MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2008

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 2008

PBS&J Project No: 0B4308801.02.03

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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 seventh and final 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** (**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 though 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 periodically accessible to livestock.

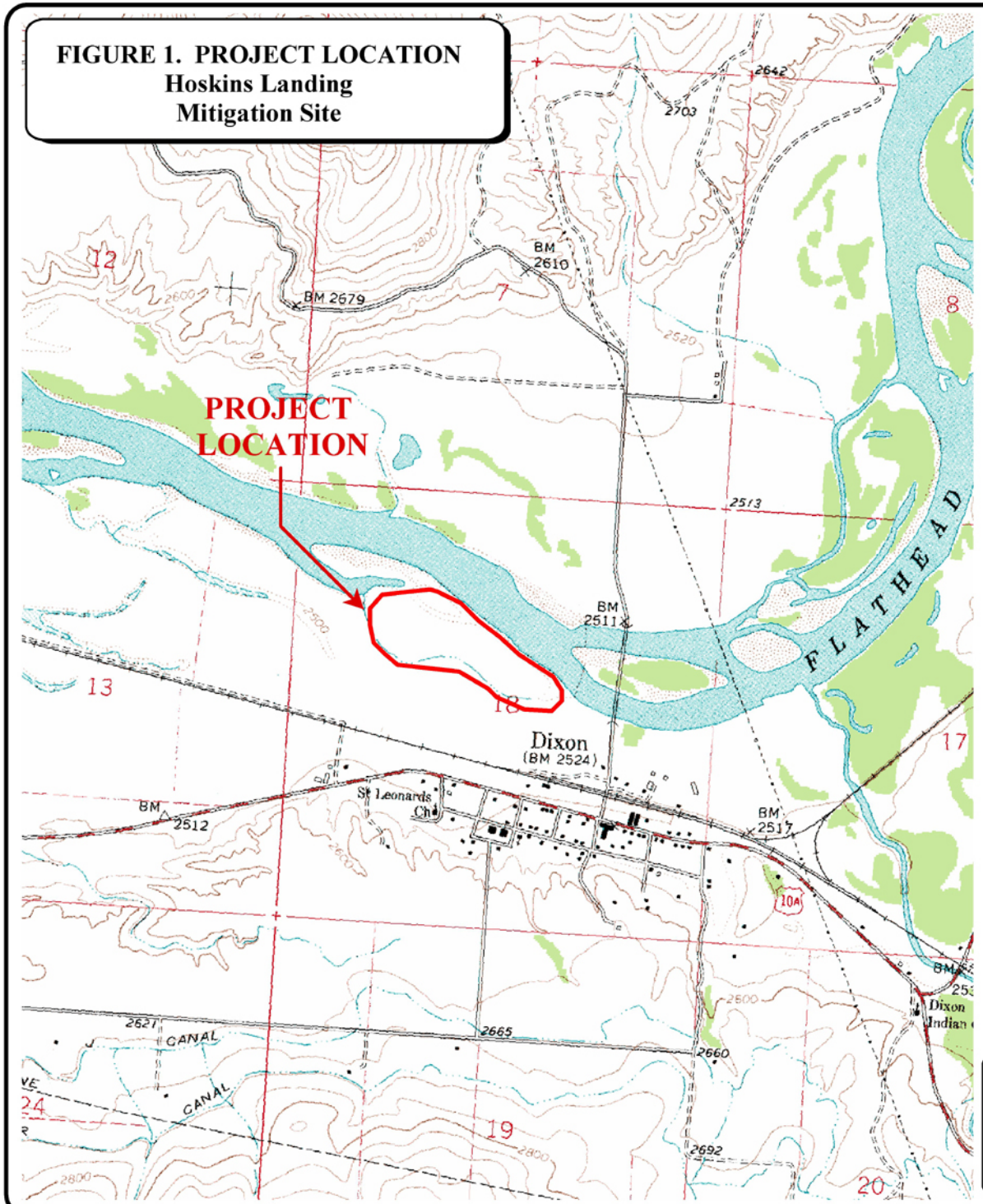
Initial construction was completed in fall 2002 with the goal of restoring/creating 8.1 acres of wetlands and enhancing vegetation on 5.2 acres of heavily grazed and cleared lands. (**Appendix D**). Revegetation work was conducted during the spring and fall of 2003, 2004 and 2005, and a berm / road crossing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

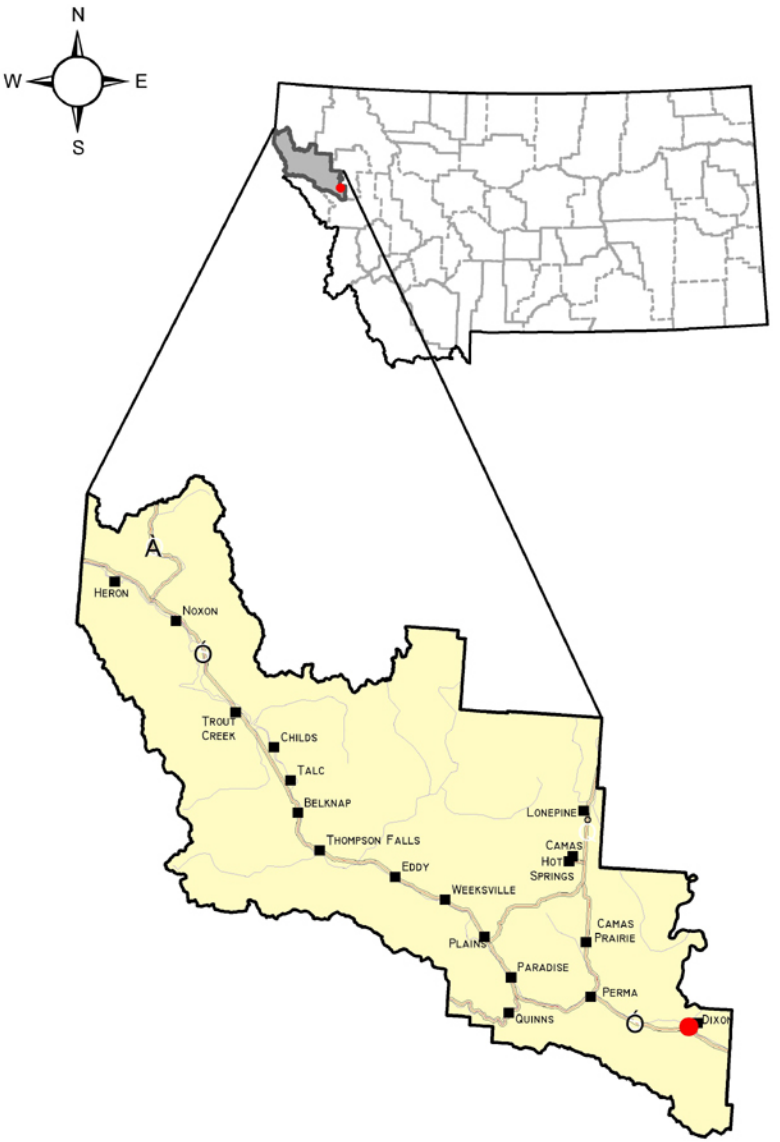
- Excavation and grading of 8.1 acres to facilitate wetland development.
- Enhancement of 5.2 acres of native vegetation characteristics in the lower Flathead River riparian corridor.
- Filling of inlet channel and removal of headgate in the northeast corner of the site.
- Removal of outlet dam along 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.

FIGURE 1. PROJECT LOCATION
Hoskins Landing Mitigation Site





800 0 800 1600 FEET

1: 24,000

PROJECT #: 0B4308801
DATE: NOV 2008
LOCATION: DIXON
PROJECT MANAGER: J. BERGLUND
DRAWN BY: B. STEINEBACH

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2.0 METHODS

2.1 Monitoring Dates and Activities

Monitoring activities were conducted on June 2nd (spring) and July 24th (mid-season) of 2008. 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 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 global positioning system (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. All noxious weed locations observed on-site were mapped using a GPS.

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**).

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit in accordance with the 1987 COE Wetland Delineation Manual. In July 2008, consultation with the COE (Steinle pers. comm.) confirmed that, where the 1987 manual was used to establish baseline wetland conditions at MDT wetland mitigation sites, it should continue to be applied at such sites for the duration of the monitoring period. Consequently, application of the new *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (COE 2008) was not required or undertaken at this site in 2008.

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 2008 were captured with resource grade GPS and also via hand-mapping onto the 2008 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

One Macroinvertebrate sample was collected during the mid-season site visit. The location was mapped using a GPS. Collection occurred using the Macroinvertebrate Sampling Protocol (**Appendix F**). The sample was preserved as outlined in the sampling procedure and sent to Rhithron Associates, Inc. in Missoula, Montana for analysis (**Appendix F**).

2.9 Functional Assessment

Western Eco Tech completed baseline functional assessment during the initial wetland delineation using the 1996 MDT Montana Wetland Field Evaluation Form. From 2002 to 2007 the functional assessment for each delineated wetland was conducted using the 1999 MDT Montana Wetland Assessment Method (Berglund 1999). In 2008 the 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was applied (**Appendix B**). Field data for this assessment were collected during the mid-season visit.

2.10 Photographs

The July 7, 2008 aerial photograph was used for **Figures 2** and **3** (**Appendix A**). Photographs were taken illustrating current land uses surrounding the site, the upland buffer, the monitored area, and the vegetation transect (**Appendix C**). Each photograph point location was recorded with a resource grade GPS in 2002 and mapped. 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 and 2008. Boundaries were also modified via hand mapping onto aerial photographs in 2008. 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 to an increase in aquatic vegetation. The same trend was observed during the 2008 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 foot. 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** in **Appendix A**).

3.2 Vegetation

Since 2002 87 plant species have been identified at the site (**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 wetland 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.* The seven upland community types include: T
ype 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). Dominant plant species observed within each of these communities are listed on the **Monitoring Form** (**Appendix B**).

All comunity types are mapped onto the 2008 aerial photograph (**Figure 3** in **Appendix A**). 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. Type 3 is dominated by large leaf pondweed (*Potamogeton amplifolius*), curly pondweed (*Potamogeton crispus*), broad water-weed (*Elodea canadensis*), least spike-rush (*Eleocharis acicularis*), and muskgrass (*Chara* spp.). 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*)

Table 1: ***2002 to 2008 vegetation species list for the Hoskins Landing Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Acer negundo	box elder	FAC+
Agropyron repens	quackgrass	FACU
Agrostis alba	redtop	FAC+
Achillea millefolium	common yarrow	FACU
Alnus incana	alder	FACW
Alopecurus pratensis	meadow foxtail	FACW
Amaranthus retroflexus	red-root pigweed	FACU+
Amelanchier alnifolia	serviceberry	FACU
Artemisia ludoviciana	white sagebrush	FACU-
Bromus japonicus	Japanese brome	UPL
Bromus tectorum	cheatgrass	--
Carex bebbiana	Bebbs sedge	OBL
Carex lanuginose	wooly sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Carex retrorsa	retrorse sedge	FAC
Carex utriculata	beaked sedge	OBL
Centaurea maculosa	spotted knapweed	--
Ceratophyllum demersum	common hornwort	OBL
Chara spp.	muskgrass	--
Chenopodium album	white goosefoot	FAC
Chrysanthemum leucanthemum	oxeye daisy	--
Cirsium arvense	Canada thistle	FACU+
Cirsium vulgare	bull thistle	FACU
Coreopsis atkinsoniana	tickseed	FACU
Cornus stolonifera	red-osier dogwood	FACW
Crataegus douglasii	Douglas hawthorn	FAC
Cynoglossum officinale	hound's tongue	FACU
Dactylis glomerata	orchard grass	--
Dipsacus fullonum	Fullers teasel	FAC
Eleocharis acicularis	least spike rush	OBL
Eleocharis palustris	creeping spike rush	OBL
Elodea canadensis	broad water-weed	OBL
Elymus trachycaulus	slender wheatgrass	FAC
Equisetum arvense	field horsetail	FAC
Equisetum hyemale	scouring rush	FACW
Festuca pratensis	meadow fescue	FACU+
Eroduim cicutarium	red-stem filaree	NI
Gnaphalium palustre	cudweed	FAC+
Helianthus annuus	common sunflower	FACU+
Helenium autumnale	common sneezeweed	FACW
Hippuris vulgaris	common mare's-tail	OBL
Hypericum perforatum	St. John's wort	--
Iris pseudoacorus	yellow iris	OBL
Juncus balticus	Baltic rush	FACW
Juncus ensifolius	three-stamen rush	FACW
Juniperus scopulorum	Rocky Mountain juniper	--
Lepidium perfoliatum	clasping pepper-grass	FACU+
Linaria dalmatica	dalmatian toadflax	--

Table 1 (continued): ***2002 to 2008 vegetation species list for the Hoskins Landing Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Malva neglecta	mallow	--
Melilotus alba	white sweetclover	FACU
Melilotus officinalis	yellow sweetclover	FACU
Mentha arvensis	field mint	FAC
Myosotis scorpioides	true forget me not	FACW
Myriophyllum spp.	water-milfoil	OBL
Oenothera villosa	hairy evening-primrose	FAC+
Panicum capillare	old witchgrass	FACU+
Phalaris arundinacea	Reed canarygrass	FACW
Phleum pratense	timothy	FACU
Pinus ponderosa	ponderosa pine	FACU-
Plantago lanceolata	English plantain	FAC
Plantago major	plantain	FACU+
Poa pratensis	Kentucky bluegrass	FACU+
Polygonum amphibium	water smartweed	OBL
Polygonum aviculare	prostrate knotweed	FACW+
Populus tremuloides	quaking aspen	FAC+
Populus trichocarpa	cottonwood	FAC
Potamogeton amplifolius	large-leaf pondweed	OBL
Potamogeton crispus	curly pondweed	OBL
Potamogeton natans	floating-leaf pondweed	OBL
Prunella vulgaris	heal-all	FACU+
Prunus americana	American plum	FACU
Rosa woodsii	woods rose	FACU
Rumex crispus	curly dock	FACW
Sagittaria latifolia	arrow-head	OBL
Salix bebbiana	Bebb willow	FACW
Salix exigua	sandbar willow	OBL
Scirpus acutus	hard stem bulrush	OBL
Scirpus microcarpus	small-fruit bulrush	OBL
Scirpus validus	soft-stem bulrush	OBL
Sisymbrium altissimum	tall tumble mustard	FACU-
Solanum dulcamara	climbing nightshade	FAC+
Solidago missouriensis	Missouri goldenrod	--
Symphoricarpos albus	snowberry	FACU
Taraxicum officinalis	common dandelion	FACU
Trifolium pratense	red clover	FACU
Verbascum thapsus	common mullein	--
Veronica Americana	American speedwell	OBL

[1] **Bolded** species indicate those documented in the analysis area for the first time in 2008.

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.

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 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. Evidence of weed control measures were observed during the 2008 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 2008 field visit were mapped (**Figure 3** in **Appendix A; Monitoring Forms** in **Appendix B**). Individual and small noxious weed locations were not mapped, but not as a community type. Noxious species found on the site included: Canada thistle (*Cirsium arvense*), Dalmatian toadflax (*Linaria dalmatica*), spotted knapweed (*Centaurea maculosa*), St. John's wort (*Hypericum perforatum*), oxeye daisy (*Chrysanthemum leucanthemum*), and yellowflag iris (*Iris pseudacorus*). Bull thistle (*Cirsium vulgare*) locations were also mapped (**Figure 3** in **Appendix A**). During previous monitoring years, a species of water milfoil (*Myriophyllum* sp.) was thought to be observed at the site; however, upon further investigation it was revealed that the specimen was actually a green algae called muskgrass (*Chara* spp.) and not the invasive aquatic Eurasian water milfoil (*Myriophyllum spicatum*) (Lesica 2008).

