NATIONAL WETLANDS INVENTORY

Map Report for the Montana Highline for the 1:100,000 Map Units of: Havre NW; Shelby NE,NW; and Cut Bank NE

U.S. Fish and Wildlife Service
Denver, Colorado
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I. INTRODUCTION

The United States Fish and Wildlife Service's National Wetlands Inventory (NWI) is producing maps showing the location and classification of wetlands and deepwater habitats of the United States. Classification of Wetlands and Deepwater Habitats of the United States by Cowardin et al. (1979) is the document used by the NWI to define and classify wetlands. Photo interpretation conventions, hydric soils lists and wetland plant lists are also used to implement the Cowardin classification system.

The purpose of this map report is to: (1) provide information on the production of NWI maps, including narrative on imagery and interpretation; (2) provide a descriptive crosswalk from NWI wetland codes on the map to common terminology and to representative plant species found on specific wetland sites; and (3) describe local geography, climate, and wetland communities.

II. FIELD RECONNAISSANCE

Field reconnaissance is a necessary procedure in order to accurately interpret aerial photography. Photographic signatures are correlated to the wetland habitat in the field. Collateral information including vegetative communities, soil types and topographic setting are further evaluated to aid in the photointerpretation process. This information is evaluated for seasonality and conditions existing at the time of photography and at ground truthing.

Project Area

The Montana Highline study area is located in the Great Plains-Shortgrass Prairie Province in North Central Montana. Field reconnaissance covered the area of each 1:100,000: Havre NW, Shelby NE, Shelby NW, and Cut Bank NE (Appendix A Locator Map).

Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service
Doug Cribbs	-	Geonex, Inc.
Greg Pipkin	-	Geonex, Inc.

Field Dates

June 22-26, 1990

Aerial Photography

Primary Source Data (98.5%)
Type: NASA Color Infra-Red High Altitude
Scale: 1:65,000

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

Secondary Source Data (1.5%) (Used to replace sections of NASA photography that were reduced by cloud coverage.)
Type: NHAP Color Infra-Red High Altitude
Scale: 1:58,000

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

Percentage Coverage: All 128 USGS quadrangles were covered with the NASA and NHAP photography.

Collateral Data

United States Geological Survey (USGS) Quadrangles
Soil Conservation Service Soil Surveys
Bailey's Description of the Ecoregions of the United States
United States Fish and Wildlife Service Wetland Plant Keys
Water Resources Data Montana
National List of Plant Species That Occur In Wetlands: Northwest (Region IX)
Wetland Plants of the State of Montana
Hydric Soils of the State Of Montana

Additional Information

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

III. PHYSICAL DESCRIPTION OF PROJECT AREA

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.

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.).

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.

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.

IV. DESCRIPTION OF WETLAND HABITATS IN PROJECT AREA

Riverine

The major drainage basins within the study area are Cut Bank Creek and Milk River, these perennials are classified R3UBH, and R2UBG respectively.

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

Riverine bars are classified as R2USA, and R2USC.

Lacustrine

Impounded and natural basin lakes are present in this study area. They are characterized as L2ABFh and L2ABF 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 L2USC.

Palustrine

The majority of wetlands in the study area are palustrine. They are located in prairie pothole basins, river floodplains, and some drainages. Many of these palustrine areas have been drained or tilled for agricultural purposes.

Emergents as PEMA, PEMC, PEMF and aquatic beds as PABF were the dominant covertypes seen with smaller areas of scrub-shrub as PSSA and forested as PFOA. Field check sites were documented where problems existed; i.e., wetland areas that were not readily recognizable on the photography. Vegetation observed in these wetland habitats were grouped according to class and water regime. The following plant species were identified on check sites and represent only a fraction of all wetland plant species occurring in the project area.

Palustrine Temporary Emergents: PEMA
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 richardsonis, mat muhly
Pucinellia nuttalliana, Nuttall's alkali grass

Palustrine Saturated Emergents: PEMB
Eleocharis spp., spikerush

Palustrine Seasonal Emergents: PEMC
Polygonum coccineum, marsh smartweed
Beckmania syzigachne, American sloughgrass
Eleocharis spp., spikerush

Palustrine Semi-permanent Emergents: PEMF
Typha spp., cattail
Scirpus validus, softstem bulrush
Scirpus americanus, common threesquare

Palustrine Semi-permanent Aquatic Bed: PABF
Hippuris vulgaris, marestail
Ranunculus flabellaris, yellow water buttercup

Palustrine Temporary Scrub-shrub: PSSA
Salix spp., willow
Rosa spp., rose
Ribes spp., currant

Palustrine Seasonal Scrub-shrub: PSSC
Salix spp., willow
Populus deltoides, eastern cottonwood

Palustrine Temporary Forested: PFOA
Populus deltoides, eastern cottonwood
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 wetland typing of these largely unconsolidated shore areas will be PUSA and PUSC.

