
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2002

Big Spring Creek Lewistown, Montana



Prepared for:
MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Avenue
Helena, MT 59620-1001

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

February 2003

Project No: 130091.029



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1.0 INTRODUCTION

In 1996, the Montana Fish, Wildlife & Parks (FWP) approached the Montana Department of Transportation (MDT) with a partnership proposal to restore approximately 0.5 mile of Big Spring Creek, at the FWP Brewery Flats Fishing Access site, 1 mile SE of Lewistown in Fergus County (**Figure 1**). Big Spring Creek was straightened through the Brewery Flats area around 1907 by the Milwaukee Railroad to facilitate the construction of a freight yard to the west of the creek. FWP proposed, through their Future Fisheries Improvement Program (FFIP), to restore that section of Big Spring Creek that traversed Brewery Flats to a more natural condition for the purpose of improving fisheries habitat. In addition to increasing total stream length from 2,300 feet to 4,000 feet, the design also included the establishment of a functional floodplain and associated wetland habitat.

In 1998, an MOA between MDT and FWP was signed by the agencies, thus formalizing a cooperative agreement to restore Big Spring Creek. In return for a cash contribution to the project, MDT would receive 7.21 acres of Corps of Engineers (COE)-approved wetland mitigation credit to provide mitigation for projected wetland impacts resulting from MDT projects in Watershed #9 (Middle Missouri River).

The proposed channel restoration was completed over two construction seasons (1998 & 1999), providing a newly created meandering channel with numerous pool, riffle, and run sections. The project incorporated the use of root wads, boulders, footer logs, sod mats, willow clumps and cuttings, coir fabric and seeding of both upland and wetland areas. Sections of floodplain were lowered 1-2 feet to provide areas for wetland development.

According to baseline wetland delineation maps (Barnum and Hoffer 1997) and aerial photographs provided in the environmental assessment prepared for the project by FWP, approximately 7.86 acres of shrub/scrub and emergent wetland occurred within the current monitoring area prior to project implementation (note: reference to a FWS/NRCS delineation resulting in over 14 acres of pre-existing wetlands was found in the project files, but no evidence of such a delineation was found in MDT, NRCS, or FWP project files, and pre-project aerial photographs do not support a 14-acre delineation within the current monitoring area). Hydrology for many of the existing wetlands was thought to be provided by leaking water pipes, with little or no connection to the incised Big Spring Creek channel. The proposed stream restoration was intended to create approximately 1.5 acres of additional wetland habitat, and restore and enhance existing wetlands by reconnecting them with Big Spring Creek.

Target wetland communities to be produced at the site included shallow marsh/wet meadow and wet meadow/scrub-shrub (Inter-Fluve, Inc. 1998). Target wetland functions to be provided at the site included habitat diversity, flood control & storage, threatened/endangered species habitat, general wildlife habitat, sediment filtration, shoreline stabilization, food chain support, nutrient cycling, and uniqueness (Inter-Fluve, Inc. 1998).

As originally proposed by FWP, the newly created channel was not immediately activated following construction, but was given approximately one year to establish streamside vegetation for stabilization purposes. Water was turned into the new channel in the fall of 2000. This site was first monitored in 2001, and is scheduled to be monitored two times per year over the 3-year contract period to document wetland and other biological attributes. The area to be monitored is illustrated in **Figure 2 (Appendix A)**.

No performance standards or success criteria were required by the COE or other agencies. The COE determined that the maximum allowable credit at the site is 7.21 acres (Rabbe 1998). This conclusion was subjectively based on acreages of existing and developed wetlands, changes in functions and values, re-creation of a functioning floodplain, and modifications to supporting hydrology (Rabbe 1998). It was the Corps' opinion that the proposed project, while improving the existing setting, would not result in doubling of actual wetland acreage but could essentially double wetland values while establishing "natural" supporting hydrology for the whole complex (Rabbe 1998).

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on June 5th (spring), August 7th (mid-season) and November 11th (fall) 2002. The primary purpose of the spring and fall visits was to conduct a bird/general wildlife reconnaissance. The early-June period was selected for the spring visit because monitoring between mid-May and early June is likely to detect migrant as well as early nesting activities for a variety of avian species (Carlson pers. comm.), as well as maximizing the potential for amphibian detection. In Montana, most amphibian larval stages are present by early June (Werner pers. comm.).

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 boundary mapping; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; macroinvertebrate sampling; functional assessment; and examination of stream habitat conditions including bank stability, fisheries habitat and survival of planted woody vegetation.

2.2 Hydrology

Hydrologic indicators were evaluated at the site during the mid-season visit. Information found in project files indicate that the leaking water pipes on or near the property have been fixed and are no longer contributing to wetland hydrology at the site. The approximate designed channel location is shown on the conceptual restoration plan in **Appendix D**. Wetland hydrology indicators were recorded 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**).

All additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). The boundary between wetlands and open water (no rooted vegetation) aquatic habitats was mapped on the aerial photograph and an estimate of the average water depth at this boundary was recorded.

No groundwater monitoring wells were installed at the site. If located within 18 inches of the ground surface (soil pit depth for purposes of delineation), groundwater depths were documented on the routine wetland delineation data form at each data point.

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Typha latifolia*/*Scirpus acutus*) 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 may not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the site monitoring form (**Appendix B**).

The 10-foot wide belt transect that was established in 2001 was evaluated for the second time **Figure 2 (Appendix A)**. Percent cover was estimated for each vegetative species encountered within the “belt” using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%).

The purpose of the transect is to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the air photo and all data recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with the GPS unit in 2001. Wooden stakes were installed in 2001 to physically mark the transect ends. Photos of the transect were taken from both ends during the mid-season visit.

A comprehensive plant species list for the site was first compiled in 2001 and was updated as new species were encountered. Ultimately, observations from past years will be compared with new data to document vegetation changes over time.

Fourteen woody species were planted at this mitigation site. Planting lists are provided in **Appendix D**. No planting map was available; consequently, not all planting locations were known, and it was not possible for observers to inventory all planted species. Rather, observers recorded the number of dead planted species observed and compared them to known planting numbers.

2.4 Soils

Soils were evaluated during the mid-season visit according to hydric soils determination procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data was recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form

(**Appendix B**). The most current terminology used by NRCS was used to describe hydric soils (USDA 1998).

2.5 Wetland Delineation

A wetland delineation of the mitigation site was conducted during the 2001 mid-season visit according to the 1987 COE Wetland Delineation Manual. The delineated boundaries were verified and changes made if necessary during the 2002 monitoring. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The indicator status of vegetation was derived from the National List of Plant Species that occur in Wetlands: Northwest (Region 9) (Reed 1997).

The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was delineated on the air photo and recorded with a resource grade GPS unit in 2001. Minor changes in wetland boundaries were noted in 2002 and drawn onto project maps. These changes were not surveyed with GPS during the 2002 monitoring. The wetland/upland boundary in combination with the wetland/open water habitat boundary was used to calculate the wetland area developed within the monitoring area.

2.6 Mammals, Reptiles, and Amphibians

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

2.7 Birds

Bird observations were recorded during each visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the spring and fall visits, observations were recorded in compliance with the bird survey protocol in **Appendix E**. During the mid-season visit, bird observations were recorded incidental to other monitoring activities. During all visits, observations were categorized by species, activity code, and general habitat association (see data forms in **Appendix B**). Observations from past years will be compared with new data.

2.8 Macroinvertebrates

One macroinvertebrate sample was collected during the mid-season site visit and data recorded on the wetland mitigation monitoring form. Macroinvertebrate sampling procedures are included in **Appendix E**. The approximate location of this sample point, within emergent marsh habitat in the north portion of the site, is shown on **Figure 2, Appendix A**. The sample was preserved as outlined in the sampling procedure and sent to a laboratory for analysis.

2.9 Functional Assessment

Functional assessment forms were completed for various assessment areas within the monitoring area using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were generally collected during the mid-season site visit. The remainder of the functional assessment was completed in the office.

The pre-project functional assessment of the mitigation site is included in **Appendix D**; however, it should be noted that this baseline functional assessment was completed using the 1997 MDT wetland assessment method. Thus, while pre- and post-project functional assessment results are not directly comparable, general trends can be discussed.

2.10 Photographs

Photographs were taken during the mid-season visit showing the current land use surrounding the site, the upland buffer, the monitored area, macroinvertebrate sampling location, and the vegetation transect. Each photograph point location was recorded with a resource grade GPS during the 2001 monitoring. The approximate location of photo points is shown on **Figure 2, Appendix A**. All photographs were taken using a 50 mm lens. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2001 monitoring season, data were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations, at all photograph locations, and at the macroinvertebrate sampling location. Wetland boundaries were also mapped with a resource grade GPS unit. No new GPS data were collected in 2002.

2.12 Maintenance Needs

The newly constructed channel was examined for signs of erosion and channel migration. Where encountered, current or future potential problems were documented, photographed and conveyed to MDT.

3.0 RESULTS

3.1 Hydrology

According to the Western Regional Climate Center, Lewistown yearly precipitation totals for 2000 (13.89 inches) and 2001 (12.37 inches) were 76 and 68 percent, respectively, of the total annual mean precipitation (18.28 inches) in this area. Precipitation levels in the project area through October of 2002 are substantially below the long-term average.

Inundation was present, to some extent, at all wetlands within the monitoring area during the mid-season visit despite the sub-normal precipitation year. Big Spring Creek contained the only

“open water” on the site. Water depths at open water/rooted vegetation interfaces along the creek ranged between approximately one to two feet. Open water areas are shown on **Figure 3 (Appendix A)**. Specific recorded values are provided on the attached data forms.

Overall, the site was approximately 40 percent inundated, with an average depth of two to four inches and a range of depths from 0 to an estimated four feet. Deepest areas were located at stream pools.

A groundwater component contributes strongly to this site, likely resulting at least partially from alluvial flow. Groundwater was encountered within about 1 foot of the ground surface at most wetlands. Several groundwater discharge sites occur along the toe of highway fill between the parking area and the northeast corner of the monitoring area. This area is developing very strong wetland characteristics despite attempts to drain this area with small hand dug ditches. According to MDT, wetlands are not desirable in this area, as they may be in conflict with future highway expansion (Urban pers. comm.).

A remnant access road west and south of the creek, south of the parking area appears to be preventing saturation within its footprint, and possibly between the road and the creek to the north. The road, however, is also functioning as a low dike that backs water onto currently upland area to the south.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. No new species were encountered during the 2002 monitoring. Three primary wetland community types were identified and mapped on the mitigation area (**Figure 3, Appendix A**). These included Type 1: *Agrostis alba*, Type 2: *Typha latifolia*, and Type 3: *Salix*. Dominant species within each of these communities are listed on the attached data form (**Appendix B**). Type 1 occurs commonly and intermittently as narrow fringes along the immediate stream channel. Type 2 occurs within emergent marsh communities throughout the site, and Type 3 occurs primarily in association with streamside areas in the south portion of the site.

Upland communities are primarily dominated by seeded and/or weedy herbaceous species including quackgrass (*Agropyron repens*), bearded wheatgrass (*Agropyron caninum*), intermediate wheatgrass (*Agropyron intermedium*), sowthistle (*Sonchus arvensis*), ragweed (*Ambrosia trifida*), field pennycress (*Thlaspi arvense*) and white sweetclover (*Melilotus alba*). A large “transitional upland” area first identified in 2001 occurs west of the creek, and south of the parking lot. This area continues to exhibit signs of transitioning from upland to wetland (**Figure 2 in Appendix A**). Additional transitional upland areas were identified in 2002 in the old creek location parallel to the highway and south of the parking area.