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	2008
Transect Length (feet)	390	390	390	390	390	390	390
# Vegetation Community Transitions along Transect	6	11	10	10	10	10	10
# Vegetation Communities along Transect	4	5	5	5	5	5	5
# Hydrophytic Vegetation Communities along Transect	2	3	3	3	3	3	3
Total Vegetative Species	31	31	30	30	30	30	28
Total Hydrophytic Species	22	23	22	23	23	23	20
Total Upland Species	9	8	8	7	7	7	8
Estimated % Total Vegetative Cover	65	70	71	74	75	75	80
% Transect Length Comprised of Hydrophytic Vegetation Communities	72	70	68	68	68	68	68
% Transect Length Comprised of Upland Vegetation Communities	28	30	32	32	32	32	32
% Transect Length Comprised of Unvegetated Open Water	0	0	0	0	0	0	0
% Transect Length Comprised of Bare Substrate	0	0	0	0	0	0	0

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.***

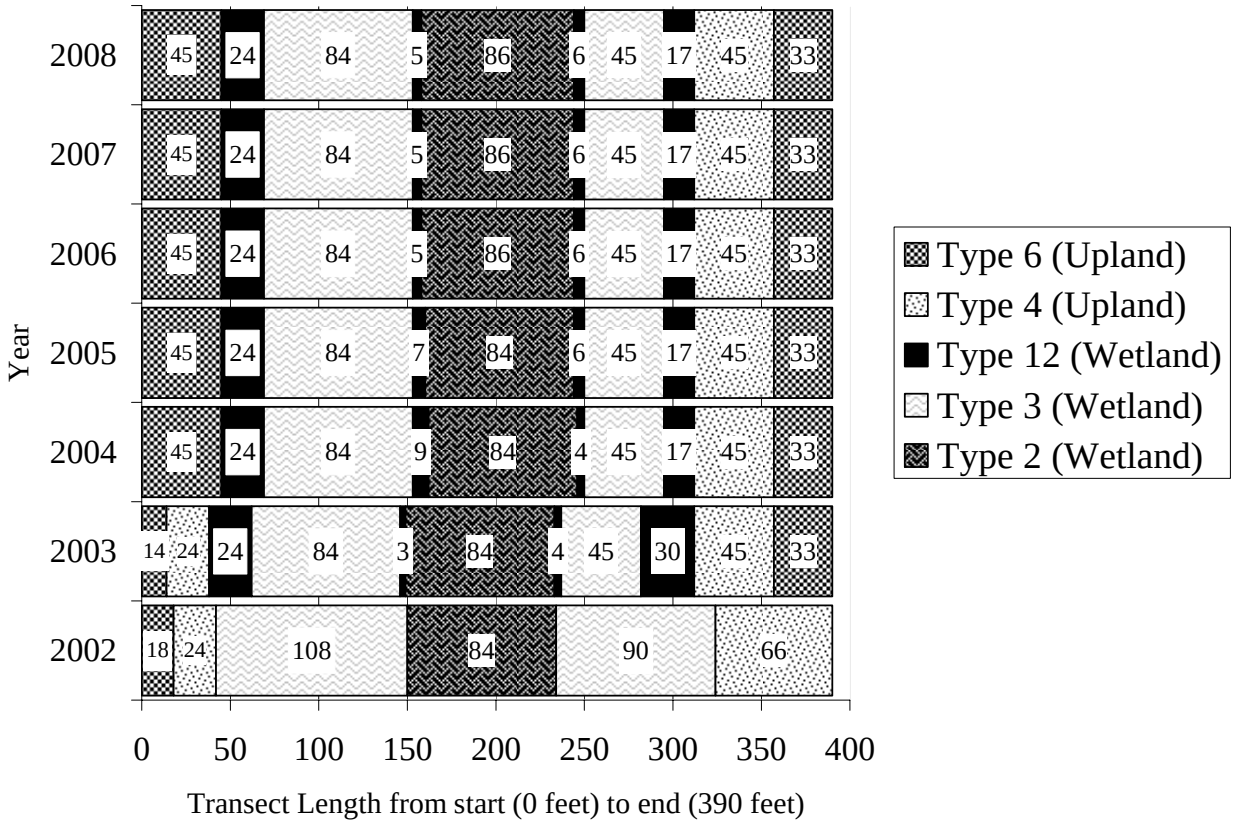
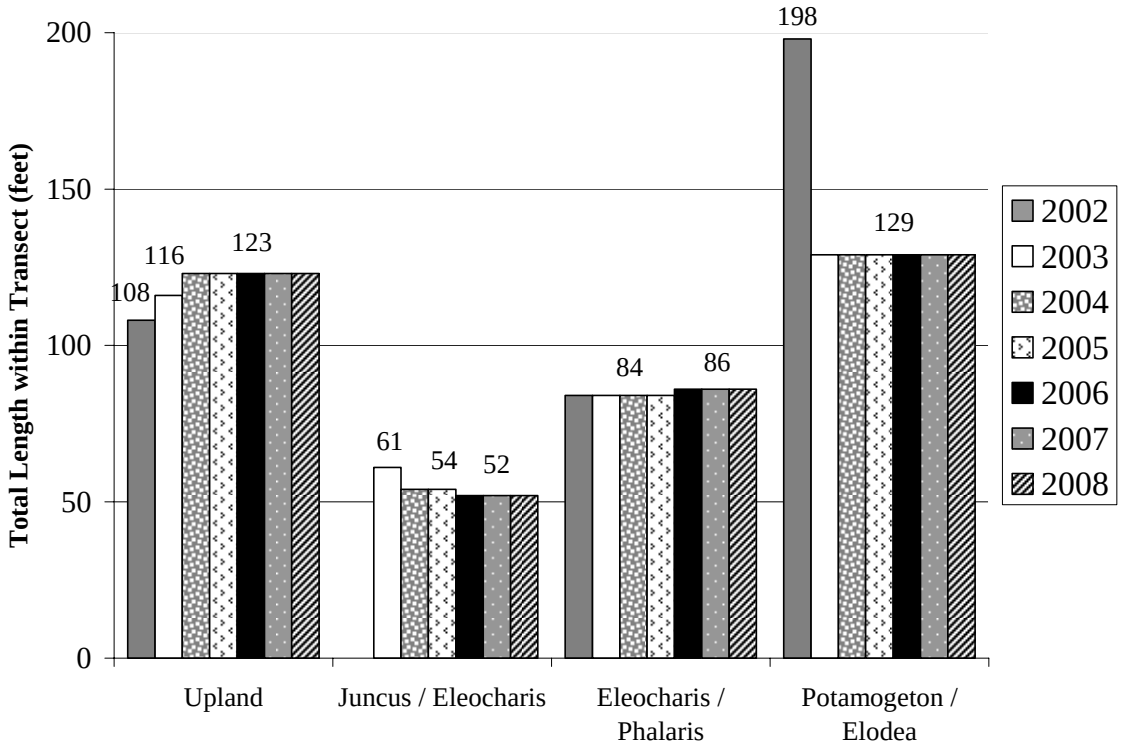


Chart 2: ***Length of vegetation communities within Transect 1 for each year monitored.***



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 were delineated on the 2008 aerial photographs (**Figure 3** in **Appendix A**). Soils, vegetation, and hydrology are discussed in preceding sections and on the **COE FORMS** (**Appendix B**). Approximately 13.91 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 2005-2008.

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 13.91 – 5.85 = 8.06 acres, essentially at the 8.1-acre goal. The very slight "shortage" may be due to mapping error associated with resource-grade GPS.

Wetland size changed during the 2008 monitoring with an increase of 0.90 acre. Wetland boundaries had remained similar between the 2005 and 2007 monitoring seasons. Wetland mapping captured new wetland areas along the outlet of the flood and backwater channels and the fringes of the Flathead River. Wetland boundaries were re-captured with GPS in 2008 and this most likely added some additional wetland areas with a more accurate account of the existing conditions after sevens years from the original GPS mapping.

During the 2003 to 2008 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.

Table 3: ***Wetland conditions identified during monitoring from 2002 to 2008.***

CONDITION	2008 (acre)	2007 (acre)	2006 (acre)	2005 (acre)	2004 (acre)	2003 (acre)	2002 (acre)
Wetland Area	13.91	13.01	13.01	13.01	11.88	11.35	10.99
Open Water Area	0.00	0.00	0.00	0.00	1.14	1.14	1.14
Total Aquatic Habitat Area	**13.91**	**13.01**	**13.01**	**13.01**	**13.02**	**12.49**	**12.13**

3.5 Wildlife

Use by wildlife species, or their evidence, have been compiled since 2002 (**Table 4**). Specific evidence observed, as well as activity codes pertaining to birds, ares provided on the **Monitoring Form** (**Appendix B**).

This site provided habitat for a variety of wildlife species. Two mammals, one reptile, one fish, and 15 bird species were noted at the mitigation site during the 2008 site visits. Many other wildlife species presumably use the site but were not observed during the monitoring visits.

Table 4: ***Fish and wildlife species observed at the Hoskins Landing Wetland Mitigation Site from 2002 to 2008.***

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

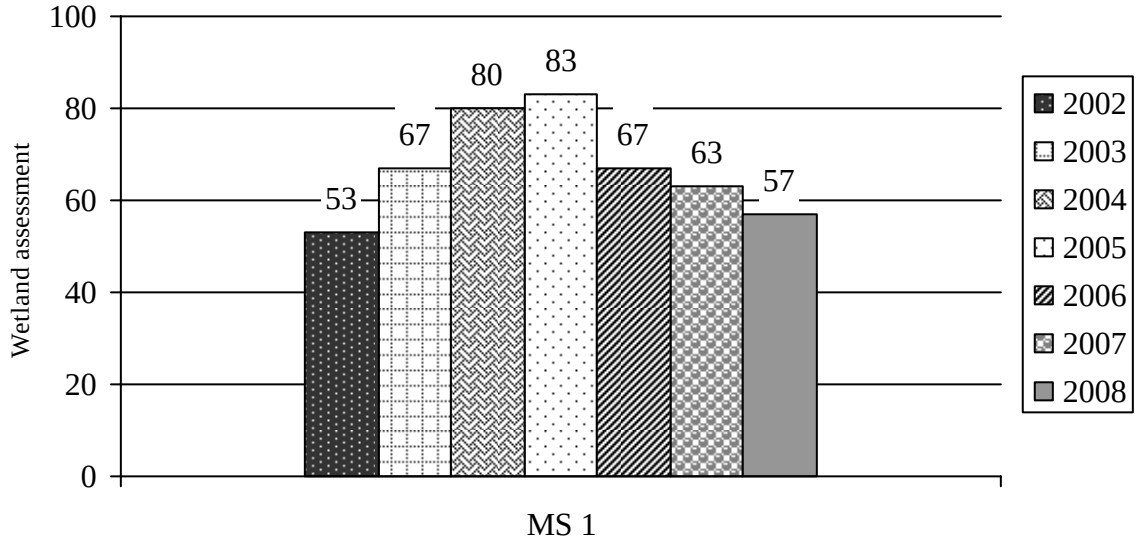
Bolded species were observed during 2008 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2008.

3.6 Macroinvertebrates

The sampling point for Hoskins Landing was 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 2008). Bioassessment scores have been graphed from 2002 to 2008 (Bollman 2008) (**Chart 3**).

The bioassessment score continued a downward trend at site MS 1. Fewer POET taxa, diminished gatherer function, and increased overall tolerance largely account for the drop in assessment score. Invertebrates were much less abundant in the 2008 sample, compared to the previous year. Dominant elements in the invertebrate fauna shifted from midges (especially Pseudochironomus sp.) in 2007 to naidid worms (Nais sp.) and physid snails (Physa sp.) in 2008. The thermal preference of the invertebrate assemblage was calculated at 19.5ºC. Hemoglobin-bearing taxa were present; hypoxic sediments are probably indicated. The composition of the assemblage and the overall tolerance is suggestive of nutrient enrichment.

Chart 3: ***Bioassessment scores using the wetland index for the Hoskins Landing Wetland Mitigation Site.***



3.7 Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (MWAM) was used to evaluate two assessment areas (AAs) within the site (**Functional Assessment Forms** in **Appendix B**). The two AAs on the Hoskins Landing mitigation site are currently rated as Category II (AA 1) and IV (AA 2) sites (**Table 5**). They received moderate ratings for Montana Natural Heritage Program (MTNHP) species habitat, general wildlife habitat, flood attenuation, sediment, nutrient, toxicant removal, and variables. Other factors contributing to their scores were high ratings for fish / aquatic habitat, surface water storage, sediment / shoreline stabilization, production export / food chain support, and groundwater discharge / recharge. Additional factors contributing to their scores were low ratings for threatened and endangered species habitat 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 threatened and endangered habitat due to observation of a Bald Eagle (*Haliaeetus leucocephalus*) at the site. In 2007, the Bald Eagle was de-listed as an endangered species and currently is considered an MTNHP species with an S3 rating (MTNHP 2008). In turn, the de-listing decreased the threatened and endangered habitat rating, but increased the MTNHP species habitat rating. 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.

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, approximately 103.60 functional units occur at the Hoskins Landing mitigation site (**Table 5**). The baseline functional assessment results are provided for general comparative purposes; however, the baseline assessment was completed using the 1996 MWAM, the 2002 to 2007 assessments were completed using the 1999 MWAM, and the 2008 assessments was completed using the 2008 MWAM.

3.8 Photographs

Representative photographs were taken in 2008 from established photo-points and transect ends (**Appendix C**).

Table 5: ***Summary of baseline and 2008 wetland function/value ratings and functional points at the Hoskins Landing Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	WETLANDS ASSESSED WITH 1996 MWAM[1]						WETLANDS ASSESSED WITH 2008 MWAM[2]	
	Baseline 1A	**Baseline 1B**	**Baseline 3**	**Baseline 8**	**Baseline 2, 9A, 9B, 10, 11, 12, 13**	**Baseline 5, 6, 7, 14A, 14B**	**2008 Site 5[2]**	**2008 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 (0.1)
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 (0.6)
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 (0.4)	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 (1.0)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (1.0)	High (1.0)	Mod (0.5)	High (1.0)	Mod (0.5)	Mod (0.4)	Mod (0.4)
Sediment/Shoreline Stabilization	Mod (0.7)	Mod (0.7)	NA	Mod (0.4)	High (0.9)	NA	NA	High (1.0)
Production Export/Food Chain Support	High (0.8)	Mod (0.6)	Mod (0.6)	Mod (0.7)	Low (0.2)	Low (0.1)	Low (0.3)	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 (0.1)
Actual Points / Possible Points	6.6 / 12	5.8 / 11	4.0 / 9	6.3 / 11	2.8 / 10	2.3 / 9	3.0 / 9	7.6 / 11
% of Possible Score Achieved	55%	53%	44%	57%	28%	26%	33%	69%
Overall Category	III	III	III	II[3]	IV	IV	IV	II
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	13.45
Functional Units (acreage x actual points) (fu)	17.03	4.99	2.73	0.37	2.10	4.00	1.38	102.22
Total Acreage at Site (ac)	**6.67**						**13.91**	
Total Functional Units at Site (fu)	**31.22**						**103.6**	
Net Acreage Gain (ac)	NA						**7.24**	
Net Functional Unit Gain (fu)	NA						**72.38**	

[1] The baseline assessment was performed using the 1996 MDT Montana Wetland Assessment Method (MWAM).
[2] The 2008 assessment was preformed using the 2008 MDT MWAM. The completed forms are in **Appendix B**.

3.9 Revegetation Efforts

Wetland and riparian vegetation enhancements were implemented in 2003 and 2004 (**Appendix G**). 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 seedling (**Appendix G**). 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*) (**Appendix G**).

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),* Bebbs 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*), Bebbs sedge (*Carex bebbiana*), and small-fruited bulrush (*Scirpus microcarpus*).

Survival rates for native shrub plantings were assessed during the summers of 2003-2008. PBS&J and Salish Kootenai College (SKC) conducted separate survival ratings for the 2003 and 2004 plantings following initial plantings. During the 2005 to 2008 monitoring years, 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 (CT 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. Results were recorded and included general qualitative descriptions of each species within the different planting areas (**Monitoring Form** in **Appendix B**) . The percentage ratings for each species' survival 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 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 planting areas were evaluated; these areas include the upland islands, river bank terrace and along the upper banks of the backwater (side) channel. During 2008 monitoring, species survival remained similar to those observed in 2007 with an overall estimate of moderate to high survival. 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 lower occurrences.

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 Bebbs 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 2008. 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 at moderate 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 was 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 not observed during the mid-season visits including herbicide applications, minor grazing and mowing. These proposed weed control applications may have occurred later in the season after the mid-season visit. Refer to **Appendix G** for the *CSKT Vegetation Management Plan – Hoskins Landing, Highway 200 Wetland Mitigation.*

Evidence of livestock accessing the site was not observed during 2008 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).

3.11 Current Credit Summary

As of 2008, approximately 13.91 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 13.91 – 5.85 = 8.06 acres, essentially at the 8.1-acre goal.

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. 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 II 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 2008 13.91-acre wetland total).

Taking these factors into consideration, the adjusted "pre-existing" acreage total would be 5.85 – 0.6 = 5.25 acres. The 2008 credit total would then be 13.91 – 5.25 = 8.66 acres, which exceeds the 8.1-acre goal. This potential credit allocation would be subject to COE and CSKT review / approval. Whether or not these considerations are taken into account, the site has essentially achieved the 8.1-acre goal.

4.0 REFERENCES

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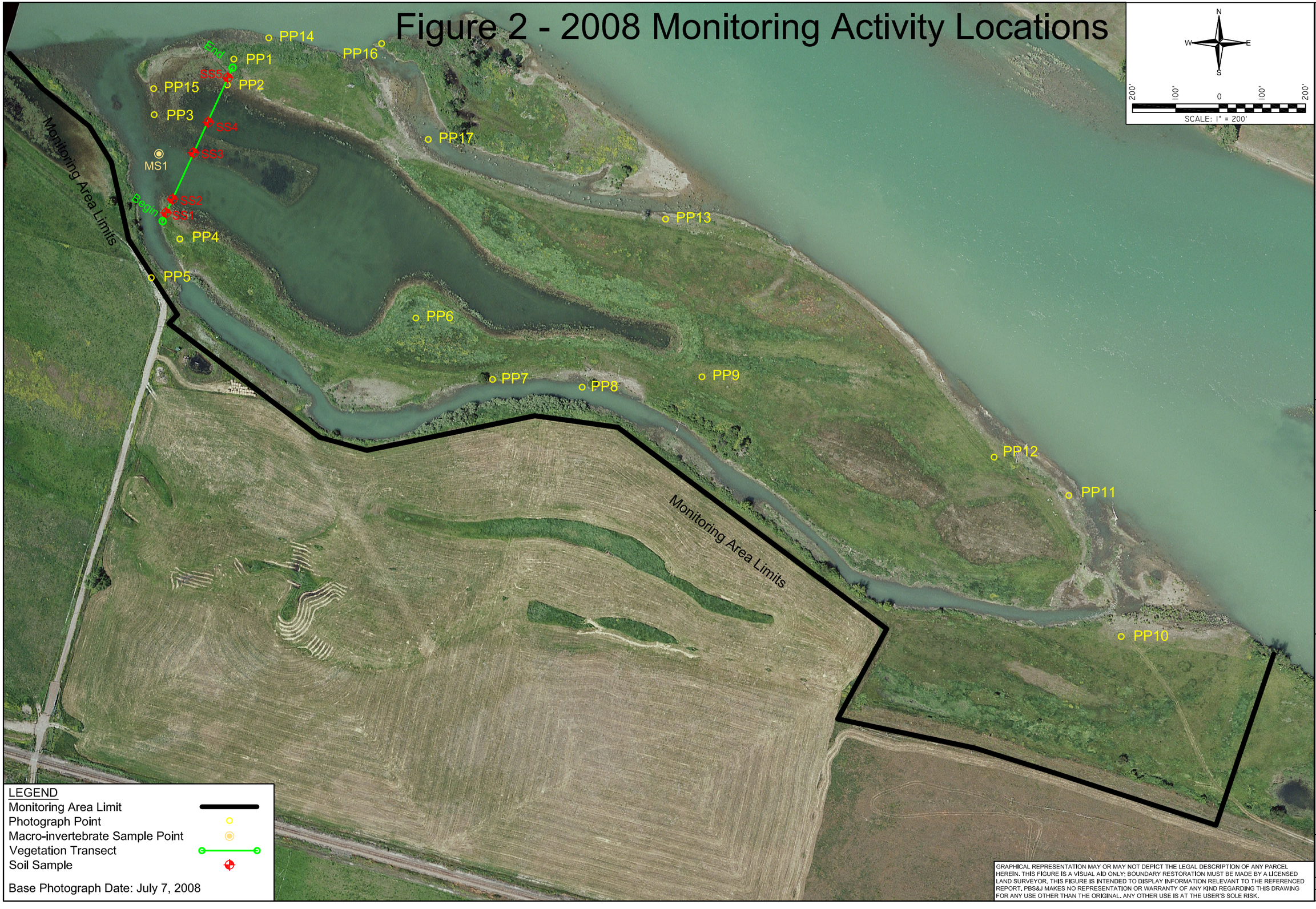
Appendix A

FIGURES 2 & 3

MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana

Figure 2 - 2008 Monitoring Activity Locations



LEGEND

- Monitoring Area Limit
- Photograph Point
- Macro-invertebrate Sample Point
- Vegetation Transect
- Soil Sample

Base Photograph Date: July 7, 2008

PROJECT NAME
MDT HOSKIN'S LANDING WETLAND MITIGATION

DRAWING TITLE
MONITORING ACTIVITY LOCATIONS 2008

DRAWN: LL/JR
PROJ MGR: J.BERGLUND
CHECKED: GH | APPVD: JB

PROJ NO: 0B4308801 02.03
LOCATION: DIXON, MT
SCALE: NOTED
FILE NAME: BASE2008.dwg

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
2 OF 3

REV -
Nov/26/2008

Figure 3 - 2008 Mapped Site Features

N
W E
S
200' 100' 0 100' 200'
SCALE: 1" = 200'

Monitoring Area Limits

Water of The U.S.

