
**MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2007**

*Hoskins Landing
Dixon, Montana*



Prepared for:

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

Prepared by:

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

December 2007

PBS&J Project No: B43088.00 - 0106

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1.0 INTRODUCTION

The Hoskins Landing Wetland Mitigation Site was developed to mitigate wetland impacts associated with Montana Department of Transportation (MDT) proposed Dixon-West and Paradise-East highway reconstruction projects along Montana Highway 200. This report documents the sixth year of monitoring at the site. Hoskins Landing is located in Sanders County in Watershed # 3 (Lower Clark Fork). The mitigation site is located approximately one-quarter mile north of Dixon, adjacent to the Flathead River (**Figure 1**). Elevation is approximately 2,500 feet with slight topographic variation throughout the project site.

The approximate site boundary is illustrated on **Figure 2** in **Appendix A**, and the original site plans are included in **Appendix D**. The project is located adjacent to the Flathead River in an area of historic floodplain, heavily impacted from past agricultural activities. Seasonal flooding provides the primary wetland hydrology through inundation of backwater channels. Local groundwater systems moving through alluvium provide a secondary source of hydrology for this site. The site is located on the Flathead Indian Reservation and is managed by the Confederated Salish & Kootenai Tribes. The wetland easement area is mostly fenced with several exclusions on the east and west ends near the river banks. Livestock grazing has mostly been removed from the site with the establishment of electric fences, although a small corridor adjacent to the Flathead River is still accessible to livestock.

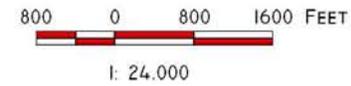
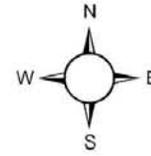
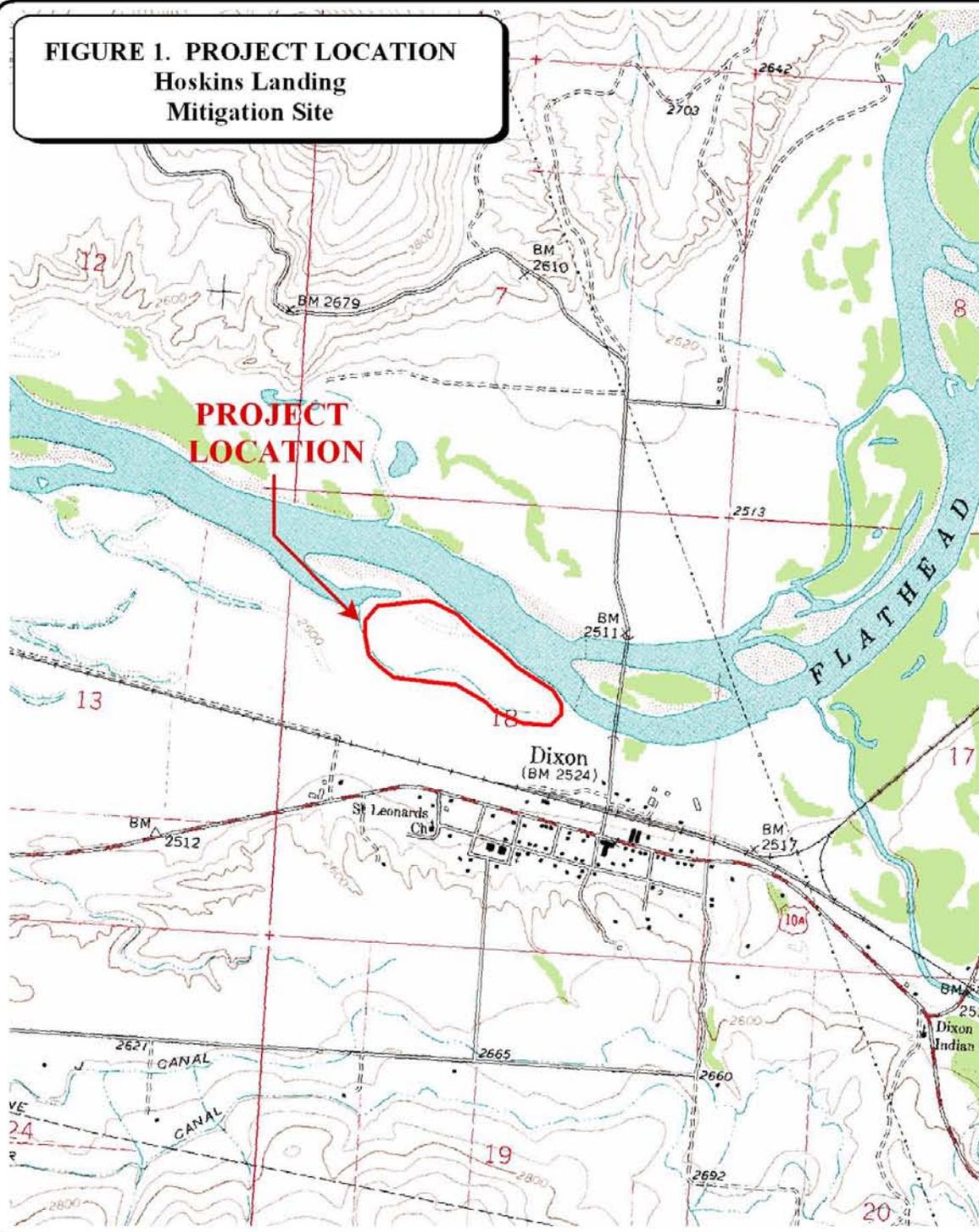
Initial construction was completed in fall 2002 with the goal of restoring/creating 8.1 acres of wetlands and enhancing vegetation on 5.2 acres of heavily grazed and cleared lands. Construction diagrams are presented in **Appendix D**. Revegetation work was conducted during the spring and fall of 2003, 2004 and 2005, and a berm / road crossing of the backwater channel was removed during spring 2005 to reconnect historical flow patterns. The primary components of construction include:

- Excavation and grading of 8.1 acres to facilitate wetland development.
- Enhancement of 5.2 acres of native vegetation characteristics in the lower Flathead River riparian corridor.
- Filling of inlet channel and removal of headgate in the northeast corner of the site.
- Removal of outlet dam along the remnant channel bordering the south portion of the site.
- Removal of man-made flood control berm along the Flathead River and grading of excavated ground to 10:1 slopes.
- Removal of a man-made berm along the remnant backwater 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, wildlife habitat and riparian vegetation.

Pre-construction wetland delineation documented 5.85 acres of wetlands and 0.82 acre of “extremely marginal” reed canarygrass (*Phalaris arundinacea*) swales at the site (Western EcoTech 1999). Consequently, definitive baseline wetland acreage was 5.85 acres. The monitoring area is illustrated on **Figure 2** in **Appendix A**.

FIGURE 1. PROJECT LOCATION
Hoskins Landing
Mitigation Site



PROJECT #: 130091.039
 DATE: Nov 2002
 LOCATION: DIXON
 PROJECT MANAGER: J. BERGLUND
 DRAWN BY: B. STEINEBACH



1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

2.0 METHODS

2.1 Monitoring Dates and Activities

Monitoring activities were conducted on May 16th (spring) and August 30th (mid-season) of 2007. The spring visit was conducted to observe bird and other wildlife use. 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.

2.2 Hydrology

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

2.3 Vegetation

General dominant species-based vegetation community types were delineated on an aerial photograph during the mid-season visit. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation and do not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the Wetland Mitigation Site Monitoring Form (**Appendix B**).

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

A comprehensive plant species list for the site was compiled and is updated as new species are encountered. All noxious weed locations observed on-site were mapped and illustrated on **Figure 3**.

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 (Environmental Laboratory 1987). 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 (NRCS 1998).

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was originally delineated on the aerial photo and then recorded with a resource grade GPS unit using the procedures outlined in **Appendix E**. Modifications to these boundaries in 2007 were accomplished by hand mapping onto the 2007 aerial photograph. The wetland/upland boundary in combination with the wetland/open water boundary was used to calculate the final wetland acreage. Pre-construction wetland delineation documented 5.85 acres of wetlands at the site (Western EcoTech 1999).

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during each visit. Indirect use indicators, including tracks, scat, burrows, eggshells, skins, bones, etc. were also recorded. Observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used.

2.7 Birds

Bird observations were recorded during the spring and mid-season visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. The spring birding visit was conducted in accordance with the Bird Survey Protocols (**Appendix E**). During the mid-season visit, bird observations were recorded incidental to other monitoring activities. Bird species observations were categorized by species, activity code, and general habitat association on the Bird Survey Field Data Sheet (**Appendix B**).

2.8 Macroinvertebrates

Macroinvertebrate samples were collected during the mid-season site visit at two separate locations (**Figure 2** in **Appendix A**). Collection occurred using the Macroinvertebrate Sampling Protocol (**Appendix F**). Samples were preserved as outlined in the sampling procedure and sent to Rhithron Associates, Inc. in Missoula, Montana for analysis (**Appendix F**).

2.9 Functional Assessment

A functional assessment form was completed in 2007 using the 1999 MDT Montana Wetland Assessment Method (Berglund 1999) (**Appendix B**). Field data necessary for this assessment were collected during the mid-season visit. Western Eco Tech completed baseline functional assessment during the initial wetland delineation using the 1996 MDT Montana Wetland Field Evaluation Form.

2.10 Photographs

The July 7, 2007 aerial photograph was used for **Figures 2 and 3** in **Appendix A**. Photographs were taken illustrating current land uses surrounding the site, the upland buffer, the monitored area, and the vegetation transect (**Appendix C**). Each photograph point location was recorded with a resource grade GPS in 2002 and mapped (**Figure 2** in **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 2007. Procedures used for GPS mapping and aerial photography referencing are included in **Appendix E**.

2.12 Maintenance Needs

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

3.0 RESULTS

3.1 Hydrology

The main source of hydrology is seasonal flooding by the Flathead River. This mitigation site occurs in Flathead River floodplain consisting of back channels and shallow open water areas. The eastern end of the site once contained a headgate that controlled the flow of water into the remnant channel running along the southern boundary. This headgate was removed, allowing water to flow through channel during seasonally high flows. A secondary source of hydrology is the persistent upwelling and lateral movement of groundwater through the alluvial materials. The water regime at Hoskins Landing is ultimately controlled by water release from Kerr Dam over 42 miles upriver.

Open water areas first decreased during 2005 due an increase in aquatic vegetation. The same trend was observed during the 2007 monitoring. Some former open water areas were mapped as Type 3 vegetation consisting of emergent wetland and aquatic bed types in shallow waters. These shallow waters occurred across approximately 3.87 acres or 30% of the wetland area (**Figure 3 in Appendix A**) during the mid-season visit. Water depth at the open water/rooted vegetation boundary was approximately 1.0 feet. Inundation was observed at this time across another 60% of the wetland area. Inundation was present throughout all of Community Types 2, 3, 11, and 12 (**Figure 3**).

3.2 Vegetation

Eighty-six plant species were identified at the site and are listed in **Table 1**. The majority of these species are herbaceous. A few small remnant shrub patches exist, found mostly along the active backwater channel. Several small stands of black cottonwood (*Populus trichocarpa*) and box elder (*Acer negundo*) occur on higher terraces located along the river and backwater channels. Eight wetlands types and seven upland community types were identified and mapped at the mitigation site (**Figure 3 in Appendix A**). The eight wetland community types include Type 2: *Eleocharis/Phalaris*, Type 3: *Potamogeton/Elodea*, Type 5: *Phalaris/Salix*, Type 7: *Phalaris*, Type 11: *Ceratophyllum*, Type 12: *Juncus/Eleocharis*, Type 13: *Phalaris/Agrostis*, and Type 14: *Populus / Salix*. Plant species observed within each of these communities are listed on the attached data form (**Appendix B**). The seven upland community types include Type 4: *Agropyron/Melilotus*, Type 6: *Festuca/Phleum*, Type 8: *Agropyron/Plantago*, Type 9: *Bromus*, Type 10: *Populus/Crataegus*, Type 14: *Agrostis/Poa* and Type 15: *Phalaris* (non-wetland). Plant species observed within each of these communities are also listed on the attached data form (**Appendix B**).

Types 3 and 11 are the wettest community types and occurred as aquatic bed/emergent wetland communities in the shallow waters of the excavated wetlands and remnant backwater channel (**Figure 3 in Appendix A**). Type 3 is dominated by large leaf pondweed (*Potamogeton amplifolius*), curly pondweed (*Potamogeton crispus*), broad water-weed (*Elodea canadensis*) and least spike-rush (*Eleocharis acicularis*). Type 11 is mostly dominated by common hornwort (*Ceratophyllum demersum*). Types 2 and 12 are the next wettest areas, consisting of emergent vegetation types occurring in an undisturbed wetland and the fringes of excavated wetland.

Type 2 is located on the west side, surrounded by the newly constructed wetlands, dominated by least spike rush, reed canarygrass, and bulrush (*Scirpus acutus*). Type 12 occurs along the fringes of excavated wetland in areas that receive annual inundation; vegetation is dominated by three-stamen rush (*Juncus ensifolius*), reed canarygrass, creeping spike rush (*Eleocharis palustris*) and redtop (*Agrostis alba*). Type 5 occurs throughout the backwater channel located on the south side of the project border. Type 7, 13 and 14 are the least wet, dominated by reed canarygrass, and are located within the seasonally flooded areas adjacent to river. A few mature cottonwoods growing on the along the river terrace are also mapped as part of the Type 7 community. Type 14, previously mapped as Type 7, is dominated by black cottonwood and sandbar willow saplings that started as volunteers in 2004. The increase in vegetation cover and overall development of woody species within this area warranted an additional community type designation.

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Table 1: 2002 to 2007 vegetation species list for the Hoskins Landing Wetland Mitigation Site.

Scientific Name ¹	Common Name	Region 9 (Northwest) Wetland Indicator
<i>Acer negundo</i>	box elder	FAC+
<i>Agropyron repens</i>	quackgrass	FACU
<i>Agrostis alba</i>	redtop	FAC+
<i>Achillea millefolium</i>	common yarrow	FACU
<i>Alnus incana</i>	alder	FACW
<i>Alopecurus pratensis</i>	meadow foxtail	FACW
<i>Amaranthus retroflexus</i>	red-root pigweed	FACU+
<i>Amelanchier alnifolia</i>	serviceberry	FACU
<i>Artemisia ludoviciana</i>	white sagebrush	FACU-
<i>Bromus japonicus</i>	Japanese brome	UPL
<i>Bromus tectorum</i>	cheatgrass	--
<i>Carex bebbiana</i>	Bebbs sedge	OBL
<i>Carex lanuginosa</i>	wooly sedge	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Carex retrorsa</i>	retorse sedge	FAC
<i>Carex utriculata</i>	beaked sedge	OBL
<i>Centaurea maculosa</i>	spotted knapweed	--
<i>Ceratophyllum demersum</i>	common hornwort	OBL
<i>Chenopodium album</i>	white goosefoot	FAC
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	--
<i>Cirsium arvense</i>	Canada thistle	FACU+
<i>Cirsium vulgare</i>	bull thistle	FACU
<i>Coreopsis atkinsoniana</i>	tickseed	FACU
<i>Cornus stolonifera</i>	red-osier dogwood	FACW
<i>Crataegus douglasii</i>	Douglas hawthorn	FAC
<i>Cynoglossum officinale</i>	hound's tongue	FACU
<i>Dactylis glomerata</i>	orchard grass	--
<i>Dipsacus fullonum</i>	Fullers teasel	FAC
<i>Eleocharis acicularis</i>	least spike rush	OBL
<i>Eleocharis palustris</i>	creeping spike rush	OBL
<i>Elodea canadensis</i>	broad water-weed	OBL
<i>Elymus trachycaulus</i>	slender wheatgrass	FAC
<i>Equisetum arvense</i>	field horsetail	FAC
<i>Equisetum hyemale</i>	scouring rush	FACW
<i>Festuca pratensis</i>	meadow fescue	FACU+
<i>Erodiun cicutarium</i>	red-stem filaree	NI
<i>Gnaphalium palustre</i>	cudweed	FAC+
<i>Helianthus annuus</i>	common sunflower	FACU+
<i>Helenium autumnale</i>	common sneezeweed	FACW
<i>Hippuris vulgaris</i>	common mare's-tail	OBL
<i>Hypericum perforatum</i>	St. John's wort	--
<i>Iris pseudoacorus</i>	yellow iris	OBL
<i>Juncus balticus</i>	Baltic rush	FACW
<i>Juncus ensifolius</i>	three-stamen rush	FACW
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	--
<i>Lepidium perfoliatum</i>	clasping pepper-grass	FACU+
<i>Linaria dalmatica</i>	dalmatian toadflax	--
<i>Malva neglecta</i>	mallow	--
<i>Melilotus alba</i>	white sweetclover	FACU
<i>Melilotus officinalis</i>	yellow sweetclover	FACU
<i>Mentha arvensis</i>	field mint	FAC
<i>Myosotis scorpioides</i>	true forget me not	FACW
<i>Myriophyllum sp.</i>	water-milfoil	OBL
<i>Oenothera villosa</i>	hairy evening-primrose	FAC+

Table 1 (continued): 2002 to 2007 vegetation species list for the Hoskins Landing Wetland Mitigation Site.

Scientific Name ¹	Common Name	Region 9 (Northwest) Wetland Indicator
<i>Panicum capillare</i>	old witchgrass	FACU+
<i>Phalaris arundinacea</i>	Reed canarygrass	FACW
<i>Phleum pratense</i>	timothy	FACU
<i>Pinus ponderosa</i>	ponderosa pine	FACU-
<i>Plantago lanceolata</i>	English plantain	FAC
<i>Plantago major</i>	plantain	FACU+
<i>Poa pratensis</i>	Kentucky bluegrass	FACU+
<i>Polygonum amphibium</i>	water smartweed	OBL
<i>Polygonum aviculare</i>	prostrate knotweed	FACW+
<i>Populus tremuloides</i>	quaking aspen	FAC+
<i>Populus trichocarpa</i>	cottonwood	FAC
<i>Potamogeton amplifolius</i>	large-leaf pondweed	OBL
<i>Potamogeton crispus</i>	curly pondweed	OBL
<i>Potamogeton natans</i>	floating-leaf pondweed	OBL
<i>Prunella vulgaris</i>	Heal-all	FACU+
<i>Prunus americana</i>	American plum	FACU
<i>Rosa woodsii</i>	woods rose	FACU
<i>Rumex crispus</i>	curly dock	FACW
<i>Sagittaria latifolia</i>	arrow-head	OBL
<i>Salix bebbiana</i>	Bebb willow	FACW
<i>Salix exigua</i>	sandbar willow	OBL
<i>Scirpus acutus</i>	Hard stem bulrush	OBL
<i>Scirpus microcarpus</i>	small-fruit bulrush	OBL
<i>Scirpus validus</i>	Soft-stem bulrush	OBL
<i>Sisymbrium altissimum</i>	tall tumble mustard	FACU-
<i>Solanum dulcamara</i>	climbing nightshade	FAC+
<i>Solidago missouriensis</i>	Missouri goldenrod	--
<i>Symphoricarpos albus</i>	snowberry	FACU
<i>Taraxicum officinalis</i>	common dandelion	FACU
<i>Trifolium pratense</i>	red clover	FACU
<i>Verbascum thapsus</i>	common mullein	--
<i>Veronica Americana</i>	American speedwell	OBL

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

Adjacent upland vegetation communities are mainly dominated by rangeland and/or aggressive invasive species. Type 6 upland areas are currently dominated with pasture grasses such as *Festuca/Phleum*. Type 4 upland areas increased in vegetation cover, now mostly dominated by upland grass species including quackgrass (*Agropyron repens*) and slender wheatgrass (*Elymus trachycaulus*). Native shrubs were planted during the spring of 2003 and 2004, as part of the riparian enhancement efforts. The cover value of the plantings has increased since the previous monitoring, but currently is not considered dominant for this community type.

Type 10 is located along the higher terraces of the river and backwater channel, consisting of mature cottonwoods and box elder. A minor shrub layer is present, consisting of hawthorn (*Crataegus douglasii*) and American plum (*Prunus americana*). Type 8 is located adjacent to the Flathead River and along the backwater channels. Type 8 is dominated by quackgrass, redtop and English plantain (*Plantago lanceolata*). Type 14 is located near the back water channel along the southern boundary of the mitigation site and is a new vegetation community. Type 14 is dominated by redtop and Kentucky bluegrass (*Poa pratensis*). This area was considered within the Type 6 community during previous monitoring. The minimization of

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livestock grazing in this area has allowed the dominant species to flourish. Type 15 is dominated by mostly reed canarygrass, which is a wetland species, but in this type is mixed with upland species and did not classify as wetland.

Several noxious weeds were observed throughout the Hoskins Landing site. Type 4 and 6 had small amounts of invasive species. During the 2003 mapping, Type 9 was dominated by mostly invasive species. Evidence of weed control measures were observed during the 2007 monitoring. These control measures have reduced the cover of invasive species and increased the cover value of grasses within Type 9. Type 9 is currently dominated by non-native grass species that usually follow a disturbance such as herbicide application.

Noxious weed locations observed during the 2007 field visit were mapped and are illustrated on **Figure 3**. These were individual noxious weed locations or small patches not mapped as a community type, and include the following species: Canada thistle (*Cirsium arvense*), Dalmatian toadflax (*Linaria dalmatica*), spotted knapweed (*Centaurea maculosa*), and St. John’s wort (*Hypericum perforatum*). Bull thistle (*Cirsium vulgare*) locations were also mapped. Weed species distributions illustrated on **Figure 3** were also captured in the community type lists (**Appendix B**) which provide detailed information regarding cover values for each species. Several other noxious weed species were recorded only at the community level and were therefore not mapped as an individual plant or patch on **Figure 3**. These included oxeye daisy (*Chrysanthemum leucanthemum*), yellowflag iris (*Iris pseudacorus*). Water milfoil (*Myriophyllum* sp.) was also observed; samples will be remitted to a local expert in 2008 to verify whether Eurasian water milfoil (*Myriophyllum spicatum*) is present at the site.

Vegetation transect results are detailed in the **Monitoring Form (Appendix B)** and are summarized in **Table 2** and **Charts 1** and **2**.

Table 2: Transect 1 data summary.

Monitoring Year	2002	2003	2004	2005	2006	2007
Transect Length (feet)	390	390	390	390	390	390
# Vegetation Community Transitions along Transect	6	11	10	10	10	10
# Vegetation Communities along Transect	4	5	5	5	5	5
# Hydrophytic Vegetation Communities along Transect	2	3	3	3	3	3
Total Vegetative Species	31	31	30	30	30	30
Total Hydrophytic Species	22	23	22	23	23	23
Total Upland Species	9	8	8	7	7	7
Estimated % Total Vegetative Cover	65	70	71	74	75	75
% Transect Length Comprised of Hydrophytic Vegetation Communities	72	70	68	68	68	68
% Transect Length Comprised of Upland Vegetation Communities	28	30	32	32	32	32
% Transect Length Comprised of Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprised of Bare Substrate	0	0	0	0	0	0

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Chart 1: Transect maps showing vegetation types from the start of transect (0 feet) to the end of transect (390 feet) for each year monitored.