OBSERVED WETLAND VEGETATION TABLE

A. EMERGENT

Agropyron smithii	western wheat
Beckmania syzigachne	American sloughgrass
Distichlis spicata	inland saltgrass
Eleocharis spp.	spikerush
Equisetum spp.	horsetail
Hordeum jubatum	foxtail barley
Juncus spp.	rush
Muhlenbergia richardsonis	mat muhly
Phleum pratense	timothy
Poa pratensis	Kentucky bluegrass
Polygonum coccineum	marsh smartweed
Pucinellia nuttalliana	Nuttall's alkali grass
Rumex spp.	dock
Salicornia europaea	glasswort
Scirpus americanus	common threesquare
Scirpus validus	softstem bulrush
Typha spp.	cattail

B. AQUATIC BED

Hippuris vulgaris	marestail
Ranunculus flabellaris	yellow water buttercup

C. SCRUB-SHRUB

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

D. FORESTED

Populus deltoides	eastern cottonwood
Populus trichocarpa	black cottonwood

Table 1. NWI WETLAND CLASSIFICATION CODES, COWARDIN DESCRIPTION AND COMMON TERMINOLOGY

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
R2UB (G)	Riverine, lower perennial, unconsolidated bottom	Meandering rivers, low gradient	Unconsolidated bottom
R2US (A,C)	Riverine, lower perennial, unconsolidated shore	Mud, sand, or gravel bars	Unconsolidated shore
R3UB (F,H)	Riverine, upper perennial, unconsolidated bottom	Mountain streams, major drainage areas	Unconsolidated bottom
R4SB (A,C,F)	Riverine, intermittent, streambed	Small streams, creeks, or irrigation ditches	Streambed
L2AB (H)	Lacustrine, littoral, aquatic bed	Shallow lake marshes	Ranunculus flabellaris (yellow water buttercup) Hippuris vulgaris (marestail)
L2US (A,C)	Lacustrine, littoral, unconsolidated shore	Dry alkaline lake beds	Unconsolidated shore
PUB (F,G,H)	Palustrine, unconsolidated bottom	Open water	Unconsolidated bottom
PAB (F,G)	Palustrine, aquatic bed	Deep basins, impoundments, excavated tanks, or sewage treatment settling ponds	Ranunculus flabellaris (yellow water buttercup) Hippuris vulgaris (marestail)

Table 1. NWI WETLAND CLASSIFICATION CODES, COWARDIN DESCRIPTION AND COMMON TERMINOLOGY

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PEM (A,B,C,F)	Palustrine, emergent	Basins, depressions, marshes, meadows, springs, seeps, or drainage areas	Agropyron smithii (western wheat) Beckmania syzigachne (American sloughgrass) Distichlis spicata (inland saltgrass) Eleocharis spp. (spikerush) Equisetum spp. (horsetail) Hordeum jubatum (foxtail barley) Juncus spp. (rush) Muhlenbergia richardsonis (mat muhly) Phleum pratense (timothy) Poa pratensis (Kentucky bluegrass) Polygonum coccineum (marsh smartweed) Puccinellia nuttalliana (Nuttall's alkali grass) Rumex spp. (dock) Salicornia europaea (glasswort)

Table 1. NWI WETLAND CLASSIFICATION CODES, COWARDIN DESCRIPTION AND COMMON TERMINOLOGY

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PEM (continued) (A,C,F)			Scirpus americanus (common threesquare) Scirpus validus (softstem bulrush) Typha spp. (cattail)
PSS (A,C)	Palustrine, scrub-shrub	Willow thicket, river banks, or drainage areas	Salix spp. (willow) Rosa spp. (rose) Ribes spp. (currant)
PFO (A)	Palustrine, forested	Cottonwood, river banks, floodplains, or drainage areas	Populus deltoides (eastern cottonwood) Populus trichocarpa (black cottonwood)
PUS (A,C)	Palustrine, unconsolidated shore	Salt flats	Unconsolidated shore

V. WATER REGIME DESCRIPTION

(A) Temporarily Flooded - Surface water present for brief periods during growing season, but water table usually lies well below soil surface. Plants that grow both in uplands and wetlands are characteristic of this water regime.

(B) Saturated - The substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present.

