

National Wetlands Inventory

**Map Report for Missouri River - Nebraska/Kansas PI
for the 1:100,000 Map Units of:**

**Sioux City SE, Sioux City SW, Fremont NE, Fremont NW,
Omaha SW, Nebraska City NW, Nebraska City SW, Lincoln NE, Lincoln
SE, Kansas City NW, Kansas City SW, Kansas City NE, Kansas City SE,
Lawrence NE, and Lawrence NW**

DRAFT

**U.S. Fish and Wildlife Service
Denver, Colorado
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TABLE OF CONTENTS

I. Introduction 1

II. Field Reconnaissance 1

III. Physical Description of Project Area 3

IV. Description of Wetland Habitats in the Project Area 4

V. Water Regime Description 5

VI. Imagery and Conventions 7

VII. Map Preparation 7

VIII. Special Mapping Problems 7

IX. Map Acquisition 8

X. Literature Cited 9

Appendix A Locator Map 11

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. Photointerpretation 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 Missouri River Nebraska/Kansas PI Project extends west of the Missouri River from Sioux City, Iowa to the north, and Ottawa, Kansas to the south. Field reconnaissance covered each of the following 1:100,000's: Sioux City SE, Sioux City SW, Fremont NE, Fremont NW, Omaha SW, Nebraska City NW, Nebraska City SW, Lincoln NE, Lincoln SE, Kansas City NW, Kansas City SW, Kansas City NE, Kansas City SE, Lawrence NE, Lawrence NW. (Appendix A Locator Map).

Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service
Chuck Elliott	-	U.S. Fish and Wildlife Service
Greg Pipkin	-	Geonex, Inc.
Lynn Ashby	-	Geonex, Inc.
Eric Seeger	-	Geonex, Inc.
Phillip Still	-	Geonex, Inc.
Mike Gilbert	-	Army Corp of Engineers (10/9/90 only)
Don Becker	-	Army Corp of Engineers (10/9/90 only)

Field Dates

October 8 - 21, 1990

Aerial Photography

Type: NHAP Color Infra-Red High Altitude

Scale: 1:58,000

Photo Dates

Sioux City SE; 11/01/84, 05/25/83
Sioux City SW; 10/01/84, 05/23/84, 04/19/84, 04/18/84
Fremont NE; 05/14/81, 10/26/81, 09/19/81, 09/20/81, 10/23/81, 11/06/81
Fremont NW; 10/26/81, 11/06/81, 10/23/81, 05/24/81
Omaha SW; 04/23/82
Nebraska City NW; 04/23/82
Nebraska City SW; 04/23/82, 04/17/82, 05/07/82
Lincoln SE; 05/14/81, 08/01/82, 09/18/81, 09/20/81, 09/19/81, 10/26/81
Lincoln NE; 11/06/81, 05/14/81, 09/20/81, 09/19/81, 10/26/81
Kansas City NW; 06/29/85, 09/07/85, 06/19/85, 06/28/85
Kansas City SW; 06/19/85, 06/28/85, 09/07/85, 06/29/85
Kansas City SE; 06/13/86, 06/29/85, 09/07/85
Kansas City NE; 06/13/86, 09/07/85
Lawrence NE; 06/28/85, 06/13/85, 06/29/85
Lawrence NW; 06/19/85, 06/28/85, 06/12/86, 06/29/85

24 quadrangles of dark photography were replaced with lighter emulsion photography.

Percentage Coverage: All 341 and 4 partial quadrangles were covered with NHAP photography.

Collateral Data

United States Geological Survey (USGS) Quadrangles

Soil Conservation Service Soil Surveys

United States Fish and Wildlife Service Wetland Plant Lists of Nebraska and Kansas (1986)

Water Resources Data Kansas (1981)

Water Resources Data Nebraska (1982)

Soil Conservation Service Hydric Soils of the State of Nebraska (1985)

Soil Conservation Service Hydric Soils of the State of Kansas (1985)

Soil Conservation Service Hydric Soils of the United States (1987)

Saline Maps prepared by Nebraska Games and Parks Commission of Lancaster County with Salt Creek and Todd Valley

Bailey's Description of Ecoregions of the United States

Additional Information

Meetings were held with Mike Gilbert and Don Becker from the Army Corps of Engineers and Dick Gerstin of the Nebraska Games and Parks Commission. Mike Gilbert and Don Becker were very informative on the wetland and flooding conditions on the Missouri River. The Missouri River can be divided into three different sections for classification, Natural Riverine, Channelized Riverine and Lacustrine. During the 1930's, stream flow stabilization structures such as wing dams and impoundment reservoirs were constructed primarily for flood control, hydroelectric power, land reclamation and the development of a navigable channel. Due to this control and channelization of the river, annual flooding is now reduced to once every 10-15 years. With this in mind, the majority of the historic floodplain is no longer considered as wetland.