Monitoring Area Limits

LEGEND
Monitoring Area Limit
Wetland-Upland Boundary
Vegetation Community Boundary

Base Photograph Date: July 7, 2008

Wetland Areas
Gross Wetland 13.91 acres

Noxious Weeds
- Cirsium arvense
- Cirsium vulgare
- Hypericum perforatum
- Linaria dalmatica
- Centaurea maculosa
- Chrysanthemum leucanthemum
- Iris pseudacorus

Infestation Size
- ✖ = < 0.1 acre
- ▲ = 0.1 to 1 acre
- ■ = 1 to 5 acres

Cover Class
- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (5-25% cover)
- H = High (25-100% cover)

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
MAPPED SITE FEATURES 2008

DRAWN: LL/JR
PROJ MGR: J.BERGLUND
CHECKED: GH | APPVD: JB
PROJ NO: 0B4308801 02.03
LOCATION: DIXON, MT
SCALE: NOTED
FILE NAME:BASE2008.dwg

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
3 OF 3
REV -
Nov/25/2008

Appendix B

2008 WETLAND MITIGATION SITE MONITORING FORM
2008 BIRD SURVEY FORM
2008 COE WETLAND DELINEATION FORMS
2008 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 02.03 Assessment Date: 07/24/08
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 80's Person(s) conducting the assessment: Greg Howard
Initial Evaluation Date: 09 / 04 / 02 Visit #: 7 Monitoring Year: 7th
Size of evaluation area: 48 acres Land use surrounding wetland: Agriculture; alfalfa & cattle grazing

HYDROLOGY

Surface Water Source: Flathead River
Inundation**:** Present X 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 x
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:
X Map emergent vegetation-open water boundary on air photo
X 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: No indications of weed control activities – heavy Canada thistle. The site still has many weedy areas dominated by Canada thistle, St. Johns wort and dalmatian toadflax. Spring bird visit and mid-season 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
Agrostis alba	60	*Phleum pratense*	T
Poa pratensis	20	*Agropyron repens*	P
Taraxacum officinalis	P	*Cirsium arvense*	T
Festuca pratensis	T		
Trifolium pratense	P		
Plantago lanceolata	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
Scirpus acutus	10	*Sagittaria latifolia*	20
Scirpus validus	P	*Carex retrorsa*	P
Phalaris arundinacea	30		
Eleocharis palustris	50		
Potamogeton natans	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
Potamogeton amplifolius	40	*Veronica americana*	P
Elodea canadensis	10	*Juncus ensifolius*	T
Potamogeton crispus	P	*Chara spp.*	10
Potamogeton natans	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*). Eurasian milfoil (*Myriophyllum spicatum)* previously listed as a species of this community type. Upon further investigation it has been determined that milfoil was not present and the species in question was a form of green algae called muskgrass (*Chara spp.*).

Additional Activities Checklist:

X 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
Plantago lanceolata	T	*Helianthus annuus*	P
Plantago major	P	*Lepidium perfoliatum*	P
Cirsium arvense	P	*Chrysanthemum leucanthemum*	T
Verbascum thapsus	T	*Centaurea maculosa*	T
Agropyron repens	40	Plantings	10
Achillea millefolium	10	*Coreopsis atkinsoniana*	P
Elymus trachycaulus	20	*dalmatian toadflax*	T
Hypericum perforatum	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
Phalaris arundinacea	60	*Juncus ensifolius*	T
Salix exigua	30	*Eleocharis acicularis*	P
Juncus balticus	P	*Salix bebbiana*	T
Scirpus acutus	T		
Cornus stolonifera	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
Phleum pratense	20	*Rosa woodsii*	P
Agropyron repens	20	*Symphoricarpos albus*	T
Taraxacum officinale	P	*Agrostis alba*	10
Cirsium arvense	10	*Festuca pratensis*	30
Rumex crispus	T	*Centaurea maculosa*	T

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

Additional Activities Checklist:
_X_ 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
Populus trichocarpa	10	*Taraxacum officinale*	P
Salix exigua	10	*Hypericum perforatum*	T
Rumex crispus	10		
Agrostis alba	P		
Phalaris arundinacea	70		

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
Plantago major	P	*Agropyron repens*	10
Plantago lanceolata	10	*Chrysanthemum leucanthemum*	T
Verbascum thapsus	T	*Centaurea maculosa*	10
Populus trichocarpa	10	*Agrostis alba*	10
Artemisia ludoviciana	10	*Linaria dalmatica*	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
Centaurea maculosa	T	*Chenopodium album*	P
Sisymbrium altissimum	T	*Bromus* spp.	50
Lepidium perfoliatum	T	*Bromus tectorum*	10
Malva neglecta	T	*Agropyron repens*	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
Crataegus douglasii	20	*Festuca pratensis*	P
Prunus americana	10	*Phleum pratense*	P
Rosa woodsii	P	*Agropyron repens*	20
Cornus stolonifera	P	*Symphoricarpos albus*	P
Populus trichocarpa	30	*Centaurea maculosa*	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
Ceratophyllum demersum	40	*Myriophyllum spicatum*	P
Equisetum hyemale	P		
Eleocharis acicularis	P		
Juncus balticus	P		
Phalaris arundinacea	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
Juncus ensifolius	20	*Rumex crispus*	T
Eleocharis palustris	10	Willow sprigs (*Salix*)	20
Agrostis alba	10	*Prunella vulgaris*	T
Phalaris arundinacea	30	*Coreopsis atkinsoniana*	P
Eleocharis acicularis	10	*Sagittaria latifolia*	T
Scirpus acutus	T	*Mentha arvensis*	P
Polygonum amphibium	T	*Helenium autumnale*	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 2008, except for the sandbar willow that increased in cover.

Additional Activities Checklist:
_X_ 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
Phalaris arundinacea	50	*Agropyron repens*	P
Agrostis alba	20	*Salix exigua*	10
Eleocharis palustris	T	*Salix lutea*	T
Alopecurus pratensis	T	Plantings (*Cornus* & *Populus*)	P
Plantago major	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
Populus trichocarpa	50	*Plantago lanceolata*	P
Salix exigua	20	*Crataegus douglasii*	T
Phalaris arundinacea	10	*Helenium autumnale*	T
Agropyron repens	P	*Artemisia ludoviciana*	P
Centaurea maculosa	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
Phalaris arundinacea	70		
Phleum pratense	10		
Agropyron repens	10		
Taraxacum officinale	T		
Cirsium arvense	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:
X Record and map vegetative communities on air photo

COMMENTS:

COMPREHENSIVE VEGETATION LIST

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

* 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 2008.

COMMENTS/PROBLEMS: <u>One new species was identified during 2008 monitoring - a green algae dominating the shallow water called muskgrass (*Chara spp.*).</u>

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Comments
Created Pond		During the 2008 monitoring, species survival remained similar to those observed in 2007 based on visual estimates. Sandbar willow, cottonwood, dogwood and alder were healthy with new vigorous growth. Sandbar willow height ranging from 5 to 9 feet 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.
Populus trichocarpa	280	
Betula occidentalis	378	
Populus tremuloides	291	
Alnus incana	241	
Salix exigua	1719	
Salix bebbiana	684	
Cornus stolonifera	800	
Side Channel		During the 2008 monitoring, species survival remained similar to those observed in 2007 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 2008 monitoring. Overall survival ratings are considered moderate based on visual assessment.
Populus trichocarpa	100	
Betula occidentalis	75	
Populus tremuloides	50	
Pinus ponderosa	103	
Alnus incana	50	
Salix exigua	125	
Cornus stolonifera	200	
Rosa woodsii	50	
Amelanchier alnifolia	25	
Upland Island		During the 2008 monitoring, species survival remained similar to those observed in 2007 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 - 2008 are successfully surviving at this site.
Populus trichocarpa	25	
Pinus ponderosa	100	
Juniperus scopulorum	20	
Rosa woodsii	300	
Symphoricarpos albus	100	
Amelanchier alnifolia	125	
Crataegus douglasii	100	
River Bank		During the 2008 monitoring, species survival remained similar to those observed in 2007 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. 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.
Populus trichocarpa	--	
Pinus ponderosa	--	
Cornus stolonifera	--	
Rosa woodsii	--	
Crataegus douglasii	--	
Symphoricarpos albus	--	

COMMENTS/PROBLEMS: The above species were planted during 2003 & 2004 seasons. Four plantings areas were assessed by PBS&J during 2008 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			
Painted Turtle	4-6				
Striped Skunk	1				

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:

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

Location	Photo	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°
14	14	Picture looking W. along the Flathead River shoreline.	270°
15	15	Picture looking W. along outlet to backwater channel.	270°
16	16	Picture looking W. along the Flathead River shoreline.	270°
17	17	Picture looking E. at emergent wetland in flood channel.	90°

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 fore site in designated GPS field notebook

Checklist:

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

COMMENTS/PROBLEMS: Wetland boundary during the 2008 monitoring mapped with resource grade hand-held GPS unit.

WETLAND DELINEATION

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

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

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: 07/24/08 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		20
Agrostis alba		10
Phleum pratense		P
Festuca pratensis		50
Agropyron repens		P
Rumex crispus		T
Phalaris arundinacea		10
Equisetum arvense		T
Total Vegetative Cover:		90%

Vegetation type 2:	Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	24	feet
Species:		Cover:
Eleocharis acicularis		40
Juncus ensifolius		P
Eleocharis palustris		30
Scirpus acutus		P
Plantago major		T
Rumex crispus		T
Salix exigua		30
Populus trichocarpa		P
Sagittaria latifolia		T
Helenium autumnale		T
Phalaris arundinacea		10
Total Vegetative Cover:		100%

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
Chara spp.		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: 07/24/08 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	30	
Scirpus acutus	T	
Coreopsis atkinsoniana	T	
Sagittaria latifolia	T	
Phalaris arundinacea	20	
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	
Chara spp.	40	
Eleocharis palustris	10	
Potamogeton natans	20	
Total Vegetative Cover:	70%	

Vegetation type 8:	Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	17	feet
Species:	Cover:	
Eleocharis acicularis	20	
Juncus ensifolius	P	
Eleocharis palustris	40	
Scirpus acutus	10	
Coreopsis atkinsoniana	T	
Phalaris arundinacea	10	
Salix exigua	P	
Total Vegetative Cover:	80%	

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 07/24/08 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	40
Plantago lanceolata	P
Polygonum amphibium	T
Agropyron repens	20
Cirsium arvense	T
Plantago major	T
Coreopsis atkinsoniana	P
Rumex crispus	P
Total Vegetative Cover:	70%

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	10
Phalaris arundinacea	80
Agrostis alba	P
Plantago major	T
Total Vegetative Cover:	95%

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:	

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

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

Percent of perimeter 100 % developing wetland vegetation – excluding dam/berm structures.

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

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

Notes:

3/01 rev

BIRD SURVEY – FIELD DATA SHEET

Site: **Hoskins Landing** Date: **6/2/08**
Survey Time: **12:00 pm** to **1:30 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Black-capped chickadee	2	F L	SS				
Magpie	2	L	UP				
Mallard	7	L F	OW MA				
Osprey	2	N F	OW				
Pheasant	1	BD	UP				
Gull sp.	3	FO					
Mourning Dove	1	FO					
Raven	1	FO					
Red-winged Blackbird	17	BD F	SS MA				
Rough-winged Swallow	2	F	OW				
Spotted Sandpiper	1	F	MF				
Wood Duck	2	L	OW				
Yellow-headed Blackbird	2	BD F	MA SS				
Yellow Warbler	1	BD	SS				

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **Mostly Cloudy with wind and scattered showers - approximately 60 degress**

Notes: **Flathead River was very high during site visit. Extensive water was flowing into old meander channel which prevented access on other side of channel (see photos). Numerous painted turtles were sunning along banks of excavated swale in middle of site. Observed one adult skunk on edge of property. Osprey were utilizing the nesting platform on north end of site.**

BIRD SURVEY – FIELD DATA SHEET

Site: **Hoskins Landing** Date: **7/24/08**
Survey Time: **10 pm** to **3:30 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Tree Swallow	10	FO L L	UP OW WM				
Osprey	1	BP FO N	UP				
Mallard	10	FO L	OW				
Ring-bill Gull	50	FO F	UP				
Red-Tailed Hawk	1	FO	UP				
Red Wing Blackbird	5	L	WM				
Robin	1						

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **Partial cloudy with temperatures in high 80's.**

Notes: **Excavated wetlands inundated to almost full capacity (90%). Highest water levels observed during the mid-season visits.**

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site:	Hoskins Landing			Date:	07/24/08
Applicant/Owner:	MDT			County:	Sanders
Investigator:	Greg Howard			State:	MT
Do Normal Circumstances exist on the site:	X	Yes	No	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?		Yes	X No	Transect ID:	T1
Is the area a potential Problem Area?:		Yes	X No	Plot ID:	1
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Plantago lanceolata*	H	FAC	9			
2	*Cirsium arvense*	H	FACU+	10			
3	*Phleum pratense*	H	FACU	11			
4	*Agropyron repens*	H	FACU+	12			
5	*Agrostis alba*	H	FACU	13			
6	*Festuca pratensis*	H	FAC+	14			
7	*Phalaris arundinacea*	H	FACW	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 3/7 = 33%

Upland pasture along the outer fringes of excavated wetland slopes.

HYDROLOGY

Recorded Data (Describe in Remarks):

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

Field Observations:

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

Wetland Hydrology Indicators:

Primary Indicators:

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

Secondary Indicators (2 or more required):

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

Remarks:

No evidence of hydrology indicators. Soil dry and crumbly, not saturated or moist at the time of evaluation.

SOILS

Map Unit Name (Series and Phase): Horseplains-riverwash complex
Drainage Class: _____
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? X Yes _____ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 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
_____ Histic Epipedon
_____ Sulfidic Odor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

No hydric soil indicators presence.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within an upland area. Sampling point located near the beginning of vegetation transect within upland community type.

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site:	Hoskins Landing			Date:	07/24/08
Applicant/Owner:	MDT			County:	Sanders
Investigator:	Greg Howard			State:	MT
Do Normal Circumstances exist on the site:	x	Yes	No	Community ID:	Emergent
Is the site significantly disturbed (Atypical Situation)?		Yes	X No	Transect ID:	T1
Is the area a potential Problem Area?:		Yes	X No	Plot ID:	2
(If needed, explain on reverse.)					

VEGETATION

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

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

x No Recorded Data Available

Field Observations:

Depth of Surface Water: 6 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:

Hydrology indicators present with saturated soils to ground surface and inundation of the site.

SOILS

Map Unit Name (Series and Phase): Horseplains-riverwash complex
Drainage Class: _____
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? _____ Yes x No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 12+	B	7.5 YR 4/1	7.5 YR 3/4	Common / Prominent	Sandy Clay

Hydric Soil Indicators:

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

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

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within a wetland area. 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: Hoskins Landing				Date: 07/24/08	
Applicant/Owner: MDT				County: Sanders	
Investigator: Greg Howard				State: MT	
Do Normal Circumstances exist on the site:	x	Yes	No	Community ID:	Emergent
Is the site significantly disturbed (Atypical Situation)?		Yes	X No	Transect ID:	T1
Is the area a potential Problem Area?:		Yes	X No	Plot ID:	3
(If needed, explain on reverse.)					

VEGETATION

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

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

Area dominated by hydrophytic vegetation.

HYDROLOGY

Recorded Data (Describe in Remarks):
- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water: 6 (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:
Hydrology 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 x 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:

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

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

WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes _____ No

Wetland Hydrology Present? X Yes _____ No

Hydric Soils Present? X Yes _____ No

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

Remarks:

Sampling point considered within an emergent wetland type.