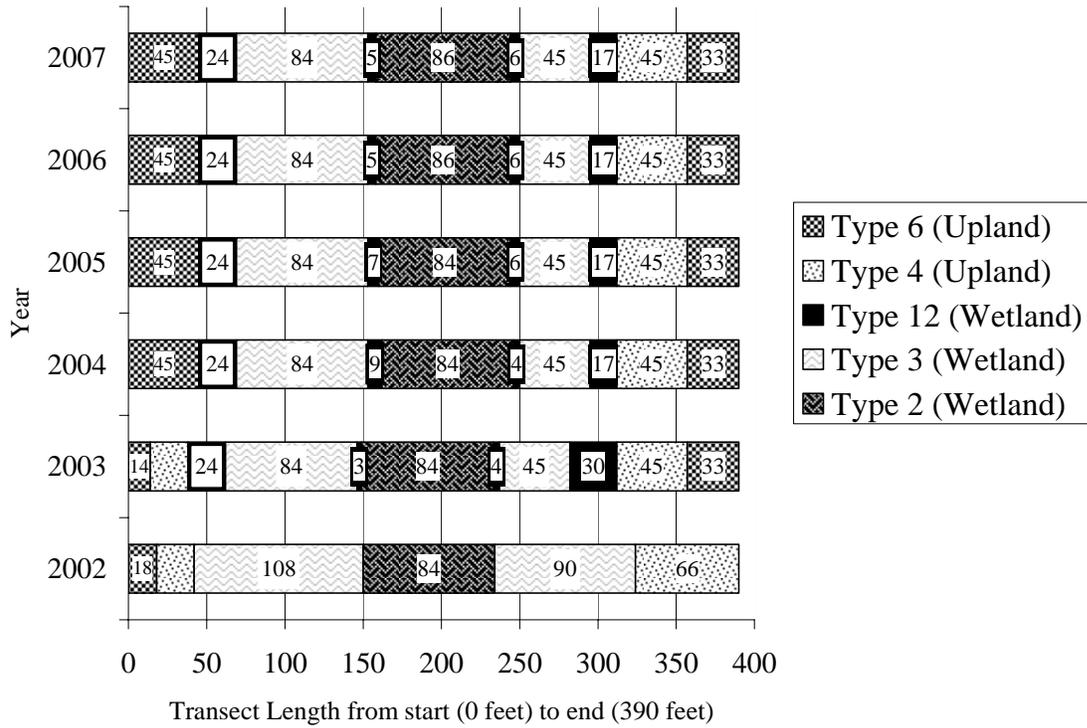
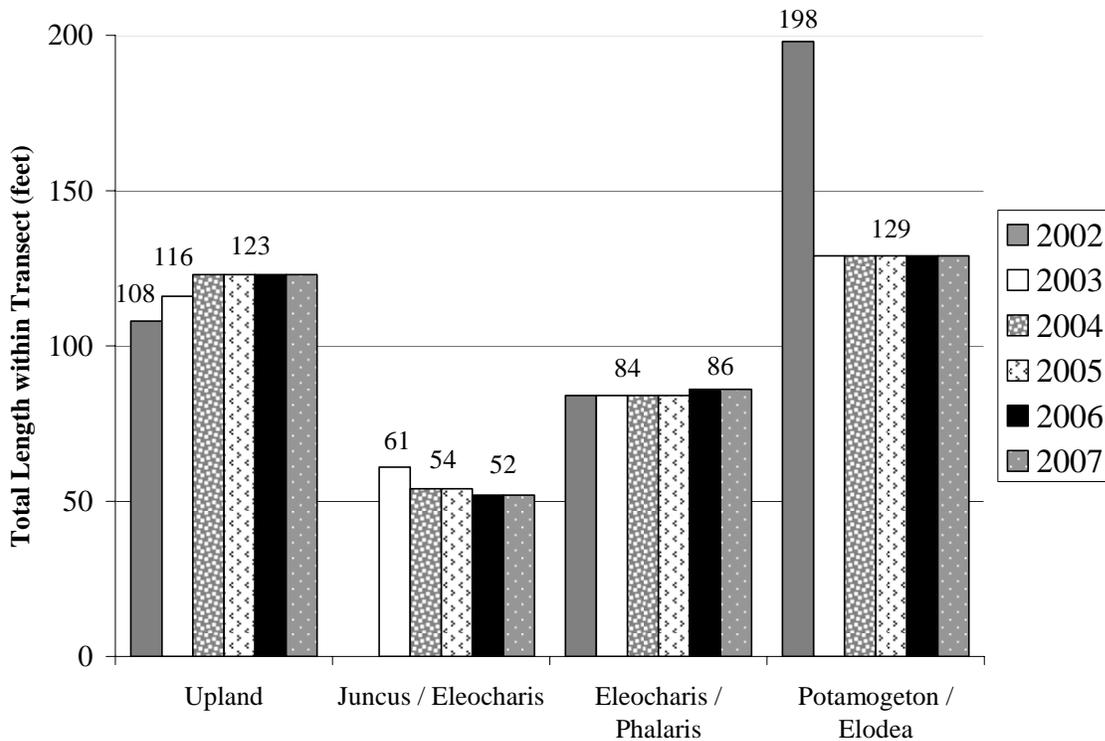


Chart 2: Length of vegetation communities within Transect 1 for each year monitored.



3.3 Soils

Soils at the site are mapped in the Sanders County Soil Survey as Horseplains-riverwash and Revais silt loam. Horseplains-riverwash is described as a fine sandy loam, 60 inches deep with a lighter surface layer, and slopes of 0-2%. Revais silt loam has a depth of 60 inches with lighter colored surface and slopes of 0-2% (NRCS 2002). Horseplains and Revais soils are not listed on the Montana NRCS Hydric Soil list. Soil characteristics at each wetland determination point were compared with those of the Horseplains and Revais soil. The soils observed across most of the site did not generally match the Horseplains and Revais soil descriptions, as textures were slightly different.

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loams, silt loams or clays with very low chromas (1 or 2) within 2 inches of the surface. Mottles (redoximorphic features) were present in three profiles, all with surface inundation. The two remaining soil profiles described on the Routine Wetland Determination forms were mapped as upland sampling points, having no soil moisture or distinct hydric characteristics within 18 inches of the surface.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3 in Appendix A**. Completed **COE Forms** are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Approximately 13.01 wetland acres currently occur within the monitoring area (**Table 3; Figure 3 in Appendix A**). The open water areas (1.14 ac.), mapped during the previous monitoring years, were considered shallow water with aquatic vegetation during 2005, 2006, and 2007.

Table 3: Wetland conditions identified during monitoring from 2002 to 2007.

Condition	2007 (acre)	2006 (acre)	2005 (acre)	2004 (acre)	2003 (acre)	2002 (acre)
Wetland Area	13.01	13.01	13.01	11.88	11.35	10.99
Open Water Area	0.00	0.00	0.00	1.14	1.14	1.14
Total Aquatic Habitat Area	13.01	13.01	13.01	13.02	12.49	12.13

Pre-construction wetland delineation documented 5.85 acres of wetlands and 0.82 acre of “extremely marginal” reed canarygrass swales at the site (Western EcoTech 1999). Consequently, definitive baseline wetland acreage was approximately 5.85 acres (wetlands were not surveyed). The net increase in aquatic habitat acres to date on the site is approximately $13.01 - 5.85 = 7.16$ acres, or 0.94 acre short of the 8.1-acre goal.

However, further investigation of the baseline delineation report and MDT mitigation project design plans revealed that approximately 0.6 acre of pre-project wetlands (two small, isolated emergent depressions) occurred within the proposed 8.1-acre “wetland creation” footprint. Also, approximately 0.3 to 0.4 acre of wetlands were mapped on the site during the baseline delineation, essentially outside of project disturbance limits, that are no longer present on the site due to climate or other hydrologic conditions (e.g., project implementation did not directly or

Hoskins Landing Wetland Mitigation 2007 Monitoring Report

indirectly affect these wetlands). These included a very narrow (1-foot wide) fringe along the Flathead River, small patchy occurrences in the floodplain, and an area in the historic side channel that was since filled by natural gravel deposition. Combined, these areas virtually equate to the 0.94-acre discrepancy between the 2007 “net” 7.16-acre wetland total and the 8.1-acre goal. Mitigation crediting for 2007 is discussed in Section 3.11.

Wetland size remained similar between the 2006 and 2007 monitoring season. An increase of 1.13 wetland acres was observed between 2004 and 2005 monitoring. The increase in wetland acres was recorded within the type 3 area. Areas considered as open water in the past have been mapped as shallow water with emergent wetland types dominated by aquatic vegetation. Community types along the shoreline of the excavated wetland exhibited similar conditions as those observed in 2006. Community Type 12 is mapped as developing emergent vegetation in areas inundated by seasonal flooding. Community Type 13 is a wetland area located adjacent to the shoreline of the excavated wetlands, further up the bank in less saturated conditions.

During the 2003 to 2007 delineations, the sparsely vegetated wheatgrass / plantain –dominated flood channel area along the north property border was mapped as “waters of the U.S.” due to the hydrologic connection to the Flathead River (but was not mapped as “open water” due to its temporarily-flooded nature). Some of these areas are also mapped as wetlands, but most of this area is not considered wetland due to the lack of qualifying vegetation and soil characteristics. The areas remain in a similar condition to that observed during 2006 monitoring.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2002, 2003, 2004, 2005, 2006 and 2007 monitoring efforts are listed in **Table 4**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the Monitoring Form in **Appendix B**.

This site provides habitat for a variety of wildlife species. One mammal, one reptile, one fish, and 20 bird species were noted at the mitigation site during the 2007 site visits. Many other wildlife species presumably use the site but were not observed during the monitoring visits.

3.6 Macroinvertebrates

Sampling points for Hoskins Landing were located along the western side of the excavated wetland (**Figure 2** in **Appendix A**). Macroinvertebrate data is included in **Appendix F** and is summarized below, in italics, by Rhithron Associates, Inc. (Bollman 2007). Bioassessment scores have been graphed from 2002 to 2007 (Bollman 2007) (**Chart 3**).

Site 1 (MS 1): *Although there was a slight decrease in bioassessment score in 2007, biological conditions at this site appear to be good. Sub-optimal conditions are indicated by the assessment index. Diversity and abundance of invertebrates remained high, and indications of good water quality and complex habitats were apparent. Taxonomic composition of the fauna was similar to the previous year, with the midge Pseudochironomus sp. dominant, and naidid worms and the mayfly Caenis sp. common. These animals suggest that filamentous algae may have been present, and bacteria may have been an important energy source.*

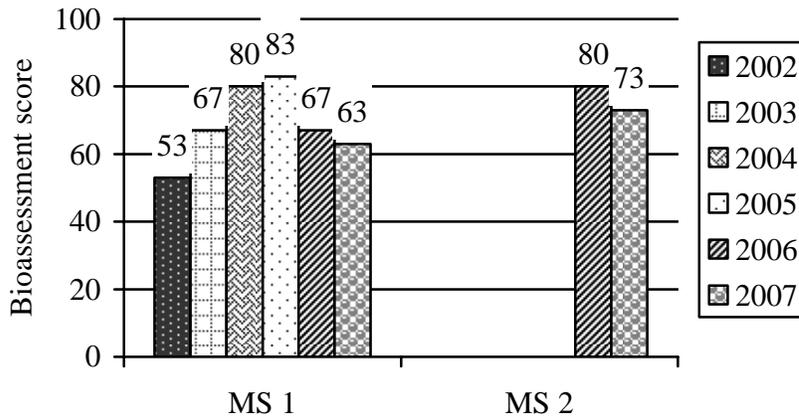
Table 4: Fish and wildlife species observed at the Hoskins Landing Wetland Mitigation Site from 2002 to 2007.

FISH	
Black Bullhead (<i>Ictalurus melas</i>) Northern Pike fingerling (<i>Esox lucius</i>)	Pumpkinseed (<i>Lepomis gibbosus</i>) ¹
AMPHIBIAN	
None	
REPTILE	
Painted Turtle (<i>Chrysemys picta</i>)	
BIRD	
American Coot (<i>Fulica americana</i>) American Crow (<i>Corvus brachyrhynchos</i>) American Robin (<i>Turdus migratorius</i>) American Wigeon (<i>Anas americana</i>) American White Pelican (<i>Pelecanus erythrorhynchos</i>) Bald Eagle (<i>Haliaeetus leucocephalus</i>) Belted Kingfisher (<i>Ceryle alcyon</i>) Barn Swallow (<i>Hirundo rustica</i>) Black-Billed Magpie (<i>Pica hudsonia</i>) Black & White Warbler (<i>Mniotilta varia</i>) Blue-Winged Teal (<i>Anas discors</i>) Brown-Headed cowbird (<i>Molothrus ater</i>) Canada Goose (<i>Branta canadensis</i>) Cinnamon Teal (<i>Anas cyanoptera</i>) Cliff Swallow (<i>Petrochelidon pyrrhonota</i>) Common Raven (<i>Corvus corax</i>) Doubled Crested Cormorant (<i>Phalacrocorax auritus</i>) Eastern Kingbird (<i>Tyrannus tyrannus</i>) Eurasian Wigeon (<i>Anas Penelope</i>) European Starling (<i>Sturnus vulgaris</i>) Field Sparrow (<i>Spizella pusilla</i>) Great Blue Heron (<i>Ardea herodias</i>)	Hooded Merganser (<i>Lophodytes cucullatus</i>) Killdeer (<i>Charadrius vociferous</i>) Lesser Yellowlegs (<i>Tringa flavipes</i>) Mallard (<i>Anas platyrhynchos</i>) Northern Flicker (<i>Colaptes auratus</i>) Northern Harrier (<i>Circus cyaneus</i>) Northern Shoveler (<i>Anas clypeata</i>) Osprey (<i>Pandoin haliaetus</i>) Red-Tailed Hawk (<i>Buteo jamaicensis</i>) Red-Winged blackbird (<i>Agelaius phoeniceus</i>) Ring-Billed Gull (<i>Larus delawarensis</i>) Ring-necked Pheasant (<i>Phasianus colchicus</i>) Song Sparrow (<i>Melospiza melodia</i>) Spotted Sandpiper (<i>Actitis macularia</i>) Tree Swallow (<i>Tachycineta bicolor</i>) Violet-Green Swallow (<i>Tachycineta thalassina</i>) Western Kingbird (<i>Tyrannus verticalis</i>) Western Meadowlark (<i>Sturnella neglecta</i>) Wood Duck (<i>Aix sponsa</i>) Yellow-Headed Blackbird (<i>Xanthocephalus xanthocephalus</i>)
MAMMAL	
Coyote (<i>Canis latrans</i>) Deer (<i>Odocoileus spp.</i>) Mouse [young] (<i>Peromyscus spp.</i>)	Muskrat (<i>Ondatra zibethicus</i>) Red Fox (<i>Vulpes vulpes</i>)

Bolded species were observed during 2007 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2007.

Site 2 (MS 2): Optimal biotic conditions appear to have characterized Site 2 in both 2006 and 2007. In these years, high taxa richness, a diverse non-insect fauna, and relatively high midge diversity resulted in high bioassessment scores. Although crayfish (*Orconectes sp.*) were collected in 2006, none appeared in the 2007 sample. The same 3 taxa that were dominant at Site 1 were also dominant at Site 2. Complex aquatic habitats and good water quality are suggested. The thermal preference of the invertebrate assemblage was calculated at 17.5°C, which is near the median value for the mitigated wetland sites studied in 2007.

Chart 3: Bioassessment scores for Hoskins Landing Wetland Mitigation Site.



3.7 Functional Assessment

Completed 2007 functional assessment forms are included in **Appendix B**. The Hoskins Landing site was separated into two assessment areas (AAs) for the purpose of functional assessments. The two assessment areas on the Hoskins Landing mitigation site are currently rated as Category III (AA 1) and IV (AA 2) (moderate value) sites. They received moderate ratings for Montana Natural Heritage Program (MTNHP) species habitat, general wildlife habitat, flood attenuation, and sediment / shoreline stabilization variables. Other factors contributing to their scores were high ratings for fish / aquatic habitat, surface water storage, production export / food chain support, and groundwater discharge / recharge. Additional factors contributing to their scores were low ratings for threatened and endangered (T&E) species habitat, sediment / nutrient removal, and recreation / education ratings.

The main body of the site received a high rating for fish / aquatic habitat due to increased coverage of floating leaved vegetation and surface water storage due to the acre-feet of water contained in these wetlands. The variable for production export/food chain support rated high due to the overall vegetated acres, high structural diversity, and perennial water regime. The variable for groundwater discharge / recharge rated high due to permeable substrate consisting of alluvial material underlying the site allowing for groundwater recharge from the Flathead River.

During 2006, the site received a moderate rating for T&E habitat due to observation of a bald eagle (*Haliaeetus leucocephalus*) at the site. In 2007, the bald eagle was been de-listed as an endangered species and currently is considered a MNHP species with a S3 rating. In turn, the de-listing changed the functional assessment ratings by decreasing the T & E species habitat and increasing the MNHP species habitat rating. The change in ratings did not have any effect on the overall functional assessment score for the site with it remaining similar to 2006 scores. The site received a moderate flood attenuation rating due to the presence of an inflow channel into the wetland and unrestricted nature of the outlet.

Table 5: Summary of baseline and 2007 wetland function/value ratings and functional points at the Hoskins Landing Wetland Mitigation Project.

Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method	WETLANDS ASSESSED WITH 1996 METHOD ¹						WETLANDS ASSESSED WITH 1999 METHOD ¹	
	Baseline 1A	Baseline 1B	Baseline 3	Baseline 8	Baseline 2, 9A, 9B, 10, 11, 12, 13	Baseline 5, 6, 7, 14A, 14B	2007 Site 5 ²	2007 Remainder of Wetlands ²
Listed/Proposed T&E Species Habitat	Low (0.3)	Mod (0.7)	None (0.0)	Mod (0.7)	None (0.0)	None (0.0)	Low (0.0)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Mod (0.7)	None (0.0)	None (0.0)	Low (0.0)	Mod (0.7)
General Wildlife Habitat	High (0.9)	Mod (0.5)	Mod (0.5)	High (0.9)	Low (0.1)	Low (0.1)	Low (0.2)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.2)	Mod (0.7)	NA	High (1.0)	NA	NA	NA	High (0.8)
Flood Attenuation	Mod (0.5)	Low (0.2)	Low (0.2)	Low (0.1)	Low (0.2)	NA	Low (0.2)	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	NA	Low (0.3)	NA	NA	Low (0.3)	Low (0.3)	High (0.9)
Sediment, Nutrient, Toxicant Removal	High (1.0)	High (1.0)	High (1.0)	Mod (0.5)	High (1.0)	Mod (0.5)	Mod (0.5)	Mod (0.4)
Sediment/Shoreline Stabilization	Mod (0.7)	Mod (0.7)	NA	Mod (0.4)	High (0.9)	NA	NA	Mod (0.6)
Production Export/Food Chain Support	High (0.8)	Mod (0.6)	Mod (0.6)	Mod (0.7)	Low (0.2)	Low (0.1)	Low (0.2)	High (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	Low (0.1)	Low (0.1)	High (1.0)	High (1)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.3)	Mod (0.5)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.1)	High (1.0)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.3)
Actual Points/Possible Points	6.6 / 12	5.8 / 11	4.0 / 9	6.3 / 11	2.8 / 10	2.3 / 9	2.8 / 10	7.6 / 12
% of Possible Score Achieved	55%	53%	44%	57%	28%	26%	28%	63%
Overall Category	III	III	III	II ³	IV	IV	IV	III
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	2.58	0.86	0.68	0.06	0.75	1.74	0.46	12.55
Functional Units (acreage x actual points) (fu)	17.03	4.99	2.73	0.37	2.10	4.00	1.29	95.38
Total Acreage at Site (ac)	6.67						13.01	
Total Functional Units at Site (fu)	31.22						96.67	
Net Acreage Gain (ac)	NA						6.34	
Net Functional Unit Gain (fu)	NA						65.45	

¹ The baseline assessment was performed using the 1996 MDT assessment method, of which several parameters were substantially revised and applied to the 1999 MDT assessment method. The 1999 MDT assessment method was used from 2002 to 2007. Therefore, direct comparison of pre- and post-project functions are not possible, but some general trends can be noted.

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

Hoskins Landing Wetland Mitigation 2007 Monitoring Report

The site received a moderate rating for sediment / shoreline stability due to increased cover in plants with deep binding roots including willows and grass-like species (sedges & rushes). Recent revegetation efforts along the fringe of excavated wetland have contributed to the increase in the sediment/shoreline stability rating. In addition, the site received a moderate rating for sediment / nutrient toxicant removal. The site received a low recreation/education rating since it has moderate disturbance level and is in private (Tribal) ownership.

Based on functional assessment results (**Table 5**), approximately 96.67 functional units occur at the Hoskins Landing mitigation site. Baseline functional assessment results are also provided in **Table 5** for general comparative purposes. However, it should be noted that direct comparison between the baseline and 2007 functional assessments are not possible as they were completed using different versions of the MDT functional assessment method. The baseline assessment was completed using the 1996 version, while the 2002 to 2007 assessments were conducted using the most current (1999) version.

3.8 Photographs

Representative photographs were taken in 2007 from established photo-points and transect ends (**Appendix C**).

3.9 Revegetation Efforts

Wetland and riparian vegetation enhancements were implemented in 2003 and 2004. **Appendix G** presents the different planting specification for each seed mix and containerized plantings. These enhancements included drill seeding of an upland seed mix into the areas of higher topography and planting of native tree, shrub, grass and grass-like seedlings. Plants installed in the upland areas included two tree species, cottonwood and ponderosa pine (*Pinus ponderosa*), and seven shrub species including American plum, chokecherry (*Prunus virginiana*), hawthorn (*Crataegus douglasii*) serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos albus*), Rocky Mountain juniper (*Juniperus scopulorum*), and woods rose (*Rosa woodsii*).

Wetland areas surrounding the excavated open water area were broadcast seeded with a custom wetland seed mix and also planted with herbaceous and woody seedlings. Vegetation planted in the wetland areas included three tree species - cottonwood, quaking aspen (*Populus tremuloides*), and water birch (*Betula occidentalis*), and four shrub species - alder (*Alnus incana*), red osier dogwood (*Cornus stolonifera*), Bebb's willow (*Salix bebbiana*) and sandbar willow (*Salix exigua*). Five herbaceous wetland species were planted along the fringe of the excavated wetland. These species included hardstem bulrush (*Scirpus microcarpus*), Nebraska sedge (*Carex nebrascensis*), beaked sedge (*Carex utriculata*), Bebb's sedge (*Carex bebbiana*), and small-fruited bulrush (*Scirpus microcarpus*).

Survival rates for native shrub plantings were assessed during the summer of 2003, 2004, 2005, 2006 and 2007. PBS&J and Salish Kootenai College (**SKC**) conducted separate survival ratings for the 2003 and 2004 plantings following initial plantings. During the 2005, 2006 and 2007 monitoring only PBS&J conducted survival ratings. Methodology employed by PBS&J included

walking transects within the four planting areas and recording all living woody plantings by species.

Planting areas included the excavated wetland, upland island (C.T. 4), backwater (side) channel, and river bank / terrace. Herbaceous plantings within the excavated wetlands area were not counted due to the difficulty in distinguishing between planted and volunteer establishment. PBS&J results are recorded on the **Monitoring Form (Appendix B)** and include general qualitative descriptions of each species within the different planting areas. The percentage ratings for each species' survival were not calculated due to lack of quantifiable plantings numbers within the transect locations and the inherent inaccuracy with calculations based on total number of original plantings within our limited transect area. Plantings were assessed using several criteria including live occurrences and health. The recorded occurrences of live plants were used to estimate a general overall survival rate for each area, but were not quantified by real percentages. The initial planting numbers for 2003 and 2004 are described in the CSKT *Riparian Vegetation Enhancement – Survival Data* presented in **Appendix G**.

Three upland plantings areas were evaluated; these areas include the upland islands, river bank terrace and along the upper banks of the backwater (side) channel. During 2007 monitoring, species survival remained similar to those observed in 2006 with an overall estimate of moderate to high rating. Woods rose and snowberry, which had the highest survival following the initial plantings, were healthy with vigorous new growth. The other species including hawthorn, chokecherry, serviceberry, ponderosa pine and American plum were less healthy and had low occurrences. Survival ratings were considered low, following the 2004 planting season, due to a high mortality experienced that season. The remaining live plantings observed in 2005, 2006 and 2007 are successfully surviving at this site.

One wetland planting area was evaluated; along the south slopes of the excavated wetland. Survival rates for the wetland plantings were high with sandbar willow and cottonwood having the highest overall estimated rates. Several other species including Bebb's willow, red osier dogwood and alder were present but at lower counts. Several woody species that had low survival rates during the 2003 monitoring were replanted in 2004. The replacement plants are doing well and exhibited an overall estimated high survival rate in 2007. Approximately 2,000 willow cuttings were installed around the fringe of excavated wetland and show vigorous seasonal growth.

3.10 Maintenance Needs/Recommendations

Several Category 1 noxious weeds were still present but at low cover values (**Figure 3, Appendix A**): Canada thistle, Dalmatian toadflax, hound's-tongue, oxeye daisy, St. John's wort, and spotted knapweed. Category 3 yellowflag iris and a water-milfoil species were also present within the mitigation site. The Confederated Salish and Kootenai Tribes are diligently following a five year (2005 to 2010) vegetation management plan that includes invasive weed control and revegetation efforts. Weed control activities were observed during the mid-season visits including herbicide applications, minor grazing and mowing. Weed control activities seem to be working with observations of lower cover values for previous weedy areas. Refer to **Appendix**

G for the *CSKT Vegetation Management Plan – Hoskin’s Landing, Highway 200 Wetland Mitigation*.

Evidence of livestock accessing the site was observed during a fall 2007 visit. During 2006, an electric fence was periodically put into place, running parallel with the river setback from the shoreline. Fences were removed prior to seasonal flows and re-installed during August to exclude livestock (Price 2006). The drier upland grass meadows were grazed and trampling within the wetlands was observed. Minor browse on the woody plantings within the wetland area was also observed.

3.11 Current Credit Summary

As of 2007, approximately 13.01 wetland acres occur on the mitigation site. Pre-construction wetland delineation documented 5.85 acres of wetlands and 0.82 acre of “extremely marginal” reed canarygrass swales at the site (Western EcoTech 1999). Consequently, definitive baseline wetland acreage was approximately 5.85 acres (wetlands were not surveyed). The initially-calculated net increase in aquatic habitat acres to date is approximately $13.01 - 5.85 = 7.16$ acres, or 0.94 acre short of the 8.1-acre goal.

However, further investigation of the baseline delineation report and MDT mitigation project design plans revealed that approximately 0.6 acre of pre-project wetlands (two small, isolated emergent depressions) occurred within the proposed 8.1-acre “wetland creation” footprint. Also, approximately 0.3 to 0.4 acre of wetlands were mapped on the site during the baseline delineation, essentially outside of project disturbance limits, that are no longer present on the site due to climate or other hydrologic conditions. These included a very narrow (1-foot wide) fringe along the Flathead River, spotty occurrences in the floodplain, and an area in the historic side channel that was since filled by natural gravel deposition. Combined, these areas virtually equate to the 0.94-acre discrepancy between the 2007 “net” 7.16-acre wetland total and the 8.1-acre goal.

The two pre-existing wetland patches within the designed wetland creation footprint were isolated, low-quality, grazed reed canarygrass-dominated areas providing little wetland function (Category IV; **Table 5**). These sites were converted to part of a single, much larger, and higher-quality Category III wetland upon project implementation. As such, credit may be warranted for these areas (e.g., they would not be counted in the “pre-existing” acreage total, and therefore not subtracted from the 2007 13.01-acre wetland total). Similarly, the 0.3 to 0.4 acre of small pre-existing sites that are no longer present on the project site due to natural conditions should not be debited against credit totals. Taking these factors into consideration, the adjusted “pre-existing” acreage total would be $5.85 - (0.6) - (0.3 \text{ to } 0.4) = 4.85 \text{ to } 4.95$ acres. The 2007 credit total would then be $13.01 - (4.85 \text{ to } 4.95) = 8.06 \text{ to } 8.16$ acres, virtually equal to the 8.1-acre goal. This potential credit allocation would be subject to COE and CSKT review / approval.

