
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2002

*South Fork Smith River
Ringling, 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: 130091.016



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1.0 INTRODUCTION

In conjunction with its Ringling – North highway reconstruction project, the Montana Department of Transportation (MDT) shifted a portion of the South Fork Smith River from its channelized location on the east side of U.S. Highway 89 to its historic channel on the west side of the roadway. It is estimated from aerial photos and topographic maps that approximately 2700 meters (8900 feet) of river channel length was eliminated with the relocation of the South Fork to the east side of the highway in 1910 (1998, MDT Hydraulics Report). The MDT, with restoration of the river to its former channel, is anticipating that various lost functions such as floodplain, fisheries and wetland habitat will be restored to previous conditions.

Located in Watershed #7 (Missouri-Sun-Smith) and the MDT Butte District, the approximate 3.2 km (2-mile) stream restoration is located approximately 11 km (7 miles) north of Ringling in Meagher County (**Figure 1**). The site occurs on private land (Galt Ranch) located west of U.S. Highway 89.

Highway reconstruction was completed during the 2001 field season, and water was returned to the historic channel in early fall 2001. The MDT did not propose or conduct any in-stream or bank construction prior to returning water to the channel, but rather elected to allow the stream to reach its own equilibrium through natural processes over time.

A baseline wetland delineation and functional assessment was completed during the 2001 field season prior to reactivation of the historic channel. MDT not only anticipates the restoration of high quality in-stream fish habitat, but the restoration of moderate to high quality floodplain wetlands as well, which will be monitored through this contract over time. Target wetland communities to be produced at the site include shallow marsh/wet meadow and shrub/scrub. Target wetland functions to be provided at the site include habitat diversity, flood control & storage, general wildlife habitat, fish habitat, sediment filtration, and nutrient cycling.

The historic channel and adjacent habitats have been heavily grazed in recent years, thus limiting the establishment of woody riparian vegetation. MDT anticipates that many of the woody species would establish with protective fencing and/or planting by MDT forces. At this time, no formal revegetation plan is proposed. Prior to project construction, MDT approached the landowner about enacting a conservation easement along the entire corridor. The landowner originally agreed, in concept, to fencing and placing the area within an easement, but rescinded late in the planning process (Urban pers. comm.).

MDT personnel have visited the site intermittently over the last few years. Photographs taken during these visits have not been incorporated into a report format, but are available in the MDT project files. This site will be monitored one time per year over the 3-year contract period to document wetland and other biological attributes.

In May 2000, the U.S. Army Corps of Engineers (COE) suggested in the 404 permit for the Ringling – North project that MDT monitor and quantify the development of wetlands in the areas adjacent to the stream restoration. If a perpetual conservation easement can be obtained, the COE would approve wetlands that develop at these locations as mitigation for construction-related wetland impacts. The area to be monitored is illustrated in **Figure 2 (Appendix A)**.

The 404 permit also requires MDT to provide the COE with an annual inspection report, documenting signs of lateral and vertical instability of the river as well as the restoration of aquatic habitat. During the annual monitoring, changes to the channel cross-section, meander patterns, and riparian vegetation will be documented. Changes will be documented through yearly ground and aerial photo analysis and inspection of bank pins installed during the spring of 2001.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on August 6, 2002. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected during this visit. Activities not conducted during the 2001 baseline delineation such as establishment of vegetation transects and precise photo points were scheduled to occur during the 2002 monitoring effort. However, due to extensive grazing on the site and the inability to accurately identify vegetation species, it was decided by MDT (Urban pers. comm.) to not commence with the establishment of the vegetation transect. Six photo point locations were established during 2002. Other activities and information conducted/collected included: wetland delineation; wetland/open water aquatic habitat boundary mapping; vegetation community mapping; soils data; hydrology data; bird and general wildlife use; macroinvertebrate sampling; functional assessment; (non-engineering) examination of the stream channel; and examination of the previously installed bank pins.

2.2 Hydrology

Hydrologic indicators were evaluated during the mid-season visit. Wetland hydrology indicators were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**), using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). All additional hydrologic data was recorded on the mitigation site monitoring form (**Appendix B**).

Two bank pins established in 2001 were examined for signs of lateral instability of the stream channel. Both pins were placed on outside bends with high probability for erosion due to trampling and overgrazing of the stream bank.

There are no groundwater monitoring wells 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.

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Typha latifolia/Scirpus acutus*) were documented during the mid-season visit, and mapped onto aerial photographs. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation. Estimated percent cover of the dominant species in each community type was recorded on the site monitoring form (**Appendix B**).

As mentioned previously, a vegetation list for the site was developed; however, a vegetation transect was not established due to poor range conditions from grazing activities. If possible, a single 10-foot wide belt transect will be established during future years monitoring events. The purpose of the transect is to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. Percent cover will be 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%).

2.4 Soils

Soils were evaluated according to procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data was recorded on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current Natural Resources Conservation Service (NRCS) terminology was used to describe hydric soils (USDA 1998). The Meagher County soil survey has not yet been published by the NRCS; however, a draft copy of preliminary mapping completed in 2001 was obtained from the NRCS (NRCS 2001). Map units and associated properties listed in this draft survey were used in describing project area soils.

