NATIONAL WETLANDS INVENTORY

Map Report of Western Nebraska for the 1:100,000 Map Units of:

Scottsbluff NW, Scottsbluff SW, Scottsbluff SE; Alliance NW, Alliance SW; and McCook 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 Western Nebraska study area is located in both the Tall-Grass Prairie and Great Plains-Shortgrass Prairie Province of western Nebraska. Field reconnaissance covered the area of each 1:100,000: Scottsbluff NW, Scottsbluff SW, Scottsbluff SE, Alliance NW, Alliance SW, and McCook NE (Appendix A Locator Map).

Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service
Renee Whitehead	-	U.S. Fish and Wildlife Service
Eric Seeger	-	Geonex, Inc.
Phillip Still	-	Geonex, Inc.
Kelly Summers	-	Geonex, Inc.
Kathleen O'Keife	-	Geonex, Inc.

Field Dates

September 8-16, 1991

Aerial Photography

Primary Source Data (100.0%)
Type: NHAP Color Infra-Red High Altitude
Scale: 1:58,000

Scottsbluff NW;	5/23/84, 7/12/84
Scottsbluff SW;	5/23/84, 7/12/84
Scottsbluff SE;	5/23/84, 6/24/84, 10/25/84, 9/13/85, 9/26/85, 6/11/86
Alliance NW;	5/23/84
Alliance SW;	5/23/84, 7/12/84
McCook NE;	5/30/81, 7/11/81, 9/27/81, 10/4/81, 11/6/81

Percentage Coverage: All 192 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

Wetland Plants of the State of Nebraska

Hydric Soils of the State of Nebraska

Cowardin's Classification of Wetlands and Deepwater Habitats of the United States

III. PHYSICAL DESCRIPTION OF PROJECT AREA

Geography

The project area is situated in western Nebraska. With the exception of McCook NE, all of the study area lies within the panhandle. McCook NE is located in southwest central Nebraska. All of the project area is located in the High Plains region of the Great Plains and includes tablelands, sandhills, badlands and alluvial valleys. Major drainages in the study area include the Platte River, North Platte River, White River and the Niobrara.

Elevations range from over 4,500 feet in the northwest near the Black Hills of South Dakota to below 3,400 feet in the southeast along the South Platte River. Most of the project area is classified by Bailey in Descriptions of Ecoregions of the United States (1980) as Shortgrass Prairie Province (Steppe). The McCook NE study area is classified Tall-Grass Prairie Province.

Climate

The Tall-Grass-Prairie is typically associated with continental, mid-latitude climates designated sub-humid. Evaporation and transpiration generally balance on a yearly basis. The Steppe (Shortgrass Prairie) is a semiarid continental regime in which maximum rainfall comes in summer but, the total supply of moisture is low. Winters are cold and dry; summers warm to hot. Evaporation usually exceeds precipitation. Annual precipitation for the project area averages 18 inches (450 m.).

Vegetation

The Tall-Grass Prairie Province includes both tall and mixed grasses. Bunch grasses are common and may grow taller than 6 feet (18 m.) but, sod-forming species are also dominant. Due to the favorable condition of the soils and climate, most of the area is cultivated and little of the original vegetation remains. The Steppe (Shortgrass Prairie) is a formation of shortgrasses, usually bunched and sparsely distributed. Scattered trees and shrubs occasionally appear and exist in all gradations of cover. Since groundcover is scarce in the Steppe, much of the soil is exposed.

Soils

The soils of the Tall-Grass Prairie are primarily Mollisols with dark upper horizons. While Mollisols are also typical of the Shortgrass Prairie, the predominant pedogenic process is calcification and salinization is dominant in poorly drained sites. Soils contain an excess of precipitated calcium carbonate and are rich in bases. 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 the Platte and North Platte Rivers, the Niobrara River and the White River. They are classified R2UBH. Smaller channels are classified R2UBF. In the Pine Ridge area, there are creeks classified R3UBF due to the gradient of the rock strata and velocity of the water.

Intermittent streams are classified as R4SBA or R4SBC. Irrigation ditches and canals carry the x modifier and are classified according to their width and photo signature.

Riverine bars are classified R2USA and R2USC.

Lacustrine

The project area has a number of impounded or excavated lakes. They are classified according to size and depth. Lake Kilpatrick is classified L1UBHh with PEMF/PEMC transitions along the lake fringe. Lakes in association with mining pits or highway overpasses are classified L1UBGx by convention. This convention is based on the presumption that these lakes are greater than two meters deep at low water.

Palustrine

The majority of wetlands in the study area are palustrine. Many are temporary or seasonal basins in farm fields. Wetlands are also located on river/creek floodplains and in drainages. Many of these have been disturbed for agricultural purposes. The dominant covertypes observed were emergents classified PEMA, PEMC, and PEMF. Shrub-Scrub and forested drainages were occasionally encountered and are classified PSSA and PFOA respectively.

