NATIONAL WETLANDS INVENTORY

MAP REPORT FOR SE KANSAS

FOR THE 1:100,000 MAP UNITS OF

JOPLIN SE, JOPLIN SW, JOPLIN NW

WICHITA NE, WICHITA SE, WICHITA SW, WICHITA NW

HUTCHINSON SE, HUTCHINSON SW

LAWRENCE SW

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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 project area - Hutchinson SW, Hutchinson SE, Joplin NW, Joplin SW, Joplin SE, Lawrence SW, Wichita NW, Wichita NE, Wichita SW, and Wichita SE are located in the southeastern portion of Kansas.

Field reconnaissance was conducted in each of the maps in the task order.

Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service
Bill Brammell	-	Geonex, Inc.
Phillip Still	-	Geonex, Inc.
Don DePra	-	Geonex, Inc.

Field Dates

June 1 - 11, 1993

Aerial Photography

Primary Source Data (100%)
Type: NHAP Color Infra-Red High Altitude
Scale: 1:58,000

Hutchinson SW; 5/25/85, 6/25/85

Hutchinson SE; 5/25/85, 6/19/85, 6/25/85, 6/28/85, 6/12/86

Joplin NW; 6/28/85, 6/29/85

Joplin SW; 6/19/85, 6/28/85, 6/29/85, 6/12/86

Joplin SE; 6/25/85, 6/28/85, 6/12/86

Lawrence SW; 6/28/85, 6/29/85, 6/12/86

Wichita NW; 5/25/85

Wichita NE; 5/25/85, 6/19/85, 6/25/85, 6/28/85, 6/29/85, 6/12/86

Wichita SW; 5/25/85

Wichita SE; 5/25/85, 6/19/85, 6/25/85, 6/28/85, 6/12/86

Percentage Coverage: All 300 USGS quadrangles were covered with the 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
Water Resources Data Kansas
National List of Plant Species That Occur In Wetlands: Kansas
Hydric Soils of the United States

III. PHYSICAL DESCRIPTION OF PROJECT AREA

Geography

According to Bailey, Description of the Ecoregions of the United States (1980), the study area is composed of two provinces - the Prairie Parkland Province and the Tall-Grass Prairie Province.

The eastern portion of the work area is contained within the Prairie Parkland Province. The topography is mostly gently rolling plains, but steep bluffs border a number of the valleys. Some areas are nearly flat; others have high rounded hills. Elevations range from approximately 800 feet to 1,200 feet.

The western portion of the work area is contained within the Tall-Grass Prairie Province. This region is characterized by flat and rolling plains with relief of less than 300 feet. Elevations range from 2,500 feet to 1,000 feet. Most of the lands excluding those south of the Missouri River, are young glacial drifts and dissected till plains. Loess and sand deposits cover the area south of the Missouri River. This flat to rolling hill land has well developed drainage systems.

Climate

The Prairie Parkland Province receives approximately 23-40 inches of precipitation annually. This precipitation falls mainly during the growing season. Summers usually are hot, and winter, especially in the northern part of the Province, are cold. Average annual temperatures may be as high as 55°F (13°C) in the north and 70°F (21°C) in the south. Winters are generally short and mild in the southern portion of the Province. The frost-free season ranges from 140 days along the northern fringe to 280 days in the south.

The western portions of the Tall-Grass Province receive approximately 20-30 inches of precipitation annually. Drought periods are less frequent and less severe near the forest than in the more westerly areas. Average annual temperatures range from 40°F (4°C) in the north and 55°F (13°C) in the east, 60°F(15°C) in the west, and 65°F(18°C) in the south.

Vegetation

Vegetation of the Prairie Parkland Province consists of forest-steppe, characterized by prairie, groves, and strips of deciduous trees. The alternating of forest and prairie in the western part of the province results mainly from local soil conditions and slope exposure. Here trees grow most commonly near streams and on north-facing slopes. Few trees grow in the thin soils on the tops of the limestone hills.

Grasses are the dominant plants in prairie vegetation. Native plants of this province include big bluestem, little bluestem, Indian grass, switch grass, prairie dropseed, western wheatgrass, and eastern gamagrass.

The upland forest in this province is dominated by oak and hickory forming part of the oak-hickory forest. On floodplains and moist hillsides, there is a thicker forest of deciduous trees. Some common species include willows, black walnut, oaks, cottonwood, green ash, and hackberry. Tamarisk, red cedar, russian-olive are also common species.

The vegetation in the Tall-Grass Prairie Province consists mainly of mixed grasslands. Extending from the deciduous forest to about longitude 104°W. Woody vegetation is confined to streambeds and in bottomlands adjacent to large rivers.