4.0 REFERENCES

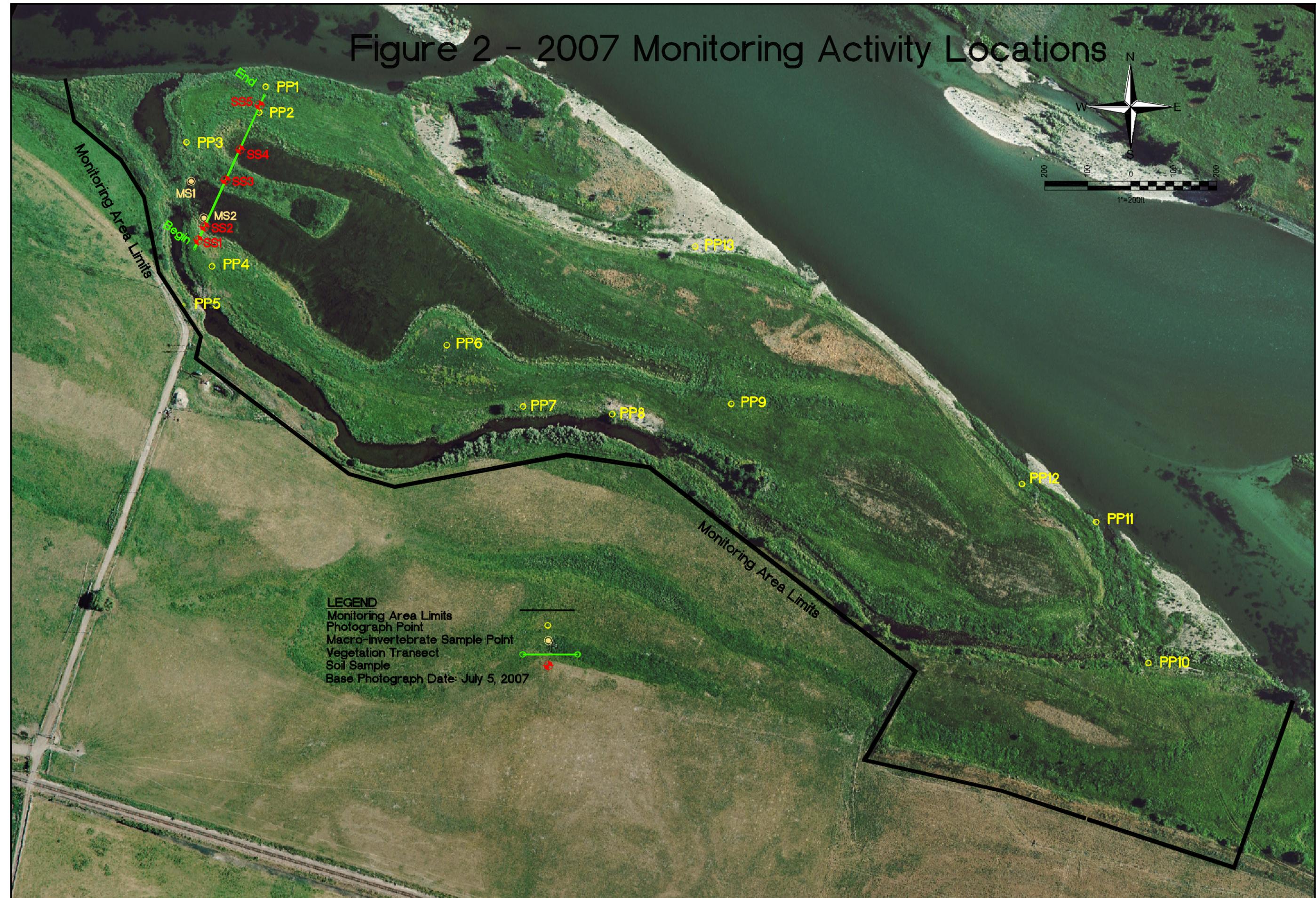
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Appendix A

FIGURES 2 & 3

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

Figure 2 - 2007 Monitoring Activity Locations



LEGEND
 Monitoring Area Limits
 Photograph Point
 Macro-invertebrate Sample Point
 Vegetation Transect
 Soil Sample
 Base Photograph Date: July 5, 2007



PROJECT NAME MDT Hoskin's Landing Wetland Mitigation	
DRAWING TITLE 2007 Monitoring Activity Locations	
PROJ. NO: B43088.110	DRAWN: LL
LOCATION: Dixon, MT	PROJ. MGR: J.Berglund
SCALE: 1" = 200'	CHECKED: APPV: JB
FILE NAME: L:\330054.110\Hoskins\dwg\TASK110_2007.dwg	APPV: JB
1120 Cedar Missoula, MT 59802	
PBS	
FIGURE	
2 OF 3	
REV - Nov/05/2007	

Figure 3 - 2007 Mapped Site Features



LEGEND

Monitoring Area Limits

Wetland-Upland Boundary

Vegetation Community Boundary

Open Water

Base Photograph Date: July 5, 2007

Wetland Areas

Gross Wetland 13.01 Acres

Weed Mapping

X Cirsium arvense

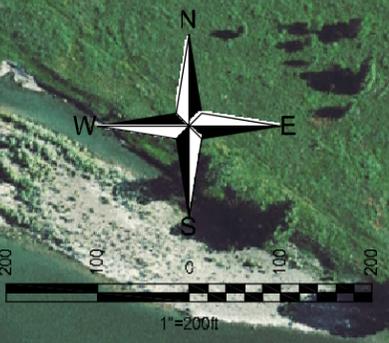
X Cirsium vulgare

X Hypericum perforatum

X Linaria dalmatica

X Centaurea maculosa

- Vegetation Community Types**
- 1 Agrostis/Poa
 - 2 Eleocharis/Phalaris
 - 3 Potamogeton/Elodea
 - 4 Agropyron/Melilotus
 - 5 Phalaris/Salix
 - 6 Festuca/Phleum
 - 7 Phalaris
 - 8 Agropyron/Plantago- Waters of the U.S.
 - 9 Bromus
 - 10 Populus/Crataegus
 - 11 Ceratophyllum
 - 12 Juncus/Eleocharis
 - 13 Phalaris/Agrostis
 - 14 Populus/Salix
 - 15 Phalaris-non Wetland



PROJECT NAME	MDT Hoskin's Landing Wetland Mitigation		
DRAWING TITLE	2007 Mapped Site Features		
PROJ. NO: B43088.110	DRAWN: LL	PROJ. MGR: J.Berglund	CHECKED: GH APPV'D: JB
LOCATION: Dixon, MT	SCALE: 1"=200'	FILE NAME: L:\330054.110\Hoskins\dwg\TASK110_2007.dwg	
1120 Cedar Missoula, MT 59802			
FIGURE	3 of 3		
REV	-		
Nov/05/2007			

Appendix B

2007 WETLAND MITIGATION SITE MONITORING FORM

2007 BIRD SURVEY FORM

2007 COE WETLAND DELINEATION FORMS

2007 MDT FUNCTIONAL ASSESSMENT FORM

MDT Wetland Mitigation Monitoring

Hoskins Landing

Dixon, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Hoskins Landing Project Number: B43088.00 0106 Assessment Date: 07/30/07
 Location: N. of Dixon, MT MDT District: Missoula Milepost:
 Legal description: T: 18 R: 21 Section: 18 Time of Day: Morning to late afternoon
 Weather Conditions: High 90's & smoky Person(s) conducting the assessment: Greg Howard
 Initial Evaluation Date: 09 / 04 / 02 Visit #: 6 Monitoring Year: 2007
 Size of evaluation area: 48 acres Land use surrounding wetland: Agriculture; alfalfa & cattle grazing

HYDROLOGY

Surface Water Source: Flathead River

Inundation: Present Absent Average depths: 1.5 ft Range of depths: 0 – 2 ft

Assessment area under inundation: 40 %

Depth at emergent vegetation-open water boundary: 0.5 ft

If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes - No

Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Drift lines present around excavated wetland. Mitigation site has seasonal high water events; inundation due to flooding of the backwater channel and excavated wetlands.

Groundwater

Monitoring wells: Present Absent

Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:

- Map emergent vegetation-open water boundary on air photo
- The area of surface water mapped during each site visit and recorded for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
- GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: Mitigation site had indications of some weed control activities such as mowing and herbicide applications. The site still has many weedy areas with Canada thistle, St. Johns wort and dalmatian toadflax as the dominants. Backwater channel entering on the eastside has evidence of seasonal flooding; scour marks, sediment deposition and increased vegetation cover. Spring bird visit revealed seasonal flow depths that reached near full holding capacity within the excavated wetland.

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Agrostis / Poa

Dominant Species	% Cover	Dominant Species	% Cover
<i>Agrostis alba</i>	60	<i>Phleum pratense</i>	T
<i>Poa pratensis</i>	20	<i>Agropyron repens</i>	P
<i>Taraxacum officinalis</i>	P	<i>Cirsium arvense</i>	T
<i>Festuca pratensis</i>	T		
<i>Trifolium pratense</i>	P		
<i>Plantago lanceolata</i>	10		

COMMENTS/PROBLEMS: Area of pre-existing pasture undisturbed during construction efforts. Removal of livestock has allowed the dominant species to flourish and identifiable for community type mapping.

Community No.: 2 Community Title (main species): Eleocharis / Phalaris

Dominant Species	% Cover	Dominant Species	% Cover
<i>Scirpus acutus</i>	10	<i>Sagittaria latifolia</i>	20
<i>Scirpus validus</i>	P	<i>Carex retrorsa</i>	P
<i>Phalaris arundinacea</i>	30		
<i>Eleocharis palustris</i>	50		
<i>Potamogeton natans</i>	10		

COMMENTS/PROBLEMS: Undisturbed emergent wetlands located on west side of site. Type 2 is connected to the outlet of the southern backwater channel. Area is surrounded by excavated wetlands. Wetland inundated during mid-season visit.

Community No.: 3 Community Title (main species): Potamogeton / Elodea

Dominant Species	% Cover	Dominant Species	% Cover
<i>Potamogeton amplifolius</i>	40	<i>Veronica americana</i>	P
<i>Elodea canadensis</i>	10	<i>Juncus ensifolius</i>	T
<i>Potamogeton crispus</i>	P	<i>Myriophyllum spicatum</i>	10
<i>Potamogeton natans</i>	T		

COMMENTS/PROBLEMS: Areas of aquatic vegetation located within the excavated wetlands. Shallow water on east side of excavated wetlands dominated by American speedwell (*Veronica americana*). The west side of type 3 consisting of shallow water dominated by *Myriophyllum spicatum*.

Additional Activities Checklist:

Record and map vegetative communities on air photo

COMMENTS: Open water removed from mapping.

VEGETATION COMMUNITIES

Community No.: 4 Community Title (main species): Agropyron / Melilotus

Dominant Species	% Cover	Dominant Species	% Cover
<i>Plantago lanceolata</i>	T	<i>Helianthus annuus</i>	P
<i>Plantago major</i>	P	<i>Lepidium perfoliatum</i>	P
<i>Cirsium arvense</i>	P	<i>Chrysanthemum leucanthemum</i>	T
<i>Verbascum thapsus</i>	T	<i>Centaurea maculosa</i>	T
<i>Agropyron repens</i>	40	Plantings	10
<i>Achillea millefolium</i>	10	<i>Coreopsis atkinsoniana</i>	P
<i>Elymus trachycaulus</i>	20	<i>dalmatian toadflax</i>	T
<i>Hypericum perforatum</i>	T		

COMMENTS/PROBLEMS: Constructed upland slopes w/ re-contoured topography and native shrub plantings. Area mostly dominated by *Agropyron repens* and other invasive or disturbance related species. Five Montana State listed noxious weeds located in this community type; *Centaurea maculosa*, *Chrysanthemum leucanthemum*, *Cirsium arvense*, *dalmatian toadflax* & *Hypericum perforatum*.

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

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phalaris arundinacea</i>	60	<i>Juncus ensifolius</i>	T
<i>Salix exigua</i>	30	<i>Eleocharis acicularis</i>	P
<i>Juncus balticus</i>	P	<i>Salix bebbiana</i>	T
<i>Scirpus acutus</i>	T		
<i>Cornus stolonifera</i>	T		

COMMENTS/PROBLEMS: Undisturbed side channel running along south edge of project boundary. Channel w/ stagnate water, no flowing inlet or outlet, except during seasonally high flows. Channel vegetation consisting mostly of aquatic bed, emergent and scrub-shrub types.

Community No.: 6 Community Title (main species): Festuca / Phleum

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phleum pratense</i>	20	<i>Rosa woodsii</i>	T
<i>Agropyron repens</i>	20	<i>Symphoricarpos albus</i>	T
<i>Taraxacum officinale</i>	P	<i>Agrostis alba</i>	10
<i>Cirsium arvense</i>	T	<i>Festuca pratensis</i>	30
<i>Rumex crispus</i>	T	<i>Centaurea maculosa</i>	T

COMMENTS/PROBLEMS: Areas of pre-existing upland pasture. Two stated listed noxious weeds found in this type; *Centaurea maculosa* & *Cirsium arvense*. This area incorporates planting units along the edge of the C.T # 8 near the river.

Additional Activities Checklist:

Record and map vegetative communities on air photo

COMMENTS:

VEGETATION COMMUNITIES

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

Dominant Species	% Cover	Dominant Species	% Cover
<i>Populus trichocarpa</i>	10	<i>Taraxacum officinale</i>	P
<i>Salix exigua</i>	20	<i>Hypericum perforatum</i>	P
<i>Rumex crispus</i>	10		
<i>Agrostis alba</i>	P		
<i>Phalaris arundinacea</i>	60		

COMMENTS/PROBLEMS: This area receives seasonal flooding and is located adjacent to the river and along the south side of the backwater channel. This site has experienced heavy grazing in the past. Removal of livestock grazing has left a vigorous canary reedgrass population. *Populus trichocarpa* seedlings established in 2002 are increasing in cover and density. Average sapling height 3-4 feet tall.

Community No.: 8 Community Title (main species): Agropyron / Plantago

Dominant Species	% Cover	Dominant Species	% Cover
<i>Plantago major</i>	P	<i>Agropyron repens</i>	10
<i>Plantago lanceolata</i>	10	<i>Chrysanthemum leucanthemum</i>	T
<i>Verbascum thapsus</i>	T	<i>Centaurea maculosa</i>	10
<i>Populus trichocarpa</i>	10	<i>Agrostis alba</i>	10
<i>Artemisia ludoviciana</i>	10	<i>Linaria dalmatica</i>	T

COMMENTS/PROBLEMS: Area adjacent to Flathead River, cobble and gravel substrate. Community type #8 considered Waters of the U.S. Increasing vegetation cover, mostly invasive or disturbance related species. Size and height of *Populus trichocarpa* saplings increased.

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

Dominant Species	% Cover	Dominant Species	% Cover
<i>Centaurea maculosa</i>	T	<i>Chenopodium album</i>	P
<i>Sisymbrium altissimum</i>	T	<i>Bromus</i> spp.	50
<i>Lepidium perfoliatum</i>	T	<i>Bromus tectorum</i>	10
<i>Malva neglecta</i>	T	<i>Agropyron repens</i>	10

COMMENTS/PROBLEMS: Area previously dominated by *Centaurea maculosa* in 2003. Weed control activities have been conducted to eradicate invasive species within the community type. Increase in *Bromus tectorum* and other brome species following control activities.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMMENTS:

VEGETATION COMMUNITIES

Community No.: 10 Community Title (main species): Populus / Crataegus

Dominant Species	% Cover	Dominant Species	% Cover
<i>Crataegus douglasii</i>	20	<i>Festuca pratensis</i>	P
<i>Prunus americana</i>	10	<i>Phleum pratense</i>	P
<i>Rosa woodsii</i>	P	<i>Agropyron repens</i>	20
<i>Cornus stolonifera</i>	P	<i>Symphoricarpos albus</i>	P
<i>Populus trichocarpa</i>	30	<i>Centaurea maculosa</i>	P

COMMENTS/PROBLEMS: Mature *Populus trichocarpa* & *Crataegus douglasii* found along higher terrace, adjacent to river & backwater channel. Understory layer consisting of pasture grasses and some invasive species. A few small shrub patches present along backwater channel.

Community No.: 11 Community Title (main species): Ceratophyllum

Dominant Species	% Cover	Dominant Species	% Cover
<i>Ceratophyllum demersum</i>	40	<i>Myriophyllum spicatum</i>	P
<i>Equisetum hyemale</i>	P		
<i>Eleocharis acicularis</i>	P		
<i>Juncus balticus</i>	P		
<i>Phalaris arundinacea</i>	T		

COMMENTS/PROBLEMS: Aquatic bed habitat dominated by *Ceratophyllum demersum*, standing water in channel. Channel experiences seasonal high flows. Evidence of high flows; scour marks, drift lines and sediment depositions on upper terrace. Standing water throughout the season. Some *Myriophyllum spicatum* identified within this wetland.

Community No.: 12 Community Title (main species): Juncus / Eleocharis

Dominant Species	% Cover	Dominant Species	% Cover
<i>Juncus ensifolius</i>	20	<i>Rumex crispus</i>	T
<i>Eleocharis palustris</i>	10	Willow sprigs (<i>Salix</i>)	10
<i>Agrostis alba</i>	10	<i>Prunella vulgaris</i>	T
<i>Phalaris arundinacea</i>	30	<i>Coreopsis atkinsoniana</i>	P
<i>Eleocharis acicularis</i>	10	<i>Sagittaria latifolia</i>	T
<i>Scirpus acutus</i>	T	<i>Mentha arvensis</i>	P
<i>Polygonum amphibium</i>	T	<i>Helenium autumnale</i>	T

COMMENTS/PROBLEMS: Emergent wetland vegetation type developing along the fringes of excavated wetland. Shrub & herbaceous plantings installed during spring 2003 and 2004. Wetland species diversity and cover values remained similar during the 2007.

Additional Activities Checklist:

Record and map vegetative communities on air photo

COMMENTS:

VEGETATION COMMUNITIES

Community No.: 13 Community Title (main species): Phalaris / Agrostis

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phalaris arundinacea</i>	50	<i>Agropyron repens</i>	P
<i>Agrostis alba</i>	20	<i>Salix exigua</i>	10
<i>Eleocharis palustris</i>	T	<i>Salix lutea</i>	T
<i>Alopecurus pratensis</i>	T	Plantings (<i>Cornus</i> & <i>Populus</i>)	P
<i>Plantago major</i>	P		

COMMENTS/PROBLEMS: Small area of vegetation developing in the backwater channel on the west side of excavated wetlands. Community # 13 also located adjacent to side slopes of excavated wetland.

Community No.: 14 Community Title (main species): Populus / Salix

Dominant Species	% Cover	Dominant Species	% Cover
<i>Populus trichocarpa</i>	50	<i>Plantago lanceolata</i>	P
<i>Salix exigua</i>	20	<i>Crataegus douglasii</i>	T
<i>Phalaris arundinacea</i>	10	<i>Helenium autumnale</i>	T
<i>Agropyron repens</i>	P	<i>Artemisia ludoviciana</i>	P
<i>Centaurea maculosa</i>	P		

COMMENTS/PROBLEMS: C.T. # 14 was previously mapped as C.T. # 7 & 8. Portions of C.T. # 14 serve as the inlet to the backwater channel with an increase in vegetative cover dominated by black cottonwood & willow.

Community No.: 15 Community Title (main species): Phalaris

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phalaris arundinacea</i>	70		
<i>Phleum pratense</i>	10		
<i>Agropyron repens</i>	10		
<i>Taraxacum officinale</i>	T		
<i>Cirsium arvense</i>	T		

COMMENTS/PROBLEMS: C.T. # 15 is similar to C.T. # 7 but is not considered a wetland. The area is mostly dominated by reed canarygrass, mixed with upland grasses and showed no indicators of hydrology.

Additional Activities Checklist:

Record and map vegetative communities on air photo

COMMENTS:

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
<i>Acer negundo</i>	10	<i>Juncus ensifolius</i>	4,5,12
<i>Agropyron repens</i>	4,6,8,9,10,13,14,15	<i>Juniperus scopulorum</i> *	4
<i>Agrostis alba</i>	6,7,8,12,13,14,15	<i>Lepidium perfoliatum</i>	4,6,9
<i>Achillea millefolium</i>	4,6,14	<i>Linaria dalmatica</i>	8
<i>Alnus incana</i> *	12	<i>Malva neglecta</i>	4,9
<i>Alopecurus pratensis</i>	6	<i>Melilotus alba</i>	14
<i>Amaranthus retroflexus</i>	6	<i>Melilotus officinalis</i>	4,6,10
<i>Amelanchier alnifolia</i> *	4	<i>Mentha arvensis</i>	2
<i>Artemisia ludoviciana</i>	4,8	<i>Myosotis scorpioides</i>	2
<i>Bromus japonicus</i>	6	<i>Myriophyllum spicatum</i>	3
<i>Bromus tectorum</i>	9	<i>Oenothera villosa</i>	4
<i>Carex bebbiana</i>		<i>Panicum capillare</i>	8
<i>Carex lanuginosa</i>	2	<i>Phalaris arundinacea</i>	2,5,7,11,12,13,15
<i>Carex nebrascensis</i>		<i>Phleum pratense</i>	6,10,15
<i>Carex retrorsa</i>	2	<i>Pinus ponderosa</i> *	4
<i>Carex utriculata</i>		<i>Plantago lanceolata</i>	4,8,15
<i>Centaurea maculosa</i>	4,6,8,9,10	<i>Plantago major</i>	4,8,13
<i>Ceratophyllum demersum</i>	11	<i>Poa pratensis</i>	6,15
<i>Chenopodium album</i>	4,6,9	<i>Polygonum amphibium</i>	2,11,12
<i>Chrysanthemum leucanthemum</i>	4,8	<i>Polygonum aviculare</i>	4
<i>Cirsium arvense</i>	4,6,12,15	<i>Populus tremuloides</i> *	4
<i>Cirsium vulgare</i>	4,6	<i>Populus trichocarpa</i> **	7,8,10
<i>Coreopsis atkinsoniana</i>	4,8	<i>Potamogeton amplifolius</i>	3
<i>Cornus stolonifera</i> **	5,10	<i>Potamogeton crispus</i>	3
<i>Crataegus douglasii</i>	10	<i>Potamogeton natans</i>	2,3
<i>Cynoglossum officinale</i>	4,6	<i>Prunella vulgaris</i>	12
<i>Dactylis glomerata</i>	6	<i>Prunus americana</i> **	10
<i>Dipsacus fullonum</i>	12	<i>Rosa woodsii</i>	6,10
<i>Eleocharis acicularis</i>	2,5,11,12	<i>Rumex crispus</i>	2,4,6,7,12
<i>Eleocharis palustris</i>	2,4,12,13	<i>Sagittaria latifolia</i>	2
<i>Elodea canadensis</i>	3	<i>Salix bebbiana</i>	5
<i>Elymus trachycaulus</i>	4	<i>Salix exigua</i> **	5,7,12
<i>Equisetum arvense</i>	2,4,8,12	<i>Scirpus acutus</i>	2,5,12
<i>Equisetum hyemale</i>	2,11	<i>Scirpus microcarpus</i>	2
<i>Festuca pratensis</i>	6,15	<i>Scirpus validus</i>	2
<i>Erodiun cicutarium</i>	4,8,10	<i>Sisymbrium altissimum</i>	6,8,9,14
<i>Gnaphalium palustre</i>	4,8	<i>Solanum dulcamara</i>	4,6
<i>Helianthus annuus</i>	4,12	<i>Solidago missouriensis</i>	10
<i>Helenium autumnale</i>	12	<i>Symphoricarpos albus</i> **	6,10
<i>Hippuris vulgaris</i>	2	<i>Taraxacum officinalis</i>	4,6,7,8,15
<i>Hypericum perforatum</i>	7	<i>Trifolium pratense</i>	15
<i>Iris pseudacorus</i>	5	<i>Verbascum thapsus</i>	4,6,8
<i>Juncus balticus</i>	5,11,12	<i>Veronica americana</i>	12

* Species planted during 2003 & 2004 riparian vegetation enhancements.

** Species observed during vegetation survey and also planted during 2003 & 2004 riparian vegetation enhancements.

Bolded species new to the list for 2006.

