MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2003

Peterson Ranch
Hall, Montana

Prepared for:

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

Prepared by:

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

March 2004

Project No: 130091.010

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1.0 INTRODUCTION

The Peterson Ranch Wetland Mitigation Site was developed to mitigate wetland impacts associated with the Montana Department of Transportation (MDT) reconstruction of Highway 1 between Maxville and Drummond and as a potential reserve for future highway projects in Watershed #2. The Peterson Ranch is located in Granite County, Watershed # 2, in the Upper Clark Fork region. The mitigation site is located south and east of Hall, Montana (**Figure 1**). Elevation is approximately 4,200 feet with slight topographic variation throughout the project site. Turnstone Biological conducted the original wetland delineation for the Peterson Ranch proposed mitigation site in 1998.

The approximate mitigation boundary is illustrated on **Figure 2** (**Appendix A**), and the original site plans are included in **Appendix D**. The mitigation site boundary starts along the southern edge of Montana Highway 512. Fence lines are located on both the west and east sides of the mitigation site, running south. On the west side of the site, an older fence line is still in place, preventing livestock from grazing within the project boundary. On the east side, the fence line follows the parcel boundary that is adjacent to an active timber mill. The fence lines form a distinct perimeter, encompassing the newly created/enhanced wetlands. Electric fence is used to close off the southern most boundary of the mitigation site near the southern end of pond #1.

Seasonal flooding of Flint Creek and an irrigation- influenced shallow groundwater table provide the primary wetland hydrology. The local groundwater systems are also influenced by the adjacent Flint Creek and the movement of subsurface flow though the highly permeable alluvium substrate located within the floodplain of the Flint Creek Valley.

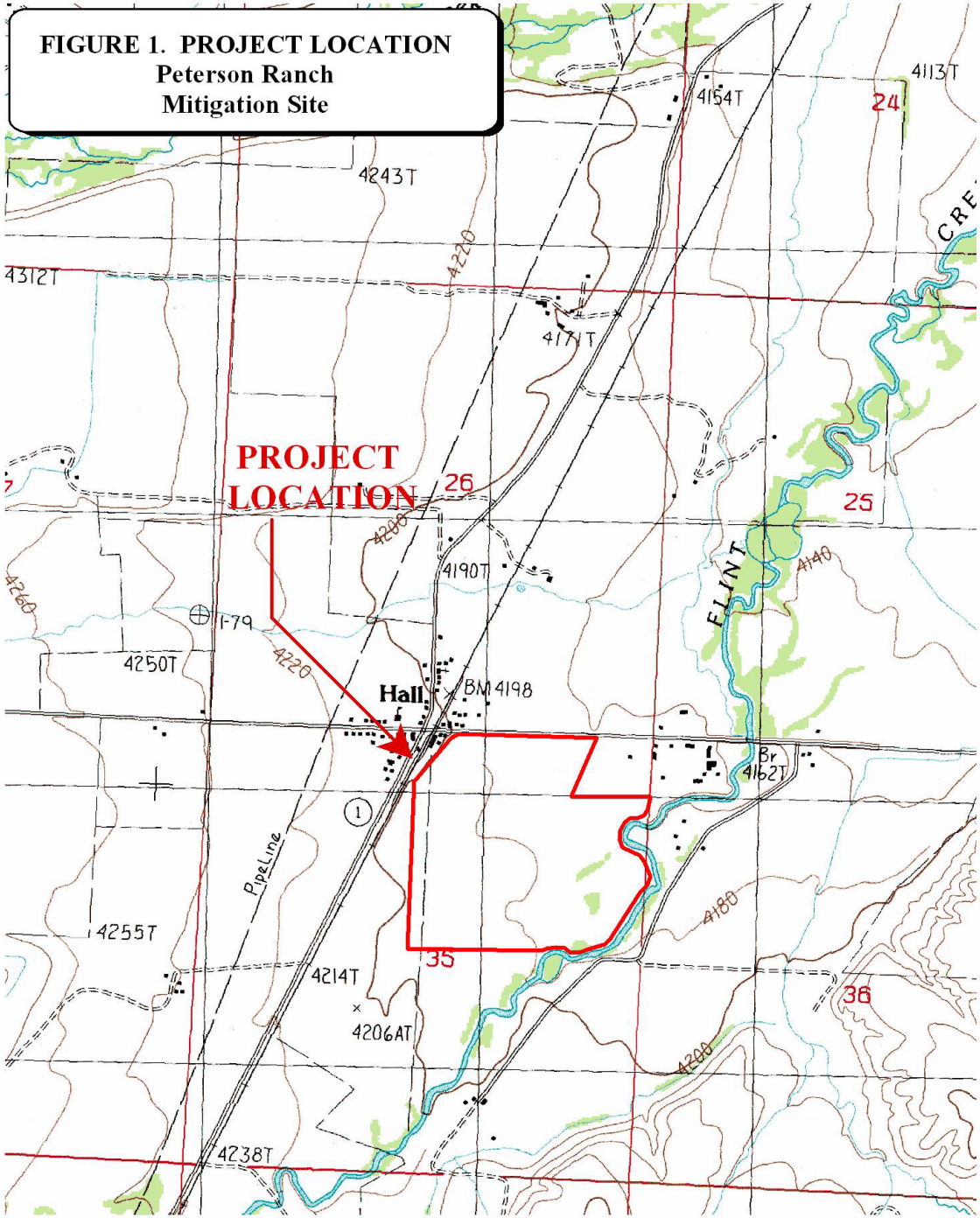
Project goals for the Peterson Ranch wetland mitigation site include the following:

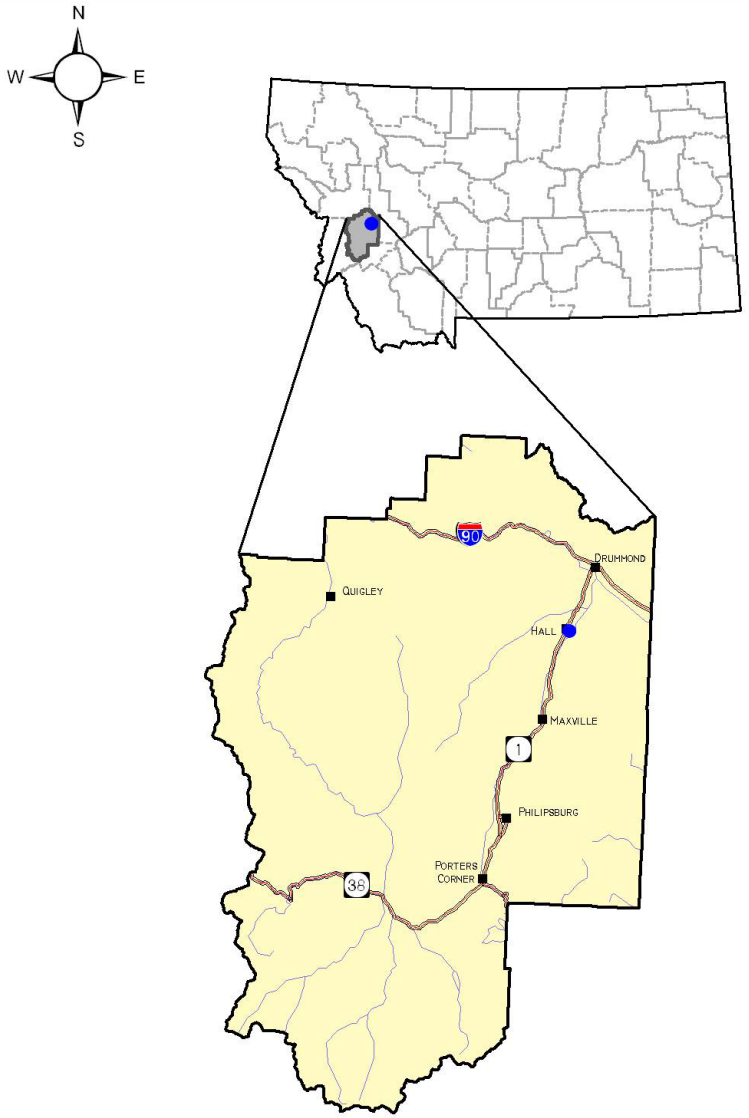
- Creation of a protective easement.
- Creation of 17.5 acres of wetlands.
- Grazing management plan developed to enhance 80.6 acres.
- Enhancement of riparian vegetation through plantings and seeding.
- Creation of new wetlands with open water habitat.
- Improved functions and values ratings.

Construction was completed in the spring of 2002; diagrams are presented in **Appendix D**. Revegetation work was also completed in the spring of 2002; planting specifications are presented in **Appendix E**. The primary components of construction include:

- Construction of existing uplands into 8.2 acres of four shallow water pools and adjoining emergent wetlands.
- Construction of degraded wet meadow into 9.4 acres of shallow open water and emergent/scrub-shrub wetlands.

FIGURE 1. PROJECT LOCATION
Peterson Ranch
Mitigation Site





PROJECT #: 130091.010
DATE: DEC 2002
LOCATION: HALL, MT
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. STEINEBACH

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The site was designed to mitigate for specific wetland functions and values impacted by MDT roadway projects. These include riparian, wet meadow, emergent and open water wetland areas lost to MDT construction. Impacted functions include sediment and nutrient retention, water quality, groundwater recharge, and waterfowl/wildlife habitat.

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

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on May 29 (spring season), August 6 (mid-season), and October 16 (fall season), 2003. The spring and fall visits were conducted to sample seasonal 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 mitigation site monitoring form (**Appendix B**). No groundwater monitoring wells were installed at the site

2.3 Vegetation

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

Two 10-foot wide belt transects were established during the mid-season monitoring event to represent the range of current vegetation conditions. Percent cover was estimated for each vegetative species within each successive vegetative community encountered within the "belt" using the following values: T (few plants); P (1-5%), 1 (5-15%); 2 (15-25%); 3 (25-35%); 4 (35-45%); 5 (45-55%) and so on to 9 (85-95%). The transect locations are illustrated on **Figure 2**

(**Appendix A**). The transects will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect locations were marked on the air photo and all data were recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with the GPS unit in 2002. A photograph was taken from both ends of each transect looking along the transect path.

A comprehensive plant species list for the site was compiled and will be updated as new species are encountered. Ultimately, observations from past years will be compared with new data to document vegetation changes over time.

2.4 Soils

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

2.5 Wetland Delineation

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

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during site visits. 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 also recorded during all three-site visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. Observations were generally recorded incidental to other monitoring activities and were categorized by species, activity code, and general habitat association.

2.8 Macroinvertebrates

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

2.9 Functional Assessment

Functional assessment forms were completed using the 1999 MDT Montana Wetland Assessment Method (**Appendix B**). Field data necessary for this assessment were collected during the mid-season visit. Turnstone Biological completed baseline functional assessment during the initial wetland delineation using the 1996 MDT Montana Wetland Field Evaluation Form.

2.10 Photographs

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

2.11 GPS Data

During the 2002 monitoring season, point data were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations and at all photograph locations. Wetland boundaries were also recorded with a resource grade GPS unit in 2002, but were modified via hand mapping onto aerial photographs in 2003. The method used to collect these points is described in the GPS protocol in **Appendix E**.

2.12 Maintenance Needs

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

3.0 RESULTS

3.1 Hydrology

The main source of hydrology is seasonal flooding by Flint Creek. This mitigation site occurs in Flint Creek Valley floodplain consisting of areas of low topography, small side channels (irrigation ditches) and ponds. Another primary source of hydrology is the high groundwater

table influenced by irrigation ditches and persistent upwelling and lateral movement of groundwater through the alluvial materials located throughout the floodplain.

Open water (OW) occurred across approximately 1.9 acres or 4% of the 48-acre mitigation site during the mid-season visit (**Figure 3**). Shallow OW/ponds #1, 2, 3, 4 and 5 (**Figure 3**) were constructed to depths of less than 6.6 feet. Emergent surrounding wetlands along the south end of OW/pond #1 were inundated and draining into the open water. The outer fringes of OW/ponds #3, 4, and 5 were also inundated and surrounded by more extensive emergent vegetation. Inundation was observed at approximately 40% of the wetland area on the site. Water levels at OW/pond # 2 were lower than observed during the 2002 monitoring. The outer pond fringes are developing into emergent vegetation types. Open water habitat was dominated by non-rooted aquatic vegetation and algae.

Approximate percentages of inundation at OW/ponds 1-5 observed during spring and fall visits are listed below:

Visit	OW/Pond #1	OW/Pond#2	OW/Pond#3	OW/Pond#4	OW/Pond#5
Spring	65%	65%	90%	80%	80%
Fall	90%	90%	90%	90%	90%

Large excavated (proposed) wetland cells west of the main ditch bisecting the property do not appear to be receiving water as originally intended. With the exception of the small ponds, most of these areas were completely dry during all three site visits. This is apparently due to the unavailability of directly applied irrigation water as originally proposed. The use of irrigation water for these sites was denied by the DNRC as a result of the water rights permitting process. The landowners are attempting to address this issue.

3.2 Vegetation

Seventy plant species were identified at the site and are listed in **Table 1**. The majority of these species are herbaceous. Two general wetland types were identified; these include emergent and scrub-shrub/emergent wetlands. A few small shrub communities exist along an active side channel/irrigation ditch. Several mature black cottonwood (*Populus trichocarpa*) and aspen (*Populus tremuloides*) were also observed along the same side channel and its associated wet fringes. Most the site consists of open wet meadows and emergent wetland vegetation.

Nine wetland types and one upland community type were identified at the mitigation site (**Figure 3**, **Appendix A**). The nine wetland community types include Type 1: *Agrostis,* Type 3: *Salix,* Type 4: *Eleocharis/Carex,* Type 5: *Carex/Typha,* Type 6: *Agrostis/Juncus,* Type 7: *Carex/Alopecurus,* Type 8: *Phleum/Agrostis,* Type 9: *Typha/Eleocharis,* and Type 10: *Agrostis/Veronica.* The one upland community observed, Type 2: *Agropyron* covers a vast majority of the mitigation site. Plant species observed within each of these communities are listed on the attached data form (**Appendix B**).

Type 4, 9 and 10 are the wettest communities and occurred as aquatic bed/emergent wetlands in the shallow waters of the created wetlands ponds # 2, 3, 4 and 5 (**Figure 3**). Type 4 is dominated

by creeping spike rush (*Eleocharis palustris*), Nebraska sedge (*Carex nebrascensis*) and common cattail (*Typha latifolia*). Type 9 is also dominated by cattail, creeping spike rush and American sloughgrass (*Beckmannia syzigachne*). Type 10 is dominated by redtop (*Agrostis alba*) and American speedwell (*Veronica americana*). Type 5 and 7 are the next wettest areas, consisting of emergent vegetation occurring in depressions and side channels throughout the wet meadow complexes. Type 5 and 7 are dominated by Nebraska sedge, common cattail, and meadow foxtail (*Alopecurus pratensis*).

Type 3 is the next wettest wetland type and is classified as scrub-shrub wetland. This area has mature shrub communities growing adjacent to the active side channel (irrigation ditch). Type 3 vegetation is dominated by Bebbs willow (*Salix bebbiana*), black cottonwood, Geyer willow (*Salix geyeriana*), and Swamp current (*Ribes aureum*). The remaining Types 1, 6, and 8 are the least wet areas. These areas function as the transitional zone between the wettest areas and drier upland vegetation boundary. These types are dominated by mostly wetter species, but also include a minor component of upland species. Types 1, 6, and 8 combined make up most of the wet meadows located within the mitigation site.

At this site only one upland type is present. The Type 2 upland area is dominated by slender wheatgrass (*Agropyron trachycaulum*), and quackgrass (*Agropyron repens*). The Type 2 community was mapped in areas of degraded pasture, as well as on upland slopes created around the pond excavations and spoil piles.

Several noxious weeds were observed throughout the Peterson Ranch site including spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), and hound's-tongue (*Cynoglossum officinale*). Other weedy species associated with disturbance include curly dock (*Rumex crispus*), common dandelion (*Taraxacum officinalis*), lambs quarters (*Chenopodium album*), pepper-grass (*Lepidium perfoliatum*), tumbleweed (*Sisymbrium altissimum*), quackgrass (*Agropyron repens*) and pennycress (*Thlaspi arvensis*).

Vegetation transect results are detailed in the attached data forms (**Appendix B**) and are summarized the transect maps, **Tables 2 and 3**, and **Charts 1 and 2** below. Vegetation transect results show a change in vegetation types for both transect # 1 and 2. The upland areas of transect # 1 were separated into 3 distinct types. Wetland areas for transect # 1 decreased between monitoring years 2002 and 2003, but showed higher diversity with one wetland type being divided into two distinct types. Transect # 2 during 2002 monitoring was mapped as exclusively upland vegetation. Transect # 2 had an increase in wetland area during the 2003 monitoring with the additions of small wetland fringe along OW/pond # 2.

