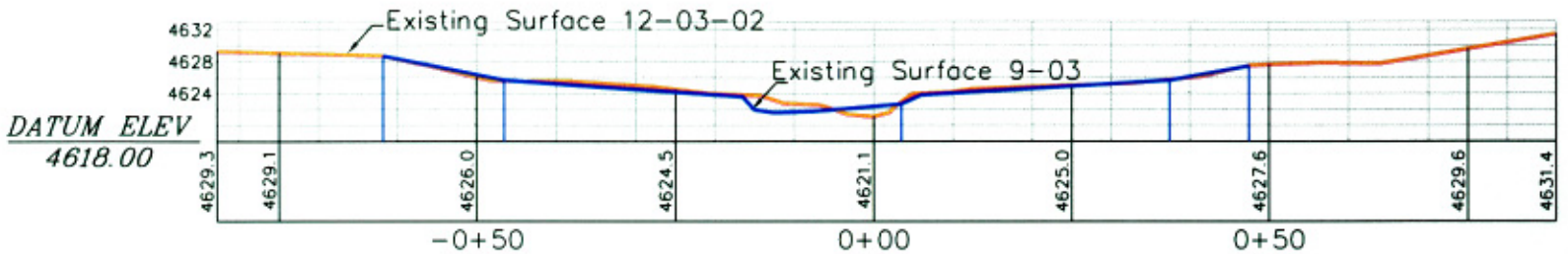
Riffle		*Pool*	
EPT richness	17	E richness	8
Percent EPT	55.17%	T richness	7
Percent Oligochaetes and Leeches	8.62%	Percent EPT	55.17%
Percent 2 dominants	30.17%	Percent non-insect	9.48%
Filterer richness	4	Filterer richness	4
Percent intolerant	39.66%	Univoltine richness	15
Univoltine richness	15	Percent supertolerant	13.79%
Percent clingers	58.62%		
Swimmer richness	2		

Appendix G

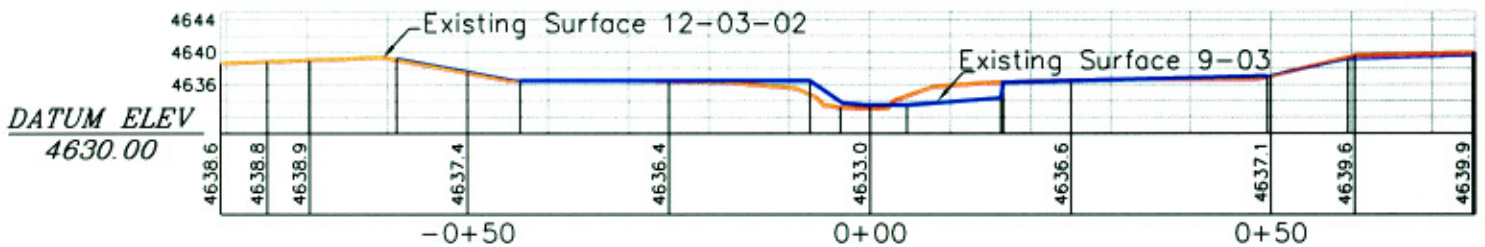
FIGURE 5 - CAMP CREEK CHANNEL CROSS SECTIONS
PLANTING SPECIFICATIONS

MDT Wetland Mitigation Monitoring
Camp Creek
Sula, Montana

LAND & WATER



Cross Section 3-A



Cross Section 4-A

LAND & WATER CONSULTING, INC. P.O. BOX 8254 Missoula, MT 59807	PROJ NO: 130091T38	DRAWN: RA	PROJECT NAME: MDT Camp Creek Wetland Mitigation	FIGURE 5
	FILE NAME: TASK38BASE.DWG	CHECKED: RA		REV -
	SCALE: 1"=20feet	APPVD: RA	DRAWING TITLE: Channel Cross Sections	DATE: 10-29-03
	LOCATION: Sula,MT	PROJ MGR: J.Bergland		

Nature's Enhancement, Inc.

2980 Eastside Highway
Stevensville, Montana 59870
Phone: (406) 777-3560
FAX: (406) 777-3560

MONITORING

LAND & WATER F-2

SOLD TO:
Department of Transportation
Project No:
NH7-1(58)9 F Sula-North & South
NH41(24) Camp Creek Restoration

SHIPPED TO:
Sula North & South/ Camp Creek Restoration
Project Site
Sula, Montana