2.5 Wetland Delineation

A wetland delineation of the mitigation site was conducted during the 2001 mid-season visit according to the 1987 COE of Engineers 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. No changes in wetland boundaries were noted in 2002. 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 the site visits. Indirect

use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. These observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not implemented. A comprehensive wildlife species list for the entire site was compiled.

2.7 Birds

Bird observations were also recorded during the site visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. Bird observations were recorded incidental to other monitoring activities observations, using the bird survey protocol (**Appendix D**) as a general guideline. Observations were categorized by species, activity code, and general habitat association (see data forms in **Appendix B**). A comprehensive bird list was compiled using these observations.

2.8 Macroinvertebrates

A single macroinvertebrate sample was collected during the mid-season site visit and data recorded on the wetland mitigation monitoring form. Macroinvertebrate sampling procedures are provided in **Appendix D**. The approximate location of this sample point is shown on **Figure 2 (Appendix A)**. Samples were 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.

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, and macroinvertebrate sampling location. Each photograph point location was recorded with a resource grade GPS. 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 baseline wetland delineation, a resource grade GPS unit was used to record the wetland/upland boundaries across the monitoring area. Bank pin locations were also recorded. During the 2002 monitoring effort, the GPS unit was used to record photo point locations.

3.0 RESULTS

3.1 Hydrology

The historic channel of the South Fork Smith River was primarily influenced by groundwater prior to reactivation in the fall of 2002. Flowing surface water was present in all reaches of the stream within the analysis area during the 2002 monitoring effort. Water depths varied within the channel depending upon channel geometry. The water tends to be shallow (1"-6") as it spreads out across widened sections of channel and deeper (6"-36") in narrow sections of channel and in pools.

Based upon the lack of any drift lines or water marks higher up on the banks, it is assumed that this channel did not see a significant run-off event in the spring of 2002. Similarly, examination of the bank pins showed no lateral movement of the streambanks at those locations. No other signs of lateral or vertical instability of the stream channel were noted.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. As previously noted, heavy grazing occurred during the spring and summer, which made plant identification extremely difficult in the analysis area. Much of the information presented below is taken directly from the 2001 Baseline Summary Report. Vegetation communities especially in the active channel are expected to change over time; however, distinct changes had not yet occurred in the first growing season following reactivation of the creek channel.

Three wetland community types were identified in the monitoring area. These included Type 1: *Typha latifolia/Carex nebrascensis*, Type 2: *Hordeum jubatum/Iris missouriensis*, and Type 3: *Potamogeton/Myriophyllum*. Dominant species within each of these communities are listed on the attached data form (**Appendix B**).

Type 1 occurred commonly along the channel bottom throughout the site and was the dominant community within the project area. Type 2 occurred along the banks of the historic channel and extended onto the floodplain in some locations. Type 3 consisted of aquatic bed communities, which occurred within the channel, especially towards the western end of the analysis area, which had a larger surface water component and thus more aquatic bed communities.

Adjacent upland communities were comprised of rangeland habitats. Common species included big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Agropyron spicatum*), western wheatgrass (*Agropyron smithii*), blue gramma (*Bouteloua gracilis*), needle-and-thread grass (*Stipa comata*), lupine (*Lupinus sp.*), common yarrow (*Achillea millefolium*), licorice (*Glycyrrhiza lepidota*), iris, and hound's-tongue (*Cynoglossum officinale*).

As previously mentioned, a vegetation transect was not established during the 2002 monitoring effort and no woody plant species have been planted on the site.

Wetland boundaries remained unchanged in 2002 and for the most part, the flowing channel remained vegetated in 2002. It is anticipated that a narrow open-water thalweg in the stream will establish over time, as the vegetation dies off. The wetland boundaries may also expand over time and will be documented in future monitoring efforts.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2002 monitoring effort are listed in **Table 2**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. Ground squirrels (*Spermophilus richardsonii*) are prevalent in the monitoring area, while elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*) use the area on a seasonal basis. Several spotted frogs (*Rana pretiosa*) were observed near the west end of the analysis area.

Table 2: Fish and Wildlife Species Observed on the South Fork Smith River Mitigation Site

| | |
|--|---|
| FISH | |
| **Brook Trout (<i>Salvelinus fontinalis</i>) | |
| AMPHIBIANS | |
| *Spotted Frog (<i>Rana pretiosa</i>) | |
| REPTILES | |
| None | |
| BIRDS | |
| *Mallard (<i>Anas platyrhynchos</i>) | *Blue-winged Teal (<i>Anas discors</i>) |
| *American Wigeon (<i>Anas americana</i>) | *Green-winged Teal (<i>Anas crecca</i>) |
| ** Cinnamon Teal (<i>Anas cyanoptera</i>) | *Sora (<i>Porzana Carolina</i>) |
| | *Red-tailed Hawk (<i>Buteo jamaicensis</i>) |
| MAMMALS | |
| *Mule Deer (<i>Odocoileus hemionus</i>) (scat only) | |
| *Elk (<i>Cervus elaphus</i>) (scat only) | |
| *Richardson's Ground Squirrel (<i>Spermophilus richardsonii</i>) | |
| *American Badger (<i>Taxidea taxus</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 | |

Fish (primarily brook trout) returned to the analysis area with the return of the creek back into its historic channel. At least 100 small trout were utilizing deep pool habitat at the highway box culvert on the east end of the analysis area, and several small schools of fish were seen at various locations within the creek.

