MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2001

Wyola-Sunlight Ranch Wetland
Wyola, Montana

Prepared for:

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

Prepared by:

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P.O. Box 8254
Missoula, MT 59807

July 2002

Project No: 130091.035

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1.0 INTRODUCTION

This annual report summarizes methods and results from the 2001 monitoring program at the Montana Department of Transportation's (MDT) Wyola-Sunlight mitigation site. This is a one-time monitoring site for the MDT and is not scheduled for continued monitoring beyond 2001.

The Wyola-Sunlight (Sunlight Ranch) wetland was constructed to mitigate wetland impacts associated with MDT projects in Watershed #13 of MDT District 5, specifically for a bridge replacement over the Little Bighorn River. The site is located on the Crow Reservation approximately eleven (11) miles southwest of Wyola, Montana in Section 17, Township 9 South and Range 34 East **(Figure 1).** The elevation at the site is approximately 3,800 feet and is shown in **Figures 2 and 3, Appendix A**. The completed 2001 monitoring data form is included as **Appendix B**.

Two pre-construction functional assessments (1993 and 1995) were conducted at this site. A post-construction functional assessment was conducted in 2001. The historic assessments are included within **Appendix C** and indicate that a riverine wetland of about one acre in size was to be enhanced. Construction of the mitigation wetland occurred in October of 1996 with the goal of creating at least 2.2 acres of wetland **(Figure 2, Appendix A)**. In 1997, problems were encountered when an overabundance of standing water in the wetland threatened the newly installed fences and the access road. To address this concern, the constructed ditch on the site was lined with a geotextile fiber and filled with gravel/cobbles to facilitate runoff. A diagram of the corrective action is included within **Appendix C**.

The wetland enhancement/mitigation site was reportedly first monitored by the MDT in July of 1997; however, no documentation was found to compare results to the 2001 data.

2.0 METHODS

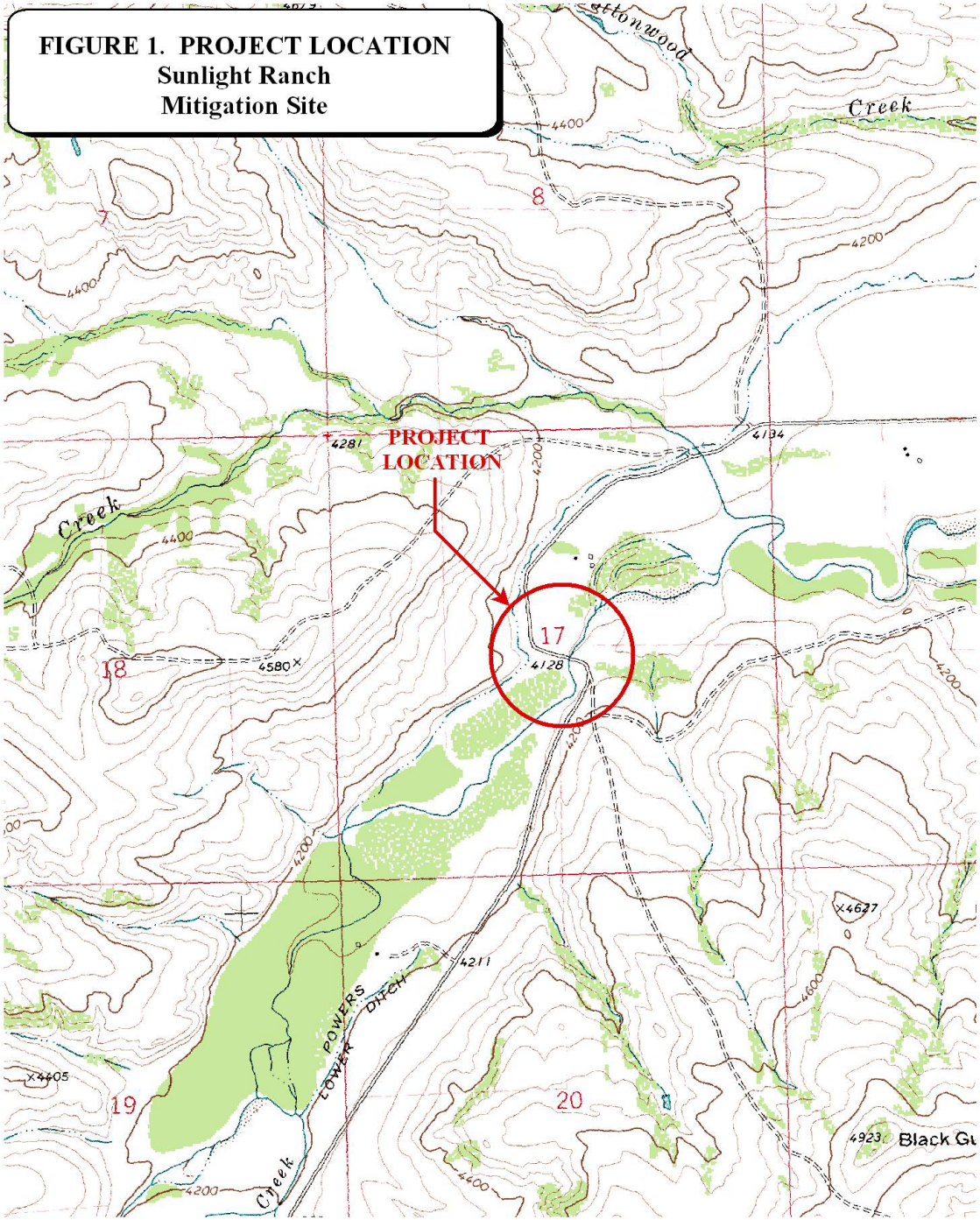
2.1 Monitoring Dates and Activities

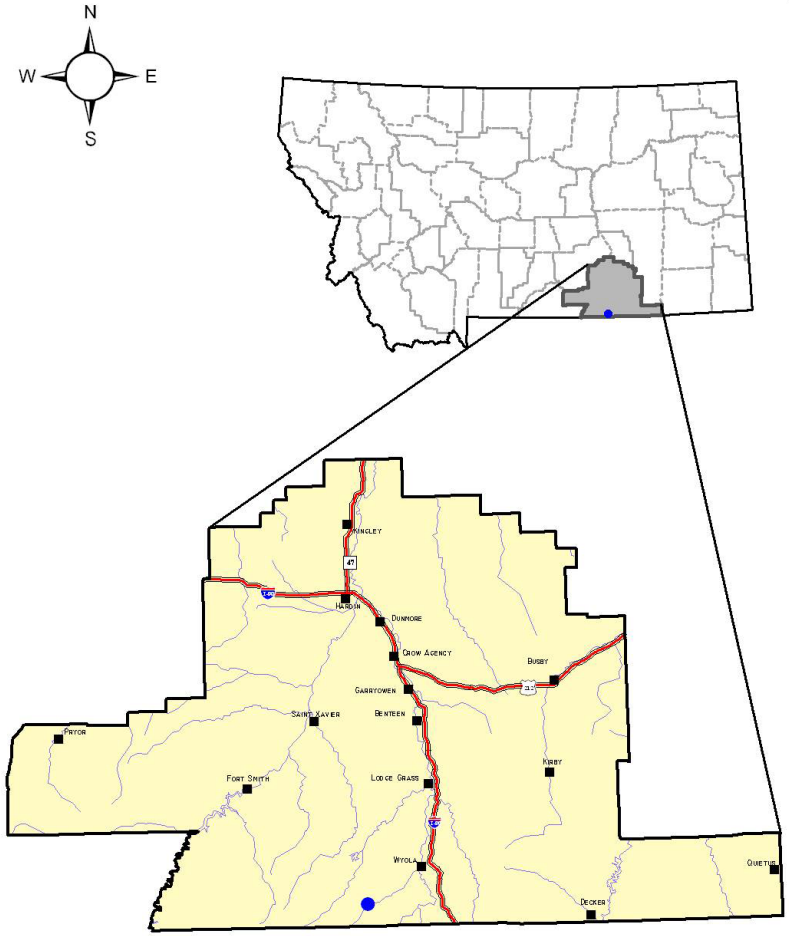
The MDT Mitigation Site Monitoring plan (Land & Water, et al. 2000) proposed a final visit to this site. The Wyola-Sunlight Ranch wetland was monitored on August 15, 2001. All information contained within the Wetland Mitigation Site Monitoring Form was collected at this time **(Appendix B)**. Activities 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; GPS data points; functional assessment; and, assess maintenance needs of any bird nesting structures and inflow and outflow structures.

2.2 Hydrology

Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual. Hydrology data was recorded on the Routine Wetland Delineation Data Form (**Appendix B**) at each wetland determination point.

FIGURE 1. PROJECT LOCATION
Sunlight Ranch
Mitigation Site





800 0 800 1600 FEET

1: 24,000

PROJECT #: 130091.035
DATE: APRIL 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

LAND & WATER CONSULTING, INC.