2003 Transect 1 Map

Start	***Type 2 Upland (138')***	***Type4 Wetland (84')***	**Total: 222**	**End**

2002 Transect 1 Map

Start	***Type 2 Upland (114')***	***Type 4 Wetland (108')***	**Total: 222**	**End**

2003 Transect 2 Map

Start	*Type 2 Upland (175')*	*Type 10 Wetland (20')*	Total: 195	End

2002 Transect 2 Map

Start	*Type 2 Upland (195')*	Total: 195	End

Table 1: ***2002 - 2003 Peterson Ranch Vegetation Species List***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agropyron repens	quack grass	FACU
Agropyron smithii	western wheatgrass	FACU
Agropyron trachycaulum	slender wheatgrass	FAC
Agrostis alba	Redtop	FAC+
Alopecurus pratensis	meadow foxtail	FACW
Amaranthus retroflexus	red-root amaranth	FACU+
Beckmannia syzigachne	American sloughgrass	OBL
Betula occidentalis	birch	FACW
Bromus inermis	smooth brome	--
Bromus tectorum	cheatgrass	--
Carduus nutans	musk thistle	--
Carex microptera	small winged sedge	FAC
Carex nebrascensis	Nebraska sedge	OBL
Carex utriculata	beaked sedge	OBL
Centaurea maculosa	spotted knapweed	--
Chenopodium album	white goosefoot	FAC
Cirsium arvense	Canada thistle	FACU+
Cornus stolonifera	red-osier dogwood	FACW
Crataegus douglasii	Douglas hawthorn	FAC
Dactylis glomerata	orchardgrass	FACU
Descurainia sophia	tansy mustard	--
Elaeagnus commutata	silverberry	NI
Eleocharis palustris	creeping spike rush	OBL
Elymus cinereus	big basin wildrye	FACU
Elymus triticoides	creeping wildrye	FAC
Epilobium ciliatum	Hairy willow-herb	FACW-
Equisetum arvense	field horsetail	FAC
Festuca pratensis	meadow fescue	FACU+
Glyceria striata	fowl mannagrass	OBL
Helianthus annuus	common sunflower	FACU+
Hordeum jubatum	barley fox-tail	FAC+
Iris missouriensis	rocky mountain iris	OBL
Juncus balticus	Baltic rush	OBL
Juncus ensifolius	three-stamen rush	FACW
Juncus mertensianus	Mertens's rush	OBL
Kochia scoparia	summer-cypress	FAC
Lepidium perfoliatum	clasping pepper-grass	FACU+
Lomatium spp.	biscuit root	--
Lychnis alba	white campion	--
Malva neglecta	mallow	--
Medicago sativa	alfalfa	--
Mentha arvensis	mint	FAC
Myriophyllum spicatum	Eurasian water-milfoil	OBL
Phalaris arundinaceae	canary reed grass	FACW
Phleum pratense	Timothy	FACU
Plantago major	common plantain	FAC+

Table 1*: (continued)*

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Poa ampla	big bluegrass	--
Polygonum amphibium	water smartweed	OBL
Polygonum aviculare	prostrate knotweed	FACW+
Populus tremuloides	aspen	FAC+
Populus trichocarpa	black cottonwood	FAC
Potentilla anserina	silverweed	OBL
Potentilla gracilis	northwest cinquefoil	FAC
Prunus virginiana	serviceberry	FACU
Ribes aureum	swamp current	FAC+
Rosa woodsii	woods rose	FACU
Rumex crispus	curly dock	FACW
Salix bebbiana	Bebbs willow	FACW
Salix exigua	sandbar willow	OBL
Salix geyeriana	Geyer willow	FACW+
Scirpus acutus	hard stem bulrush	OBL
Sisymbrium altissimum	tall tumble mustard	FACU-
Solidago missouriensis	Missouri goldenrod	--
Taraxacum officinale	common dandelion	FACU
Thlaspi arvensis	pennycress	NI
Triglochin maritimum	seaside arrowgrass	OBL
Trifolium pratense	red clover	FACU
Typha latifolia	common cattail	OBL
Veronica americana	American speedwell	OBL

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

Table 2: *Transect 1 Data Summary*

Monitoring Year	2002	2003
Transect Length	222 feet	222 feet
# Vegetation Community Transitions along Transect	1	1
# Vegetation Communities along Transect	2	2
# Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	14	15
Total Hydrophytic Species	9	11
Total Upland Species	4	3
Estimated % Total Vegetative Cover	85%	95%
% Transect Length Comprised of Hydrophytic Vegetation Communities	49%	38%
% Transect Length Comprised of Upland Vegetation Communities	51%	62%
% Transect Length Comprised of Unvegetated Open Water	0%	0%
% Transect Length Comprised of Bare Substrate	0%	0%

Table 3: *Transect 2 Data Summary*

Monitoring Year	2002	2003
Transect Length	390 feet	390 feet
# Vegetation Community Transitions along Transect	0	0
# Vegetation Communities along Transect	1	2
# Hydrophytic Vegetation Communities along Transect	0	1
Total Vegetative Species	15	13
Total Hydrophytic Species	6	6
Total Upland Species	6	7
Estimated % Total Vegetative Cover	85%	95%
% Transect Length Comprised of Hydrophytic Vegetation Communities	0%	10%
% Transect Length Comprised of Upland Vegetation Communities	100%	90%
% Transect Length Comprised of Unvegetated Open Water	0%	0%
% Transect Length Comprised of Bare Substrate	0%	0%

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

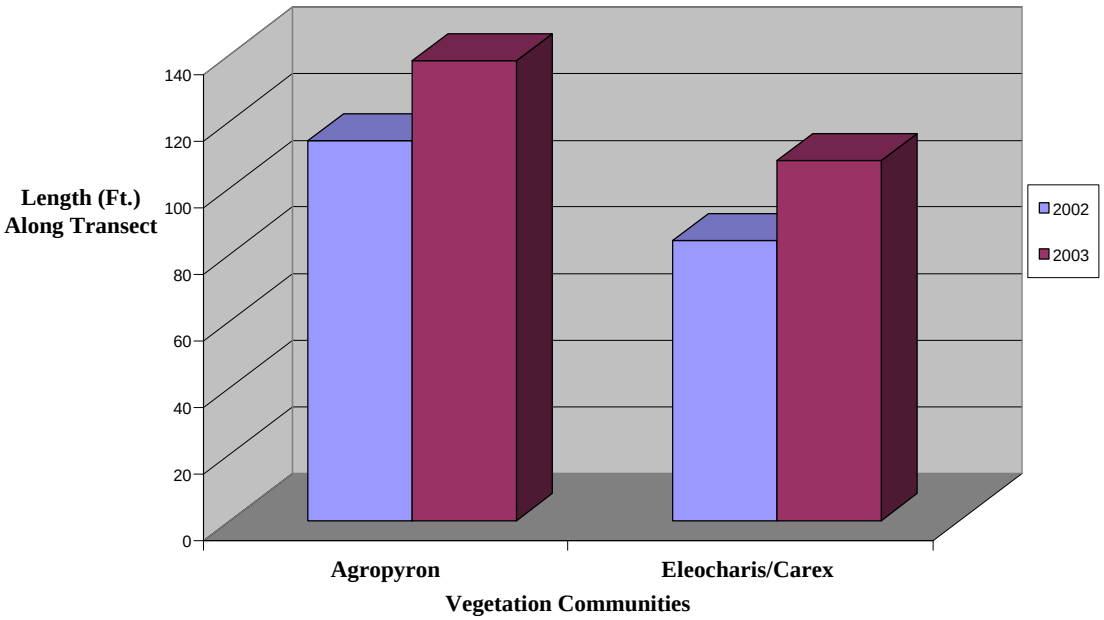
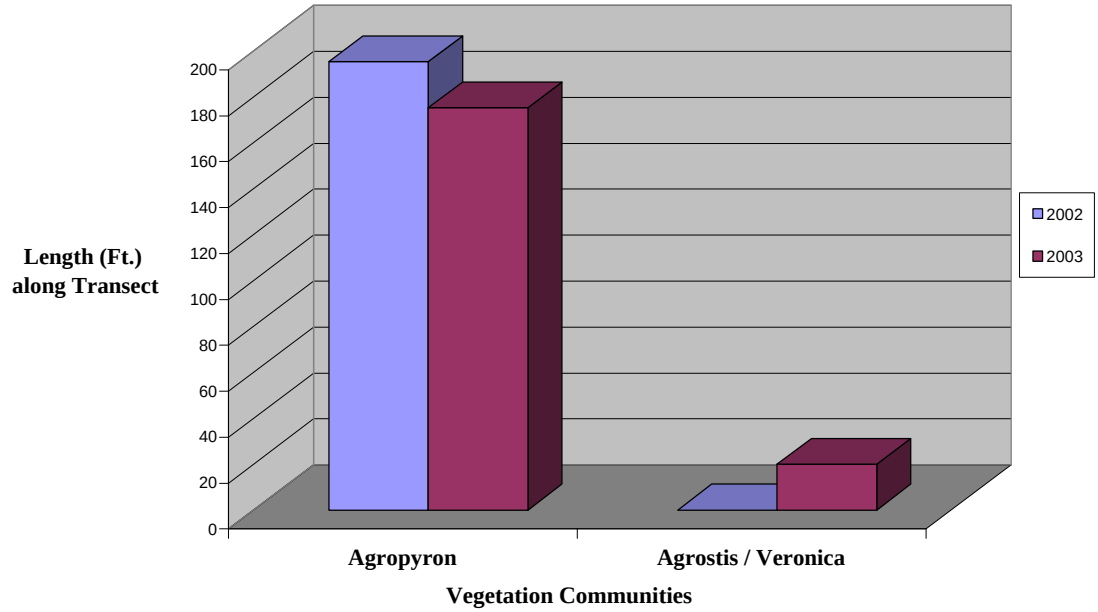


Chart 2: ***Length of Vegetation Communities along Transect 2***



3.3 Soils

Soils are mapped in the Granite County Soil Survey as Nirling cobbly loam, Blossberg loam and Nythar-Flintcreek Complex. Blossberg loam and Nythar-Flintcreek Complex are both listed as hydric soils for Granite County (NRCS 2003). Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly sandy clay, clay loams, sandy clay loams and minor components of peat with very low chromas (1 or 2) within 6 inches of the surface. Mottles (redoximorphic features) were present in one profile sampled along transect # 2. Several soil profiles described on the Routine Wetland Determination forms were mapped as upland sampling points, having no soil moisture or distinct hydric characteristics within 18 inches of the surface.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3 in Appendix A**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Monitoring in 2003 identified the following conditions:

	Monitoring Area 2003	**Monitoring Area 2002**
Gross Wetland Area	26.23	25.98
Open Water Area	1.90	1.90
Upland "Islands"	2.72	1.63
Net Wetland Area	**21.61**	**22.45**

Approximately 21.61 wetland acres and 1.90 open water acres are currently within the monitoring area (**Figure 3**), for a total of 23.51 acres of aquatic habitat. The pre-construction wetland delineation reported 90 acres of wetland and no open water acres throughout the entire 135-acre conservation easement. The mitigation site encompasses only 48 acres of this larger total. Turnstone Biological mapped 22.6 acres of wetlands within the current mitigation site boundary. A pre-project delineation map is provided in **Appendix A, Figure 4**. The net increase in aquatic habitat to date is 23.51 – 22.6 = 0.91 acres.

Pre-project and post-project delineation boundaries were observed to be fairly consistent. However, during the 2002 and 2003 monitoring some differences were observed between pre-project and post-project wetland boundaries. A few such areas of note occur northeast of OW/Pond #2, where mapped pre-project wetlands were apparently disturbed by construction and did not exhibit wetland characteristics during the 2002 and 2003 monitoring efforts. Given adequate hydrology, these areas may revert back to wetlands over time. The general timing of site visits and different evaluators also had a minor influence on wetland boundaries.

Changes in aquatic habitat were observed between 2002 and 2003 monitoring. A small increase in wetland area was observed with the development of emergent vegetation around OW/pond # 2 fringes. The increase in wetlands acres was offset by an increase in area of upland islands near OW/pond # 4. Upland areas near OW/pond # 1 also increased with upper fringes of pond basin developing more upland characteristics. The general lack of hydrology in these areas likely contributed to the upland conversion observed at this site.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2002 and 2003 monitoring efforts is listed in **Table 4**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the completed monitoring form in **Appendix B**.

This site provides habitat for a variety of wildlife species. Three mammal and seventeen bird species were noted at the mitigation site during the 2003 site visits.

Table 4: ***Wildlife Species Observed at the Peterson Ranch Mitigation Site During 2002-2003 Monitoring***

FISH None	
AMPHIBIANS None	
REPTILES None	
BIRDS **American Crow (*Corvus brachyrhynchos*)** **American Robin (*Turdus migratorius*)** **Brewer's blackbird (*Euphagus cyanocephalus*)** **Brown-headed cowbird (*Molothrus ater*)** **Cliff swallow (*Petrochelidon pyrrhonota*)** **Common merganser (*Mergus merganser*)** **Common snipe (*Capella gallinago*)** **Eastern kingbird (*Tyrannus tyrannus*)** **Golden Eagle (*Aquila chrysaetos*)** Great Blue Heron (*Ardea herodias*) **Killdeer (*Charadrius vociferous*)**	**Mallard (*Anas platyrhynchos*)** Northern Flicker (*Colaptes auratus*) **Red-winged blackbird (*Agelaius phoeniceus*)** **Spotted sandpiper (*Actitis macularia*)** **Tree swallow (*Iridoprocne bicolor*)** **Vesper sparrow (*Pooecetes gramineus*)** **Western Meadowlark (*Sturnella neglecta*)** **Willow flycatcher (*Empidonax traillii*)** **Wilson's phalarope (*Steganopus tricolor*)** Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)
MAMMALS Coyote (*Canis latrans*) **Deer (*Odocoileus* spp.)** Red Fox (*Vulpes vulpes*)	
Bolded species were observed during 2003 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2003.	

3.6 Macroinvertebrates

Complete results from the macroinvertebrate sampling locations (**Figure 2**) are presented in **Appendix F.** Sampling points for the Peterson Ranch were located at OW/ponds #1, 2, 4 and 5. Three locations were sampled during the 2003 monitoring. OW/pond # 2 was excluded due to the low water conditions and lack of quality samplings environments. The following analysis was provided by Rhithron Associates (Bollman 2003).

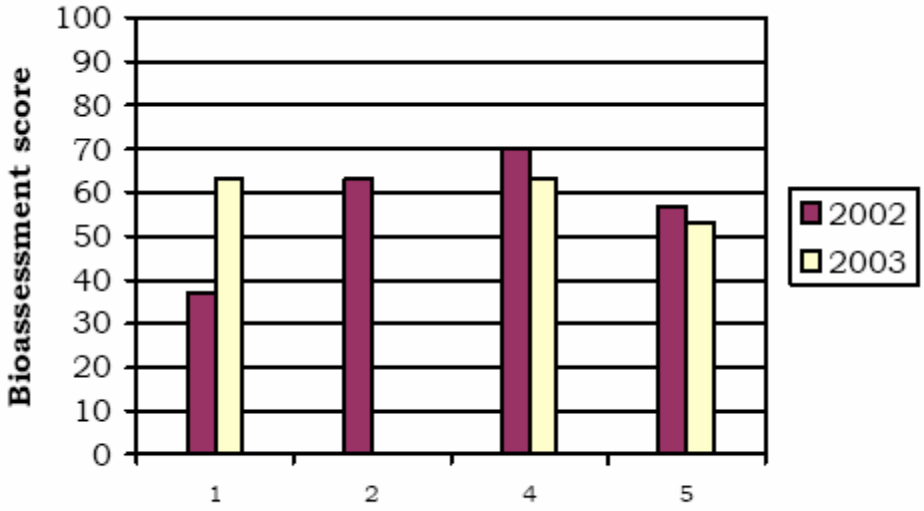
OW/Pond 1. *The sample collected in 2003 contained many more taxa and many more organisms than that collected in 2002. This resulted in an increase of bioassessment score between the 2 years; sub-optimal conditions were indicated. The faunal pattern of cladocerans and copepods suggest that relatively deep water characterized the site. Apparently, few other habitats were available; perhaps a few macrophytes added some complexity. Benthic habitats were likely*

anoxic, and thus not extensively colonized. The improvement in water quality suggested by the lower biotic index value in 2003 was very slight. There was a notable shift in the functional composition of the invertebrate assemblage between the 2 years; in 2002, no filter-feeders were collected, while in 2003 water column filterers were the dominant functional component.

OW/Pond 4. *Scores indicated a slight worsening of biotic conditions at this site, but sample composition suggests otherwise. A much more prolific fauna was collected in 2003 than in the previous year. Damselfly larvae and snails dominated the taxonomic mix, suggesting abundant emergent macrophytes. The lower biotic index value implies improved water quality in terms of nutrient enrichment and possibly water temperature. Sub-optimal conditions are indicated.*

OW/Pond 5. *A richer fauna was collected at this site in 2003 than in 2002. The predominance of the damselfly Enallagma sp. indicates that macrophytes provided the major habitat for invertebrates, and also skews the functional composition. Predators made up 70% of the mix. The simple fauna as well as the relatively high biotic index value suggest that conditions were sub-optimal here in 2003.*

Chart 3: ***Bioassessment Scores for Peterson Ranch***



3.7 Functional Assessment

Completed 2003 functional assessment forms are included in **Appendix B**. The Peterson Ranch was separated into three assessment areas (AA's) for purposes of functional assessment. These areas included the created wetland OW/pond # 1, 2 and associated emergent wet meadow west of the irrigation ditch (AA 1), scrub-shrub emergent wetlands along the irrigation ditch (AA 2), and the created wetland OW/ponds #3, 4 and 5 with associated emergent vegetation east of the irrigation ditch (AA 3). OW/pond #2 was not included during 2002 assessment of these areas, but was included in the 2003 assessment due to the development of emergent vegetation class around the pond fringe. A complete breakdown of ratings for each assessment area and pre-project assessment areas are presented in **Table 3**.