3.6 Macroinvertebrates

Macroinvertebrate sampling results are provided in **Appendix B**, which lists all species collected during sampling. The macroinvertebrate synopsis prepared by Rhithron Associates is provided below.

Optimal biotic conditions were implied by the bioassessment scores calculated for this site. A diverse assemblage was collected in the sample, suggesting complex habitats. These apparently included macrophytes, since several dragonflies and damselflies were present. Benthic habitats also appeared to be well developed, since the midge fauna was rich. Water quality appeared to be about average for the sites in this study; the biotic index (7.41) was near the median value. Two mayfly taxa were present at the site, suggesting that impairment of water quality by warm temperatures or nutrient impacts were only slight.

3.7 Functional Assessment

A completed functional assessment form is presented in **Appendix B**. Functional assessment results are summarized in **Table 3**. The wetland habitat associated with the South Fork Smith River rated as a Category III (moderate value), primarily due to high ratings for surface water storage, food chain support and groundwater discharge. All other ratings were low or moderate. Actual functional points increased slightly over the baseline (see **Table 3**), as perennial flow was reintroduced to the site as well as a fisheries resource.

Table 3: Summary of 2001 & 2002 Wetland Function/Value Ratings and Functional Points ¹ at the South Fork Smith River Mitigation Project

| Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method | Wetland Site | |
|--|--|---|
| | Historic Channel S.F. Smith River - 2001 | Reactivated Channel S.F. Smith River - 2002 |
| Listed/Proposed T&E Species Habitat | Low (0.3) | Low (0.3) |
| MNHP Species Habitat | Low (0.1) | Low (0.1) |
| General Wildlife Habitat | Low (0.3) | Mod (0.5) |
| General Fish/Aquatic Habitat | Low (0.1) | Mod (0.4) |
| Flood Attenuation | Mod (0.4) | Mod (0.4) |
| Short and Long Term Surface Water Storage | High (0.9) | High (1.0) |
| Sediment, Nutrient, Toxicant Removal | Mod (0.4) | Mod (0.4) |
| Sediment/Shoreline Stabilization | Low (0.2) | Low (0.3) |
| Production Export/Food Chain Support | High (0.8) | High (0.9) |
| Groundwater Discharge/Recharge | High (1.0) | High (1.0) |
| Uniqueness | low (0.3) | low (0.2) |
| Recreation/Education Potential | Low (0.1) | Low (0.1) |
| Actual Points/Possible Points | 4.9 / 12 | 5.6/ 12 |
| % of Possible Score Achieved | 41% | 47% |
| Overall Category | III | III |
| Total Acreage of Assessed Wetlands and Other Aquatic Habitats within Site Boundaries | 8.9 ac | 8.9 ac |
| Functional Units (acreage x actual points) | 43.61 fu | 49.84 |

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

3.8 Photographs

Representative photographs taken from photo-points are provided in **Appendix C**.

3.9 Maintenance Needs/Recommendations

At this time, extensive cattle grazing within the South Fork Smith River channel, its banks, and the surrounding uplands is limiting the extent to which restoration can occur on the site. Fencing

of the stream corridor would allow for the re-establishment of woody vegetation along the creek, help protect stream banks from trampling, and improve the overall health of the system. Function and value ratings would also increase substantially, thus generating considerably more functional units from the site.