1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

All additional hydrologic data were recorded on the mitigation site monitoring form **(Appendix B)**. The boundary between emergent vegetation and open water was mapped on the air photograph **(Figure 3, Appendix A)**. There are no groundwater monitoring wells at the site.

2.3 Vegetation

General vegetation types were delineated on an air photograph during the site visit (**Figure 3, Appendix A)**. Coverage of the dominant species in each community type is listed on the monitoring form **(Appendix B)**. A comprehensive plant species list for the entire site was compiled and will be updated as new species are encountered. Woody species were not planted at this site.

One transect was established during the 2001 monitoring event to represent the range of current vegetation conditions. The location of this transect is shown on **Figure 2, Appendix A**. Percent cover for each species was recorded on the vegetation transect form **(Appendix B)**. The transect could be used to evaluate changes in the plant community over time if desired by the MDT. The transect ends were marked with metal fence posts and their locations were recorded with the GPS unit. Photos of the transect were taken from both ends during the site visit.

2.4 Soils

Soils were evaluated during the site visit according to the procedure outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form **(Appendix B)**.

2.5 Wetland Delineation

A wetland delineation was conducted within the assessment area according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: North Plains Region 4 (Reed 1988). The information was recorded on the COE Routine Wetland Delineation Forms **(Appendix B)**. A Site Plan was designed in 1994; a preconstruction functional assessment (1993) and COE data sheet with functional assessment was conducted in 1995 by the MDT **(Appendix C)**. In 2001 the wetland/upland and open water boundaries were used to calculate the wetland area.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations were recorded on the wetland monitoring form during each visit **(Appendix B)**. Indirect use indicators were also recorded including tracks, scat and burrows. A comprehensive wildlife species list for the entire site was compiled and could be updated as new species are encountered if the MDT desires.

2.7 Birds

Bird observations were recorded during the site visit according to the established bird survey protocol **(Appendix D)**. Three wood duck boxes were installed on the site, but not by MDT. A general, qualitative bird list has been compiled using these observations.

2.8 Macroinvertebrates

No macroinvertebrate samples were collected on the site.

2.9 Functional Assessment

A functional assessment form was completed in 2001 for the Wyola-Sunlight Ranch Wetland mitigation site using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were collected on a condensed data sheet included in the mitigation site monitoring form **(Appendix B)**. The remainder of the assessment was completed in the office. Included in **Appendix C** are two other "Site Evaluation" forms from 1993 and 1995 (MDT).

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the wetland buffer, the monitored area, and the vegetation transect. A description and compass direction for each photograph were recorded on the wetland monitoring form.

During the 2001 monitoring season, each photograph point was marked on the ground with a wooden stake and the location recorded with a resource grade GPS **(Appendix E)**. The approximate locations are shown on **Figure 2, Appendix A**. All photographs were taken using a 50 mm lens.

2.11 GPS Data

During the 2001 monitoring season, survey points were collected using a resource grade Trimble, Geoexplorer III hand-held GPS unit. Points collected included: the vegetation transect beginning and ending locations; photograph locations; and the jurisdictional wetland boundary. In addition, during the August 2001 monitoring season survey points were collected at four (4) landmarks recognizable on the air photo for purposes of line fitting to the topography.

2.12 Maintenance Needs

There is no inlet structure and the outlet is restricted; the outlet area was examined for maintenance needs.

3.0 RESULTS

3.1 Hydrology

During the August 2001 site visit 75% of the assessment areas was inundated with 0-3 feet of water. Pat Cunningham, ranch manager for the Sunlight Ranch, reports that the water within the wetland disappears when the flows in the adjacent irrigation ditch are shut off. According to MDT, the project was designed to take advantage of irrigation water seeping from the ditch (Urban pers. comm.).

According to the Western Regional Climate Center, Wyola yearly precipitation totals for 2000 (13.44 inches) and 2001 (9.77 inches) were 84 and 61 percent, respectively, of the total annual mean precipitation (16 inches) in this area.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and in the monitoring form **(Appendix B)**. Three (3) vegetation communities were mapped on the mitigation area map **(Figure 3, Appendix A)**. The communities include: Type 1, *Typha spp.*; Type 2, *Juncus balticus; and* Type 3, *Cirsium arvense*. Dominant species within each community are listed on the monitoring form **(Appendix B)**. The Wyola-Sunlight wetland site has developed wetland vegetation along the edge of the site's high water mark that is inundated with less than one (1) foot of water throughout **(Figure 3, Appendix A)**. Surrounding the site are riparian wetlands dominated by a shrub-scrub community of willows, dogwood and rose.

Table 1: ***2001 Wyola-Sunlight Wetland Vegetation Species List***

Scientific Name	Common Name	Indicator status
Artemesia tridentata	big sage	NI
Cirsium arvense	Canada thistle	FACU
Hordeum jubatum	fox-tail barley	FACW
Juncus balticus	Baltic rush	OBL
Juncus spp.	rush	FACW-OBL
Panicum capillare	witchgrass	FAC
Poa pratensis	Kentucky bluegrass	FACU
Typha spp.	cattail	OBL

The vegetation transect results are detailed in the monitoring form **(Appendix B)** and are summarized below.

Transect 1 Start	Upland Type 3 (10')	Wetland Type 2 (5')	Upland Type 3 (15')	Wetland Types 1&2 (10')	Total 40'	End Transect 1

3.3 Soils

The site was mapped as part of the Soil Survey of Bighorn County Area (USDA 1971). The predominant soil is mapped as Alluvial land, cobbly (ATb) and it is listed on the Montana NRCS

Hydric Soil list. These are very stony, gravelly, and cobbly silt loam and loam alluvium soils found on flood plains and in valley bottoms.

Soils were sampled at one wetland location (SP-2) and one upland (SP-1). Soils at SP-1 (upland) consisted of packed, impenetrable gravels that could not be excavated. Soils at SP-2 (wetland) were a black (10YR2/1) loamy peat from 0-18 inches with a strong sulfidic odor.

3.4 Wetland Delineation

The delineated wetland boundary is depicted on **Figure 3, Appendix A**. The wetland boundary encompasses 0.854 acres of wetland with 0.740 acres of open water habitat; the open water averages only one foot in depth. The 2001 COE data forms are included in **Appendix B;** the 1995 wetland delineation form and functional assessment is included in **Appendix C**. The data that was collected in 1995 may have been from the northeast side of the Little Bighorn River bridge; it is evident from the aerial photograph that a much more diverse riparian community still exists on that side of the river.

3.5 Wildlife

Wildlife species are listed in **Table 2.** Activities and densities associated with these observations area included on the monitoring form in **Appendix B**. Wildlife observation included observation of deer tracks, trees chewed by beavers, and sightings of leopard frogs (3). Three wood duck boxes were installed on the site. None of these boxes showed signs of occupation during either of the monitoring visits.

Table 2. ***Fish and Wildlife Species Observed at the Wyola-Sunlight Wetland Mitigation Site***

AMPHIBIANS Leopard frogs (*Rana pipiens)*
BIRDS American robin (*Turdus migratorius)* Belted kingfisher (*Ceryle alcyon* Blue winged teal (*Anas discors)* Cedar waxwing (*Bombycilla cedrorum)* Western kingbird (*Tyrannus verticalis)* Wilson's warbler (*Wilsonia pusilla)*
MAMMALS Beaver (*Castor canadensis)* White-tailed deer *(Odocoileus virginianus)*

3.6 Macroinvertebrates

No macroinvertebrate samples were collected on the site.

3.7 Functional Assessment

Completed functional assessment forms for 2001 are included in **Appendix B** and summarized below in **Table 3**. Although two assessments were completed (1993 and 1995) prior to the bridge replacement and mitigation, only the 1995 assessment is shown below to compare with the 2001 data. The assessment form used for 1995 is most directly comparable to the form used in 2001; the 1993 assessment form is included in **Appendix C**. Note that the 1995 function and value parameters are not the same as those for 2001. The functional unit data is not directly comparable but is provided below for reference. The "percent of possible score achieved" increased from 1995 (40 %) to 2001 (72 %).

The data show the site to rank as a Category II wetland at 72 %. It scored an exceptional ranking for general wildlife habitat and high for the following: MTNHP species habitat; flood attenuation; short and long-term surface water storage; sediment, nutrient, toxicant removal; production export/food chain support; and groundwater discharge/recharge.