The wetlands on the Peterson Ranch mitigation site are currently all rated as a Category III (moderate value), primarily due to moderate ratings for general wildlife, flood attenuation and sediment/nutrient removal variables. Other factors contributing to this score were low ratings for TE species/MNHP species habitat and recreation/education ratings. These areas received a high rating for surface water storage due to the potential acre-feet of water contained within the wetlands during seasonal high flows. The variable for production export/food chain support rated high due to the overall vegetated acres, outlet presence, and perennial water regime.

The AA's received a low to moderate flood attenuation rating due to the presence of an inflow channel into the wetland and restricted nature of the outlet. The AA's also received a low recreation/education rating since the site is moderately disturbed and is privately owned. AA's 1 and 3 received a low to moderate ratings for sediment/shoreline stability due to a lack of plants with deep binding roots. AA 2 received a higher rating for sediment/shoreline stability due to the presence of mature shrubs with deep binding root systems.

Based on functional assessment results (**Table 3)**, approximately 141.95 functional units occur at the Peterson Ranch mitigation site. Baseline functional assessment results are also provided in **Table 3** for general comparative purposes. However, it should be noted that direct comparison between the baseline and 2003 functional assessments are not possible, as they were completed using different versions of the MDT functional assessment method. However, assessments can still compare qualitatively. The baseline assessment was completed using the 1996 version, while the 2002 and 2003 assessment was conducted using the most current (1999) version.

Table 5: ***Summary of Baseline, 2002 and 2003 Wetland Function/Value Ratings and Functional Points*** [1] ***at the Peterson Ranch Mitigation Project***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	Assessment Area and Year						
	Baseline 1998 (1996 Method)	2002 AA 1 (1999 Method)	2002 AA 2 (1999 Method)	2002 AA 3 (1999 Method)	2003 AA 1 (1999 Method)	2003 AA 2 (1999 Method)	2003 AA 3 (1999 Method)
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
MNHP Species Habitat	Low (0.1)	None (0.0)	Low (0.1)	None (0.0)	None (0.0)	Low (0.1)	None (0.0)
General Wildlife Habitat	Low (0.1)	Mod (0.5)	Mod (0.7)	Mod (0.7)	Mod (0.5)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	NA	NA
Flood Attenuation	NA	Mod (0.5)	Low (0.2)	Mod (0.5)	Mod (0.5)	Low (0.2)	Mod (0.5)
Short and Long Term Surface Water Storage	High (1.0)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment, Nutrient, Toxicant Removal	Mod (0.5)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)
Sediment/Shoreline Stabilization	NA	Low (0.3)	High (1.0)	Mod (0.7)	Low (0.3)	High (1.0)	Mod (0.7)
Production Export/Food Chain Support	Mod (0.7)	High (0.8)	High (0.8)	High (0.8)	High (0.9)	High (0.8)	High (0.9)
Groundwater Discharge/ Recharge	UNK	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Recreation/Education Potential	Low (0.1)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Actual Points/ Possible Points	3.0 / 8	5.5 / 11	6.4 / 11	6.1 / 11	5.6 / 11	6.4 / 11	6.2 / 11
% Of Possible Score Achieved	38%	50%	58%	55%	51%	58%	56%
Overall Category	III (borderline IV)	III	III	III	III	III	III
Total Acreage of Assessed Wetlands and Open Water within Easement by AA	22.6 ac	7.0 ac	3.0 ac	13.8 ac	7.35 ac	3.0 ac	13.16 ac
Functional Units (acreage x actual points) by AA	67.8 fu	38.5 fu	19.2 fu	84.18 fu	41.16 fu	19.2 fu	81.59 fu
Total Acreage of Assessed Wetlands and Open Water on Site	22.6 ac	24.35 ac total – (0.55 ac Pond #2) = 23.8 ac			23.51 ac		
Total Functional Units on Site	67.8 fu	141.88 fu			141.95 fu		
Net Acreage Gain (assessed wetlands and open water only)	NA	1.2 ac			0.91 ac		
Net Functional Unit Gain	NA	74.08 fu			74.11 fu		

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

[2] The baseline assessment was performed using the 1996 MDT assessment method, several parameters which were substantially revised during development of the 1999 MDT assessment method, which was applied during 2003 monitoring. Thus, direct comparison of pre- and post-project functions is not possible, although some general trends can be noted.

3.8 Photographs

Representative photographs taken from photo-points and transect ends are presented in **Appendix C**. A copy of the 2003 aerial photograph is also provided in **Appendix C**.

3.9 Revegetation Efforts

Upon completion of the project construction, revegetation efforts were conducted to enhance riparian and wetland habitat surrounding the created ponds. Riparian cuttings collected from surrounding Flint Creek areas were sprigged along the margins of created ponds. Further enhancement included plantings of containerized stock of several native shrubs found within the area. These species included woods rose (*Rosa woodsii*), golden current (*Ribes aureum*), chokecherry (*Prunus virginiana*), silverberry (*Elaeagnus commutata*), and red-osier dogwood (*Cornus stolonifera*). The adjacent wetland slopes of the created wetland ponds were seeded with a wet mix consisting of slender wheatgrass (*Agropyron trachycaulum*), western wheatgrass (*Agropyron smithii*), creeping wildrye (*Elymus triticoides*), American sloughgrass (*Beckmannia syzigachne*), western mannagrass (*Glyceria occidentalis*), Baltic rush (*Juncus balticus*), and bluejoint reedgrass (*Calamagrostis canadensis*). Drier upland slopes disturbed during construction efforts were seeded with a dry mix consisting of slender wheatgrass (*Agropyron trachycaulum*), western wheatgrass (*Agropyron smithii*), big basin wildrye (*Elymus cinereus*), green needlegrass (*Stipa viridula*), and big bluegrass (*Poa ampla*). Planting specifications are presented in **Appendix G.**

Woody species survival data were collected for the Peterson Ranch. In general, species survival was good except for two species, silverberry and red osier dogwood, which exhibited low survival rates of 28% and 38%. The following species had higher survival rates: woods rose (90%), golden current (99%), and chokecherry (81%). The number of willow sprigs were approximated, but not accurately counted due to high numbers of cuttings. In general most of the observed sprigs were alive and exhibited survival rate of approximately 80%. Plantings were difficult to find during the 2003 monitoring due to extensive herbaceous cover of upland grass species. The plantings that were located had evidence of heavy browse from wildlife and possibly livestock grazing. The high mortality of red osier dogwood likely can attributed to heavy browse. Survival data are presented in **Appendix B**.

3.10 Maintenance Needs/Recommendations

Weed control and revegetation of disturbed sites is needed to prevent further weed spread, reduce the risk of new weeds invading, reduce wind and water erosion, and reduce sediment input to surface waters. Several noxious weeds are present including Canada thistle, hound's-tongue and spotted knapweed that must be controlled under the Montana County Noxious Weed Control Act [7-22-2151].

3.11 Current Credit Summary

At this time approximately 21.61 acres of wetland and 1.90 acres of open water occur on the mitigation site, for a total of 23.51 acres of aquatic habitat. Subtracting the original 22.6 acres of pre-project wetlands from this total yields a current net of approximately 0.91 wetland/open water acres. It is likely that additional acreage will form with additional time and more normal precipitation, and if the irrigation issue is rectified. The site has gained approximately 74 functional units to date.

4.0 REFERENCES

Carlson, J. Program Zoologist, Montana Natural Heritage Program. Helena, MT. April 2001 conversation.

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USDA Natural Resource Conservation Service. 1989. *Soil Survey of Madison County Area, Montana.*

USDA Natural Resources Conservation Service. 1998. *Field Indicators of Hydric Soils in the United States*, Version 4. G. Hurt, P. Whited and R. Pringle (eds.). USDA, NRCS Fort Worth, TX.

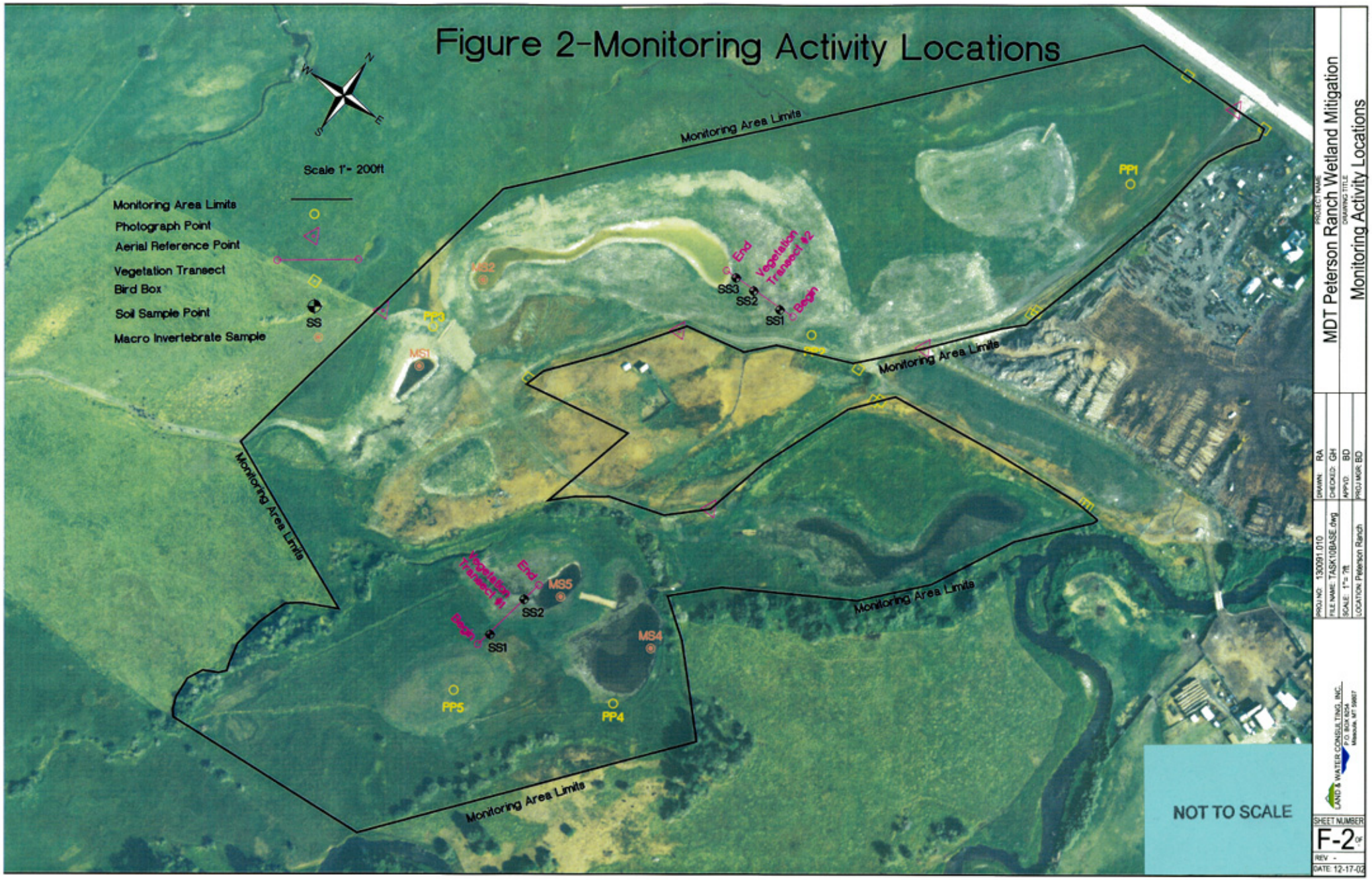
Appendix A

FIGURES 2, 3, AND 4

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER

Figure 2-Monitoring Activity Locations



PROJECT NAME: MDT Peterson Ranch Wetland Mitigation

DRAWING TITLE: Monitoring Activity Locations

PROJ NO: 130091.010 | DRAWN: RA
FILE NAME: TASK10BASE.dwg | CHECKED: GH
SCALE: 1"= 7ft | APPVD: BD
LOCATION: Peterson Ranch | PROJ MGR: BD

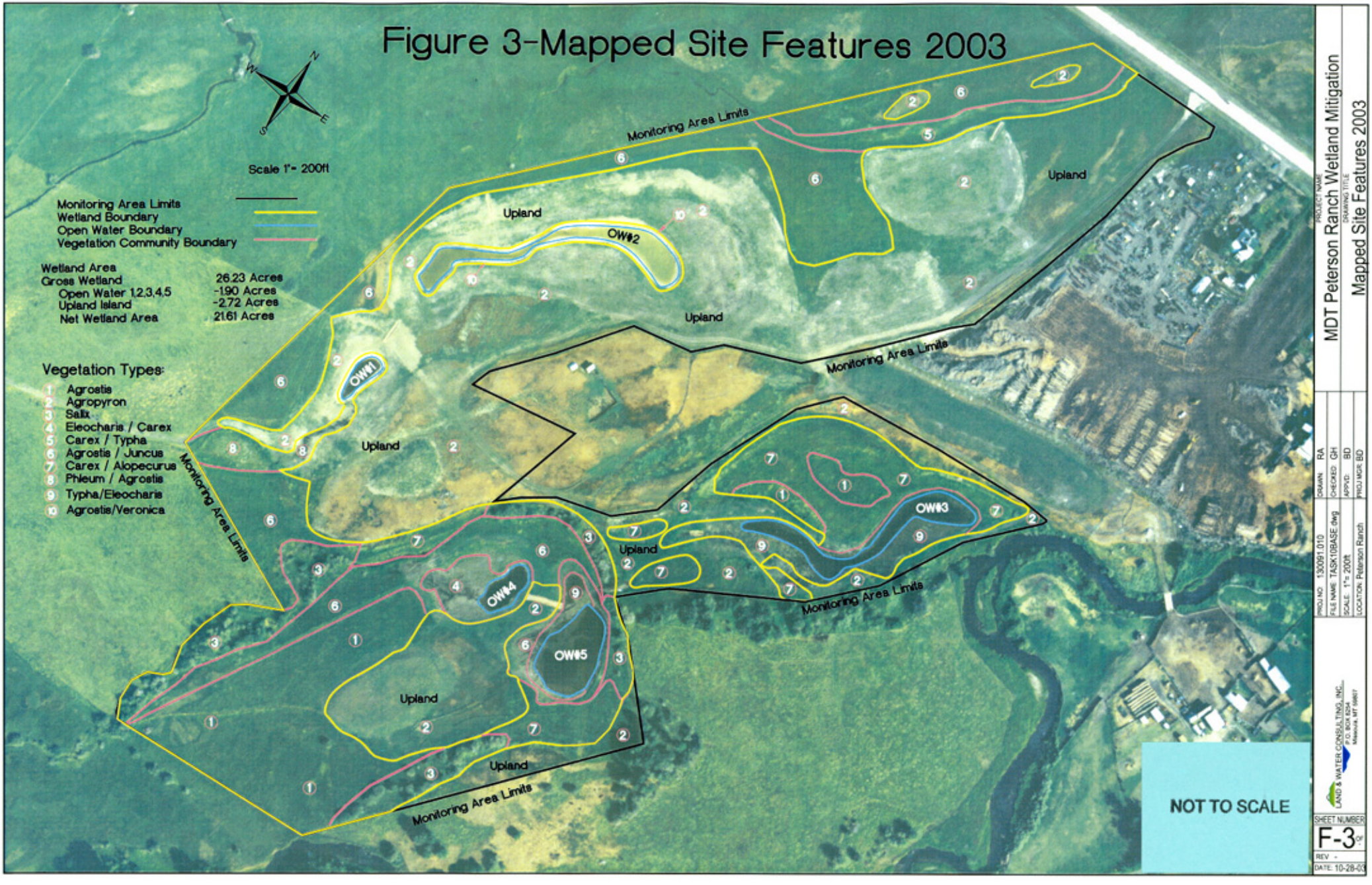
LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807