The dominant plants include big and little bluestem, side-oats gama, panic grass, and prairie dropseed. Rushes and sedges dominate the wetter areas. Because of the generally favorable conditions of climate and soil, most of the area is cultivated and little of the original vegetation remains.

Soils

Mollisols dominate throughout the Prairie Parkland Province. The soils associated with the major floodplains and tributaries are primarily derived from Alluvium. It consists of water and deposits of silt, clay, sand, and gravel that has been modified by historic channel migration.

Other upland soils in the Prairie Parkland Province include those formed from weathering of local parent material and Alluvium deposits of glacial drift.

The Lanton-Osage-Helper Association is an important wetland soil in this Province. These deep, nearly level, somewhat poorly drained and poorly drained soils are located along the major floodplains.

The somewhat poorly drained Lanton soils formed in silty and clayey alluvium. Typically, the surface layer is very dark grayish brown silt loam about eight inches thick. The subsurface layer is mottled silty clay loam.

The poorly drained Osage soils formed in clayey alluvium. Typically, the surface layer is very dark gray silty clay about five inches thick. The subsurface layer is silty clay about twelve inches thick. The upper part is black, and the lower part is very dark gray and mottled.

The somewhat poorly drained Helper soils formed in silty alluvium.. In general, the surface layer is very dark grayish brown silt loam about nine inches thick. The subsurface layer is mottled silt loam about fifteen inches thick. The upper part is dark grayish brown, and the lower part is grayish brown.

The soils of the Tall-Grass Prairie are primarily Mollisols. There are smaller areas of Entisols and Vertisols. Again, soils within the major floodplains and tributaries are derived from alluvium.

Furthermore, small sand hill areas are located in the Hutchinson SW 1:100,000 map. These areas are composed of slightly alkaline soils. The Flint Hills Region is characterized by Cherty Limestone soils.

IV. DESCRIPTION OF WETLAND HABITATS

Riverine

The major rivers in the project area are the Arkansas, Neosho, Verdigris and Walnut. All will be classified as R2UBH. (Sandbars on these rivers will be labeled R2USC darker in color, and R2USA when the signature is bright white.)

Rivers of the same size, or sightly smaller that have periods of no flow will be labeled R2UBG. Furthermore, rivers with more numerous periods of no flow will be classified R2UBF.

Very little floodplain development or wetland vegetation lies in the upper reaches of the first order streams. The majority of these streams are deeply incised and will be labeled R4SBA or R4SBC. Most of these creeks are obscured by tree canopy. The vegetation adjacent to these streams do not receive yearly flooding sufficient to classify them as wetland, as the streams are deeply incised.

Lacustrine

Most lacustrine habitats in this area are impounded with some natural basins present. All impounded basins over twenty acres will be labeled L1UBHh. All natural basins will not have the "h" modifier. All strip mines regardless of size will be mapped as L1UBHx due to depth. L2ABG/F will be used in general for oxbow lakes larger than twenty (20) acres. Unconsolidated shore classes in conjunction with these basins that are large enough to be polygons will be labeled L2USC or L2USA according to signature.

Palustrine

A large majority of the wetland habitat in the study area is within the palustrine system. PABF was used for basins smaller than twenty (20) acres. In general, wetlands not quite large enough to be classified within the lacustrine system will be classified as intermittently exposed. PAB was used instead of PUB because it was observed in past years that by the end of the growing season most of these impoundments will have aquatic bed to at least 30%. Small re-use pits or dug outs used for irrigation will be labeled PUBFx, PUSCx, or PUSAx. Emergents (PEMA, C, F) are the dominant covertypes. The majority of these wetland types occur in conjunction with swales associated with riverine systems, or the backwater of impoundments. Areas of scrub-shrub and forest will be labeled PSSA and PFOA, with the "C" (seasonal) water regime used on rare occasions. The majority of forested and scrub-shrub wetlands were observed along the edges and backwater of impoundments. Although there were few palustrine forested wetlands in association with major rivers observed in the field (due to lack of access), some native hardwood floodplain communities were added during photo interpretation. These additions were made based on the presence of hydric soil and photo signature. PUSA was used for the bright white signature usually associated with impoundments. PUSC was used for shallow basins.