Table 3: ***Summary of Wetland Function/Value Ratings and Functional Points at the Wyola-Sunlight Ranch Wetland Mitigation Project (1995 and 2001)***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	1995 Pre-con.	2001
Listed/Proposed T&E Species Habitat	Low (0)	Low (0)
MNHP Species Habitat	Low (0)	High (1)
General Wildlife Habitat	High (5)	High (.9)
General Fish/Aquatic Habitat		Moderate (0.6)
Flood Attenuation	High (5)	High (0.8)
Short and Long Term Surface Water Storage		High (0.8)
Sediment, Nutrient, Toxicant Removal	Low (1)	High (1)
Sediment/Shoreline Stabilization		High (1)
Production Export/Food Chain Support	High (5)	High (0.8)
Groundwater Discharge/Recharge	High (5)	High (1)
Uniqueness	Low (1)	Moderate (0.6)
Recreation/Education Potential	Low (1)	Low (0.1)
Actual Points/ Possible Points	42/105	8.6/12
% of Possible Score Achieved	40%	72%
Overall Category	II	II
Total Acreage of Assessed Wetlands within Easement	1 ac (visual est.)	0.854 ac
Functional Units (acreage x actual points)	NA	7.344 fu
Net Acreage Gain		NA
Net Functional Unit Gain		7.344 fu
Total Functional Unit "Gain"		NA

3.8 Photographs

Representative photos taken from photo points and transect ends are included in **Appendix E.**

3.9 Maintenance Needs/Recommendations

No maintenance needs were apparent at the site.

3.10 Current Credit Summary

The functional unit data are not directly comparable between 1995 (pre-construction) and 2001 (post-construction) but are provided above in **Table 3** for reference. The "percent of possible score achieved" increased from 1995 (40 %) to 2001 (72 %). The data show the site to rank as a Category II wetland. It scored high rankings for the following: general wildlife habitat; MNHP species habitat; flood attenuation; short and long-term surface water storage; sediment, nutrient, toxicant removal; production export/food chain support; and groundwater discharge/recharge. The total functional units are 7.34 for 2001.

The wetland acreage for the site is measured at 0.854 acres with 0.74 acres being shallow (<1'), open water. The whole site meets wetland criteria. It is difficult to say with certainty that any wetland acreage was gained since the pre-construction assessments visually estimated the site to be about one acre before mitigation. There is, however, a gain in the site's "percent of possible score achieved" from 1995 (40 %) to 2001 (72 %). The actual credit allocated to this site will need to be determined by MDT and the COE.

4.0 REFERENCES

Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. Prepared for Montana Department of Transportation. May 1999.

Reed, P.B. 1988. National list of plant species that occur in wetlands: North Plains (Region 4). Biological Report 88(26.4), May 1988. U.S. Fish and Wildlife Service. Washington, D.C.

Urban, L. Wetland Mitigation Specialist, Montana Department of Transportation. Helena, Montana. April 29, 2002 meeting.

US Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual.* US Army Corps. Washington, DC.

USDA Natural Resource Conservation Service. Soil Survey of Bighorn County, Montana.

Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Wyola-Sunlight Ranch Wetland
Wyola, Montana

LAND & WATER

Figure 2 - Monitoring Activity Locations

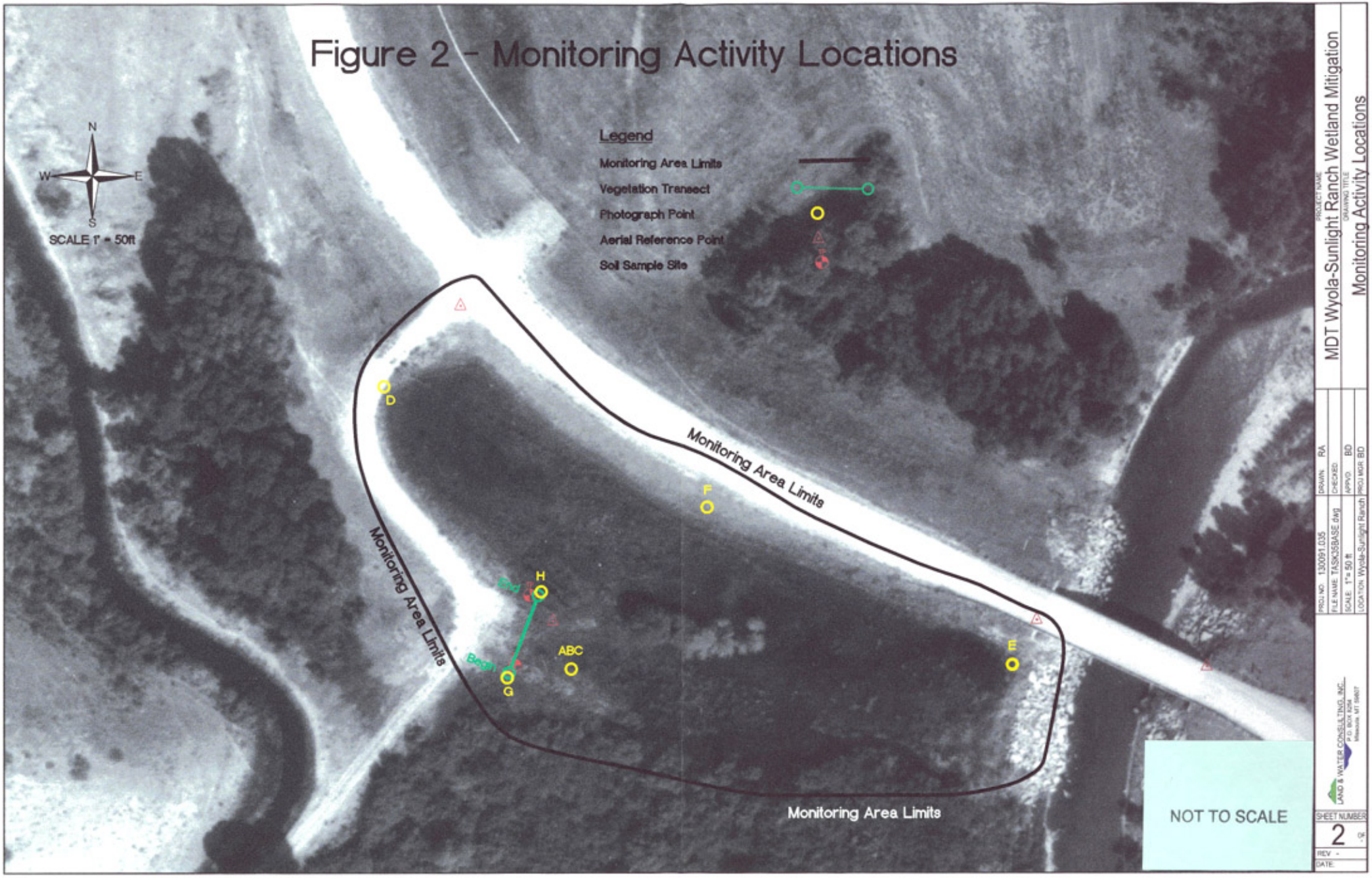
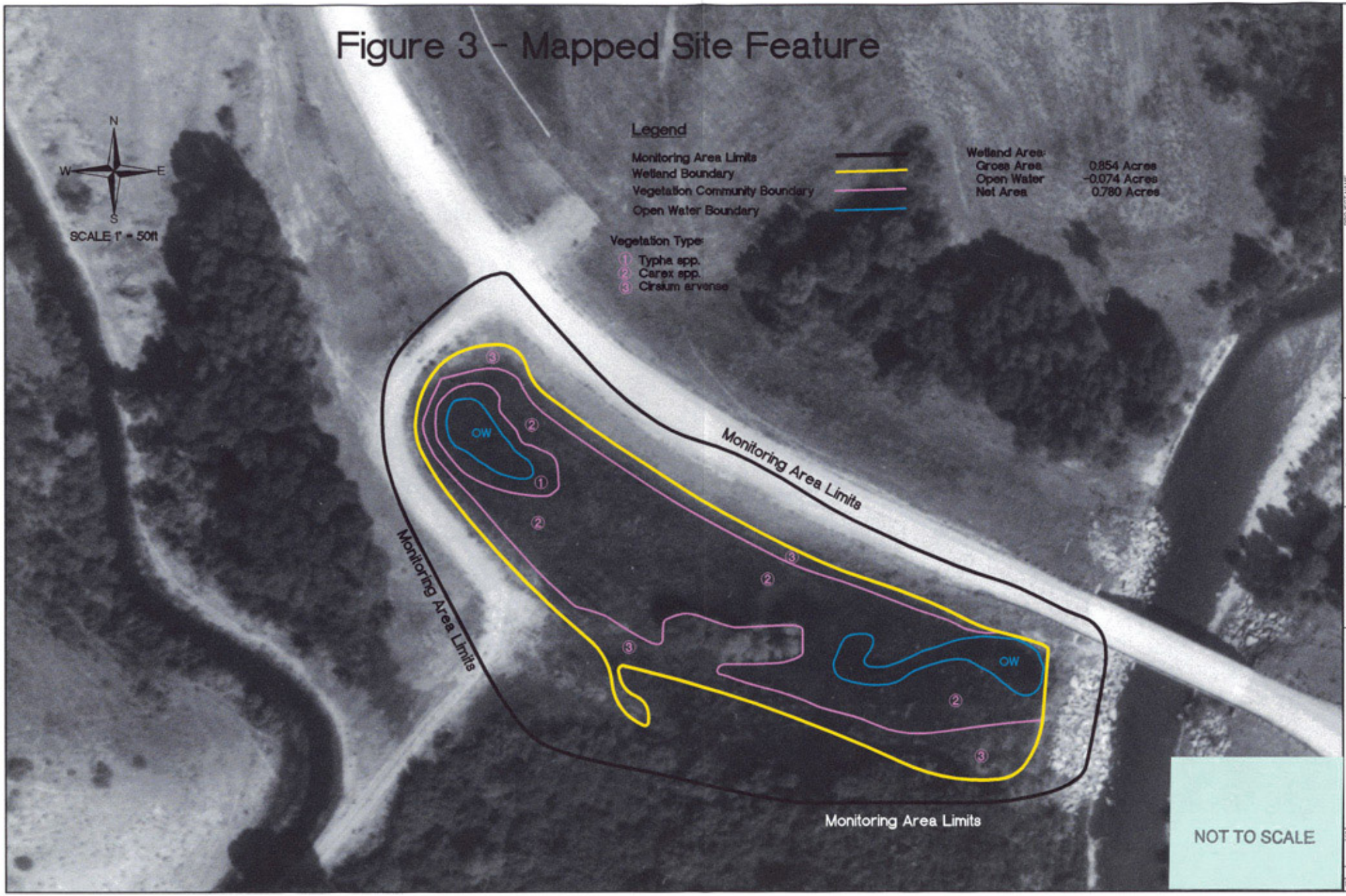