Dick Gerstin discussed the Saline wetlands of Lancaster County around Lincoln, Nebraska. The Dakota Sandstone Formation running through eastern Nebraska is known for accumulated salts. Saline areas are found where there is outcropping of sandstone formations. There are three types of hydrology associated with saline wetlands, 1) surface water runoff, 2) floods, and 3) spring seeps associated with the ground water aquifer. Since salts are key to saline wetlands, water control structures are used to control salt levels. Salt levels can be kept down by keeping water on top of the substrate and built up by draining the wetland. Therefore, salts percolate upward through the substrate as the area dries out. This wet/dry cycle is helpful in supporting over 230 bird species on these wetlands.

III. PHYSICAL DESCRIPTION OF PROJECT AREA

Geography

According to Robert Bailey this area is described as a Tall Grass Prairie Province. It is characterized by flat and rolling plains with relief of less than 300 feet. Most of the lands, excluding those south of the Missouri River, are young glacial drifts and dissected till plains. This flat to rolling hill land has well developed drainage systems.

Climate

Average annual temperatures range from 40°F (4°C) in the north to 65°F (18°C) in the south. Annual precipitation in this province is about 40 inches (1,000 mm.). Drought periods are less frequent and less severe near the forest than in the more westerly areas.

Vegetation

Most of this region includes the tall grass and mixed grasslands. Because of the generally favorable conditions of the climate and soil, most of this province is cultivated and little original vegetation remains.

Soils

Soils in the region are primarily Mollisols. There are also areas of Entisols and a small area of Vertisols. Areas of saline soils are also found in Lancaster County in Nebraska.

IV. DESCRIPTION OF WETLAND HABITATS IN PROJECT AREA

Riverine System

The largest major drainage basin within the study area is the Missouri River Basin which is classified as R2UBH. With the introduction of wing dams in the 1930's, channelization has resulted in man's control of the river. Because of this, the frequency of flooding has been reduced to once every 10 - 15 years. The historic bottomland floodplain is no longer considered wetland because of this, as evidenced by the old stands of cottonwoods, sycamores, box elders, and hackberry. The only area of floodplain still considered as wetland is the first bench where the dominant species are peach leaf willow, sand bar willow, reed canary grass, equisetum, and phragmites.

Other major rivers classified as R2UBH are the Elkhorn, Big Nemaha, and the Big Blue. Riverine bars within these and other rivers were classified as R2USC. R4SBA/C/F is used for tributaries of these rivers and intermittent streams, with the excavation modifier being used for irrigation ditches and diverted streams. The excavation modifier is used extensively in this area due to intense agriculture.

Lacustrine System

Most lacustrine habitats in this area are impounded with some natural basins present. Impoundments are represented by L1UBHh and basins will be the same without the "h" modifier. L1UBHx is used for all excavated lakes and pits over six feet deep.

Palustrine System

The majority of the wetlands in the study area are Palustrine. Dominant covertypes were PEMC, PEMF, and PEMA, with smaller areas of PABF (aquatic beds) also being present. Also found other than emergents and aquatic bed were areas of scrub-shrub as PSSA and forested areas as PFOA.

PUBF/G/H was used to label impoundments of varying sizes, with unconsolidated bottoms. PUSA (unconsolidated shore) was used for sandy or saline areas. PUSCh was used in the sandy back areas of impoundments. Again the "h" modifier was used for impoundments and the "x" modifier was used for excavated lakes or basins.

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 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 the 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 land surface throughout the year in all years.