TABLE 1 - OBSERVED WETLAND VEGETATION

Palustrine Temporary Emergents: PEMA	
Hordeum jubatum	foxtail barley
Spartina pectinata	prairie cordgrass
Carex spp.	sedges
Polygonum spp.	smartweed
Rumex spp.	dock
Palustrine Seasonal Emergents: PEMC	
Eleocharis palustris	spikerush
Polygonum spp.	smartweed
Juncus spp.	rush
Scirpus americanus	American threesquare
Palustrine Semi-Permanent Emergents: PEMF	
Typha spp.	cattail
Scirpus acutus	hardstem bulrush
Palustrine Semi-Permanent Aquatic Bed: PABF	
Lemna spp.	duckweed
Palustrine Intermittently Exposed Aquatic Bed: PABG	
Lemna spp.	duckweed
Palustrine Temporary Scrub-Shrub: PSSA	
Amorpha fruticosa	false indigo
Populus deltoides	eastern cottonwood
Salix spp.	willow
Palustrine Seasonal Scrub-Shrub: PSSC	
Amorpha fruticosa	false indigo
Populus deltoides	eastern cottonwood
Salix spp.	willow
Palustrine Temporary Forested: PFOA	
Populus deltoides	eastern cottonwood
Salix spp.	willow
Carya illinoenis	pecan
Palustrine Seasonal Forested: PFOC	
Populus deltoides	eastern cottonwood
Salix spp.	willow
Carya illinoenis	pecan

Table 2. NWI WETLAND CLASSIFICATION CODES, COWARDIN DESCRIPTION AND COMMON TERMINOLOGY

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
R2UB (F,G,H)	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
R4SB (A,C)	Riverine, intermittent, streambed	Small streams, creeks, or irrigated ditches	Streambed
L2AB (F,G)	Lacustrine, littoral, aquatic bed	Shallow lakes	Aquatic bed
L2US (A,C)	Lacustrine, littoral, unconsolidated shore	Dry lake beds	Unconsolidated shore
PUBFx	Palustrine, unconsolidated bottom	Open water, dug outs	Unconsolidated bottom
PAB (F,G)	Palustrine, aquatic bed	Deep basins, impoundments	Aquatic bed
PABK	Palustrine, aquatic bed	Sewage treatment	Aquatic bed

Table 2. 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, oxbows,	Amorpha fruticosa (false indigo) Carex spp. (sedges) Eleocharis palustris (spikerush) Hordeum jubatum (foxtail barley) Juncus spp. (rush) Polygonum spp. (smartweed) Populus deltoides (eastern cottonwood) Rumex (dock) Salix amygdaloides (peach leaf willow) Scirpus acutus (hardstem bulrush) Scirpus americanus (American threesquare) Spartina pectinata (prairie cordgrass) Typha spp. (cattail)

Table 2. NWI WETLAND CLASSIFICATION CODES, COWARDIN DESCRIPTION AND COMMON TERMINOLOGY

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PSSh (A,C)	Palustrine, scrub-shrub	Backs of impoundments, river banks	Amorpha fruticosa (false indigo) Populus deltoides (Eastern cottonwood) Salix amygdaloides (peach leaf willow)
PFOh (A,C)	Palustrine, forested	River banks, oxbows, floodplains, impoundments	Populus deltoides (eastern cottonwood) Salix amygdaloides (peach leaf willow) Carya illinoenis (pecan)
PUSh (A,C)	Palustrine, unconsolidated shore	Dry sandy impoundments	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.

(K) Artificially Flooded - The amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. The vegetation growing on these areas cannot be considered a reliable indicator of water regime. Examples of artificially flooded wetlands are some agricultural lands managed under a rice-soybean rotation, and wildlife management areas where forests, crops, or pioneer plants may be flooded or dewatered to attract wetland wildlife. Neither wetlands within or resulting from leakage from man-made impoundments, nor irrigated pasture lands supplied by diversion ditches or artesian wells, are included under this modifier.

VI. IMAGERY

Overall imagery was good. Some darker strips were encountered, example Lawrence SW strip 6, but delineation was possible with few limitations.

VII. PHOTOGRAPHIC CONVENTIONS FOR PALUSTRINE WETLANDS

Artificial Water Regime

Artificial palustrine wetlands appear as open water or aquatic bed. These are sewage treatment settling ponds. Man's influence on the water level of these ponds is ever changing and controlled by means of pumps or syphons. Aquatic bed class will be used with sewage treatment settling ponds i.e. PABKx.

Temporary Water Regimes

The temporary water regime will be used with the scrub-shrub, forested, emergent and unconsolidated shore classes.

There are very few temporary emergents. The signature is very subtle and tended to be maroon in color with a smooth texture.

The temporarily flooded trees and shrubs will be light pink with fluffy crowns. In most instances temporary trees and shrubs were located along riverbanks and in the backs of impoundments.

Unconsolidated shore signatures will have a well defined basin boundary and a scoured white signature.