COMMENTS/PROBLEMS: No new species identified during 2007 monitoring.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Comments
Created Pond		
<i>Populus trichocarpa</i>	280	During the 2007 monitoring, species survival remained similar to those observed in 2006 based on visual estimates. Sandbar willow, cottonwood, dogwood and alder were healthy with new vigorous growth. Sandbar willow shoot growth is above 5 ft. tall. Willows spreading by rhizomes. Other species including water birch and aspen were not observed or, respectfully, recorded at low densities with less vigor. Overall survival ratings are considered moderate to high based on visual assessment. Area sustaining minor livestock browse.
<i>Betula occidentalis</i>	378	
<i>Populus tremuloides</i>	291	
<i>Alnus incana</i>	241	
<i>Salix exigua</i>	1719	
<i>Salix bebbiana</i>	684	
<i>Cornus stolonifera</i>	800	
Side Channel		
<i>Populus trichocarpa</i>	100	During the 2007 monitoring, species survival remained similar to those observed in 2006 based on visual estimates. Woods rose was healthy with new stem growth. Other species including American plum and cottonwood were less healthy, showing signs of stress with little growth and discolored leaves. Sandbar willow, dogwood, alder, water birch, serviceberry, aspen and ponderosa pine were not observed along the side channel during 2007 monitoring. Plantings areas difficult to assess due to tall grass and overgrown white sweetclover. Overall survival ratings are considered moderate based on visual assessment.
<i>Betula occidentalis</i>	75	
<i>Populus tremuloides</i>	50	
<i>Pinus ponderosa</i>	103	
<i>Alnus incana</i>	50	
<i>Salix exigua</i>	125	
<i>Cornus stolonifera</i>	200	
<i>Rosa woodsii</i>	50	
<i>Amelanchier alnifolia</i>	25	
Upland Island		
<i>Populus trichocarpa</i>	25	During the 2007 monitoring, species survival remained similar to those observed in 2006 based on visual estimates. Woods rose and snowberry were healthy with new stem growth. Other species including hawthorn, serviceberry, and cottonwood were less healthy with little growth and discolored leaves. Overall survival ratings are considered low with a high mortality following the 2004 planting season. The remaining live plantings observed in 2005 - 2007 are successfully surviving at this site.
<i>Pinus ponderosa</i>	100	
<i>Juniperus scopulorum</i>	20	
<i>Rosa woodsii</i>	300	
<i>Symphoricarpos albus</i>	100	
<i>Amelanchier alnifolia</i>	125	
<i>Crataegus douglasii</i>	100	
River Bank		
<i>Populus trichocarpa</i>	--	During the 2007 monitoring, species survival remained similar to those observed in 2006 based on visual estimates. Initial planting quantities for the river bank area were not included in CSKT survival data and therefore not included. Ponderosa pine, woods rose and snowberry were healthy with new vigorous growth. Snowberry spreading by rhizomes. Ponderosa pine sapling reaching 2 – 3 ft tall. Cottonwood volunteer saplings dominate planting area and have vigorous growth. Other species including hawthorn and dogwood were recorded in low numbers with less vigor. Overall survival ratings considered moderate to high based on visual assessment.
<i>Pinus ponderosa</i>	--	
<i>Cornus stolonifera</i>	--	
<i>Rosa woodsii</i>	--	
<i>Crataegus douglasii</i>	--	
<i>Symphoricarpos albus</i>	--	

COMMENTS/PROBLEMS: The above species were planted during 2003 & 2004 seasons. Four plantings areas were assessed by PBS&J during 2007 monitoring: upland C.T. # 4, excavated wetland, backwater channel, and river bank / terrace. Transects were walked, live plants recorded per species. Species survival ratings were not calculated due to lack of quantifiable plantings numbers within the transect locations and the inherit inaccuracy with calculations based on total number of original plantings. Plantings were assessed using several criteria including live occurrences and health. The recorded occurrences of live plants were used to estimate a general overall survival rate for each area, but were not quantified by real percentages. The number of species observed during the assessment does not reflect the total of number of species planted. Refer to **Appendix G** for the total number of plants installed and initial survival data for the 2003 and 2004 monitoring periods assessed by CSKT.

WILDLIFE

BIRDS

See attached Bird Survey – Field Data Sheet (Spring & Fall)

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			

Additional Activities Checklist:

X Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Macroinvertebrate samples collected and location marked on map.

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:

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

Location	Photo	Photograph Description	Compass Reading
1	1	Picture looking S. at upland, emergent vegetation and open water area.	180°
2	2	Picture looking N. at emergent vegetation and open water area.	180°
3	3	Picture looking E. at emergent vegetation that existed before construction.	90°
4	4	Panoramic view running W. to E., created open water area.	315° – 135°
5	5	Picture looking E. at backwater side channel.	90°
6	6	Panoramic view running W. to E., emergent wetlands, open water area & upland.	315° – 90°
7	7	Picture looking E. at side channel & area where berm was removed.	90°
8	8	Picture looking E. at side channel & area of high water disturbance.	90°
9	9a	Picture looking W. at upland, emergent wetlands & created open water areas.	315°
9	9b	Picture looking N. at upland pasture.	0°
9	9c	Picture looking S. at riparian vegetation along side channel.	180°
10	10	Picture looking W. at inlet to backwater side channel.	270° – 135°
11	11	Picture looking NW. along N. side of project boundary & Flathead River.	315°
12	12	Picture looking NW. along N. side of site, areas where berm was removed.	315°
13	13	Picture looking W. at empty floodplain channel near river.	315°

COMMENTS/PROBLEMS: All pictures were taken with a digital camera.

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 for 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: _____

WETLAND DELINEATION

At each site conduct the items on the checklist below:

- Delineate wetlands according to the 1987 Army Corps manual.
- Delineate wetland-upland boundary on the air photo
- Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

See attached completed MDT Montana Wetland Assessment Method forms.

MAINTENANCE

Were man-made nesting structures installed at this site? YES ___ NO X

If yes, do they need to be repaired? YES ___ NO ___

If yes, describe problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures build or installed to impound water or control water flow into or out of the wetland?

YES ___ NO X

If yes, are the structures working properly and in good working order? YES ___ NO ___

If no, describe the problems below.

COMMENTS/PROBLEMS: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 07/30/07 Examiner: Greg Howard Transect # 1

Approx. transect length: 390 ft Compass Direction from Start (Upland): 45°

Vegetation type 1:		Festuca/Phleum (Community No. 6)	
Length of transect in this type:	45		feet
Species:		Cover:	
Plantago lanceolata		P	
Cirsium arvense		P	
Agrostis alba		10	
Phleum pratense		P	
Festuca pratensis		50	
Agropyron repens		P	
Rumex crispus		T	
Phalaris arundinacea		P	
Equisetum arvense		P	
Total Vegetative Cover:		70%	

Vegetation type 2:		Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	24		feet
Species:		Cover:	
Eleocharis acicularis		40	
Juncus ensifolius		10	
Eleocharis palustris		10	
Scirpus acutus		P	
Plantago major		P	
Rumex crispus		T	
Salix exigua		10	
Populus trichocarpa		P	
Sagittaria latifolia		T	
Helenium autumnale		T	
Phalaris arundinacea		10	
Total Vegetative Cover:		90%	

Vegetation type 3:		Potamogeton/Elodea (Community No. 3)	
Length of transect in this type:	84		feet
Species:		Cover:	
Eleocharis acicularis		T	
Elodea canadensis		T	
Potamogeton amplifolius		T	
Eleocharis palustris		T	
Potamogeton crispus		T	
Potamogeton natans		20	
Myriophyllum spicatum		50	
Scirpus acutus		P	
Eleocharis palustris		P	
Total Vegetative Cover:		80%	

Vegetation type 4:		Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	5		feet
Species:		Cover:	
Eleocharis acicularis		10	
Juncus ensifolius		T	
Eleocharis palustris		30	
Phalaris arundinacea		10	
Helenium autumnale		P	
Potamogeton natans		T	
Total Vegetative Cover:		60%	

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 07/30/07 Examiner: Greg Howard Transect # 1

Approx. transect length: 390 ft Compass Direction from Start (Upland): 45°

Vegetation type 5:	Eleocharis/Phalaris (Community No. 2)	
Length of transect in this type:	86	feet
Phalaris arundinacea	60	
Eleocharis palustris	P	
Hippuris vulgaris	P	
Scirpus acutus	30	
Sagittaria latifolia	10	
Veronica americana	P	
Rumex crispus	T	
Equisetum arvense	T	
Carex retrorsa	P	
Total Vegetative Cover:	100%	

Vegetation type 6:	Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	6	feet
Species:		Cover:
Eleocharis acicularis		10
Juncus ensifolius		T
Eleocharis palustris		50
Scirpus acutus		T
Coreopsis atkinsoniana		T
Sagittaria latifolia		T
Total Vegetative Cover:	65%	

Vegetation type 7:	Potamogeton/Elodea (Community No. 3)	
Length of transect in this type:	45	feet
Species:		Cover:
Eleocharis acicularis		P
Myriophyllum spicatum		60
Eleocharis palustris		10
Potamogeton natans		10
Total Vegetative Cover:	85%	

Vegetation type 8:	Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	17	feet
Species:		Cover:
Eleocharis acicularis		30
Juncus ensifolius		P
Eleocharis palustris		20
Scirpus acutus		P
Coreopsis atkinsoniana		10
Phalaris arundinacea		10
Total Vegetative Cover:	75%	

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 07/30/07 Examiner: Greg Howard Transect # 1

Approx. transect length: 390 ft Compass Direction from Start (Upland): 45°

Vegetation type 9:		Agropyron/Melilotus (Community No. 4)	
Length of transect in this type:	45	feet	
Species:		Cover:	
Phalaris arundinacea		20	
Plantago lanceolata		P	
Polygonum amphibium		T	
Agropyron repens		30	
Cirsium arvense		T	
Plantago major		T	
Coreopsis atkinsoniana		P	
Total Vegetative Cover:		55%	

Vegetation type 10:		Festuca/Phleum (Community No. 6)	
Length of transect in this type:	33	feet	
Species:		Cover:	
Festuca pratensis		P	
Agropyron repens		P	
Cirsium arvense		P	
Verbascum thapsus		T	
Phalaris arundinacea		60	
Agrostis alba		P	
Plantago major		T	
Iris pseudoacorus		T	
Total Vegetative Cover:		70%	

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

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

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

Project/Site: <u>Hoskins Landing</u>	Date: <u>07/30/07</u>
Applicant/Owner: <u>MDT</u>	County: <u>Sanders</u>
Investigator: <u>Greg Howard</u>	State: <u>MT</u>
Do Normal Circumstances exist on the site: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: <u>Upland</u>
Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: <u>T1</u>
Is the area a potential Problem Area?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Plot ID: <u>1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 <i>Plantago lanceolata</i>	H	FAC	9		
2 <i>Cirsium arvense</i>	H	FACU+	10		
3 <i>Phleum pratense</i>	H	FACU	11		
4 <i>Agropyron repens</i>	H	FACU+	12		
5 <i>Agrostis alba</i>	H	FACU	13		
6 <i>Festuca pratensis</i>	H	FAC+	14		
7 <i>Phalaris arundinacea</i>	H	FACW	15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-).			<u>3/7 = 33%</u>		
Upland pasture along the outer fringes of excavated wetland slopes.					

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u> </u> - <u> </u> (in.)</p> <p>Depth to Free Water in Pit: <u> </u> - <u> </u> (in.)</p> <p>Depth to Saturated Soil: <u> </u> - <u> </u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Remarks:</p> <p>No evidence of hydrology. Soil dry and crumbly, not saturated or moist at the time of evaluation.</p>	

SOILS

Map Unit Name		Horseplains-riverwash complex		Drainage Class: _____	
(Series and Phase):		_____		Field Observations	
Taxonomy (Subgroup):		_____		Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2	A	10 YR 3/2	-	-	Loam
2 – 12	B1	10 YR 4/2	-	-	Silty Loam
12+	B2	10 YR 5/2	-	-	Silty Loam
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions		_____ High Organic Content in surface Layer in Sandy Soils	
_____ Histic Epipedon		_____ Organic Streaking in Sandy Soils		_____ Listed on Local Hydric Soils List	
_____ Sulfidic Odor		_____ Aquic Moisture Regime		_____ Listed on National Hydric Soils List	
_____ Reducing Conditions		_____ Gleyed or Low-Chroma Colors		_____ Other (Explain in Remarks)	
No hydric soil indicators presence.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? _____ Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? _____ Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? _____ Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present? _____ Yes <input checked="" type="checkbox"/> No	
Remarks:	
Sampling point considered within an upland area. Sampling point located near the beginning of vegetation transect within upland.	

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

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>07/30/07</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u> x </u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u> X </u> No Is the area a potential Problem Area?: <u> </u> Yes <u> X </u> No (If needed, explain on reverse.)	Community ID: <u>Emergent</u> Transect ID: <u>T1</u> Plot ID: <u>2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 <i>Eleocharis acicularis</i>	H	OBL	9		
2 <i>Juncus ensifolius</i>	H	FACW	10		
3 <i>Eleocharis palustris</i>	H	OBL	11		
4 <i>Scirpus acutus</i>	H	OBL	12		
5 <i>Salix exigua</i>	S	OBL	13		
6 <i>Phalaris arundinacea</i>	H	FACW	14		
7 <i>Mentha arvensis</i>	H	FAC	15		
8 <i>Sagittaria latifolia</i>	H	OBL	16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 8/8 = 100%

Area dominated by hydrophytic vegetation. Developing emergent vegetation type along outer fringe of excavated wetland.

HYDROLOGY

<u> </u> Recorded Data (Describe in Remarks): <u> </u> Stream, Lake, or Tide Gauge <u> </u> Aerial Photographs <u> </u> Other <u> x </u> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <u> x </u> Inundated <u> </u> Saturated in Upper 12 Inches <u> </u> Water Marks <u> </u> Drift Lines <u> </u> Sediment Deposits <u> </u> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <u> </u> Oxidized Root Channels in Upper 12 Inches <u> </u> Water-Stained Leaves <u> </u> Local Soil Survey Data <u> </u> FAC-Neutral Test <u> </u> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u> </u> - (in.) Depth to Free Water in Pit: <u> </u> - (in.) Depth to Saturated Soil: <u> </u> 0 (in.)	
Remarks: Hydrology indicators present with saturated soils to ground surface and minor inundation.	

SOILS

Map Unit Name (Series and Phase):		Horseplains-riverwash complex		Drainage Class:	_____
Taxonomy (Subgroup):		_____		Field Observations	_____
				Confirm Mapped Type?	_____ Yes <input checked="" type="checkbox"/> No
Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 12+	B	7.5 YR 4/1	7.5 YR 3/4	Common / Prominent	Sandy Clay
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions		_____ High Organic Content in surface Layer in Sandy Soils	
_____ Histic Epipedon		_____ Organic Streaking in Sandy Soils		_____ Listed on Local Hydric Soils List	
_____ Sulfidic Odor		_____ Listed on National Hydric Soils List		_____ Other (Explain in Remarks)	
_____ Aquic Moisture Regime		_____		_____	
_____ Reducing Conditions		_____		_____	
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		_____		_____	
Hydric soil indicators present with low-chroma colors and mottles.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes _____ No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes _____ No Hydric Soils Present? <input checked="" type="checkbox"/> Yes _____ No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes _____ No
Remarks: Sampling point considered within a wetland. Wetland area dominated by emergent vegetation type located along fringe of excavated wetland.	

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

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>07/30/07</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u> x </u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u> X </u> No Is the area a potential Problem Area?: <u> </u> Yes <u> X </u> No (If needed, explain on reverse.)	Community ID: <u>Emergent</u> Transect ID: <u>T1</u> Plot ID: <u>3</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 <i>Eleocharis palustris</i>	H	OBL	9		
2 <i>Phalaris arundinacea</i>	H	FACW	10		
3 <i>Scirpus acutus</i>	H	OBL	11		
4 <i>Hippuris vulgaris</i>	H	OBL	12		
5 <i>Carex retrorsa</i>	H	FAC	13		
6 <i>Sagittaria latifolia</i>	H	OBL	14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 6/6 = 100%

Area dominated by hydrophytic vegetation.

HYDROLOGY

Recorded Data (Describe in Remarks): <u> </u> Stream, Lake, or Tide Gauge <u> </u> Aerial Photographs <u> </u> Other <u> x </u> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <u> x </u> Inundated <u> </u> Saturated in Upper 12 Inches <u> </u> Water Marks <u> </u> Drift Lines <u> </u> Sediment Deposits <u> </u> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <u> </u> Oxidized Root Channels in Upper 12 Inches <u> </u> Water-Stained Leaves <u> </u> Local Soil Survey Data <u> </u> FAC-Neutral Test <u> </u> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u> - </u> (in.) Depth to Free Water in Pit: <u> - </u> (in.) Depth to Saturated Soil: <u> 0 </u> (in.)	
Remarks: Hydrology indicators present with inundation and saturated soils to ground surface.	

SOILS

Map Unit Name (Series and Phase):	Horseplains-riverwash complex	Drainage Class:	
Taxonomy (Subgroup):		Field Observations	
		Confirm Mapped Type?	____ Yes <input checked="" type="checkbox"/> No

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2	O	10 YR 3/2	-	-	Organics
2 – 10	A	10 YR 3/1	10 YR 2/6	Common, Distinct	Clay
10+	B	10 YR 4/1	10 YR 2/6	Many, Prominent	Clay

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Hydric soil indicators present with mottles and low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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Remarks:
 Sampling point considered within an emergent wetland type.

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

Project/Site: <u>Hoskins Landing</u>	Date: <u>07/30/07</u>
Applicant/Owner: <u>MDT</u>	County: <u>Sanders</u>
Investigator: <u>Greg Howard</u>	State: <u>MT</u>
Do Normal Circumstances exist on the site: x Yes No	Community ID: <u>Aquatic bed & emergent</u>
Is the site significantly disturbed (Atypical Situation)? ____ Yes <u>x</u> No	Transect ID: <u>T1</u>
Is the area a potential Problem Area?: ____ Yes <u>x</u> No (If needed, explain on reverse.)	Plot ID: <u>4</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 <i>Eleocharis acicularis</i>	H	OBL	9		
2 <i>Juncus ensifolius</i>	H	FACW	10		
3 <i>Phalaris arundinacea</i>	H	FACW	11		
4 <i>Eleocharis palustris</i>	H	OBL	12		
5 <i>Scirpus microcarpus</i>	H	OBL	13		
6 <i>Potamogeton natans</i>	H	OBL	14		
7 <i>Myriophyllum spicatum</i>	H	OBL	15		

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

Aquatic habitat dominated by mostly obligate wetland species. *Myriophyllum spicatum* considered a aquatic nuisance and is rated as a Category III for state listed noxious weed species.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p style="padding-left: 20px;">____ Stream, Lake, or Tide Gauge</p> <p style="padding-left: 20px;">____ Aerial Photographs</p> <p style="padding-left: 20px;">____ Other</p> <p><u> x </u> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: ____ - ____ (in.)</p> <p>Depth to Free Water in Pit: ____ - ____ (in.)</p> <p>Depth to Saturated Soil: ____ 0 ____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>____ Inundated</p> <p><u> x </u> Saturated in Upper 12 Inches</p> <p>____ Water Marks</p> <p><u> x </u> Drift Lines</p> <p>____ Sediment Deposits</p> <p>____ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>____ Oxidized Root Channels in Upper 12 Inches</p> <p>____ Water-Stained Leaves</p> <p>____ Local Soil Survey Data</p> <p>____ FAC-Neutral Test</p> <p>____ Other (Explain in Remarks)</p>
<p>Remarks:</p> <p>Hydrology indicator present with soils saturated to ground surface.</p>	

SOILS

Map Unit Name (Series and Phase):	Horseplains-riverwash complex	Drainage Class:	_____
Taxonomy (Subgroup):	_____	Field Observations	_____
		Confirm Mapped Type?	_____ Yes <input checked="" type="checkbox"/> No

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 1	A	10 YR 3/1	-	-	Organics w/clay loam
1 - 12	B1	10 YR 5/1	10 YR 4/6	Medium, 15%	Clay
12+	B2	2.5 YR 4/1	10 YR 4/6	Small, 10%	Clay

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Hydric soil indicators present with low-chroma colors & mottles.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Remarks:
 Sampling point considered within a wetland area. Excavated wetland; aquatic bed and emergent vegetation types.

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

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>07/30/07</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: <u>-</u> Transect ID: <u>T1</u> Plot ID: <u>5</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 <u>Agropyron repens</u>	<u>H</u>	<u>FACU</u>	9		
2 <u>Festuca pratensis</u>	<u>H</u>	<u>FACU+</u>	10		
3 <u>Cirsium arvense</u>	<u>H</u>	<u>FACU+</u>	11		
4 <u>Agrostis alba</u>	<u>H</u>	<u>FAC+</u>	12		
5 <u>Plantago major</u>	<u>H</u>	<u>FACU</u>	13		
6 <u>Phalaris arundinacea</u>	<u>H</u>	<u>FACW</u>	14		
7 _____			15		
8 _____			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 2/6 = 33%

Area dominated upland vegetation.

HYDROLOGY

Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>-</u> (in.) Depth to Free Water in Pit: <u>-</u> (in.) Depth to Saturated Soil: <u>-</u> (in.)	
Remarks: No hydrology indicators present, sampling pit was dry.	

SOILS

Map Unit Name		Horseplains-riverwash complex		Drainage Class: _____	
(Series and Phase):		_____		Field Observations	
Taxonomy (Subgroup):		_____		Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 1	B1	10 YR 4/2	-	-	Roots w/silty clay
1 – 12+	B2	10 YR 4/2	-	-	Silty loam
Hydric Soil Indicators:					
_____ Histosol		_____ Concretions		_____ High Organic Content in surface Layer in Sandy Soils	
_____ Histic Epipedon		_____ Organic Streaking in Sandy Soils		_____ Listed on Local Hydric Soils List	
_____ Sulfidic Odor		_____ Listed on National Hydric Soils List		_____ Other (Explain in Remarks)	
_____ Aquic Moisture Regime		_____			
_____ Reducing Conditions					
_____ Gleyed or Low-Chroma Colors					
No hydric soils indicators found.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Hydric Soils Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Remarks: Sampling point considered within an upland area.	

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S gray wolf, bull trout
- No usable habitat D S _____

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	---	.3 (L)	---

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

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

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S Bald Eagle
- Incidental habitat (list species) D S American White Pelican (D), western toad (S), Peregrine Falcon (S) B&W Warbler (D)
- No usable habitat D S _____

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	.7 (M)	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): American white pelican observed during fall 2006 and Bald Eagle during 2004 and 2007.

14C. GENERAL WILDLIFE HABITAT RATING

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

Substantial (based on any of the following)

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

Low (based on any of the following)

- few or no wildlife observations during peak use periods
- little to no wildlife sign
- sparse adjacent upland food sources
- interviews with local biologists with knowledge of AA

Moderate (based on any of the following)

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

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

Structural Diversity (from 13)	<input checked="" type="checkbox"/> High								<input type="checkbox"/> Moderate								<input type="checkbox"/> Low			
	<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even			
Class Cover Distribution (all vegetated classes)	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
Duration of Surface Water in ≥ 10% of AA																				
Low disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see 12)	--	--	--	--	H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: _____

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

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

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

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

Duration of Surface Water in AA	<input checked="" type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)									
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.	H	--	--	--	--	--	--	--	--

ii. Modified Habitat Quality: Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

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

Types of Fish Known or Suspected within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	.8 (H)	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: _____

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

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

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

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input checked="" type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
% of flooded wetland classified as forested, scrub/shrub, or both									
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	.4 (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: Road crossing on west end of backwater channel has been removed, allowing for surface flow during highwater to move unrestricted along channel and drain back into excavated wetland and Flathead River.

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

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

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

P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input checked="" type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Duration of surface water at wetlands within the AA									
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	.9 (H)	--	--	--	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
% cover of wetland vegetation in AA	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Evidence of flooding or ponding in AA								
AA contains no or restricted outlet	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	.4 (M)	--	--	--

Comments: _____

14H. SEDIMENT/ShORELINE STABILIZATION NA (proceed to 14I)

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input checked="" type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	.6 (M)	--
< 35 %	--	--	--

Comments: Shoreline planted with wetland shrubs and development of emergent vegetation along banks.

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	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input checked="" type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	1H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. Discharge Indicators

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

ii. Recharge Indicators

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

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

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

Comments: _____

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant
Estimated Relative Abundance from 11									
Low disturbance at AA (12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (12i)	--	--	--	--	.5M	--	--	--	--
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)		
	<input type="checkbox"/> Low	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	.3(L)	--

Comments: Area managed by the Confederated Salish & Kootenai Tribes.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	low	0.30	1	
B. MT Natural Heritage Program Species Habitat	moderate	0.7	1	
C. General Wildlife Habitat	moderate	0.70	1	
D. General Fish/Aquatic Habitat	high	0.80	1	
E. Flood Attenuation	moderate	0.40	1	
F. Short and Long Term Surface Water Storage	high	0.90	1	
G. Sediment/Nutrient/Toxicant Removal	moderate	0.40	1	
H. Sediment/Shoreline Stabilization	moderate	0.60	1	
I. Production Export/Food Chain Support	high	1.00	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	moderate	0.50	1	
L. Recreation/Education Potential	low	0.30	1	
Total:		<u>7.60</u>	<u>12.00</u>	_____
Percent of Total Possible Points:			<u>63%</u> (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not satisfied, proceed to Category II.)</p> <p><input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or</p> <p><input type="checkbox"/> Score of 1 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or</p> <p><input type="checkbox"/> Percent of total Possible Points is > 80%.</p>
<p>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.)</p> <p><input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or</p> <p><input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or</p> <p><input type="checkbox"/> Score of .9 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Percent of total possible points is > 65%.</p>
<p><input checked="" type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, return to Category III.)</p> <p><input type="checkbox"/> "Low" rating for Uniqueness; and</p> <p><input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and</p> <p><input type="checkbox"/> Percent of total possible points is < 30%.</p>

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

I **II** **III** **IV**

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S _____
- No usable habitat D S none

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

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

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

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

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S _____
- No usable habitat D S none

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	---	---	0 (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)
- abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- presence of extremely limiting habitat features not available in the surrounding area
- interviews with local biologists with knowledge of the AA

Low (based on any of the following)

- few or no wildlife observations during peak use periods
- little to no wildlife sign
- sparse adjacent upland food sources
- interviews with local biologists with knowledge of AA

Moderate (based on any of the following)

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

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

Structural Diversity (from 13)	<input type="checkbox"/> High								<input type="checkbox"/> Moderate								<input checked="" type="checkbox"/> Low			
	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input checked="" type="checkbox"/> Even			
Class Cover Distribution (all vegetated classes)	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
Duration of Surface Water in ≥ 10% of AA																				
Low disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	M	--	--
High disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	--	--	--
Low	--	--	.2 (L)	--

Comments: _____

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

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

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

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

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

ii. Modified Habitat Quality: Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

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

Types of Fish Known or Suspected within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: _____

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

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

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

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input checked="" type="checkbox"/> ≤2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
% of flooded wetland classified as forested, scrub/shrub, or both									
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	.2 (L)
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

ii. Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA? (check)

Y N Comments: Rarely floods, but does likely occur on occasion.