SHEET NUMBER: F-2

REV: -

DATE: 12-17-02

Figure 3-Mapped Site Features 2003



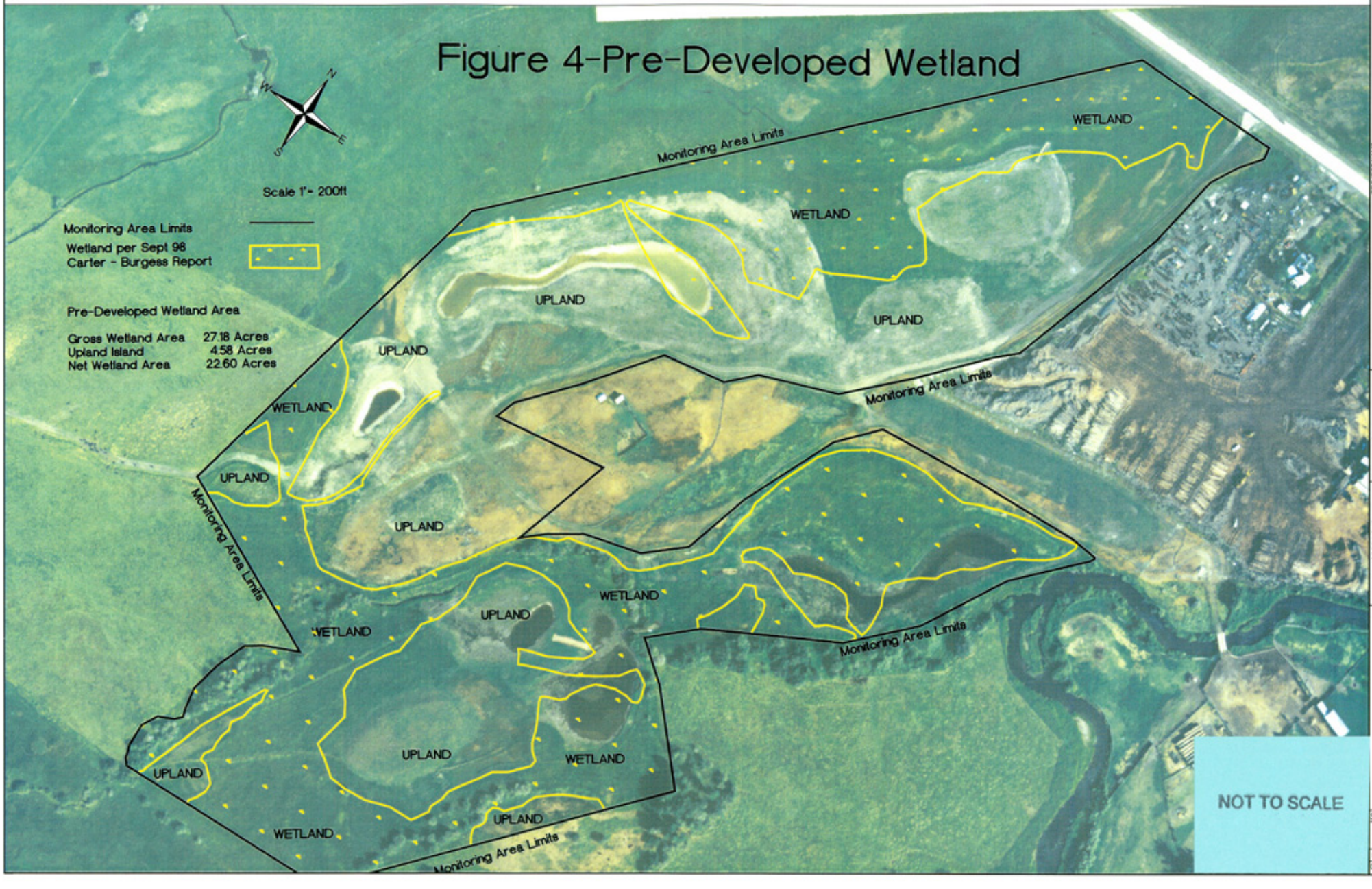
PROJECT NAME: MDT Peterson Ranch Wetland Mitigation
DRAWING TITLE: Mapped Site Features 2003

PROJ NO: 1300911.010 | DRAWN: RA
FILE NAME: TASK10BASE.dwg | CHECKED: GH
SCALE: 1"= 200ft | APP'D: BD
LOCATION: Peterson Ranch | PROJ MGR: BD

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

SHEET NUMBER: F-3
REV: -
DATE: 10-28-03

Figure 4-Pre-Developed Wetland



PROJECT NAME: MDT Peterson Ranch Wetland Mitigation

DRAWING TITLE: Pre-Developed Wetland

PROJ NO: 130091.010
FILE NAME: TASK10BASE.dwg
SCALE: 1"= 200ft
LOCATION: Peterson Ranch

DRAWN: RA
CHECKED: GH
APPVD: BD
PROJ MGR: BD

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

SHEET NUMBER: F-4

REV: -

DATE: 1-22-03

Appendix B

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

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Peterson Ranch Project Number: 130091.010 Assessment Date: 8/06/03
Location: E. of Hall MDT District: Upper Clark Fork Milepost:__
Legal description: T 10 N R 13 W Section 35 Time of Day: Morning to Afternoon
Weather Conditions: Clear & sunny Person(s) conducting the assessment: Greg Howard
Initial Evaluation Date: 7/31/02 Visit #: 1 Monitoring Year: 2
Size of evaluation area: 93 acres Land use surrounding wetland: Agriculture & forestry products

HYDROLOGY

Surface Water Source:_____
Inundation**:** Present x Absent____ Average depths: 1.5 ft Range of depths: 0-3 ft
Assessment area under inundation: 20-25 %
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 x No_
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): _____

_____

_____

Groundwater
Monitoring wells: Present_____ Absent x
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:
x Map emergent vegetation-open water boundary on air photo
x Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
_____GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: Second year of monitoring at this mitigation site. Water levels in the created ponds 1 and 2 were considerably lower than last year's levels. Emergent / aquatic vegetation is becoming established throughout the ponds.

VEGETATION COMMUNITIES

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

Dominant Species	% Cover	Dominant Species	% Cover
Agrostis alba	50	*Typha latifolia*	T
Carex nebrascensis	10	*Scirpus acutus*	T
Agropyron trachycaulum	P	*Hordeum jubatum*	P
Potentilla anserina	P	*Festuca pratensis*	10
Trifolium pratense	P	*Juncus balticus*	P

COMMENTS/PROBLEMS: Emergent wetland, dominated by grasses and some sedges.

Community No.: 2 Community Title (main species): Agropyron

Dominant Species	% Cover	Dominant Species	% Cover
Agropyron trachycaulum	70	*Malva neglecta*	P
Agrostis alba	T	*Thlaspi arvensis*	T
Potentilla anserina	P	*Chenopodium album*	T
Helianthus annuus	T	*Alopecurus pratensis*	T
Cirsium arvense	T	*Taraxacum officinale*	P

COMMENTS/PROBLEMS: Dry slopes surrounding created ponds. Area dominated by upland grasses and weedy forb species.

Community No.: 3 Community Title (main species): Salix

Dominant Species	% Cover	Dominant Species	% Cover
Salix bebbiana	50	*Geum macrophyllum*	T
Crataegus douglasii	50	*Cornus stolonifera*	P
Ribes americanum	P	*Salix geyeriana*	10
Salix exigua	10	*Agrostis alba*	10
Carex utriculata	20	*Populus trichocarpa*	10

COMMENTS/PROBLEMS: Scrub-shrub wetland type, located along side channel or irrigation ditch.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

VEGETATION COMMUNITIES (continued)

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

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	20	*Agrostis alba*	T
Carex nebrascensis	P	*Juncus ensifolius*	T
Typha latifolia	P	*Potentilla anserina*	T
Alopecurus pratensis	P	*Beckmannia syzigachne*	P
Polygonum amphibium	T	*Glyceria striata*	T

COMMENTS/PROBLEMS: Emergent wetland surrounding created pond # 4 & 5.

Community No.: 5 Community Title (main species): Carex/Typha

Dominant Species	% Cover	Dominant Species	% Cover
Carex nebrascensis	40		
Typha latifolia	20		
Alopecurus pratensis	30		

COMMENTS/PROBLEMS: Depressional wetlands found within areas of lower topography, running across northwest corner of mitigation site. Hydrology source is groundwater & irrigation ditches.

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

Dominant Species	% Cover	Dominant Species	% Cover
Agrostis alba	30	*Alopecurus pratensis*	P
Juncus balticus	40	*Carex nebrascensis*	P
Phleum pratense	10	*Rumex crispus*	T
Trifolium pratense	P		
Agropyron repens	P		

COMMENTS/PROBLEMS: Wetland meadow complex, located between drier upland slopes and emergent wetlands listed in community no. 5. Vegetation fringe between upland and wetland areas, community type considered wetland.

VEGETATION COMMUNITIES (continued)

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

Dominant Species	% Cover	Dominant Species	% Cover
Carex utriculata	50		
Alopecurus pratensis	20		
Veronica americana	P		
Juncus balticus	P		
Poa spp.	T		

COMMENTS/PROBLEMS: Vegetation along irrigation ditch, emergent wetlands with no shrub coverage. Ditch and surrounding bottoms inundated, low flow present.

Community No.: 8 Community Title (main species): Phleum/Agrostis

Dominant Species	% Cover	Dominant Species	% Cover
Phleum pratense	20	*Typha latifolia*	T
Agrostis alba	20	*Scirpus acutus*	T
Veronica americana	P	*Hordeum jubatum*	P
Alopecurus pratensis	P	*Glyceria striata*	10
Juncus balticus	T	*Willow sprigs*	P
Carex nebrascensis	P		

COMMENTS/PROBLEMS: Upper basin of created wetland pond # 1. Surface water present, flowing down gradient into pond. Hydrology source comes from irrigation ditch. Low vegetation cover, few drier species mixed with mostly wetland species. Area sprigged with willow cuttings, heavy planting along areas of standing water.

Community No.: 9 Community Title (main species): Typha / Eleocharis

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	50	*Potentilla anserina*	P
Eleocharis palustris	30	*Carex nebrascensis*	10
Beckmannia syzigachne	10	*Alopecurus pratensis*	P
Agrostis alba	P	*Glyceria striata*	P
Veronica americana	T		

COMMENTS/PROBLEMS: Emergent wetland type located along the fringes of pond # 3's open water surrounding.

Community No.: 10 Community Title (main species): Agrostis / Veronica

Dominant Species	% Cover	Dominant Species	% Cover
Juncus mertensianus	T	*Potentilla anserina*	T
Agrostis alba	20	*Phleum pratense*	T
Veronica americana	10		
Agropyron trachycaulum	10		
Epilobium ciliatum	T		

COMMENTS/PROBLEMS: Emergent wetland type located along the fringe of pond # 2's open water.

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Achillea millefolium	2	*Kochia scoparia*	2
Agropyron repens	2,6	*Lepidium perfoliatum*	2
Agropyron smithii	2	*Lomatium spp.*	2
Agropyron trachycaulum	2,6,10	*Lychnis alba*	2
Agrostis alba	1,2,3,4,6,8,9,10	*Malva neglecta*	2
Alopecurus pratensis	2,4,5,7,8,9	*Medicago sativa*	2
Amaranthus retroflexus	2	*Mentha arvensis*	4,7
Beckmannia syzigachne	5,7,9	*Myriophyllum spicatum*	OW
Betula occidentalis	3	*Phalaris arundinaceae*	6,7,8
Bromus inermis	2	*Phleum pratense*	6,8,10
Bromus tectorum	2	*Plantago major*	2
Carduus nutans	2	*Poa ampla*	2
Carex microptera	6	*Polygonum amphibium*	4
Carex nebrascensis	1,4,5,8,9	*Polygonum aviculare*	4
Carex utriculata	1,3,7	*Populus tremuloides*	3
Centaurea maculosa	2	*Populus trichocarpa*	3
Chenopodium album	2	*Potentilla anserina*	4,9,10
Cirsium arvense	2	*Potentilla gracilis*	2
Cornus stolonifera	3	*Prunus virginiana*	2
Crataegus douglasii	3	*Ribes aureum*	2
Dactylis glomerata	2	*Rosa woodsii*	2,3
Descurainia sophia	2	*Rumex crispus*	2
Elaeagnus commutata	2	*Salix bebbiana*	3
Eleocharis palustris	4,9	*Salix exigua*	3
Elymus cinereus	2	*Salix geyeriana*	3
Elymus triticoides	2	*Scirpus acutus*	1
Epilobium ciliatum	10	*Sisymbrium altissimum*	2
Equisetum arvense	2,4	*Solidago missouriensis*	2
Festuca pratensis	2	*Taraxacum officinale*	2,6
Glyceria striata	7,9	*Thlaspi arvensis*	2
Helianthus annuus	2	*Triglochin maritimum*	1,6,7
Hordeum jubatum	2	*Trifolium pratense*	2
Iris missouriensis	4,7	*Typha latifolia*	1,4,5,9,10
Juncus balticus	6,7		
Juncus ensifolius	4		
Juncus mertensianus	10		

COMMENTS/PROBLEMS: Two new species observed during the second year monitoring (*Epilobium ciliatum and Juncus mertensianus*).

PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed	Mortality Causes
Prunus virginiana	60	49	
Salix spp.		469	
Rosa woodsii	43	39	
Elaeagnus commutata	10	2	
Ribes aureum	14	14	
Cornus stolonifera	42	16	

COMMENTS/PROBLEMS: Planting areas difficult to find during second year monitoring due to tall and dense herbaceous cover. Evidence of heavy browse on plantings. The survival rates for *Prunus virginiana*, *Salix* spp., *Rosa woodsii* and *Ribes aureum* ranged between 80 to 100%. Remaining planted species *Elaeagnus commutata* and *Cornus stolonifera* had low survival rates ranging from 20% to 38%. High mortality on *Cornus stolonifera* most likely contributed to the heavy *browse.*

WILDLIFE / BIRDS

(Attach Bird Survey Field Forms)

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

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Red fox	3				
Deer		X			
Coyote			X		

Additional Activities Checklist:

_X_ Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Three invertebrate samples were collected from pools 1, 4, and 5. Due to low water levels, several inches deep, the sample at pool 2 was not collected.

PHOTOGRAPHS

Using a camera with a 50 mm lenses and color film take photographs of the following permanent reference points listed in the checklist below. Record the direction of the photograph using a compass. (The first time at each site establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3' above ground, survey the location with a resource grade GPS and mark the location on the air photo.)
Checklist:

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

Location	Photo Frame #	Photograph Description	Compass Reading
1	1-3	Panoramic looking from south to north across the western half of the site.	180 ^{o} – 0 ^{o}
1	5	Looking northeast towards parcel boundary, lumber mill in background	90 ^{o}
2	6	Looking southwest along vegetation transect no. 2.	225 ^{o}
3	7 – 8	Looking north at the southern end of created wetland pond no.2.	0 ^{o}
3	9 - 10	Looking west at emergent wetlands along fence line and beyond.	270 ^{o}
3	11 - 12	Looking southeast at created wetland pond no. 1.	135 ^{o}
4	13	Looking south across created wetland pond no 4.	180 ^{o}
5	14	Looking north along vegetation transect no. 2 and created wetland no. 5.	0 ^{o}
5	15	Looking north along vegetation transect no. 2 and created wetland no. 5.	0 ^{o}
5	16	Looking northeast at created wetland no. 4	45 ^{o}
5	17	Looking south at the top of upland spoil pile, view opposite of transect..	0^{o}

COMMENTS/PROBLEMS: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points with the GPS unit set at 5 second recording rate. Record file numbers fore site in designated GPS field notebook

Checklist:

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

COMMENTS/PROBLEMS: _____

WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

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

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS: Three distinct areas were evaluated separately, these assessment areas include ponds no. 1 & 2, scrub-shrub emergent and ponds no. 4 &5.

MAINTENANCE

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

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

COMMENTS/PROBLEMS: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Pond no. 2 Date: 8/06/03 Examiner: Greg Howard Transect # 2

Approx. transect length: 195ft. Compass Direction from Start (Upland): 270

Vegetation type 1:	Agropyron (Community No. 2)	
Length of transect in this type:	175	feet
Species:		Cover:
Agropyron trachycaulum		40
Agropyron repens		30
Agrostis alba		10
Potentilla anserina		P
Festuca pratensis		T
Malva neglecta		T
Taraxacum officinale		T
Cirsium arvense		T
Phleum pratense		T
Plantago major		P
Total Vegetative Cover:		85%

Vegetation type 2:	Agrostis / Veronica (Community No. 10)	
Length of transect in this type:	20	feet
Species:		Cover:
Agrostis alba		P
Veronica americana		T
Potentilla anserina		T
Plantago major		T
Agropyron trachycaulum		T
Hordeum jubatum		T
Polygonum aviculare		T
Total Vegetative Cover:		10%

Vegetation type 3:		
Length of transect in this type:		feet
Species:		Cover:
Total Vegetative Cover:		

Vegetation type 4:		
Length of transect in this type:		feet
Species:		Cover:
Total Vegetative Cover:		

MDT WETLAND MONITORING – VEGETATION TRANSECT (continued)

Site: Ponds no. 4 Date: 8/06/03 Examiner: Greg Howard Transect # 1

Approx. transect length: 222 Compass Direction from Start (Upland): North (0^{o})

Vegetation type 1:	Agropyron (Community No. 2)	
Length of transect in this type:	138	feet
Species:		Cover:
Agropyron trachycaulum		30
Thlaspi arvensis		T
Alopecurus pratensis		T
Trifolium pratense		T
Agrostis alba		P
Agropyron repens		10
Taraxacum officinale		P
Juncus balticus		10
	Total Vegetative Cover:	60%

Vegetation type 2:	Eleocharis/Carex (Community No. 4)	
Length of transect in this type:	84	feet
Species:		Cover:
Carex nebrascensis		P
Eleocharis palustris		60
Potentilla anserina		T
Alopecurus pratensis		5
Polygonum amphibium		5
Agrostis alba		T
Glyceria striata		T
Beckmannia syzigachne		20
Typha latifolia		5
	Total Vegetative Cover:	95%

Vegetation type 4:		
Length of transect in this type:	66	feet
Species:		Cover:
	Total Vegetative Cover:	

Vegetation type 5:		
Length of transect in this type:	18	feet
Species:		Cover:
	Total Vegetative Cover:	

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

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

Indicator Class:

+ = Obligate
- = Facultative/Wet
0 = Facultative

Source:

P = Planted
V = Volunteer

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

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

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

Notes:

3

BIRD SURVEY – FIELD DATA SHEET

Date: 5/29/03

SITE: Peterson Ranch

Survey Time: 0915-1100

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American crow	1	F	UP				
American robin	1	F	UP				
Brewer's blackbird	6	F	UP				
brown-headed cowbird	6	F	UP				
cliff swallow	3	F	MA				
common merganser	3	BP, F	MA				
common snipe	1	F	MA				
eastern kingbird	1	F	UP				
killdeer	2	F	US				
mallard	1	F	MA				
red-winged blackbird	10	F, N	MA				
spotted sandpiper	6	F	MA, US				
tree swallow	20	N, F	MA				
vesper sparrow	12	F, N	UP				
western meadowlark	2	F	US				
willow flycatcher	1	F	SS				
Wilson's phalarope	6	F	MA, OW				

Notes:
Pond 2 = 65-70% inundated; Pond 1 = 65% inundated; Ponds 4 and 5 = 80% inundated, Pond 3 = 85%
Electric fence down south and west of Pond 1
No herps. observed
Tree swallows are using bird boxes (need to GPS bird box locations)
Deer tracks
No water in bermed impoundment areas.