Approved by HQUSACE 2/92

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site: Hoskins Landing						Date: 07/24/08	
Applicant/Owner: MDT						County: Sanders	
Investigator: Greg Howard						State: MT	
Do Normal Circumstances exist on the site:	x	Yes		No		Community ID:	Aquatic bed & emergent
Is the site significantly disturbed (Atypical Situation)?		Yes	x	No		Transect ID:	T1
Is the area a potential Problem Area?: (If needed, explain on reverse.)		Yes	x	No		Plot ID:	4

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Eleocharis acicularis*	H	OBL	9			
2	*Juncus ensifolius*	H	FACW	10			
3	*Phalaris arundinacea*	H	FACW	11			
4	*Eleocharis palustris*	H	OBL	12			
5	*Scirpus microcarpus*	H	OBL	13			
6	*Potamogeton natans*	H	OBL	14			
7	*Salix exigua*	S	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.

HYDROLOGY

Recorded Data (Describe in Remarks):
- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water: - (in.)

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

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

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

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

Remarks:
Hydrology indicator present with soils saturated to ground surface.

SOILS

Map Unit Name (Series and Phase): Horseplains-riverwash complex

Drainage Class: _____

Taxonomy (Subgroup): _____

Field Observations

Confirm Mapped Type? _____ Yes x No

Profile Description:

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

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

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

WETLAND DETERMINATION

Hydrophytic Vegetation Present? x Yes _____ No

Wetland Hydrology Present? x Yes _____ No

Hydric Soils Present? x Yes _____ No

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

Remarks:

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

DATA FORM

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

Project/Site: Hoskins Landing	Date: 07/24/08
Applicant/Owner: MDT	County: Sanders
Investigator: Greg Howard	State: MT

Do Normal Circumstances exist on the site:	x	Yes		No	Community ID: -
Is the site significantly disturbed (Atypical Situation)?		Yes	x	No	Transect ID: T1
Is the area a potential Problem Area?:		Yes	x	No	Plot ID: 5
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Agropyron repens*	H	FACU	9			
2	*Festuca pratensis*	H	FACU+	10			
3	*Cirsium arvense*	H	FACU+	11			
4	*Agrostis alba*	H	FAC+	12			
5	*Plantago major*	H	FACU	13			
6	*Phalaris arundinacea*	H	FACW	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):
- Stream, Lake, or Tide Gauge
- Aerial Photographs
- Other

x No Recorded Data Available

Field Observations:

Depth of Surface Water: - (in.)

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

Depth to Saturated Soil: - (in.)

Wetland Hydrology Indicators:

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

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

Remarks:
No hydrology indicators present, sampling pit was dry.

SOILS

Map Unit Name (Series and Phase): Horseplains-riverwash complex
Drainage Class: _____
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? _____ Yes x No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 1	B1	10 YR 4/2	-	-	Roots w/silty clay
1 – 12+	B2	10 YR 4/2	-	-	Silty loam

Hydric Soil Indicators:

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

No hydric soils indicators found.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within an upland area.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Hoskins Landing **2. MDT Project #:** B4308801 02.05 **3. Control #:** _____

3. Evaluation Date: 7/24/08 **4. Evaluator(s):** G. Howard **5. Wetland/Site #(s):** AA-1 (Excavated wetlands and channel)

6. Wetland Location(s): Township 18 N, Range 21 W, Section 18; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: _____

Watershed: 3 - Lower Clark Fork **County:** _ _ Sanders _____

7. Evaluating Agency: MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
13.45 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 13.45 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Aquatic Bed	Excavated	Permanent / Perennial	50
Riverine	Unconsolidated Bottom	Excavated	Permanent / Perennial	15
Riverine	Emergent Wetland		Permanent / Perennial	20
Riverine	Rock Bottom		Seasonal / Intermittent	5
Riverine	Scrub-Shrub Wetland		Seasonal / Intermittent	10

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** Historic livestock grazing.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Bull thistle, Canada thistle, goats weed, hound's tongue,oxeye daisy, spotted knapweed, and yellow toadflax.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: Area of historic heavy alteration from livestock. AA had several small wetlands and an active backwater channel. Surrounding lands are used for cropland, livestock, residental and boat launching.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	high	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: _____

Wetland/Site #(s): AA-1

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Bull trout, gray wolf
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	.1L	---

Sources for documented use (e.g. observations, records): _____

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

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 ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	.6M	---	---	---	---

Sources for documented use (e.g. observations, records): American white pelican oberved 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 substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ 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
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☐ 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
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

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

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

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

Comments: _____

Wetland/Site #(s): AA-1

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

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☒ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☒ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☒ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	.8H	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

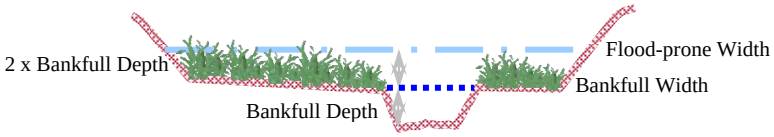
iii. Final Score and Rating: .8H **Comments:** _____

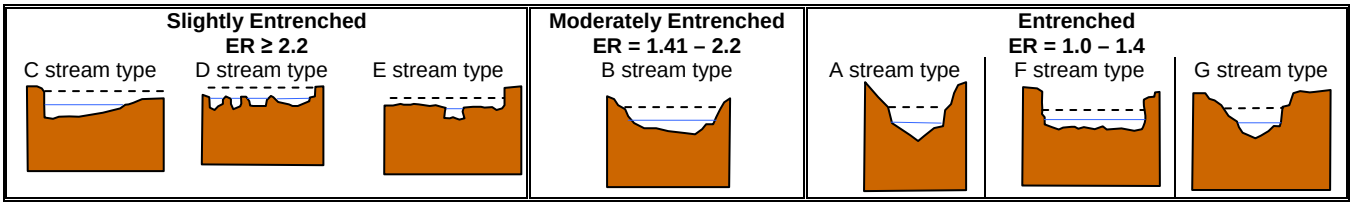
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☐ Slightly Entrenched C, D, E stream types			☒ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☒ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	.4M	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** _____

Wetland/Site #(s): AA-1

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 the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☒ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1H	---	---	---	---	---	---	---	---
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 wetland with potential to receive 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 the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☐ **≥ 70%**		☐ **< 70%**		☒ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	.4M	---	---	---

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 which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☒ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☒ **≥ 65%**	1H	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☒ **E/H**	---	H	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☐ **NA**	---	---	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☒ **Vegetated Component >5 acres**						☐ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☒ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	1H	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): AA-1

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☐ **YES**, add 0.1 to score in **ii** = ___ ☒ **NO**

iv. Final Score and Rating: 1H **Comments:** _____

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps 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.
- ☒ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

ii. Recharge Indicators
- ☒ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☒ **P/P**	☐ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: _____

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	.5M	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☒ Educational/Scientific Study ☒ Consumptive Recreational ☒Non-consumptive recreational
☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	**Known**	**Potential**
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	.1M
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: _____

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): _____

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.10	1.00		
B. MT Natural Heritage Program Species Habitat	mod 0.60	1.00		
C. General Wildlife Habitat	mod 0.70	1.00		
D. General Fish Habitat	high 0.80	1.00		
E. Flood Attenuation	mod 0.40	1.00		
F. Short and Long Term Surface Water Storage	high 1.00	1.00		
G. Sediment / Nutrient / Toxicant Removal	mod 0.40	1.00		
H. Sediment / Shoreline Stabilization	high 1.00	1.00		
I. Production Export / Food Chain Support	high 1.00	1.00		
J. Groundwater Discharge / Recharge	high 1.00	1.00		
K. Uniqueness	mod 0.50	1.00		
L. Recreation / Education Potential (bonus point)	mod 0.10			
Total Points	**7.6**	**11**	**Total Functional Units**	
Percent of Possible Score 69% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☒ Percent of possible score > 65% (round to nearest whole #).

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Hoskins Landing **2. MDT Project #:** B4308801 02.05 **3. Control #:** _____

3. Evaluation Date: 7/24/08 **4. Evaluator(s):** G. Howard **5. Wetland/Site #(s):** AA-2 (Emergent wetlands)

6. Wetland Location(s): Township 18 N, Range 21 W, Section 18; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: _____

Watershed: 3 - Lower Clark Fork **County:** _ _ Sanders _____

7. Evaluating Agency: MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
0.46 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.46 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland		Seasonal / Intermittent	100

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** Historic livestock grazing.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Spotted knapweed, timothy, and tumble mustard.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: A small isolated emergent depression within larger mitigation site. This site is currently at baseline conditions.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: _____

Wetland/Site #(s): AA-2

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

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

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): _____

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

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

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

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	---	---	---	.0L

Sources for documented use (e.g. observations, records): _____

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ 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
- ☐ interview with local biologist with knowledge of the AA

☒ ***Minimal:*** Based on any of the following [check].
- ☒ few or no wildlife observations during peak use periods
- ☒ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☐ ***Moderate:*** Based on any of the following [check].
- ☐ 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
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

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

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☐ **Exceptional**	☐ **High**	☒ **Moderate**	☐ **Low**
☐ **Substantial**	---	---	---	---
☐ **Moderate**	---	---	---	---
☒ **Minimal**	---	---	.2L	---

Comments: _____

Wetland/Site #(s): AA-2

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

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☐ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☐ **N0**

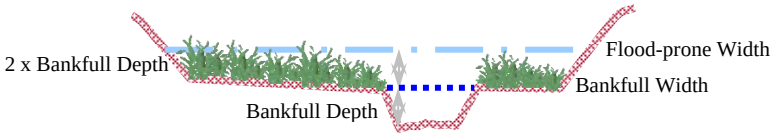
iii. Final Score and Rating: _ **Comments:** _____

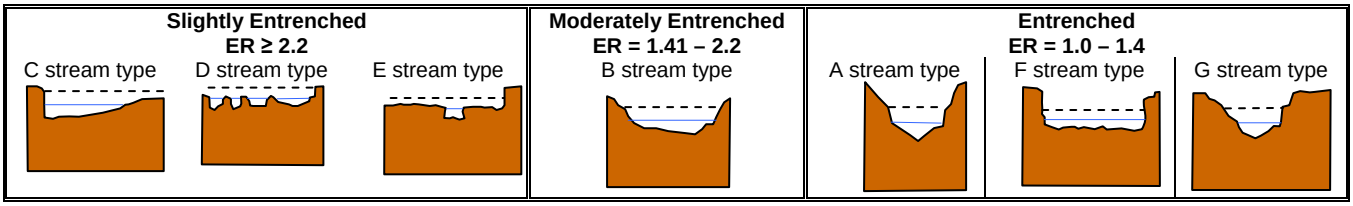
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☐ Slightly Entrenched C, D, E stream types			☒ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☒ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	.4M	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** _____

Wetland/Site #(s): AA-2

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 the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☒ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☒ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	---	---	---	---	---	---	.3L	---
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 wetland with potential to receive 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 the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☐ **≥ 70%**		☐ **< 70%**		☒ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	.4M	---	---	---

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 which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☐ **M**	☒ **L**
☐ **E/H**	---	H	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	---	L

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☐ **Vegetated Component >5 acres**						☐ **Vegetated Component 1-5 acres**						☒ **Vegetated Component <1 acre**					
B	☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☒ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	1H	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.3L	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): AA-2

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☐ **YES**, add 0.1 to score in **ii** = ___ ☒ **NO**

iv. Final Score and Rating: .3L **Comments:** _____

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps 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.
- ☒ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

ii. Recharge Indicators
- ☒ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☒ **P/P**	☐ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: _____

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

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

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☒ Educational/Scientific Study ☒ Consumptive Recreational ☒Non-consumptive recreational
☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	.1M
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: _____

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): AA-2

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00		
B. MT Natural Heritage Program Species Habitat	low 0.00	1.00		
C. General Wildlife Habitat	low 0.20	1.00		
D. General Fish Habitat	NA	NA		
E. Flood Attenuation	mod 0.40	1.00		
F. Short and Long Term Surface Water Storage	low 0.30	1.00		
G. Sediment / Nutrient / Toxicant Removal	mod 0.40	1.00		
H. Sediment / Shoreline Stabilization	NA	NA		
I. Production Export / Food Chain Support	low 0.30	1.00		
J. Groundwater Discharge / Recharge	high 1.00	1.00		
K. Uniqueness	low 0.30	1.00		
L. Recreation / Education Potential (bonus point)	mod 0.10			
Total Points	**3.0**	**9**	**Total Functional Units**	
Percent of Possible Score 33% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☒ "Low" rating for Uniqueness; **and**
- ☒ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☒ Percent of possible score < 35% (round to nearest whole #).

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

☐ **I** ☐ **II** ☐ **III** ☒ **IV**

Appendix C

2008 REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana

Hoskins Landing Mitigation Site 2008

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

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

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

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

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

Photo Point No. 7: View looking east near backwater channel. Woody plants developing along streambank and terrace.

Hoskins Landing Mitigation Site 2008

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

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

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

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

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

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

Hoskins Landing Mitigation Site 2008

Photo Point No. 12: View looking 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 looking west along backwater flood channel. Substrate of cobbles and gravels with increasing vegetation cover of black cottonwood saplings.

Photo Point No. 4: Panoramic view looking 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 2008

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

Hoskins Landing Mitigation Site 2008

Photo Point No. 14: View looking west along Flathead River near the outlet to the backwater channel. Area dominated by emergent wetlands.

Photo Point No. 17: View looking east along backwater flood channel. Area of wetlands dominated by emergent wetland within the channel.

Photo Point No. 15: View looking east across the outlet of the backwater channel into the Flathead River. Area dominated by emergent wetlands. Some noxious weeds located within the adjacent uplands.

Photo Point No. 16: View looking west along the flathead River at a small pocket of emergent wetlands located near the outlet of a backwater flood channel

Appendix D

ORIGINAL SITE PLAN

MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana

MONTANA DEPARTMENT OF TRANSPORTATION

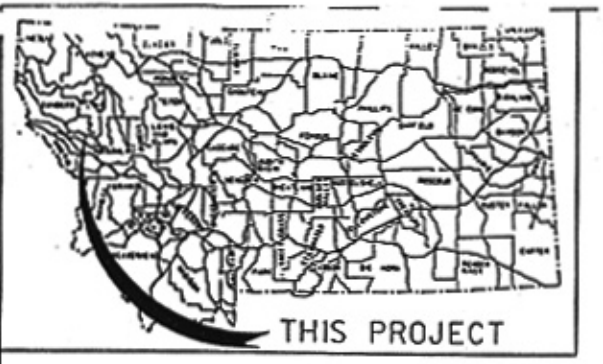
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 45(29)	1

FEDERAL AID PROJECT NO. STPP 45(29)

WETLAND

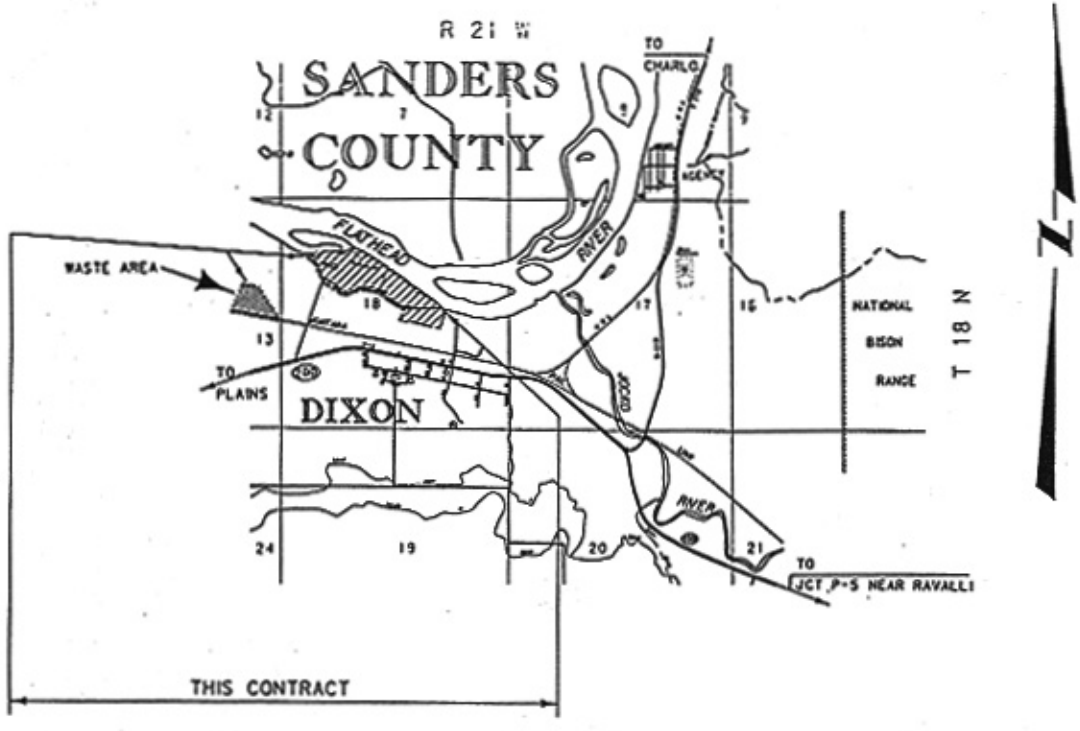
DIXON WETLAND MITIGATION

SANDERS COUNTY



SCALES AS NOTED ON PLANS

REDUCED PRINTS 1 /2 ORIGINAL SCALE



PRELIMINARY

FOR PLAN IN HAND ONLY

MONTANA DEPARTMENT OF TRANSPORTATION

APPROVED :

DAVID A. GALT
DIRECTOR OF TRANSPORTATION

BY

RECONSTRUCTION ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

DIVISION ADMINISTRATOR — DATE

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

R/W & UC	
P.E.	STPP 45(29)

CONTROL NO. 0000

LAND & WATER D-1

STATE	PROJECT NUMBER	SHEET
MONTANA	STPP 45(29)1	2

TABLE OF CONTENTS

NOTES

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 HOT BARBED 5-WIRE FENCE WITH WOODEN POSTS (TYPE FSW1. 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.