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

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

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

P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input checked="" type="checkbox"/> ≤1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Duration of surface water at wetlands within the AA									
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	--	--	--	--	--	--	.3 (L)	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

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

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

Comments: _____

14H. SEDIMENT/ShORELINE STABILIZATION

NA (proceed to 14I)

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: No shoreline present.

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	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input checked="" type="checkbox"/> Vegetated component <1 acre					
B	<input checked="" type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input checked="" type="checkbox"/> Low	
C	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
P/P	1H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.2L
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. Discharge Indicators

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

ii. Recharge Indicators

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

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

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

Comments: _____

14K. UNIQUENESS

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

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

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

- Yes [Proceed to 14L (ii) and then 14L(iv)]
- No [Rate as low in 14L(iv)]

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

Ownership	Disturbance at AA from 12(i)		
	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: Area managed by the Confederated Salish & Kootenai Tribes.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	low	0.00	1	
B. MT Natural Heritage Program Species Habitat	low	0.00	1	
C. General Wildlife Habitat	low	0.20	1	
D. General Fish/Aquatic Habitat	N/A		--	
E. Flood Attenuation	low	0.20	1	
F. Short and Long Term Surface Water Storage	low	0.30	1	
G. Sediment/Nutrient/Toxicant Removal	moderate	0.50	1	
H. Sediment/Shoreline Stabilization	N/A		--	
I. Production Export/Food Chain Support	low	0.20	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	low	0.30	1	
L. Recreation/Education Potential	low	0.10	1	
Total:		<u>2.80</u>	<u>10.00</u>	
Percent of Total Possible Points:			<u>28%</u> (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not satisfied, proceed to Category II.)</p> <p><input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or</p> <p><input type="checkbox"/> Score of 1 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or</p> <p><input type="checkbox"/> Percent of total Possible Points is > 80%.</p>
<p>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.)</p> <p><input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or</p> <p><input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or</p> <p><input type="checkbox"/> Score of .9 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Percent of total possible points is > 65%.</p>
<p><input type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, return to Category III.)</p> <p><input type="checkbox"/> "Low" rating for Uniqueness; and</p> <p><input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and</p> <p><input checked="" type="checkbox"/> Percent of total possible points is < 30%.</p>

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

- I**
 II
 III
 IV

Appendix C

2007 REPRESENTATIVE PHOTOGRAPHS

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

HOSKINS LANDING MITIGATION SITE 2007



Photo Point No. 1: View facing south along vegetation transect. Upland vegetation transitioning into wetlands.



Photo Point No. 2: View facing south towards excavated wetland and shallow waters with emergent wetlands.



Photo Point No. 3: View facing east, excavated wetland, adjacent to undisturbed emergent wetlands. Emergent vegetation continuing to expand into inundated portions of excavated wetland.



Photo Point No. 4: View facing north across the mitigation site. Western side of excavated wetland with aquatic bed and emergent wetland types.



Photo Point No. 5: View facing east, reconnected backwater channel along southern edge of site boundary. Disturbed areas dominated by mostly weedy species.



Photo Point No. 7: View facing east near backwater channel. Woody plants developing along streambank and terrace. Area overgrown with white clover and upland grasses.

HOSKINS LANDING MITIGATION SITE 2007



Photo Point No. 8: View facing east along backwater channel from within the adjacent upland.



Photo Point No. 9: View facing west, towards excavated wetland. Upland community in foreground and excavated wetland in background.



Photo Point No. 9: View facing north across remnant pasture. Undisturbed areas consisting of mostly upland grasses. Portions of the site mowed for weed control efforts.



Photo Point No. 9: View facing south, upland shrub community type consisting of hawthorn, American plum and cottonwood. Located on higher terrace along backwater channel.



Photo Point No. 10: View facing west; inlet to backwater channel on eastern side of mitigation site. Vegetation cover increasing along inlet to backwater channel.



Photo Point No. 11: View facing northwest along the Flathead river banks. Increase in vegetation cover, area dominated by reed canarygrass and redtop.

HOSKINS LANDING MITIGATION SITE 2007



Photo Point No. 12: View facing northwest along Flathead River. Area of excavation and grading work to remove historic berm along north boundary of site during 2002.



Photo Point No. 13: View facing west along backwater flood channel. Substrate of cobbles and gravels with increasing vegetation cover of black cottonwood saplings.



Photo Point No. 4: Panoramic view facing north across the mitigation site. Western side of excavated wetland, aquatic bed and emergent wetland types, undisturbed wetland located in center. Outlet to remnant backwater channel located on left side of photo. Transect located along western side of excavated wetland. Emergent vegetation developing denser cover around excavated wetland fringe and within shallow waters.

HOSKINS LANDING MITIGATION SITE 2007



Photo Point No. 6: Panoramic view facing northwest; area of upland grass community in foreground and excavated wetland in background. Emergent wetland vegetation developing around excavated wetland fringe.



Photo Point No. 6: Panoramic view facing northeast; area of upland grass community in foreground and excavated wetland in background.

Appendix D

ORIGINAL SITE PLAN

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

MONTANA DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 45(29)	1

FEDERAL AID PROJECT NO. STPP 45(29)

WETLAND

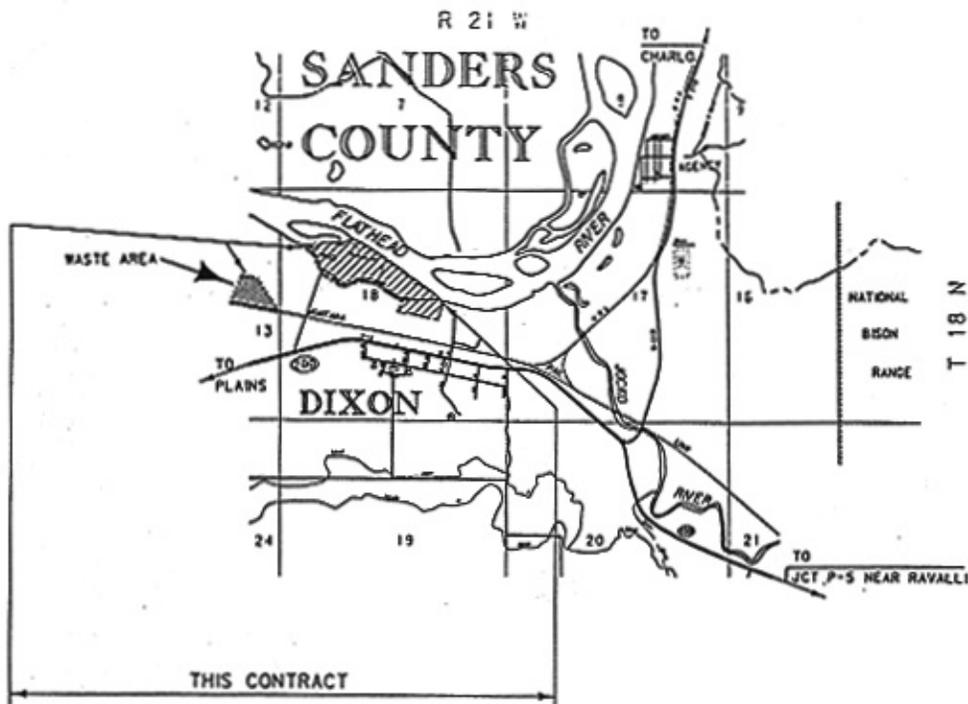
DIXON WETLAND MITIGATION

SANDERS COUNTY



THIS PROJECT

SCALES AS NOTED ON PLANS
REDUCED PRINTS 1/3 ORIGINAL SCALE



PRELIMINARY
FOR PLAN IN HAND ONLY

RELATED PROJECTS	

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & UL	
P.A.	STPP 45(29)

MONTANA DEPARTMENT OF TRANSPORTATION	
APPROVED: _____	
DAVE A. SALT DIRECTOR OF TRANSPORTATION	
BY: _____	PRODUCTION NUMBER
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
APPROVED: _____	DATE

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CONSTRUCTION ACCESS

THE CONTRACTOR IS RESPONSIBLE FOR REVEGETATING ALL DISTURBED ACCESS AND STAGING AREAS.

WETLAND TOPSOIL

EXCAVATE WETLAND TOPSOIL FROM WITHIN CONSTRUCTION LIMIT AREAS AND STOCKPILE TOPSOIL IN THE AREAS DESIGNATED ON THE PLANS. PLACE TOPSOIL TO A MINIMUM DEPTH OF 100mm ON ALL DISTURBED AREAS.
FINISHED GRADE ELEVATIONS DO NOT INCLUDE TOPSOIL.

GRADING

PERFORM ALL EXCAVATION AND EMBANKMENTS BY METHODS DESCRIBED IN SECTION 203 OF THE STANDARD SPECIFICATIONS. ALL EXCAVATION INCLUDING MUCK EXCAVATION AND DISPOSAL OF EXCESS MATERIAL WILL BE PAID FOR AS "UNCLASSIFIED EXCAVATION". EXCAVATION OF SATURATED MATERIAL IS ANTICIPATED IN SOME AREAS, HOWEVER NO PAYMENT WILL BE MADE FOR MUCK EXCAVATION. DISPOSE OF EXCESS MATERIAL OFF SITE IN AREA SPECIFIED SOUTHWEST OF THE WETLAND SITE.
ROUND ALL SLOPES 10:1 AND STEEPER.

SEEDING

SEED AREAS SHOWN ON THE PLANS AND OTHER AREAS DISTURBED DURING CONSTRUCTION. SEE SPECIAL PROVISIONS FOR SEED MIX TO BE USED ON EACH AREA.

FENCING

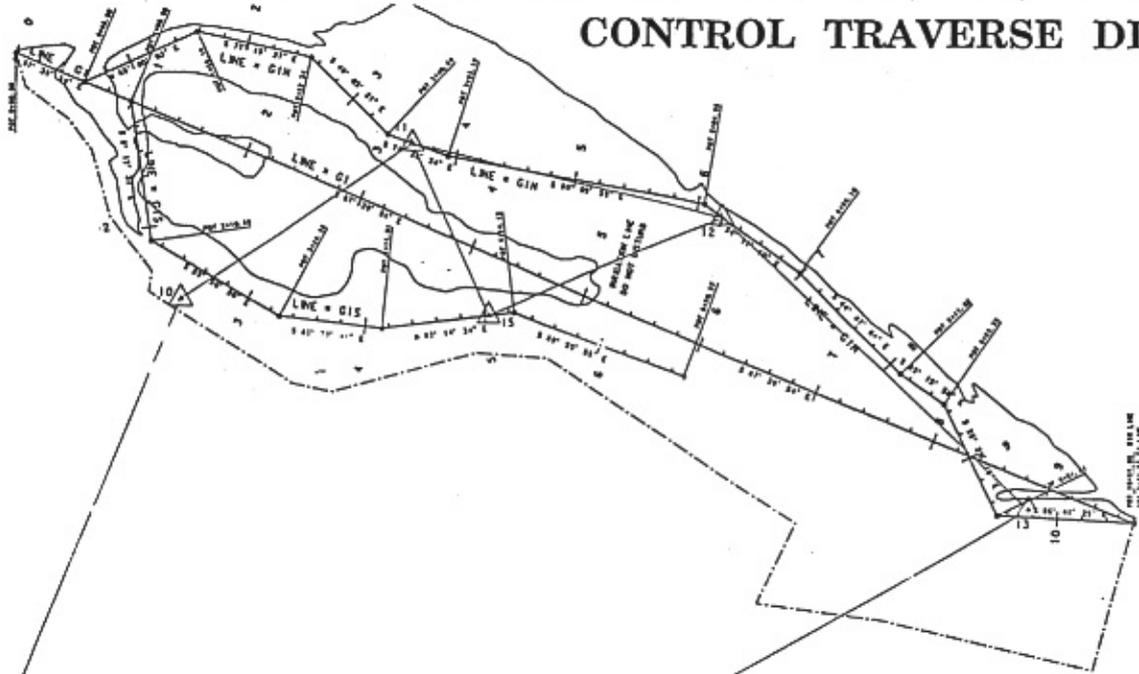
PERIMETER FENCING IS STANDARD 140T BARBED 5-WIRE FENCE WITH WOODEN POSTS (TYPE F5W1). PLACE PERIMETER FENCING 0.2 m OUTSIDE THE BOUNDARY DEFINED BY THE CERTIFICATE OF SURVEY (C.O.S. 20701). DO NOT FENCE THE NORTH BOUNDARY ADJACENT TO THE RIVER.

PRELIMINARY

LINEAR AND LEVEL DATA

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
0+00.00	POB	33,418.1288	66,807.6208	LINE = 61
0+12.97	POB	33,848.3882	67,507.5918	LINE = 61
0+25.94	POB	34,278.6476	68,207.5628	LINE = 61M
0+38.91	POB	34,708.9070	68,907.5338	LINE = 61M
0+51.88	POB	35,139.1664	69,607.5048	LINE = 61M
0+64.85	POB	35,569.4258	70,307.4758	LINE = 61M
0+77.82	POB	35,999.6852	71,007.4468	LINE = 61M
0+90.79	POB	36,429.9446	71,707.4178	LINE = 61M
1+03.76	POB	36,860.2040	72,407.3888	LINE = 61M
1+16.73	POB	37,290.4634	73,107.3598	LINE = 61M
1+29.70	POB	37,720.7228	73,807.3308	LINE = 61M
1+42.67	POB	38,150.9822	74,507.3018	LINE = 61M
1+55.64	POB	38,581.2416	75,207.2728	LINE = 61M
2+08.61	POB	39,011.5010	75,907.2438	LINE = 61M
2+21.58	POB	39,441.7604	76,607.2148	LINE = 61M
2+34.55	POB	39,872.0198	77,307.1858	LINE = 61M
2+47.52	POB	40,302.2792	78,007.1568	LINE = 61M
2+60.49	POB	40,732.5386	78,707.1278	LINE = 61M
2+73.46	POB	41,162.7980	79,407.0988	LINE = 61M
2+86.43	POB	41,593.0574	80,107.0698	LINE = 61M
2+99.40	POB	42,023.3168	80,807.0408	LINE = 61M
3+12.37	POB	42,453.5762	81,507.0118	LINE = 61M
3+25.34	POB	42,883.8356	82,207.0008	LINE = 61M
3+38.31	POB	43,314.0950	82,907.0008	LINE = 61M
3+51.28	POB	43,744.3544	83,607.0008	LINE = 61M
3+64.25	POB	44,174.6138	84,307.0008	LINE = 61M
3+77.22	POB	44,604.8732	85,007.0008	LINE = 61M
3+90.19	POB	45,035.1326	85,707.0008	LINE = 61M
4+03.16	POB	45,465.3920	86,407.0008	LINE = 61M
4+16.13	POB	45,895.6514	87,107.0008	LINE = 61M
4+29.10	POB	46,325.9108	87,807.0008	LINE = 61M
4+42.07	POB	46,756.1702	88,507.0008	LINE = 61M
4+55.04	POB	47,186.4296	89,207.0008	LINE = 61M
5+08.01	POB	47,616.6890	89,907.0008	LINE = 61M
5+21.00	POB	48,046.9484	90,607.0008	LINE = 61M
5+34.00	POB	48,477.2078	91,307.0008	LINE = 61M
5+47.00	POB	48,907.4672	92,007.0008	LINE = 61M
5+60.00	POB	49,337.7266	92,707.0008	LINE = 61M
5+73.00	POB	49,767.9860	93,407.0008	LINE = 61M
5+86.00	POB	50,198.2454	94,107.0008	LINE = 61M
5+99.00	POB	50,628.5048	94,807.0008	LINE = 61M
6+12.00	POB	51,058.7642	95,507.0008	LINE = 61M
6+25.00	POB	51,489.0236	96,207.0008	LINE = 61M
6+38.00	POB	51,919.2830	96,907.0008	LINE = 61M
6+51.00	POB	52,349.5424	97,607.0008	LINE = 61M
6+64.00	POB	52,779.8018	98,307.0008	LINE = 61M
6+77.00	POB	53,210.0612	99,007.0008	LINE = 61M
6+90.00	POB	53,640.3206	99,707.0008	LINE = 61M
7+03.00	POB	54,070.5800	100,407.0008	LINE = 61M
7+16.00	POB	54,500.8394	101,107.0008	LINE = 61M
7+29.00	POB	54,931.0988	101,807.0008	LINE = 61M
7+42.00	POB	55,361.3582	102,507.0008	LINE = 61M
7+55.00	POB	55,791.6176	103,207.0008	LINE = 61M
8+08.00	POB	56,221.8770	103,907.0008	LINE = 61M
8+21.00	POB	56,652.1364	104,607.0008	LINE = 61M
8+34.00	POB	57,082.3958	105,307.0008	LINE = 61M
8+47.00	POB	57,512.6552	106,007.0008	LINE = 61M
8+60.00	POB	57,942.9146	106,707.0008	LINE = 61M
8+73.00	POB	58,373.1740	107,407.0008	LINE = 61M
8+86.00	POB	58,803.4334	108,107.0008	LINE = 61M
9+00.00	POB	59,233.6928	108,807.0008	LINE = 61M
9+13.00	POB	59,663.9522	109,507.0008	LINE = 61M
9+26.00	POB	60,094.2116	110,207.0008	LINE = 61M
9+39.00	POB	60,524.4710	110,907.0008	LINE = 61M
9+52.00	POB	60,954.7304	111,607.0008	LINE = 61M
10+05.00	POB	61,384.9898	112,307.0008	LINE = 61M
10+18.00	POB	61,815.2492	113,007.0008	LINE = 61M
10+31.00	POB	62,245.5086	113,707.0008	LINE = 61M
10+44.00	POB	62,675.7680	114,407.0008	LINE = 61M
10+57.00	POB	63,106.0274	115,107.0008	LINE = 61M
11+10.00	POB	63,536.2868	115,807.0008	LINE = 61M
11+23.00	POB	63,966.5462	116,507.0008	LINE = 61M
11+36.00	POB	64,396.8056	117,207.0008	LINE = 61M
11+49.00	POB	64,827.0650	117,907.0008	LINE = 61M
11+62.00	POB	65,257.3244	118,607.0008	LINE = 61M
11+75.00	POB	65,687.5838	119,307.0008	LINE = 61M
11+88.00	POB	66,117.8432	120,007.0008	LINE = 61M
12+01.00	POB	66,548.1026	120,707.0008	LINE = 61M
12+14.00	POB	66,978.3620	121,407.0008	LINE = 61M
12+27.00	POB	67,408.6214	122,107.0008	LINE = 61M
12+40.00	POB	67,838.8808	122,807.0008	LINE = 61M
12+53.00	POB	68,269.1402	123,507.0008	LINE = 61M
13+06.00	POB	68,699.3996	124,207.0008	LINE = 61M
13+19.00	POB	69,129.6590	124,907.0008	LINE = 61M
13+32.00	POB	69,559.9184	125,607.0008	LINE = 61M
13+45.00	POB	69,990.1778	126,307.0008	LINE = 61M
13+58.00	POB	70,420.4372	127,007.0008	LINE = 61M
14+11.00	POB	70,850.6966	127,707.0008	LINE = 61M
14+24.00	POB	71,280.9560	128,407.0008	LINE = 61M
14+37.00	POB	71,711.2154	129,107.0008	LINE = 61M
14+50.00	POB	72,141.4748	129,807.0008	LINE = 61M
15+03.00	POB	72,571.7342	130,507.0008	LINE = 61M
15+16.00	POB	73,001.9936	131,207.0008	LINE = 61M
15+29.00	POB	73,432.2530	131,907.0008	LINE = 61M
15+42.00	POB	73,862.5124	132,607.0008	LINE = 61M
15+55.00	POB	74,292.7718	133,307.0008	LINE = 61M
16+08.00	POB	74,723.0312	134,007.0008	LINE = 61M
16+21.00	POB	75,153.2906	134,707.0008	LINE = 61M
16+34.00	POB	75,583.5500	135,407.0008	LINE = 61M
16+47.00	POB	76,013.8094	136,107.0008	LINE = 61M
16+60.00	POB	76,444.0688	136,807.0008	LINE = 61M
16+73.00	POB	76,874.3282	137,507.0008	LINE = 61M
16+86.00	POB	77,304.5876	138,207.0008	LINE = 61M
17+00.00	POB	77,734.8470	138,907.0008	LINE = 61M
17+13.00	POB	78,165.1064	139,607.0008	LINE = 61M
17+26.00	POB	78,595.3658	140,307.0008	LINE = 61M
17+39.00	POB	79,025.6252	141,007.0008	LINE = 61M
17+52.00	POB	79,455.8846	141,707.0008	LINE = 61M
18+05.00	POB	79,886.1440	142,407.0008	LINE = 61M
18+18.00	POB	80,316.4034	143,107.0008	LINE = 61M
18+31.00	POB	80,746.6628	143,807.0008	LINE = 61M
18+44.00	POB	81,176.9222	144,507.0008	LINE = 61M
18+57.00	POB	81,607.1816	145,207.0008	LINE = 61M
19+10.00	POB	82,037.4410	145,907.0008	LINE = 61M
19+23.00	POB	82,467.7004	146,607.0008	LINE = 61M
19+36.00	POB	82,897.9598	147,307.0008	LINE = 61M
19+49.00	POB	83,328.2192	148,007.0008	LINE = 61M
20+02.00	POB	83,758.4786	148,707.0008	LINE = 61M
20+15.00	POB	84,188.7380	149,407.0008	LINE = 61M
20+28.00	POB	84,618.9974	150,107.0008	LINE = 61M
20+41.00	POB	85,049.2568	150,807.0008	LINE = 61M
20+54.00	POB	85,479.5162	151,507.0008	LINE = 61M
21+07.00	POB	85,909.7756	152,207.0008	LINE = 61M
21+20.00	POB	86,340.0350	152,907.0008	LINE = 61M
21+33.00	POB	86,770.2944	153,607.0008	LINE = 61M
21+46.00	POB	87,200.5538	154,307.0008	LINE = 61M
21+59.00	POB	87,630.8132	155,007.0008	LINE = 61M
22+12.00	POB	88,061.0726	155,707.0008	LINE = 61M
22+25.00	POB	88,491.3320	156,407.0008	LINE = 61M
22+38.00	POB	88,921.5914	157,107.0008	LINE = 61M
22+51.00	POB	89,351.8508	157,807.0008	LINE = 61M
23+04.00	POB	89,782.1102	158,507.0008	LINE = 61M
23+17.00	POB	90,212.3696	159,207.0008	LINE = 61M
23+30.00	POB	90,642.6290	159,907.0008	LINE = 61M
23+43.00	POB	91,072.8884	160,607.0008	LINE = 61M
23+56.00	POB	91,503.1478	161,307.0008	LINE = 61M
24+09.00	POB	91,933.4072	162,007.0008	LINE = 61M
24+22.00	POB	92,363.6666	162,707.0008	LINE = 61M
24+35.00	POB	92,793.9260	163,407.0008	LINE = 61M
24+48.00	POB	93,224.1854	164,107.0008	LINE = 61M
25+01.00	POB	93,654.4448	164,807.0008	LINE = 61M
25+14.00	POB	94,084.7042	165,507.0008	LINE = 61M
25+27.00	POB	94,514.9636	166,207.0008	LINE = 61M
25+40.00	POB	94,945.2230	166,907.0008	LINE = 61M
25+53.00	POB	95,375.4824	167,607.0008	LINE = 61M
26+06.00	POB	95,805.7418	168,307.0008	LINE = 61M
26+19.00	POB	96,236.0012	169,007.0008	LINE = 61M
26+32.00	POB	96,666.2606	169,707.0008	LINE = 61M
26+45.00	POB	97,096.5200	170,407.0008	LINE = 61M
26+58.00	POB	97,526.7794	171,107.0008	LINE = 61M
27+11.00	POB	97,957.0388	171,807.0008	LINE = 61M
27+24.00	POB	98,387.2982	172,507.0008	LINE = 61M
27+37.00	POB	98,817.5576	173,207.0008	LINE = 61M
27+50.00	POB	99,247.8170	173,907.0008	LINE = 61M
28+03.00	POB	99,678.0764	174,607.0008	LINE = 61M
28+16.00	POB	100,108.3358	175,307.0008	LINE = 61M
28+29.00	POB	100,538.5952	176,007.0008	LINE = 61M
28+42.00	POB	100,968.8546	176,707.0008	LINE = 61M
28+55.00	POB	101,399.1140	177,407.0008	LINE = 61M
29+08.00	POB	101,829.3734	178,107.0008	LINE = 61M
29+21.00	POB	102,259.6328	178,807.0008	LINE = 61M
29+34.00	POB	102,689.8922	179,507.0008	LINE = 61M
29+47.00	POB	103,120.1516	180,207.0008	LINE = 61M
30+00.00	POB	103,550.4110	180,907.0008	LINE = 61M
30+13.00	POB	103,980.6704	181,607.0008	LINE = 61M
30+26.00	POB	104,410.9298	182,307.0008	LINE = 61M
30+39.00	POB	104,841.1892	183,007.0008	LINE = 61M
30+52.00	POB	105,271.4486	183,707.0008	LINE = 61M
31+05.00	POB	105,701.7080	184,407.0008	LINE = 61M
31+18.00	POB	106,131.9674	185,107.0008	LINE = 61M
31+31.00	POB	106,562.2268	185,807.0008	LINE = 61M
31+44.00	POB	106,992.4862	186,507.0008	LINE = 61M
31+57.00	POB	107,422.7456	187,207.0008	LINE = 61M
32+10.00	POB	107,853.0050	187,907.0008	LINE = 61M
32+23.00	POB	108,283.2644	188,607.0008	LINE = 61M
32+36.00	POB	108,713.5238	189,307.0008	LINE = 61M
32+49.00	POB	109,143.7832	190,007.0008	LINE =