Field sites were documented for representative photo signature as well as problem photo signatures. Vegetation observed in wetland habitats were grouped according to class and water regime. The following plant species were identified on field 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
Juncus sp., rush
Rumex sp., dock
Echinochloa crusgalli, barnyard grass
Phalaris arundinacea, reed canarygrass
Phragmites australis, common reed
Distichlis spicata, saltgrass
Salicornia rubra, rocky mountain glasswort

Palustrine Seasonal Emergents: PEMC
Polyganum coccineum, marsh smartweed
Eleocharis sp., spike rush
Carex sp., sedge
Triglochin sp., arrowgrass
Scirpus americanus, common three square

Palustrine Semi-permanent Emergents: PEMF
Typha sp., cattail
Scirpus acutus, hardstem bulrush

Palustrine Temporary Scrub-Shrub: PSSA
Salix sp., willow

Palustrine Seasonal Scrub-Shrub: PSSC
Salix sp., willow
Populus deltoides, eastern cottonwood

Palustrine Temporary Forested: PFOA
Populus deltoides, eastern cottonwood

Table 1. 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
R3UB (F,H)	Riverine, upper perennial, unconsolidated bottom	Mountain streams, major drainage areas	Unconsolidated bottom
R4SB (A,C)	Riverine, intermittent, streambed	Small streams, creeks, or irrigation ditches	Streambed
L1UB (G,H)	Lacustrine, limnetic, unconsolidated bottom	Deep water habitats	Unconsolidated bottom
L2AB (F)	Lacustrine, littoral, aquatic bed	Shallow lakes and reservoirs	Submerged, floating aquatic bed
PUB (F)	Palustrine, unconsolidated bottom	Open water, re-use ponds, level drains	Unconsolidated bottom
PUS (C,A)	Palustrine, unconsolidated shore	Shallow basins, saline areas, excavated pits	Unconsolidated shore
PAB (F,K)	Palustrine, aquatic bed	Open water basins, impoundments, excavated ponds, or sewage treatment settling ponds	*Lemna* sp. (duckweed)

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	Carex sp. (sedge) Phragmites australis (common reed) Distichlis spicata (inland saltgrass) Eleocharis sp. (spikerush) Triglochin sp. (arrowgrass) Hordeum jubatum (foxtail barley) Juncus sp. (rush) Echinochloa crusgalli (barnyard grass) Phalaris arundinacea (reed canarygrass) Polygonum coccineum (marsh smartweed) Rumex sp. (dock) Salicornia rubra (rocky mountain glasswort) Scirpus americanus (common three square) Scirpus acutus (hardstem bulrush) Typha sp. (cattail)

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

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PSS (A,C)	Palustrine, scrub-shrub	Willow thicket, river banks, or drainage areas	Salix sp. (willow)
PFO (A)	Palustrine, forested	Cottonwood, river banks, floodplains, or drainage areas	Populus deltoides (eastern cottonwood)

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

All 192 quadrangles were flown by the National High Altitude Program (NHAP). The majority of the photography is dated 1984 and was taken in late spring/ summer (May-July). The photos of the North Platte River reveal extreme high water. McCook NE was photographed during the same time of year but is dated 1981. The July 1981 strip of photography is slightly dark but should not present a problem. All remaining photos are of good quality and should yield a fine interpreted product.

The field reconnaissance resulted in a good signature verification effort. Generally, signatures identified during the routing procedure correlated well with vegetation observed in the field. Temporary and seasonal basins were sometimes difficult to recognize on the photograph. Collateral data (e.g. the presence of hydric soils and/or depression contours on topographic maps) will help to delineate these problem areas.

Identification of Checksite-related Signatures

Temporary and seasonal signatures in McCook NE should prove challenging. The seasonal signature ranged from dark gray to open water. The temporary signature was the most difficult to define, ranging from dark grey to very pale grey. The pale grey signature closely resembled the upland white signature. Care must be taken to identify depression contours on the topo and any associated hydric soils (e.g. Scott Series) when delineating these signatures. Throughout the rest of the work area temporary and seasonal basin were not as difficult to identify by signature. Soil surveys and topographic information will still be used to help determine the proper classification. Many pastures and open fields also showed evidence of meandering drainages. These are identified on the photo by a pink to light red return for temporary PEMA and a dark red to dark brown return for seasonal PEMC.

Oxbows in connection with major rivers and streams were found to contain cattail and hardstem bulrush. This signature ranged from dark red to black to dark green and will be delineated as PEMF.

Excavated re-use pits that are used for farming will be labeled PUBFx. These will contain a good water signature. Shallow excavated ponds in pasture land will be labeled PUSCx or PUSAx depending on signature. These shallow ponds are used for livestock.

Temporary streambeds, labeled R4SBA, encountered in the field indicated evidence of invading pioneer plant species; (common during periods of drawdown). The signature typically ranges from chalk white to pale light pink. Many linear drainages were found to be upland. These contained upland plant species and should show no evidence of a channel or streambed.

Impoundments with significant water present will be labeled PABFh. Signatures indicating shallow water will receive the PUSCh label. Impoundments with a chalk white signature and those with light pink indicating emergents will be labeled PUSAh and PEMAh respectively.

