

Manhattan SE, Kansas PI

Field Summary Report

Mapping Conventions

I. INTRODUCTION

A. 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.

B. Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service - Denver, Colorado
Cindy 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

C. Field Dates

July 29-30, 1992

D. 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%

E. 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).
- 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).

F. 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

A. 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.

B. 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.

C. 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.

D. Soils

The soils associated with the major floodplains and tributaries are principally 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 formed 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.

III. BIOLOGICAL CHARACTERISTICS OF WETLAND HABITATS AND MAPPING CONVENTIONS

A. Riverine System

USGS Water Resources Data, Water Year 1990 will be used to classify whenever possible. The photo signature will be used where information is unavailable.

- R2UBH** - Lower perennial, unconsolidated bottom, intermittently exposed. These are low gradient rivers with wide historic floodplains but relatively confined active floodplains. Signature is blue open water with little flat development. These may be portrayed as double or single line on topo.
- R2UBF** - Lower perennial, unconsolidated bottom, semipermanently flooded. Similar in characteristic to R2UBG with less watershed contribution. Generally portrayed by USGS topo as perennial single line streams.
- R2USC** - Lower perennial, unconsolidated shore, seasonally flooded. These are sand or mud flats along lower perennial rivers. Signatures will vary from white to light blue and light gray. (These were completely flooded during field reconnaissance.)
- R4SBC** - Intermittent, streambed, seasonally flooded. These are smaller drainageways, creeks or streams, with gravel bottoms and little or no active or historic floodplain development. These creeks will dry up at the end of the growing season but usually show water in streambed on photography. These are often covered by forested canopy of upland species. USGS topo may portray these as perennial however they are predominantly intermittent linears. This classification may also be used for agricultural drainage canals with appropriate modifier.
- R4SBA** - Intermittent, streambed, temporarily flooded. Identical to R4SBC with a more predominant white scouring present on photo and an absence of water in streambed.

B. Lacustrine System

The lacustrine system will be defined by the photo signature in collaboration with elevations portrayed on topo for large reservoirs such as Milford Lake and Tuttle Creek Lake.

- L1UBH** - Limnetic, unconsolidated bottom, permanently flooded. These are generally impoundments which will carry the "h" modifier on reservoirs greater than twenty acres. This may also include twenty acres or larger excavations such as large quarries or gravel pits which will carry the "x" modifier. Signatures will show open water.
- L2UBF** - Littoral, unconsolidated bottom, semipermanently flooded. These are typically shallow flats associated with the large reservoirs which are only drawdown at the very end of the growing season. The photo signature will show open water with light blue sand showing through. Appropriate modifiers will be used.
- L2USC** - Littoral, unconsolidated shore, seasonally flooded. Similar to L2UBF but drawdown occurs earlier in the growing season. These areas may fluctuate throughout the growing season prohibiting the establishment of emergent species and favoring pioneering vegetation. Signatures are typically light blue to gray exposed sand or shallow water.
- L2USA** - Similar to L2USC with flats exposed for longer periods throughout the growing season. Photo signature reveals white to light blue exposed sand.

C. Palustrine System

- PABK** - Aquatic bed, artificially flooded. This classification will be restricted to open sewage treatment or water treatment ponds with visible aquatic growth. The signature is typically pinkish to orange and smooth texture. These aquatic communities were typically algae.
- PUBK** - Unconsolidated bottom, artificially flooded. This classification is restricted to the same situation as PABK without the evidence of aquatic bed. These will be more predominant in water treatment plants.