CONTROL TRAVERSE DIAGRAM



T. 18 N. R. 21 W.

SEC 18

CONTROL TRAVERSE ABSTRACT

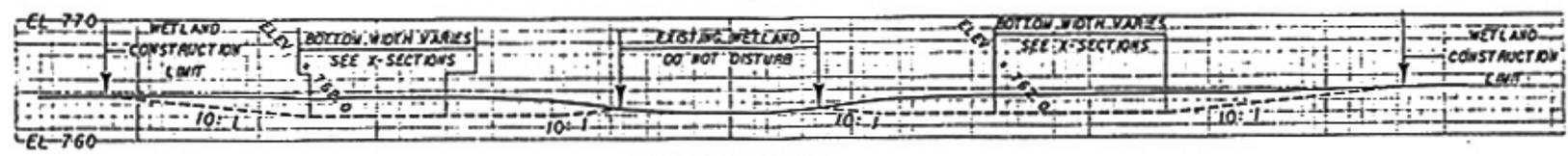
POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
2	22 924.941	68 492.169	764.253	16 mm x 762 mm L.P. w/ALUM CAP = 50 mm 108B ON BLUFF 15.2 m + ABOVE ROAD. 1.9 m N.W. OF FX LNE. 21 m N.E. OF FX COR.
3	22 925.908	67 019.314	764.218	16 mm x 762 mm L.P. w/ALUM CAP = 50 mm 108C 2 m S.W. OF R/W FX. 10.6 m N.E. OF TEL. POLE. 11.6 m S.W. CENTERLINE B.N. RAILROAD
13	23 060.401	67 423.532	764.551	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
12	23 292.455	67 180.601	765.366	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
11	23 346.981	66 921.843	764.325	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
10	23 226.122	66 735.675	765.846	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
15	23 213.133	66 891.185	764.152	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
139	22 905.478	67 430.571	765.850	SET 600 NAIL BETWEEN GRAVEL ACCESS ROAD FENCE AROUND STORM WATER LAGOON 25m NORTH OF THE SE FENCE CORNER

MONTANA CADSW

PREPARED BY: [Name]
 CHECKED BY: [Name]
 DATE: [Date]

PRELIMINARY

TYPICAL SECTIONS



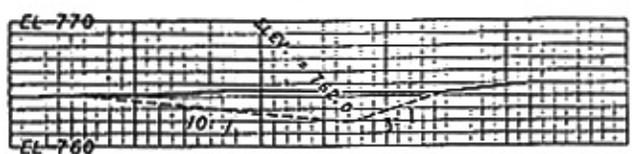
WETLAND TYPICAL
STATION 1+00 TO 2+30
LINE = G1



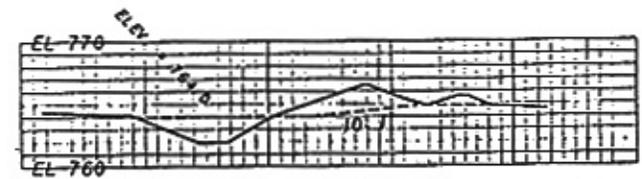
WETLAND TYPICAL
STATION 2+40 TO 5+00
LINE = G1



INLET CHANNEL DAM REMOVAL TYPICAL
STATION 9+35
LINE = G1N



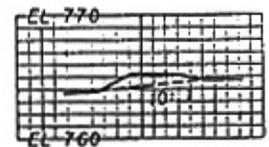
OUTLET DAM REMOVAL TYPICAL
STATION 2+15
LINE = G1S



INLET CHANNEL FILL AND BERM REMOVAL TYPICAL
STATION 9+60 TO 10+40
LINE = G1N



UPLAND AREA TYPICAL
STATION 6+20 TO 7+10
STATION 7+20 TO 8+00
LINE = G1



BERM REMOVAL TYPICAL
STATION 2+50 TO 9+25 LINE = G1N
STATION 1+60 TO 5+90 LINE = G1S

not to be used in water area

PRELIMINARY

10/1/81
 1001
 10/1/81
 1001

10/1/81
 1001

10/1/81
 1001
 10/1/81
 1001
 10/1/81
 1001

SUMMARY

GRADING							
STATION		cubic meters					REMARKS
FROM	TO	EXCAVATION	EMB. +	TOPSOIL	EXCESS	WASTE AREA	
1+00.00	8+10.00	33 358	6 907	3 755	22 576		CI LMC
1+25.00	10+75.00	5 273	979	935	1 471		CI LMC
1+50.00	13+25.00	3 723	0	103	0		CI LMC
1+75.00	15+75.00						SPONGE SALVAGE WASTE AREA
2+00.00	18+25.00						WASTE AREA
TOTAL		44 631	6 886	7 543	24 192	24 091	

* FOR INFORMATION ONLY

IRRIGATION STRUCTURES			
STATION	COUNT		REMARKS
	REMOVE	INSTALL	
TOTAL	1	1	CIH LEFT

TOPSOIL & SEEDING							
STATION		FACTORS					REMARKS
FROM	TO	TOPSOIL SALVAGE & PLACING	SEED		FERTILIZER	CONDITION SEEDING	
			NO. 1		NO. 1		
1+00.00	8+10.00	2 755	2.54		3.64	3.64	CI LMC
1+25.00	10+75.00	922	0.91		0.91	0.91	CI LMC
1+50.00	13+25.00	300	0.31		0.31	0.31	CI LMC
2+00.00	18+25.00	1 215	0.21		0.21	0.21	WASTE AREA
TOTAL		7 543	7.9		7.9	7.9	

ADD 2, 3
↑
WASTE WASTE AREA

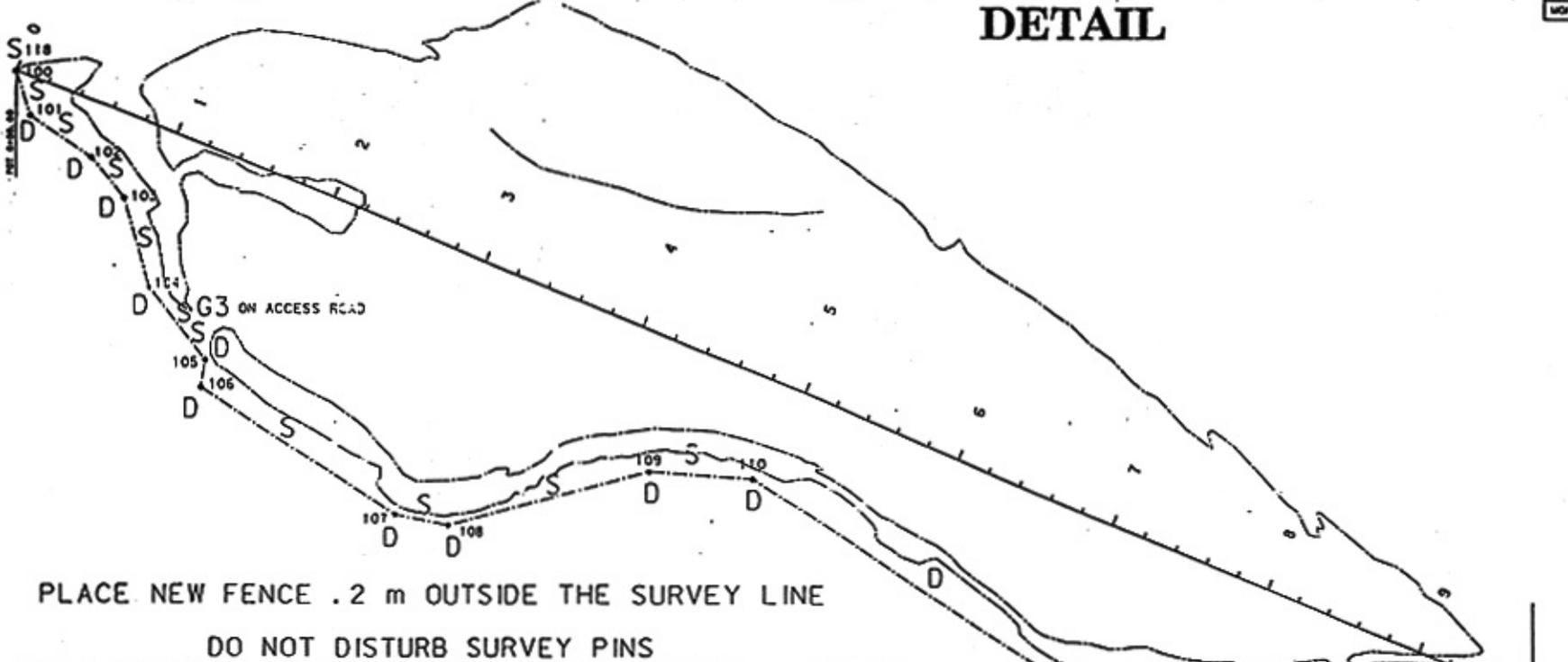
PLUG WATER WELL			
STATION	COUNT		REMARKS
	REMOVE	INSTALL	
1+14		0.5	To RIGHT OF LMC CI
2+10		0.5	To RIGHT OF LMC CI
TOTAL		1.0	

FENCING								
STATION		METERS		WOOD		METERS		REMARKS
FROM	TO	REMOVE FENCE	FARM FENCE	FARM FENCE PANEL		FARM GATE		
			TYPE F24	SINGLE	DOUBLE		TYPE G3	
0+00	3+73		1287.85	18	15		9.74	RIGHT OF CI LMC
1+28	1+73	1055.44						RIGHT OF CI LMC
TOTAL		1055.44	1287.85	18	15		9.74	

PRELIMINARY

MONTANA DEPARTMENT OF LAND & WATER
 DIVISION OF WATER RESOURCES
 1500 WEST WYOMING AVENUE
 BUTTE, MONTANA 59717-0001
 PHONE: (406) 241-2300
 FAX: (406) 241-2301
 WWW: WWW.DLR.MT.GOV

DETAIL



PLACE NEW FENCE .2 m OUTSIDE THE SURVEY LINE
DO NOT DISTURB SURVEY PINS

POINT	NORTH	EAST	DESCRIPTION
118	23421.402407	66606.950500	PROPERTY CORNER ESTIMATED LOW WATER LINE NOTHING SET
100	23419.126000	66607.623000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 100 29235
101	23392.151000	66615.592000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 101 29235
102	23367.054000	66650.652000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 102 29235
103	23342.312000	66669.030000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 103 29235
104	23289.794000	66683.586000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 104 29235
105	23247.146000	66716.710000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 105 29235
106	23231.349000	66714.303000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 106 29235
107	23158.157000	66828.977000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 107 29235
108	23151.747000	66861.746000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 108 29235
109	23183.382000	66981.133000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 109 29235
110	23179.297000	67040.335000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 110 29235
111	23049.592000	67239.242000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 111 29235
112	22984.430000	67208.423000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 112 29235
113	22970.254000	67306.505000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 113 29235
114	22928.750000	67475.036000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 114 29235
115	23049.382000	67507.593000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 115 29235
116	23053.606339	67508.733094	PROPERTY CORNER ESTIMATED LOW WATER LINE NOTHING SET

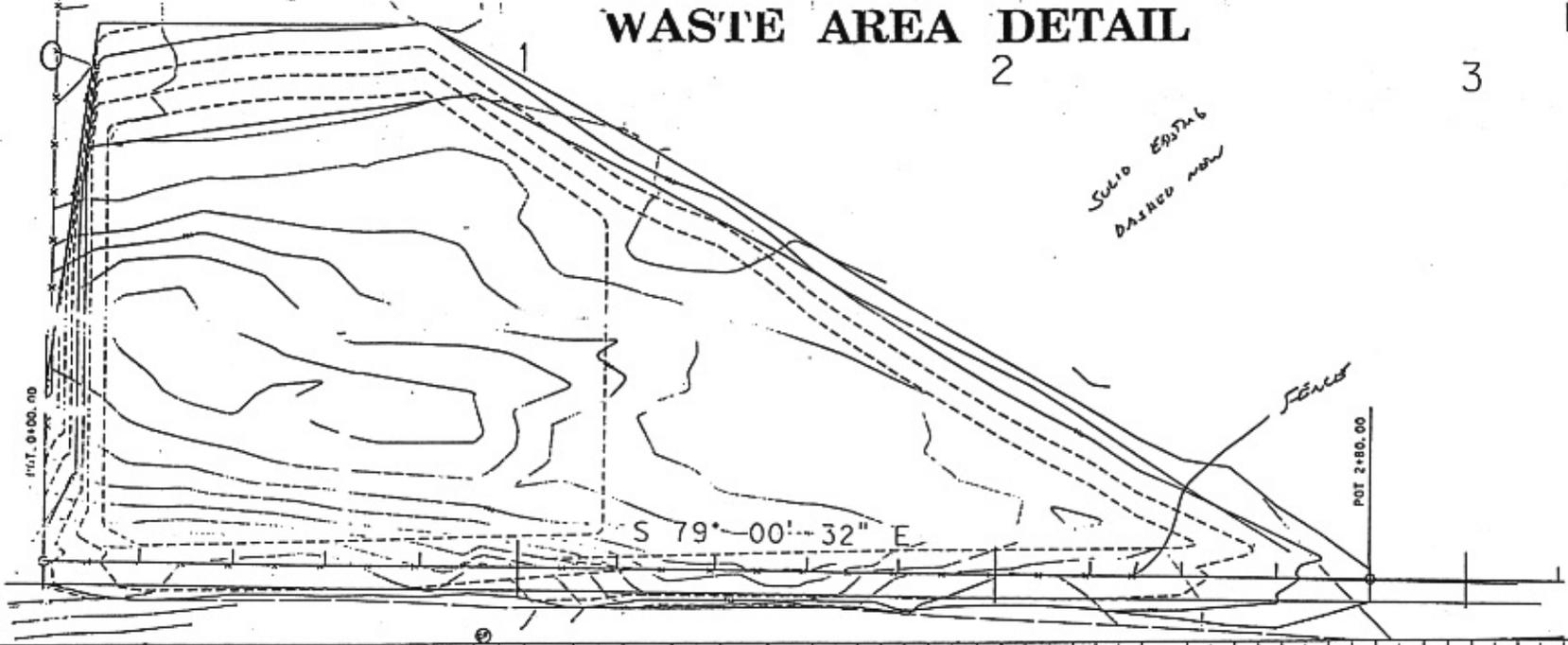
S = SINGLE PANEL
D = DOUBLE PANEL
G3 = GATE (G-3)

FENCING
PRELIMINARY

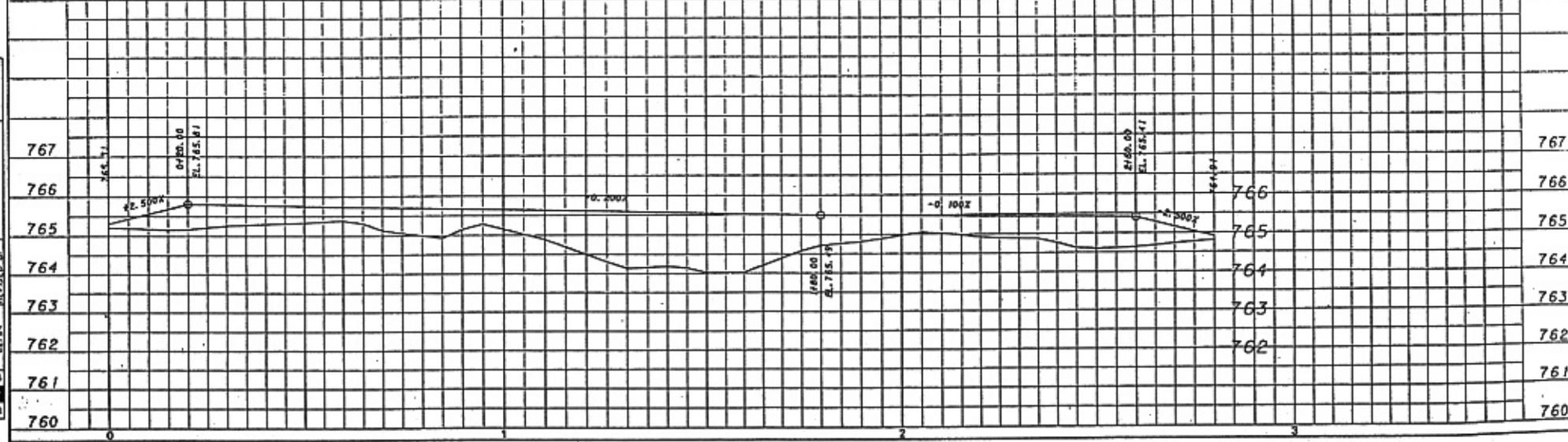
WASTE AREA DETAIL

2

3



PRELIMINARY

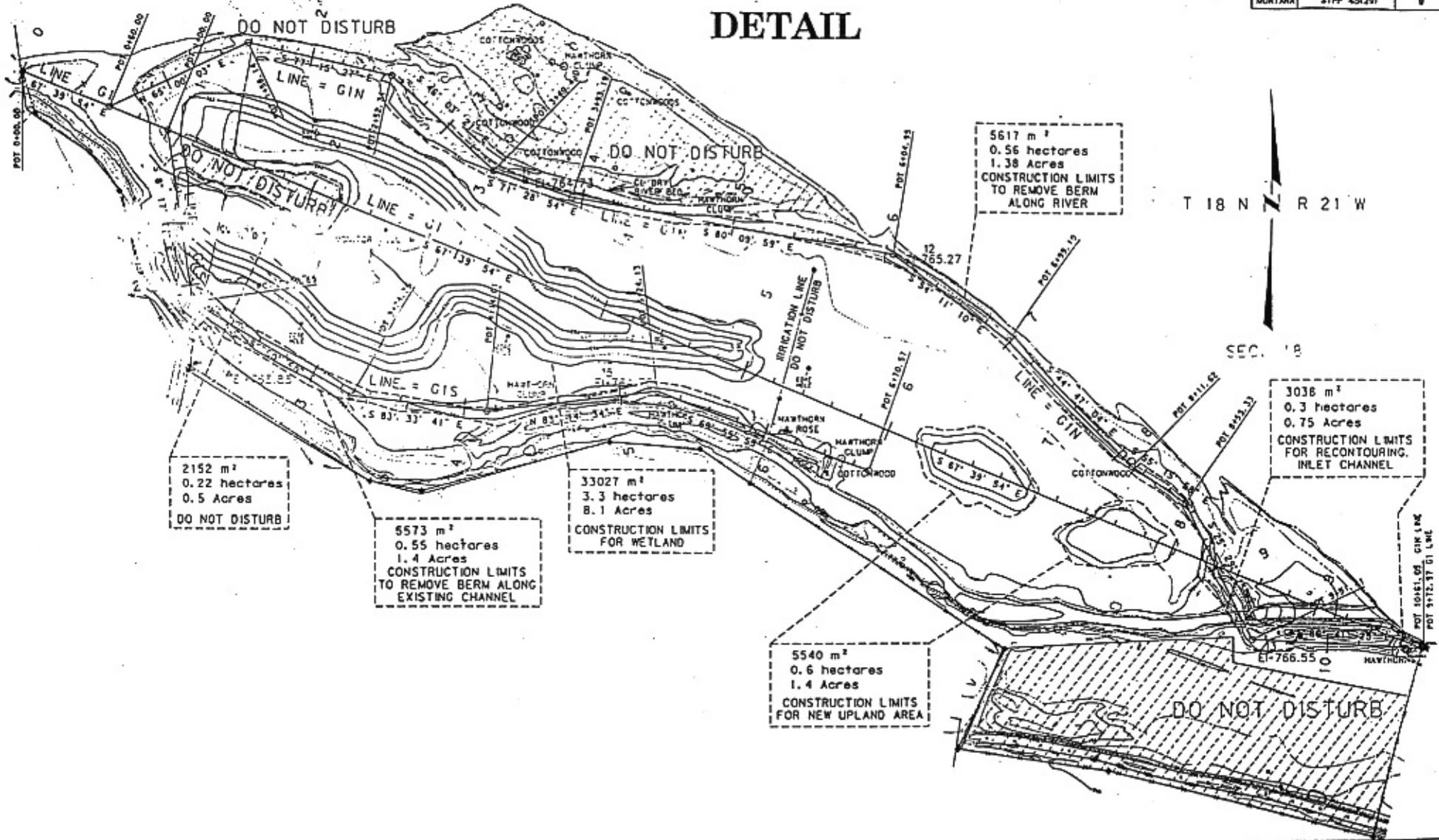


STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 454291	8

DETAIL

T 18 N R 21 W

SEC. 18



2152 m²
0.22 hectares
0.5 Acres
DO NOT DISTURB

5573 m²
0.55 hectares
1.4 Acres
CONSTRUCTION LIMITS
TO REMOVE BERM ALONG
EXISTING CHANNEL

33027 m²
3.3 hectares
8.1 Acres
CONSTRUCTION LIMITS
FOR WETLAND

5617 m²
0.56 hectares
1.38 Acres
CONSTRUCTION LIMITS
TO REMOVE BERM
ALONG RIVER

3038 m²
0.3 hectares
0.75 Acres
CONSTRUCTION LIMITS
FOR RECONTOURING
INLET CHANNEL

5540 m²
0.6 hectares
1.4 Acres
CONSTRUCTION LIMITS
FOR NEW UPLAND AREA

DO NOT DISTURB

SITE PLAN
PRELIMINARY

MONTANA DEPARTMENT OF LAND & WATER

41444000-111600-000

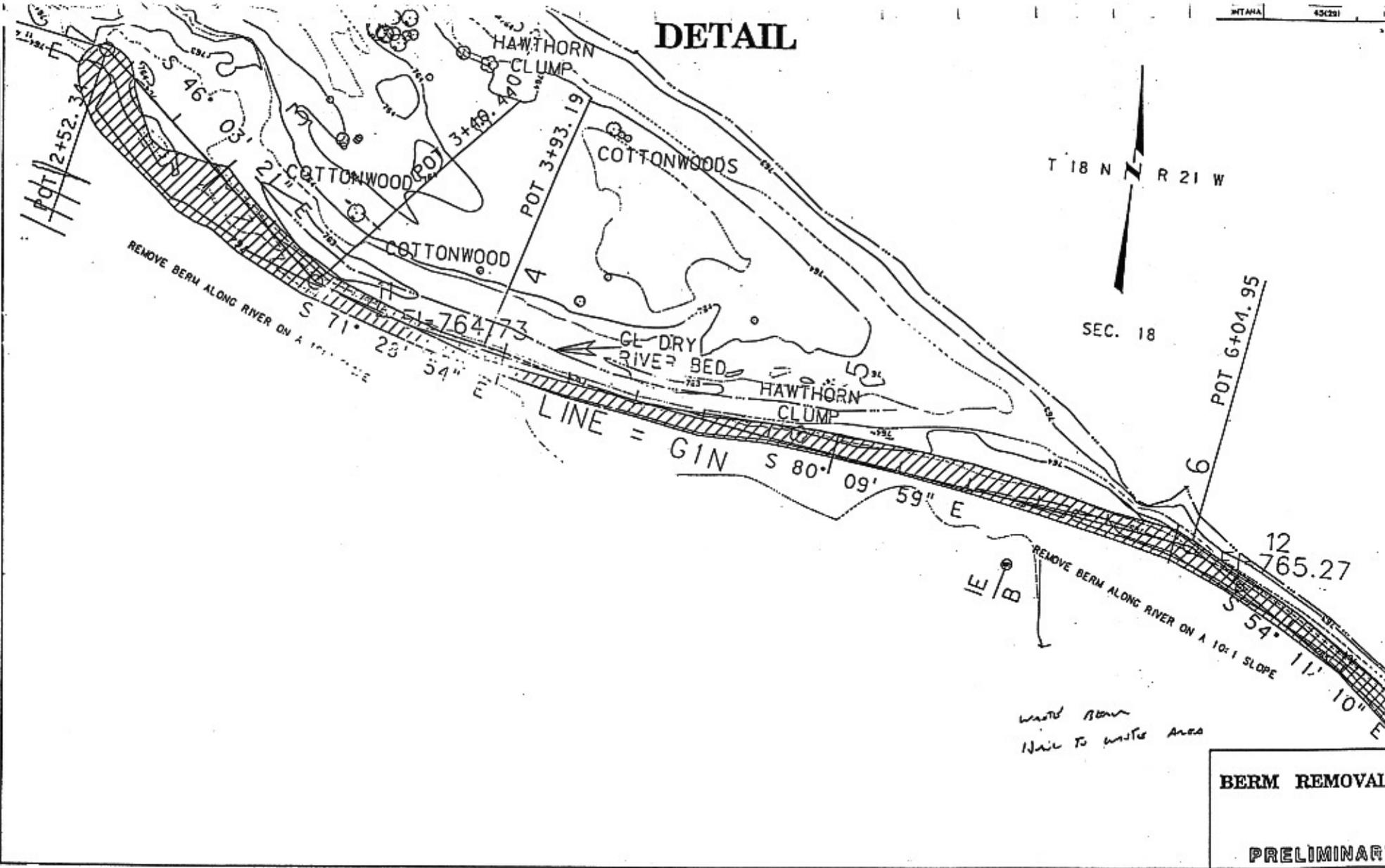
DATE	BY	REVISION
2-27-2011	J.P.S.	1
2-27-2011	J.P.S.	2
2-27-2011	J.P.S.	3
2-27-2011	J.P.S.	4
2-27-2011	J.P.S.	5
2-27-2011	J.P.S.	6
2-27-2011	J.P.S.	7
2-27-2011	J.P.S.	8

DETAIL



4/14/2011 11:41:41 AM

DATE	04/14/2011
TIME	11:41:41 AM
USER	...
...	...