PRELIMINAR

LINEAR AND LEVEL DATA

CENTERLINE COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
0+00.00	POT	23,419.1288	66,607.6204	LINE + C1
9+72.97	POT	23,049.3802	67,507.5916	LINE + C1
[illegible]	PCT	23,375.3375	[illegible]	LINE + C1W
[illegible]	PCT	23,437.8[illegible]	66,[illegible]	LINE + C1W
[illegible]	PCT	23,417.6269	66,843.9426	LINE + C1W
[illegible]	PCT	23,355.8[illegible]	66,907.2[illegible]	LINE + C1W
3+[illegible]	POT	23,319.0218	66,957.3147	LINE + C1W
4+04.95	POT	23,[illegible].9620	67,186.0414	LINE + C1W
4+35.10	POT	23,247.8142	67,242.3100	LINE + C1W
4+[illegible].62	POT	23,164.0087	67,321.6387	LINE + C1W
4+51.33	POT	23,144.2415	67,355.9310	LINE + C1W
9+5[illegible]	POT	23,055.7045	67,338.1406	LINE + C1W
10+54.05	PCT	23,049.3802	67,507.5916	LINE + C1W
1+00.00	POT	23,381.1264	66,700.1185	LINE + C1S
2+13.85	PCT	23,271.4341	66,716.1085	LINE + C1S
3+28.75	PCT	23,212.4156	66,817.7445	LINE + C1S
4+14.01	PCT	23,202.8054	65,902.8229	LINE + C1S
5+24.13	PCT	23,215.7634	67,012.1944	LINE + C1S
6+74.57	PCT	23,165.9148	67,149.7328	LINE + C1S
0+00.00	POT	23,041.2000	66,127.1600	WASTE AREA
2+46.50	PCT	22,997.7[illegible]	66,462.6200	WASTE AREA

BEARING SOURCE

THE BASIS OF BEARING N 69°10'00" E BETWEEN MDOH CONTROL CAPS STAMPED 108B AND 108C ESTABLISHED FOR THE DIXON - WEST PROJECT STPP 6-1(86)99.

LEVEL DATUM SOURCE

U.S.C.&G.S. BRONZE DISK (L373) ELEV. 782.48 ESTABLISHED THE ELEVATIONS FOR THE CONTROL TRAVERSE ON THE DIXON - WEST PROJECT STPP 6-1(86)99. CONTROL POINT 108B ON DIXON - WEST = CONTROL POINT 2 ON THIS PROJECT. ELEVATION = 784.253

BENCH MARKS *

LOCATION	DESCRIPTION	ELEVATION
9.0 m S. OF CL.	BRONZE DISK 1.6 km S.E. OF PERMA (USC&GS L373)	782.48

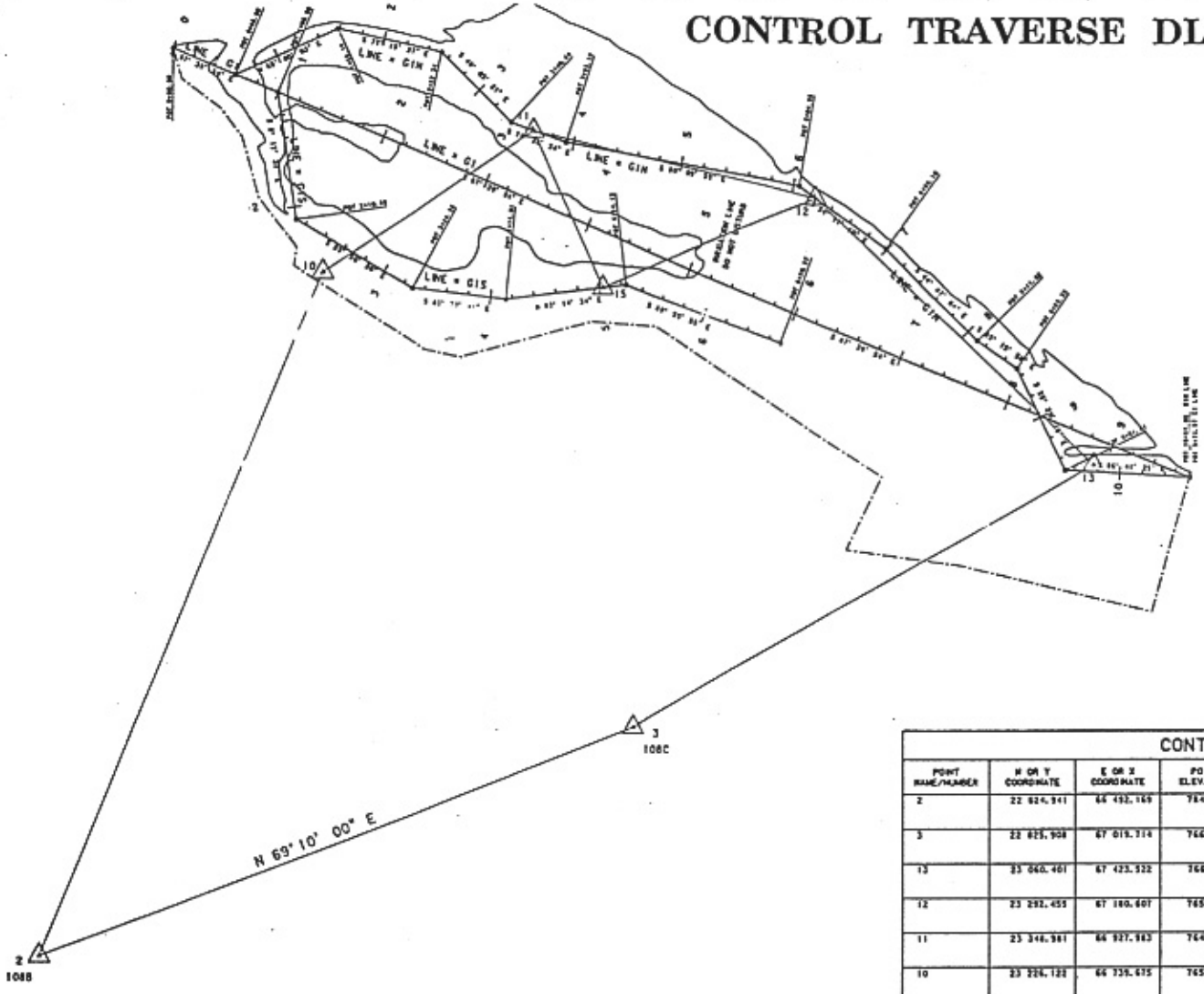
LEVEL DATUM SOURCE *

LEVEL DATUM IS BASED ON U.S.C. & G.S. BENCH MARKS WHICH ARE BASED ON THE SEA-LEVEL DATUM OF 1929 THROUGH THE PACIFIC NORTHWEST SUPPLEMENTARY ADJUSTMENT OF 1947.

PRELIMINARY

CONTROL TRAVERSE DIAGRAM

STATE	PROJECT NUMBER	SHEET
MONTANA	STPP 4512(9)	4

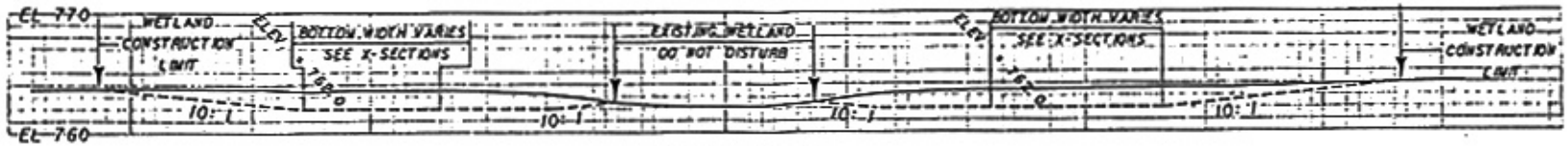


CONTROL TRAVERSE ABSTRACT

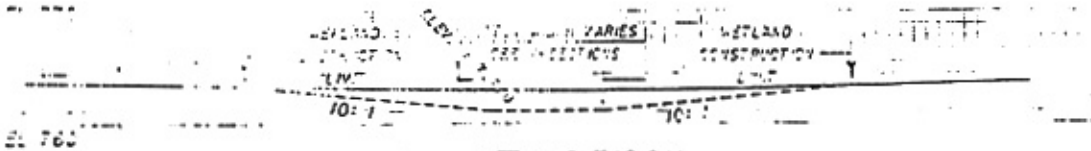
POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
2	22 824.941	66 432.169	764.253	16 mm X 762 mm L.P. w/ALUM CAP + 50 mm 1088 ON BLUFF 15.2 m + ABOVE ROAD, 1.9 m N.W. OF F2 LINE, 21 m N.E. OF F2 COR.
3	22 825.908	67 019.114	766.218	16 mm X 762 mm L.P. w/ALUM CAP + 50 mm 108C 2 m S.W. OF R/R F2, 10.8 m N.E. OF TEL. POLE, 11.6 m S.W. CENTERLINE B.N. RAILROAD
13	23 060.401	67 423.522	766.551	16 mm X 762 mm L.P. w/25mm YELLOW PLASTIC CAP
12	23 292.455	67 180.607	765.266	16 mm X 762 mm L.P. w/25mm YELLOW PLASTIC CAP
11	23 348.981	66 927.983	764.725	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	66 991.185	764.752	16 mm X 762 mm L.P. w/25mm YELLOW PLASTIC CAP
139	22 908.475	67 430.571	765.850	SET 600 MAIL BETWEEN GRAVEL ACCESS ROAD FENCE AROUND STORM WATER LAGOON 25m NORTH OF THE SE FENCE CORNER

PRELIMINARY

TYPICAL SECTIONS

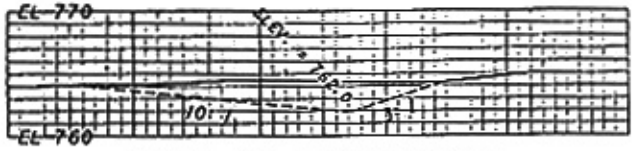


WETLAND TYPICAL
STATION 1+20 TO 2+70
LINE = G1

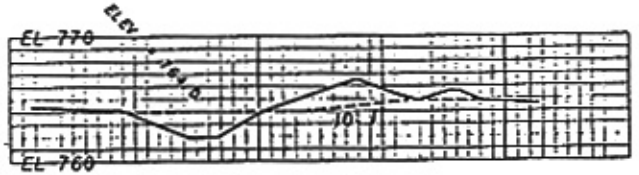


WETLAND TYPICAL
STATION 2+40 TO 5+00
LINE = G1

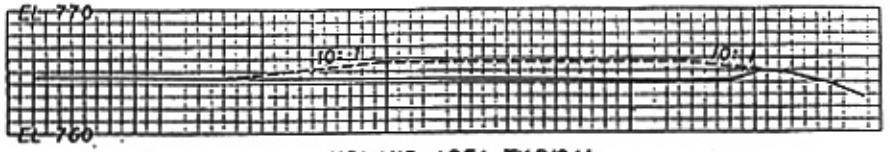
INLET CHANNEL DAM REMOVAL TYPICAL
STATION 9+35
LINE = G1N



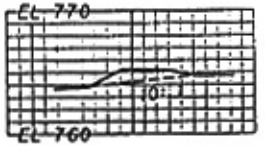
OUTLET DAM REMOVAL TYPICAL
STATION 2+15
LINE = G1S



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

PRELIMINAR

SUMMARY

GRADING

STATION FROM	STATION TO	* EXCAVATION (cubic meters)	EMB. + (cubic meters)	TOPSOIL (cubic meters)	EXCESS (cubic meters)	WASTE AREA (cubic meters)	REMARKS
1+00.00	8+10.00	33 358	6 017	3 765	23 576		C1 LINE
1+75.00	10+[illegible]	3 2[illegible]	879	933	1 [illegible]		C1H LINE
[illegible]	[illegible]	3 725	0	562	[illegible]		C1S LINE
[illegible]	[illegible]	2,[illegible]	[illegible]	[illegible]	[illegible]		TOPSOIL SALVAGE WASTE AREA
2+15.00	2+40.00					30 091	WASTE AREA
* TOTAL		44 631	* 6 896	* 7 543	* 30 192	* 30 091	

* FOR INFORMATION ONLY

IRRIGATION STRUCTURES

STATION	(each)	REMOVE IRRIGATION STRUCTURE (each)	(each)	REMARKS
9+17.00		1		C1H LEFT
TOTAL		1		

TOPSOIL & SEEDING

STATION FROM	STATION TO	TOPSOIL SALVAGING & PLACING (cubic meters)	SEED NO. 1 (hectares)	SEED	SEED	FERTILIZER NO. 1 (hectares)	FERTILIZER	CONDITION SEEDBED (hectares)		REMARKS
1+00.00	8+10.00	2 765	3.68			3.68		3.68		C1 LINE
1+25.00	10+50.00	933	0.99			0.99		0.99		C1H LINE
1+60.00	3+95.00	560	0.55			0.55		0.55		C1S LINE
0+00.00	2+95.00	2,285	2.29			2.29		2.29		WASTE AREA
TOTAL		7 543	7.5			7.5		7.5		

ADD 2; 3 ↑ [illegible] WASTE AREA

PLUG WATER WELL

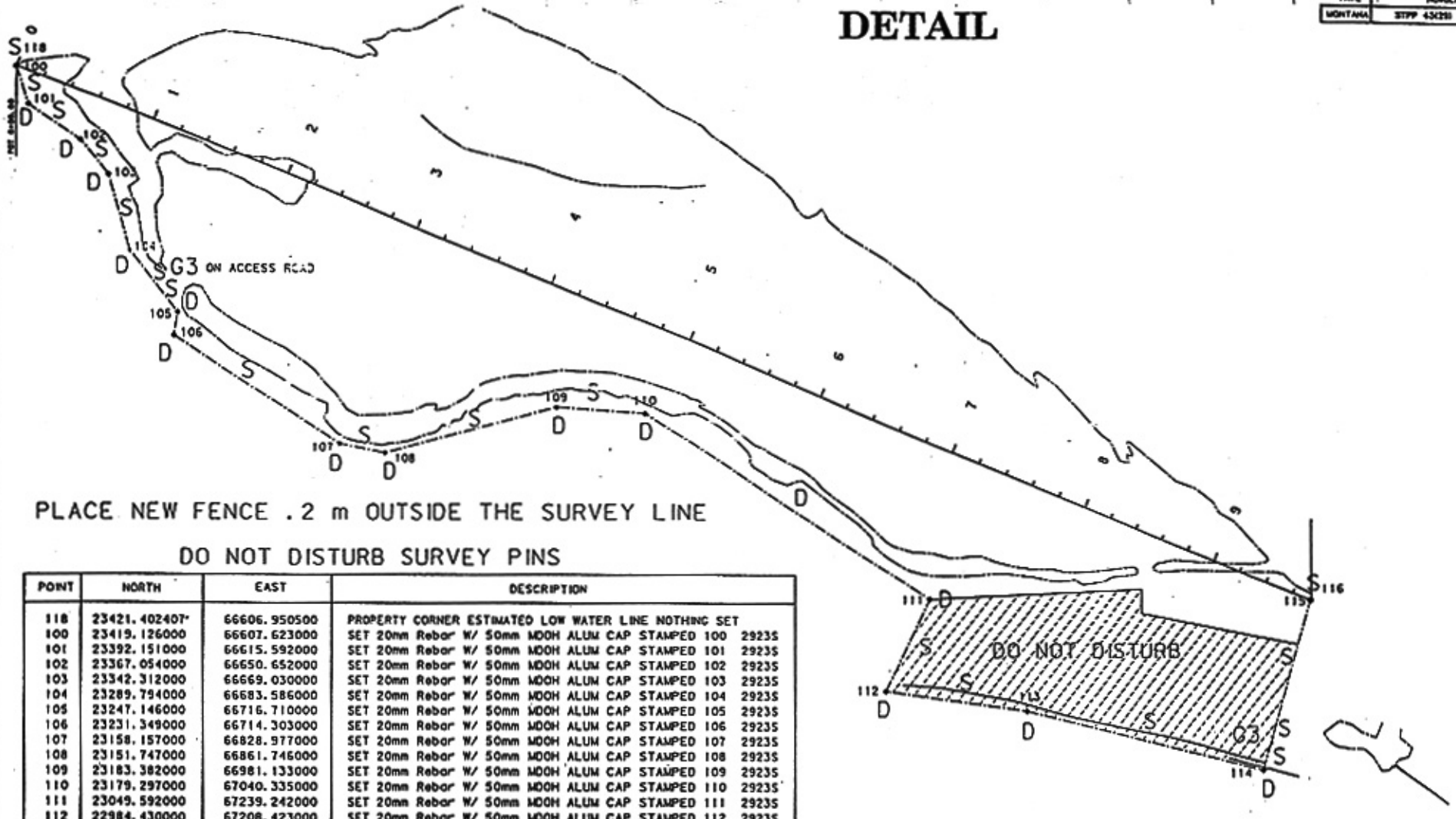
STATION	(lump sum)	PLUG WATER WELLS (lump sum)	(lump sum)	REMARKS
2+54		0.5		5m RIGHT OF LINE C1
4+45		0.5		7m RIGHT OF LINE C1
TOTAL		1.0		

FENCING

STATION FROM	STATION TO	REMOVE FENCE (meters)	FARM FENCE (meters)	FARM FENCE TYPE F5b (meters)	(meters)	FARM FENCE PANEL SINGLE (each)	FARM FENCE PANEL DOUBLE (each)	(each)	FARM GATE (meters)	FARM GATE TYPE G3 (meters)	REMARKS
0+00	3+73			1297.86		16	15			9.76	RIGHT OF C1 LINE
1+18	3+73	1059.44									RIGHT OF C1 LINE
TOTAL		1059.44		1297.86		16	15			9.76	

