NATIONAL WETLANDS INVENTORY

Map Report for West River South Dakota
for the 1:100,000 Map Units of:
Rapid City NW, SW, NE, SE;
Hot Springs NW, SW, NE, SE;
Lemmon NW, SW, NE, SE

U.S. Fish and Wildlife Service
Denver, Colorado
September, 1992

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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

The West River South Dakota study area is located in the Great Plains-Shortgrass Prairie Province (Bailey, 1980). Field reconnaissance covered the area of each 1:100,000: Lemmon NW, Lemmon NE, Lemmon SE, Lemmon SW, Rapid City NW, Rapid City NE, Rapid City SW, Rapid City SE, Hot Springs NW, Hot Springs NE, Hot Springs SW, Hot Springs SE (Appendix A).

Field Personnel

Bill Pearson	-	U.S. Fish and Wildlife Service
Renee Whitehead	-	U.S. Fish and Wildlife Service
Chuck Elliott	-	U.S. Fish and Wildlife Service
Eugene Beckwith	-	SDSU, National Wetlands Inventory team
Todd Hoernemann	-	SDSU, National Wetlands Inventory team
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Field Dates

4-12 May 1992

Aerial Photography

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

Lemmon NW: 8/13/83, 8/14/83, 9/23/83
Lemmon NE: 8/13/83, 8/14/83, 9/22/83, 9/23/83
Lemmon SW: 8/13/83, 8/14/83, 9/23/83
Lemmon SE: 8/13/83, 10/26/84, 10/30/84, 11/5/84, 6/223/85
Rapid City NW: 7/6/81, 9/13/81, 7/15/82, 8/7/82, 9/20/82, 10/7/82
Rapid City NE: 7/5/81, 7/6/81, 9/13/81, 7/15/82
Rapid City SW: 7/6/81, 9/13/81, 7/15/82, 9/20/82, 10/7/82
Rapid City SE: 7/5/81, 7/6/81, 9/13/81, 7/15/82, 8/7/82
Hot Springs NW: 7/6/81, 9/13/81, 7/15/82, 8/7/82, 9/20/82
Hot Springs NE: 7/5/81, 7/6/81, 9/1/81, 7/15/82
Hot Springs SW: 7/6/81, 7/15/82, 8/7/82, 9/20/82
Hot Springs SE: 7/5/81, 7/6/81, 9/1/81, 9/13/81, 7/15/82

Percent Coverage: All 384 USGS 7.5' quadrangles were covered with the NHAP photography.

Collateral Data

United States Geological Survey (USGS) Quadrangles
United States Soil Conservation Service (USSCS) Soil Surveys
Bailey's Description of the Ecoregions of the United States (1980)
Water Resource Data, South Dakota, Water Year 1990
National List of Plant Species That Occur In Wetlands: North Plains (Region IV)
Hydric Soils of the State of South Dakota
Wetland Plants of the State of South Dakota

Additional Information

A meeting was held with the SDSU National Wetlands Inventory team and the personnel at the regional SCS Office in Rapid City regarding the status of soil surveys of Custer and Pennington counties.

III. PHYSICAL DESCRIPTION OF PROJECT AREA

Geography

Bailey, Description of the Ecoregions of the United States (1980), describes the west-central South Dakota project area as the Wheatgrass--Needlegrass Section of the Great Plains-Shortgrass Prairie Province. This region is characterized by rolling plains and tablelands of moderate relief. They are in a broad belt that slopes gradually eastward down from an altitude of 5,500 feet (1,520 m.) near the foot of the Rocky Mountains to 2,500 feet (760 m.) in the Central States. The plains are notably flat, but there are occasional valleys, canyons, and buttes.