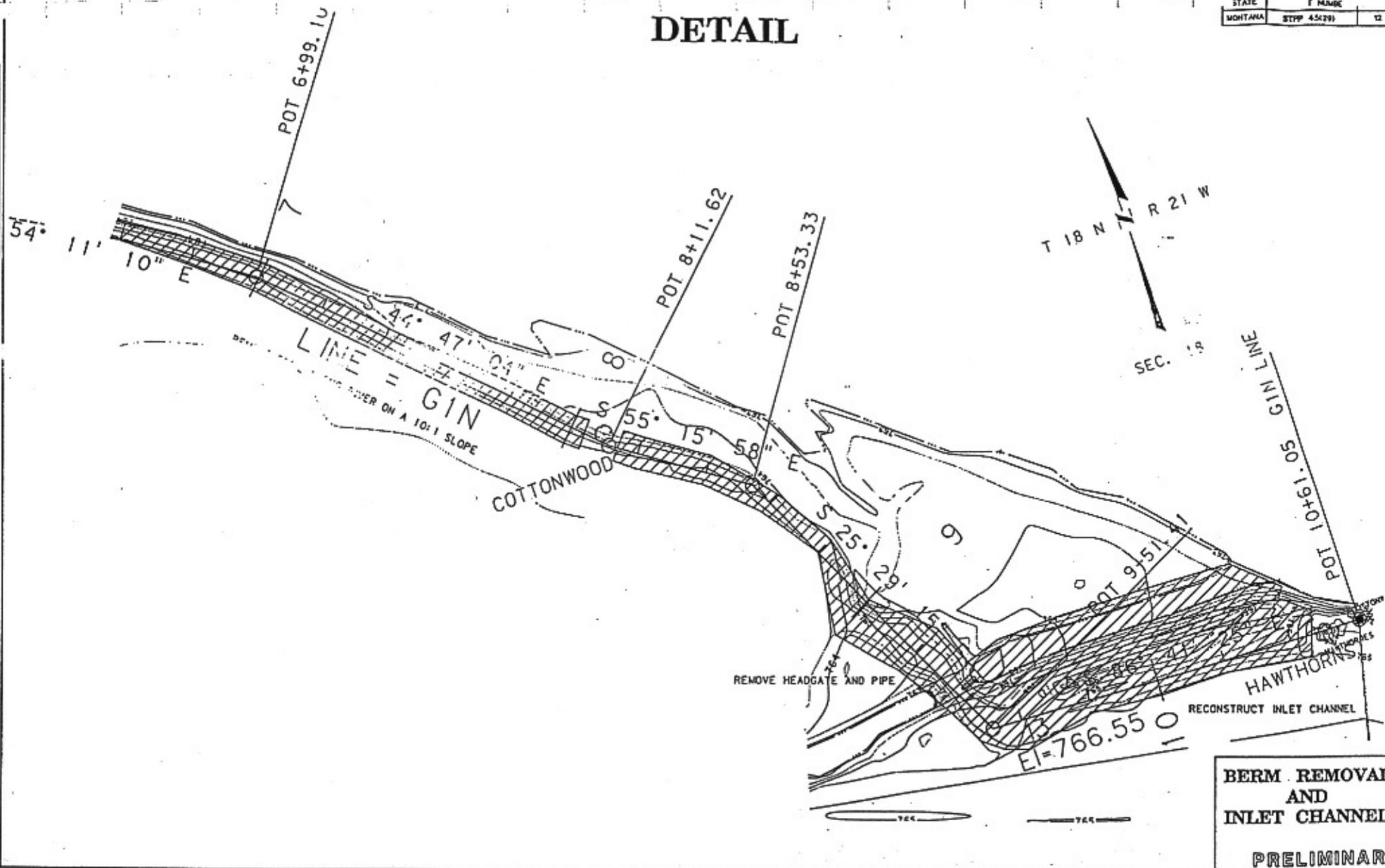
BERM REMOVAL

PRELIMINARY

DETAIL

MONTANA
 PROFESSIONAL ENGINEER
 LICENSE NO. 10000

DATE	DESCRIPTION
01/24/20	DESIGN
02/14/20	CHECK
03/13/20	REVISION
04/13/20	REVISION
05/13/20	REVISION
06/13/20	REVISION
07/13/20	REVISION
08/13/20	REVISION
09/13/20	REVISION
10/13/20	REVISION
11/13/20	REVISION
12/13/20	REVISION



**BERM REMOVAL
 AND
 INLET CHANNEL**
 PRELIMINARY

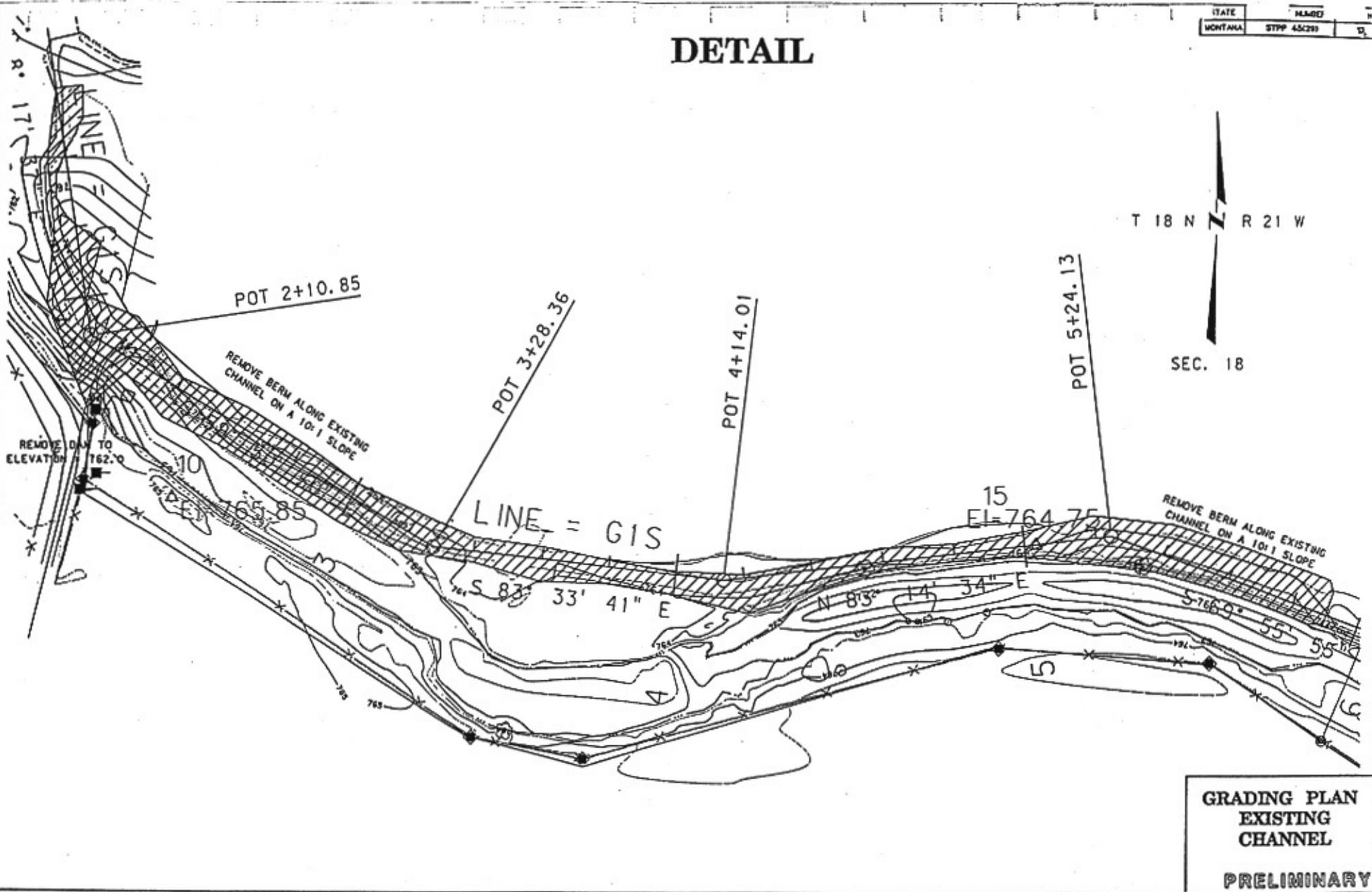
DETAIL

T 18 N
R 21 W
SEC. 18

MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CAD

CHV041448.dwg

DATE	DESCRIPTION
08/21/14	ISSUED FOR PERMIT

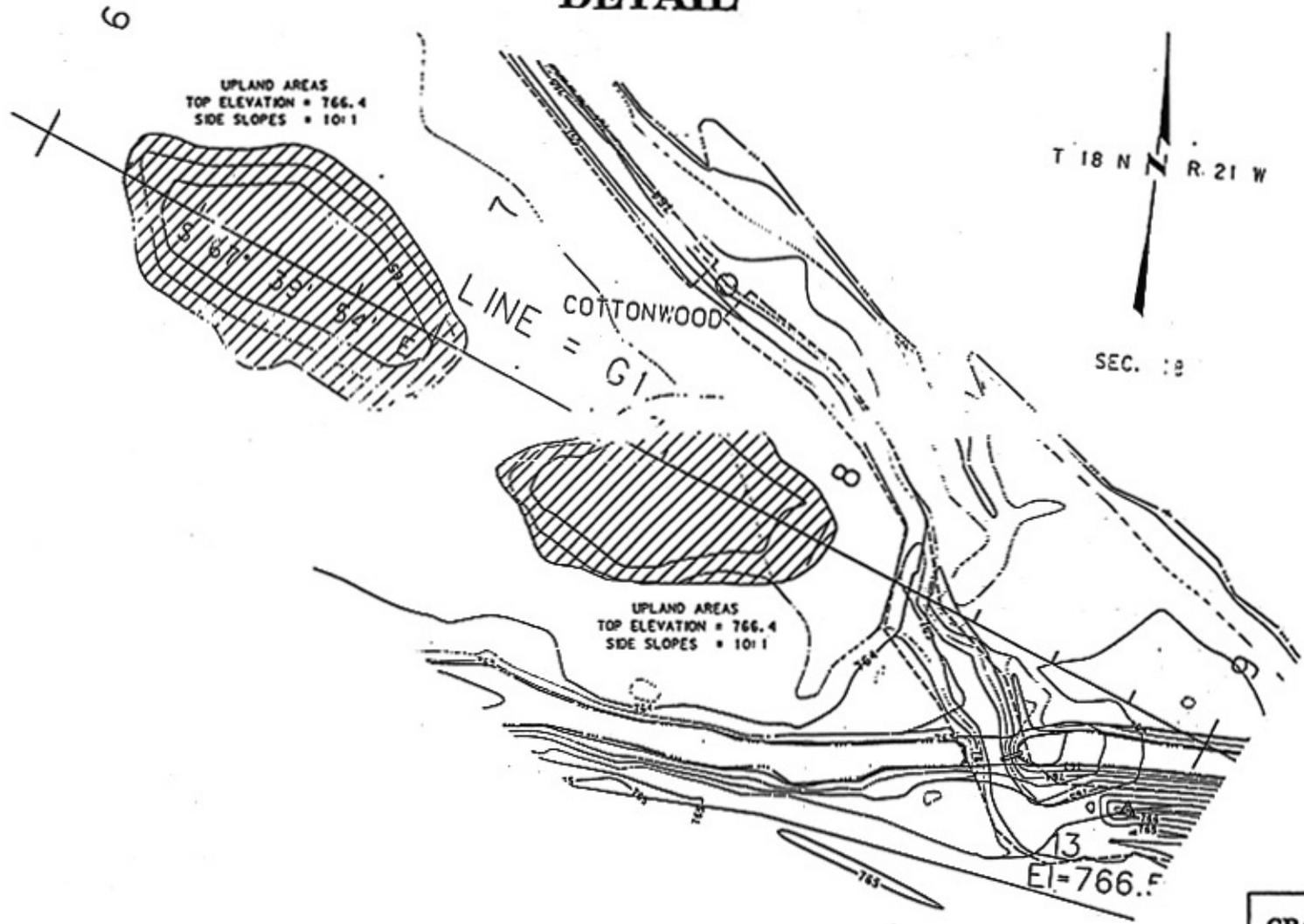


**GRADING PLAN
EXISTING
CHANNEL**

PRELIMINARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 45220	34

DETAIL



**GRADING PLAN
UPLAND AREAS**

PRELIMINARY



MONTANA STATE UNIVERSITY
 DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
 CLAYTON L. WILSON
 PROFESSOR
 1985

Appendix E

BIRD SURVEY PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

BIRD SURVEY PROTOCOL

This protocol was developed by the Montana Department of Transportation (MDT) to monitor bird use within their Wetland Mitigation Sites. Though each wetland mitigation site is vastly different, the bird survey data collection methods were standardized to order to increase repeatability. The protocol uses an "area search within a restricted time frame" to collect data on bird species, density, behavior, and habitat-type use.

Survey Area

Sites that can be entirely walked: Sites where the entire perimeter or area can be walked include, but are not limited to: small ponds, enhanced historic river channels, and wet meadows. If the wetland is not uncomfortably inundated, walk several meandering transects to sufficiently cover the wetland. Meandering transects can be used, even if a small portion of the area is inaccessible (e.g. cannot cross due to inundation). Use binoculars to identify the bird species, to count the number of individuals, and to identify their behavior and habitat type. Data can be recorded directly onto the bird survey form or into a field notebook. The number of meandering transects and their direction (or location) should be recorded in the field notebook and/or drawn onto the aerial photograph or topographic map. Meandering transects are not formal and should not be staked. Each site should be walked and surveyed to the fullest extent within the set time limit.

Sites than cannot be entirely walked: Sites where the entire perimeter or area cannot be walked include, but are not limited to: very large sites (i.e. perimeter of 2-3 miles), and large-bodied waters (i.e. reservoirs), where deep water habitat (> 6 feet) is close to shore. For large-bodied waters where only one area was graded to create or enhance the development of wetland, bird surveys should be walked along meandering transects within or around the graded area (see above.). For sites that cannot be walked, bird surveys should be conducted from many lookout posts, established at key vantage points. The general location of lookout posts should be recorded in the field notebook or drawn onto the aerial photograph or topographic map. Lookout post locations do not need to be staked. Both binoculars and spotting scopes may be used in order to accurately identify and count the birds. Depending upon the size of the open water, more time may be spent viewing the mitigation area from lookout posts than is spent traveling between posts.

Survey Time

Ideally, bird surveys should be conducted in the morning hours when bird activity is often greatest (i.e. sunrise to no later than 11:00 am). Surveys can be completed before 11am if all transects have been walked or all lookout posts have been viewed with no new bird activity observed. For some sites bird surveys may need to be performed in the late afternoon or evening due to traveling constraints or weather. The overall limiting time factor will be the number of budgeted hours for the project.

Data Recording

Bird Species List: Record each bird species observed onto the Bird Survey-Field Data Sheet (or field notebook). Record the bird's common name using the appropriate 4-letter code. The 4-letter code uses the first two letters of the first two word's of the bird's common name or if one name, the first four letters. For example, Mourning Dove is coded as MODO while Mallard is coded as MALL. If an unknown individual is observed, use the 4-letter protocol, but define your

BIRD SURVEY PROTOCOL (continued)

abbreviation at the bottom of the field data sheet. For example, unknown shorebird is UNSB; unknown brown bird is UNBR; unknown warbler is UNWA; and unknown waterfowl is 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 parenthesis; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded as UNBB / FO (25).

Bird Density: For each observation record the actual or estimated number of individuals observed per species and per behavior. Totals can be tallied in the office and entered onto the Bird Survey-Field Data Sheet.

Bird Behavior: Bird behavior must be identified by what is known. When a species is observed, the behavior that is immediately exhibited is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair (BP); foraging (F); flyover (FO); loafing (L), which is defined as sleeping, roosting, or floating with head tucked under wing; and nesting (N). If other behaviors that have a specific descriptive word are observed then it can be used and should later be added to the protocol. Descriptive words or phrases such as "migrating" or "living on site" are unknown behaviors.

Bird Species Habitat Use: When a species is observed, the habitat is also recorded. The following broad habitat categories are used:

- ◆ aquatic bed (AB), defined as rooted-floating, floating-leaved, or submergent vegetation.
- ◆ marsh (MA), defined as emergent (e.g. cattail, bulrush) vegetation with surface water.
- ◆ wet meadow (WM), defined as grasses, sedges, or rushes with little to no surface water.
- ◆ scrub-shrub (SS), defined as shrub covered wetland.
- ◆ forested (FO), defined as tree covered wetland.
- ◆ open water (OW), defined as unvegetated surface water.
- ◆ upland (UP), defined as the upland buffer.

Other categories can be used and defined on the data sheet and should later be added to the protocol.

Other Fields

Bird Visit: Each bird survey (i.e. spring, fall, and mid-season) should be completed on separate Bird Survey-Field Data Sheets.

Time: Record the start time and end time on the Bird Survey-Field Data Sheet.

Date: Record the date of the bird survey.

Weather: Record the weather conditions (i.e. temperature, wind, condition).

Notes: Note if a particular individual bird is using a constructed nest box and note the condition of constructed nest box(es). Also record any comments about the site, wildlife, wetland conditions, etc.

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

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

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

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

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

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

Appendix F

2007 MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

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

Site Selection

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

Sampling Procedure

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

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

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

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

Photograph each macroinvertebrate sampling site.

Sample Handling/Delivery

In the field, keep sample jars cool by placing in a cooler with a small amount of ice.

Deliver samples to the PBS&J office in Missoula, where they will be inventoried and delivered to Rhithron Associates, Inc.

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

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

INTRODUCTION

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

METHODS

Sample processing

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

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

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

Quality assurance systems

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

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

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

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

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

Assessment

The method employed to assess these wetlands is based on an index incorporating a battery of 12 bioassessment metrics or attributes (Table 1) tested and recommended by Stribling et al. (1995) in a report to the Montana Department of Health and Environmental Science. In that study, it was determined that some of the metrics were of limited use in some geographic regions, and for some wetland types. Despite that finding, all 12 metrics are used in this evaluation of mitigated wetlands, since detailed geographic information and wetland classifications were unavailable. Scoring criteria for the 12 metrics were developed specifically for this project, since mitigated wetlands were not included in original criteria development.

Scoring criteria for wetland metrics were developed by generally following the tactic used by Stribling et al. (1995). Boxplots were generated using a statistical software package (Statistica™), and distributions, median values, ranges, and quartiles for each metric were examined. For the wetland sites, “optimal” scores were generally those that fell above the 75th percentile (for those metrics that decrease in value in response to stress) or below the 25th percentile (for metrics that respond to stress by an increase in value) of all scores. Additional scoring ranges were established by bisecting the range below the 75th percentile for decreasing scores (or above the 25th percentile for increasing scores) into “sub-optimal” and “poor” assessment categories. A score of 5, 3, or 1 was assigned to optimal, sub-optimal, and poor metric performance, respectively. In this way, metric values were translated into normalized metric scores, and scores for all metrics were summed to produce a total bioassessment score, which is expressed as a percentage of the maximum possible score (60). Total bioassessment scores were classified according to a similar process, using the ranges and distributions of total scores for all sites studied in all years. Data from a total of 167 samples were used to develop criteria.

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

The purpose of constructing an index from biological attributes or metrics is to provide a means of integrating information to facilitate the determination of whether management action is needed. However, the nature of the action needed is not determined solely by the index score or impairment classification, but by consideration of an analysis of the component metrics, the taxonomic composition of the assemblages, and other issues. The diagnostic functions of the metrics and taxonomic data need more study since our understanding of the interrelationships of natural environmental factors and anthropogenic disturbances is tentative. Thus, the further interpretive remarks accompanying the raw taxonomic and metric data in this summary are offered cautiously. Year-to-year comparisons depend on an assumption that specific sites were revisited in each year, and that equivalent sampling methods were utilized at each site revisit.

Bioassessment metrics - wetlands

An index based on the performance of 12 metrics was constructed, as described above. Table 2 lists those metrics, describes their calculation and the expected response of each to increased degradation or impairment of the wetland.

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

Four composition metrics (%Chironomidae, %Orthocladiinae of Chironomidae, %Crustacea + %Mollusca, and %Amphipoda) measure the relative contributions of certain taxonomic groups that may have significant responses to habitat and/or water quality impacts. For example, amphipods have been demonstrated to increase in abundance in

alkaline conditions. Short-lived, relatively mobile taxa such as chironomids dominate ephemeral environments; many are hemoglobin-bearers capable of tolerating de-oxygenated conditions.

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

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

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

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

Bioassessment metrics – lotic habitats

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

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

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

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

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

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

RESULTS

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

Quality Assurance

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

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

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

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

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

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

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

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

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

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

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

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- Caton, L. W. 1991. Improving subsampling methods for the EPA's "Rapid Bioassessment" benthic protocols. Bulletin of the North American Benthological Society. 8(3): 317-319.
- Stribling, J.B., J. Lathrop-Davis, M.T. Barbour, J.S. White, and E.W. Leppo. 1995. Evaluation of environmental indicators for the wetlands of Montana: the multimetric approach using benthic macroinvertebrates. Report to the Montana Department of Health and Environmental Science. Helena, Montana.

Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ006

RAI No.: MDT07PBSJ006

Sta. Name: Hoskins Landing MS 1

Client ID:

Date Coll.: 7/30/2007

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Cladocera	1	0.89%	Yes	Unknown		8	CF
Ostracoda	15	13.39%	Yes	Unknown		8	CG
Glossiphoniidae							
<i>Helobdella</i> sp.	1	0.89%	Yes	Unknown		6	PA
Naididae							
Naididae	17	15.18%	Yes	Unknown		8	CG
Pisidiidae							
Pisidiidae	10	8.93%	Yes	Unknown		8	CG
Planariidae							
<i>Polycelis coronata</i>	1	0.89%	Yes	Unknown		1	OM
Planorbidae							
<i>Helisoma</i> sp.	2	1.79%	Yes	Unknown		6	SC
Planorbidae	2	1.79%	No	Immature		6	SC
Tubificidae							
Tubificidae	5	4.46%	Yes	Unknown		10	CG
Odonata							
Libellulidae							
Libellulidae	11	9.82%	Yes	Larva	Damaged	9	PR
Ephemeroptera							
Caenidae							
<i>Caenis</i> sp.	18	16.07%	Yes	Larva		7	CG
Heteroptera							
Belostomatidae							
<i>Belostoma</i> sp.	1	0.89%	Yes	Adult		7	PR
Corixidae							
Corixidae	2	1.79%	Yes	Larva		10	PH
Notonectidae							
<i>Notonecta</i> sp.	1	0.89%	Yes	Adult		5	PR
Trichoptera							
Leptoceridae							
Leptoceridae	1	0.89%	Yes	Larva	Early Instar	4	CG
Coleoptera							
Halplidae							
<i>Halplus</i> sp.	2	1.79%	Yes	Larva		5	PH
Diptera							
Ceratopogonidae							
Ceratopogoninae	1	0.89%	Yes	Larva		6	PR
Chironomidae							
Chironomidae							
<i>Apedilum</i> sp.	1	0.89%	Yes	Larva		11	CG
<i>Pseudochironomus</i> sp.	20	17.86%	Yes	Larva		5	CG
Sample Count	112						

Metrics Report

Project ID: MDT07PBSJ
 RAI No.: MDT07PBSJ006
 Sta. Name: Hoskins Landing MS 1
 Client ID:
 STORET ID:
 Coll. Date: 7/30/2007

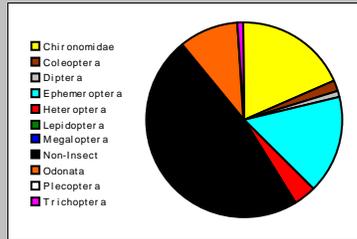
Abundance Measures

Sample Count: 112
 Sample Abundance: 640.00 17.50% of sample used

Coll. Procedure:
 Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	8	54	48.21%
Odonata	1	11	9.82%
Ephemeroptera	1	18	16.07%
Plecoptera			
Heteroptera	3	4	3.57%
Megaloptera			
Trichoptera	1	1	0.89%
Lepidoptera			
Coleoptera	1	2	1.79%
Diptera	1	1	0.89%
Chironomidae	2	21	18.75%

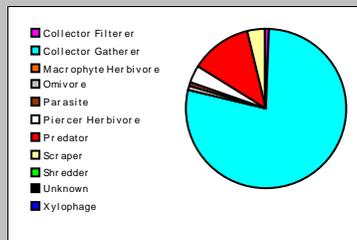


Dominant Taxa

Category	A	PRA
Pseudochironomus	20	17.86%
Caenis	18	16.07%
Naididae	17	15.18%
Ostracoda	15	13.39%
Libellulidae	11	9.82%
Pisidiidae	10	8.93%
Tubificidae	5	4.46%
Planorbidae	2	1.79%
Helisoma	2	1.79%
Halipus	2	1.79%
Corixidae	2	1.79%
Leptoceridae	1	0.89%
Ceratopogoninae	1	0.89%
Belostoma	1	0.89%
Apedilum	1	0.89%

Functional Composition

Category	R	A	PRA
Predator	4	14	12.50%
Parasite	1	1	0.89%
Collector Gatherer	8	87	77.68%
Collector Filterer	1	1	0.89%
Macrophyte Herbivore			
Piercer Herbivore	2	4	3.57%
Xylophage			
Scraper	1	4	3.57%
Shredder			
Omnivore	1	1	0.89%
Unknown			

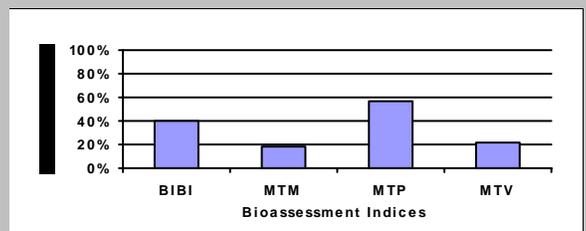


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	18	1	2		0
Non-Insect Percent	48.21%				
E Richness	1	1		0	
P Richness	0	1		0	
T Richness	1	1		0	
EPT Richness	2		0		0
EPT Percent	16.96%		1		0
Oligochaeta+Hirudinea Percent	20.54%				
Baetidae/Ephemeroptera	0.00%				
Hydropsychidae/Trichoptera	0.00%				
<i>Dominance</i>					
Dominant Taxon Percent	17.86%		3		3
Dominant Taxa (2) Percent	33.93%				
Dominant Taxa (3) Percent	49.11%	5			
Dominant Taxa (10) Percent	91.07%				
<i>Diversity</i>					
Shannon H (loge)	2.316				
Shannon H (log2)	3.341		3		
Margalef D	3.617				
Simpson D	0.116				
Evenness	0.084				
<i>Function</i>					
Predator Richness	4		2		
Predator Percent	12.50%	3			
Filterer Richness	1				
Filterer Percent	0.89%			3	
Collector Percent	78.57%		2		1
Scraper+Shredder Percent	3.57%		1		0
Scraper/Filterer	4.00%				
Scraper/Scraper+Filterer	0.80%				
<i>Habit</i>					
Burrower Richness	2				
Burrower Percent	18.75%				
Swimmer Richness	3				
Swimmer Percent	4.46%				
Clinger Richness	0	1			
Clinger Percent	0.00%				
<i>Characteristics</i>					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	5				
Hemoglobin Bearer Percent	27.68%				
Air Breather Richness	0				
Air Breather Percent	0.00%				
<i>Voltinism</i>					
Univoltine Richness	10				
Semivoltine Richness	3	3			
Multivoltine Percent	33.93%		3		
<i>Tolerance</i>					
Sediment Tolerant Richness	1				
Sediment Tolerant Percent	6.25%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.974				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	33.93%	3		1	
Hilsenhoff Biotic Index	7.225		0		0
Intolerant Percent	0.89%				
Supertolerant Percent	54.46%				
CTQa	95.400				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	20	40.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	17	56.67%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	4	22.22%	Moderate
MTM	Montana DEQ Mountains (Bukantis 1998)	4	19.05%	Severe



Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ007

RAI No.: MDT07PBSJ007

Sta. Name: Hoskins Landing MS 2

Client ID:

Date Coll.: 7/30/2007

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Naididae							
Naididae	13	11.61%	Yes	Unknown		8	CG
Physidae							
<i>Physa</i> sp.	1	0.89%	Yes	Unknown		8	SC
Pisidiidae							
Pisidiidae	1	0.89%	Yes	Unknown		8	CG
Planorbidae							
<i>Gyraulus</i> sp.	1	0.89%	Yes	Unknown		8	SC
<i>Helisoma</i> sp.	6	5.36%	Yes	Unknown		6	SC
Tubificidae							
Tubificidae	9	8.04%	Yes	Unknown		10	CG
Odonata							
Aeshnidae							
<i>Aeshna</i> sp.	1	0.89%	Yes	Larva		5	PR
Coenagrionidae							
Coenagrionidae	1	0.89%	Yes	Larva	Early Instar	7	PR
<i>Enallagma</i> sp.	1	0.89%	Yes	Larva		7	PR
Libellulidae							
Libellulidae	1	0.89%	Yes	Larva	Early Instar	9	PR
Ephemeroptera							
Caenidae							
<i>Caenis</i> sp.	14	12.50%	Yes	Larva		7	CG
Heteroptera							
Notonectidae							
Notonectidae	1	0.89%	Yes	Larva		10	PR
Diptera							
Ceratopogonidae							
Ceratopogoninae	2	1.79%	Yes	Larva		6	PR
Tabanidae							
Tabanidae	1	0.89%	Yes	Larva		6	PR
Chironomidae							
Chironomidae							
<i>Apedilum</i> sp.	1	0.89%	Yes	Larva		11	CG
Chironomidae	2	1.79%	No	Pupa		10	CG
<i>Cricotopus (Isocladius)</i> sp.	2	1.79%	Yes	Larva		7	SH
<i>Paratanytarsus</i> sp.	5	4.46%	Yes	Larva		6	CG
<i>Polypedilum</i> sp.	1	0.89%	Yes	Larva		6	SH
<i>Pseudochironomus</i> sp.	40	35.71%	Yes	Larva		5	CG
Tanypodinae	1	0.89%	Yes	Larva	Early Instar	7	PR
<i>Tanytarsus</i> sp.	7	6.25%	Yes	Larva		6	CF
	Sample Count	112					

Metrics Report

Project ID: MDT07PBSJ
 RAI No.: MDT07PBSJ007
 Sta. Name: Hoskins Landing MS 2
 Client ID:
 STORET ID:
 Coll. Date: 7/30/2007

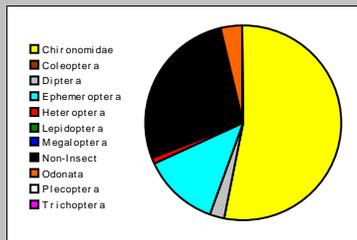
Abundance Measures

Sample Count: 112
 Sample Abundance: 186.67 60.00% of sample used

Coll. Procedure:
 Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	6	31	27.68%
Odonata	4	4	3.57%
Ephemeroptera	1	14	12.50%
Plecoptera			
Heteroptera	1	1	0.89%
Megaloptera			
Trichoptera			
Lepidoptera			
Coleoptera			
Diptera	2	3	2.68%
Chironomidae	7	59	52.68%

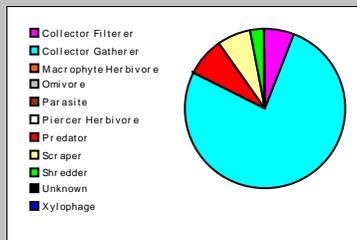


Dominant Taxa

Category	A	PRA
Pseudochironomus	40	35.71%
Caenis	14	12.50%
Naididae	13	11.61%
Tubificidae	9	8.04%
Tanytarsus	7	6.25%
Helisoma	6	5.36%
Paratanytarsus	5	4.46%
Cricotopus (Isocladius)	2	1.79%
Chironomidae	2	1.79%
Ceratopogoninae	2	1.79%
Libellulidae	1	0.89%
Gyraulus	1	0.89%
Enallagma	1	0.89%
Coenagrionidae	1	0.89%
Aeshna	1	0.89%

Functional Composition

Category	R	A	PRA
Predator	8	9	8.04%
Parasite			
Collector Gatherer	7	85	75.89%
Collector Filterer	1	7	6.25%
Macrophyte Herbivore			
Piercer Herbivore			
Xylophage			
Scraper	3	8	7.14%
Shredder	2	3	2.68%
Omnivore			
Unknown			

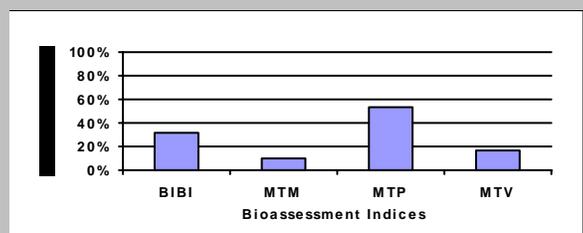


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	21	3	2		1
Non-Insect Percent	27.68%				
E Richness	1	1		0	
P Richness	0	1		0	
T Richness	0	1		0	
EPT Richness	1		0		0
EPT Percent	12.50%		1		0
Oligochaeta+Hirudinea Percent	19.64%				
Baetidae/Ephemeroptera	0.00%				
Hydropsychidae/Trichoptera	0.00%				
<i>Dominance</i>					
Dominant Taxon Percent	35.71%		2		1
Dominant Taxa (2) Percent	48.21%				
Dominant Taxa (3) Percent	59.82%	3			
Dominant Taxa (10) Percent	89.29%				
<i>Diversity</i>					
Shannon H (loge)	2.220				
Shannon H (log2)	3.203		3		
Margalef D	4.255				
Simpson D	0.172				
Evenness	0.081				
<i>Function</i>					
Predator Richness	8		3		
Predator Percent	8.04%	1			
Filterer Richness	1				
Filterer Percent	6.25%			2	
Collector Percent	82.14%		1		0
Scraper+Shredder Percent	9.82%		1		0
Scraper/Filterer	1.143				
Scraper/Scraper+Filterer	0.533				
<i>Habit</i>					
Burrower Richness	2				
Burrower Percent	37.50%				
Swimmer Richness	0				
Swimmer Percent	0.00%				
Clinger Richness	3	1			
Clinger Percent	8.93%				
<i>Characteristics</i>					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	7				
Hemoglobin Bearer Percent	52.68%				
Air Breather Richness	1				
Air Breather Percent	0.89%				
<i>Voltinism</i>					
Univoltine Richness	12				
Semivoltine Richness	2	1			
Multivoltine Percent	52.68%		2		
<i>Tolerance</i>					
Sediment Tolerant Richness	2				
Sediment Tolerant Percent	8.93%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.948				
Pollution Sensitive Richness	0				
Pollution Tolerant Percent	25.89%	1		0	
Hilsenhoff Biotic Index	6.550		1		0
Intolerant Percent	0.00%				
Supertolerant Percent	25.89%				
CTQa	105.600				

Bioassessment Indices

BiIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	16	32.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	16	53.33%	Moderate
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	3	16.67%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	2	9.52%	Severe



Appendix G

REVEGETATION, SURVIVAL DATA CKST VEGETATION MANAGEMENT PLAN

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

RIPARIAN VEGETATION ENHANCEMENT - SURVIVAL DATA FOR SPRING 2004

Hoskins Landing 2004 Planting Ledger

	Container size / Type	Species	Spring 2004 Quantity Planted	Spring Survival	Fall 2004 Quantity Planted
Inlet Channel	Sm Shrub	American Plum	100	93	
Side Channel	Sm Shrub	American plum	100	90	
Upland Islands	Sm Shrub	American plum	100	96	
	Sm Shrub	Chokecherry	100	100	
	Sm Shrub	Hawthorn	100	99	
	Sm Shrub	Serviceberry	100	98	
	Sm Shrub	Rose	100	100	
Wetland	Plug	Hardstem bulrush			1600
	Plug	Nebraska sedge			1440
	Plug	Beaked sedge			1120
	Plug	Bebb's sedge			1120
	Plug	Small-fruited bulrush			800
	Lg Tree	Cottonwood	50	50	
	Lg Shrub	Dogwood	150	150	
	Sm Tree	Aspen	200	183	
	Sm Tree	Cottonwood	100	92	
	Sm Shrub	Dogwood	401	397	
	Sm Shrub	Bebb's Willow	239	218	
	Sm Shrub	Alder	150	142	
	Sm Shrub	Waterbirch	150	144	
	Cutting	Sandbar willow	1000	inundated	
Replacement	Sm	Waterbirch	53	53	
	Sm	Alder	49	49	
	Sm	Aspen	16	16	
	Sm	Cottonwood	42	42	
	Cutting	Bebb's Willow	445	Inundated	
	Cutting	Sandbar Willow	500	Inundated	
Total			4245	2212	6080

RIPARIAN VEGETATION ENHANCEMENT - SURVIVAL DATA FOR SPRING 2003

(Confederated Salish and Kootenai Tribes, November 2003)

Wetland Planting Areas - Created Pond

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	125	41	22	62	50%
Water Birch	175	20	76	79	55%
Aspen	75	9	19	47	37%
Total Trees	375	70	117	188	50%
SHRUBS					
Alder	42	7	5	30	29%
Sandbar willow	100	34	47	19	81%
R O Dogwood	400	111	68	221	45%
Total Shrubs	542	152	120	270	50%

Spring 2003 Cuttings					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	13	4	8	1	92%
Total Trees	13	4	8	1	92%
SHRUBS					
Sandbar willow	119	109	8	2	98%
Total Shrubs	119	109	8	2	98%

Wetland Planting Areas - Side Channel

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	100	60	27	13	87%
Water Birch	75	15	56	4	95%
Aspen	50	29	7	14	72%
Pine	103	18	26	59	43%
Total Trees	328	122	116	90	73%
SHRUBS					
Alder	50	15	25	10	80%
Sandbar willow	125	60	17	48	62%
R O Dogwood	200	81	82	37	82%
Rose	50	24	15	11	78%
Service berry	25	16	4	5	80%
Total Shrubs	450	196	143	111	75%

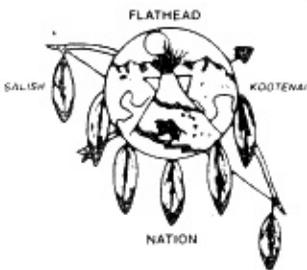
RIPARIAN VEGETATION ENHANCEMENT - SURVIVAL DATA FOR SPRING 2003
(CONTINUED)

Upland Planting Areas - Upland Islands

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	25	18	2	5	80%
Pine	100	23	29	48	52%
Total Trees	125	41	31	53	58%
SHRUBS					
Juniper	20	6	7	7	65%
Rose	200	136	39	23	88%
Snowberry	100	55	21	24	76%
Service berry	25	5	10	10	60%
Total Shrubs	345	202	77	64	81%

Upland Planting Areas - Access Road

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Pine	100	50	2	48	52%
Total Trees	100	50	2	48	52%
SHRUBS					
Plum	72	0	2	70	3%
Juniper	20	0	0	20	0%
Chokecherry	20	2	6	12	40%
Rose	100	5	15	80	20%
Snowberry	65	8	2	55	15%
Serviceberry	50	3	4	43	14%
Total Shrubs	327	18	29	280	14%



THE CONFEDERATED SALISH AND KOOTENAI TRIBES
OF THE FLATHEAD NATION

P.O. BOX 278
Pablo, Montana 59855
(406) 275-2700
FAX (406) 275-2806

www.cskt.org

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ENVIRONMENTAL

September 27, 2006

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Steve Lozar
Jim Malatara
Reuben A. Mathias
Sonny Morigeau

Bonnie Steg
Environmental Services
Montana Department of Transportation
P.O. Box 201001
Helena, MT 59620-1001

Re: Hoskin's Landing Wetland Mitigation Site
STPX 0045 (037) Control Number 4144
MDT Monitoring Reports – Weed Control

Dear Bonnie,

As requested in your letter of August 15, 2006 I am sending the Tribes' vegetation management plan for the Hoskin's Landing Wetland Mitigation Site for reference and inclusion in the 2006 Monitoring Report for Hoskin's Landing. If you have any questions please call me at (406) 675-2700, ext. 7242.

Sincerely,

Mary B. Price
Project Manager / Wetland Ecologist
Confederated Salish and Kootenai Tribes

cc: Dan Lipscomb, CSKT Shoreline Protection Office
Dale Becker, CSKT Wildlife Management Program

**Confederated Salish and Kootenai Tribes
Wildlife Management Program
Vegetation Management Plan – Hoskin’s Landing
Highway 200 Wetland Mitigation**

1. Property Description

Site: LFR5 / “Hoskin’s Landing”
Location: Sanders county / T18N, R21W, Sec 18
Size: 48.23 ac
Funding: Hwy 200 mitigation
Manager: Mary Price; (406) 883-2888 ex 7242

2. Mitigation Actions-to-Date:

Date	Action
2002	MDT completed construction per <u>Project Specific Agreement Between MDT and CSKT For Wetlands Mitigation For Highway 200 Dixon West Project (January 2002).</u>
2002 - 2005	SKC Native Plant Nursery completed revegetation per (1) <u>Project Specific Agreement Between MDT and CSKT For Wetlands Mitigation For Highway 200 Dixon West Project (January 2002)</u> and (2) <u>MOA Between CSKT and SKC for Plant Installation for Hoskin’s Landing Wetland Mitigation Project (March 2004).</u>
2004	MDT conducted remedial construction activities to remove berm at wetland outlet.
2005	April: White top treatment May: Thistle treatment June: Thistle treatment July: Thistle treatment July: Installed electric fence at river bank to exclude livestock. Sept.: Yellow Iris treatment
2006	April: Removed electric fence at river bank prior to spring snow-melt. August: Re-installed electric fence at river bank to exclude livestock. Sept: Mowed to reduce plant residue; hand pulled houndstongue.

3. Current Vegetation Management Goals:

Reduce invasive plant species and promote early to mid-serial native (and non-invasive non-native) plant community. This will be accomplished by: 1) reducing current non-native forb and grass (“weed”) component and 2) seeding appropriate forb and grass species as needed.

4. Targeted Invasive Plant Species:

The following is an inventory of invasive plant species that were identified for treatment as of September 2006:

Species	Common Name	MT Noxious Weed List	Infested Area (ac)	Cover Class ¹	Management Objective ²	Proposed Treatment ³
<i>Forbs:</i>						
ARCMIN	common burdock		trace	L	E	M
CENMAC	spotted knapweed	category 1	10	M	S	(M +) H
CHEALB	lambsquarters		<0.1	L	S	H
CHRLEU	oxeye daisy	category 1	<0.1	L	E	H
CIRARV	Canada thistle	category 1	15	M	S	(M +) H
CIRVUL	bull thistle		10	L	E	M + H
CONARV	bindweed	category 1	<0.1	L	S	H
CYNOFF	houndstounge	category 1	trace	L	E	M (+) H
DIPFUL	teasle		<0.1	L	S	M
HYPPER	St. Johnswort	category 1	trace	L	E	M + H
ISIPSE	yellow iris	category 3	trace	L	E	M
LACSER	prickly lettuce		15	H	S	M + H
LINGEN	dalmation toadflax	category 1	trace	L	E	H
LINVUL	yellow toadflax	category 1	trace	L	E	H
MELALB	white sweetclover		<1	M	S	M + H
SISALT	tumble mustard		15	H	S	M + H
<i>Grasses:</i>						
BROTEC	cheatgrass		5	M	S	H

¹ Cover class: High (H) >26%; Moderate (M) 6-25%; Low (L) 0-5%

² Mgmt Objective: Eradicate (E) - totally eliminate; Suppress (S) - prevent seed production / reduce coverage; Contain (C) - prevent spread beyond current; Tolerate (T) - accept continual presence / probable spread

³ Treatment: Biocontrol (B); Mechanical/Manual (M); Herbicide (H)

5. Revegetation Species:

Areas treated for invasive plant species will require seeding when sufficient desirable vegetation is not present. The following is a list of plant species recommended for use at the site:

Species	Common Name	Native/Intro	Notes
<i>Forbs:</i>			
Achillia millefolium	yarrow	N	use native species only
Aster occidentalis	western mountain aster	N	
Balsamorhiza sagittata	arrowleaf balsamroot	N	
Cleome serrulata	Rocky Mountain beeplant	N	
Gaillardia aristata	blanketflower	N	
Geranium viscosissimum	sticky geranium	N	

<i>Helianthus annuus</i>	common sunflower	N	
<i>Linum lewisii</i>	Lewis flax	N	
<i>Lupinus argenteus</i> , <i>leucophyllus</i> , and/or <i>sericeus</i>	silvery lupine, velvet lupine, silky lupine	N	
<i>Phacelia hastate</i> or <i>heterophylla</i>	whiteleaf or virgate phacelia	N	
<i>Sisyrinchium inflatum</i>	blue-eyed grass	N	
<i>Solidago canadensis</i> or <i>missouriensis</i>	Canada or Missouri goldenrod	N	
Grasses:			
<i>Bromus carinatus/marginatus</i>	California/mountain brome	N	competitive - use very low rate
<i>Elymus canadensis</i>	Canada wildrye	N	
<i>Elymus cinereus</i>	basin wildrye	N	
<i>Elymus elymoides</i>	squireltail	N	
<i>Elymus glaucus</i>	blue wildrye	N	
<i>Elymus lanceolatus</i>	thickspike/streambank wheatgrass	N	competitive - use very low rate
<i>Elymus trachycaulus</i>	slender wheatgrass	N	
<i>Hierochloe oderata</i>	sweetgrass	N	
<i>Koeleria macrantha</i>	prairie Junegrass	N	
<i>Pascopyrum smithii</i>	western wheatgrass	N	
<i>Poa secunda</i>	Sandberg bluegrass	N	
<i>Pseudoroegneria spicata</i>	bluebunch wheatgrass	N	
<i>Stipa comada</i>	needle-and-thread	N	

*Usage dependant upon commercial availability.

Species Selection Notes:

- Seeding: Final seed mix shall have approximately 120 seed / sq ft for broadcast application (60 seeds / sq ft for drill-seeder application)
- Species selection: Recommended forbs and grasses can be readily established from seed. All recommended species are representative of an early to mid seral / competitive community.

6. Vegetation Management Plan – 2006 to 2010 (see Appendix 1 for herbicide codes):

Year 1 / 2006

Activity	Timing	Cost Estimate
mow (to reduce plant residues prior to herbicide application)	Late Summer / Fall	
herbicide application (broadcast/spot) – CENMAC, CIRARV, CIRVUL w/ A; BROTEC, LINGEN w/I	Fall: Oct +/-	

Year 2 / 2007

Activity	Timing	Cost Estimate
herbicide application #1 (broadcast/spot) – CENMAC, CHRLEU, CIRARV, CIRVUL, HYPPER, annuals w/ A (rosette to bud); CONARV, LINVUL w/ G?	Spring: May +/-	

mow #1 – CHRLEU, CIRARV, CIRVUL, annuals (for late buds); DIPFUL (late bolt to early bud)	June/July	
hand pull – ARCMIN, CYNOFF, ISIPSE, LINGEN	June	
mow #2 – CENMAC, CHRLEU, CIRARV, CIRVUL, annuals (for late buds); DIPFUL (late bolt to early bud)	July/Aug	
herbicide application #2 (spot) – CIRARV, CENMAC, others as needed w/ A; BROTEC, LINGEN w/ I	Fall: Oct +/-	
dormant seeding w/ grass/forb mix (in bare areas as needed)	Fall: Oct/Nov	

Year 3 / 2008

Activity	Timing	Cost Estimate
herbicide application #1 (broadcast/spot) – CENMAC, CHRLEU, CIRARV, CIRVUL, HYPFER w/ A (rosette to bud); CONARV, LINVUL w/ G?	Spring: May +/-	
mow/burn? #1 – CHRLEU, CIRARV, CIRVUL, annuals (for late buds); DIPFUL (late bolt to early bud)	June/July	
hand pull – ARCMIN, CYNOFF, ISIPSE, LINGEN	June	
mow #2 – CENMAC, CHRLEU, CIRARV, CIRVUL, annuals (for late buds); DIPFUL (late bolt to early bud)	July/Aug	
herbicide application #2 (spot) – CIRARV, CENMAC, others as needed w/ A; BROTEC, LINGEN w/ I	Fall: Oct +/-	

Year 4 / 2009

Activity	Timing	Cost Estimate
mow, hand pull, and spot spray	as needed	

Year 5 / 2010

Activity	Timing	Cost Estimate
mow, hand pull, and spot spray	as needed	

Appendix 1. Herbicides approved for use on the Flathead Indian Reservation¹.

Active Ingredient	Code	Example Registered Trade Names ²	Target Species
2,4-D amine	2a	various	broadleaf
2,4-D ester	2e	various	broadleaf
Aminopyralid	A	Milestone	broadleaf
Clopyralid	Cp	Transline, Reclaim	annual/perennial broadleaf
Chlorsulfuron	Cs	Telar	annual/perennial broadleaf
Dicamba	D	Banvel	annual/perennial broadleaf, woody
Fluazifop-p-Butyl	F	Fusion, Toronado	annual/perennial grasses
Glyphosate	G	Roundup, Accord	non-selective
Glyphosate (aquatic label)	Ga	Rodeo	non-selective
Imazapic	I	Plateau	annual/perennial broadleaf and grasses
Metsulfuron	M	Escort	annual/perennial broadleaf, woody
MCPA amine	Ma	various	broadleaf
Picloram	P	Tordon 22K	perennial broadleaf, vines, woody
Triclopyr	T	Remedy, Garlon	broadleaf, woody
<i>Mixes:</i>			
	Cp+2	Curtail	broadleaf
	M+Cs	Cimmeron Max	broadleaf
	I+G	Journey	non-selective
	T+Cp	Redeem	annual/perennial broadleaf

¹ All herbicide use shall comply with the CSKT Integrated Weed Management Plan and Proposed Noxious Weed Treatments – Environmental Assessments (2005 and 2006); and shall be approved by the Restoration Ecologist.

² The naming of specific products under this column does not constitute an endorsement of these products by CSKT; rather, these products serve as examples of herbicides that include the chemicals approved for use on the Flathead Indian Reservation.