Seasonal Water Regimes

Seasonal water regimes are used to classify emergents, scrub-shrub, and unconsolidated shore. Seasonally flooded forested classes were rare.

The seasonal signature is smooth and deep bluish-green with brown stains. In agricultural fields there will be evidence of avoidance.

There is a very small amount of seasonal scrub-shrub. The scrub-shrub signature in this water regime will have a very dark understory and possibly open water. Small polygons in the back of impoundments, will make up most of these labels.

Seasonal unconsolidated shore signatures will be a defined grey to blue signature. This classification may have shallow water signature in all or part of the polygon.

Semi-Permanent Water Regimes

Wetlands in this study area that are semi-permanently flooded are emergents, unconsolidated bottom and aquatic bed.

By convention, impoundments and open water bodies less than twenty acres which appear as unconsolidated bottom will be classified as aquatic bed. As it has been observed that these wetlands will be covered to at least 30% by aquatic bed during the growing season. The diked/impounded modifier will be used when appropriate.

Semipermanent water regime will be used with the unconsolidated bottom class and carry the excavated water modifier to identify all excavations holding water in the project area.

Emergents in this water regime will be a mottled reddish hue and have a clumpy texture due mostly to the dominance of cattails. Areas with high concentration of bulrushes tends to give more of a black signature.

Intermittently Exposed Water Regime

In general, basins not quite large enough to be classified within the lacustrine system will be classified intermittently exposed whether aquatic bed or unconsolidated bottom.

Conventions for Linear Wetlands

Linear wetlands are delineated if the channel is entrenched, there is evidence of hydrophytic vegetation, open water or a scoured white streambed.

Most vegetated wetland linears will be classed PEMC. PEMA linears were not observed with great frequency on the field trip.

There are few PFOA and PSSA linears associated with the riverine system. Unless the drainages were in flatter areas these linears were not used. The vegetation consisted primarily of willow and cottonwood.

Several major rivers were located in the study area most being labeled R2UBH.

Lower perennial and intermittent linears will be classified R2UBF, R2UBG, R4SBC and R4SBA according to signature. R2UBF/G will have open water signature with R2UBF being mostly linear size and R2UBG in most cases being polygon size. R4SBC will have shallow intermittent water throughout the course of stream flow. R4SBA will have a well defined scoured white signature.

VIII. MISCELLANEOUS

This section addresses conventions that are uncommon throughout the area.

Sewage treatment ponds will be classified as PABKx or L2ABKx depending on their size. Reclaimed strip mines will be classified as L1UBHx and irrigation pits will be classified as PUBFx or PUSA/Cx if they are dry.

Abandoned oil field berms will be mapped if they support hydrophytic vegetation. These areas will carry the excavated modifier. The Augusta quadrangle in Wichita NE is a good example of this situation.

Grassed waterways will be avoided, as they do not meet the wetland definition.

Road ditches with identifiable signatures will be delineated as PEMC/Fx.

IX. MAP PREPARATION

The classification and delineation of wetlands is in accordance with Cowardin et. al. (1979). National Wetlands Inventory photographic and cartographic conventions can provide more information about the mapping process. Delineations are produced through stereoscopic interpretation of 1:58,000 scale color infrared photography. NHAP photography was taken in 1985 and 1986.

Field check sites were selected to clarify varying signatures found on the photography. These signatures were then identified in the field using vegetative 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 be unidentified. Since the photography depicts only one specific moment in time there may be discrepancies between the maps and current field conditions. Changes in landscape which occurred after the date of photograph would result in such discrepancies.

Aerial photointerpretation and drafting were completed by Geonex, Inc., St. Petersburg, Florida.

X. SPECIAL MAPPING PROBLEMS

One problem encountered was in the Lawrence SW quad, strips 7 and 8, pertaining to the John Redmond Reservoir in the Flint Hills National Wildlife Refuge (Coffey and Lyon counties). The reservoir crosses two strips with high water on strip 7 (1985) and low water on strip 8 (1986). The problem arises when attempting to tie the adjacent photos, as well as in determining the duration of inundation at different contour levels.

After consulting with the Region 6 staff and Lew Cowardin conventions for this reservoir are as follows:

CLASSIFICATION	ELEVATION (in feet)
L1UBHh	<1036'
L2USAh, PFOAh, PSSAh, PEMC/Ah	1036' - 1050'
As signature indicates, without impounded modifier (h)	>1050'

XI. 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.

ks-se-94.rpt
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XII. 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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Water Resources Data Kansas, 1990. United States Department of the Interior, Geological Survey. Prepared in cooperation with the State of Kansas and with other agencies.

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

APPENDIX A
LOCATOR MAP

SE KANSAS PROJECT AREA