Table 1: 2001 & 2002 Big Spring Creek Vegetation Species List

Species	Region 9 (Northwest) Wetland Indicator	Observed in 2001	Observed in 2002
<i>Achillea millefolium</i>	FACU	X	X
<i>Agropyron caninum</i>	FAC-	X	X
<i>Agropyron intermedium</i>	--	X	X
<i>Agropyron repens</i>	FACU	X	X
<i>Agrostis alba</i>	FACW	X	X
<i>Alopecurus pratensis</i>	FACW	X	X
<i>Ambrosia trifida</i>	--	X	X
<i>Arctium minus</i>	--	X	X
<i>Aster spp.</i>	--	X	X
<i>Avena fatua</i>	--	X	X
<i>Beckmannia syzigachne</i>	OBL	X	X
<i>Betula occidentalis</i>	FACW	X	X
<i>Bidens cernua</i>	FACW+	X	X
<i>Bromus inermis</i>	--	X	X
<i>Calamagrostis inexpansa</i>	FACW	X	X
<i>Carex aquatilis</i>	OBL	X	X
<i>Carex nebrascensis</i>	OBL	X	X
<i>Carex utriculata</i>	OBL	X	X
<i>Cirsium arvense</i>	FAC-	X	X
<i>Cornus stolonifera</i>	FACW	X	X
<i>Crataegus douglasii</i>	FAC	X	X
<i>Dactylis glomerata</i>	--	X	X
<i>Echinochloa crusgalli</i>	FACW	X	X
<i>Eleocharis palustris</i>	OBL	X	X
<i>Elodea canadensis</i>	OBL	X	X
<i>Epilobium ciliatum</i>	FACW-	X	X
<i>Equisetum arvense</i>	FAC	X	X
<i>Fraxinus pensylvanica</i>	FAC	X	X
<i>Galium aparine</i>	--	X	X
<i>Glyceria elata</i>	FACW+	X	X
<i>Glycyrrhiza lepidota</i>	FAC+	X	X
<i>Hordeum jubatum</i>	FAC-	X	X
<i>Iva xanthifolia</i>	FAC	X	X
<i>Juncus bufonius</i>	FACW+	X	X
<i>Juncus ensifolius</i>	FACW	X	X
<i>Juncus nodosus</i>	OBL	X	X
<i>Juncus torreyi</i>	FACW	X	X
<i>Lactuca serriola</i>	FACU	X	X
<i>Lemna minor</i>	OBL	X	X
<i>Linaria vulgaris</i>	--	X	X
<i>Lycopus americanus</i>	OBL	X	X
<i>Medicago lupulina</i>	FAC	X	X
<i>Melilotus alba</i>	FACU	X	X
<i>Melilotus officinalis</i>	FACU	X	X
<i>Mentha arvensis</i>	FAC	X	X
<i>Muhlenbergia minutissima</i>	FAC	X	X
<i>Nasturtium officinale</i>	OBL	X	X
<i>Phalaris arundinacea</i>	FACW	X	X
<i>Phleum pratense</i>	FAC-	X	X
<i>Plantago major</i>	FAC+	X	X
<i>Poa pratensis</i>	FAC	X	X
<i>Polygonum lapathifolium</i>	FACW	X	X
<i>Polypogon monspeliensis</i>	FACW	X	X
<i>Populus angustifolia</i>	FACW	X	X
<i>Populus deltoides</i>	FAC	X	X
<i>Populus tremuloides</i>	FAC+	X	X
<i>Populus trichocarpa</i>	FAC	X	X
<i>Prunus virginiana</i>	FACU	X	X
<i>Ribes aureum</i>	FAC+	X	X
<i>Ranunculus aquatilis</i>	OBL	X	X
<i>Rosa woodsii</i>	FACU	X	X

Table 1: 2001 & 2002 Big Spring Creek Vegetation Species List (continued)

Species	Region 9 (Northwest) Wetland Indicator	Observed in 2001	Observed in 2002
<i>Rumex crispus</i>	FACW	x	x
<i>Sagittaria cuneata</i>	OBL	x	x
<i>Salix amygdaloides</i>	FACW	x	x
<i>Salix exigua</i>	OBL	x	x
<i>Salix lutea</i>	OBL	x	x
<i>Scirpus acutus</i>	OBL	x	x
<i>Scirpus microcarpus</i>	OBL	x	x
<i>Scirpus pungens</i>	OBL	x	x
<i>Shepherdia canadensis</i>	--	x	x
<i>Sisymbrium altissimum</i>	FACU-	x	x
<i>Sium suave</i>	OBL	x	x
<i>Solidago canadensis</i>	FACU	x	x
<i>Sonchus arvensis</i>	FACU+	x	x
<i>Taraxacum officinale</i>	FACU	x	x
<i>Thlaspi arvense</i>	--	x	x
<i>Trifolium fragiferum</i>	FACU	x	x
<i>Trifolium repens</i>	--	x	x
<i>Typha latifolia</i>	OBL	x	x
<i>Verbascum thapsus</i>	--	x	x

Vegetation transect results in 2002 were very similar to the 2001 results and are detailed in the attached data form, and are summarized graphically below.

2001	VT Start	Upland (17')	Type 2 (155')	Type 1 (95')	Upland (87')	Type 2 (40')	Upland (8')	Type 2 (8')	Upland (8')	Total: 418'	VT End
2002	VT Start	Upland (15')	Type 2 (157')	Type 1 (95')	Upland (87')	Type 2 (40')	Upland (8')	Type 2 (12')	Upland (4')	Total: 418'	VT End

Observed mortality of planted woody vegetation species is summarized below in **Table 2**. As specific planting locations were unknown, only observations of dead, obviously planted individuals were recorded in order to avoid spending available monitoring time searching the site for possible planting areas.

Table 2: 2002 Observed Mortality of Planted Woody Species

Species	Estimated # Originally Planted	# Dead Observed	Comments
<i>Salix exigua</i> <i>Salix amygdaloides</i>	up to 3,500 cuttings; not distinguished by species	see comments	Willows planted below the ordinary high water mark were generally dead, presumably due to drowning. Willows planted above the OHWM were generally alive. Estimated overall survival rate of 50 – 60%.
<i>Populus deltoides</i>	21	10	Mortality likely due to drier or wetter than anticipated conditions at individual planting locations.
<i>Populus trichocarpa</i>	24	11	Mortality likely due to drier or wetter than anticipated conditions at individual planting locations.
<i>Populus angustifolia</i>	30	0	Doing well; many observed.
<i>Populus tremuloides</i>	50	0	No dead observed, but estimated <50 live observed. Assume some mortality.
<i>Betula occidentalis</i>	31	5	Few dead observed, but estimated <10 live observed. Mortality likely due to drought.
<i>Rosa woodsii</i>	10	0	No dead observed, but estimated <5 live observed. Mortality likely due to drought / competition with upland grasses.
<i>Cornus stolonifera</i>	130	0	No dead observed, but estimated <50 live observed. Mortality likely due to drought / competition with upland grasses, and possibly deer.
<i>Prunus virginiana</i>	150	10	Doing well; numerous observations.
<i>Shepherdia canadensis</i>	30	0	No dead observed, but estimated <20 live observed. Assume some mortality.
<i>Fraxinus pensylvanica</i>	30	0	Doing well; several observed.
<i>Ribes aureum</i>	35	0	No dead observed, but estimated <10 live observed.
<i>Crataegus douglasii</i>	10	2	Few live or dead observed.

3.3 Soils

According to the Fergus County soil survey (Soil Conservation Service 1988), pre-existing soils at the site were mapped as Fluvaquentic Haplaquolls and Enbar-Nesda loams. Fluvaquentic Haplaquolls are poorly drained soils on flood plains that formed in alluvium. Enbar-Nesda loams are well drained to somewhat poorly drained soils that occur on floodplains and terraces. Oddly, soils descriptions provided in the survey for these two map units seem to apply in the reverse on the ground. The survey describes the upland portions of the site as supporting the wetter Fluvaquentic Haplaquolls, and the wetland portions as supporting drier Enbar-Nesda loams. On the ground, just the opposite seems true. Both of these soils types exhibit a seasonal high water table. Fluvaquentic Haplaquolls are included on the Fergus County hydric soils list (floodplains), while Enbar-Nesda loams are not considered hydric.

Soils sampled in wetland areas were generally comprised of silty clay loams or silt loams with a matrix color of 10YR3/1 without mottles, or 10YR3/2 with distinct mottles in the range of 10YR 4/6, indicating a fluctuating water table. Wetland soils were saturated or inundated at the time of the survey. Soils in the area denoted as “transitional upland” on **Figure 3 (Appendix A)** south of the parking area actually satisfied hydric soils criteria and were saturated during the survey, but vegetation had not yet shifted into a community dominated by hydrophytes.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. The wetland area north of the parking area and east of the creek expanded in 2002 as shown on **Figure 3**. Delineation results including the expanded areas are as follows:

Big Spring Creek: 8.70 wetland acres within large polygons and small depressions
 0.06 wetland acres along stream margins
 2.41 acres open water (non-wetland perennial stream channel)

Based on maps provided in the project EA, approximately 7.86 wetland acres and 1.3 acres of non-wetland perennial stream channel occurred within the monitoring area prior to project implementation. Currently, the site has gained 0.90 wetland acres and 1.11 acres of non-wetland perennial stream channel.

3.5 Wildlife and Fish

Wildlife species, or evidence of wildlife, observed on the site during 2002 monitoring efforts are listed in **Table 3**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. Six mammal, one reptile, one amphibian, and 26 bird species were noted using portions of the mitigation site during 2002 monitoring. Rainbow trout (*Oncorhynchus mykiss*) were also observed. The wetland and stream habitat provided on the site, particularly large streamside wetland complexes in the north and south portions of the site, provide quality wildlife habitat for several species. This habitat value

is expected to increase as vegetation establishes and diversifies, and as additional wetlands are restored/created. The lone wood duck nesting box located on the site (see **Figure 2, Appendix A**) appeared to be inactive during the 2002 nesting season.

Preliminary fish shocking data for the restored reach are encouraging. In 2001, the reach of Big Spring Creek including the restored channel was shocked, and yielded 710 rainbow and brown (*Salmo trutta*) trout over 10 inches in length (MFWP 2002). This compares with pre-project (1995 – 2000) shocking results that averaged 434 trout over 10 inches in length (MFWP 2002) through reaches including the project area.

Table 3: Fish and Wildlife Species Observed on the Big Spring Creek Mitigation Site

FISH	
**Rainbow Trout (<i>Oncorhynchus mykiss</i>)	
AMPHIBIANS	
**Western Chorus Frog (<i>Pseudacris triseriata</i>)	
REPTILES	
**Western Terrestrial Garter Snake (<i>Thamnophis elegans</i>)	
BIRDS	
*American Robin (<i>Turdus migratorius</i>)	**Mourning Dove (<i>Zenaida macroura</i>)
**Belted Kingfisher (<i>Ceryle alcyon</i>)	**Northern Harrier (<i>Circus cyaneus</i>)
**Black-billed Magpie (<i>Pica pica</i>)	*Northern Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)
*Blue-winged Teal (<i>Anas discors</i>)	*Red-tailed Hawk (<i>Buteo jamaicensis</i>)
**Canada Goose (<i>Branta Canadensis</i>)	*Red-winged Blackbird (<i>Agelaius phoeniceus</i>)
**Cedar Waxwing (<i>Bombycilla cedrorum</i>)	*Ring-necked Pheasant (<i>Phasianus colchicus</i>)
**Cinnamon Teal (<i>Anas cyanoptera</i>)	Sandhill Crane (<i>Grus Canadensis</i>)
**Common Merganser (<i>Mergus merganser</i>)	*Song Sparrow (<i>Melospiza melodia</i>)
*Common Snipe (<i>Gallinago gallinago</i>)	Sora (<i>Porzana Carolina</i>)
*Common Yellowthroat (<i>Geothlypis trichas</i>)	*Spotted Sandpiper (<i>Actitis macularia</i>)
*Eastern Kingbird (<i>Tyrannus tyrannus</i>)	*Tree Swallow (<i>Tachycineta bicolor</i>)
**European Starling (<i>Sturnus vulgaris</i>)	Willow Flycatcher (<i>Empidonax traillii</i>)
**Gray Catbird (<i>Dumetella carolinensis</i>)	*Yellow Warbler (<i>Dendroica petechia</i>)
Killdeer (<i>Charadrius vociferous</i>)	**Yellow-headed Blackbird (<i>Xanthocephalus xanthocephalus</i>)
*Mallard (<i>Anas platyrhynchos</i>)	
**Northern Flicker (<i>Colaptes auratus</i>)	
MAMMALS	
*White-tailed Deer (<i>Odocoileus virginianus</i>)	
*American Beaver (<i>Castor Canadensis</i>)	
*Eastern Cottontail (<i>Sylvilagus floridanus</i>)	
*Meadow Vole (<i>Microtus pennsylvanicus</i>)	
**Muskrat (<i>Ondatra zibethicus</i>)	
**Raccoon (<i>Procyon lotor</i>)	
*denotes observed in 2002 in addition to previous years	
**denotes observed in 2002 for the first time	
No star indicates a species was observed in 2001, but not in 2002	

3.6 Macroinvertebrates

Macroinvertebrate sampling results are provided in **Appendix B** and summarized below.