Figure 3 - Mapped Site Feature



PROJECT NAME
MDT Wyola-Sunlight Ranch Wetland Mitigation
DRAWING TITLE
Mapped Site Features

PROJ NO. 130091.035
FILE NAME TASK35BASE.dwg
SCALE 1"= 50 ft
LOCATION Wyola-Sunlight Ranch

DRAWN RA
CHECKED
APPV'D BD
PROJ MGR BD

LAND & WATER CONSULTING, INC.
P.O. BOX 8264
Missoula, MT 59807

SHEET NUMBER
3 OF -
REV -
DATE

Appendix B

COMPLETED 2001 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2001 BIRD SURVEY FORMS
COMPLETED 2001 WETLAND DELINEATION FORMS
COMPLETED 2001 FIELD AND FULL FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Wyola-Sunlight Ranch Wetland
Wyola, Montana

LAND & WATER

DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Sunlight Project Number: 215-35 Assessment Date: 15 / Aug / 2001
Location: Wyola, MT MDT District: Five Milepost: 31
Legal description: T 85 R 34E Section 26/30 Time of Day: 9:00 a.m. - 12:00 pm
Weather Conditions: Partly Cloudy, 75° Person(s) conducting the assessment: LeCoin, Wetland Wesc, Inc
Initial Evaluation Date: 15 July 97 Visit #: 2 Monitoring Year: 2001
Size of evaluation area: 2.2 acres Land use surrounding wetland: Agriculture / Rangeland

HYDROLOGY

Surface Water
Inundation: Present ✓ Absent ___ Average depths: 1 ft Range of depths: 0 - 3 ft
Assessment area under inundation: 75%
Depth at emergent vegetation-open water boundary: 1 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: Pat Cunningham, Sunlight Ranch manager reports that wetland turns dry when the irrigation ditch is turned off. On evaluation date wetland was flooded

VEGETATION COMMUNITIES

LAND & WATER B-2

Community No.: 1 Community Title (main species): Typha spp.

Dominant Species	% Cover	Dominant Species	% Cover
Typha spp.	5		

COMMENTS/PROBLEMS:

Community No.: 2 Community Title (main species): Carex spp.

Dominant Species	% Cover	Dominant Species	% Cover
Carex ~~spp.~~ aquatilis	5		
Juncus ~~spp.~~ balticus	3		
Scirpus spp.			

COMMENTS/PROBLEMS:

Community No.: 3 Community Title (main species): Cirsium arvense

Dominant Species	% Cover	Dominant Species	% Cover
Cirsium arvense	5	Phleum pretense	3
Agropyron spp.	3		
Panicum capilare	3		
Salix spp.	3		
Hordreum Jubatum	3		

COMMENTS/PROBLEMS:

Additional Activities Checklist:

√ Record and map vegetative communities on air photo

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Sunlight Date: 15 Aug 2001 Examiner: LeCain Transect # 1

Approx. transect length: 40 feet Compass Direction from Start (Upland): 340° N

Vegetation type ~~1~~ 3:	Agropyron	
Length of transect in this type:	1-10'	feet
Species:		Cover:
Agropyron spp.		3
Hordeum jubatum		3
Cirsium arvense		3
Panicum capilare		3
Total Vegetative Cover:		12

Vegetation type 2:	10-15 CAAQ	
Length of transect in this type:	5	feet
Species:		Cover:
Carex aquatilis		5
Juncus balticus		3
Cirsium arvense		3
Total Vegetative Cover:		11

Vegetation type 3:	15-30	
Length of transect in this type:	15	feet
Species:		Cover:
Cirsium arvense		5
Total Vegetative Cover:		5

Vegetation type 4:	30-40	
Length of transect in this type:	10	feet
Species:		Cover:
Carex aquatilis		5
Typha spp.		3
Total Vegetative Cover:		8

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form) LAND & WATER B-4

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 50 % developing wetland vegetation – excluding dam/berm structures.

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

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

Notes:

WETLAND DELINEATION

LAND & WATER B-5

At each site conduct the items on the checklist below:

✓ Delineate wetlands according to the 1987 Army Corps manual.

✓ Delineate wetland-upland boundary on the air photo

✓ Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

Complete Jeff's abbreviated MDT Function and Values Assessment field form.

MAINTENANCE

Were man-made nesting structures installed at this site? YES___ NO ✓

If yes, do they need to be repaired? YES____ NO____

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

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

YES ✓ NO____

If yes, are the structures working properly and in good working order? YES ✓ NO___

If no, describe the problems below.

COMMENTS/PROBLEMS: _____

COMPREHENSIVE VEGETATION LIST

LAND & WATER B-6

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Agropyron spp.	1		
Hordeum jubatum	1		
Cirsium arvense	1, 3, 2		
Panicum capilare	1		
Carex aquatilus	2, 4		
Juncus balticus	2		
Typha spp.	4		
Poa pratensis	1		

COMMENTS/PROBLEMS:

PLANTED WOODY VEGETATION SURVIVAL

LAND & WATER B-7

Species	Number Originally Planted	Number Observed	Mortality Causes
N/A			

COMMENTS/PROBLEMS: _____

PHOTOGRAPHS

LAND & WATER B-8

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 a 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

Wyola/ sunlight

Location	Photo Frame #	Photograph Description	Compass Reading
~~A~~ A	19A ~~A~~	Wetland view	~~N~~ E
B	~~1~~ 17A	~~Upland use~~ wr buffer	220° ~ N
C	~~1~~ 16 18A	~~Wetland buffer~~ upland use B	260°
D	~~A~~ 14A	wetland view	E
E	~~A~~ 13A	wetland view	S
F	~~A~~ 12A	wetland view	W
G	~~A~~ 16A	vegetation transect begin	
H	~~A~~ 15A	vegetation transect end	

E2

not sure of

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: _____

WILDLIFE

LAND & WATER B-9

BIRDS

Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating	Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating
Blue winged teal	4		✓						
Cedar waxwing	1								
Wilson's warbler	1								
western tanager	1								
Belted kingfisher	1		✓						
Am. Robin	2								

Were man made nesting structures installed? Yes____ No ✓ Type:_____ How many?_____ Are the nesting structures being utilized? Yes____ No____ Do the nesting structures need repairs? Yes____ No____

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Deer	—	✓			
Beaver	—				Chews
leopard frogs	3				

Additional Activities Checklist:

_____Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: This was a very warm morning possibly limiting wildlife activity

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

Project/Site: Sunlight/Wyola Applicant/Owner: MDT Investigator: LeCain, Wetlands West, Inc.	Date: 15 Aug 2001 County: Crow reservation State: MT
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: CIAR Transect ID: UP-1 Plot ID: SP-1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. CIAR	H	FACU	9.		
2. PACA	H	FAC	10.		
3. HOJU	H	NI	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

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

Remarks:

HYDROLOGY

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

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: ___ (in.)

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

Depth to Saturated Soil: ___ (in.)

Wetland Hydrology Indicators:

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

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

Remarks: No hydrology indicating wetland

SOILS

Map Unit Name (Series and Phase): Alluvial land cobbly (ATb) Drainage Class: Well drained

Taxonomy (Subgroup): not classified Field Observations Confirm Mapped Type? Yes No

Profile Description:

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

Hydric Soil Indicators:

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

Remarks: Soil pit not dug. Packed, impenetrable gravel berm

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)	
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	Yes (No)	
Is this Sampling Point Within a Wetland?	Yes (No)	(Circle)

Remarks: Upland site

Approved by HQUSACE 3/92

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

Project/Site: Sunlight/Wyola Applicant/Owner: MDT Investigator: LeCain Wetlands West, Inc.	Date: 15 Aug 2001 County: Crow reservation State: MT
Do Normal Circumstances exist on the site? **Yes** No Is the site significantly disturbed (Atypical Situation)? Yes **No** Is the area a potential Problem Area? Yes **No** (If needed, explain on reverse.)	Community ID: CAAQ Transect ID: W-1 Plot ID: SP-2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha spp.	H	Obl	9.		
2. Carex spp.	H	Obl	10.		
3. Juncus spp.	H	Facw to Obl	11.		
4. Scirpus spp.	H	Obl	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). <50%

Remarks: nicely developed emergent vegetation

HYDROLOGY

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

✓ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: 2" (in.)