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

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

LAND & WATER

BIRD SURVEY – FIELD DATA SHEET

Page__1_of__1_
Date: 8/6/03
Survey Time: 8:30-3:00

SITE: Peterson Ranch

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American crow	1	F	UP				
killdeer	2	F	US				
mallard	2	F	MA				
red-winged blackbird	1	F, N	MA				
western meadowlark	1	F	US				
tree swallow	5	N, F	MA				

Notes:
Pond No. 2 water levels very low, emergent vegetation developing across pond.
Bird boxes being used by Tree swallows.

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

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

LAND & WATER

BIRD SURVEY – FIELD DATA SHEET

Page__1_of__1_
Date: 10/16/03

SITE: Peterson Ranch

Survey Time: 0915-1100

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
mallard	3	F	MA				
golden eagle	1	FO	MA				
Brewer's blackbird	15	FO	MA				

Notes:
Pond 2 = 100% inundated; Pond 1 = 100% inundated; Ponds 4 and 5 = 100% inundated, Pond 3 = 100%
Electric fence down south and west of Pond 1
Deer tracks, beds, gopher holes
Partly cloudy, calm, dry

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

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

LAND & WATER

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Peterson Ranch			Date:	8/6/03
Applicant/Owner:	MDT			County:	Granite
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	___ No		Transect ID:	1 – Pool 4
Is the area a potential Problem Area?:	___ Yes	___ No		Plot ID:	1
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Agropyron trachycaulum*	H	FAC	9			
2	*Trifolium pratense*	H	FACU	10			
3	*Agropyron repens*	H	FACU	11			
4	*Thlaspi arvensis*	H	--	12			
5	Taraxacum officinale	H	FACU	13			
6	*Bromus inermis*	H	--	14			
7	*Agrostis alba*	H	FAC+	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 2/7 = 28%

Area dominated by upland vegetation.

HYDROLOGY

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

x No Recorded Data Available

Field Observations:

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

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

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

Wetland Hydrology Indicators:

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

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

Remarks: No hydrology indicators present at this sampling point.

LAND & WATER

SOILS

Map Unit Name (Series and Phase):	Blossberg loam, 0 to 4 percent slopes	Drainage Class:	Poorly drained
Taxonomy (Subgroup):		Field Observations Confirm Mapped Type?	____ Yes __x__ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 8+	A	10 YR 2/1	--	--	Sandy clay, fine to medium gravels, large cobbles

Hydric Soil Indicators:

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

Spoil piles from construction of ponds. Low chroma color is present, but is not enough of a hydric indicator to be considered wetland soils. Spoils piles created during construction efforts and does not reflect mapped soil type fro this area.

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 is located on the slope of construction spoil pile. Area planted with upland shrubs and seeded with upland grass mix.

Approved by HQUSACE 2/92

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

Project/Site:	Peterson Ranch			Date:	8/6/03
Applicant/Owner:	MDT			County:	Granite
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	No	Transect ID:	1– Pool 4
Is the area a potential Problem Area?:		Yes	No	Plot ID:	2
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	Eleocharis palustris	H	OBL	9			
2	*Carex nebrascensis*	H	OBL	10			
3	*Typha latifolia*	H	OBL	11			
4	*Potentilla anserina*	H	OBL	12			
5	*Alopecurus pratensis*	H	FACW	13			
6	*Polygonum amphibium*	H	OBL	14			
7	*Agrostis alba*	H	FAC+	15			
8				16			

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

Area dominated by hydrophytic vegetation.

HYDROLOGY

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

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

Wetland Hydrology Indicators:

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

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

Remarks:
Hydrologic indicators present with free water in pit and saturated ground.

LAND & WATER

SOILS

Map Unit Name (Series and Phase): Blossberg loam, 0 to 4 percent slopes
Drainage Class: Poorly drained
Taxonomy (Subgroup): _____
Field Observations
Confirm Mapped Type? x Yes _____ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 6	A1	10 YR 2/1	-	-	Clay loam
6 – 12+	A2	10 YR 2/1	2.5 YR 3/6-	Few / Faint-	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	x	Listed on Local Hydric Soils List
_____	Reducing Conditions	_____	Listed on National Hydric Soils List
X	Gleyed or Low-Chroma Colors	_____	Other (Explain in Remarks)

Sampling point located along vegetation transect, fringe of wetland pond no. 5. Hydric soil indicators present with low-chroma colors and mottles. Mapped soils listed as hydric in Granite County Soil survey.

WETLAND DETERMINATION

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

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

Remarks:
Sampling point considered within a wetland.

Approved by HQUSACE 2/92

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Peterson Ranch	Date: 8/6/03
Applicant/Owner: MDT	County: Granite
Investigator: Greg Howard	State: MT

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

Community ID:
Transect ID: 2 – Pool 2
Plot ID: 1

VEGETATION

	Dominant Plant Species	Stratum	Indicator
1	*Agropyron trachycaulum*	H	FAC
2	*Thlaspi arvensis*	H	--
3	*Potentilla anserina*	H	OBL
4	*Malva neglecta*	H	--
5	*Helianthus annuus*	H	FACU+
6	*Descurainia sophia*	H	--
7	*Plantago major*	H	FAC+
8			
9			
10			
11			
12			
13			
14			
15			
16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 3/7 = 42%

Area dominated by mostly upland grasses and invasive 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: -- (in.)

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

Remarks:
No hydrology indicators present.

SOILS

Map Unit Name	Nythar-Flintcreek Complex, 0 to 4 percent slopes	Drainage Class:	Very poorly drained
(Series and Phase):		Field Observations	
Taxonomy (Subgroup):		Confirm Mapped Type?	____ Yes __x__ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2.5	O	10 YR 3/2	-	-	Roots & organic w/loam
2.5 – 10+	A	10 YR 3/1	-	-	Clay

Large cobbles 4-6 inches in wide.

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	x	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors	____	Other (Explain in Remarks)

Low chroma-colors present, no other evidence of hydric soils. Soils for this area listed as hydric, but characteristics in sampling pit do not reflect mapped type for this area. Likely alteration due to construction efforts.

WETLAND DETERMINATION

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

Remarks:
Sampling point considered within an upland area.

Approved by HQUSACE 2/92

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Peterson Ranch			Date:	8/6/03
Applicant/Owner:	MDT			County:	Granite
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	No	Transect ID:	2 – Pool 2
Is the area a potential Problem Area?:		Yes	No	Plot ID:	2
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Agropyron trachycaulum*	H	FAC	9	*Phleum pratense*	H	FACU
2	*Agrostis alba*	H	FAC+	10			
3	*Potentilla anserina*	H	OBL	11			
4	*Festuca pratensis*	H	FACU+	12			
5	*Malva neglecta*	H	--	13			
6	*Taraxacum officinale*	H	FACU	14			
7	*Helianthus annuus*	H	FACU+	15			
8	*Cirsium arvense*	H	FACU+	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 2/9 = 22%

Area mostly dominated by upland grasses and weedy 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:	--	(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:
Soil pit was moist, but not saturated. No hydrology indicators present at this sampling point.

LAND & WATER

SOILS

Map Unit Name	Nythar-Flintcreek Complex, 0 to 4 percent slopes	Drainage Class:	Very poorly drained
(Series and Phase):		Field Observations	
Taxonomy (Subgroup):		Confirm Mapped Type?	____ Yes __x__ No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 12+	A	10 YR 3/2	-	-	Sandy clay loam

Hydric Soil Indicators:

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

Low chroma-colors present, no other hydric indicators evident. Sampling point is considered upland. Soils listed as hydric, but sampling pit characteristics do not reflect mapped type.

WETLAND DETERMINATION

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

Remarks:
Sampling point considered within an upland area.

Approved by HQUSACE 2/92

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Peterson Ranch			Date:	8/6/03
Applicant/Owner:	MDT			County:	Granite
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	No	Transect ID:	2 – Pool 2
Is the area a potential Problem Area?:		Yes	No	Plot ID:	3
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Agropyron trachycaulum*	H	*FAC*	9			
2	*Potentilla anserina*	H	*OBL*	10			
3	*Malva neglecta*	H	--	11			
4	*Taraxacum officinale*	H	*FACU*	12			
5	*Eleocharis palustris*	H	*OBL*	13			
6	*Carex nebrascensis*	H	*OBL*	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 4/6 = 66%

Hydrophytic vegetation present, several obligate wetland species. Area mostly dominated by upland grasses and weedy species present.

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 at this sampling point.

LAND & WATER

SOILS

Map Unit Name	Nythar-Flintcreek Complex, 0 to 4 percent slopes	Drainage Class:	Very poorly drained
(Series and Phase):		Field Observations	
Taxonomy (Subgroup):		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 – 6	A	10 YR 3/2	-	-	Clay loam
6 – 12+	B	10 YR 4/2	-	-	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	x	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
X	Gleyed or Low-Chroma Colors	____	Other (Explain in Remarks)

Some evidence of hydric soil conditions with low-chroma colors. Soils listed as hydric.

WETLAND DETERMINATION

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

Is this Sampling Point Within a Wetland? ____ Yes __x__ No

Remarks:
The sampling area is located along the fringe between open water/shoreline and upland slopes. Vegetation was dominated mostly by upland species. The obligate species present were observed in only trace amounts and located closer to waters edge. This area was still occupied by mostly upland grasses and did not warrant separate types. Sampling point considered within an upland area.

Approved by HQUSACE 2/92

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

1. Project Name: Peterson Ranch **2. Project #:** 130091 **Control #:** _____

3. Evaluation Date: 8/6/2003 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA 1

6. Wetland Location(s) i. T: 10 N **R:** 13 W **S:** 35 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 17010202 **GPS Reference No. (if applies):** _____

Other Location Information: Pond # 1, 2 & adjacent emergent wetlands west of irrigation ditch.

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

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

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

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

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Riverine	Palustrine	None	Emergent Wetland	Seasonally Flooded	Artifical	60
Riverine	Palustrine	None	Unconsolidated Bottom	Permanently Flooded	Excavated	35
Riverine	Palustrine	None	Aquatic Bed	Permanently Flooded	Excavated	5
---	---	---	---	---	---	

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

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

12. GENERAL CONDITION OF AA

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

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

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

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, Canada thistle and hounds tongue.

iii. Briefly describe AA and surrounding land use / habitat: Hydrology influenced by irrigation ditches & groundwater. Area consists of two ponds with open-water/emergent wetlands and extensive wet meadow. Surrounding land use includes livestock grazing to the west & timber mill toward the east.

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	= 1 Vegetated Class
Select Rating	---	Moderate	---

Comments: Increase in number of vegetated classes during 2003 assessment with the addition of aquatic bed class. Increase in rating from low to moderate.

LAND & WATER

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

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

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

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

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

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

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

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

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

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

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

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

14C. General Wildlife Habitat Rating

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

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

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

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

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

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

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☐ Exceptional	☐ High	☒ Moderate	☐ Low
Substantial	--	--	--	--
Moderate	--	--	.5 (M)	--
Low	--	--	--	--

Comments: _____

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

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

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

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

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

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

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

Comments: No useable fish habitat.

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)
Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

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

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

ii. **Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA?** (check)
☐**Y** ☒**N** **Comments:** Low % scrub-scrub class in this AA, AA does contain restricted outlet.

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)
Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond [3] **5 out of 10 years**	--	--	--	.8 (H)	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: New ponds with a high capcity to contain water during seasonal flooding of Flint Creek.

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)
Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☒ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	.7 (M)	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Low % vegetation cover around ponds.

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

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

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

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

Comments: Small amount of vegtation cover along shore-line.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A	☐ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☒ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments:

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

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

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

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

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

Comments: High groundwater table, irrigation influenced and subsurface flow through alluvial materials.

14K. UNIQUENESS

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

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

Comments:

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Comments: _____

LAND & WATER

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	None	0.00	1	
C. General Wildlife Habitat	Moderate	0.50	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Moderate	0.50	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.70	1	
H. Sediment/Shoreline Stabilization	Low	0.30	1	
I. Production Export/Food Chain Support	High	0.90	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.30	1	
L. Recreation/Education Potential	Low	0.3	1	
	Totals:	5.60	11.00	
	Percent of Total Possible Points:		**51%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

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

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

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

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

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

1. Project Name: Peterson Ranch **2. Project #:** 130091 **Control #:** _____

3. Evaluation Date: 8/6/2003 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA 2

6. Wetland Location(s) i. T: 10 N **R:** 13 W **S:** 35 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 17010202 **GPS Reference No. (if applies):** _____

Other Location Information: Mature scrub-shrub vegetation class along irrigation ditch.

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

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

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

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

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Riverine	Palustrine	None	Scrub-Shrub Wetland	Seasonally Flooded	Artifical	80
Riverine	Palustrine	None	Emergent Wetland	Seasonally Flooded	Artifical	15
Riverine	Palustrine	None	Rock Bottom	Seasonally Flooded	Artifical	5
---	---	---	---	---	---	

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

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

12. GENERAL CONDITION OF AA

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

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

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

ii. Prominent weedy, alien, & introduced species: _____

iii. Briefly describe AA and surrounding land use / habitat: Mature scrub-shrub located along an irrigaton ditch. Several small pockets of cottonwoods and aspen present along ditch. Open areas dominated by emergent wetlands.

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	= 1 Vegetated Class
Select Rating	---	Moderate	---

Comments: Increase in number of vegetated classes during 2003 assessment with the addition of aquatic bed class. Increase in rating from low to moderate.

LAND & WATER

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

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

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

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

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

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

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

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

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

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

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

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

14C. General Wildlife Habitat Rating

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

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

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

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

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

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

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

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

Comments: _____

LAND & WATER

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

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

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

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

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

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

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

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

Comments: No useable fish habitat.

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

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

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

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

ii. **Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA?** (check)
☐**Y** ☒**N** **Comments:** Irrigation ditch with outlet into Flint Creek.

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

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

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond [3] **5 out of 10 years**	--	--	--	.8 (H)	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: .

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

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

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	.9 (H)	--	--	--	--	--	--	--

Comments: High % vegetation cover from mature willows community.

LAND & WATER

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

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
[3] **65 %**	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: Mature willows with deep binding roots systems along irrigation ditch.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☒ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	.8H	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments:

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

i. ☐ **Discharge Indicators**

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

ii. ☒ **Recharge Indicators**

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

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

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

Comments: High groundwater table, irrigation influenced and subsurface flow through alluvial materials.

14K. UNIQUENESS

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

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

Comments:

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

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

Comments: _____

LAND & WATER

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	Low	0.10	1	
C. General Wildlife Habitat	Moderate	0.7	1	
D. General Fish/Aquatic Habitat	NA	NA	--	
E. Flood Attenuation	Low	0.20	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	High	0.90	1	
H. Sediment/Shoreline Stabilization	High	1.00	1	
I. Production Export/Food Chain Support	High	0.80	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.30	1	
L. Recreation/Education Potential	Low	0.30	1	
	Totals:	6.40	11.00	
	Percent of Total Possible Points:		**58%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

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

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

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

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

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

1. Project Name: Peterson Ranch **2. Project #:** 130091 **Control #:** _____

3. Evaluation Date: 8/6/2003 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA 3

6. Wetland Location(s) i. T: 10 N **R:** 13 W **S:** 35 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 17010202 **GPS Reference No. (if applies):** _____

Other Location Information: Pond # 's 3, 4, & 5.

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

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

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

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

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	*MODIFIER* [2]	% OF AA
Riverine	Palustrine	None	Emergent Wetland	Permanently Flooded	Excavated	70
Riverine	Palustrine	None	Unconsolidated Bottom	Permanently Flooded	Excavated	25
Riverine	Palustrine	None	Aquatic Bed	Permanently Flooded	Excavated	5
---	---	---	---	---	---	

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

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

12. GENERAL CONDITION OF AA

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

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

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

ii. Prominent weedy, alien, & introduced species: Spotted knapweed, Canada thistle, & hounds tongue.

iii. Briefly describe AA and surrounding land use / habitat: Hydrology influenced by ground water & seasonal flooding of adjacent irrigation ditch. Area has three created wetland ponds. Surrounding lands uses include grazing and timber mill.