The sample was taken within the emergent marsh complex east of the creek in the north portion of the site (see **Figure 2**). The same location was sampled during both the 2001 and 2002 monitoring seasons. Bioassessment scores suggested that conditions at this site deteriorated from sub-optimal in 2001 to poor in 2002. Changes to the taxonomic composition of the invertebrate fauna included the loss of the coelenterate *Hydra* sp., which suggested that flow conditions changed from lotic to lentic in the interim. The mayfly *Callibaetis* sp. was also lost from the sampled assemblage in 2002. These findings, along with an apparently increased abundance of snails, suggested that water temperatures may have been warmer in 2002 than in 2001.

3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B**. Functional assessment results in 2002 were virtually unchanged from the 2001 assessment, and are summarized in **Table 4**. For comparative purposes, the functional assessment results for baseline conditions prepared by Inter-Fluve are also included in **Table 3**. However, the baseline assessment was performed using a modified 1997 MDT assessment method. Several parameters of this method were substantially revised during development of the 1999 MDT assessment method, which was applied during 2002 monitoring.

For example, baseline fish habitat scored a 1.0 using the 1997 method, and scored a 0.9 post project using the 1999 method due to the addition of several variables for consideration in the updated method. Fish habitat increased dramatically with addition of channel length, substrate improvement, and other features; however, this was not reflected in the comparative functional assessments. Thus, direct comparison of pre- and post-project functions is not possible, although some general trends can be noted. Also, as the baseline assessment was performed using a modified 1997 MDT method, it resulted in an incorrect overall category designation (Category IV). This was corrected to a Category III on **Table 4**.

Large wetland polygons bisected by the stream rated as Category II sites, primarily due to high wildlife and fish habitat, flood attenuation, sediment removal, production export, and recreation/education ratings. Narrow fringes along the creek rated as Category III sites, rating high for groundwater discharge and recreation/education. Isolated depressions rated as Category III sites and scored high for sediment/nutrient removal and groundwater discharge.

Generally speaking, functions that increased substantially over baseline conditions include wildlife and fish habitat, flood attenuation, sediment/nutrient/toxicant removal, production export, and groundwater discharge. The pre-project site provided about 29 functional units within the monitoring area (using the 1997 method), and the post-project site provides about 75 functional units (using the 1999 method), for a conservative gain of at least 46 functional units.

3.8 Photographs

Representative photographs taken from photo-points and transect ends are provided in **Appendix C**. A 2002 aerial photograph is also provided in **Appendix C**.

3.9 Maintenance Needs/Recommendations

All stream banks were in good condition during the spring and mid-season visits. MDT and/or FWP may want to consider removing the previously mentioned access road located southwest of the parking area and south of the creek. If the short access road is no longer needed for maintenance purposes, then removal of the fill may allow for wetland expansion in this area.

Table 4: Summary of 2002 Wetland Function/Value Ratings and Functional Points¹ at the Big Spring Creek Mitigation Project

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	Wetland Sites			
	2002: Large Wetland Polygons Bisected by Creek Near North and South Ends of Site	2002: Five Isolated Wetland Depressions West of Creek	2002: Narrow Wetland Fringe Segments along Creek	1998 Baseline Assessment ²
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.0)	Low (0.3)	Low (0.2)
MNHP Species Habitat	Mod (0.6)	Low (0.1)	Low (0.1)	Low (0.0)
General Wildlife Habitat	High (0.9)	Mod (0.5)	Mod (0.7)	Mod (0.5)
General Fish/Aquatic Habitat	High (0.9)	NA	Mod (0.7)	High (1.0)
Flood Attenuation	High (0.7)	Low (0.2)	Low (0.2)	Low (0.3)
Short and Long Term Surface Water Storage	Mod (0.6)	Low (0.3)	Low (0.3)	--
Sediment, Nutrient, Toxicant Removal	High (1.0)	High (1.0)	Mod (0.6)	Low (0.1)
Sediment/Shoreline Stabilization	Mod (0.7)	NA	Mod (0.7)	NA
Production Export/Food Chain Support	High (0.9)	Low (0.3)	Mod (0.4)	Low (0.4)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	NA
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.2)
Recreation/Education Potential	High (1.0)	Mod (0.5)	High (1.0)	High (1.0)
Actual Points/Possible Points	8.9 / 12	4.2 / 10	5.3 / 12	3.7 / 10
% of Possible Score Achieved	74%	42%	44%	37%
Overall Category	II	III	III	III ³
Total Acreage of Assessed Wetlands within AA Boundaries (note: non-wetland stream channel is not included in these totals) * Pre-project (baseline) wetland areas within the current monitoring area boundaries were measured via digital planimeter from delineation maps provided in project EA.	7.81 wetland ac	0.54 wetland ac	0.06 wetland ac	7.86 wetland ac.
Functional Units (acreage x actual points)	72.6 fu	2.3 fu	0.3 fu	29.1 fu
Net Acreage Gain	Site currently supports 8.76 acres of wetlands and 2.4 acres of non-wetland perennial stream channel. Baseline conditions within the current monitoring area boundaries included 7.86 wetland acres and 1.3 acres of non-wetland perennial stream channel. Net gain is approximately 0.90 wetland acres and 1.1 acres of non-wetland perennial stream channel.			
Net Functional Unit Gain ²	Approximately 46 Functional Units ²			

¹ See completed MDT functional assessment forms in Appendix B for further detail.

² The baseline assessment was performed by Inter-Fluve using a modified 1997 MDT assessment method, several parameters which were substantially revised during development of the 1999 MDT assessment method, which was applied during 2002 monitoring. Thus, direct comparison of pre- and post-project functions is not possible, although some general trends can be noted.

³ The baseline assessment was performed using a modified 1997 MDT method, which resulted in an incorrect overall category designation (Category IV). This was corrected to a Category III.

3.10 Current Credit Summary

Approximately 8.76 wetland acres and 2.4 acres of non-wetland perennial stream channel occur within the monitoring area. Based on maps provided in the project EA, approximately 7.86 wetland acres and 1.3 acres of non-wetland perennial stream channel occurred within the monitoring area prior to project implementation. Currently, the site has gained 0.90 wetland acre and 1.11 acres of non-wetland perennial stream channel, substantially improving fish habitat.

The pre-project site provided about 29 functional units within the monitoring area (using the 1997 method), and the post-project site provides about 75 functional units (using the 1999 method), for a conservative gain of at least 46 functional units.

The COE determined that the maximum allowable credit at the site is 7.21 acres (Rabbe 1998). This conclusion was subjectively based on acreages of existing and developed wetlands, changes in functions and values, re-creation of a functioning floodplain, and modifications to supporting hydrology (Rabbe 1998). No performance standards were required by the COE, although the site appears to be well on its way to functioning as anticipated.

4.0 REFERENCES

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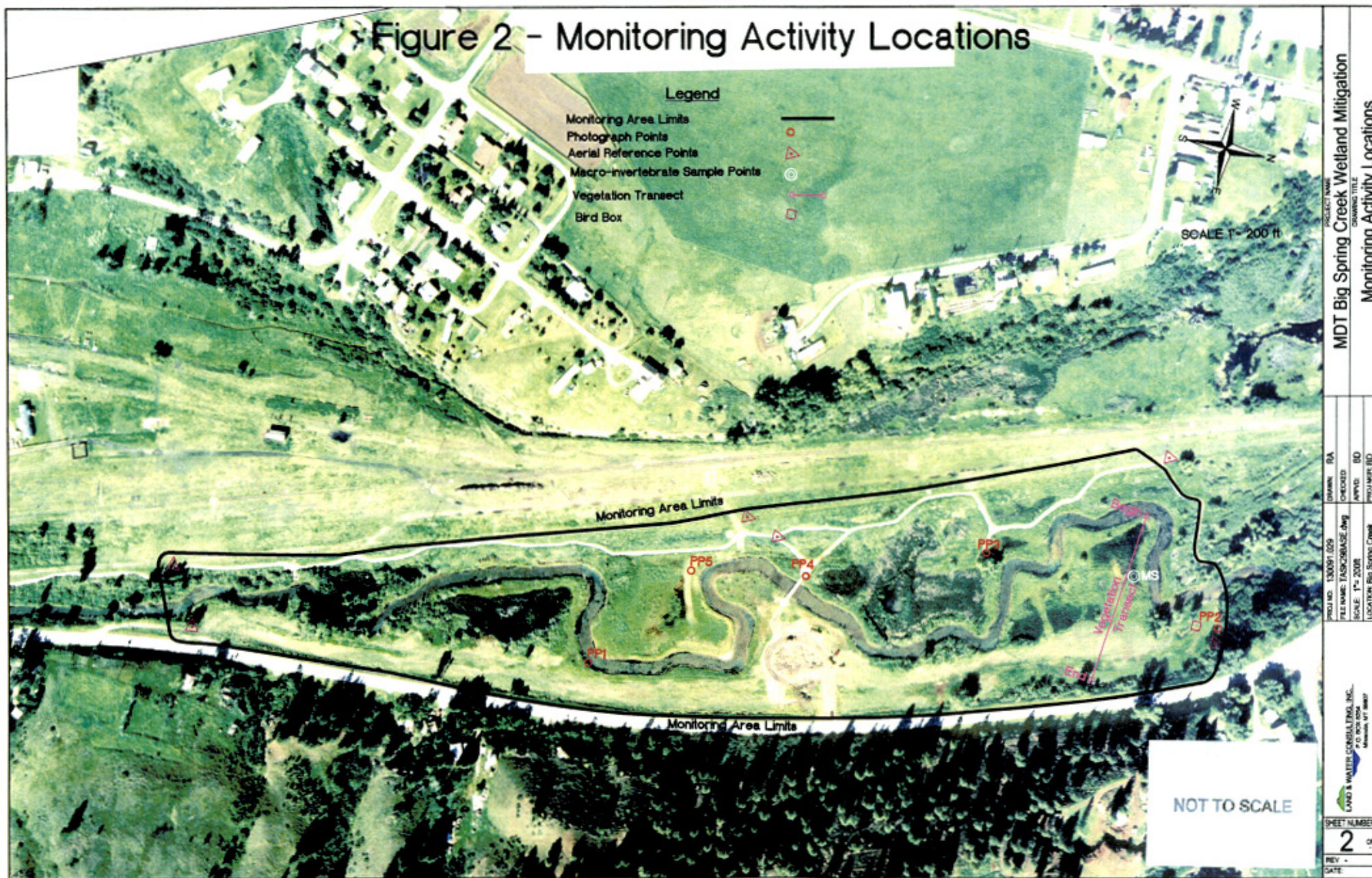
Werner, K. Herpetologist, Salish-Kootenai Community College. Pablo, MT. May 1998 instructional presentation.