INVOICE NUMBER	
PURCHASE ORDER #	
ORDER DATE	
SHIP DATE (EST.)	
TERMS	
DUE DATE	
SALES REP	Greg
SHIP VIA	NE

	CC5: REVEGETATION		
446	Alnus incana	1 Gallon	1-2'
315	Alnus incana	5 Gallon	3-4'
752	Amelanchier alnifolia	1 Gallon	1-2'
374	Betula occidentalis	5 Gallon	3-4'
667	Cornus stolonifera	1 Gallon	2-3'
369	Cornus stolonifera	5 Gallon	4-5'
213	Pinus contorta	1 Gallon	1-2'
89	Pinus contorta	5 Gallon	2-3'
213	Pinus ponderosa	1 Gallon	1-2'
89	Pinus ponderosa	5 Gallon	2-3'
303	Populus tremuloides	1 Gallon	18-24"SS
15	Populus tremuloides	5 Gallon	4-5'SS
791	Populus tremuloides	1 Gallon	18-24"MS
311	Populus tremuloides	5 Gallon	4-5'MS
500	Populus trichocarpa	1 Gallon	2-3'
518	Populus trichocarpa	5 Gallon	5-6'
2025	Potentilla fruticosa	1 Gallon	12-18"
213	Pseudotsuga menziesii	1 Gallon	12-15"
89	Pseudotsuga menziesii	5 Gallon	24-30"
1178	Rosa woodsii	1 Gallon	2-3'
1902	Willox (Salix spp.)	1 Gallon	2-3'MS

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429	Willox (Salix spp.)	5 Gallon	4-6MS
1178	Syphoricarpos albus	1 Gallon	18-24
10681	Installation of above 1 Gallon Plants		
2598	Installation of above 5 Gallon Plants		
20,480	Willow Cuttings 12" long with a minimum ba 12" x .75 Base of .75 inches(800/Hectare) Includes collection, installation		
	WILLOW SALVAGE		
57	Tree Spade dig at a minimum diameter of 24", burlap, basket, crimp, tie		
	Storage of the above on site in .75m fine soil, to be provided by prime contractor		
	Replant willow clumps		

Shipping Charges:

Common Carrier (CMN): billed COD from the trucking company.
Nature's Enhancement (NE): billed from NE on the Final Invoice.
Nursery Pick Up (NPU): no charge.

SUBTOTAL	
QTY. DISCOUNT	Included
SHIPPING (ESTIMATE)	Included
BOXING & HANDLING	Included
TOTAL	0.00

$0.00 PAY THIS AMOUNT

Questions concerning this order?
Call: PHONE: (406) 777-3560
FAX: (406) 777-3560

MAKE ALL CHECKS PAYABLE TO:
Nature's Enhancement, Inc.
2080 Eastside Highway
Stevensville, Montana 59870

THANK YOU FOR YOUR ORDER! WE LOOK FORWARD TO SERVING YOU AGAIN.

LAND & WATER F-4

SEED BLENDING REPORT

Dept. of Transportation, Great Falls, MT

1-Materials Bureau, (Pat Hoy)
1-District Lab Gt. Falls
1-E.P.M. T. BENEDIK — MISSOULA

PROJECT NO.: NH 41(24) TERMINI: CAMP CREEK RESTORATION

BLENDING WITNESSED BY: JAMES O. BLOSSOM JB DATE: 04/22/2002

LOCATION: Fairfield, Montana

SEED SUPPLIER: Treasure State Seed Inc.

Type Of Seed	Lot No.	~~ACRE~~ Hectare Area 1 1.25 LBS kg Pls per ~~AC.~~ ha	(d) Total ~~kg~~ LBS Pls	(e) Total Bulk Seed Blended For Area 1	MSU Seed Laboratory test results (a) % Purity	(b) % Germ	(c) % Pls	Hectare Area 2 kg Pls Per ha	(d) Total kg Pls	(e) Total Bulk Seed Blended for Area 2	Mat'ls. Bureau Pretest Lab. No	MSU Test Date Expires
MEADOW BARLEY •	NBS-1-053SH	0.5	0.6	0.7	93.59	97	90.78					
BLUEJOINT REEDGRASS •	CACA24204	0.3	0.4	0.6	85.86	77	66.13					
FOWL BLUEGRASS •	00-043	2.0	2.5	3.2	86.91	89	77.35					
TUFFED HAIRGRASS •	99-1438-75	2.0	2.5	2.7	94.2	99	93.26					
BLUE WILDRYE •	GBS-0-300	7.0	8.8	9.7	99.06	92	91.15					
BROMAR MOUNTAIN BROME	006-026-12A	6.0	7.5	7.8	98.85	97	95.88					
TOTAL				24.7	LBS							

BULK SEEDING RATE AREA 1 19.76 ~~KILOGRAMS~~ LBS (kg) PER ~~HECTARE~~ ACRE (ha). BULK AREA 2 _____ KILOGRAMS (kg) PER HECTARE (ha)

% PURITY (a) X % GERMINATION (b) = % PURE LIVE SEED © X 100.

TOTAL KILOGRAMS (kg) PURE LIVE SEED (d) = % PURE LIVE SEED © X 100 = BULK SEED NEEDED (e)

REMARKS: