MONTANA HIGHLINE
FIELD SUMMARY REPORT

I. INTRODUCTION

The purpose of this field trip was to ground truth aerial photography of the study area to facilitate accurate photointerpretation.

A. 1:100,000

Havre NW	Shelby NW
Shelby NE	Cut Bank NE

B. 7.5' Quadrangles with Checksites

(* Indicates Checksites)

Havre NW

Richmond Reservoir NE	Tule Lake
Richmond Reservoir NW	Rabbit Hills
North Chinook Reservoir NE	Telescope Coulee
North Chinook Reservoir NW	Reservoir Coulee
Lake Thibadeau NE	Havre NE
Creedman Coulee East	Havre NW
Creedman Coulee West	Quigley Coulee
Wild Horse Lake East	Kiehns Coulee
Richmond Reservoir	Zurich
Richmond Reservoir SW	Chinook*
North Chinook Reservoir	Lohman SE
Mclaren Reservoir	Lohman*
Lake Thibadeau	Havre SE
Lake Thibadeau SW	Havre*
Hilldale Colony	Herron Park
Cottonwood	Fresno Dam

Shelby NE

Wild Horse Lake West	Saddle Butte
Simpson	Dry Lake
Lost River NE	Gilford NE*
Lost River	Gilford NW*
Gold Stone	Rudyard NE
Laird Lake	Rudyard NW
Bobcat Coulee NE	Chester NE
Laird School	Chester NW
St. Johns	Kremlin
Ninemile Coulee East*	Sage Lake
Ninemile Coulee West	Gilford
McKinnsey Reservoir East	Hingham
McKinnsey Reservoir West*	Rudyard
Goldstone SW	Inverness
Bobcat Coulee SE	Joplin
Vaver Reservoir	Chester

Shelby NW

Bingham Lake
Hawley Hill
Whitlash
Fey Lakes
West Butte*
Beaupre Coulee*
Willshaw Flats
Sunburst
Mt. Lebanon
Haystack Butte
Grassy Butte
Cameron Lake*
Fivemile Coulee East
Fivemile Coulee West
Ferdig
Kevin North
Lakey Ranch
Blair Ranch
Berkholder Reservoir
Hawthorne School
Johannson Coulee
Antelope Coulee NW
Oilmont
Kevin South*
Tiber
North Lothair School
McCarters Lake SE
McCarters Lake
Antelope Coulee SE
Antelope Coulee SW
Shelby
Virdon

Cut Bank NE

Hillside Colony*
Fitzpatrick Lake
Headlight Butte NE
Headlight Butte NW
Love Rock
Landslide Butte
Del Bonita
Bushnell Hill
Mountain View School
Glacier Colony
Headlight Butte
Dead Indian Spring
Rocky Butte
Buffalo Lake
Rimrock Ranch
Nightshoot Coulee
Aloe*
Ethridge NW
Cut Bank
Gunsight
Sundance
Fort Piegan
Rimrock Butte
Sharp Lake
Ethridge*
Boru Spring
Cut Bank SE
Squan Butte
Mission Lake East
Mission Lake West
Kipp Lake
Blackfoot

C. Field Members

W. Pearson - U.S. Fish and Wildlife Service
D. Cribbs - Geonex Martel, Inc.
G. Pipkin - Geonex Martel, Inc.

D. Field Dates

June 22-26, 1990

E. Aerial Photography

Primary Source Data
Type: NASA Color Infra-Red High Altitude
Scale: 1:65,000

Havre NW; 05/05/89 Shelby NE; 05/05/89, 07/06/89
Shelby NW; 05/05/89 Cut Bank NE; 07/06/89

Secondary Source Data (Used to replace sections of NASA photography that were reduced by cloud coverage.)
Type: NHAP Color Infra-Red High Altitude
Scale: 1:65,000

Shelby NE; 08/10/84, 08/12/84, 08/22/84, 09/11/87
Cut Bank NE; 08/17/84

F. Collateral Data

Meetings were held with the personnel at the S.C.S. Office in Toole County and Blaine County and with J. Stutzman of the U.S. Fish and Wildlife Service at Bowdoin National Wildlife Refuge to gain supplementary information concerning water conditions, soil types, and land use practices.