Appendix A

FIGURES 2 & 3

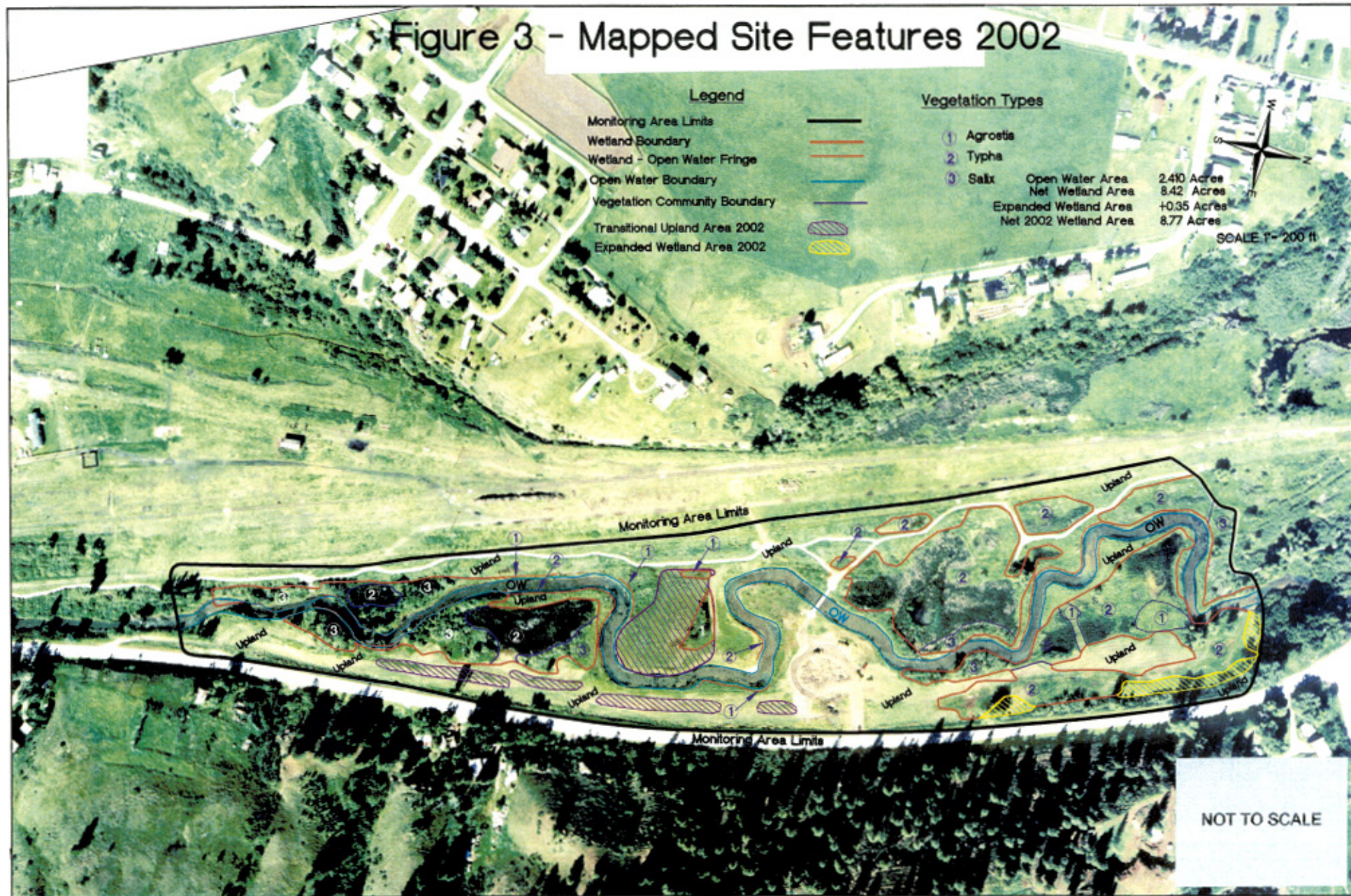
*MDT Wetland Mitigation Monitoring
Big Spring Creek
Lewistown, Montana*

Figure 2 - Monitoring Activity Locations



PROJECT NAME		MDT Big Spring Creek Wetland Mitigation	
DRAWING TITLE		Monitoring Activity Locations	
PROJECT NO.	130091.029	DRAWN BY	RA
FILE NAME	TASKORANGE.dwg	CHECKED BY	
SCALE	1" = 200 ft	APPROVED BY	BD
LOCATION	Big Spring Creek	PROJECT ID	
LAND & WATER CONSULTING, INC.		SHEET NUMBER	
P.O. BOX 4004		2	
Merriden, VT 05847		REV	
		DATE	

Figure 3 - Mapped Site Features 2002



Appendix B

**COMPLETED 2002 WETLAND MITIGATION SITE MONITORING
FORM**

COMPLETED 2002 BIRD SURVEY FORMS

COMPLETED 2002 WETLAND DELINEATION FORMS

**COMPLETED 2002 FIELD AND FULL FUNCTIONAL
ASSESSMENT FORMS**

MACROINVERTEBRATE SAMPLING DATA

MDT Wetland Mitigation Monitoring

Big Spring Creek

Lewistown, Montana



LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Big Spring Creek** Project Number: _____ Assessment Date: **8/7/02**
 Location: **Lewistown** MDT District: **Billings** Milepost: _____
 Legal description: **T15N R18E Section 23** Time of Day: **0800-1300**
 Weather Conditions: **Cloudy & Cool approx. 65 degrees** Person(s) conducting the assessment: **Traxler**
 Initial Evaluation Date: **8 / 29 / 01** Visit #: **2** Monitoring Year: **2002 (year 2)**
 Size of evaluation area: **15 acres** Land use surrounding wetland: **Park, Residential, industrial**

HYDROLOGY

Surface Water Source: **Big Spring Creek, groundwater**
 Inundation: Present ☒ Absent _____ Average depths: **.25ft** Range of depths: **0 - 4 ft**
 Assessment area under inundation: **40%**
 Depth at emergent vegetation-open water boundary: **1-2 ft**
 If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes ☒ No _____
 Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): **Most of the wetlands on site were either inundated or saturated to the surface.**

Groundwater

Monitoring wells: Present _____ Absent ☒
 Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:

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

COMMENTS/PROBLEMS: Area adjacent to toe of road fill north and south of the main parking area is inundated and developing strong wetland characteristics. These areas are groundwater driven and receive surface spring flows from underneath the highway.

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): AGR ALB

Dominant Species	% Cover	Dominant Species	% Cover
AGR ALB	>50	CAR AQU	11-20
MEN ARV	11-20		
BID CER	1-5		
EQU ARV	11-20		
JUN NOD	11-20		

COMMENTS/PROBLEMS:

Community No.: 2 Community Title (main species): TYP LAT

Dominant Species	% Cover	Dominant Species	% Cover
TYP LAT	>50	SCI PUN	1-5
SCI ACU	6-10	CAR NEB	6-10
AGR ALB	6-10	CAR AQU	6-10
ALO PRA	6-10		
PHA ARU	11-20		

COMMENTS/PROBLEMS: ALO PRA WAS NOTED IN 2002.

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

Dominant Species	% Cover	Dominant Species	% Cover
SAL LUT	>50	AGR ALB	6-10
SAL AMY	21-50		
SAL EXI	21-50		
CAL INE	6-10		
MEN ARV	6-10		

COMMENTS/PROBLEMS: Similar to 2001.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
<i>Achillea millefolium</i>	4	<i>Lycopus americanus</i>	1,2
<i>Agropyron caninum</i>	4	<i>Medicago lupulina</i>	4,5
<i>Agropyron intermedium</i>	4	<i>Melilotus alba</i>	4,5
<i>Agropyron repens</i>	4	<i>Melilotus officinalis</i>	4
<i>Agrostis alba</i>	1,2,3,5	<i>Mentha arvensis</i>	1,3,5
<i>Alopecurus pratensis</i>	2,5	<i>Muhlenbergia minutissima</i>	4
<i>Ambrosia trifida</i>	4	<i>Nasturtium officinale</i>	1,2
<i>Arctium minus</i>	4,5	<i>Phalaris arundinacea</i>	1,2,3
<i>Aster spp.</i>	4	<i>Phleum pratense</i>	4
<i>Avena fatua</i>	4	<i>Plantago major</i>	4
<i>Beckmannia syzigachne</i>	1	<i>Poa pratensis</i>	4
<i>Betula occidentalis</i>	3	<i>Polygonum lapathifolium</i>	5
<i>Bidens cernua</i>	1,5	<i>Polypogon monspeliensis</i>	5
<i>Bromus inermis</i>	4	<i>Populus angustifolia</i>	3,4
<i>Calamagrostis inexpansa</i>	1,3	<i>Populus deltoides</i>	3,4
<i>Carex aquatilis</i>	1,2	<i>Populus tremuloides</i>	3,4
<i>Carex nebrascensis</i>	2	<i>Populus trichocarpa</i>	3,4
<i>Carex utriculata</i>	1,2	<i>Prunus virginiana</i>	3
<i>Cirsium arvense</i>	4	<i>Ribes aureum</i>	4
<i>Cornus stolonifera</i>	3	<i>Ranunculus aquatilis</i>	1,2
<i>Crataegus douglasii</i>	4,5	<i>Rosa woodsii</i>	4
<i>Dactylis glomerata</i>	4	<i>Rumex crispus</i>	1,5
<i>Echinochloa crusgalli</i>	5	<i>Sagittaria cuneata</i>	1,2
<i>Eleocharis palustris</i>	1,2	<i>Salix amygdaloides</i>	3
<i>Elodea canadensis</i>	2	<i>Salix exigua</i>	3
<i>Epilobium ciliatum</i>	1,2	<i>Salix lutea</i>	3
<i>Equisetum arvense</i>	1,5	<i>Scirpus acutus</i>	1,2
<i>Fraxinus pensylvanica</i>	4	<i>Scirpus microcarpus</i>	2
<i>Galium aparine</i>	4,5	<i>Scirpus pungens</i>	1
<i>Glyceria elata</i>	1,5	<i>Shepherdia canadensis</i>	4
<i>Glycyrrhiza lepidota</i>	4,5	<i>Sisymbrium altissimum</i>	4
<i>Hordeum jubatum</i>	1,5	<i>Sium suave</i>	1
<i>Iva xanthifolia</i>	4,5	<i>Solidago canadensis</i>	4,5
<i>Juncus bufonius</i>	1	<i>Sonchus arvensis</i>	4
<i>Juncus ensifolius</i>	1	<i>Taraxacum officinale</i>	4
<i>Juncus nodosus</i>	1,2	<i>Thlaspi arvense</i>	4
<i>Juncus torreyi</i>	1	<i>Trifolium fragiferum</i>	4
<i>Lactuca serriola</i>	4,5	<i>Trifolium repens</i>	4
<i>Lemna minor</i>	1,2	<i>Typha latifolia</i>	2
<i>Linaria vulgaris</i>	4	<i>Verbascum thapsus</i>	4

COMMENTS/PROBLEMS: _____

COMMENTS/PROBLEMS: Overall survival in year two was not significantly changed from year 1 except that a few plants thought to have been dead in 2001 had actually re-sprouted from the bases. A local citizen interviewed on site, thought that poor weed spraying techniques may have led to some loss of individual plants.

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes x No Type: How many? 1 Are the nesting structures being utilized? Yes No x Do the nesting structures need repairs? Yes x No

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
white-tailed deer	0	yes	yes		
beaver	0				Tree gnaws
muskrat	6			yes	
raccoon	0	yes			
meadow vole	2				
western terrestrial garter snake	2				
western chorus frogs	0				vocalizing
cottontail	2				

X Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Wood duck nesting box needs to be re-secured to the tree – was hanging upside down during summer visit.

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal black lines across its entire width, typical of notebook or legal stationery. The paper is otherwise completely empty, with no margins, text, or other markings.