Depth to Saturated Soil: 0" (in.)

Wetland Hydrology Indicators:

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

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

Remarks: 0-2' of standing water. Ranch manager reports wetland runs dry when irrigation ditch is shut off.

SOILS

Map Unit Name (Series and Phase): Alluvial land cobbly ATb

Drainage Class: well drained

Taxonomy (Subgroup): Not classified

Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-18	A	Black 10YR2/1	—	—	Loamy Peat

Hydric Soil Indicators:

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

Remarks: strong sulfidic odor

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	
Is this Sampling Point Within a Wetland?		(Circle) Yes No

Remarks: Constructed, depressional wetland.

Approved by HQUSACE 3/92

Draft Field Data Collection Sheet for MDT Montana Wetland Assessment Form

1. CLASSIFICATION

Vegetated Cowardin Class	Estimated % of AA	Predominant Water Regime (CIRCLE)
Emergent	30 %	PF (IE) SPF SF S TF IF
Aquatic Bed	30%	(PF) IE SPF SF S TF IF
Moss-Lichen	—	PF IE SPF SF S TF IF
Scrub-Shrub	—	PF IE SPF SF S TF IF
Forested	—	PF IE SPF SF S TF IF
Total Estimated % Vegetated	60%	

2. DISTURBANCE is: High Moderate (Low) constructed in 19

3. HYDROLOGY

Do wetlands on site pond or flood? (Y) N (if no, skip to groundwater discharge/recharge portion of this section)

Does AA contain surface or subsurface outlet? (Y) N If outlet present, is it restricted (subsurface will always be "yes")? (Y) N

Longest duration of surface water:		Surface Water Duration and other attributes (circle)		
at any wetlands within AA		(Perm / Peren)	Seas / Intermit	Temp / Ephem
in at least 10% of AA (both wetlands and nonwetlands [deepwater, streambed...]		(Perm / Peren)	Seas / Intermit	Temp / Ephem
where fish are or historically were present (cross out if not applicable)		(Perm / Peren)	Seas / Intermit	Temp / Ephem
	% of waterbody containing cover objects	>25%	(10-25%)	<10%
	% bank or shore with riparian or wetland shrub or forested communities	>75%	50-74%	(<50%)
adjacent to ~~rooted wetland vegetation along a defined~~ watercourse or shoreline subject to wave action (cross out if not applicable)		Perm / Peren	~~Seas / Intermit~~	~~Temp / Ephem~~
	% cover of wetland bank or shore by sp. with binding rootmasses	>65%	(35-64%)	<35%

Do any wetlands on site flood as a result of in-channel or overbank flow? (Y) N (if no, go to groundwater section below)

Estimated wetland area subject to periodic flooding (acres): ≥10 (2-10) <2

Estimated % of flooded wetland classified SS, FO or both: ≥75 25-74 <25

Evidence of groundwater discharge or recharge? (Y) N List: restricted outlet

4. VERTEBRATES

Evidence of or potential for T&E or MNHP species use? (For general wildlife use, see separate form.) No

Fish observations?

5. OTHERS

Do wetlands have potential to ~~receive excess sediments~~, nutrients, or toxicants? (Y) N From: agriculture

Potential to receive: low to moderate levels high levels

Does site contain bog, fen, warm springs, >80 year-old forested wetland, or MNHP "S1" or "S2" plant association? Y (N)

List:

Is AA a known recreation / education site? Y (N) Type:

Does AA offer strong potential for use as recreation / education site? Y (N) Type:

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

1. Project Name: Wy[illegible]-Sunlight Ranch 2. Project #: Site 21 Control #: Task 35

3. Evaluation Date: Mo. 1 Day 22 Yr. 02 4. Evaluator(s): LB\RL 5. Wetlands/Site #(s) _____

6. Wetland Location(s): I. Legal: T 8 N or (S) R 34 (E) or W; S 17 ; T ___ N or S; R ___ E or W; S ___ ;
II. Approx. Stationing or Mileposts: _____

III. Watershed: [illegible] GPS Reference No. (if applies): _____
Other Location Information:

7. a. Evaluating Agency: Wetlands West;
b. Purpose of Evaluation:
1.____ Wetlands potentially affected by MDT project
2.____ Mitigation wetlands; pre-construction
3.X Mitigation wetlands; post-construction
4.____ Other

8. Wetland size: (total acres) _____ (visually estimated)
_____ (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) _____ (visually estimated)
_____ (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
Palustrine	Palustrine	NA	UB	H, to G	E	100%

(Abbreviations: System: Palustrine(P)/ Subsyst.: 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)/ Subsyst.: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsyst.: 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 cleaning; contains few roads or buildings	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, cleaning, 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 cleaning, 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, cleaning, or hydrological alteration; high road or building density	high disturbance	high disturbance	high disturbance

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

III. Provide brief descriptive summary of AA and surrounding land use/habitat:
roads dirt and paved, grazing(?), agriculture

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	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	

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 in14A 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	Leopard frogs
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)	.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

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

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

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			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	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 ih 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: per RL – there is a potential – LB

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: Bridge site over Lis River

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: Adjacent to river.

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:

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					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.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:

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

i. Discharge Indicators

___Springs are known or observed
X 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

i. 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:

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units; (Actual Points x Estimated AA Acreage) 0.854
A. Listed/Proposed T&E Species Habitat	L	Ø	1	Ø
B. MT Natural Heritage Program Species Habitat	H	1.0	1	.854
C. General Wildlife Habitat	H	.9	1	.7686
D. General Fish/Aquatic Habitat	M	.6	1	0.5124
E. Flood Attenuation	H	.8	1	0.6832
F. Short and Long Term Surface Water Storage	H	.8	1	0.6832
G. Sediment/Nutrient/Toxicant Removal	H	1	1	0.854
H. Sediment/Shoreline Stabilization	H	1	1	0.854
I. Production Export/Food Chain Support	H	.8	1	0.6832
J. Groundwater Discharge/Recharge	H	1	1	0.854
K. Uniqueness	M	.6	1	0.5124
L. Recreation/Education Potential	L	.1	1	0.0854
Totals:		8.6	12	7.344

72%

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)
- X Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or
- X 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
- X 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

Appendix C

1993 PRE-CON. SITE EVALUATION
1995 PRE-CON. COE DATA SHEET AND FUNCTIONAL ASSESS.
1994 SITE PLAN
1997 CORRECTIVE ACTION PLAN

MDT Wetland Mitigation Monitoring
Wyola-Sunlight Ranch Wetland
Wyola, Montana

LAND & WATER

MDT/MDFWP
WETLAND SITE EVALUATION

Date April 20, 1993

Project No. BR 9002(10), Control No. 1323

Project Name Little Bighorn Bridge - 11 Miles S. of Wyola

County Bighorn Drainage Yellowstone
R. 34E, T. 9S, Section 17

Site Location Station (on plan sheet) See attached map

Comments (route, milepost, etc.) Off-system bridge replacement

1. Classification (from Novitski, 1979)

Hydrologic Type(s) IIIB
Area

Vegetative Type(s) (1) IIIB
Dominant Species (a) Willow
(b) Wild rose
(c)
(2)
(a)
(b)
(c)
(3)
(a)
(b)
(c)

2. Adjacent Supporting Habitats (Descriptive Summary)
Wetlands (type, vegetation, area, location, condition, wildlife values)
Found in bottomlands of river system. Wetlands are abundant in the area. Wetland is fed by floodwaters and overflow from adjacent wetland by culvert under roadway. Wetland is seasonally inundated with water. Vegetation is not diverse and consists of a stand of willow and wild rose.

Uplands (vegetation type, area, location, condition, land use, erosion potential, wildlife values)
Consists of livestock pastures and upland grazing. Wildlife values are high due to large food sources and water availability.