Bailey, R.G., 1978. Description of The Ecoregions of The United States. United States Department of Agriculture, Forest Service.

Cowardin, L.M., V. CArter, F.C. Golet, and E.T. LaRue, 1979. Classification of Wetlands and Deepwater Habitats of The United States. United States Department of Interior, Fish and Wildlife Service, FWS/PBS - 79/81.

Wetland Plants of the State of Montana, 1986. U.S. Department of the Interior, Fish and Wildlife Service.

Hydric Soils of the State Montana, 1985. U.S. Department of Agriculture, Soil Conservation Service.

Soil Survey of Glacier County Area and Part of Pondera County, Montana, 1972. U.S. Department of Agriculture, Soil Conservation Service.

Soil Survey of Blaine County and Part of Phillips County, Montana, 1976. U.S. Department of Agriculture, Soil Conservation Service.

7.5 Minute and 1:250,000 Scale U.S.G.S. Topographic Maps.

II. OVERVIEW

A. Physical Geography

According to Bailey, Description of the Ecoregions of the United States (1980), the Montana Highline area is described as the Great Plains-Shortgrass Prairie Province. This region is characterized by rolling plains and tablelands of moderate relief. They are in a broad belt that slopes gradually eastward down from an altitude of 5,500 feet (1,520 m.) near the foot of the Rocky Mountains to 2,500 feet (760 m.) in the Central States. The plains are notably flat, but there are occasional valleys, canyons, and buttes.

B. Climate

The climate is a semiarid continental regime in which maximum rainfall comes in summer, but the total supply of moisture is low. Ninety-five percent (95%) of basin collected run-off comes from the spring snowmelt. Evaporation usually exceeds precipitation. The average annual temperature is 45°F (8°C) throughout most of the region. Winters are cold and dry; the summers warm to hot. The frost-free season is usually fewer than one-hundred (100) days and precipitation is approximately ten (10) inches (250 m.).

C. Vegetation

Steppe, sometimes called shortgrass prairie, is a formation class of short grasses usually bunched and sparsely distributed, and is characteristic of this province. Scattered shrubs and trees occasionally appear in the steppe, and exist as all gradations of cover into semidesert and woodland formations. Since ground cover is scarce, much soil is exposed. Many species of grasses and herbs grow in this province.

D. Soils

In this climate regime, the dominant pedogenic process is calcification; salinization is dominant in poorly drained sites. Soils contain a large excess of precipitated calcium carbonate and are rich in bases. Molisols are typical. Humus content is small because vegetation is sparse.

III. BIOLOGICAL CHARACTERISTICS OF WETLAND HABITATS

A. Marine: None represented.

B. Estuarine: None represented.

C. Riverine

The major drainage basins within the study area are Cut Bank Creek and Milk River, these perennials are classified R3UBH, and R2UBH respectively.

Intermittent streams are classified as R4SBA, R4SBC, or occasionally R4SBF, except where vegetated. The excavation modifier is rarely used and limited to irrigation ditches as R4SBFx.

Riverine bars are classified as R2USA, and R2USC.

D. Lacustrine

Impounded and natural basin lakes are present in this study area. They are characterized as L2ABHh and L2ABH respectively with marestail (*Hippuris vulgaris*), or yellow water buttercup (*Ranunculus flabellaris*) present. These two species of aquatic plants do well in the shallow basins that are common to this area.

Dry alkaline lake beds exhibiting Mexican summer-cypress (*Kochia scoparia*) are also prevalent, they are classified as L2USA and L2LSC.

E. Palustrine

The majority of wetlands in the study area are palustrine. They are located in prairie pothole basins, river floodplains, and some coulee drainages. Many of these palustrine areas have been disturbed by man, drained or tilled in order to use the areas for agriculture.

Emergents and aquatic beds were the dominant covertypes seen. Field check sites were documented where problems existed; i.e., wetland areas that were not recognizable on the photo. Vegetation observed in these wetland habitats were grouped according to system and water regime. The following plant types were identified.