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	= 1 Vegetated Class
Select Rating	---	Moderate	---

Comments: Increase in number of vegetated classes during 2003 assessment with the addition of aquatic bed class. Increase in rating from low to moderate.

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

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

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

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

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

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

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

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

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

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

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

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

14C. General Wildlife Habitat Rating

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

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

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

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

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

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

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

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

Comments: _____

LAND & WATER

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

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

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

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

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

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

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

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

Comments: No useable fish habitat.

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

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

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

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

ii. **Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA?** (check)
☐**Y** ☒**N** **Comments:** Irrigation ditch with outlet into Flint Creek & lack of scrub-shrub / forested communities.

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

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

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond [3] **5 out of 10 years**	--	--	--	.8 (H)	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: Moderate capacity to contain waters within the wetland areas.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☐ ≥ 70%		☒ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	.7 (M)	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: Moderate % vegetation cover .

LAND & WATER

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

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
[3] **65 %**	--	--	--
35-64 %	.7 (M)	--	--
< 35 %	--	--	--

Comments: Area dominated by emergent vegetation.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A	☐ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☒ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments:

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

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

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

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

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

Comments: Groundwater subsurface flow, highly permeable alluvial substrate.

14K. UNIQUENESS

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

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

Comments:

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

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

Comments: _____

LAND & WATER

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	None	0.00	1	
C. General Wildlife Habitat	Moderate	0.70	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Moderate	0.50	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.70	1	
H. Sediment/Shoreline Stabilization	Moderate	0.70	1	
I. Production Export/Food Chain Support	High	0.90	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.30	1	
L. Recreation/Education Potential	Low	0.30	1	
	Totals:	6.20	11.00	
	Percent of Total Possible Points:		**56%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

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

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

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

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

Appendix C

REPRESENTATIVE PHOTOGRAPHS
2003 AERIAL PHOTOGRAPH

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER

Photo Point No. 1: View looking west across mitigation site. Upland vegetation in foreground.

Photo Point No. 2: View looking west along vegetation transect No. 2. Upland community type in foreground, created wetland pond No. 2 in background.

Photo Point No. 3: View looking north at southern end of created wetland pond No.2. Side slopes transitioning down towards the open water are dominated by wetland species.

Photo Point No. 4: View looking southwest across pond No. 4. Emergent wetlands observed around pond fringes and open waters with lower depths.

Photo Point No. 5: View looking north toward created wetland pond No. 4. Emergent wetlands surrounding ponds fringes and scrub-shrub wetlands in the background.

Peterson Ranch Mitigation Site

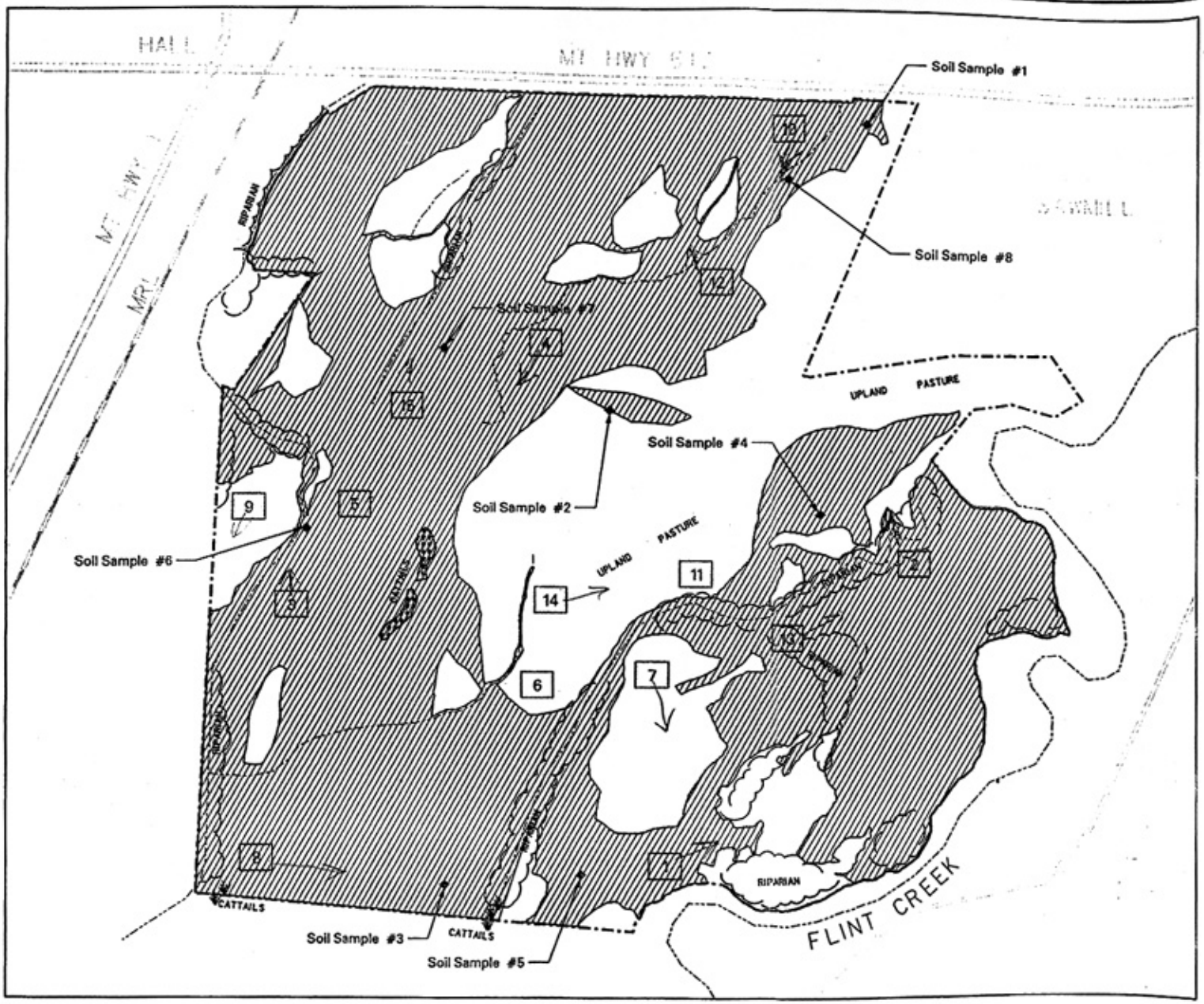
2003 Aerial Photograph

Appendix D

ORIGINAL SITE PLAN

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER



LAND & WATER D-1

N

0 300 FEET

0 100 METERS

LEGEND

- PROPOSED EASEMENT
- EXISTING WETLAND BOUNDARY
- CREEK /IRRIGATION DITCH
- HIGHWAY
- ROAD
- SOIL SAMPLE
- xx PHOTO LOCATION

MAXVILLE-DRUMMOND

PETERSON RANCH WETLAND MITIGATION

EXISTING WETLANDS

MAP SOURCE:
GPS FIELD SURVEY DATA OBTAINED 7/10/98,
AND USGS TIGERLINE DATA OBTAINED FROM
THE MONTANA NRIS WEB SITE

Carter-Burgess

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPX 20 (19)	1

MONTANA DEPARTMENT OF TRANSPORTATION

LAND & WATER D-2

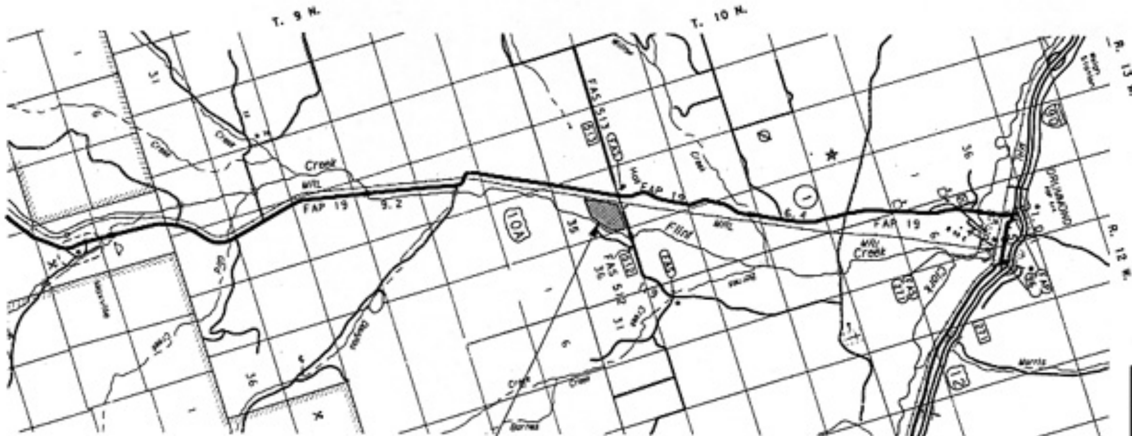
FEDERAL AID PROJECT NO. STPX 20 (19)
PETERSON WETLAND MITIGATION PLAN
GRANITE COUNTY

THIS PROJECT

RECEIVED
MAY 17 2001
ENVIRONMENTAL

RECEIVED
JUN 10 2002
ENVIRONMENTAL

SCALES AS NOTED ON PLANS
REDUCED PRINTS APPROXIMATELY 1/2 ORIGINAL SCALE



THIS CONTRACT

PLANS PREPARED BY

Carter-Burgess
113 W. FRONT ST. SUITE 103
MISSOULA, MONTANA 59802
(406) 721-1471

WGM Group, Inc.
3021 PALMER
P.O. BOX 16027
MISSOULA, MONTANA 59808-6027
(406) 728-4611

RELATED PROJECTS

MAXVILLE-DRUMMOND
STPP 19-2(6)48

ASSOCIATED PROJECT AGREEMENT NUMBERS

R/W & I.C.	
P.E.	

WGM Group, Inc.

BY Jeremy W. Keene
DATE 5/16/01

MONTANA DEPARTMENT OF TRANSPORTATION
RECEIVED :
BY Carl S. Peil May 17, 2001
PRECONSTRUCTION ENGINEER DATE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

DIVISION ADMINISTRATOR DATE

WGM Group, Inc.

713/design/1280TITL.DGN 05/16/2001 11:12:26 AM

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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPX 20 (19)	2

NOTES

LAND & WATER D-J

PROTECTION OF EXISTING WETLANDS

ENCLOSE DESIGNATED CONSTRUCTION AREAS WITH TEMPORARY FENCING. CONSTRUCTION VEHICLES ARE NOT PERMITTED OUTSIDE OF THE CONSTRUCTION AREAS, EXCEPT ON DESIGNATED CONSTRUCTION ACCESS ROADS. MAINTAIN ALL FENCING UNTIL THE COMPLETION OF CONSTRUCTION.

CONSTRUCTION ACCESS AND STAGING

AN EXISTING APPROACH ON HIGHWAY 512 MAY BE USED TO ACCESS THE MAIN IRRIGATION DITCH ON THE WEST SIDE OF THE PROPERTY. A TEMPORARY APPROACH MAY BE CONSTRUCTED TO GAIN ACCESS TO THE SITE FROM HIGHWAY 512 AT THE NORTHEAST CORNER OF THE PROPERTY, ADJACENT TO THE SAWMILL. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE APPROACH FOLLOWING COMPLETION OF CONSTRUCTION.

STORE ALL EQUIPMENT AND MATERIALS WITHIN THE DESIGNATED STAGING AREA PROVIDED SOUTH OF THE CORRAL. CONSTRUCTION ACCESS TO THE STAGING AREA IS SHOWN ON THE PLANS. 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 BERMS AND SPOIL PILES, AND AT VARIABLE DEPTHS RANGING FROM 100mm TO 400mm WITHIN "SHALLOW WATER AREAS" TO CREATE AN UNEVEN NATURAL BOTTOM. DO NOT PLACE TOPSOIL IN "DEEP WATER AREAS". FINISHED GRADE ELEVATIONS DO NOT INCLUDE TOPSOIL.

GRADING

PERFORM ALL EXCAVATION AND EMBANKMENT BY THE METHODS DESCRIBED IN SECTION 203 OF THE STANDARD SPECIFICATIONS. ALL EXCAVATION, INCLUDING MUCK EXCAVATION, AND DITCH EXCAVATION WILL BE PAID FOR AS "UNCLASSIFIED EXCAVATION". EXCAVATION OF SATURATED AND UNSTABLE MATERIAL IS ANTICIPATED IN SOME AREAS, HOWEVER, NO PAYMENT WILL BE MADE FOR "MUCK EXCAVATION". TOPSOIL EXCAVATION IS DEDUCTED FROM THE GRADING QUANTITY.

SEEDING

SEED AREAS SHOWN ON THE PLANS AND OTHER AREAS DISTURBED DURING CONSTRUCTION. SEEDING AREA NO. 1 IS A NATIVE SEED MIX TO BE USED IN ALL NON-WETLAND (DRY) AREAS. SEEDING AREA NO. 2 IS A TRANSITIONAL SEED MIX TO BE USED IN WET AND SEMI-WET AREAS. SEE SPECIAL PROVISIONS.

PLANTING

COLLECT AND PLANT LIVE CUTTINGS FROM SUITABLE WILLOW SPECIES RESIDENT WITHIN THE FLINT CREEK FLOODPLAIN. OBTAIN BAREROOT STOCK FROM A QUALIFIED NURSERY. SUPPLIER OR INSTALLATION CONTRACTOR IS TO HAVE NOT LESS THAN THREE (3) YEARS OF EXPERIENCE IN SUCCESSFULLY COLLECTING AND PLANTING WETLAND PLANT MATERIAL. SEE SPECIAL PROVISIONS.

PLANT WILLOW CUTTINGS AND BAREROOT STOCK AS DIRECTED BY THE ENGINEER IN THE APPROXIMATE LOCATIONS SHOWN ON THE PLANTING PLAN.

FENCING

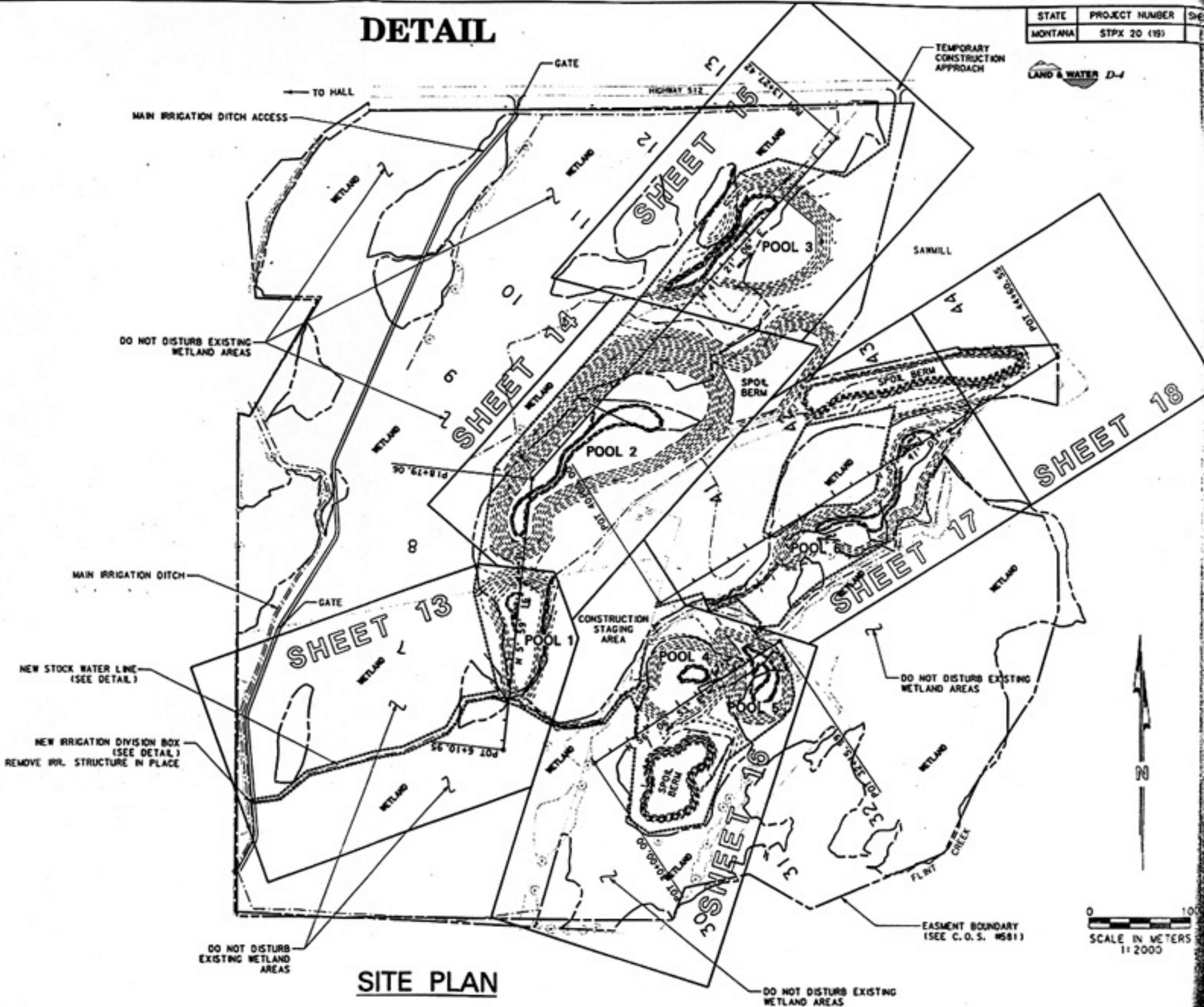
PERIMETER FENCING IS STANDARD NOT BARBED 5-WIRE FENCE WITH WOODEN POSTS (TYPE F5W). PLACE PERIMETER FENCING ON THE EASEMENT BOUNDARY DEFINED BY THE CERTIFICATE OF SURVEY (C.O.S. 581). INTERIOR FENCING IS STANDARD NOT BARBED 4-WIRE FENCE WITH WOODEN POSTS (TYPE F4W). FINAL PLACEMENT OF INTERIOR FENCING IS SUBJECT TO REVIEW BY THE LANDOWNER.