SITE: Big Spring Creek

BIRD SURVEY – FIELD DATA SHEET

Page 1 of 1

Date: 11/11/02

Survey Time: 1200

SITE: Big Spring Creek

[illegible]

Notes:

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

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

PHOTOGRAPHS

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

Checklist:

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

Location	Photo Frame #	Photograph Description	Compass Reading
A		See photo sheets and field notes	
B			
C			
D			
E			
F			
G			
H			

COMMENTS/PROBLEMS: _____

GPS SURVEYING

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

Checklist:

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

COMMENTS/PROBLEMS: _____GPS not used during 2002; minor changes in wetland borders were hand-adjusted using aerial photograph and 2001 delineation.

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

FUNCTIONAL ASSESSMENT

MAINTENANCE

COMMENTS/PROBLEMS:

MDT WETLAND MONITORING – VEGETATION TRANSECT



Site: Big Spring Creek Date: 8/7/02 Examiner: Traxler Transect # 1

Approx. transect length: 418 ft Compass Direction from Start (Upland): 94 degrees

Vegetation type A: Upland		
Length of transect in this type:	15	feet
Species:	Cover:	
<i>CIR ARV (6-10)</i>	1-5	
SON ARV	6-10	
AGR CAN	>50	
MEN ARV	1-5	
POA PRA	1-5	
<i>AGR ALB (1-5)</i>	6-10	
TRI FRA	1-5	
TYP LAT	1-5	
Total Vegetative Cover:	100%	

Vegetation type B: TYP LAT (veg type 2)		
Length of transect in this type:	157	feet
Species:	Cover:	
TYP LAT	>50	
AGR ALB	1-5	
ELE PAL	>50	
MEN ARV	1-5	
JUN NOD	6-10	
CER DEM	1-5	
SAG CUN	1-5	
<i>CAR NEB (1-5)</i>	6-10	
ALO PRA	6-10	
<i>LEM MIN (6-10)</i>	11-20	
CAR AQU	1-5	
Total Vegetative Cover:	90	

Vegetation type C: AGR ALB (veg type 1)		
Length of transect in this type:	95	feet
Species:	Cover:	
AGR ALB	21-50	
CAL INE	1-5	
EPI CIL	1-5	
MEN ARV	11-20	
BID CER	1-5	
AGR CAN	1-5	
CON MAC	<1	
RUM CRI	<1	
TYP LAT	1-5	
CAR NEB	11-20	
ALO PRA	1-5	
Total Vegetative Cover:	100%	

Vegetation type D: Upland		
Length of transect in this type:	87	feet
Species:	Cover:	
<i>SON ARV (11-20)</i>	6-10	
<i>POL LAP (6-10)</i>	1-5	
<i>AGR CAN (1-5)</i>	>50	
AMB TRI	1-5	
<i>THL ARV (>50)</i>	6-10	
HOR JUB	<1	
CIR ARV	1-5	
TRI FRA	1-5	
Total Vegetative Cover:	90%	

MDT WETLAND MONITORING – VEGETATION TRANSECT (continued)

Site: Big Spring Creek Date: 8/7/02 Examiner: Traxler Transect # 1 (cont.)

Approx. transect length: 418 ft Compass Direction from Start (Upland): 94 deg.

Vegetation type E: TYP LAT (veg type 2)	
Length of transect in this type:	40 feet
Species:	Cover:
TYP LAT	>50
ALO PRA (<1)	1-5
AGR ALB (<1)	1-5
EPI CIL	1-5
JUN NOD	11-20
JUN TOR	1-5
GLY ELA	1-5
ELE PAL	21-50
RUM CRI	1-5
CAR NEB	6-10
Total Vegetative Cover: 100%	

Vegetation type G: TYP LAT	
Length of transect in this type:	12 feet
Species:	Cover:
TYP LAT	21-50
JUN BUF (>50)	21-50
EPI CIL	1-5
POL LAP	1-5
CIR ARV	<1
AGR ALB	<1
TRI FRA	1-5
Total Vegetative Cover: 100	

Vegetation type F: Upland	
Length of transect in this type:	8 feet
Species:	Cover:
TRI FRA	6-10
IVA XAN	6-10
CIR ARV	6-10
THL ARV	21-50
AGR INT	1-5
Total Vegetative Cover: 100%	

Vegetation type H: Upland	
Length of transect in this type:	4 feet
Species:	Cover:
SON ARV (>50)	21-50
HOR JUB	<1
AGR INT	11-20
THL ARV	11-20
PLA MAJ	1-5
POL LAP	1-5
TRI FRA	1-5
AMB TRI	<1
CIR ARV	1-5
MEN ARV	1-5
Total Vegetative Cover: 100	

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

**Cover Estimate**

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

Bolded species are new additions in 2002. Changes in species cover percentages are indicated by *italics*, with the 2001 percentages included in parentheses

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: Big Spring Creek 2. Project #: _____ Control #: _____3. Evaluation Date: Mo. 08 Day 29 Yr. 01 4. Evaluator(s): Berglund/Traister 5. Wetlands/Slit # (s): Large polygons w/ North + South ends of mit. Area6. Wetland Location(s): I. Legal: T 150 or S: R 180 or W: S 23 : T _____ N or S: R _____ E or W: S _____
II. Approx. Stationing or Mileposts: Just S. of Lewistown along Big Spring CreekIII. Watershed: 10040103 GPS Reference No. (if applies): N/A
Other Location Information: Brewery Flats7. a. Evaluating Agency: MDT 8. Wetland size: (total acres) 10+ (visually estimated)
b. Purpose of Evaluation: (Connects off-site) _____ (measured, e.g. by GPS [if applies])

1. Wetlands potentially affected by MDT project
 2. Mitigation wetlands; pre-construction
 3. ☒ Mitigation wetlands; post-construction
 4. Other
- * 9. Assessment area: (AA, tot., ac., see instructions on determining AA) 3 to 6.5 (visually estimated)
~3 to 6.5 (measured, e.g. by GPS [if applies])

* S. polygon = 2.35 AC + .69 stream = 3.04 N. polygon = 5.46 AC + 1 AC stream = 6.46 AC

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
Riverine	Riverine	Upper perennial	RB	H	EX	220
"	Palustrine	-	EM	F/C	-	240
"	Palustrine	-	SS	F/C	-	240

(Abbreviations: System: Palustrine (P)/ Subsystem: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO) System: Lacustrine (L), Subsystem: Limnetic (2) Classes: RB, UB, AB/ Subsystem: Littoral (4) Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsystem: Lower Perennial (2) Classes: RB, UB, AB, US/ Subsystem: Upper Perennial (3) Classes: RB, UB, AB, US/ Water Regimes: Permanently Flooded (H), Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) HGM Classes: Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare Common Abundant

Comments:

12. General condition of AA:

I. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	Predominant conditions adjacent to (within 500 feet of) 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 natural state, is not grazed, hayed, logged, or otherwise converted, does not contain roads or occupied buildings	low disturbance	low disturbance	<u>moderate disturbance</u>
AA not cultivated, but moderately grazed or hayed or selectively logged, or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged, subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): Residential, Recreational - moderate to low disturbance
II. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) Smooth brome, RagweedIII. Provide brief descriptive summary of AA and surrounding land use/habitat: Largely pre-existing wetland polygons near north and south ends of mitigation area. Areas are bisected by creek.
Surrounding use = Residential development + 2-lane highway.

13. Structural Diversity: (based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	≥ 3 vegetated classes (or ≥ 2 if one is forested)	2 vegetated classes (or 1 if forested)	≤ 1 vegetated class
Rating (circle)	High	<u>Moderate</u>	Low

Comments:

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

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

Bald eagle

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus./primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.9 (H)	.8 (M)	.7 (M)	.5 (L)	.3 (L)	0 (L)

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

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

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

N. leopard frog, possible WS cutthroat

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus./primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.8 (H)	.7 (M)	.6 (M)	.2 (L)	.1 (L)	0 (L)

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

14C. General Wildlife Habitat Rating:

I. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

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

Low (based on any of the following [check]):

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

Moderate (based on any of the following [check]):

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

ii. Wildlife habitat features (working from top to bottom, circle appropriate AA attributes in matrix to arrive at 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 of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

Structural diversity (see #13)	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Duration of surface water in ≥ 10% of AA																				
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1 (E)	.9 (H)	.8 (H)	.7 (M)
Moderate	.9 (H)	.7 (M)	.5 (M)	.3 (L)
Minimal	.6 (M)	.4 (M)	.2 (L)	.1 (L)

Comments:

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

i. **Habitat Quality** (circle appropriate AA attributes in matrix to arrive at 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 such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading - 50 to 75% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - < 50% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support? Y N Modified habitat quality rating = (circle) E H M L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Types of fish known or suspected within AA	Modified Habitat Quality (ii)			
	Exceptional	High	Moderate	Low
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)
No fish	.5 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

Mtn. Whitefish, Sauger present (MRS 2002)

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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	1(H)	.9(H)	.6(M)	.8(H)	.7(H)	.5(M)	.4(M)	.3(L)	.2(L)
AA contains unrestricted outlet	.9(H)	.8(H)	.5(M)	.7(H)	.6(M)	.4(M)	.3(L)	.2(L)	.1(L)

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

Comments:

Residences

14F. Short and Long Term Surface Water Storage: (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, circle NA here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			<5, >1 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	1(H)	.9(H)	.8(H)	.8(H)	.6(M)	.5(M)	.4(M)	.3(L)	.2(L)
Wetlands in AA flood or pond < 5 out of 10 years	.9(H)	.8(H)	.7(M)	.7(M)	.5(M)	.4(M)	.3(L)	.2(L)	.1(L)

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (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, circle NA here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.)

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with 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 with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding or ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1 (H)	.8 (H)	.7 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains unrestricted outlet	.9 (H)	.7 (M)	.6 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

14H Sediment/Shoreline Stabilization: (applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If does not apply, circle NA here and proceed to next function)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses	Duration of surface water adjacent to rooted vegetation		
	permanent / perennial	seasonal / intermittent	Temporary / ephemeral
≥ 65%	1 (H)	.9 (H)	.7 (M)
35-64%	.7 (M)	.6 (M)	.5 (M)
< 35%	.3 (L)	.2 (L)	.1 (L)

Comments:

May increase w/ plantings

14I. Production Export/Food Chain Support:

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
B	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
C	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
P/P	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
S/I	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L
T/E/A																		

Comments:

14J. Groundwater Discharge/Recharge: (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

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

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Other

iii. Rating: Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

Criteria	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments:

14K. Uniqueness:

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: I. Is the AA a known rec./ed. site: (circle) Y (If yes, rate as [circle] High [1] and go to ii; if no go to 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 strong potential for rec./ed. use? (circle) Y N

(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iv. Rating (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	Disturbance at AA (#12j)		
	low	moderate	high
public ownership	1 (H)	.5 (M)	.2 (L)
private ownership	.7 (M)	.3 (L)	.1 (L)

Comments:

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & 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	0.3	1	
B. MT Natural Heritage Program Species Habitat	MOD	0.6	1	
C. General Wildlife Habitat	HIGH	0.9	1	
D. General Fish/Aquatic Habitat	HIGH	0.9	1	
E. Flood Attenuation	HIGH	0.7	1	
F. Short and Long Term Surface Water Storage	MOD	0.6	1	
G. Sediment/Nutrient/Toxicant Removal	HIGH	1	1	
H. Sediment/Shoreline Stabilization	MOD	0.7	1	
I. Production Export/Food Chain Support	HIGH	0.9	1	
J. Groundwater Discharge/Recharge	HIGH	1	1	
K. Uniqueness	LOW	0.3	1	
L. Recreation/Education Potential	HIGH	1	1	
Totals:		8.9	12	

74 %

OVERALL ANALYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below) I **II** III IV

Category I Wetland: (Must satisfy one of the following criteria; if does not meet criteria, go to Category II)

- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or
- ☐ Score of 1 functional point for Uniqueness; or
- ☐ Score of 1 functional point for Flood Attenuation and answer to Question 14E.ii is "yes"; or
- ☐ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following criteria; if not satisfied, go 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
- ☒ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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 does not satisfy criteria go to Category III)