Palustrine Temporary Emergents:

Hordeum jubatum, foxtail barley
Agropyron smithii, western wheat
Juncus spp., rush
Rumex spp., dock
Equisetum spp., horsetail
Eleocharis coloradoensis, dwarf spikerush
Phleum pratense, timothy
Poa pratensis, Kentucky bluegrass
Muhlenbergia richardsonsi, Mat muhly
Puccineliia nuttalliana, Nuttall's alkali grass

Palustrine Seasonal Emergents:

Polygonum coccineum, marsh smartweed
Beckmania syzigachne, American sloughgrass
Eleocharis spp., spikerush

Palustrine Semi-permanent Emergents:

Typha spp., cattail
Scirpus validus, softstem bulrush
Scirpus americanus, common threesquare

Palustrine Semi-permanent Aquatic Bed:

Hippuris vulgaris, marestail
Ranunculus flabellaris, yellow water buttercup

Palustrine Temporary Scrub-shrub:

Salix spp., willow
Rosa spp., rose
Ribes spp., currant

Palustrine Seasonal Scrub-shrub:

Salix spp., willow
Populus trichocarpa, black cottonwood

Palustrine Temporary Forested:

Populus trichocarpa, black cottonwood

Salt flats were also noted in the study area. These were sparsely vegetated with inland saltgrass (*Distichlis spicata*) and slender glasswort (*Salicornia europaea*). The systematics of these largely unconsolidated areas will be PUSA.

IV. IMAGERY, DELINEATIONS, FIELD CHECKING

The NASA and NHAP Color Infra-Red Emulsion is of high quality and resolution is excellent. The majority of the Havre NW and Shelby NE imagery was flown in early May to reflect optimum water conditions. Due to various technical difficulties, most of the imagery for Shelby NW and Cut Bank NE was not flown until early July. The early spring photography shows the basins and drainages with high water, while the July imagery reflects dryer than normal conditions.

Ground truthing revealed that wetland conditions were near normal for mid-June with a majority of the basins vegetated. This is consistent with prairie pothole dynamics; high water in spring, with vegetation taking over in the latter part of the growing season. There was an overall trend of increased rainfall and wetter conditions in Cut Bank NE and Shelby NW, while Shelby NE and Havre NW exhibited the normal average dry climatic conditions. Even though some dry field conditions were encountered, temporary and seasonal indicators were located and identification was successful.

The photo signatures generally correlated well with the wetlands observed. Some of the May 1989 imagery exhibits flooded conditions. Great discipline will be necessary for the extraction of the actual basins from these signatures. Conversely, the June 1989 (dry) imagery presents temporary emergent signatures which are barely discernable. Alternative photography will be pursued as collateral data for these dry and indistinguishable signatures. Soil surveys (when available) and U.S.G.S. topographic maps will also be used extensively in all aspects of delineation. Overall, the consistency of tones and breaks in the imagery will promote accurate photographic interpretation.

Wetland identification will be accomplished using <u>Classification of Wetlands and Deepwater Habitats of the United States</u> (Cowardin et. al., 1979). Wetlands will be delineated on the photograph using the National Wetland Inventory Mapping Conventions. Emergent and aquatic bed classes will be the most numerous, with temporary, seasonal, and semi-permanent water regimes most often used.

VI. SUMMARY

The Montana Highline study area is typical of the High Plains Glaciated Prairie Pothole Region. The majority of run-off that collects in these pothole basins and drainages is from the spring snowmelt. The amount of precipitation varies annually, but the net evapotranspiration deficit remains fairly constant. Annual precipitation, topography, and soils are some of the main environmental factors which will determine how long water will remain in these pothole basins. this variation in water permanence determines the structure of hydrophytic communities and the water regime classification.

Two dates of imagery were flown in the study area. The May 1989 imagery is very "wet", flooding over several basins, while the June 1989 photography is exceptionally "dry". Great discipline will be instilled in the delineation of the June 1989 imagery. Particularly the northwest sections which appear to be the driest.

Overall, the imagery is of good quality allowing sufficient detail in delineations. Attention to U.S.G.S. topographic maps, soil surveys, and field checksites are essential aspects for completion of this project.