PRELIMINARY

DETAIL



PLACE NEW FENCE .2 m OUTSIDE THE SURVEY LINE

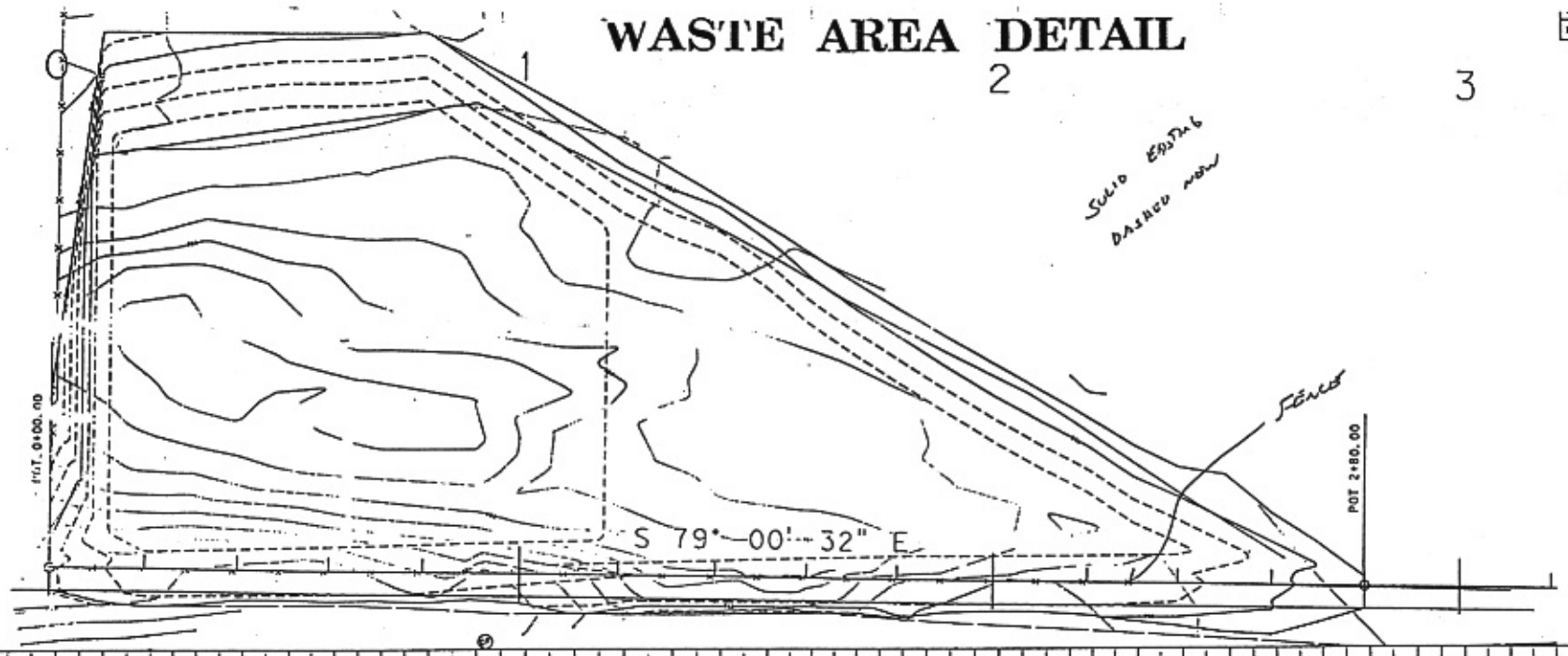
DO NOT DISTURB SURVEY PINS

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 MDOH ALUM CAP STAMPED 100 2923S
101	23392.151000	66615.592000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 101 2923S
102	23367.054000	66650.652000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 102 2923S
103	23342.312000	66669.030000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 103 2923S
104	23289.794000	66683.586000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 104 2923S
105	23247.146000	66716.710000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 105 2923S
106	23231.349000	66714.303000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 106 2923S
107	23158.157000	66828.977000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 107 2923S
108	23151.747000	66861.746000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 108 2923S
109	23183.382000	66981.133000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 109 2923S
110	23179.297000	67040.335000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 110 2923S
111	23049.592000	67239.242000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 111 2923S
112	22984.430000	67208.423000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 112 2923S
113	22970.254000	67306.505000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 113 2923S
114	22928.750000	67475.036000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 114 2923S
115	23049.382000	67507.593000	SET 20mm Rebar W/ 50mm MDOH ALUM CAP STAMPED 115 2923S
116	23053.606339	67508.733094	PROPERTY CORNER ESTIMATED LOW WATER LINE NOTHING SET

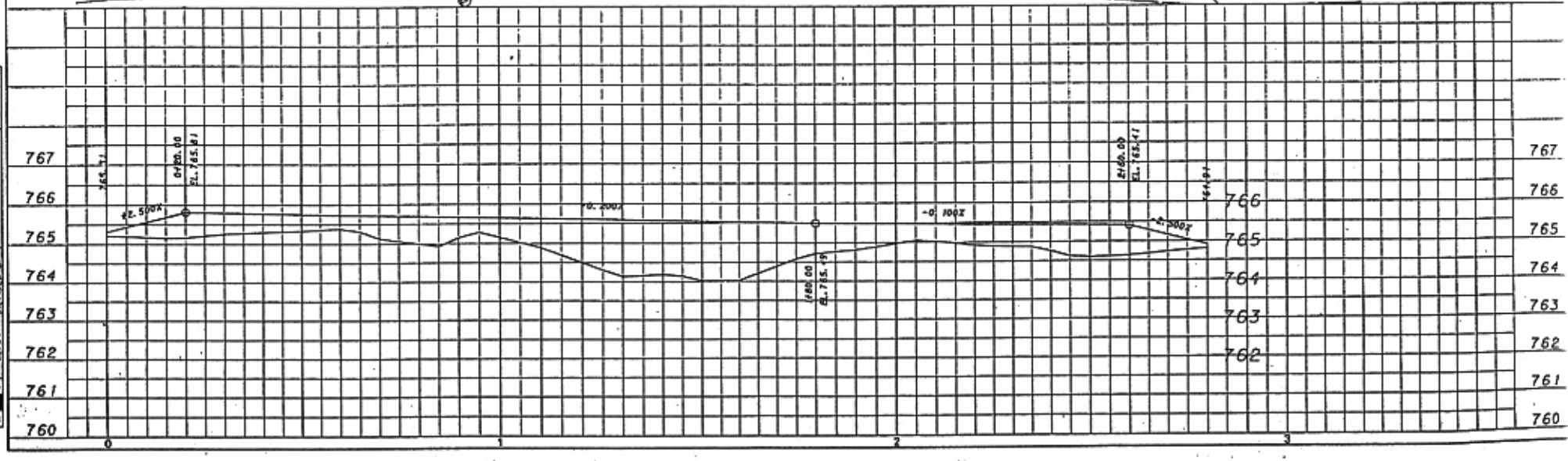
FENCING

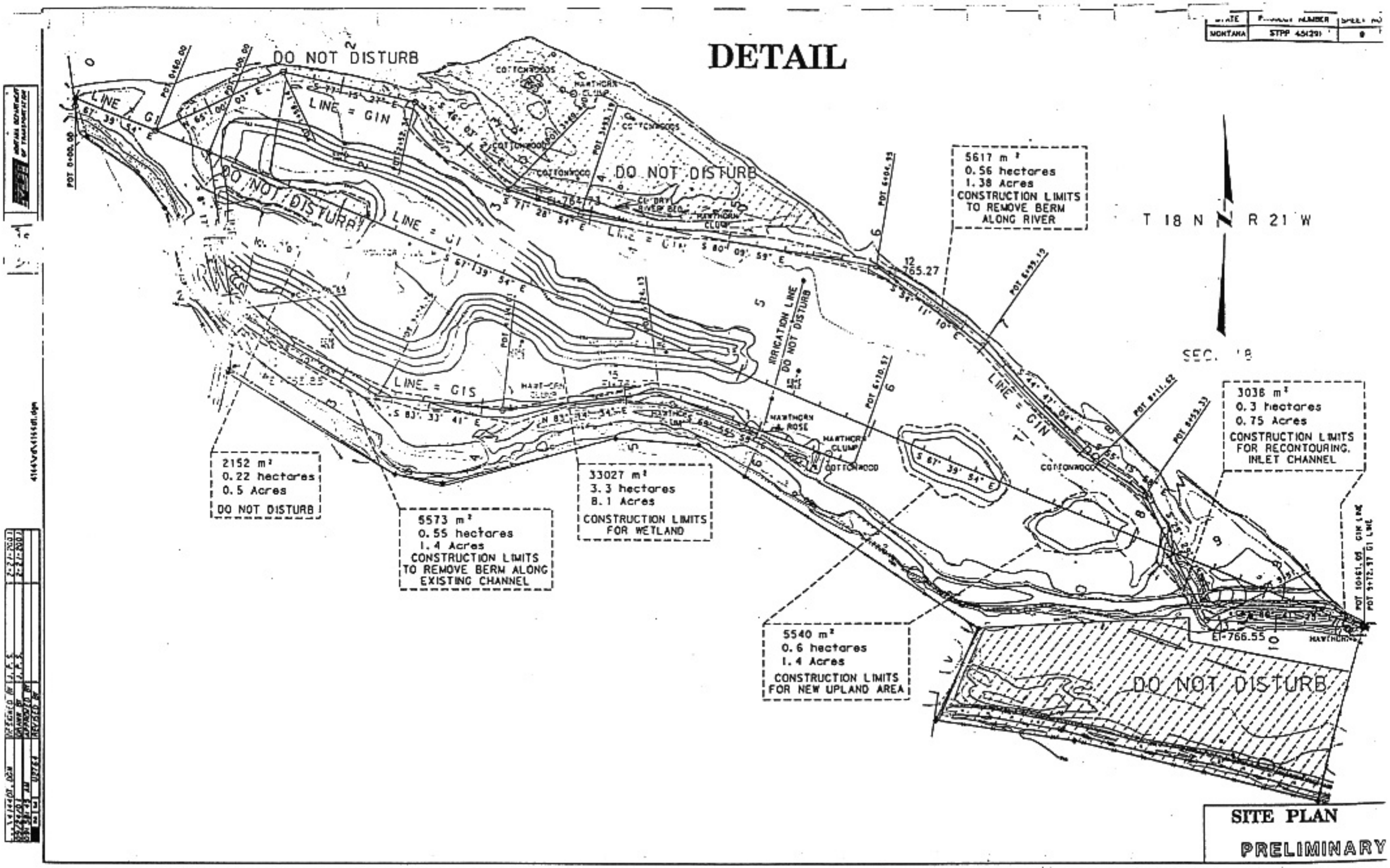
PRELIMINARY

WASTE AREA DETAIL

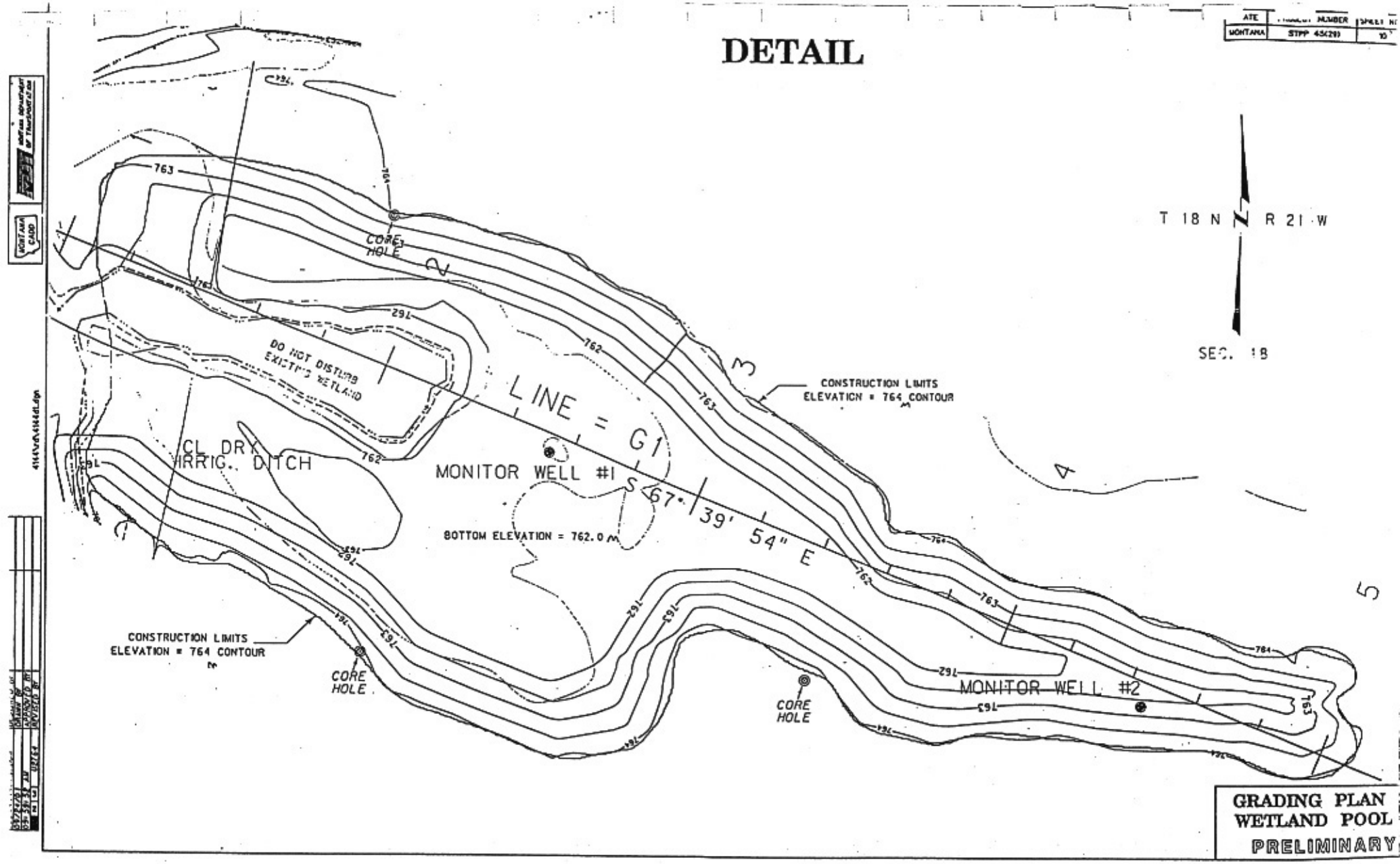


PRELIMINARY

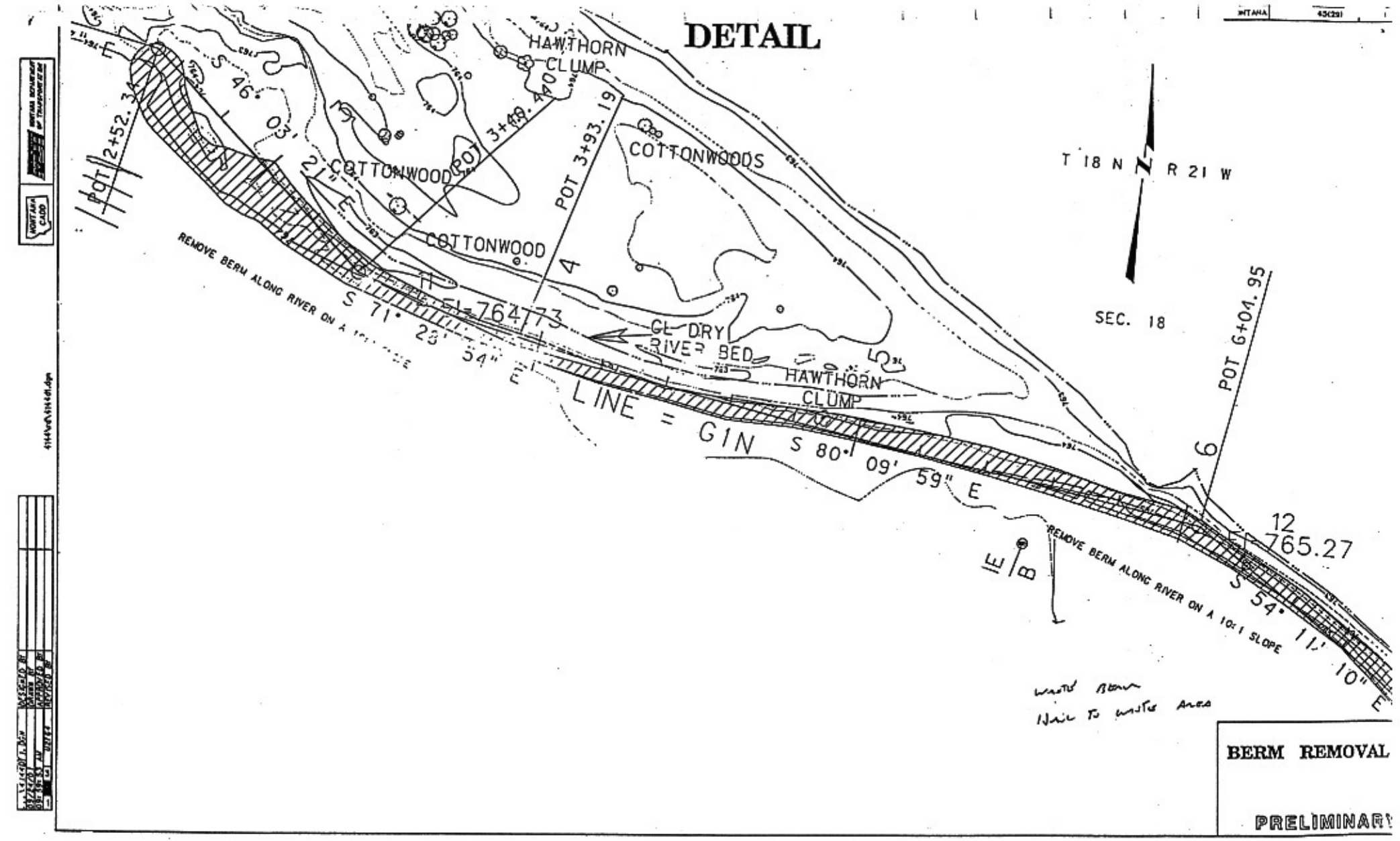



DETAIL
MONTANA
STPP 45(29)
DO NOT DISTURB
DO NOT DISTURB
DO NOT DISTURB
DO NOT DISTURB
LINE = GIN
LINE = GI
LINE = GIS
LINE = GIN
S 67° 39' 54" E
S 71° 28' 54" E
S 80° 09' 59" E
S 83° 33' 41" E
IRRIGATION LINE DO NOT DISTURB
COTTONWOODS
HAWTHORN CLUMP
COTTONWOOD
HAWTHORN & ROSE
T 18 N R 21 W
SEC. 18
El-765.27
El-766.55
5617 m²
0.56 hectares
1.38 Acres
CONSTRUCTION LIMITS
TO REMOVE BERM
ALONG RIVER
3036 m²
0.3 hectares
0.75 Acres
CONSTRUCTION LIMITS
FOR RECONTOURING
INLET CHANNEL
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
5540 m²
0.6 hectares
1.4 Acres
CONSTRUCTION LIMITS
FOR NEW UPLAND AREA
SITE PLAN
PRELIMINARY