- ☐ "Low" rating for Uniqueness; and
- ☐ "Low" rating for Production Export/Food Chain Support; and
- ☐ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: Big Spring Creek 2. Project #: _____ Control #: _____3. Evaluation Date: Mo 08 Day 29 Yr. 01 4. Evaluator(s): Berglund/Traxler 5. Wetlands/Site #(s): along bank-fringe wetlands6. Wetland Location(s): I. Legal: T 15N or S; R 18E or W; S 23 : T _____ N or S; R _____ E or W; S _____II. Approx. Stationing or Mileposts: Just S. of Lewisville along Big Spring CreekIII. Watershed: 10040103 GPS Reference No. (if applies): NAOther Location Information: Brewery Flats7. a. Evaluating Agency: MDT

b. Purpose of Evaluation:

1. _____ Wetlands potentially affected by MDT project
 2. _____ Mitigation wetlands; pre-construction
 3. ☒ Mitigation wetlands; post-construction
 4. _____ Other

8. Wetland size: (total acres) _____ (visually estimated)
21 (measured, e.g. by GPS [if applies])9. Assessment area: (AA, tot., ac., _____ (visually estimated)
 see instructions on determining AA) 21 (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
Riverine	Palustrine	-	EM	SF	EX	10
	Riverine	Upper perennial	RB	H	EX	90
(Willows planted, but still considered within herbaceous layer due to height (<3' tall))						

(Abbreviations: System: Palustrine (P)/ Subsystem: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO) System: Lacustrine (L)/ Subsystem: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsystem: Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3)/ Classes: RB, UB, AB, US/ Water Regimes: Permanently Flooded (H), Intermittently Flooded (J), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) HGM Classes: Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)

(Circle one) Unknown Rare Common Abundant
 Comments: _____

12. General condition of AA:

I. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	Predominant conditions adjacent to (within 500 feet of) 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 natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings	low disturbance	low disturbance	<u>moderate disturbance</u>
AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): Residential Recreational - moderate to low disturbanceII. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) Smooth brome, Ragweed

III. Provide brief descriptive summary of AA and surrounding land use/habitat: Narrow wetland fringes along portions of Big Spring Creek. Creek included in AA where adjacent to wetlands.
Surrounding use - Residential development + 2-lane highway.

13. Structural Diversity: (based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	≥ 3 vegetated classes (or ≥ 2 if one is forested)	2 vegetated classes (or 1 if forested)	≤ 1 vegetated class
Rating (circle)	High	Moderate	<u>Low</u>

Comments: Willows included in herbaceous layer. This will likely change over time.

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

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

Bald Eagle

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus./primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.9 (H)	.8 (M)	.7 (M)	.5 (L)	<u>.3 (L)</u>	0 (L)

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

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

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

N. Leopard Frog

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus./primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.8 (H)	.7 (M)	.6 (M)	.2 (L)	<u>.1 (L)</u>	0 (L)

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

14C. General Wildlife Habitat Rating:

I. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

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

Low (based on any of the following [check]):

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

Moderate (based on any of the following [check]):

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

ii. Wildlife habitat features (working from top to bottom, circle appropriate AA attributes in matrix to arrive at 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 of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

Structural diversity (see #13)	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Duration of surface water in ≥ 10% of AA																	<u>P/P</u>			
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	<u>H</u>	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1 (E)	<u>.9 (H)</u>	.8 (H)	.7 (M)
<u>Moderate</u>	.9 (H)	<u>.7 (M)</u>	.5 (M)	.3 (L)
Minimal	.6 (M)	.4 (M)	.2 (L)	.1 (L)

Comments:

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

i. **Habitat Quality** (circle appropriate AA attributes in matrix to arrive at 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 such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading - 50 to 75% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - < 50% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. **Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support? Y N Modified habitat quality rating = (circle) E H M L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Types of fish known or suspected within AA	Modified Habitat Quality (ii)			
	Exceptional	High	Moderate	Low
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)
No fish	.5 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

Sauger, Mtn. Whitefish present (MRIS 2002)

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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	1 (H)	.9 (H)	.6 (M)	.8 (H)	.7 (H)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains unrestricted outlet	.9 (H)	.8 (H)	.5 (M)	.7 (H)	.6 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

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

Comments:

Residences

14F. Short and Long Term Surface Water Storage: (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, circle NA here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			<5, >1 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
Wetlands in AA flood or pond < 5 out of 10 years	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (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, circle NA here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.)

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with 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 with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding or ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1 (H)	.8 (H)	.7 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains unrestricted outlet	.9 (H)	.7 (M)	.6 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

14H Sediment/Shoreline Stabilization: (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 which is subject to wave action. If does not apply, circle NA here and proceed to next function)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses	Duration of surface water adjacent to rooted vegetation		
	permanent / perennial	seasonal / intermittent	Temporary / ephemeral
> 65%	1 (H)	.9 (H)	.7 (M)
35-64%	.7 (M)	.6 (M)	.5 (M)
< 35%	.3 (L)	.2 (L)	.1 (L)

Comments: *Planted shrubs will improve this rating once better established.*

14I. Production Export/Food Chain Support:

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
B	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
C	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
P/P	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
S/I	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L
T/E/A																		

Comments:

14J. Groundwater Discharge/Recharge: (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

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

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Other

iii. Rating: Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

Criteria	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments:

14K. Uniqueness:

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site: (circle) *Y* N (If yes, rate as [circle] High [1] and go to ii; if no go to 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 strong potential for rec./ed. use? *Y* N

(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iv. Rating (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	Disturbance at AA (#12i)		
	low	moderate	high
public ownership	1 (H)	.5 (M)	.2 (L)
private ownership	.7 (M)	.3 (L)	.1 (L)

Comments: *Fishing, Established park, school nearby,*

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & 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	0.3	1	
B. MT Natural Heritage Program Species Habitat	Low	0.1	1	
C. General Wildlife Habitat	MOD	0.7	1	
D. General Fish/Aquatic Habitat	MOD	0.7	1	
E. Flood Attenuation	Low	0.2	1	
F. Short and Long Term Surface Water Storage	Low	0.3	1	
G. Sediment/Nutrient/Toxicant Removal	MOD	0.6	1	
H. Sediment/Shoreline Stabilization	MOD	0.7	1	
I. Production Export/Food Chain Support	MOD	0.4	1	
J. Groundwater Discharge/Recharge	HIGH	1	1	
K. Uniqueness	Low	0.3	1	
L. Recreation/Education Potential	HIGH	1	1	
Totals:		5.3	12	

44%

OVERALL ANALYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below) I II III IV

Category I Wetland: (Must satisfy one of the following criteria; if does not meet criteria, go to Category II)

- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or
- ☐ Score of 1 functional point for Uniqueness; or
- ☐ Score of 1 functional point for Flood Attenuation and answer to Question 14E.ii is "yes"; or
- ☐ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following criteria; if not satisfied, go 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
- ☐ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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 does not satisfy criteria go to Category III)

- ☒ "Low" rating for Uniqueness; and
- ☒ "Low" rating for Production Export/Food Chain Support; and
- ☐ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: Big Spring Creek 2. Project #: _____ Control #: _____
3. Evaluation Date: Mo. 08 Day 29 Yr. 01 4. Evaluator(s): Berglund/Traxler 5. Wetlands/Site #s: 5 "isolated" depressions west of creek; 2 W. of sidewalk, 2 in new "bend" area.
6. Wetland Location(s): I. Legal: T 150 N or S; R 180 E or W; S 23 : T N or S; R E or W; S S
 II. Approx. Stationing or Mileposts: Just S. of Lewis & Clark along Big Spring Creek
 III. Watershed: 10040103 GPS Reference No. (if applies): NA
 Other Location Information: Brewery Flats
7. a. Evaluating Agency: MDT
 b. Purpose of Evaluation:
 1. ☐ Wetlands potentially affected by MDT project
 2. ☐ Mitigation wetlands; pre-construction
 3. ☒ Mitigation wetlands; post-construction
 4. ☐ Other
8. Wetland size: (total acres) _____ (visually estimated)
< 1 AC (measured, e.g. by GPS [if applies])
9. Assessment area: (AA, tot., ac., _____ (visually estimated)
 see instructions on determining AA) < 1 AC (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
<u>Riverine</u>	<u>Palustrine</u>	<u>-</u>	<u>EM</u>	<u>C</u>	<u>-</u>	<u>100</u>

(Abbreviations: System: Palustrine (P)/ Subsystem: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ System: Lacustrine (L)/ Subsystem: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsystem: Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3)/ Classes: RB, UB, AB, US/ Water Regimes: Permanently Flooded (H), Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) HGM Classes: Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
 (Circle one) Unknown Rare Common Abundant
 Comments: _____

12. General condition of AA:

- I. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	Predominant conditions adjacent to (within 500 feet of) 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 natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	low disturbance	low disturbance	<u>moderate disturbance</u>
AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): Residential, Recreational - moderate to low disturbanceII. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) Smooth brome, RagweedIII. Provide brief descriptive summary of AA and surrounding land use/habitat: 5 small depressions west of creek.2 are in new bend area E. of sidewalk, 3 are W. of sidewalk in north portion of site.Surrounding use = Residential development + 2-lane highway.

13. Structural Diversity: (based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	≥ 3 vegetated classes (or ≥ 2 if one is forested)	2 vegetated classes (or 1 if forested)	≤ 1 vegetated class
Rating (circle)	High	Moderate	<u>Low</u>

Comments: _____

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

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

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus./primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.9 (H)	.8 (M)	.7 (M)	.5 (L)	.3 (L)	<u>0 (L)</u>

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

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (list species) D S _____
 Secondary habitat (list species) D S _____
 Incidental habitat (list species) D S N. leopard frog
 No usable habitat D S _____

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus./primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.8 (H)	.7 (M)	.6 (M)	.2 (L)	<u>.1 (L)</u>	0 (L)

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

14C. General Wildlife Habitat Rating:

I. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

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

Low (based on any of the following [check]):

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

Moderate (based on any of the following [check]):

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

ii. Wildlife habitat features (working from top to bottom, circle appropriate AA attributes in matrix to arrive at 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 of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

Structural diversity (see #13)	High								Moderate								<u>Low</u>			
	Even				Uneven				Even				Uneven				<u>Even</u>			
Class cover distribution (all vegetated classes)	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	<u>S/I</u>	T/E	A
Duration of surface water in ≥ 10% of AA	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Low disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	<u>M</u>	L	L
Moderate disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L
High disturbance at AA (see #12i)																				

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	<u>Moderate</u>	Low
Substantial	1 (E)	.9 (H)	<u>.8 (H)</u>	.7 (M)
<u>Moderate</u>	.9 (H)	.7 (M)	<u>.5 (M)</u>	.3 (L)
Minimal	.6 (M)	.4 (M)	.2 (L)	.1 (L)

Comments:

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

i. Habitat Quality (circle appropriate AA attributes in matrix to arrive at 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 such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading - 50 to 75% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - < 50% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. Modified Habitat Quality (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = NA]). Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support? Y N Modified habitat quality rating = (circle) E H M L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Types of fish known or suspected within AA	Modified Habitat Quality (ii)			
	Exceptional	High	Moderate	Low
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)
No fish	.5 (M)	.3 (L)	.2 (L)	.1 (L)

Comments: NA

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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	1(H)	.9(H)	.6(M)	.8(H)	.7(H)	.5(M)	.4(M)	.3(L)	.2(L)
AA contains unrestricted outlet	.9(H)	.8(H)	.5(M)	.7(H)	.6(M)	.4(M)	.3(L)	.2(L)	.1(L)

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

Comments: Residences

14F. Short and Long Term Surface Water Storage: (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, circle NA here and proceed with the evaluation.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			<5, >1 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	1(H)	.9(H)	.8(H)	.8(H)	.6(M)	.5(M)	.4(M)	.3(L)	.2(L)
Wetlands in AA flood or pond < 5 out of 10 years	.9(H)	.8(H)	.7(M)	.7(M)	.5(M)	.4(M)	.3(L)	.2(L)	.1(L)

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (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, circle NA here and proceed with the evaluation.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.)