- PUBG** - Unconsolidated bottom, intermittently exposed. This is typically an impounded farm pond without evidence of vegetation. The signature will be open water.
- PABG** - Aquatic bed, intermittently exposed. Similar to PUBG with photo evidence of aquatic bed communities. Although not observed in field, these communities all commonly contain algae, Polygonum sp., and Lemna minor.
- PUBF** - Unconsolidated bottom, semipermanently flooded. This classification is used for small ponds and shallow open water areas associated with river flooding. They hold surface water throughout the growing season. Examples include farm ponds, sand and gravel pits and oxbow lakes with no photo evidence of vegetation. Modifiers are used when applicable.
- PABF** - Aquatic bed, semipermanently flooded. Similar situations to PUBF with photo evidence of aquatic bed. Signatures will appear pink to orangish with smooth textured or milky black. Common species include those listed as PABG.
- PEMF** - Emergent, semipermanently flooded. This community type is adapted to standing water for extended periods throughout the growing season and is associated more with large or permanent open water bodies such as oxbow sloughs or backwater reservoir areas. Species indicative to this situation include Typha latifolia, Scirpus sp. and Polygonum sp. (when rooted). Photo signatures show dark undertones with gray or reddish texture depending on species.
- PUSC** - Unconsolidated shore, seasonally flooded. This situation is similar to that of PEMC but a vegetated signature is absent on the photo. These are often areas of highly fluctuating water where emergent vegetation cannot establish and are vegetated by pioneering species or unvegetated. The photo signature is white to bluish sand and were flooded at field review.
- PEMC** - Emergent, seasonally flooded. These communities are commonly associated in the upper zones of reservoirs and ponds where water levels do not fluctuate severely to allow the establishment of emergent species. Common associations include Carex sp., Typha latifolia, and Scirpus sp. Photo signature is typically red to gray texture depending on species with less surface water staining. These areas were flooded during field reconnaissance.

- PEMA** - Emergent, temporarily flooded. These communities which consisted primarily of Spartina pictinata, Carex sp., Juncus sp. and Rumex sp. are found in small streams and creeks where low gradient and water velocity allow for the establishment of vegetation. This signature is typically a dark gray to reddish line inside the stream bed on the flat ridges. This community is also found in small pockets of flooded agricultural fields or in ponds or the uppermost back water of reservoirs.
- PSSC** - Shrub-scrub, seasonally flooded. This classification was restricted to areas such as the major river floodplains and large reservoirs where shrub vegetation has become established. Species were predominantly Salix spp. and Acer spp. Photo signature reveal red to brick red with water understory. These were flooded at field time.
- PSSA** - Scrub-shrub, temporarily flooded. This community is also found in association with the major river flats and back waters of reservoirs and includes Salix spp. in conjunction with Populus deltoides, (less than 18 feet) and an herbaceous understory more indicative of temporary surface water. Many of these communities were also flooded during field review. The photo signature is again red to brick red but contains more texture and less staining than PSSC.
- PFOC** - Forested, seasonally flooded. Acer saccharinum and Acer rubra were the primary indicator species for this classification of bottom land forested habitat. These communities are restricted to the major river floodplains typically the Kansas River on the lowest terrace. These species were found in association with Salix spp. and Populus deltoides (greater than 18 feet) in confined areas and were not widespread. Photo signature appears red to brick red, rough texture with bluish staining or in standing water.
- PFOA** - Forested, temporarily flooded. This forested bottomland communities are found in higher zones of the lowest floodplain terrace or backwater reservoirs as described with PFOC. These species include Populus deltoides, Salix spp., Fraxinus pennsylvanica, Plantanus occidentalis and Celtis oxidentalis. Understory was either shallowly flooded during field investigations or revealed wetland herbaceous species more indicative of temporary conditions. Photo signature appears as red to brick red, large crowns with little staining. These communities are still but associated with lowest river level.

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 radicans, Viber sp., Smilax sp. and Parthenociassus quinquefolia.

D. Special Modifiers

Special modifiers portraying diked/impounded (h), partially drained (d), and excavated (x) will be used when appropriate as photo signature dictates.

IV. DISCUSSION OF IMAGERY AND FIELD CONDITIONS

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 growing season growth. In addition, floodplain delineations will support distinction of separate water regimes and flats.

The field conditions, however, 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.

VI. SUMMARY

Field investigations and signature correlations were hampered due to extreme flooding conditions. However, the collaboration with previous work and local officials will help to provide an understanding of normal wetland conditions. The photography provides excellent resolution and climatic vegetation allowing accurate wetland delineations in accordance with contract specifications.