4.0 REFERENCES

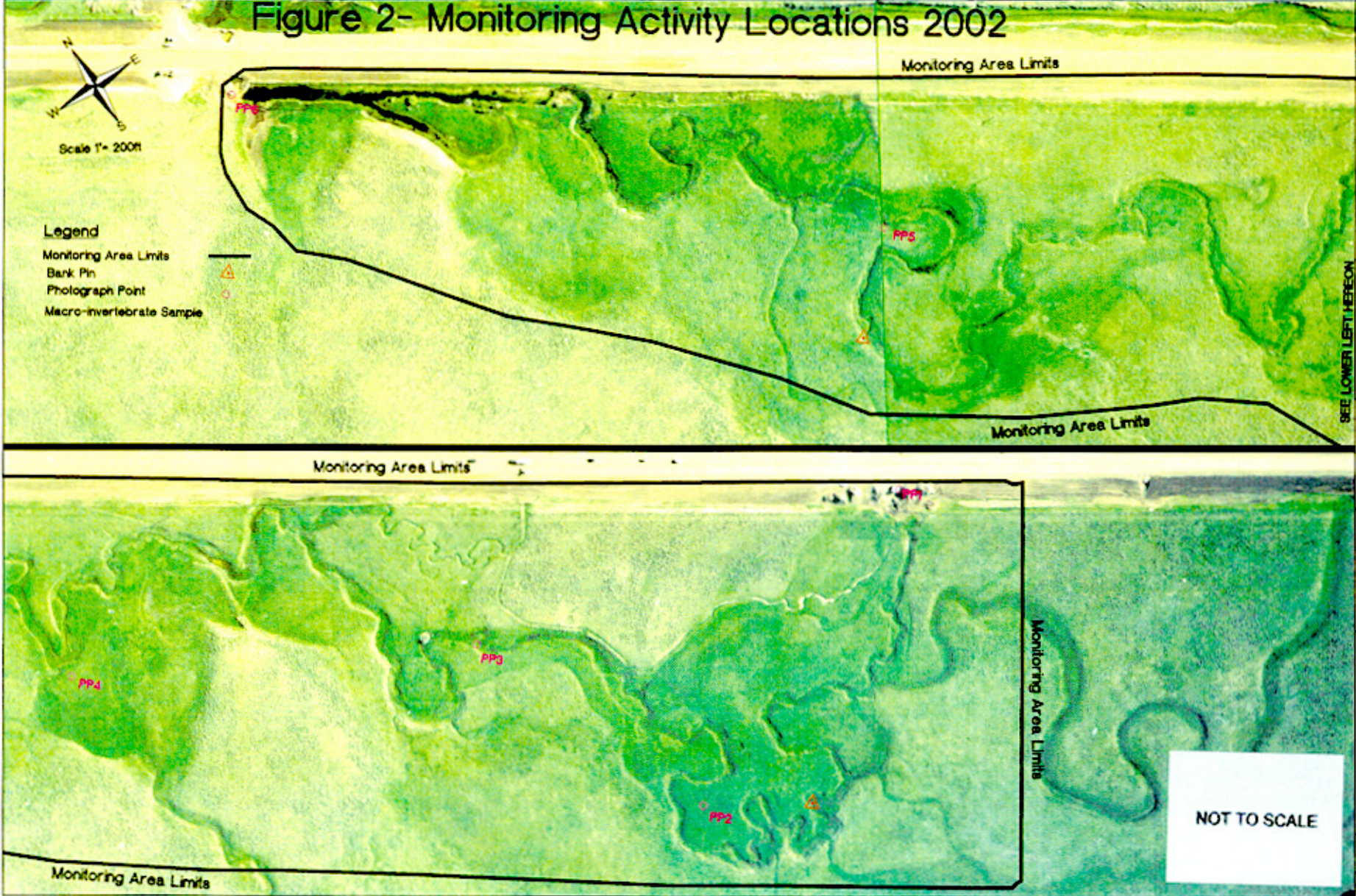
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Appendix A

FIGURES 2 - 3

*MDT Wetland Mitigation Monitoring
South Fork Smith River
Ringling, Montana*

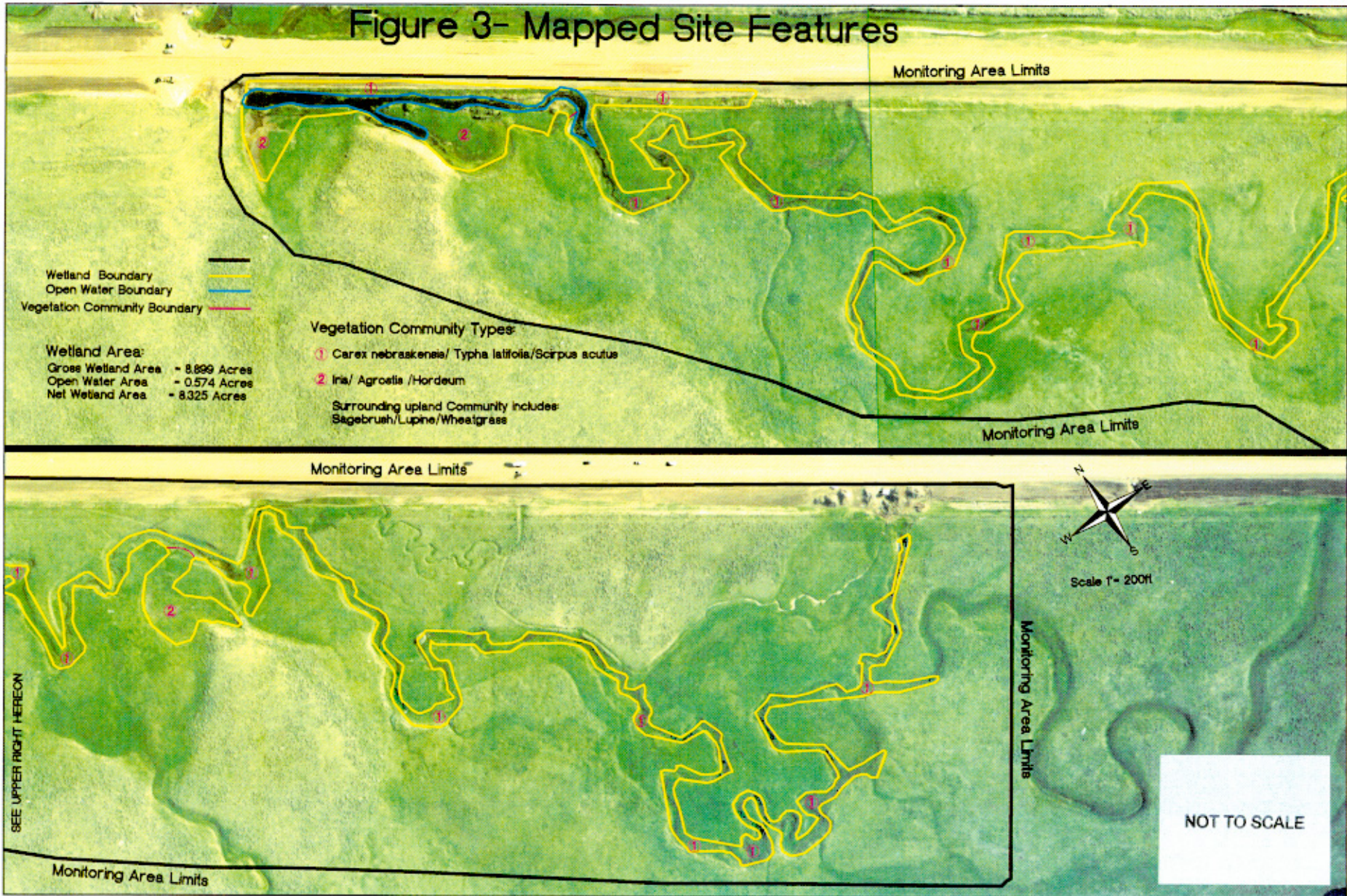
Figure 2- Monitoring Activity Locations 2002