The Platte River will be labeled R2UBH. The braided channels associated with the river will be labeled R2UBF, R2USC, or R2USA according to the photo signature. The sandbars and mudflats will also be labeled R2USC or R2USA depending on signature. Flats that are vegetated with cottonwood and willow will be delineated PFOA and PSSA.

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 during the spring and summer (May-July) of 1981 and 1984. In addition, Scottsbluff SE and McCook NE have autumn imagery (September-November).

Field check sites found within the project area were made prior to actual delineation of wetlands. Field checksites 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 with quality control conducted by the U.S. Fish and Wildlife Service.

VIII. SPECIAL MAPPING PROBLEMS

The photo signatures generally correlated well with the wetlands observed. Some of the July 1984 imagery exhibits flood conditions. Discipline is required to separate the actual boundary limits of the river or streambed from that of the photo signature. Conversely, on some of the imagery, basins are barely discernable. Collateral data will be used to identify and delineate these. 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.

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X. LITERATURE CITED

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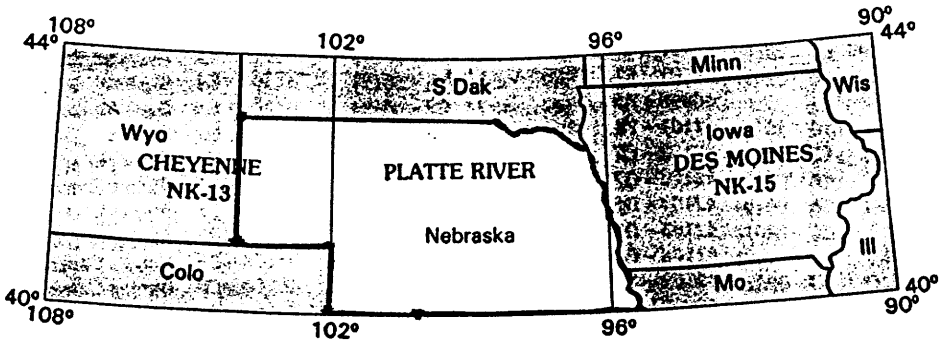
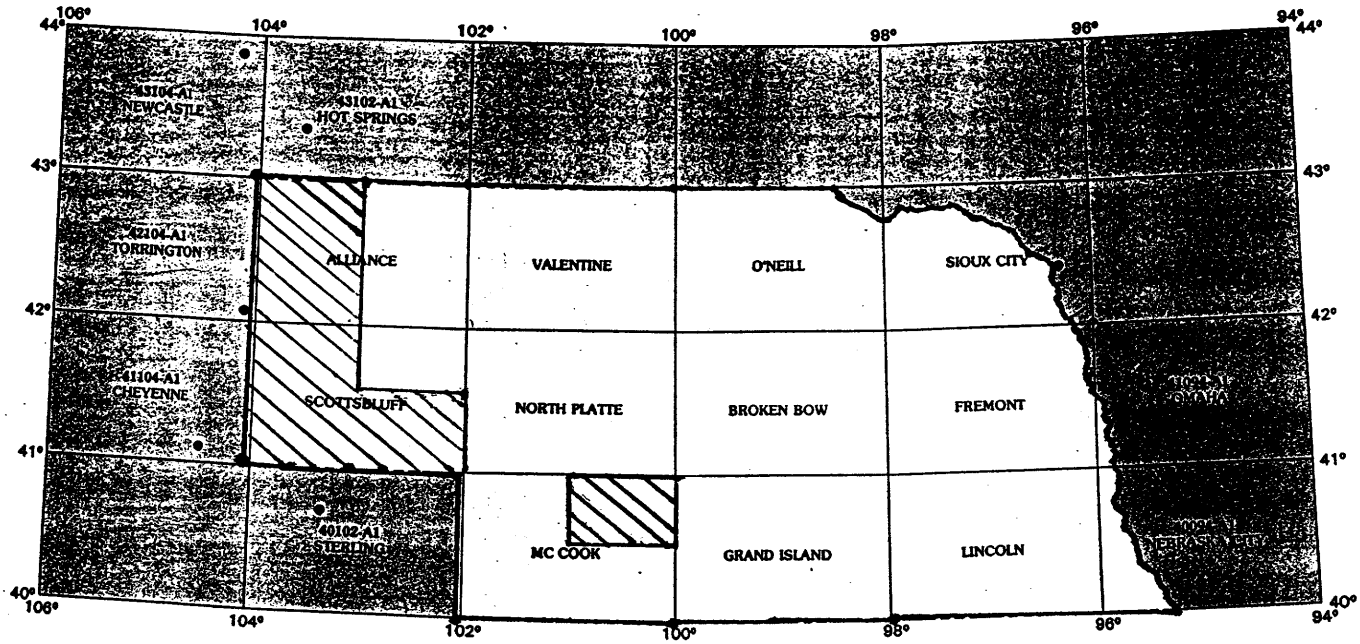
7.5 Minute 1:100,000 and 1:250,000 Scale USGS Topographic Maps.

APPENDIX A
LOCATOR MAP

WESTERN NEBRASKA PROJECT AREA