3. Relative Commonness of Wetland Type in Area 1
   (1) abundant (2) common (3) rare

4. Degree of Habitat Interspersion
   Low = 1 Moderate = 2 High = 3

5. Vegetative Cover Characteristics of Flooded Wetlands.
   (not applicable to non-flooded wetlands)

		Rating
a.	Cover occupies more than 95% of wetland	0.5
b.	Cover occupies 76-95% of wetland in a peripheral band	1.5
c.	Cover occupies 76-95% of wetland with scattered open water areas	2.5
d.	Cover occupies 26-75% of wetland occurring in dense patches or diffuse open stands	3.0
e.	Cover occupies 26-75% of wetland in a peripheral band	2.0
f.	Cover occupies 5-25% of wetland occurring in a peripheral band or diffuse open stands	1.0
g.	Cover occupies less than 5% of the wetland	0.5

6. Inundation Frequency

		Rating
a.	Temporary surface water or saturated soil	1
b.	Seasonally or intermittently flooded	2
c.	Semi-permanent or permanently flooded	3

7. Sediment Control/Load Rating Criteria

		Rating
a.	Wetland does not receive detectable amounts of sediment - the watercourse is relatively sediment-free and accumulations are not evident	1
b.	Wetland receives some sediment load but not enough to impact the plants or aquatic organisms using the site. The watercourse has sediment accumulations, but the water is not normally turbid	2
c.	Wetland receives heavy sediment loads that has impacted the plant/animal growth/use of	

the site. The watercourse has large accumulations of sediment and the water is usually turbid 3

8. Water Flow Rating Criteria

a. Most of the water flows through the wetland in distinct channels or watercourses or has little flow of surface water during the year 1

b. Channels of watercourses present, but a significant portion of water is sheet flow through the wetland 2

c. Water flows across wetland uniformly and is not contained in channels or watercourses 3

9. Nutrient Retention Capabilities (circle one ranking)

a. Non-contiguous wetland with little accumulation of organic matter 1

b. Non-contiguous wetland with organic material accumulation 2

c. Contiguous wetland with little accumulation of organic matter 2.5

d. Contiguous wetland with organic material accumulation 3

10. Relative Flood Storage Potential

a. Section 8, line a; Section 6, line a 1

b. Section 8, line b; Section 6, line b 2

c. Section 8, line c; Section 6, line c 3

11. Relative Food Chain Support Potential (Based on percent vegetative cover and estimated relative standing crop).

a. Low (vegetative cover less than 5%; non-contiguous; no accumulation of organic matter) 1

b. Moderate (vegetative cover 6-25%; contiguous or non-contiguous to other supporting habitats; some accumulation of organic material) 2

c. High (vegetative cover 26-100%; contiguous to other supporting habitats, some accumulation of organic material) 3

12. Wildlife Habitat Values (Overall) Rating (0-3)
(Based on cover, diversity, supporting habitats, and productivity)

Evaluation Group or Species

a.	Waterfowl	0
b.	Upland Game Birds	1
c.	Songbirds	2
d.	Raptors and Others	1
e.	Furbearers	1
f.	Non-furbearing small mammals	1
g.	Large Ungulates (elk, moose, deer)	1
h.	Large Carnivores (bear, cat)	0
i.	Threatened or Endangered Species	0

Evaluate utilization by waterfowl/wildlife of wetland site for nesting, rearing young, feeding or protective cover based upon the following criteria (high, medium, low).

Use by wildlife group is <u>significant</u> in that loss or reduction by the wildlife use would have an adverse effect on the population of the species or wildlife in the general area (township) 3

Use by wildlife group is <u>evident</u> or probably and loss or reduction of the wildlife use may have an adverse effect on the local wildlife population (surrounding section[s]) 2

Use by wildlife group is <u>low</u> or incidental in that loss or reduction of the wildlife use would have a negligible effect on the local wildlife population . 1

Use by wildlife group is non-existent at any time during any year. NOTE: Use .3 to signify occasional use 0

13. Estimate utilization by fish for spawning, nursery, feeding, or cover.

a.	Montana fishes of special concern	0
b.	Trout "brookies"	0
c.	Other Salmonids	0

d. Non-Salmonid Game Fish (pike, bass, walleyes) ___0___

e. Non-Game or Rough Fish ___0___

Use by fish is significant in that loss or reduction of the fish use would have an adverse effect on the population of the fish in adjacent waters 3

Use by fish is evident or probably and loss or reduction of the fish use may have an adverse effect on the population of fish in the immediate vicinity but the magnitude of the reduction would be insignificant in relation to the total population of fish in adjacent waters 2

Use by fish is low or incidental in that loss or reduction of the fish use would have negligible effect on the population of fish in the immediate vicinity 1

Use by fish never present at any time in the year 0

14. Recreational Use Potential ..... ___1___ ___2___ ___3___

15. Summary of Functional Values and Overall Site Ranking

Sediment control rating	1/3
Nutrient retention rating	1/3
Relative flood storage rating	2.5/3
Relative food chain support	3/3
Wildlife Habitat Values	
Highest (Evaluation Group C)	2/3
Lowest (Evaluation Group H)	0/3
Fisheries Habitat Values	
Highest (Evaluation Group ____)	0/3
Lowest (Evaluation Group ____)	0/3
	11/24

JH:Q:ENV:84.dlw

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

Project/Site: WYOLA - BRIDGE REPLACEMENT
Applicant/Owner: MDT
Investigator: B. KUNKEL

Date: 11/14/95
County:
State: MT

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

Community ID: EMERGENT/SHRUB
Transect ID:
Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Reed Canary Grass	G	FACW+	9.		
2. Willow spp	S	FACW	10.		
3. Cottonwood	T	FAC	11.		
4. Box Elder	T	FACW	12.		
5. Dogwood	S	FACW	13.		
6. Sedge spp.	G	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). > 80%

Remarks: Grazed area northeast of bridge has less %, but is likely due to grazing than what would normally occur.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

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

Depth to Saturated Soil: _____ (in.)

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

Remarks: SOIL FROZEN AT TIME OF SURVEY, OBSERVATIONS MADE AT SURFACE

SOILS

FROZEN - ASSUMED HYDRIC BASED ON FLOODPLAIN OF STREAM, VEGETATION CHANGE AND TOPOGRAPHY

Map Unit Name (Series and Phase): _____ Drainage Class: _____

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): _____

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? assumed (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Wetland Edge based on topographic change on stream bank where hydrologic indicators and wetland vegetation occurred.

Approved by HQUSACE 3/92

Project Name: Wyola-Bridge Replacement Number

Evaluation Date: 11/14/95 Evaluator(s): B. Kunkel Site Name(s): Little Bighorn River

Site Location:

Estimated Total Wetland Size: One Estimated Site Within Proposed ROW: < 0.5 acres

Conditions During Evaluation: Cloudy, scattered drizzle, 40°F, scattered snow patches

Wetland Classification (from MDT Wetland Classification Scheme)

Water Regime (e.g., Permanently Flooded)	Wetland Type (e.g., Marsh)	Dominant Species	Modifier (e.g., Impounded) and/or Descriptor	% of Wetland
Temp. Flooded	Emergent Channel	Canary Grass	Riparian	40
"	Shrub	Willow/Dogwood	Riparian	20-40

Wetland Type(s) is (are) locally (circle): Rare (Common) Abundant

Brief Descriptive Summary: Area described includes area ~ 100 ft upstream & downstream of bridge, except where noted. Canary at base of bank slope

Functions and Values Assessment

1. Wetland Size (All size criteria throughout the assessment refer to the size of the entire wetland.)

Size	Score		Calcul. Score =	Rating (circle)	Point Value = (circle)
> 10 acres	(-10)	entire riparian complex	1 =	Low	-1
6 to 10 acres	-5		3 =	Moderate	-3
1 to 5 acres	-3		5 =	High	-5
< 1 acre	-1		10 =	Except.	(-10)

2. Habitat Diversity (Function of wetland type diversity and presence of open water component.)

# of Wetland Types (not including open water types)	(1 Multiply 1) Score	Score	Open Water	Calcul. Score =	Rating (circle)	Point Value = (circle)
≥ 3 types	-5	2	(Present)	1 =	Low	-1
(2 types)	-3	1 =	Absent	2-3 =	Moderate	(-3)
≤ 1 type	-1			5-6 =	High	(-5)
			Calculated Score = 6	10 =	Except.	-10

3. Food Chain Support (Function of habitat diversity [HD] and wetland size)

HD Rating (from #2 above)	(1 Multiply 1) Score	Score	Size	Calcul. Score =	Rating (circle)	Point Value = (circle)
Low	-1	(5 =)	> 5 acres	1-2 =	Low	-1
Moderate	-2	3 =	1-5 acres	3-9 =	Moderate	-3
High	(-3)	1 =	< 1 acre	10-15 =	High	(-5)
Exceptional	-4		Calculated Score = 15	20 =	Except.	-10

4. Habitat for Federally-listed Endangered, Threatened, Proposed, or Candidate (C1 or C2) Species

Wetland Requires:	Score	Calcul. Score =	Rating (circle)	Point Value = (circle)
Regular use by such species or is designated critical habitat	-10	0 =	None	(-0)
Occasional use (e.g., infrequent, sporadic use)	-5	3 =	Moderate	-3
Incidental use (e.g., chance, inconsequential use)	-3	5 =	High	-5
No known or suspected use	(-0)	10 =	Except.	-10

5. Habitat for Species Rated "S1", "S2", or "S3" by the Montana Natural Heritage Program (Not including those addressed under #4 above.)