| | | | |
|---------------------------------|---------|---|---------|
| PROJECT NAME | | MDT South Fork Smith River Wetland Mitigation | |
| PROJECT TITLE | | Monitoring Activity Locations 2002 | |
| PROJECT NO. | DATE | PROJECT NO. | DATE |
| 100001-010 | 10/2002 | 100001-010 | 10/2002 |
| DRAWN BY | | CHECKED BY | |
| TAS/HEAR/DPG | | TAS/HEAR/DPG | |
| SCALE: 1" = 200' | | SCALE: 1" = 200' | |
| PROJECT LOCATION | | PROJECT LOCATION | |
| Southern South Fork Smith River | | Southern South Fork Smith River | |
| PROJECT NO. | | PROJECT NO. | |
| 100001-010 | | 100001-010 | |
| DATE | | DATE | |
| 10/2002 | | 10/2002 | |
| SHEET NUMBER | | SHEET NUMBER | |
| 2 | | 2 | |
| DATE | | DATE | |
| 10/2002 | | 10/2002 | |

LAND & WATER CONSULTING, INC.
 CONSULTING ENGINEERS
 100001-010

Figure 3- Mapped Site Features



| | | | |
|--|-------------------|---|--------------------|
| PROJECT NAME | | MDT South Fork Smith River Wetland Mitigation | |
| DRAWING TITLE | | Mapped Site Features | |
| PROJECT NO. | DATE | DESIGNED BY | APPROVED BY |
| 130301.016 | 01/16 | JAWHNEY BA | ED |
| FILE NAME: TASK RELEASE.dwg | SCALE: 1" = 200ft | LOCATION: South Fork Smith River | PROJECT NUMBER: ED |
| LAND'S WATER CONSULTING, INC. 412 WEST 20th STREET MADISON, WI 53703 | | SHEET NUMBER 3 of | |
| REV | DATE | | |

Appendix B

**COMPLETED 2002 WETLAND MITIGATION SITE
MONITORING FORM**

COMPLETED 2002 BIRD SURVEY FORMS

COMPLETED 2002 WETLAND DELINEATION FORMS

COMPLETED 2002 FUNCTIONAL ASSESSMENT FORMS

*MDT Wetland Mitigation Monitoring
South Fork Smith River
Ringling, Montana*

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: SF Smith River Project Number: Task 16 Assessment Date: 8/6/02
 Location: 7 miles N of Ringling MDT District: Butte Milepost: _____
 Legal description: T7N R7E Section 15 Time of Day: 1300-1600
 Weather Conditions: Partly cloudy approx. 65 degrees Person(s) conducting the assessment: Traxler
 Initial Evaluation Date: 5 / 29 / 01 Visit #: 1 Monitoring Year: 2002 (year 2)
 Size of evaluation area: 15+ acres Land use surrounding wetland: Agriculture, grazing, highway

HYDROLOGY

Surface Water Source: South Fork Smith River
 Inundation: Present Absent _____ Average depths: 0.5 ft Range of depths: 0 - 3 ft
 Assessment area under inundation: 60%
 Depth at emergent vegetation-open water boundary: 0.5 ft
 If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes No _____
 Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.):

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: **Flow from the South Fork Smith River was turned into the assessment area between the 2001 baseline assessment and the 2002 monitoring effort. Water was flowing in the channel, however, it did not appear that a high-water event had occurred during the spring of 2002. There was no evidence of bank erosion. All vegetated banks and insteam vegetation was heavily grazed.**



VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): TYP LAT / CAR NEB / SCI ACU

| Dominant Species | % Cover | Dominant Species | % Cover |
|------------------|---------|------------------|---------|
| TYP LAT | 11-20 | | |
| SCI ACU | 11-20 | | |
| CAR NEB | 21-50 | | |
| | | | |
| | | | |

COMMENTS/PROBLEMS: Heavily grazed and difficult to identify species.