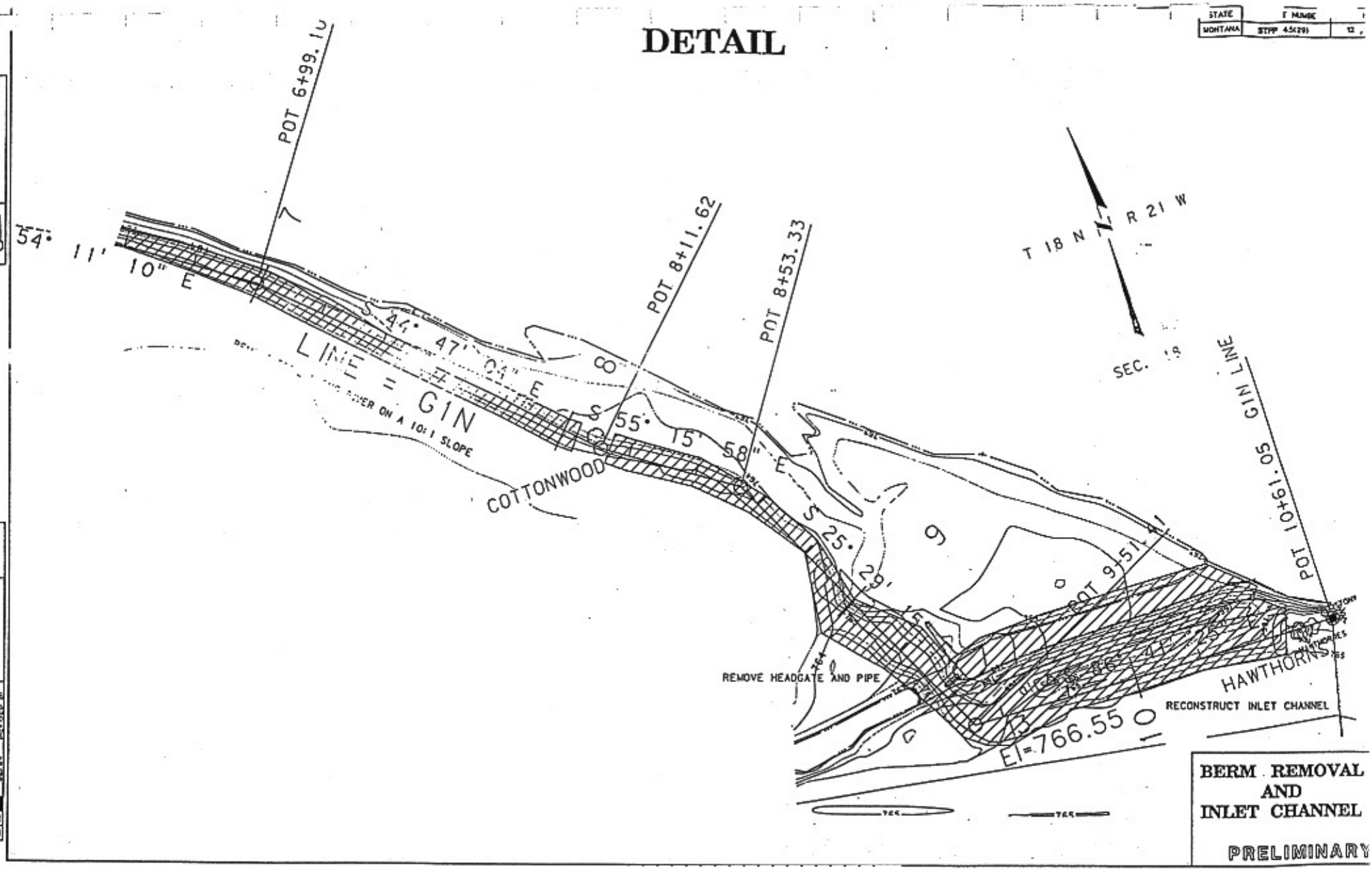
DETAIL



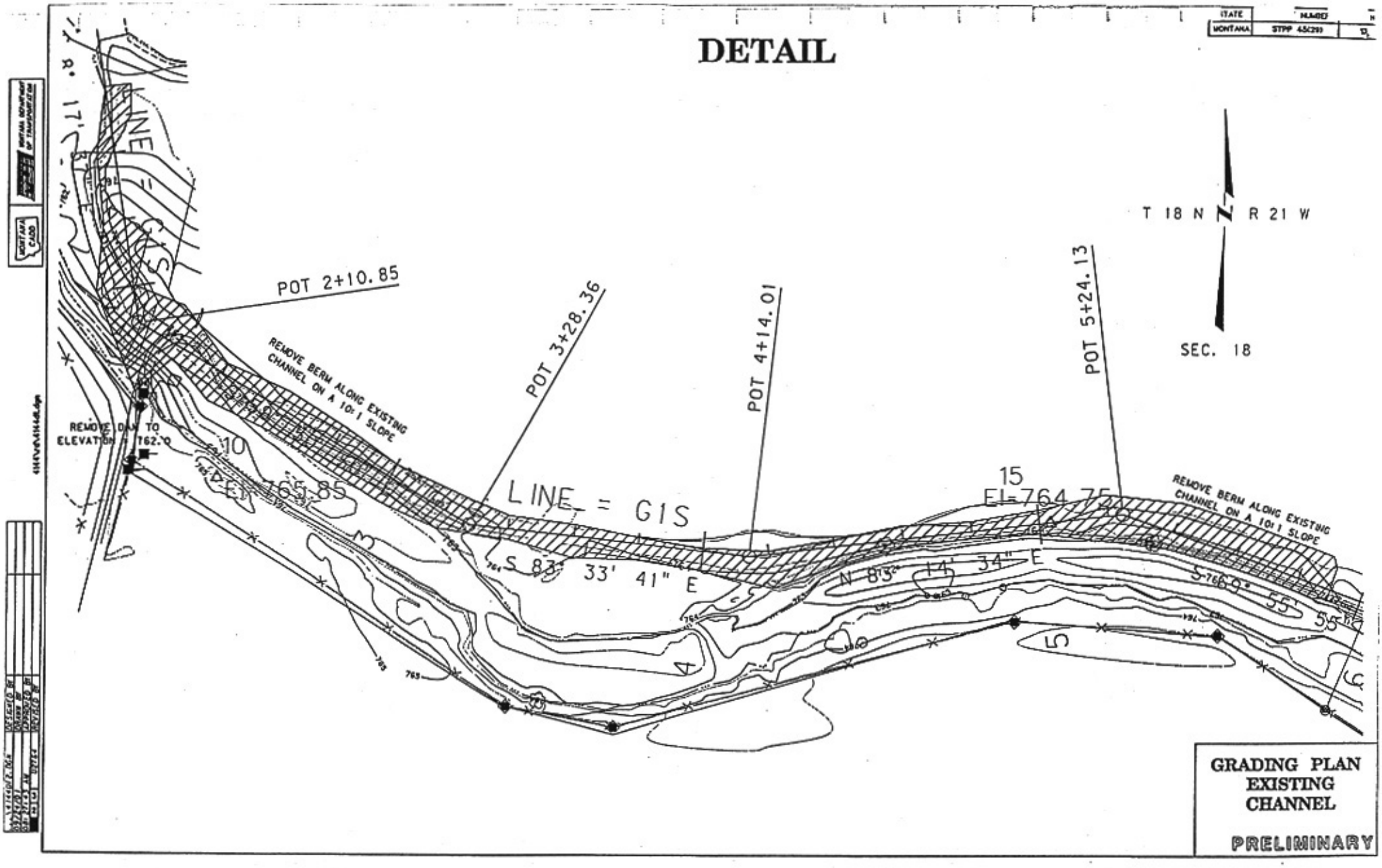
GRADING PLAN
WETLAND POOL
PRELIMINARY


DETAIL
HAWTHORN CLUMP
COTTONWOODS
COTTONWOOD
COTTONWOOD POT
POT 2+52.34
POT 3+49.40
POT 3+93.19
POT 6+04.95
S 46° 03' 21" E
T 18 N R 21 W
SEC. 18
REMOVE BERM ALONG RIVER ON A 10:1 SLOPE
S 71° 23' 54" E
EL 764.73
DRY RIVER BED
HAWTHORN CLUMP
LINE = G1N S 80° 09' 59" E
765.27
S 54° 11' 10" E
REMOVE BERM ALONG RIVER ON A 10:1 SLOPE
BERM REMOVAL
PRELIMINARY
LAND & WATER D-11

DETAIL


POT 6+99.10
POT 8+11.62
POT 8+53.33
POT 10+91.05
GIN LINE
T 18 N, R 21 W
SEC. 18
S 41° 47' 24" E
S 55° 15' 58" E
S 25° 29'
11' 10" E
LINE = GIN
COTTONWOOD
POT 9+51
REMOVE HEADGATE AND PIPE
HAWTHORNS
RECONSTRUCT INLET CHANNEL
El=766.55
BERM REMOVAL AND INLET CHANNEL
PRELIMINARY
LAND & WATER D-12

DETAIL

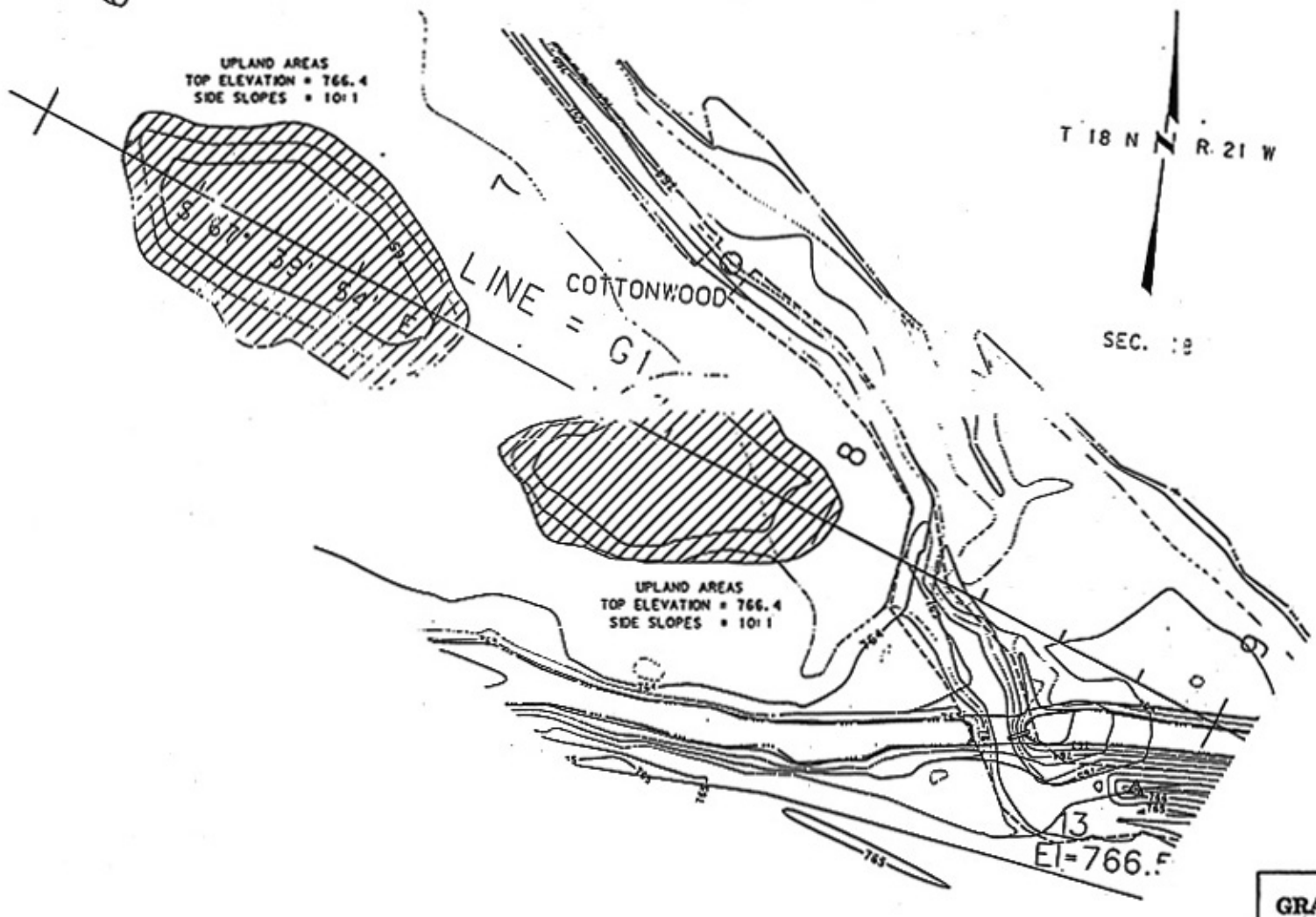


GRADING PLAN
EXISTING CHANNEL

PRELIMINARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 6342(9)	14

DETAIL



GRADING PLAN
UPLAND AREAS

PRELIMINARY

LAND & WATER D.14

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

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 Trimble GEO III GPS unit was also used for some sites in 2007.

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 and 2008 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

2008 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 – 2008

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

INTRODUCTION

This report summarizes data generated from eight years of mitigated wetland monitoring from sites throughout the State of Montana. Over all years of sampling, a total of 210 invertebrate samples have been collected. Table 1 lists the currently monitored sites at which aquatic invertebrates were collected in 2008, 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, 2007, and 2008 by personnel of PBS&J (Table 1). Sampling procedures were based on the protocols developed by the Montana Department of Environmental Quality (MDEQ) 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.

Assessment

The method employed to assess these wetlands is based on an index incorporating a battery of 12 bioassessment metrics or attributes (Table 2) 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, “good” 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 good, 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.

Six 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 2008, the lotic sites were Camp Creek (2 sites), Cloud Ranch stream, Jack Creek – McKee Spring, and Jocko Spring Creek (2 sites). 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 (MVFP index: 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 (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 2008 samples are given in Tables 4a-4c and 5. Thermal preference of invertebrate assemblages was calculated using Brandt 2001.

Bioassessment metrics – lotic habitats

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

1. Ephemeroptera (mayfly) taxa richness. The number of mayfly taxa declines as water quality diminishes. Impairments to water quality which have been demonstrated to adversely affect the ability of mayflies to flourish include elevated water temperatures, heavy metal contamination, increased turbidity, low or high pH, elevated specific conductance and toxic chemicals. Few mayfly species are able to tolerate certain disturbances to instream habitat, such as excessive sediment deposition.

2. Plecoptera (stonefly) taxa richness. Stoneflies are particularly susceptible to impairments that affect a stream on a reach-level scale, such as loss of riparian canopy, streambank instability, channelization, and alteration of morphological features such as pool frequency and function, riffle development and sinuosity. Just as all benthic organisms, they are also susceptible to smaller scale habitat loss, such as by sediment deposition, loss of interstitial spaces between substrate particles, or unstable substrate.

3. Trichoptera (caddisfly) taxa richness. Caddisfly taxa richness has been shown to decline when sediment deposition affects habitat. In addition, the presence of certain case-building caddisflies can indicate good retention of woody debris and lack of scouring flow conditions.

4. Number of sensitive taxa. Sensitive taxa are generally the first to disappear as anthropogenic disturbances increase. The list of sensitive taxa used here includes organisms sensitive to a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others. Unimpaired streams of western Montana typically support at least four sensitive taxa (Bollman 1998).

5. Percent filter feeders. Filter-feeding organisms are a diverse group; they capture small particles of organic matter, or organically enriched sediment material, from the water column by means of a variety of adaptations, such as silken nets or hairy appendages. In forested montane streams, filterers are expected to occur in insignificant numbers. Their abundance increases when canopy cover is lost and when water temperatures increase and the accompanying growth of filamentous algae occurs. Some filtering organisms, specifically the Arctopsychid caddisflies (*Arctopsyche* spp. and *Parapsyche* spp.) build silken nets with large mesh sizes that capture small organisms such as chironomids and early-instar mayflies. Here they are considered predators, and, in this study, their abundance does not contribute to the percent filter feeders metric.

6. Percent tolerant taxa. Tolerant taxa are ubiquitous in stream sites, but when disturbance increases, their abundance increases proportionately. The list of taxa used here includes organisms tolerant of a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others.

Table 1. Montana Department of Transportation Mitigated Wetlands Monitoring Project sites: sampling history. Only those sites sampled in 2008 are included. An asterisk indicates lotic sites.