Wetland Provides:	Score	Calcul. Score =	Rating (circle)	Point Value = (circle)
Breeding or other crucial habitat	-10	0 =	None	(-0)
Habitat that is used regularly	-5	1 =	Low	-1
Habitat that is used occasionally (e.g., infrequent, sporadic use)	-3	3 =	Moderate	-3
Habitat that is used incidentally (e.g., chance, inconsequential use)	-1	5 =	High	-5
No known or suspected habitat	(-0)	10 =	Except.	-10

Criteria I (apply to each group)				Criteria II (apply to entire group)	Score
Substantial or significant use	=S	S	M Songbirds	≥ 6 S's or ≥ 8 M's	=10
Occasional or moderate use	=M	S	M Raptors	3-5 S's or 6-7 M's	=5
Little or no perceived use	=L	S	M Waterfowl	1-2 S's or 3-5 M's	=3
			L Marsh & Shorebirds	No S's and ≤ 2 M's	=1
		?	M Rodents & Insectivores		
			L Carnivores		
			M Ungulates	Calculated Score = 5	
			M Herpetiles		
		?	S Fish		
			S Invertebrates		

Calcul. Score =	Rating (circle)	Point Value = (circle)
1 =	Low	=1
3 =	Moderate	=3
5 =	High	=5
10 =	Except.	=10

7. Flood Control & Storage (Function of floodwater proximity, wetland size, vegetative composition, and flow restriction; Applies only to sites within a a discernable floodplain [based on floodwater proximity, flood deposits, FEMA maps, etc.]; if does not apply, Point Value is 0.)

(1 Multiply 1)

A.

Wetland Size	Score	Score	Vegetative Composition
> 5 acres	=5	3 =	> 50% forested or shrub or combination
1-5 acres	=3	2 =	10-50% forested or shrub or combination
< 1 acre	=1	1 =	< 10% forested or shrub or combination

B.

Flow Restriction	Score
Outlet restricted or absent	=2
Outlet unrestricted	=1

Calculated Score (A + B) = 11

Calcul. Score =	Rating (circle)	Point Value = (circle)
0 =	None	=0
2-3 =	Low	=1
4-8 =	Moderate	=3
10-16 =	High	=5
17 =	Except.	=10

8. Sediment Filtration and Water Purification (Function of proximity to potential sediment/pollutant source and emergent vegetative component.)

(1 Multiply 1)

Likelihood to Receive Sediment/Pollutants	Score	Score	Emergent Vegetative Component
Substantial accumulations evident or likely	=2	5 =	> 50% emergent
Moderate accumulations evident or likely	=1	3 =	10-50% emergent
Accumulations not evident and unlikely	=0.5	1 =	< 10% emergent

Calculated Score = 1.5

Calcul. Score =	Rating (circle)	Point Value = (circle)
.5-1.5 =	Low	=1
2-3 =	Moderate	=3
5-10 =	High	=5

9. Erosion Control (Flow or wave dissipation; applies only if site is on shoreline of lake [subject to wave action], river, stream, or other defined drainage; if does not apply, Point Value is 0.)

Size of Rooted Vegetative Component	Score
> 5 acres	=5
1-5 acres	=3
< 1 acre	=1

Calculated Score = 1

Calcul. Score =	Rating (circle)	Point Value = (circle)
0 =	None	=0
1 =	Low	=1
3 =	Moderate	=3
5 =	High	=5

10. Nutrient Cycling (Potential to accumulate, process, and export nutrients [expressed as organic matter].)

(1 Multiply 1)

Organic Matter Accumulation	Score	Score	Proximity to Other Aquatic Habitats
Substantial accumulation evident	=3	3 =	Adjacent or contiguous to other aquatic habitats
Little to no accumulation evident	=1	1 =	Isolated basin

Calculated Score = 3

Calcul. Score =	Rating (circle)	Point Value = (circle)
1 =	Low	=1
3 =	Moderate	=3
9 =	High	=5

11. Groundwater Discharge/Recharge

Wetlands	Criteria	Score
A. is a known discharge or recharge area	A, B, or C true	=5
B. occurs immediately below a dam		
C. is a suspected discharge or recharge area due to: _____	D true, all others false	=3
D. has an outlet, but no inlet	A-D false.	=1

Calcul. Score =	Rating (circle)	Point Value = (circle)
1 =	Low	=1
3 =	Moderate	=3
5 =	High	=5

12. Uniqueness (Function of relative abundance of wetland type in Montana and replacement potential of ecological functions.)

(1 Multiply 1)

Frequency of Occurrence in Montana	Score	Score	Replacement Potential
Rare	=3	5 =	Irreplaceable ecological functions
Common	=2	3 =	Ecological functions replaceable with difficulty
Abundant	=1	1 =	Ecological functions readily replaceable

Calculated Score =

Calcul. Score =	Rating (circle)	Point Value = (circle)
1-2 =	Low	=1
3-6 =	Moderate	=3
9-10 =	High	=5
15 =	Except.	=10

13. Recreation/Education Potential (Subjective assessment of potential for boating, hunting, birdwatching, photography, and other recreation/education activities; remember to consider access restrictions.)

(4 Multiply 1)

Recreation Potential	Score	Score	Education Potential
High	=3	5 =	High
Moderate	=2	3 =	Moderate
Low	=1	1 =	Low

Calculated Score =

Calcul. Score =	Rating (circle)	Point Value = (circle)
1-2 =	Low	=1
3-6 =	Moderate	=3
9-15 =	High	=5

Function & Value Summary and Overall Wetland Rating

for Wetland Site(s): _____

Function & Value Parameters	Point Values	Ratings
1. Wetland Size	10	Except
2. Habitat Diversity	5	H
3. Food Chain Support	5	H
4. T&E/Proposed/Candidate Species Habitat	0	N/A
5. MNHP Species Habitat	0	N/A
6. General Fish & Wildlife Habitat	5	H
7. Flood Control & Storage	5	H
8. Sediment Filtration	1	L
9. Erosion Control	~~3~~ 1	~~M~~ L
10. Nutrient Cycling	~~5~~ 3	M
11. Groundwater Discharge/Recharge	5	H
12. Uniqueness	1	L
13. Recreation/Education Potential	1	L
TOTAL POINT VALUE	42	

40%

Overall Wetland Rating (Circle appropriate category based on the criteria outlined below):

(II) III IV

Category I Wetland - Must satisfy one of the following criteria:

- Total Point Value of 65 or more; or
- "Exceptional" ratings for T&E/Proposed/Candidate Species Habitat or Flood Control & Storage or Uniqueness.

Category II Wetland - Does not satisfy criteria for Category I and:

- (+) Total Point Value of 40 - 64; or
- "Exceptional" ratings for MNHP Species Habitat or General Wildlife & Fish Habitat; or
- (+) "High" ratings for Food Chain Support or Uniqueness.

Category III Wetland - Does not satisfy criteria for Category I, Category II, or Category IV.

Category IV Wetland - Does not satisfy criteria for Category I, Category II, or Category III and:

- Total Point Value less than 26; and
- "Low" ratings for Wetland Size and Habitat Diversity.

MDT Wetland Classification Scheme
(adapted from Windell et al.[1986] and Cowardin et al.[1979])

Water Regime	Vegetation Type	Substrate	Wetland Type	Modifiers and Descriptors
• Permanently flooded • Intermittently exposed • Semi-permanently flooded • Seasonally flooded • Saturated • Temporarily flooded	Rooted floating, floating-leaved, or submergent	Water, mineral, or organic	Aquatic Bed (standing water)	Modifiers • Excavated ditch • Excavated basin • Impounded • Diked • Farmed • Grazed • Partly Drained Descriptors • Riparian • Deepwater Habitat • Drumlin Wetland • Seasonal Wetland • Prairie Pothole • Vegetated Flat
			Aquatic Channel (within channel)	
	Emergent (erect, rooted, herbaceous hydrophytes [includes mosses and lichens])	Organic (peat, muck)	Fen (typically "peatland" dominated by sedges and grasses)	
			Bog (typically "peatland" dominated by sphagnum mosses)	
			Marsh (substrate can be "muck" or mineral; not typically dominated by sedges and grasses)	
		Mineral	Wet Meadow (dominated by sedges, grasses and rushes)	
			Marsh (substrate can be "muck" or mineral; not typically dominated by sedges and grasses)	
			Emergent Channel (within channel)	
	Shrub (woody vegetation less than 20 feet tall)	Organic (peat, muck)	Carr (shrub-dominated fen)	
			Shrub-bog (shrub-dominated bog)	
		Mineral	Shrub (coniferous, deciduous, or mixed)	
	Forested (woody vegetation greater than 20 feet tall)	Organic or Mineral	Forested (coniferous, deciduous, or mixed)	
	Unvegetated	Mineral or Water	Open Water	
			Bare Substrate	

Permanently flooded: Water covers land surface throughout the year in all years.
Intermittently exposed: Surface water present throughout the year except during years of extreme drought.
Semipermanently flooded: Surface water persists throughout growing season in most years.
Seasonally flooded: Surface water present for extended periods, especially early in the growing season, but usually absent by end of season.
Saturated: Substrate saturated to surface during growing season, but surface water seldom present.
Temporarily flooded: Surface water present for brief periods during growing season, but [illegible]

Excavated ditch or basin: Lies within basin or channel excavated by man.
Impounded: Created or modified by barrier or dam which purposefully or unintentionally obstructs water outflow.
Diked: Created or modified by man-made barrier or dike designed to obstruct the inflow of water.
Farmed: Soil surface has been mechanically or physically altered for crop production, but hydrophytes will reestablish if farming discontinued.
Grazed: Vegetation grazed by domestic stock.
Partly Drained: Water level has been artificially lowered, but soil moisture sufficient to support hydrophytes.
Riparian: Of, on, or pertaining to the bank of a natural watercourse.
Deepwater Habitat: Open water area with a mean annual water depth > 6.6 feet.
Drumlin and Seasonal Wetlands, Prairie Potholes, and Vegetated Flats: See 1987 COE Wetland Delineation Manual, Section G - Problem Areas.