(C) Seasonally Flooded - Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is extremely variable, extending from saturated to a water table well below ground surface.

(F) Semipermanently Flooded - Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land's surface.

(G) Intermittently Exposed - Surface water is present throughout the year except in years of extreme drought.

(H) Permanently Flooded - Water covers the land surface throughout the year in all years.

VI. IMAGERY

The NASA and NHAP Color Infra-Red Emulsion is high quality. The majority of the Havre NW and Shelby NE imagery was flown in early May to reflect optimum water conditions. This photography has excellent resolution. 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 above normal for mid-June with a majority of the basins vegetated. This is consistent with prairie pothole dynamics; open water in spring, with vegetation dominating in the latter part of the growing season. Even though some dry field conditions were encountered, temporary and seasonal indicators were located and identification was successful.

Field reconnaissance provided the following mapping conventions for all the imagery based on seasonal and climatic conditions. These conventions will cover prairie pothole basins, alkali flats, riverine and vegetated linears, oxbows, impoundments, and miscellaneous signatures.

PHOTOGRAPHIC CONVENTIONS FOR BASIN WETLANDS

Basins represent the majority of wetlands in the Montana Highline project. A basin wetland can be described by water regime as temporary, seasonal, or semipermanent. The following guidelines are used to distinguish basin types.

Temporary Water Regimes

Temporary basins usually occur as open water with evidence of plow marks through the basin in agricultural areas. On the May imagery, these tones are light blue with a darker frayed edge. Occasionally, particularly on the June imagery, temporary basins are not evident as open water. They appear as vegetated basins containing foxtail, western wheatgrass, timothy, Kentucky bluegrass, mat muhly, and Nuttall's alkali grass. The photographic tone is bluish-gray and sometimes pinkish-gray. Temporaries which are retilled may be lacking vegetation and appear as whitish-gray water spots. These lighter tones are difficult to distinguish from upland areas.

Alkali saltflats are characterized by temporary flooding of shallow basins in which salts are leeched from the soil through frequent evapotranspiration. Hydrophytic growth is limited to patchy stands of inland saltgrass and slender glasswort. The exposed soil in these basins show as bright white tones on the imagery, but should not be confused with the gray-white upland tones. These areas are classified as PUSA. Basins larger than twenty (20) acres (lacustrine), usually labelled as lake bed on topographic maps, are labelled L2USA.

Saturated Water Regimes

Saturated basins or seeps usually appear on the imagery as reddish-purple swales of spikerush. The surrounding topography usually includes moderate sloping relief and limited drainage. Occurrence is rare and limited to the western portion of the work area.

Seasonal Water Regimes

Basin seasonals usually appear on the imagery as open water that show no evidence of cattail or bulrush. Seasonal tones are generally dark blue with reddish-purple fringes which in most cases represent American sloughgrass or smartweed. Pinkish-purple tones sometimes noted within these basins are probably spikerush. High water conditions exhibited in the eastern areas of Shelby NE and southeastern Shelby NW (May imagery) cause PEMC and PEMA signatures to reverse. Seasonal basins tend to be lighter tones of blue, while temporary signatures show darker mixes of purple tones. In the northwest sections of Shelby NW and Cut Bank NE (June imagery), the seasonal signatures may be reddish-purple if the basins lack standing water. Seasonals are distinguished from temporaries by tillage marks which circumvent the seasonal basins.

Semipermanent Water Regimes

Semipermanent wetlands are found in impoundments and oxbows and are classified as PEMF, PABF, and L2ABF. Each classification is separately defined as follows:

PEMF oxbows contain cattail and bulrush in the Milk River floodplain. The cattail is easily recognized as cloning (grainy-white popcorn appearance). The bulrush is not as easily recognized. It appears as an almost indistinguishable grainy gray to charcoal colored hue overset on the open water.

Most impounded wetlands have a strong open water signature. These areas are labeled PABFh and L2ABF and may occasionally have a periphery of cattail, bulrush, or common threesquare. Also, they may exhibit marestail or yellow water buttercup as a speckled pink signature within the impoundment.

L2ABF basins contain yellow water buttercup, pondweed and open water. These basins are also shown on the topographic maps as permanent water.

CONVENTIONS FOR LINEAR WETLANDS

The majority of coulees do not exhibit wetland characteristics and will not be delineated. These are typified by a bright-red signature. Care must be taken not to delineate linears that are nothing more than grassy waterways. These typically occur in agricultural areas. Linear wetlands will be delineated if the channel is noticeably entrenched and there is evidence of open water and/or emergents. Most linears will be PEMC and occasionally PEMA or PEMF in some areas. The larger coulees are good drainage ways that typically promote spikerush and willow. Spikerush dominates these areas and exhibits a dark blue-purple tone, while the surrounding willows promote a bright pink tone. Care must be taken not to over delineate these areas by closely following the contours on topographic maps.