Climate

The climate is a semiarid continental regime in which maximum rainfall comes in summer, but the total supply of moisture is low. Ninety-five percent (95%) of basin collected run-off comes from the spring snowmelt. Evaporation usually exceeds runoff. The frost-free season is usually fewer than one-hundred (100) days and the precipitation is approximately ten (10) inches (200 mm). The average annual temperature is 45°F (8°C) throughout most of the region. Winters are cold and dry; the summers warm to hot.

Vegetation

Steppe, sometimes called shortgrass prairie, is a formation class of short grasses usually bunched and sparsely distributed, and is characteristic of this province. Scattered shrubs and trees occasionally appear in the steppe, and exist as all gradations of cover from semidesert to woodland formations. Since ground cover is scarce, much soil is exposed. Many species of grasses and herbs grow in this province.

Soils

In this climate regime, the dominant pedogenic process is calcification; salinization is dominant in poorly drained sites. Soils contain a large excess of precipitated calcium carbonate and are rich in bases. Molisols are typical. Humus content is small because vegetation is sparse.

IV. DESCRIPTION OF WETLAND HABITATS IN PROJECT AREA

Riverine

The major river drainages of Spearfish Creek, Castle Creek, and Rapid Creek are classified R3UBH or R2UBH in the upper elevations of the Black Hills and are classified R2UBG where they flow through the arid prairie. Boxelder Creek is classified R3UBH or R2UBH in the Black Hills but loses water in sink holes and is classified intermittent on the prairie. The Grand River, the Belle Fourche River, and the Redwater River, after the confluence of Spearfish Creek, are classified R2UBG. The Moreau River, the White River, the South Fork Grand River, and the North Fork Grand Rivers are classified as R2UBF.

Many intermittent streams exist on the study area. Intermittent streams are classified as R4SBA or R4SBC.

Lacustrine

Most of the lakes on the project area are impounded. The classifications are L1UBGh, L2ABFh or a combination of these classifications on larger impoundments. The predominant aquatic bed vegetation is Lemna spp.. Many of these lakes are bordered by persistent emergent vegetation. Natural lakes on the study area are usually shallow basins which are classified L2ABF, L2USC, or L2USA.

Palustrine:

The majority of wetlands on the study area are palustrine. Palustrine wetlands are located in basins, river floodplains, and many drainages. Some wetlands have been drained or tilled for agricultural purposes, but most wetlands are located on untilled prairie.

Emergents (PEMA, PEMC, PEMF) and aquatic bed (PABF) are the dominant cover types with smaller areas of scrub-shrub (PSSA) and forested (PFOA). Field checksites were documented where problem areas existed due to inconsistent wetland photosignatures. Vegetation observed in these wetland habitats were grouped according to class and water regime. The following plant species were identified on check sites or field sites and represent only a fraction of all wetland plant species occurring on the project area.

Palustrine Temporary Emergents: PEMA
Hordeum jubatum, foxtail barley
Agropyron smithii, western wheatgrass
Eleocharis spp., spikerush
Spartina pectinata, prairie cord grass
Kochia spp., fireweed
Helianthus spp., sunflower
Solidago spp., goldenrod
Melilotus spp., sweetclover
Stipa spp., needlegrass
Calamagrostis canadensis, Canada bluejoint
Agrostis stolonifera, redtop
Equisetum spp., horsetail
Polygonum spp., smartweed

Palustrine Saturated Emergent: PEMB
Scirpus spp., bulrush
Typha spp., cattail
Carex spp., sedge

Palustrine Seasonal Emergents: PEMC
Scirpus spp., bulrush
Typha spp., cattail
Eleocharis spp., spikerush
Phalaris arundinacea, reed canary grass
Mentha spp., mint
Sagittaria spp., arrowhead
Rumex spp., dock
Spartina pectinata, prairie cord grass
Juncus spp., rush
Polygonum, smartweed
Carex spp., sedge

Palustrine Semi-permanent Emergents: PEMF
Typha spp., cattail
Scirpus spp., bulrush
Nasturtium officinale, water cress

Palustrine Semi-permanent Aquatic Bed: PABF
Lemna spp., duckweed

Palustrine Temporary Scrub-shrub: PSSA
Populus spp., cottonwood
Salix spp., willow
Cornus stolonifera, red osier dogwood

Palustrine Temporary Forested: PFOA
Fraxinus spp., ash
Populus spp., cottonwood
Acer negundo, boxelder
Elaeagnus angustifolia, Russian Olive
Picea glauca var. densata, Black Hills spruce

OBSERVED WETLAND VEGETATION TABLE

A. EMERGENT

Angropyron smithii	western wheatgrass
Carex spp.	sedge
Eleocharis spp.	spikerush
Equisetum spp.	horsetail
Helianthus spp.	sunflower
Hordeum jubatum	foxtail barley
Juncus spp.	rush
Kochia spp.	fireweed
Melilotus spp.	sweetclover
Mentha spp.	mint
Phalaris arundinacea	reed canary grass
Polygonum spp.	smartweed
Rumex spp.	dock
Sagittaria spp.	arrowhead
Scirpus spp.	bulrush
Solidago spp.	goldenrod
Spartina pectinata	prairie cord grass
Stipa spp.	needlegrass
Typha spp.	cattail
Calamagrostis canadensis	Canada bluejoint
Agrostis stolonifera	redtop
Nasturtium officinale	water cress

B. AQUATIC BED

Lemna spp.	duckweed

C. SCRUB-SHRUB

Populus spp.	cottonwood
Rosa spp.	rose
Salix spp.	willow
Cornus stolonifera	red osier dogwood

D. FORESTED

Acer negundo	boxelder
Elaeagnus angustifolia	Russian Olive
Fraxinus spp.	ash
Populus spp.	cottonwood
Picea glauca var. densata	Black Hills spruce

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
R2UB	Riverine,	Meandering rivers,	Unconsolidated bottom

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

R3UB (F,G,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
[illegible] (G)	lower perennial, unconsolidated bottom	low gradient	[illegible]
R2US (A,C)	Riverine, lower perennial, unconsolidated shore	Mud, sand, or gravel bars	Unconsolidated shore
			(duckweed)
L2US (A,C)	Lacustrine, littoral, unconsolidated shore	Dry alkaline lake beds	Unconsolidated shore
L2AB (F,G)	Lacustrine, littoral aquatic bed	Shallow lake marshes	Hippuris vulgaris (marestail) Lemna spp. (duckweed)
PUB (F,G,H)	Palustrine, unconsolidated bottom	Open water	Unconsolidated bottom
PAB (F,G,K)	Palustrine, aquatic bed	Deep basins, impoundments, excavated tanks, or sewage treatment settling ponds	Hippuris vulgaris (marestail) Lemna spp. (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	Agropyron smithii (western wheat) Beckmania syzigachne (American sloughgrass) Carex spp. (sedges) Distichlis spicata (inland saltgrass) Eleocharis spp. (spikerush) Equisetum spp. (horsetail) Hordeum jubatum (foxtail barley) Juncus spp. (rush) Phalaris arundinacea (reed canary grass) Phleum pratense (timothy) Poa pratensis (Kentucky bluegrass) Polygonum spp. (smartweed) Rumex spp. (dock) Sagittaria spp. (arrowhead) Spartina pectinata (prairie cord grass) Nasturtium officinale (water cress)

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

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PSS (A,B,C)	Palustrine, scrub-shrub	Willow thicket, river banks or drainage areas	Salix spp. (willow) Rosa spp. (rose) Ribes spp. (currant)
PEM (continued) (A,B,C,F)			Populus deltoides Scirpus americanus (common threesquare) Scirpus validus (softstem bulrush) Typha spp. (cattail)
PFO (A,C)	Palustrine, forested	Cottonwood, river banks, floodplains, or drainage areas	Fraxinus spp. (ash) Acer negundo (boxelder) Populus deltoides (eastern cottonwood) Salix spp. (willow)
PUS (A,C)	Palustrine, unconsolidated shore	Salt flats	Unconsolidated shore