Community No.: 2 Community Title (main species): IRI MIS / AGR ALB / HOR JUB

| Dominant Species | % Cover | Dominant Species | % Cover |
|------------------|---------|------------------|---------|
| IRI MIS | 6-10 | | |
| AGR ALB | 21-50 | | |
| HOR JUB | 21-50 | | |
| | | | |
| | | | |

COMMENTS/PROBLEMS: Heavily grazed and difficult to identify species.

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

| Dominant Species | % Cover | Dominant Species | % Cover |
|------------------|---------|------------------|---------|
| ART TRI | 21-50 | | |
| LUP ARB | 11-20 | | |
| AGR SPI | 21-50 | | |
| AGR SMI | 21-50 | | |
| | | | |

COMMENTS/PROBLEMS:
Heavily grazed and difficult to identify species.

Additional Activities Checklist:

Record and map vegetative communities on air photo



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 | |
| 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 used during 2002 monitoring to collect photo point locations.



WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:

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

COMMENTS/PROBLEMS: See attached completed delineation forms.

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS: See attached completed functional assessment forms.

MAINTENANCE

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

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

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

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

YES NO X

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

If no, describe the problems below.

COMMENTS/PROBLEMS: .



MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: _____ Date: _____ Examiner: _____ Transect # _____

Approx. transect length: _____ Compass Direction from Start (Upland): _____

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

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

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

| Vegetation type D: Upland | |
|----------------------------------|--------|
| Length of transect in this type: | feet |
| Species: | Cover: |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| Total Vegetative Cover: | |



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

1. Project Name: S.F. Smith River Wetland Mitigation 2. Project #: TASK 016 Control #: _____

3. Evaluation Date: Mo. 8 Day 6 Yr. 02 4. Evaluator(s): Traxler 5. Wetlands/Site #(s) _____

6. Wetland Location(s): I. Legal: T 70 or S; R 70 or W; S 15; T _____ N or S; R _____ E or W; S _____;
 II. Approx. Stationing or Mileposts: _____

III. Watershed: L2030103 GPS Reference No. (if applies): _____
 Other Location Information: _____

7. a. Evaluating Agency: _____; 8. Wetland size: (total acres) _____ (visually estimated)
 b. Purpose of Evaluation: 8.3 (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., 10+ (visually estimated)
 see instructions on determining AA) _____ (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>Riverine</u> | | <u>AB</u> | <u>H</u> | | <u>30</u> |
| <u>" "</u> | <u>Palustrine</u> | | <u>EM</u> | <u>F</u> | | <u>70</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 | moderate disturbance |
| 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 | <u>high disturbance</u> | high disturbance |

Comments: (types of disturbance, intensity, season, etc.): Grazing, highway
 II. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) _____

III. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes recently reactivated channel of South Fork Smith River and adjacent wetland + upland habitat

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 | <input checked="" type="radio"/> S | Bald eagle |
| 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) | 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 | <input checked="" type="radio"/> 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) | .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 | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A |
| Low disturbance at AA (see #12i) | 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: waterfowl, shorebirds, amphibians, small mammals, big game

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 | | |
|---|-----------------------|--------|------|-------------------------|--------|------|-----------------------|--------|------|
| | >25% | 10-25% | <10% | >25% | 10-25% | <10% | >25% | 10-25% | <10% |
| Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc. | | | | | | | | | |
| 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) | <u>.4 (M)</u> |
| Non-game fish | .7 (M) | .6 (M) | .5 (M) | .3 (L) |
| No fish | .5 (M) | .3 (L) | .2 (L) | .1 (L) |

Comments: Brook trout and possibly some non-game species now have access to AA

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 | | |
|---|------------|--------|-------|---------------|--------|--------------|-----------|--------|-------|
| | 75% | 25-75% | <25% | 75% | 25-75% | <25% | 75% | 25-75% | <25% |
| % of flooded wetland classified as forested, scrub/shrub, or both | | | | | | | | | |
| AA contains no outlet or restricted outlet | 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) | <u>.4(M)</u> | .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: highway

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 | | |
|---|--------------|-------|-------|------------------|-------|-------|---------------|-------|-------|
| | P/P | S/I | T/E | P/P | S/I | T/E | P/P | S/I | T/E |
| Duration of surface water at wetlands within the AA | | | | | | | | | |
| Wetlands in AA flood or pond > 5 out of 10 years | <u>1(H)</u> | .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. | | | |
|---|--|--------|--------|--------|---|--------|--------|--------|
| | ≥ 70% | | < 70% | | ≥ 70% | | < 70% | |
| % cover of wetland vegetation in AA | | | | | | | | |
| 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) | <u>.4 (M)</u> | .3 (L) | .2 (L) | .1 (L) |

Comments: highway, livestock

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: *NO stable communities due to grazing, heavy trampling in some areas*

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 | | |
| | 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 | .6M | .4M | .4M | .3L |
| S/I | .9H | .8H | .8H | .7M | .7M | .6M | .8H | .7M | .7M | .6M | .5M | .6M | .5M | .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:

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

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 | | |
|------------------------------------|--|--------|----------|---|--------|----------|--|--------|----------|
| | rare | common | abundant | rare | common | abundant | rare | common | abundant |
| Estimated relative abundance (#11) | | | | | | | | | |
| 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:

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 | 0.5 | 1 | |
| D. General Fish/Aquatic Habitat | mod | 0.4 | 1 | |
| E. Flood Attenuation | mod | 0.4 | 1 | |
| F. Short and Long Term Surface Water Storage | high | 1 | 1 | |
| G. Sediment/Nutrient/Toxicant Removal | mod. | 0.4 | 1 | |
| H. Sediment/Shoreline Stabilization | low | 0.3 | 1 | |
| I. Production Export/Food Chain Support | high | 0.9 | 1 | |
| J. Groundwater Discharge/Recharge | high | 1.0 | 1 | |
| K. Uniqueness | low | 0.2 | 1 | |
| L. Recreation/Education Potential | low | 0.1 | 1 | |
| Totals: | | 5.6 | 12 | |

47%

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: South Fork Smith River Wetland Mitigation Site Applicant/Owner: Montana Department of Transportation Investigators: Traxler | Project No: Task 016 | Date: 6-Aug-2002 County: Meagher State: Montana Plot ID: 1 |
|--|-----------------------------|---|

| | |
|--|--|
| Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation:)? Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No (If needed, explain on the reverse side) | Community ID: Emergent Transect ID: Field Location: |
|--|--|

VEGETATION (USFWS Region No. 9)

| Dominant Plant Species(Latin/Common) | Stratum | Indicator | Plant Species(Latin/Common) | Stratum | Indicator |
|---|---------|-----------|--|---------|-----------|
| <i>Typha latifolia</i> Cattail, Broad-Leaf | Herb | OBL | <i>Carex nebrascensis</i> Sedge, Nebraska | Herb | OBL |
| <i>Scirpus acutus</i> Bulrush, Hard-Stem | Herb | OBL | <i>Mentha arvensis</i> Mint, Field | Herb | FAC |
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| | |
|---|---|
| Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 4/4 = 100.00% | FAC Neutral: 3/3 = 100.00% Numeric Index: 6/4 = 1.50 |
|---|---|

Remarks:
 Plot is along historic channel of the S.F. Smith River.

HYDROLOGY

| | |
|--|---|
| <u>NO</u> Recorded Data(Describe in Remarks): N/A Stream, Lake or Tide Gauge N/A Aerial Photographs N/A Other <u>YES</u> No Recorded Data Field Observations Depth of Surface Water: N/A (in.) Depth to Free Water in Pit: = 5 (in.) Depth to Saturated Soil: = 0 (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>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:
 groundwater influenced system. Soil saturated to surface in most areas, with some standing water present in various locations.

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



| | | |
|---|-----------------------------|-------------------------|
| Project/Site: South Fork Smith River Wetland Mitigation Site | Project No: Task 016 | Date: 6-Aug-2002 |
| Applicant/Owner: Montana Department of Transportation | | County: Meagher |
| Investigators: Traxler | | State: Montana |
| | | Plot ID: 1 |

SOILS

| Map Unit Name (Series and Phase): Fluvaquentic Haploquolls | | | | Mapped Hydric Inclusion? | | |
|---|---------|------------------------------|--|--|-----|--------------------------------------|
| Map Symbol: 501B Drainage Class: | | | | Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No | | |
| Taxonomy (Subgroup): | | | | | | |
| Profile Description | | | | | | |
| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Color (Munsell Moist) | Mottle Abundance/Contrast | | Texture, Concretions, Structure, etc |
| 18 | A/B | 10YR2/1 | 10YR5/8 | Few | N/A | Clay loam |
| Hydric Soil Indicators: | | | | | | |
| <u>NO</u> Histosol | | | <u>NO</u> Concretions | | | |
| <u>NO</u> Histic Epipedon | | | <u>NO</u> High Organic Content in Surface Layer in Sandy Soils | | | |
| <u>YES</u> Sulfidic Odor | | | <u>NO</u> Organic Streaking in Sandy Soils | | | |
| <u>NO</u> Aquic Moisture Regime | | | <u>UNK</u> Listed on Local Hydric Soils List | | | |
| <u>YES</u> Reducing Conditions | | | <u>NO</u> Listed on National Hydric Soils List | | | |
| <u>YES</u> Gleyed or Low Chroma Colors | | | <u>NO</u> Other (Explain in Remarks) | | | |
| Remarks: | | | | | | |

WETLAND DETERMINATION

| | |
|--|--|
| Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No | Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No | |
| Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No | |
| Remarks: | |