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with 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 with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	> 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding or ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1 (H)	.8 (H)	.7 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains unrestricted outlet	.9 (H)	.7 (M)	.6 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments:

14H Sediment/Shoreline Stabilization: (applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If does not apply, circle NA here and proceed to next function)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses	Duration of surface water adjacent to rooted vegetation		
	permanent / perennial	seasonal / intermittent	Temporary / ephemeral
≥ 65%	1 (H)	.9 (H)	.7 (M)
35-64%	.7 (M)	.6 (M)	.5 (M)
< 35%	.3 (L)	.2 (L)	.1 (L)

Comments: NA

14I. Production Export/Food Chain Support:

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
B	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments: Subsurface

14J. Groundwater Discharge/Recharge: (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

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

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Other

iii. **Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

Criteria	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments:

14K. Uniqueness:

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site: (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to 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 strong potential for rec./ed. use? Y N

(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iv. **Rating** (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	Disturbance at AA (#12i)		
	low	moderate	high
public ownership	1 (H)	.5 (M)	.2 (L)
private ownership	.7 (M)	.3 (L)	.1 (L)

Comments: School nearby, public site, moderate potential for study of wetland development.

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & 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	0.0	1	
B. MT Natural Heritage Program Species Habitat	Low	0.1	1	
C. General Wildlife Habitat	Med	0.5	1	
D. General Fish/Aquatic Habitat	NA	—	—	
E. Flood Attenuation	Low	0.2	1	
F. Short and Long Term Surface Water Storage	Low	0.3	1	
G. Sediment/Nutrient/Toxicant Removal	High	1	1	
H. Sediment/Shoreline Stabilization	NA	—	—	
I. Production Export/Food Chain Support	Low	0.3	1	
J. Groundwater Discharge/Recharge	High	1	1	
K. Uniqueness	Low	0.3	1	
L. Recreation/Education Potential	Med	0.5	1	
Totals:		4.2	10	

42%

OVERALL ANALYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below) I II III IV

Category I Wetland: (Must satisfy one of the following criteria; if does not meet criteria, go to Category II)

- ___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or
- ___ Score of 1 functional point for Uniqueness; or
- ___ Score of 1 functional point for Flood Attenuation and answer to Question 14E.ii is "yes"; or
- ___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following criteria; if not satisfied, go 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
- ___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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 does not satisfy criteria go to Category III)

- ☒ "Low" rating for Uniqueness; and
- ☒ "Low" rating for Production Export/Food Chain Support; and
- ___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

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



Project/Site: Big Spring Creek Applicant/Owner: Montana Department of Transportation Investigators: Traxler	Project No: Task 29	Date: 7-Aug-2002 County: Fergus State: Montana Plot ID: 1
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes <input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/>	Community ID: EM/SS Transect ID: NA Field Location: E. of stream, S. portion (pre-exist)
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VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Salix amygdaloides</i>	Shrub	FACW	<i>Rumex crispus</i>	Herb	FACW
Willow, Peach-Leaf			Dock, Curly		
<i>Salix exigua</i>	Shrub	OBL	<i>Beckmannia syzigachne</i>	Herb	OBL
Willow, Sandbar			Sloughgrass, American		
<i>Agrostis alba</i>	Herb	FACW	<i>Glycyrrhiza lepidota</i>	Herb	FAC+
Redtop			Licorice, American		
<i>Mentha arvensis</i>	Herb	FAC	<i>Cirsium arvense</i>	Herb	FACU+
Mint, Field			Thistle, Creeping		
<i>Typha latifolia</i>	Herb	OBL	<i>Juncus ensifolius</i>	Herb	FACW
Cattail, Broad-Leaf			Rush, Three-Stamen		
<i>Calamagrostis inexpansa</i>	Herb	FACW			
Small-Reedgrass, Narrow-Spike					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 10/11 = 90.91%	FAC Neutral: 8/9 = 88.89% Numeric Index: 23/11 = 2.09
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Remarks:

HYDROLOGY

YES Recorded Data(Describe in Remarks): NO Stream, Lake or Tide Gauge YES Aerial Photographs NO Other NO No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: = 0 (in.) Depth to Saturated Soil: N/A (in.)	Wetland Hydrology Indicators Primary Indicators NO Inundated YES Saturated in Upper 12 Inches NO Water Marks NO Drift Lines NO Sediment Deposits YES Drainage Patterns in Wetlands Secondary Indicators YES Oxidized Root Channels in Upper 12 Inches NO Water-Stained Leaves NO Local Soil Survey Data YES FAC-Neutral Test NO Other(Explain in Remarks)
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Remarks:

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



Project/Site: Big Spring Creek Applicant/Owner: Montana Department of Transportation Investigators: Traxler	Project No: Task 29	Date: 7-Aug-2002 County: Fergus State: Montana Plot ID: 1
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SOILS

Map Unit Name (Series and Phase): Enbar-Nesda loams, 0-2% slopes Map Symbol: 83 Drainage Class: SPD Taxonomy (Subgroup): Cumulic Haploborolls Profile Description						Mapped Hydric Inclusion? Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes No	
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc		
8	B	10YR3/1	N/A	N/A N/A	Silt loam		
8	B	10YR3/2	10YR4/6	Common Distinct	Silt loam		
Hydric Soil Indicators: <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>NO</u> Reducing Conditions <u>YES</u> Gleyed or Low Chroma Colors </div> <div style="width: 45%;"> <u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>NO</u> Organic Streaking in Sandy Soils <u>NO</u> Listed on Local Hydric Soils List <u>NO</u> Listed on National Hydric Soils List <u>NO</u> Other (Explain in Remarks) </div> </div>							
Remarks:							

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No Wetland Hydrology Present? <input checked="" type="radio"/> Yes No Hydric Soils Present? <input checked="" type="radio"/> Yes No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes No
Remarks: This plot was taken in apparent pre-existing wetland, east of the stream and in the south portion of the site.	

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



Project/Site: Big Spring Creek Applicant/Owner: Montana Department of Transportation Investigators: Traxler	Project No: Task 29	Date: 7-Aug-2002 County: Fergus State: Montana Plot ID: 2
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Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation:)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on the reverse side)	Community ID: EM Transect ID: NA Field Location: hwy slope toe, NE portion of site
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VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Typha latifolia</i>	Herb	OBL	<i>Polygonum lapathifolium</i>	Herb	FACW+
Cattail, Broad-Leaf			Willow-Weed		
<i>Agrostis alba</i>	Herb	FACW	<i>Juncus articulatus</i>	Herb	OBL
Redtop			Rush, Jointed		
<i>Alopecurus pratensis</i>	Herb	FACW	<i>Juncus ensifolius</i>	Herb	FACW
Foxtail, Meadow			Rush, Three-Stamen		
<i>Bidens cernua</i>	Herb	FACW+	<i>Echinochloa crusgalli</i>	Herb	FACW
Beggar-Ticks, Nodding			Grass, Barnyard		
<i>Epilobium ciliatum</i>	Herb	FACW-	<i>Glyceria elata</i>	Herb	FACW+
Willow-Herb, Hairy			Grass, Tall Manna		
<i>Eleocharis palustris</i>	Herb	OBL	<i>Juncus torreyi</i>	Herb	FACW
Spikerush, Creeping			Rush, Torrey's		
<i>Rumex crispus</i>	Herb	FACW	<i>Plantago major</i>	Herb	FAC+
Dock, Curly			Plantain, Common		
<i>Carex aquatilis</i>	Herb	OBL	<i>Salix exigua</i>	Shrub	OBL
Sedge, Water			Willow, Sandbar		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 16/16 = 100.00%	FAC Neutral: 15/15 = 100.00% Numeric Index: 28/16 = 1.75
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Remarks:
 Salix scattered.

HYDROLOGY

YES Recorded Data(Describe in Remarks): <u>NO</u> Stream, Lake or Tide Gauge <u>YES</u> Aerial Photographs <u>NO</u> Other <u>NO</u> No Recorded Data Field Observations Depth of Surface Water: = 2 (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: N/A (in.)	Wetland Hydrology Indicators Primary Indicators <u>YES</u> Inundated <u>YES</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>YES</u> Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data <u>YES</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
---	--

Remarks:
 Spring-fed; obvious groundwater connection.

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



Project/Site: Big Spring Creek Applicant/Owner: Montana Department of Transportation Investigators: Traxler	Project No: Task 29	Date: 7-Aug-2002 County: Fergus State: Montana Plot ID: 2
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SOILS

Map Unit Name (Series and Phase): Fluvaquentic Haplaquolls, nearly level Map Symbol: 105 Drainage Class: PD Mapped Hydric Inclusion? Taxonomy (Subgroup): Fluvaquentic Haplaquolls Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes No Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
10	B	10YR3/1	N/A	N/A N/A	Silty clay loam
Hydric Soil Indicators: <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>NO</u> Reducing Conditions <u>YES</u> Gleyed or Low Chroma Colors </div> <div style="width: 48%;"> <u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>NO</u> Organic Streaking in Sandy Soils <u>NO</u> Listed on Local Hydric Soils List <u>NO</u> Listed on National Hydric Soils List <u>NO</u> Other (Explain in Remarks) </div> </div>					
Remarks:					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No Wetland Hydrology Present? <input checked="" type="radio"/> Yes No Hydric Soils Present? <input checked="" type="radio"/> Yes No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes No
Remarks: Plot taken along toe of highway fill slope in NE corner of site. This area is developing rapidly into a functional wetland.	

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



Project/Site: Big Spring Creek Applicant/Owner: Montana Department of Transportation Investigators: Traxler	Project No: Task 29	Date: 7-Aug-2002 County: Fergus State: Montana Plot ID: 3
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Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes <input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/>	Community ID: Transitional Transect ID: NA Field Location: W. of stream, S. of Parking lot @ bend
---	---	---

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Cirsium arvense</i>	Herb	FACU+	<i>Sonchus arvensis</i>	Herb	FACU+
Thistle, Creeping			Sowthistle, Field		
<i>Equisetum arvense</i>	Herb	FAC	<i>Bromus inermis</i>	Herb	NI
Horsetail, Field			Brome, smooth		
<i>Phleum pratense</i>	Herb	FACU	<i>Alopecurus pratensis</i>	Herb	FACW
Timothy			Foxtail, Meadow		
<i>Trifolium fragiferum</i>	Herb	FACU	<i>Trifolium repens</i>	Herb	FACU+
Clover, Strawberry			Clover, White		
<i>Agrostis alba</i>	Herb	FACW			
Redtop					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 3/8 = 37.50%	FAC Neutral: 2/7 = 28.57% Numeric Index: 27/8 = 3.38
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Remarks:
 Does not satisfy hydrophytic vegetation criteria yet, but appears to be transitioning in that direction.

HYDROLOGY

NO Recorded Data(Describe in Remarks): <u>N/A</u> Stream, Lake or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other YES No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: N/A (in.) Depth to Saturated Soil: = 6 (in.)	Wetland Hydrology Indicators Primary Indicators <u>NO</u> Inundated <u>YES</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>NO</u> Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
---	---

Remarks:
 Saturated.

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



Project/Site: Big Spring Creek Applicant/Owner: Montana Department of Transportation Investigators: Traxler	Project No: Task 29	Date: 7-Aug-2002 County: Fergus State: Montana Plot ID: 3
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SOILS

Map Unit Name (Series and Phase): Enbar-Nesda loams, 0-2% slopes Map Symbol: 83 Drainage Class: SPD Taxonomy (Subgroup): Cumulic Haploborolls Profile Description						Mapped Hydric Inclusion? Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes No
Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc	
10	B	10YR3/2	10YR4/6	Few Faint	Silt loam	
Hydric Soil Indicators: <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>NO</u> Reducing Conditions <u>YES</u> Gleyed or Low Chroma Colors </div> <div style="width: 45%;"> <u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>NO</u> Organic Streaking in Sandy Soils <u>NO</u> Listed on Local Hydric Soils List <u>NO</u> Listed on National Hydric Soils List <u>NO</u> Other (Explain in Remarks) </div> </div>						
Remarks: Mottles faint; soils developing.						