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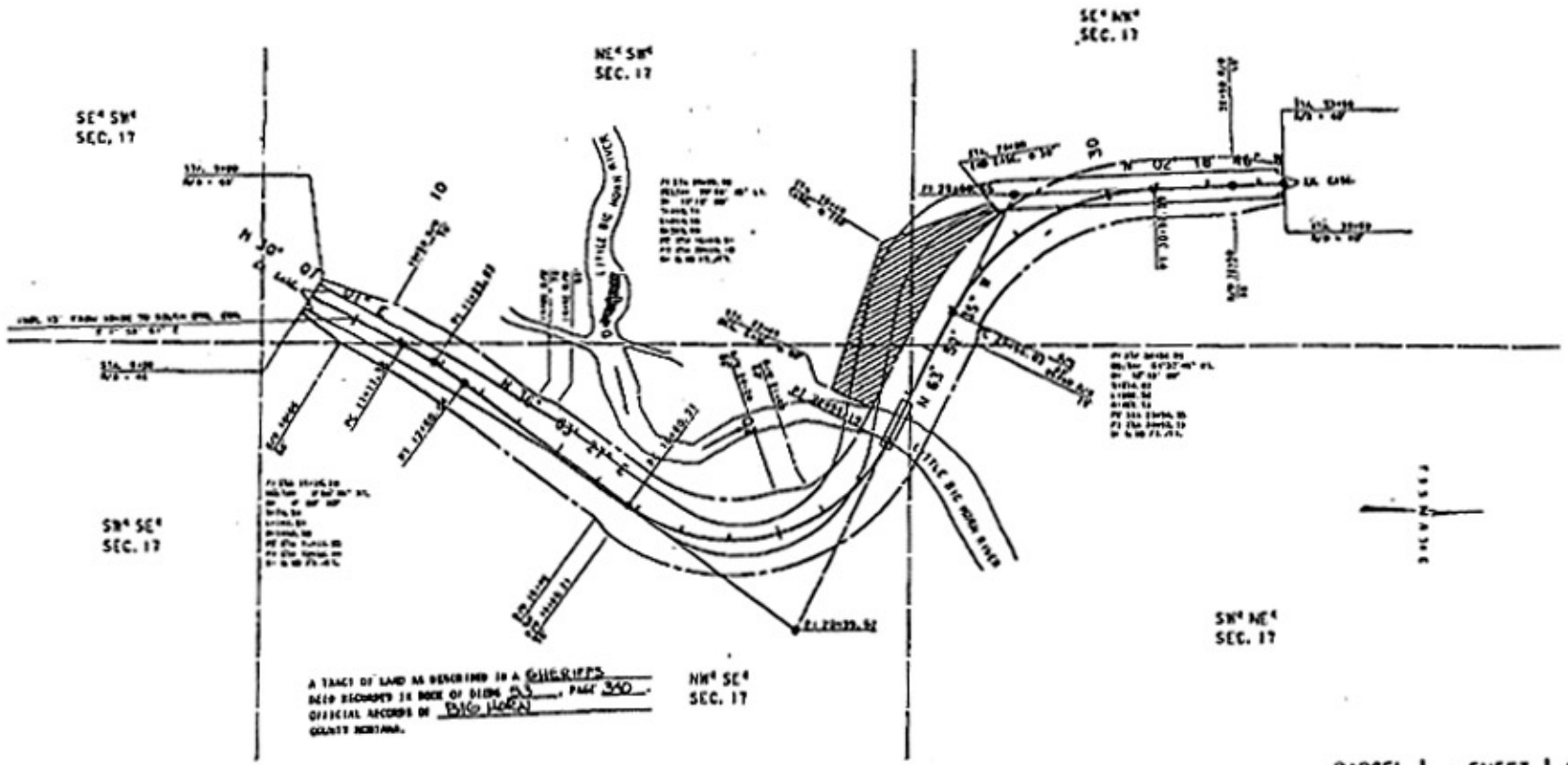
STATE	PROJECT NUMBER	
MONTANA	BR 3002(10)	2

PROJECT NUMBER 3002-010

LITTLE BIGHORN RIVER -
11 MI. S.E. HARDIN

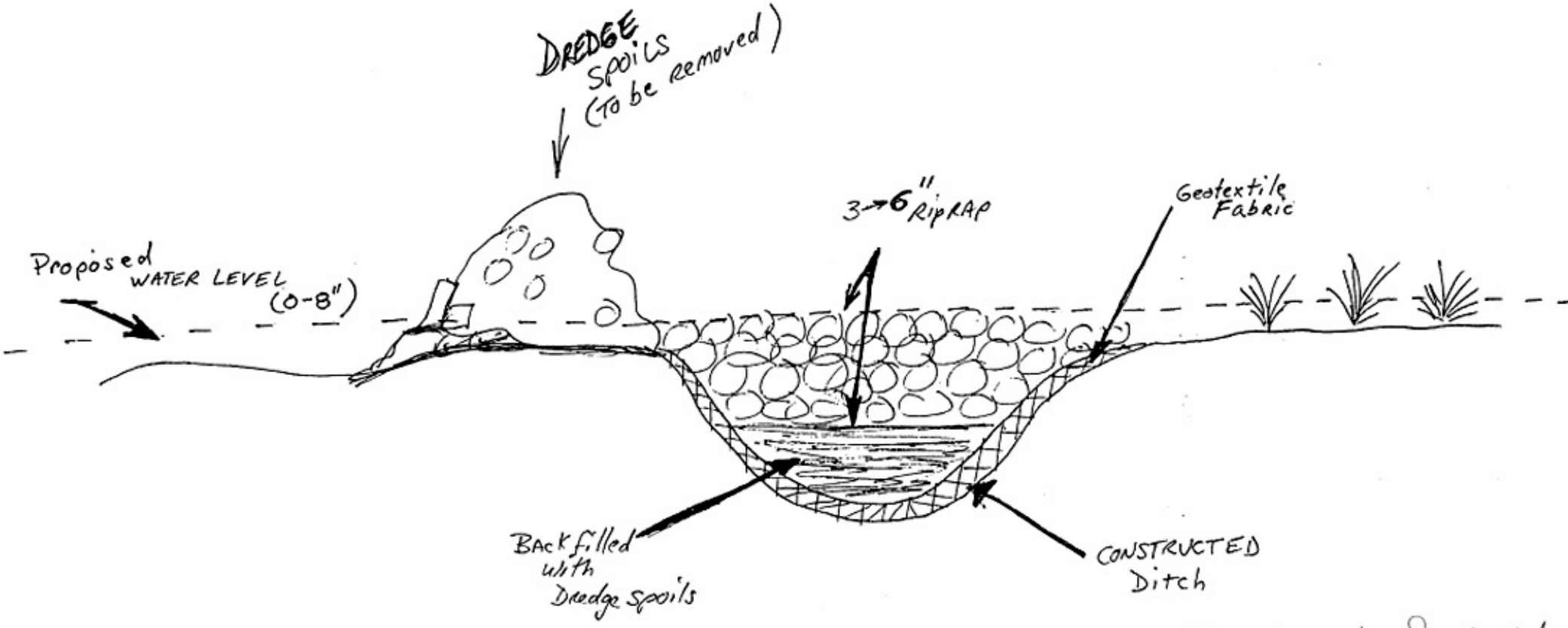
BR 3002(10) P.E.



PARCEL 1 : SHEET 1 OF 1

STATE OF MONTANA
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RIGHT OF WAY DRAWING
BIG HORN COUNTY

LAND & WATER C-13



Wyola-Sunlight
1997
Corrective Actions

Appendix D

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Wyola-Sunlight Ranch Wetland
Wyola, Montana

LAND & WATER

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

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

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

GPS Mapping and Aerial Photo Referencing Procedure

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

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

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

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

Appendix E

REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Wyola-Sunlight Ranch Wetland
Wyola, Montana

LAND & WATER

Photo point A, view East

Photo point B, view North

Photo point C, view North

Photo point D, view East

Photo F, view West

Photo point E, view South

Photo point G, beginning Transect; view North	Photo point H, end transect; view South

2001 Wyola\Sunlight Sheet 2