| Montana Department of Transportation Wetland Mitigation Monitoring Project Rhithron Associates, Inc. for Land and Water Consulting 2001 and 2002 | | Project Name | SF Smith |
|--|-----------------|-------------------------------------|----------|
| | | Date | 8/6/2002 |
| Coelenterata | | <i>Hydra</i> | |
| Turbellaria | | <i>Dugesia</i> | |
| Oligochaeta | Enchytraeidae | Enchytraeidae | |
| | Lumbriculidae | Lumbriculidae | |
| | Naididae | <i>Chaetogaster</i> | |
| | | <i>Nais elinguis</i> | |
| | | <i>Nais variabilis</i> | 29 |
| | | <i>Ophidonais serpentina</i> | 1 |
| | Tubificidae | Tubificidae - immature | |
| | | <i>Limnodrilus hoffmeisteri</i> | |
| Hirudinea | | <i>Mooreobdella microstoma</i> | |
| | | <i>Nephelopsis</i> | |
| | | <i>Helobdella stagnalis</i> | |
| | | <i>Helobdella</i> | 1 |
| | | <i>Glossiphonia</i> | |
| | | <i>Theromyzon</i> | 1 |
| Bivalvia | Sphaeriidae | <i>Sphaerium</i> | |
| Gastropoda | Lymnaeidae | <i>Fossaria</i> | |
| | Physidae | <i>Physa</i> | 3 |
| | Planorbidae | <i>Gyraulus</i> | |
| | | <i>Helisoma</i> | |
| | | <i>Planorbella</i> | 4 |
| Crustacea | Cladocera | Cladocera | |
| | Copepoda | Calanoida | |
| | | Cyclopoida | 2 |
| | Ostracoda | Ostracoda | 136 |
| | Amphipoda | <i>Gammarus</i> | |
| | | <i>Hyaella azteca</i> | 55 |
| | Isopoda | <i>Caecidotea</i> | |
| | Decapoda | <i>Orconectes</i> | |
| Acarina | | Acari | |
| Odonata | Aeshnidae | <i>Anax junius</i> | |
| | Libellulidae | Libellulidae-early instar | 2 |
| | | <i>Sympetrum</i> | |
| | Coenagrionidae | Coenagrionidae-early instar | 12 |
| | | <i>Enallagma</i> | 2 |
| | Lestidae | <i>Lestes</i> | |
| Ephemeroptera | Baetidae | <i>Baetis tricandatus</i> | |
| | | <i>Callibaetis</i> | 5 |
| | | <i>Centroptilum</i> | |
| | Caenidae | <i>Caenis</i> | 9 |
| | 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> | |
| | | <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>Heterlimnius</i> | |
| | | <i>Lara avara</i> | |
| | | <i>Optioservus</i> | |
| | | <i>Zaitzevia</i> | |
| | Haliplidae | <i>Haliplus</i> | 1 |
| | | <i>Peltodytes</i> | |
| | 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/Palpomyia</i> | 1 |
| | | <i>Dasyhelea</i> | |
| | Chaoboridae | <i>Chaoborus</i> | |
| | 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> | 4 |
| | | <i>Acricotopus</i> | |
| | | <i>Camptocladius</i> | |
| | | <i>Chironomus</i> | 4 |
| | | <i>Cladotanytarsus</i> | |
| | | <i>Corynoneura</i> | |
| | | <i>Cricotopus Bicinctus</i> Gr. | |
| | | <i>Cricotopus (Cricotopus)</i> Gr. | 1 |
| | | <i>Cricotopus nostococladus</i> | |
| | | <i>Cryptotendipes</i> | |
| | | <i>Diamesa</i> | |

Appendix C

REPRESENTATIVE PHOTOGRAPHS AERIAL PHOTOGRAPHS

*MDT Wetland Mitigation Monitoring
South Fork Smith River
Ringling, Montana*

| | |
|---|--|
|  |  |
| | |
| <p>Photo Point 1: 180 degrees South Looking downstream from inlet culvert under highway.</p> | <p>Photo Point 2: 110 degrees East Typical channel profile with cattle path along top of bank.</p> |
|  |  |
| | |
| <p>Photo Point 2: 10 degrees North</p> | <p>Photo Point 3: 100 degrees East</p> |
|  |  |
| | |
| <p>Photo Point 3: 280 degrees West Lone mature willow along channel, heavily grazed vegetation.</p> | <p>Photo Point 4: 340 degrees NW Shallow/widened channel with standing water</p> |

2002 SF Smith River Photographs

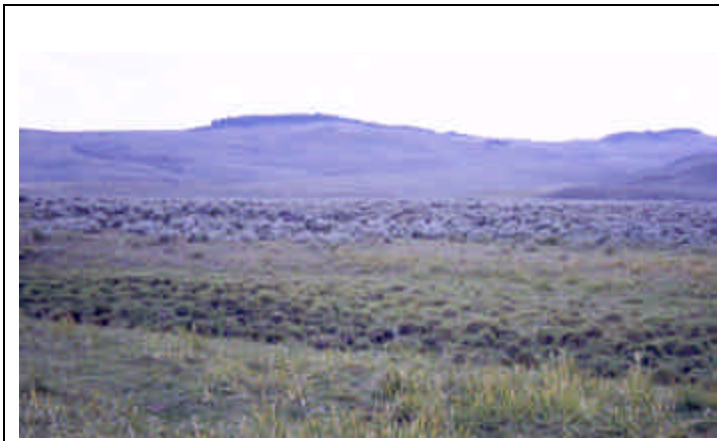


Photo Point 4: 200 degrees SW
Heavily grazed/hummocky historic meander.



Photo Point 5: 80 degrees East
Narrow, deeper, more natural channel with some gravel substrate



Photo Point 5: 215 degrees SW



Photo Point 6: 170 degrees South
Dry backwater area



Photo Point 6: 90 degrees East
Stream channel parallel to highway at west end of analysis area.



Photo Point 6: 15 degrees North
Culvert under highway where creek leaves the analysis area.

2002 SF Smith River Photographs

Appendix D

BIRD SURVEY PROTOCOL MACROINVERTEBRATE SAMPLING PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
South Fork Smith River
Ringling, 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.