National Wetlands Inventory

Map Report for

Manhattan SE, Kansas PI

U.S. Fish and Wildlife Service
Denver, Colorado
May, 1993

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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. 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

This Manhattan SE PI study area is a twenty-five (25) quad area located in East Central Kansas, centered around the town of Manhattan, Kansas. It does not contain the area represented by the Fort Riley Military Reservation.

Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service - Denver, Colorado
Cynthia Bohn	-	Geonex, Inc. - St. Petersburg, Florida
Herb Able	-	U.S. Army - Ft. Riley, Missouri
Don Haley	-	U.S. Fish and Wildlife Service - Manhattan, Kansas
Greg Kramos	-	U.S. Fish and Wildlife Service - Manhattan, Kansas

Field Dates

July 29-30, 1992

Aerial Photography

Type:	NHAP Color Infrared High Altitude
Scale:	1:58,000
Dates:	5/25/85, 6/28/85, 6/25/85, 9/18/85
Coverage:	100%

Collateral Data

United States Geological Survey. Twenty-five 7½ minute quadrangles for the entire area.

United States Geological Survey. Water Resources Data - Kansas - Water Year 1990.

Soil Conservation Service. Soil Surveys for the counties of Riley (1975), Geary (1975, 1960), Shawnee (1970), Clay (1984), Pottawatomie (1987), and Jackson (1979).

Soil Conservation Service. List of Hydric Soils for the Kansas counties of Dickinson, Clay, Shawnee, Jackson, Riley, Geary, and Pottawatomie (all dated 3/15/89). Hydric Soils of the United States (1990).

Forest Service. Descriptions of the Ecoregions of the United States. Robert Bailey (1980).

Fish and Wildlife Service. National List of Plant Species That Occur in Wetlands: Kansas (May 1988).

Soil Conservation Service. Midwestern Wetland Flora Field Office. Guide to Plant Species.

Fish and Wildlife Service. Missouri Cooperative Fish and Wildlife Research Unit. Aquatic and Wetland Plants of Missouri. Daniel Combs and Ronald Drobney.

Army Corps of Engineers. Kansas River Bank Stabilization Study. Social and Environmental Inventory. (1980).

Additional Information

Meetings and field work were held with Natural Resource Specialist for Fort Riley Military Reservation, Riley, Kansas to allow adherence to seven quad area previously delineated, and with United States Fish and Wildlife Service field office personnel in Manhattan, Kansas.

III. PHYSICAL DESCRIPTION OF PROJECT AREA

Geography

According to Bailey and the NWI Ecoregions and Land Surface Form Map, the Manhattan SE work area falls entirely within the Bluestem Prairie Section of the Tallgrass Prairie Province. Physiographically, the mapping area is dissected east to west between the West Central Rolling Hills to the north and the Mid-Continent Plains and Escarpment Physiographic Region in the southern half. The land surface forms of the area are characterized primarily by irregular plains with a small section of open hills. Twenty percent to seventy-five percent of gentle slope in uplands. Elevations range from about 900 feet to 1,500 feet with the lowest elevation found along the Kansas River, the major waterway of the region.

The mapping area also contains several large reservoirs including Tuttle Creek Reservoir formed by the Army Corps damming of the Big Blue River. Milford Reservoir built on the Republican River lies just outside this twenty-five quad area but within the 1:100,000 Manhattan SE map. All three of these major rivers converge within the Manhattan SE 1:100,000 unit. The land use is primarily agriculture with grazing on the hillsides and grain crops in the level floodplains. The city of Manhattan provides the largest commercial and institutional base.

Climate

The climate of Riley County located in center of the area is described as continental, characterized by warm to hot summers, cold winter, abundant sunshine, moderate winds, low to moderate humidity. A pronounced peak in rainfall occurs late in spring and during the first half of summer. Total average rainfall for the year is 32 inches with 75% falling in the growing season months of April through September. A lack of precipitation affects the production of crops and grasses in some years, and droughts of several years duration occur at irregular intervals.

Vegetation

Native plants of this section of the Tallgrass Prairie include Indian grass, prairie dropseed, big bluestem, little bluestem, western wheatgrass, and switch grass. The sedge, Carex pennsylvanica, dominates in wetter sites. Woody vegetation is confined to streambeds and in bottomlands next to large rivers. Common riparian species include black walnut, oaks, cottonwood, maple, green ash, hackberry and sycamore. Red cedar and other shrub species are sometimes found along protected terraces.

Soils

The soils associated with the major floodplains and tributaries are principality derived from alluvium. It consists of water laid deposits of silt, clay, sand and gravel and has been modified by historic channel migration and flooding particularly in the Kansas River Basin.

Other upland soils in the project area include those farmed from the weathering of local parent material and alluvium deposits of glacial drift. These are typically shallow sloping clayey soils. In addition, the Flint Hills region is covered with cherty limestone soils.