Site Identifier	2001	2002	2003	2004	2005	2006	2007	2008
Roundup	+	+	+	+	+	+	+	+
Hoskins Landing MS-1		+	+	+	+	+	+	+
Peterson Ranch Pond 2		+		+	+	+	+	+
Peterson Ranch Pond 4		+	+	+	+	+	+	+
Perry Ranch		+			+			+
Camp Creek MS-1*		+	+	+	+	+	+	+
Camp Creek MS-2*						+	+	+
Cloud Ranch Pond				+	+		+	+
Cloud Ranch Stream*				+			+	+
Jack Creek – Pond				+	+	+	+	+
Jack Creek – McKee*							+	+
Norem				+	+	+	+	+
Rock Creek Ranch					+	+	+	+
Wagner Marsh					+	+	+	+
Alkali Lake 1						+	+	+
West Fork of Charley Creek							+	+
Woodson Pond MI 1							+	+
Woodson Stream MI 2*							+	+
Little Muddy Creek							+	+
Selkirk Ranch							+	+
DH Ranch							+	+
Jocko Spring Creek MS-1								+
Jocko Spring Creek MS-2								+
Sportsman's Campground Site #1								+
Sportsman's Campground Site #2								+
Sportsman's Campground Site #3								+
Lonepine #1								+
Lonepine #2								+

Table 2. Aquatic invertebrate metrics employed for wetland (lentic) invertebrate assemblages in the MDT mitigated wetlands study, 2001 – 2008.

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

RESULTS

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

Table 4a. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	Roundup	Hoskins Landing MS 1	Peterson Ranch Pond 2	Peterson Ranch Pond 4	Perry Ranch	Cloud Ranch Pond	Jack Creek Pond	Norem
Total taxa	9	18	13	25	11	27	21	14
POET	0	2	1	3	0	5	2	0
Chironomidae taxa	4	5	3	6	5	14	7	6
Crustacea + Mollusca	3	6	3	5	2	4	6	2
% Chironomidae	80.37%	17.00%	3.70%	13.21%	88.79%	49.53%	42.86%	34.69%
Orthocladiinae/Chir	0.63	0.18	1.50	0.21	0.82	0.66	0.40	0.53
% Amphipoda	0.00%	8.00%	0.00%	0.00%	0.00%	6.54%	15.24%	0.00%
% Crustacea + % Mollusca	15.89%	48.00%	86.11%	43.40%	6.54%	10.28%	30.48%	26.53%
HBI	8.01	7.62	7.85	7.40	7.37	5.94	8.17	7.61
% Dominant taxon	50.47%	27.00%	84.26%	25.47%	62.62%	13.08%	19.05%	26.53%
% Collector-Gatherers	31.78%	54.00%	87.96%	20.75%	20.56%	56.07%	65.71%	44.90%
% Filterers	2.80%	10.00%	0.00%	1.89%	0.00%	3.74%	1.90%	0.00%
Total taxa	1	3	1	5	1	5	5	1
POET	1	1	1	3	1	5	1	1
Chironomidae taxa	3	3	3	3	3	5	5	3
Crustacea + Mollusca	1	5	1	3	1	3	5	1
% Chironomidae	1	5	5	5	1	1	1	3
Orthocladiinae/Chir	5	1	5	3	5	5	3	5
% Amphipoda	5	3	5	5	5	3	3	5
% Crustacea + % Mollusca	5	3	1	3	5	5	5	5
HBI	1	1	1	3	3	5	1	1
% Dominant taxon	1	5	1	5	1	5	5	5
% Collector-Gatherers	1	3	5	1	1	3	3	1
% Filterers	3	1	3	3	3	3	3	3
Total Score	**28**	**34**	**32**	**42**	**30**	**48**	**40**	**34**
Percent of Maximum Score	**46.67%**	**56.67%**	**53.33%**	**70.00%**	**50.00%**	**80.00%**	**66.67%**	**56.67%**
Impairment Classification	**poor**	**sub-optimal**	**sub-optimal**	**good**	**poor**	**good**	**sub-optimal**	**sub-optimal**

Table 4b. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	Rock Creek Ranch	Wagner Marsh	Alkali Lake	West Fork of Charley Creek	Woodson Pond	Woodson Stream	Little Muddy Creek	Selkirk Ranch
Total taxa	23	11	10	9	13	7	14	17
POET	1	4	0	0	1	3	1	1
Chironomidae taxa	5	2	2	1	7	0	2	8
Crustacea + Mollusca	5	2	3	3	2	2	3	5
% Chironomidae	28.97%	2.83%	5.41%	0.91%	60.00%	0.00%	55.00%	23.38%
Orthocladiinae/Chir	0.97	0.00	0.00	0.00	0.52	0	0.64	0.33
% Amphipoda	0.00%	0.00%	0.00%	67.27%	0.00%	7.69%	0.00%	5.19%
% Crustacea + % Mollusca	28.97%	39.62%	32.43%	70.91%	25.45%	15.38%	17.00%	48.05%
HBI	6.91	7.45	8.57	8.19	8.14	4.62	6.97	7.76
% Dominant taxon	22.43%	48.11%	48.65%	67.27%	25.45%	30.77%	35.00%	32.47%
% Collector-Gatherers	30.84%	52.83%	21.62%	68.18%	86.36%	23.08%	29.00%	16.88%
% Filterers	1.87%	0.00%	0.00%	0.00%	0.00%	30.77%	0.00%	32.47%
Total taxa	5	1	1	1	1	1	1	3
POET	1	5	1	1	1	3	1	1
Chironomidae taxa	3	1	1	1	5	1	1	5
Crustacea + Mollusca	3	1	1	1	1	1	1	3
% Chironomidae	3	5	5	5	1	5	1	3
Orthocladiinae/Chir	5	1	1	1	5	Not Scored	5	3
% Amphipoda	5	5	5	1	5	3	5	3
% Crustacea + % Mollusca	5	3	5	1	5	5	5	3
HBI	3	3	1	1	1	5	3	1
% Dominant taxon	5	3	3	1	5	5	3	5
% Collector-Gatherers	1	3	1	3	5	1	1	1
% Filterers	3	3	3	3	3	1	3	1
Total Score	**42**	**34**	**28**	**20**	**38**	**31**	**30**	**32**
Percent of Maximum Score	**70.00%**	**56.67%**	**46.67%**	**33.33%**	**63.33%**	**56.36%**	**50.00%**	**53.33%**
Impairment Classification	**good**	**sub-optimal**	**poor**	**poor**	**sub-optimal**	**sub-optimal**	**poor**	**sub-optimal**

Table 4c. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	DH Ranch	Sportsman's Campground Site # 1	Sportsman's Campground Site # 2	Sportsman's Campground Site # 3	Lonepine # 1	Lonepine # 2
Total taxa	15	16	9	12	18	4
POET	1	1	0	0	2	0
Chironomidae taxa	6	6	3	7	12	3
Crustacea + Mollusca	2	5	3	4	1	1
% Chironomidae	52.29%	10.91%	41.18%	69.09%	81.82%	57.14%
Orthocladiinae/Chir	0.09	0.17	0.00	0.25	0.13	0.00
% Amphipoda	0.00%	24.55%	5.88%	27.27%	0.00%	0.00%
% Crustacea + % Mollusca	30.28%	83.64%	23.53%	29.09%	7.27%	42.86%
HBI	7.33	7.55	8.76	7.55	7.60	8.14
% Dominant taxon	33.03%	56.36%	29.41%	25.45%	25.45%	42.86%
% Collector-Gatherers	49.54%	20.91%	11.76%	57.27%	55.45%	28.57%
% Filterers	0.92%	63.64%	11.76%	25.45%	22.73%	42.86%
Total taxa	3	3	1	1	3	1
POET	1	1	1	1	1	1
Chironomidae taxa	3	3	3	5	5	3
Crustacea + Mollusca	1	3	1	3	1	1
% Chironomidae	1	5	3	1	1	1
Orthocladiinae/Chir	1	1	1	3	1	1
% Amphipoda	5	1	3	1	5	5
% Crustacea + % Mollusca	5	1	5	5	5	3
HBI	3	3	1	3	3	1
% Dominant taxon	5	1	5	5	5	3
% Collector-Gatherers	3	1	1	3	3	1
% Filterers	3	1	1	1	1	1
Total Score	**34**	**24**	**26**	**32**	**34**	**22**
Percent of Maximum Score	**56.67%**	**40.00%**	**43.33%**	**53.33%**	**56.67%**	**36.67%**
Impairment Classification	**sub-optimal**	**poor**	**poor**	**sub-optimal**	**sub-optimal**	**poor**

Table 5. Metric values and scores for stream (lotic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	Camp Creek MS-1	Camp Creek MS-2	Cloud Ranch Stream	Jack Creek – McKee Spring	Jocko Spring Creek MS-1	Jocko Spring Creek MS-2
E Richness	7	5	4	1	0	1
P Richness	2	2	0	0	0	1
T Richness	4	6	5	3	2	5
Pollution Sensitive Richness	0	1	0	0	0	0
Filterer Percent	29.00%	37.00%	5.00%	40.00%	15.00%	11.00%
Pollution Tolerant Percent	5.00%	3.00%	28.00%	1.00%	62.00%	15.00%
E Richness	3	2	2	0	0	0
P Richness	2	2	0	0	0	1
T Richness	2	3	3	2	1	3
Pollution Sensitive Richness	0	1	0	0	0	0
Filterer Percent	1	0	3	0	1	1
Pollution Tolerant Percent	3	3	0	3	0	1
Total score	**11**	**11**	**8**	**5**	**2**	**6**
Percent of maximum score	**61%**	**61%**	**44%**	**28%**	**11%**	**33%**
Impairment classification	**slight**	**slight**	**moderate**	**moderate**	**severe**	**moderate**

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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: MDT08PBSJ
RAI No.: MDT08PBSJ017

RAI No.: MDT08PBSJ017 **Sta. Name:** Hoskins Landing MS 1
Client ID:
Date Coll.: 7/24/2008 **No. Jars:** 1 **STORET ID:**

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Cladocera	9	9.00%	Yes	Unknown		8	CF
Hyalellidae							
Hyalella sp.	8	8.00%	Yes	Unknown		8	CG
Lymnaeidae							
Fossaria sp.	2	2.00%	Yes	Unknown		6	SC
Naididae							
Nais sp.	24	24.00%	Yes	Unknown		8	CG
Physidae							
Physidae	27	27.00%	Yes	Unknown		8	SC
Planorbidae							
Gyraulus sp.	1	1.00%	Yes	Unknown		8	SC
Planorbidae	1	1.00%	Yes	Immature		6	SC
Odonata							
Libellulidae							
Libellulidae	1	1.00%	Yes	Larva	Damaged	9	PR
Ephemeroptera							
Baetidae							
Callibaetis sp.	6	6.00%	Yes	Larva		9	CG
Heteroptera							
Belostomatidae							
Belostoma sp.	1	1.00%	Yes	Larva		7	PR
Coleoptera							
Haliplidae							
Peltodytes sp.	1	1.00%	Yes	Larva		5	SH
Hydrophilidae							
Hydrophilidae	1	1.00%	Yes	Larva		5	PR
Diptera							
Ceratopogonidae							
Ceratopogoninae	1	1.00%	Yes	Larva		6	PR
Chironomidae							
Chironomidae							
Ablabesmyia sp.	1	1.00%	Yes	Larva		8	CG
Chironomidae	1	1.00%	No	Pupa		10	CG
Dicrotendipes sp.	1	1.00%	Yes	Larva		8	CG
Psectrocladius sp.	3	3.00%	Yes	Larva		8	CG
Pseudochironomus sp.	10	10.00%	Yes	Larva		5	CG
Tanytarsus sp.	1	1.00%	Yes	Larva		6	CF
Sample Count	**100**						

Metrics Report

Project ID: MDT08PBSJ
RAI No.: MDT08PBSJ017
Sta. Name: Hoskins Landing MS 1
Client ID:
STORET ID:
Coll. Date: 7/24/2008

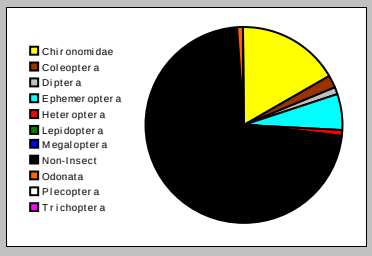
Abundance Measures

Sample Count: 100
Sample Abundance: 3,000.00 3.33% of sample used

Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	7	72	72.00%
Odonata	1	1	1.00%
Ephemeroptera	1	6	6.00%
Plecoptera			
Heteroptera	1	1	1.00%
Megaloptera			
Trichoptera			
Lepidoptera			
Coleoptera	2	2	2.00%
Diptera	1	1	1.00%
Chironomidae	5	17	17.00%

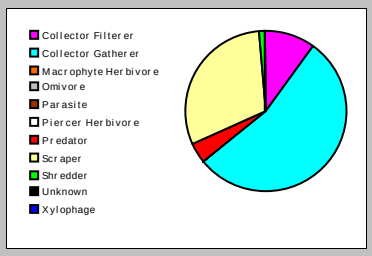


Dominant Taxa

Category	A	PRA
Physidae	27	27.00%
Nais	24	24.00%
Pseudochironomus	10	10.00%
Cladocera	9	9.00%
Hyalella	8	8.00%
Callibaetis	6	6.00%
Psectrocladius	3	3.00%
Fossaria	2	2.00%
Hydrophilidae	1	1.00%
Gyraulus	1	1.00%
Dicrotendipes	1	1.00%
Chironomidae	1	1.00%
Ceratopogoninae	1	1.00%
Belostoma	1	1.00%
Ablabesmyia	1	1.00%

Functional Composition

Category	R	A	PRA
Predator	4	4	4.00%
Parasite			
Collector Gatherer	7	54	54.00%
Collector Filterer	2	10	10.00%
Macrophyte Herbivore			
Piercer Herbivore			
Xylophage			
Scraper	4	31	31.00%
Shredder	1	1	1.00%
Omivore			
Unknown			

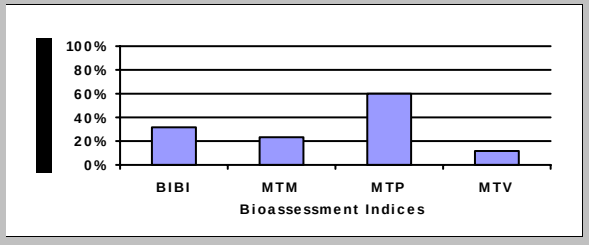


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
Composition					
Taxa Richness	18	1	2		0
Non-Insect Percent	72.00%				
E Richness	1	1		0	
P Richness	0	1		0	
T Richness	0	1		0	
EPT Richness	1		0		0
EPT Percent	6.00%		0		0
Oligochaeta+Hirudinea Percent	24.00%				
Baetidae/Ephemeroptera	1.000				
Hydropsychidae/Trichoptera	0.000				
Dominance					
Dominant Taxon Percent	27.00%		3		2
Dominant Taxa (2) Percent	51.00%				
Dominant Taxa (3) Percent	61.00%	3			
Dominant Taxa (10) Percent	91.00%				
Diversity					
Shannon H (loge)	2.170				
Shannon H (log2)	3.130		3		
Margalef D	3.700				
Simpson D	0.156				
Evenness	0.090				
Function					
Predator Richness	4		2		
Predator Percent	4.00%	1			
Filterer Richness	2				
Filterer Percent	10.00%			2	
Collector Percent	64.00%		2		2
Scraper+Shredder Percent	32.00%		3		1
Scraper/Filterer	3.100				
Scraper/Scraper+Filterer	0.756				
Habit					
Burrower Richness	3				
Burrower Percent	12.00%				
Swimmer Richness	2				
Swimmer Percent	7.00%				
Clinger Richness	1	1			
Clinger Percent	1.00%				
Characteristics					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	5				
Hemoglobin Bearer Percent	14.00%				
Air Breather Richness	1				
Air Breather Percent	1.00%				
Voltinism					
Univoltine Richness	7				
Semivoltine Richness	4	3			
Multivoltine Percent	32.00%		3		
Tolerance					
Sediment Tolerant Richness	3				
Sediment Tolerant Percent	4.00%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.083				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	44.00%	3		0	
Hilsenhoff Biotic Index	7.620		0		0
Intolerant Percent	0.00%				
Supertolerant Percent	82.00%				
CTQa	99.692				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	16	32.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	18	60.00%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	2	11.11%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	5	23.81%	Moderate



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

September 27, 2006

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 Project Specific Agreement Between MDT and CSKT For Wetlands Mitigation For Highway 200 Dixon West Project (January 2002).
2002 - 2005	SKC Native Plant Nursery completed revegetation per (1) Project Specific Agreement Between MDT and CSKT For Wetlands Mitigation For Highway 200 Dixon West Project (January 2002) and (2) MOA Between CSKT and SKC for Plant Installation for Hoskin's Landing Wetland Mitigation Project (March 2004).
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]
Forbs:						
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
Grasses:						
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
Forbs:			
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	

Helianthus annuus	common sunflower	N	
Linum lewisii	Lewis flax	N	
Lupinus argenteus, leucophyllus, and/or sericeus	silvery lupine, velvet lupine, silky lupine	N	
Phacelia hastate or heterophylla	whiteleaf or virgate phacelia	N	
Sisyrinchium inflatum	blue-eyed grass	N	
Solidago canadensis or missouriensis	Canada or Missouri goldenrod	N	
Grasses:			
Bromus carinatus/marginatus	California/mountain brome	N	competitive - use very low rate
Elymus canadensis	Canada wildrye	N	
Elymus cinereus	basin wildrye	N	
Elymus elymoides	squireltail	N	
Elymus glaucus	blue wildrye	N	
Elymus lanceolatus	thickspike/streambank wheatgrass	N	competitive - use very low rate
Elymus trachycaulus	slender wheatgrass	N	
Hierochloe oderata	sweetgrass	N	
Koeleria macrantha	prairie Junegrass	N	
Pascopyrum smithii	western wheatgrass	N	
Poa secunda	Sandberg bluegrass	N	
Pseudoroegneria spicata	bluebunch wheatgrass	N	
Stipa comada	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, HYPPER 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 Reservation[1].

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
Mixes:			
	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.