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No Wetland Hydrology Present? <input checked="" type="radio"/> Yes No Hydric Soils Present? <input checked="" type="radio"/> Yes No	Is the Sampling Point within the Wetland? Yes <input checked="" type="radio"/> No
Remarks: Plot take in inside bend of creek, south of parking lot. This area is currently technically upland, but will likely develop a prevalence of hydrophytic vegetation, based on hydrology and soils. Area is considered transitional.	

Montana Department of Transportation Wetland Mitigation Monitoring Project Rhithron Associates, Inc. for Land and Water Consulting 2001 and 2002		Project Name	Big Spring Creek	Big Spring Creek
		Date	8/29/2001	8/7/2002
Coelenterata		<i>Hydra</i>	42	
Turbellaria		<i>Dugesia</i>		
Oligochaeta	Enchytraeidae	Enchytraeidae		
	Lumbriculidae	Lumbriculidae		
	Naididae	<i>Chaetogaster</i>	6	
		<i>Nais elinguis</i>		
		<i>Nais variabilis</i>	6	5
		<i>Ophidonais serpentina</i>		
	Tubificidae	Tubificidae - immature		
		<i>Limnodrilus hoffmeisteri</i>		
Hirudinea		<i>Mooreobdella microstoma</i>		
		<i>Nepheleopsis</i>		
		<i>Helobdella stagnalis</i>		
		<i>Helobdella</i>		
		<i>Glossiphonia</i>		
		<i>Theromyzon</i>		
Bivalvia	Sphaeriidae	<i>Sphaerium</i>		
Gastropoda	Lymnaeidae	<i>Fossaria</i>	36	82
	Physidae	<i>Physa</i>	19	35
	Planorbidae	<i>Gyraulus</i>	5	10
		<i>Helisoma</i>		
		<i>Planorbella</i>		
Crustacea	Cladocera	Cladocera	6	1
	Copepoda	Calanoida		2
		Cyclopoida	5	
	Ostracoda	Ostracoda	2	5
	Amphipoda	<i>Gammarus</i>		
		<i>Hyalella azteca</i>	90	79
	Isopoda	<i>Caecidotea</i>		
	Decapoda	<i>Orconectes</i>		
Acarina		Acari		
Odonata	Aeshnidae	<i>Anax junius</i>	1	
	Libellulidae	Libellulidae-early instar		1
		<i>Sympetrum</i>		
	Coenagrionidae	Coenagrionidae-early instar	3	15
		<i>Enallagma</i>		
	Lestidae	<i>Lestes</i>		
Ephemeroptera	Baetidae	<i>Baetis tricaudatus</i>		
		<i>Callibaetis</i>	8	
		<i>Centroptilum</i>		
	Caenidae	<i>Caenis</i>		
	Ephemerellidae	<i>Ephemerella</i>		
	Heptageniidae	<i>Cinygma</i>		
		<i>Nixe</i>		
	Leptophlebiidae	<i>Paraleptophlebia</i>		
	Ameletidae	<i>Ameletus</i>		
Homoptera	Corixidae	Corixidae - immature		
		<i>Corisella tarsalis</i>		
		<i>Hesperocorixa</i>		1
		<i>Palmacorixa buenoi</i>		
		<i>Sigara</i>		
		<i>Trichocorixa</i>		
	Nepidae	<i>Ranatra</i>		
	Notonectidae	<i>Notonecta</i>		
Plecoptera	Chloroperlidae	<i>Sweltsa</i>		
	Perlodidae	<i>Skwala</i>		
Trichoptera	Brachycentridae	<i>Brachycentrus</i> - early instar		
	Hydroptilidae	Hydroptilidae - pupa		


		<i>Hydroptila</i>		
	Lepidostomatidae	<i>Lepidostoma</i>		
	Leptoceridae	Leptoceridae - early instar		
		<i>Ceraclea</i>		
		<i>Mystacides</i>		
		<i>Nectopsyche</i>		
		<i>Ylodes</i>		
	Limnephilidae	<i>Psychoglypha suborealis</i>		
Coleoptera	Chrysomelidae	Chrysomelidae		
	Curculionidae	<i>Bagous</i>		
	Dytiscidae	<i>Acilius</i>		
		Dytiscidae - early instar larvae		
		Hydroporinae - early instar larvae		
		<i>Hygrotus</i>		
		<i>Liodessus</i>		
		<i>Laccophilus</i>		
		<i>Neoporus</i>		
		<i>Oreodytes</i>		
		<i>Rhantus</i>		
		<i>Stichtotarsus</i>		
	Elmidae	<i>Dubiraphia</i>		
		<i>Heterolimnius</i>		
		<i>Lara avara</i>		
		<i>Optioservus</i>		
		<i>Zaitzevia</i>		
	Haliplidae	<i>Haliplus</i>	6	8
		<i>Peltodytes</i>		1
	Hydrophilidae	Hydrophilidae - early instar larvae		
		<i>Berosus</i>		
		<i>Helophorus</i>		
		<i>Hydrobius</i>		
		<i>Hydrochara</i>		
		<i>Laccobius</i>		
		<i>Tropisternus</i>		
Diptera	Athericidae	<i>Atherix</i>		
	Ceratopogonidae	<i>Bezzia/Palpomysia</i>	4	10
		<i>Dasyhelea</i>	9	
	Chaoboridae	<i>Chaoborus</i>	2	
	Culicidae	<i>Anopheles</i>		
		<i>Culex</i>		
	Dixidae	<i>Dixella</i>		
	Dolichopodidae	Dolichopodidae		
	Empididae	<i>Clinocera</i>		
	Ephydriidae	Ephydriidae		
	Muscidae	Muscidae		
	Pelecorhynchidae	<i>Glutops</i>		
	Psychodidae	<i>Pericoma</i>		
	Simuliidae	<i>Simulium</i>		
	Sciomyzidae	Sciomyzidae		
	Stratiomyidae	<i>Odontomyia</i>		
	Tabanidae	Tabanidae		
	Tipulidae	<i>Hexatoma</i>		
		<i>Tipula</i>		
	Chironomidae	<i>Ablabesmyia</i>		5
		<i>Acricotopus</i>	3	
		<i>Camptocladius</i>		
		<i>Chironomus</i>		
		<i>Cladotanytarsus</i>		
		<i>Corynoneura</i>		
		<i>Cricotopus Bicinctus</i> Gr.		
		<i>Cricotopus (Cricotopus)</i> Gr.		
		<i>Cricotopus nostococladius</i>		
		<i>Cryptotendipes</i>		
		<i>Diamesa</i>		

	<i>Dicrotendipes</i>		
	<i>Einfeldia</i>		
	<i>Endochironomus</i>		
	<i>Labrundinia</i>		
	<i>Micropsectra</i>		
	<i>Microtendipes</i>		
	<i>Odontomesa</i>		
	<i>Orthocladius annectens</i>		
	<i>Pagastia</i>		
	<i>Parachironomus</i>		
	<i>Paracladopelma</i>		
	<i>Paramerina</i>		
	<i>Parametriocnemus</i>		
	<i>Paratanytarsus</i>		
	<i>Paratendipes</i>		
	<i>Phaenopsectra</i>		
	<i>Polypedilum</i>		
	<i>Procladius</i>		
	<i>Psectrocladius elatus</i>		
	<i>Psectrocladius vernalis</i>		1
	<i>Psectrotanytus</i>		
	<i>Pseudochironomus</i>	1	4
	<i>Stichtochironomus</i>		
	<i>Tanytus</i>		
	<i>Tanytarsus</i>		
	<i>Theinmanniella</i>		
	<i>Tvetenia</i>		
	Total	254	265
	Total taxa	19	17
	POET	3	2
	Chironomidae taxa	2	3
	Crustacea taxa + Mollusca taxa	7	7
	% Chironomidae	1.57%	3.77%
	Orthocladinae/Chironomidae	0.75	0.10
	%Amphipoda	35.43%	29.81%
	%Crustacea + %Mollusca	64.17%	80.75%
	HBI	7.48	7.11
	%Dominant taxon	35.43%	30.94%
	%Collector-Gatherers	70.47%	82.26%
	%Filterers	2.36%	0.38%
	Scores (2002 criteria)		
	Total taxa	3	3
	POET	3	1
	Chironomidae taxa	1	3
	Crustacea taxa + Mollusca taxa	5	5
	% Chironomidae	5	5
	Orthocladinae/Chironomidae	5	1
	%Amphipoda	1	1
	%Crustacea + %Mollusca	3	1
	HBI	3	3
	%Dominant taxon	3	3
	%Collector-Gatherers	3	3
	%Filterers	1	1
	Total score	36	30

Appendix C

REPRESENTATIVE PHOTOGRAPHS **2002 AERIAL PHOTOGRAPH**

MDT Wetland Mitigation Monitoring
Big Spring Creek
Lewistown, Montana

	
<p>Photo Point 1: 346 degrees North New Big Spring Creek channel</p>	<p>Photo Point 1: 300 degrees NW</p>
	
<p>Photo Point 1: 260 degrees West New Big Spring Creek channel</p>	<p>Photo Point 2: 155 degrees SE Location of old creek channel parallel to highway</p>
	
<p>Photo Point 3: 190 degrees SW</p>	<p>Photo Point 3: 340 Degrees North</p>

2002 Big Spring Creek Photographs

	
<p>Photo Point 4: 15 degrees NE From center of walkway – 6 feet from west bridge end</p>	<p>Photo Point 4: 200 degrees SW From center of walkway – 6 feet from west bridge end</p>
	
<p>Photo Point 5: 10 Degrees North Photo looking North towards foot bridge</p>	<p>Photo Point 5: 100 degrees East</p>
	
<p>Vegetation Transect start: 94 degrees East</p>	<p>Vegetation Transect End: 274 degrees West</p>

2002 Big Spring Creek Photographs

Big Spring Creek 7/22/2002

LAND & WATER C-3



FILED 17 200 245 6
FILED 17 200 245 6
41121 6
27 34 -600h ER

Appendix D

CONCEPTUAL SITE LAYOUT

*MDT Wetland Mitigation Monitoring
Big Spring Creek
Lewistown, Montana*



Scale (feet)



Highway 258

LEGEND

- | | | | |
|--|--------------------------|--|---|
| | Existing Channel | | Proposed Channel with Center Line |
| | Existing Wetlands | | Levels of Disturbance |
| | Existing Open Water | | Nature Vegetation to Remain as Riparian Wetland |
| | Water Pipe Lines | | Open Water Wetland to Remain |
| | Fence Line | | Wetland to be Created |
| | Highway Right-of-Way | | Emergent Wetland to Remain |
| | Overhead Telephone Lines | | |

Lowest point approx. 1 mile

PROJECT NO.	DATE	PROJECT
100-000000-000	01/01/98	Final Design for the Rehabilitation of the Spring Creek and the Associated Fluvial at Browns Lake
DESIGNED BY	DATE	
J. R. HARRIS	01/01/98	
CHECKED BY	DATE	
J. R. HARRIS	01/01/98	
APPROVED BY	DATE	
WETLAND PLAN		
INTER-FLUVE, INC.		
10000 N. 10th Ave., Suite 100, Denver, CO 80231		
TEL: 303.733.1111 FAX: 303.733.1112		
WWW.INTER-FLUVE.COM		
SHEET 5.4		

Appendix E

BIRD SURVEY PROTOCOL MACROINVERTEBRATE SAMPLING PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Big Spring Creek
Lewistown, Montana*

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.

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.

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.