IV. DESCRIPTION OF WETLAND HABITATS IN PROJECT AREA

Riverine System

This watershed is defined by USGS within the Missouri River Basin and portrays typical dendredic drainage patterns. Very little floodplain development or wetland vegetation lies in the upper reaches in the first order streams. These are primarily grassy waterways with stands of wetland vegetation (PEMA) or intermittent down cutting streams and creeks (R4SBA, R4SBC) depending on relief. Most of these creeks are obscured by the canopy but because of the incised nature of the streams the vegetation itself does not receive yearly flooding.

As the streams converge into larger order streams, the water volume increases and results in more floodplain development. However, this is more evident when considering the historic floodplain as little or no overland flooding occurs on a yearly basis. These streams generally flow throughout the summer or year round except in extreme dry years (R2UBF, R2UBG).

Three major perennial rivers converge within the 1:100,000 area, the Big Blue, the Republican and the Kansas Rivers (R2UBH). The flooding on these rivers is controlled by large flood control dams and consequently, the overland flow has been reduced and wetland vegetation is restricted to the lowest terrace and within the active channel or larger oxbow channels. Not until the eastern sections of the work area does the Kansas River portray overland flow to support riverine hardwood floodplain communities.

Lacustrine System

Most lacustrine habitats in this area are impounded including the large reservoirs of Tuttle Creek Dam and Milford Lake which were formed by flood control structured erected by the Army Corps of Engineers. Impoundments greater than twenty acres are represented by L1UBHh. L1UBHx is used for all excavated lakes greater than twenty acres and pits over six feet deep. Shallower littoral zones, L2UBFh-L2UBCh-L2USAh, accompanied the large reservoirs on the backwater areas and shorelines. These were vegetated sandy areas of differing hyrdoperiods.

Palustrine System

A large majority of the wetland habitat in the study area is considered within the Palustrine System. Unvegetated palustrine habitats were common throughout the work area as farm ponds, generally less than twenty acres and impounded (PUBGh, PUBFh). These were occasionally found with aquatic bed species (PABGh, PABFh) or vegetated along the edges with various kinds of wetland herbaceous or woody species. Large areas of palustrine wetlands were observed along the edges and in backwaters of the major reservoirs and along the confined floodplain of the Kansas River. These primarily included species of willows, cottonwood, and maples at scrub or forested height. This vegetation is indicative of fairly short hydroperiods (PFOA, PSSA). Willow growing directly in the river channel were identified on a limited scale and received more seasonally flooded regime (PSSC). The predominance of maple also helped indicate forested habitat of a wetter condition (PFOC). These were confined areas associated with depressions, or oxbows in the Kansas River floodplain.

The severe flooding events of the 1991 season prevented the identification of many emergent and herbaceous species in these communities. However, their signature is observable on the photography and mapped according to presence and duration of water at photo capture date (PEMA, PEMC, PEMF).

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.

(K) Artificially Flooded -- The amount and duration of flooding is controlled by means of pumps or syphons in combination with dikes or dams.

OBSERVED WETLAND VEGETATION

A. EMERGENT

Carex spp.	sedges
Eleocharis sp.	spikerush
Hordeum jubatum	foxtail barley
Phalaris arundinacea	reed canary grass
Polygonum sp.	smartweed
Rumex sp.	dock
Scirpus sp.	bulrush
Spartina pectinata	prairie cordgrass
Typha sp.	cattail

B. SCRUB-SHRUB

Acer rubra	red maple
Acer saccharinum	silver maple
Salix amygdaloides	peach leaf willow
Salix exigua	sand bar willow
Salix nigra	black willow

C. FORESTED

Acer rubra	red maple
Acer saccharinum	silver maple
Celtis occidentalis	hackberry
Cornus alternifolia	dogwood
Fraxinus pennsylvanica	green ash
Plantanus occidentalis	sycamore
Populus deltoides	eastern cottonwood
Quercus bicolor	swamp white oak
Quercus palustris	pin oak
Salix amygdaloides	peach leaf willow
Salix nigra	black willow
Ulmus americana	American elm

VI. IMAGERY

Imagery is of excellent quality and will facilitate a high degree of accuracy in wetland photo interpretation. The photography was taken in late May to late June of "normal" water years therefore displaying wetlands approximately end of season growth. In addition, floodplain delineations will support distinction of separate water regimes and flats.

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 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

The field conditions revealed a period of extreme high water and therefore impaired the identification of water regimes and many plant signature correlations. Standing water in agricultural fields and to the ten-year floodplain hampered the identification of emergent and aquatic species. Consequently, the delineations on this photography will reflect classifications and conclusions gained during previous field investigations of geographically similar or adjacent areas. Regional USFWS field personnel were consulted to gain insight into conditions in more normal water years.