Linear intermittent riverine systems will be classified as R4SBA thru F depending upon their signature and hydrologic situation.

The two major drainage ways in the work area are the Milk River and Cut Bank Creek. The Milk River is classified as a lower perennial riverine system and Cut Bank Creek is an upper perennial. Riverine bars are classified as R2/R3USA and C.

Forested linears are found to contain willows and/or cottonwood and are labeled PFOA or PSSA.

Roadside ditches are delineated as either PEMAx/Cx/Fx. Water regime differences denote the same vegetation characteristics as basin wetlands.

MISCELLANEOUS

This section addresses obscure conventions that are uncommon throughout the work area.

Some light, mottled, bluish-gray "shotgun pattern" tones not directly associated with wetlands are upland. They are delineated as PEMA's if they are within the basin contours and appear to be wet.

Care must be taken not to delineate clumps of dark blue tones in coulees which are probably buckbrush or fireweed. At first glance these look like a dark open water tone.

Open water excavated ponds are delineated as either PUBFx/Gx/Hx.

Sewage treatment settling ponds will be classified as PABGx or L2ABGx.

A "d" modifier is used on all wetlands that are either ditched or partly drained. Drainage ditches are delineated if they are either significant length (1+ miles) or well channelized with major impacts.

All excavation ponds or dugouts with aquatic bed are delineated as PABFx.

VII. MAP PREPARATION

Wetland delineation and classification is in accordance with Cowardin et al (1979). Further wetland mapping guidance is provided by NWI photographic and cartographic conventions in concert with National consistency. Delineations are produced through stereoscopic interpretation of 1:65,000 and 1:58,000 scale color infrared photography. NASA photography was taken during the spring and fall of 1989 and the NHAP was acquired during the summer of 1984 and fall of 1987.

Field checks of areas found within Havre NW, Shelby NE, Shelby NW, and Cut Bank NE photography were made prior to the actual delineation of wetlands. Field check sites were selected to clarify varying signatures found on the photography. These photographic signatures were then identified in the field using vegetation types and soil types, as well as additional input from field personnel.

Collateral data included USGS topographic maps, SCS soil surveys, USGS water resources data, vegetation, climate, and ecoregional information.

The user of the map is cautioned that, due to the limitation of mapping primarily through aerial photointerpretation, a small percentage of wetlands may be unidentified. Since the photography was taken during a particular time and season, there may be discrepancies between the maps and current field conditions. Changes in landscape which occurred after the photography was taken would result in such discrepancies.

Aerial photointerpretation and drafting were completed by Geonex, Inc., St. Petersburg, Florida with quality control conducted by the FWS.

VIII. SPECIAL MAPPING PROBLEMS

The photo signatures generally correlated well with the wetlands observed. Some of the May 1989 imagery exhibits flooded conditions. Discipline was 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 was used as collateral data for these dry and indistinguishable signatures. Soil surveys (when available) and USGS topographic maps were used extensively in all aspects of delineation. Overall, the consistency of tones and breaks in the imagery promote accurate photographic interpretation.

IX. MAP ACQUISITION

To discuss any questions concerning these maps, please contact:

Regional Wetland Coordinator
U.S. Fish and Wildlife Service - Region 6
Denver Federal Center
P. O. Box 25486
Denver, CO 80225

To order maps call 1-800-USA-MAPS.

Maps are identified by the name of the corresponding USGS 1:24,000 scale topographic quadrangle name. Topographic map indices are available from the USGS.