STATE	PROJECT NUMBER
MONTANA	STPX 20 (19)

DETAIL

LEGEND

- EASEMENT BOUNDARY
- EXISTING TREES AND SHRUBS
- EXSITING TREE
- EXISTING FENCE
- EXISTING IRRIGATION DITCH
- EXISTING 0.25m CONTOUR
- EXISTING 1.0m CONTOUR
- CONTROL LINE
- TEMPORARY CONSTRUCTION FENCING
- PROPOSED BERM
- PROPOSED BANK PROTECTION
- PROPOSED 0.25m CONTOUR
- PROPOSED 1.0m CONTOUR
- REMOVE FENCE
- PROPOSED FENCE



SITE PLAN

WGM Group, Inc.

MONTANA DEPARTMENT OF TRANSPORTATION

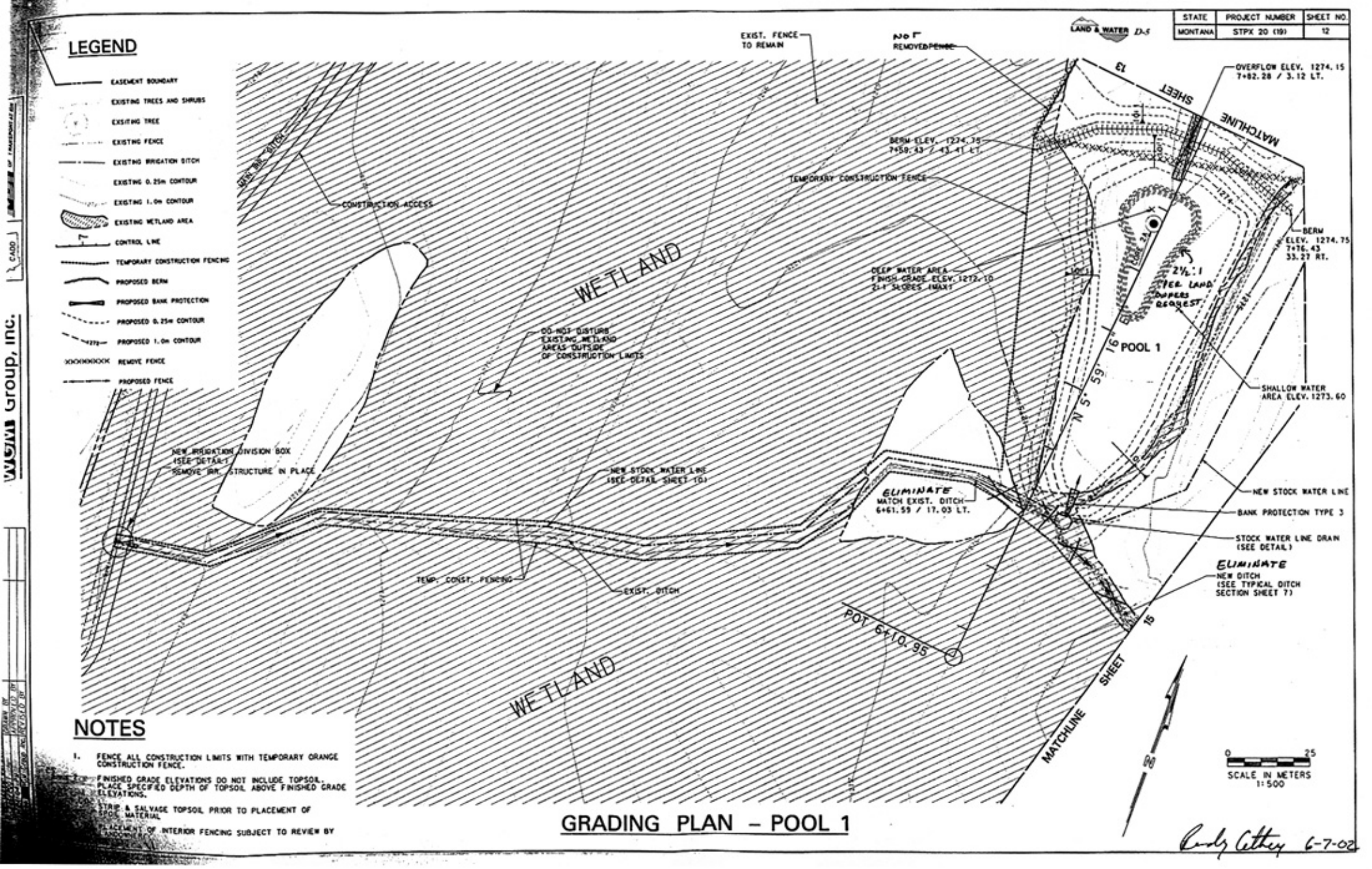
MONTANA CADD

DESIGNED BY / DRAWN BY / APPROVED BY / REVISED BY

./990713/design/1280DT01.DGN 05/16/2001 01:17:03 PM

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPX 20 (19)	12

LAND & WATER D-5



NOTES

1. FENCE ALL CONSTRUCTION LIMITS WITH TEMPORARY ORANGE CONSTRUCTION FENCE.
2. FINISHED GRADE ELEVATIONS DO NOT INCLUDE TOPSOIL. PLACE SPECIFIED DEPTH OF TOPSOIL ABOVE FINISHED GRADE ELEVATIONS.
3. STRIP & SALVAGE TOPSOIL PRIOR TO PLACEMENT OF SPOIL MATERIAL.
4. PLACEMENT OF INTERIOR FENCING SUBJECT TO REVIEW BY LANDOWNER.

GRADING PLAN – POOL 1

Randy Cathey 6-7-02

Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

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

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

GPS Mapping and Aerial Photo Referencing Procedure

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

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

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

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

Appendix F

MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

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

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

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

Site Selection

Select the sampling site with these considerations in mind:

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

Sampling

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

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

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

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

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

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

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

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

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

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

Photograph the sampled site.

Sample Handling/Shipping

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

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

METHODS

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

The method employed to assess these wetlands is based on constructing an index using a battery of 12 bioassessment metrics or attributes (**Table 1**) tested and recommended by Stribling et al. (1995) in a report to the Montana Department of Health and Environmental Science. In that study, it was determined that some of the metrics were of limited use in some geographic regions, and for some wetland types. Despite that finding, all 12 metrics are used in this evaluation of mitigated wetlands, since detailed geographic information and wetland classifications were unavailable.

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

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

Sample Processing

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

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

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

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

Bioassessment Metrics

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

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

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

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

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

RESULTS

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

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

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

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

LITERATURE CITED

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

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

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

Table 2. Sampled MDT Mitigation Sites by Year

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

Aquatic Invertebrate Taxonomic Data

Site Name PETERSON RANCH POOL 1 **Date Collected** 8/ 6/2003

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
		Ostracoda	1	0.92%	Yes	8	CG
		Copepoda	30	27.52%	Yes	8	CG
Acarina							
	Acari						
		Acari	4	3.67%	Yes	5	PR
Amphipoda							
	Talitridae						
		Hyalella	3	2.75%	Yes	8	CG
Basommatophora							
	Lymnaeidae						
		Stagnicola	1	0.92%	Yes	6	SC
	Physidae						
		Physidae	2	1.83%	Yes	8	SC
Coleoptera							
	Haliplidae						
		Haliplus	1	0.92%	Yes	5	PH
Diplostraca							
		Cladocera	49	44.95%	Yes	8	CF
Diptera							
	Chironomidae						
		Psectrocladius	1	0.92%	Yes	8	CG
Ephemeroptera							
	Baetidae						
		Callibaetis	2	1.83%	Yes	9	CG
Odonata							
	Coenagrionidae						
		Enallagma	14	12.84%	Yes	7	PR
	Libellulidae						
		Libellulidae	1	0.92%	Yes	9	PR
Grand Total			**109**				

Aquatic Invertebrate Taxonomic Data

Site Name PETERSON RANCH POOL 4 **Date Collected** 8/ 6/2003

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
Acarina							
	Acari						
		Acari	1	0.67%	Yes	5	PR
Basommatophora							
	Lymnaeidae						
		Stagnicola	34	22.67%	Yes	6	SC
	Physidae						
		Physidae	20	13.33%	Yes	8	SC
	Planorbidae						
		Gyraulus	6	4.00%	Yes	8	SC
Coleoptera							
	Dytiscidae						
		Coptotomus	1	0.67%	Yes	5	PR
		Laccophilus	2	1.33%	Yes	5	PR
	Haliplidae						
		Haliplus	3	2.00%	Yes	5	PH
Diplostraca							
		Cladocera	13	8.67%	Yes	8	CF
Diptera							
	Chironomidae						
		Cricotopus (Cricotopus)	7	4.67%	Yes	7	SH
	Tipulidae						
		Tipula	1	0.67%	Yes	4	SH
Heteroptera							
	Corixidae						
		Corixidae	1	0.67%	Yes	10	PH
	Notonectidae						
		Notonectidae	1	0.67%	Yes	10	PR
Odonata							
	Coenagrionidae						
		Enallagma	60	40.00%	Yes	7	PR
Grand Total			**150**				

Aquatic Invertebrate Taxonomic Data

Site Name PETERSON RANCH POOL 5 **Date Collected** 8/ 6/2003

Order	Family	Taxon	Count	Percent	Unique	BI	FFG
Acarina							
	Acari						
		Acari	3	2.73%	Yes	5	PR
Basommatophora							
	Lymnaeidae						
		Stagnicola	14	12.73%	Yes	6	SC
	Planorbidae						
		Gyraulus	4	3.64%	Yes	8	SC
Coleoptera							
	Haliplidae						
		Haliplus	2	1.82%	Yes	5	PH
	Hydrophilidae						
		Tropisternus	1	0.91%	Yes	5	PR
Diplostraca							
		Cladocera	6	5.45%	Yes	8	CF
Diptera							
	Ceratopogonidae						
		Ceratopogoninae	1	0.91%	Yes	6	PR
	Chironomidae						
		Ablabesmyia	1	0.91%	Yes	8	CG
		Acricotopus	1	0.91%	Yes	10	CG
		Endochironomus	2	1.82%	Yes	10	SH
		Pseudochironomus	1	0.91%	Yes	5	CG
Ephemeroptera							
	Baetidae						
		Callibaetis	1	0.91%	Yes	9	CG
Heteroptera							
	Corixidae						
		Hesperocorixa	1	0.91%	Yes	10	PH
Odonata							
	Coenagrionidae						
		Enallagma	71	64.55%	Yes	7	PR
Rhynchobdellida							
	Glossiphoniidae						
		Glossiphonia complanata	1	0.91%	Yes	9	PR
Grand Total			**110**				

Aquatic Invertebrate Data Summary

Project ID: MDT03LW

STORET Station ID:

Station Name: PETERSON RANCH POOL 1

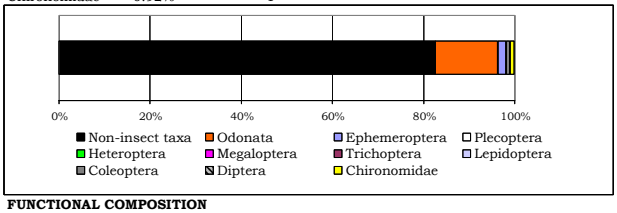
Activity ID:

Sample Date: 8/6/2003

Sample type	
SUBSAMPLE TOTAL ORGANISMS	109
Portion of sample used	25.00%
Estimated number in total sample	436
Sampling effort	
Time	
Distance	
Jabs	
Habitat type	
EPT abundance	2
Taxa richness	12
Number EPT taxa	1
Percent EPT	1.83%

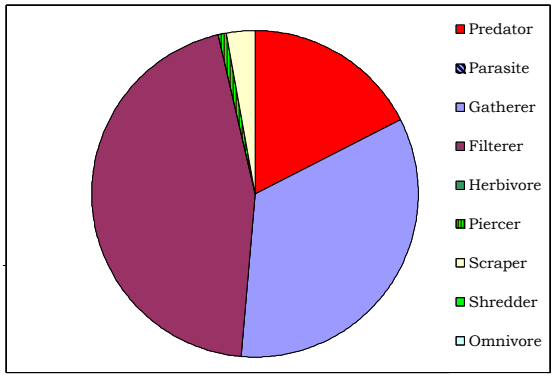
TAXONOMIC COMPOSITION

GROUP	PERCENT	#TAXA
Non-insect taxa	82.57%	7
Odonata	13.76%	2
Ephemeroptera	1.83%	1
Plecoptera	0.00%	0
Heteroptera	0.00%	0
Megaloptera	0.00%	0
Trichoptera	0.00%	0
Lepidoptera	0.00%	0
Coleoptera	0.92%	1
Diptera	0.00%	0
Chironomidae	0.92%	1



FUNCTIONAL COMPOSITION

GROUP	PERCENT	#TAXA
Predator	17.43%	3
Parasite	0.00%	0
Gatherer	33.94%	5
Filterer	44.95%	1
Herbivore	0.00%	0
Piercer	0.92%	1
Scraper	2.75%	2
Shredder	0.00%	0
Omnivore	0.00%	0
Unknown	0.00%	0



COMMUNITY TOLERANCES

Sediment tolerant taxa	1
Percent sediment tolerant	0.92%
Sediment sensitive taxa	0
Metals tolerance index (McGuire)	9.05
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	0
Percent hemoglobin bearers	0.00%
Air-breather richness	0
Percent air-breathers	0.00%
Burrower richness	0
Percent burrowers	0.00%
Swimmer richness	0
Percent swimmers	0.00%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Cladocera	49	44.95%
Copepoda	30	27.52%
Enallagma	14	12.84%
Acari	4	3.67%
Hyalella	3	2.75%
SUBTOTAL 5 DOMINANTS	100	91.74%
Physidae	2	1.83%
Callibaetis	2	1.83%
Stagnicola	1	0.92%
Ostracoda	1	0.92%
Libellulidae	1	0.92%
TOTAL DOMINANTS	107	98.17%

SAPROBITY

Hilsenhoff Biotic Index	7.42

DIVERSITY

Shannon H (loge)	1.81
Shannon H (log2)	1.26
Margalef D	2.34
Simpson D	0.29
Evenness	0.11

VOLTINISM

TYPE	# TAXA	PERCENT
Multivoltine	6	79.82%
Univoltine	4	18.35%
Semivoltine	2	1.83%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	6	7.34%
Intolerant	0	0.00%
Clinger	0	0.00%

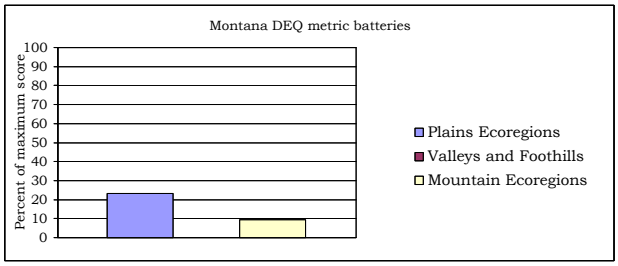
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE	
Taxa richness	12	1	
E richness	1	1	
P richness	0	1	
T richness	0	1	
Long-lived	2	1	
Sensitive richness	0	1	
%tolerant	7.34%	5	
%predators	17.43%	3	
Clinger richness	0	1	
%dominance (3)	85.32%	1	
	TOTAL SCORE	16	32%

MONTANA DEQ METRICS (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	12	1	0	0
EPT richness	1	0	0	0
Biotic Index	7.42	0	0	0
%Dominant taxon	44.95%	2	1	1
%Collectors	78.90%	2	1	1
%EPT	1.83%	0	0	0
Shannon Diversity	1.26	0		
%Scrapers +Shredders	2.75%	0	0	0
Predator taxa	3	1		
%Multivoltine	79.82%	1		
%H of T	#DIV/0!		#DIV/0!	
TOTAL SCORES		7	#DIV/0!	2
PERCENT OF MAXIMUM		23.33	#DIV/0!	9.52
IMPAIRMENT CLASS		MODERATE	#DIV/0!	SEVERE



Montana Plains ecoregions metrics (Bramblett and Johnson)

Riffle		*Pool*	
EPT richness	1	E richness	1
Percent EPT	1.83%	T richness	0
Percent Oligochaetes and Leeches	0.00%	Percent EPT	1.83%
Percent 2 dominants	72.48%	Percent non-insect	82.57%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.00%	Univoltine richness	4
Univoltine richness	4	Percent supertolerant	81.65%
Percent clingers	0.00%		
Swimmer richness	0		