OBSERVED WETLAND VEGETATION

A. EMERGENT

<u>Batis maritima</u>	saltwort
<u>Carex</u> sp.	sedges
<u>Cyperus</u> sp.	galingale
<u>Distichlis spicata</u> sp.	saltgrass
<u>Eleocharis</u> sp.	spikerush
<u>Equisetum</u> sp.	horsetail
<u>Hordeum jubatum</u>	foxtail barley
<u>Iva frutescens</u>	marsh elder
<u>Persicaria polygonum</u>	smartweed
<u>Phalaris arundinacea</u>	reed canary grass
<u>Phragmites</u>	common reed
<u>Scirpus</u> sp.	bulrush
<u>Spartina pectina</u>	prairie cordgrass
<u>Suaeda calceoliformis</u>	sea blight
<u>Typha</u> sp.	cattail
<u>Verbena hastata</u>	blue vervain

B. SCRUB-SHRUB

<u>Acer rebrum</u>	red maple
<u>Acer saccharinum</u>	silver maple
<u>Cephalanthus occidentalis</u>	button bush
<u>Morus rubra</u>	mulberry
<u>Salix amygdaloides</u>	peach leaf willow
<u>Salix exigua</u>	sand bar willow
<u>Salix nigra</u>	black willow

C. FORESTED

<u>Acer rebrum</u>	red maple
<u>Acer saccharinum</u>	silver maple
<u>Carya laciniosa</u>	shell bark hickory
<u>Celtis occidentalis</u>	hackberry
<u>Cornus alternifolia</u>	dogwood
<u>Fraxinus pennsylvanica</u>	green ash
<u>Plantanus occidentalis</u>	sycamore
<u>Populus deltoides</u>	eastern cottonwood
<u>Quercus bicolor</u>	swamp white oak
<u>Quercus palustris</u>	pin oak
<u>Salix babylonica</u>	weeping willow
<u>Ulmus americana</u>	American elm

VI. IMAGERY

Overall the imagery for the work area is good. Dates of photography must be taken into account since some of the photography was taken in May and June, and other photos were taken in late fall. For instance the May photography was taken during high water periods and so caution must be taken not to over delineate on these photos. Also some photo's in Fremont NW, Fremont NE, Lincoln SE, and Lincoln NE had to be replaced because of dark emulsion. Soil surveys will be followed closely because of different dates of photography.

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 1:58,000 scale color infrared photography. NHAP photography was taken in 1981, 1982, 1984, and 1985.

Field check sites were selected to clarify varying signatures found on the photography. These 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, climate, vegetative, 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 have gone unidentified. Since the photography was taken during a particular time and season, there may be discrepancies between the map 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.

VIII. SPECIAL MAPPING PROBLEMS

Special care must be taken on the May 1984 photography due to high water conditions in basin type wetlands. Most dark signatures with crisp edges will be mapped as PEMA. Areas with frayed edges will be left as U. Adjacent photography taken during dryer conditions will be used when possible to help avoid mapping any ephemeral water. Leafed out photography present a special challenge for mapping forested floodplains. Soil surveys and topo information will be used closely in these situations where wetland/upland breaks are not easily discernable due to photo signatures.

4

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

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.

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Wetland Plants of the State of Kansas, 1986. United States Department of Interior, Fish and Wildlife Service.

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

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

7.5 Minute and 1:250,000 scale USGS Topographic Maps

Soil Surveys for the following counties:

<u>KANSAS</u>					
Nemaha	Feb.	1982	Franklin	July	1981
Atchison	Feb.	1984	Linn	June	1981
Wyandotte	Feb.	1977	Jackson	Apr.	1979
Doniphan	Sept.	1980	Leavenworth	Feb.	1977
Johnson	Jan.	1979	Crawford	Dec.	1973
Brown	Sept.	1960	Jefferson	Nov.	1977
Douglas	July	1977	Miami	June	1981
Bourbon	Feb.	1981			

NEBRASKA

Wayne	Feb.	1975	Richardson	Nov.	1974
Cedar	Oct.	1985	Arthur	Nov.	1977
Stanton	Jan.	1982	Grant	Nov.	1977
Cass	Mar.	1984	Butler	Feb.	1982
Platte	Sept.	1988	Burt	Oct.	1980
Thurston	Mar.	1972	Colfax	Jan.	1982
Cuming	Dec.	1975	Dixon	June	1978
Custer	July	1982	Jefferson	May	1975
Dakota	Jan.	1976	Lincoln	Aug.	1978
Antelope	Apr.	1978	Nemaha	Dec.	1985
Madison	May	1984	Pierce	Sept.	1976
Gage	May	1964	Boone	Jan.	1972
Dawson	May	1978	Sarpy	Dec.	1975
Hayes	Aug.	1982	Dodge	Feb.	1979
Lancaster	May	1980	Johnson	Sept.	1986
Nance	July	1960	McPherson	June	1969
Pawnee	Feb.	1976	Otoe	Mar.	1982
Seward	June	1974	Saunders	Jan.	1965
Douglas	Dec.	1975	Washington	Sept.	1964

APPENDIX A
LOCATOR MAP