X. LITERATURE CITED

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

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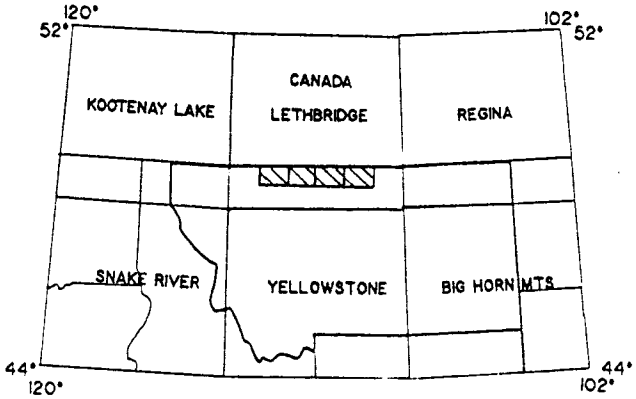
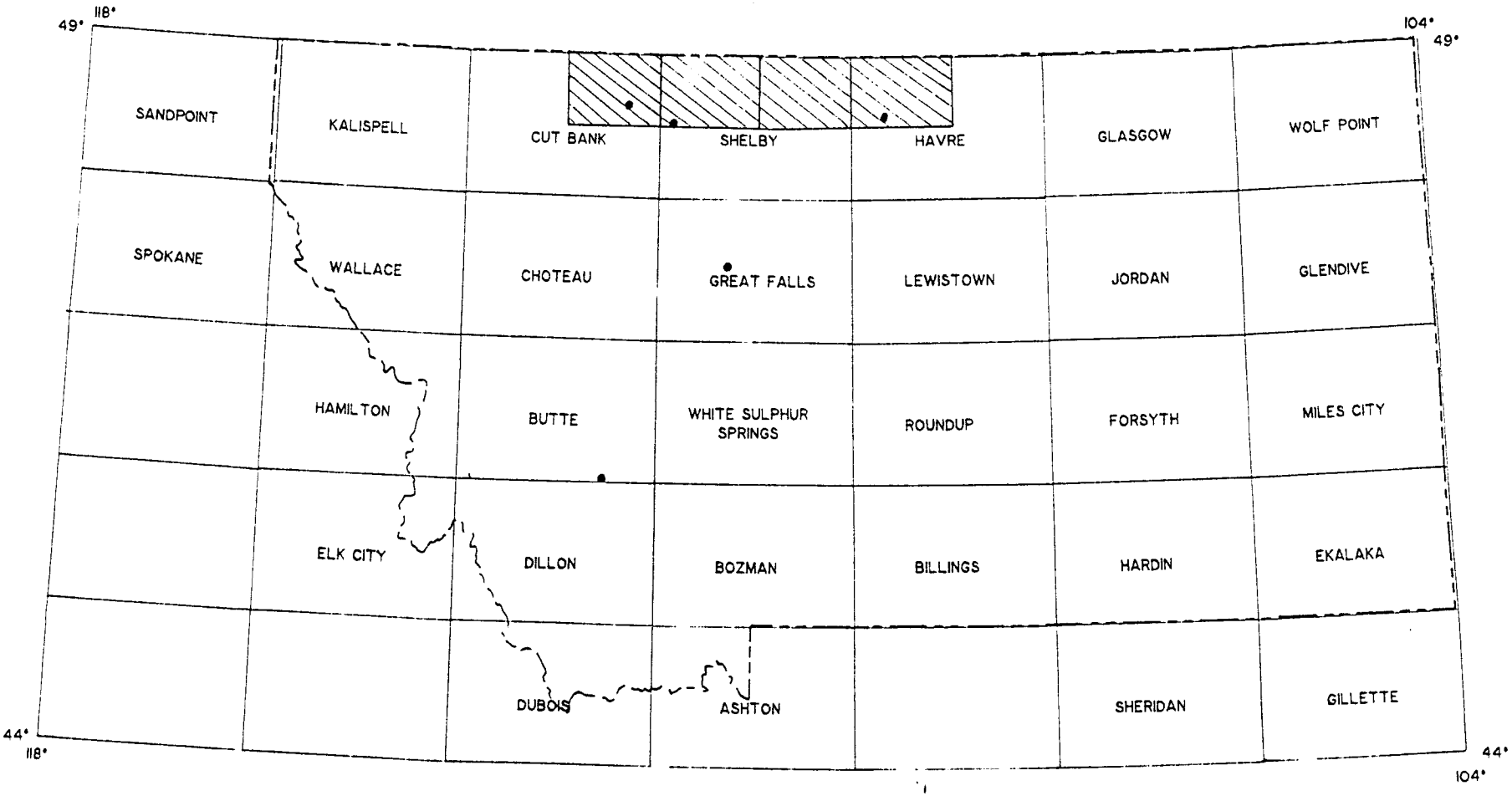
Hydric Soils of the State Montana, 1985. United States Department of Agriculture, Soil Conservation Service.

Soil Survey of Glacier County Area and Part of Pondera County, Montana, 1972. United States 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.

Water Resources Data Montana, 1987. United States Department of the Interior, Geological Survey. Prepared in cooperation with the State of Montana and with other agencies.

7.5 Minute and 1:250,000 Scale USGS Topographic Maps.

APPENDIX A
LOCATOR MAP

MONTANA HIGHLINE PROJECT AREA