Aquatic Invertebrate Data Summary

Project ID: MDT03LW

STORET Station ID:

Station Name: PETERSON RANCH POOL 4

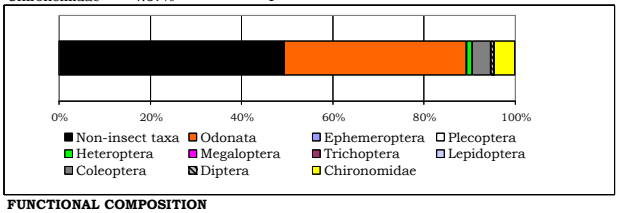
Activity ID:

Sample Date: 8/6/2003

Sample type	
SUBSAMPLE TOTAL ORGANISMS	150
Portion of sample used	20.00%
Estimated number in total sample	750
Sampling effort	
Time	
Distance	
Jabs	
Habitat type	
EPT abundance	0
Taxa richness	13
Number EPT taxa	0
Percent EPT	0.00%

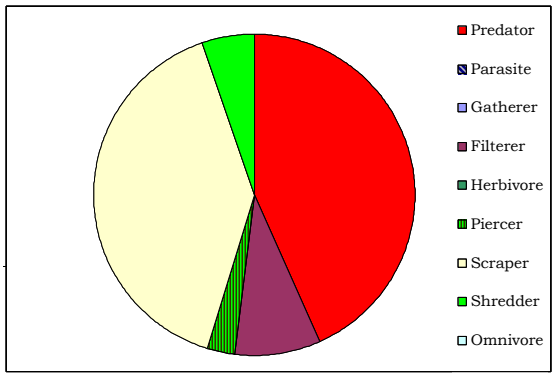
TAXONOMIC COMPOSITION

GROUP	PERCENT	#TAXA
Non-insect taxa	49.33%	5
Odonata	40.00%	1
Ephemeroptera	0.00%	0
Plecoptera	0.00%	0
Heteroptera	1.33%	2
Megaloptera	0.00%	0
Trichoptera	0.00%	0
Lepidoptera	0.00%	0
Coleoptera	4.00%	3
Diptera	0.67%	1
Chironomidae	4.67%	1



FUNCTIONAL COMPOSITION

GROUP	PERCENT	#TAXA
Predator	43.33%	5
Parasite	0.00%	0
Gatherer	0.00%	0
Filterer	8.67%	1
Herbivore	0.00%	0
Piercer	2.67%	2
Scraper	40.00%	3
Shredder	5.33%	2
Omnivore	0.00%	0
Unknown	0.00%	0



COMMUNITY TOLERANCES

Sediment tolerant taxa	3
Percent sediment tolerant	27.33%
Sediment sensitive taxa	0
Metals tolerance index (McGuire)	4.47
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	2
Percent hemoglobin bearers	4.67%
Air-breather richness	3
Percent air-breathers	2.67%
Burrower richness	1
Percent burrowers	0.67%
Swimmer richness	2
Percent swimmers	2.00%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Enallagma	60	40.00%
Stagnicola	34	22.67%
Physidae	20	13.33%
Cladocera	13	8.67%
Cricotopus (Cricotopus)	7	4.67%
SUBTOTAL 5 DOMINANTS	134	89.33%
Gyraulus	6	4.00%
Haliplus	3	2.00%
Laccophilus	2	1.33%
Acari	1	0.67%
Corixidae	1	0.67%
TOTAL DOMINANTS	147	98.00%

SAPROBITY

Hilsenhoff Biotic Index	6.77

DIVERSITY

Shannon H (loge)	2.17
Shannon H (log2)	1.50
Margalef D	2.39
Simpson D	0.24
Evenness	0.12

VOLTINISM

TYPE	# TAXA	PERCENT
Multivoltine	3	14.00%
Univoltine	7	82.00%
Semivoltine	3	4.00%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	4	42.00%
Intolerant	0	0.00%
Clinger	1	4.67%

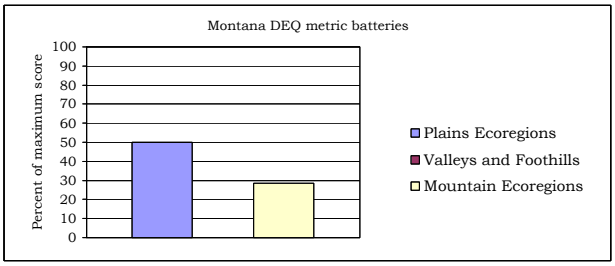
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE	
Taxa richness	13	1	
E richness	0	1	
P richness	0	1	
T richness	0	1	
Long-lived	3	3	
Sensitive richness	0	1	
%tolerant	42.00%	3	
%predators	43.33%	3	
Clinger richness	1	1	
%dominance (3)	76.00%	1	
	TOTAL SCORE	16	32%

MONTANA DEQ METRICS (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	13	1	0	0
EPT richness	0	0	0	0
Biotic Index	6.77	1	0	0
%Dominant taxon	40.00%	2	1	1
%Collectors	8.67%	3	3	3
%EPT	0.00%	0	0	0
Shannon Diversity	1.50	0		
%Scrapers +Shredders	45.33%	3	3	2
Predator taxa	5	2		
%Multivoltine	14.00%	3		
%H of T	#DIV/0!		#DIV/0!	
TOTAL SCORES		15	#DIV/0!	6
PERCENT OF MAXIMUM		50.00	#DIV/0!	28.57
IMPAIRMENT CLASS		MODERATE	#DIV/0!	MODERATE



Montana Plains ecoregions metrics (Bramblett and Johnson)

Riffle		*Pool*	
EPT richness	0	E richness	0
Percent EPT	0.00%	T richness	0
Percent Oligochaetes and Leeches	0.00%	Percent EPT	0.00%
Percent 2 dominants	62.67%	Percent non-insect	49.33%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.00%	Univoltine richness	7
Univoltine richness	7	Percent supertolerant	27.33%
Percent clingers	4.67%		
Swimmer richness	2		

Aquatic Invertebrate Data Summary

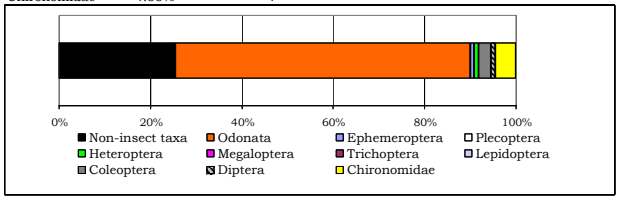
Project ID: MDT03LW
STORET Station ID:
Station Name: PETERSON RANCH POOL 5

Activity ID:
Sample Date: 8/6/2003

Sample type	
SUBSAMPLE TOTAL ORGANISMS	110
Portion of sample used	20.83%
Estimated number in total sample	528
Sampling effort	
Time	
Distance	
Jabs	
Habitat type	
EPT abundance	1
Taxa richness	15
Number EPT taxa	1
Percent EPT	0.91%

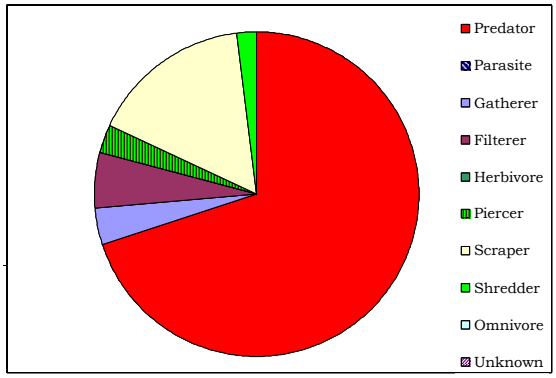
TAXONOMIC COMPOSITION

GROUP	PERCENT	#TAXA
Non-insect taxa	25.45%	5
Odonata	64.55%	1
Ephemeroptera	0.91%	1
Plecoptera	0.00%	0
Heteroptera	0.91%	1
Megaloptera	0.00%	0
Trichoptera	0.00%	0
Lepidoptera	0.00%	0
Coleoptera	2.73%	2
Diptera	0.91%	1
Chironomidae	4.55%	4



FUNCTIONAL COMPOSITION

GROUP	PERCENT	#TAXA
Predator	70.00%	5
Parasite	0.00%	0
Gatherer	3.64%	4
Filterer	5.45%	1
Herbivore	0.00%	0
Piercer	2.73%	2
Scraper	16.36%	2
Shredder	1.82%	1
Omnivore	0.00%	0
Unknown	0.00%	0



COMMUNITY TOLERANCES

Sediment tolerant taxa	2
Percent sediment tolerant	16.36%
Sediment sensitive taxa	0
Metals tolerance index (McGuire)	3.78
Cold stenotherm taxa	0
Percent cold stenotherms	0.00%

HABITUS MEASURES

Hemoglobin bearer richness	3
Percent hemoglobin bearers	6.36%
Air-breather richness	1
Percent air-breathers	0.91%
Burrower richness	2
Percent burrowers	1.82%
Swimmer richness	3
Percent swimmers	5.45%

DOMINANCE

TAXON	ABUNDANCE	PERCENT
Enallagma	71	64.55%
Stagnicola	14	12.73%
Cladocera	6	5.45%
Gyraulus	4	3.64%
Acari	3	2.73%
SUBTOTAL 5 DOMINANTS	98	89.09%
Haliplus	2	1.82%
Endochironomus	2	1.82%
Glossiphonia complanata	1	0.91%
Callibaetis	1	0.91%
Hesperocorixa	1	0.91%
TOTAL DOMINANTS	105	95.45%

SAPROBITY

Hilsenhoff Biotic Index	7.40

DIVERSITY

Shannon H (loge)	1.76
Shannon H (log2)	1.22
Margalef D	2.97
Simpson D	0.43
Evenness	0.08

VOLTINISM

TYPE	# TAXA	PERCENT
Multivoltine	6	12.73%
Univoltine	7	84.55%
Semivoltine	2	2.73%

TAXA CHARACTERS

	#TAXA	PERCENT
Tolerant	6	21.82%
Intolerant	0	0.00%
Clinger	0	0.00%

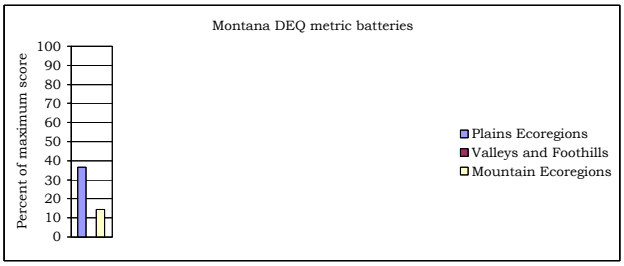
BIOASSESSMENT INDICES

B-IBI (Karr et al.)

METRIC	VALUE	SCORE	
Taxa richness	15	1	
E richness	1	1	
P richness	0	1	
T richness	0	1	
Long-lived	2	1	
Sensitive richness	0	1	
%tolerant	21.82%	3	
%predators	70.00%	3	
Clinger richness	0	1	
%dominance (3)	82.73%	1	
	TOTAL SCORE	14	28%

MONTANA DEQ METRICS (Bukantis 1998)

METRIC	VALUE	Plains Ecoregions	Valleys and Foothills	Mountain Ecoregions
Taxa richness	15	1	1	0
EPT richness	1	0	0	0
Biotic Index	7.40	0	0	0
%Dominant taxon	64.55%	0	0	0
%Collectors	9.09%	3	3	3
%EPT	0.91%	0	0	0
Shannon Diversity	1.22	0		
%Scrapers +Shredders	18.18%	2	1	0
Predator taxa	5	2		
%Multivoltine	12.73%	3		
%H of T	#DIV/0!		#DIV/0!	
TOTAL SCORES		11	#DIV/0!	3
PERCENT OF MAXIMUM		36.67	#DIV/0!	14.29
IMPAIRMENT CLASS		MODERATE	#DIV/0!	SEVERE



Montana Plains ecoregions metrics (Bramblett and Johnson)

Riffle		*Pool*	
EPT richness	1	E richness	1
Percent EPT	0.91%	T richness	0
Percent Oligochaetes and Leeches	0.91%	Percent EPT	0.91%
Percent 2 dominants	77.27%	Percent non-insect	25.45%
Filterer richness	1	Filterer richness	1
Percent intolerant	0.00%	Univoltine richness	7
Univoltine richness	7	Percent supertolerant	15.45%
Percent clingers	0.00%		
Swimmer richness	3		

Appendix G

REVEGETATION

MDT Wetland Mitigation Monitoring
Peterson Ranch
Hall, Montana

LAND & WATER

24. SEEDING

A. Description

This work consists of revegetating areas shown on the plans and other areas disturbed during construction. Seeding Area No. 1 is a native seed mix to be used in all non-wetland (dry) areas. Seeding Area No. 2 is a transitional seed mix to be used in wet and semi-wet areas. All work is to be conducted in accordance with Section 610 of the Standard Specifications.

B. Construction Requirements

1. Schedule. Drill seed only between **October 1 and May 15.** Broadcast seeding is acceptable between April 1 and May 15. Double seeding rate for broadcast seeding.

C. Materials

1. Seeding Area No. 1

Species	Kgs(lbs) per Hectare (Acre)
Revenue slender wheatgrass	1.0 (1.0)
Rosana western wheatgrass	6.5 (6.0)
Lodorm green needlegrass	3.5 (3.0)
Sherman big bluegrass	2.0 (2.0)
Magnar Great Basin wildrye	4.5 (4.0)

2. Seeding Area No. 2

Species	Kgs(lbs) per Hectare (Acre)
Revenue slender wheatgrass	1.0 (1.0)
Rosana western wheatgrass	7.5 (7.0)

Shoshone creeping wildrye	4.5 (4.0)
Western mannagrass	1.0 (1.0)
American sloughgrass	1.0 (1.0)
Blatic rush	0.1 (0.1)
Bluejoint reedgrass	0.1 (0.1)

25. PLANTING

A. Description

This work includes collecting, preparing, and planting live cuttings from suitable willow species resident within the Flint Creek floodplain.

B. Construction Requirements

1. Schedule

Collect and plant cuttings when the ground is ice-free and while the whole plants are dormant. This will typically be in late fall after leaf-drop (October-November), or early spring before bud-break (March-May).

2. Quality Assurance

Supplier or installation contractor is to have not less than three years of experience in successfully collecting and installing wetland plant material.

3. Selection

Select cuttings from the list of suitable species provided below. Identification of willow species is to be made by a qualified agronomist or biologist supervising the project. Select young, green wood (1-3 years). Do not use suckers (<1 year). Choose branches that are 13-25 millimeters (0.5-1.0 inches) in diameter and 900-1800 millimeters (3-6 feet) in length. Select branches that will not overly affect the health and appearance of the parent plant when removed. Do not remove more than 25% of the branches from any given individual.

4. Preparation

Trim all side branches of the cutting to a single stem. Cut the tip where the cutting becomes less than 13 millimeters (0.5 inches). Cut the bottom of the cutting at a 45 degree angle to assist in planting and identification of the bottom end. Label each cutting with color-coded flagging or paint to identify species. Soak cuttings in water for at least 24 hours prior to planting.

5. Storage

Cuttings may be stored up to two weeks wrapped in burlap and bailing twine and soaked in water. Store vertically and soak the lower 450-600 millimeters (18-24 inches) of the stems. Do not submerge the entire cutting. If it is necessary to store cuttings for longer periods, store vertically in a dry, well ventilated, dark, and cool (35-50 deg. F) without freezing. Keep cuttings in moist (not soaked), fungus-free sawdust. At no time should the cuttings be spread out on the ground or exposed to sun and/or wind.

6. Planting

Plant cuttings in small colonies of 8-10 plants each in the locations shown on the plans. Space colonies at 8-10 meters (26-33 feet) apart. Space individual cuttings at 300-900 millimeters (1-3 feet) apart.

Insert cuttings in the ground so that the bottom is between 50 and 150 millimeters (2-6 inches) below the water table throughout the growing season. Insert cuttings by hand or with a rubber mallet where possible. If the soil is rocky or gravelly, use a rod or rebar stake to create a hole. The use of a shovel or other large tools should be avoided. If shoveling is necessary, the soil should be well tamped to insure good contact between the cutting and the soil.

Cleanly clip the top of the cutting so that at least 3/4 of the length of the stem is below ground, and 3-4 healthy buds are above ground. A minimum of 200 millimeters (8 inches) should remain above ground. Clip any portion of the top end that is deformed by installation with a rubber mallet.

C. Materials

The following species are suitable for cuttings and can be found within the project site. Obtain cuttings on-site or from other off-site locations within the Flint Creek floodplain. Obtain permission from landowners prior to collecting cuttings on private property.

Suitable Cutting Species	
Peach-Leaved Willow	*Salix amygdaloides*
Sandbar Willow	*Salix exigua*
Bebb's Willow	*Salix bebbiana*
Drummond Wilow	*Salix drummondiana*
Yellow Willow	*Salix lutea*

Other willow species native to the Flint Creek floodplain may be substituted upon approval.

D. Method of Measurement

Willow cuttings will be measured as each, including collection, storage, planting, and installation in place.

E. Basis of Payment

Payment for the completed and accepted quantities will be made under the following:

Pay Item	Pay Unit
Bareroot Stock	Each
Willow Cuttings	Each

Such price and payment constitutes full compensation for all labor, equipment, tools, materials and incidentals necessary to complete the item.