Hydric soils as described by the 1990 SCS Hydric Soils County lists were found to be too inclusive to directly associate with a wetland delineation of the forested floodplains. Therefore the use of soil surveys will be of minimal help in delineating these areas as most were identified as upland. Understories included Rhus radians, Viber sp., Smilax sp. and Parthenociassus quinquefolia.

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.

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X. LITERATURE CITED

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Combs, Daniel L. and Ronald D. Drobney. Aquatic and Wetland Plants of Missouri. Missouri Cooperative Fish and Wildlife Research Unit, United States Fish and Wildlife 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.

Geiger, C. O., D. L. Lacock, D. R. Schneider, M. D. Carlson, and B. J. Pabst, 1991. Water Resources Data Kansas Water Year 1990. United States Geological Survey Water - Data Report KS-90-1.

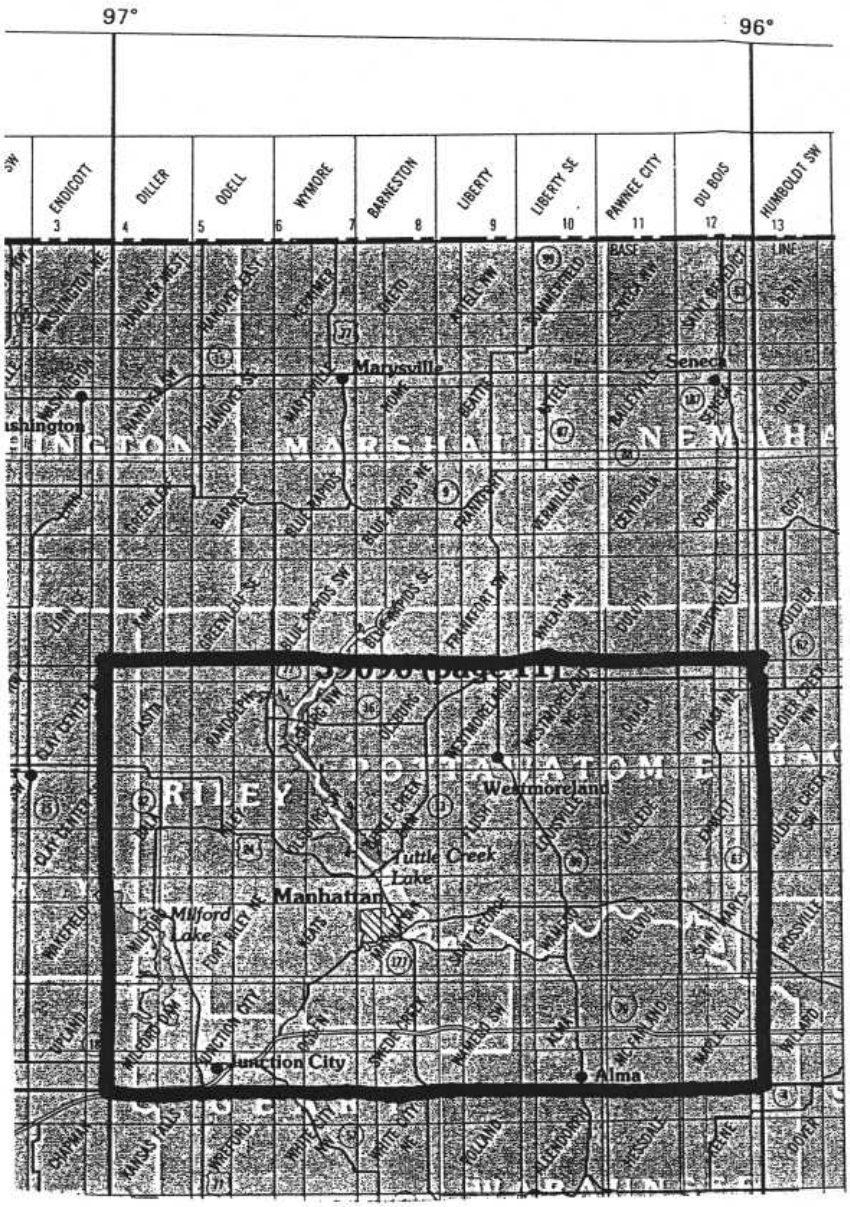
Mohlenbrock, Robert H., et. al. Midwestern Wetland Flora. United States Department of Agriculture - Soil Conservation Service Midwest National Technical Center.

National Technical Committee for Hydric Soils, 1990. Hydric Soils of the United States. United States Department of Agriculture - Soil Conservation Service. Miscellaneous Publication 1491.

Reed, Porter B., 1988. National List of Plant Species That Occur in Wetlands: 1988, Kansas. United States Department of Interior, Fish and Wildlife Service, NERC-88/18.16.

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Kansas Agricultural Experimental Station. Soil Survey of the following counties:

Clay (1984)
Geary (1975, 1960)
Jackson (1979)
Pottawatomie (1987)
Riley (1975)
Shawnee (1970)

APPENDIX A

LOCATOR MAP