V. WATER REGIME DESRIPTION

(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 persist 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

The NHAP Color Infra-Red Emulsion is good quality. The dates imagery were flown ranged from July to October. The 1981 photography is much dryer than normal, especially the 9/13/81 photos. The 1982 (July and August) photography is wetter than normal. The fall 1982 photography (September and October) ranges from normal to slightly dry wetland conditions. Water conditions on the 1983 photography are above normal for September and October.

Ground truthing revealed that wetland water conditions were extremely dry for the middle of May. Most wetland basins were devoid of water but the unfarmed basins contained representative emergent hydrophytic vegetation. Wetland photosignatures correlated with actual wetland classifications with the exception of the extremely dry photography (9/13/81).

Field reconnaissance provided the following mapping conventions for all the imagery based on seasonal and climactic conditions. These conventions will cover general conventions, wetland basins, riverine and vegetated linears, oxbows, impoundments, and miscellaneous signatures.

GENERAL CONVENTIONS FOR WEST RIVER SOUTH DAKOTA WETLANDS

- All open water impoundments are classified ABF_h unless they are 15-19 acres in size and the water signature justifies UBG_h classification.

- All open water dugouts, except for waste water treatment facilities, are classified UBF_x and occasionally G_x if they are very large. Excavations exhibiting a AB photosignature are classified as such.

- Aquatic bed photosignatures are classified ABF, ABG, or ABH. There are no ABC classifications.

- Intermittent versus perennial riverine classifications were determined by photosignature coupled with other collateral data and in field observations. USGS quads had no bearing on riverine system classification.

- R2/3G versus R2/3H were determined by the South Dakota water resource data.

PHOTOGRAPHIC CONVENTIONS FOR BASIN WETLANDS

Temporary water Regimes

Temporary emergent basins can often be distinguished by their indistinct edges. However, these borders are quite distinct within agricultural areas of crops and haying. Depending on date of photography, temporary photosignatures exhibit a variety of gray, red, and brownish green tones, although some dates of photography show an open water signature for temporary basins.

The 13 September 1981 photography is extremely dry on the eastern quads. Temporary basins are a very indistinct light grey photosignature. Adjoining strips were used for collateral data.

On July 1981 imagery (which is slightly dryer than normal water conditions) temporary emergent basins exhibit a vegetated photosignature of light grays and a variety of reddish tones. Most wetlands have a mixture or a mottle of these tones, with others having a single tone photosignature. Some of the temporary basins on 1981 photography have extremely weak signatures which are difficult to distinguish from upland unless different land use methods are being employed. Temporary wetlands in agricultural fields have an unvegetated gray photosignature located within a basin type depression.

The 1982 imagery presents wetter than normal water conditions. Temporary basins are inundated with water on the June photography. However, there is an emergent signature present throughout the basin. Indistinct upland/wetland boundaries coupled with photosignatures on adjacent photos help to distinguish seasonal versus temporary wetland on this date of photography.

The majority of temporary wetlands on 1983 photography (above "normal" water conditions) have a red to deep red photosignature. The wetland borders are fringed with more subdued red tones.

Temporary oxbow basins are common along riverine and palustrine drainages. These areas exhibit gray and red signatures and have the characteristic crescent shape.

Unconsolidated shore temporary wetlands are a white basin with well defined edges. These wetlands are similar to blowout areas. However, blowout areas have diffuse and convoluted peripheries. Topographic maps and soil surveys provide valuable collateral data in these areas.

Seasonal Basins

July 1981 seasonal emergent wetlands exhibit deep red densely vegetated basins containing varying amounts of water.

On September 1981 (dry photography) imagery seasonal emergent basins exhibit a red-gray mottled photosignature. Open water is not present in the basins on this date of photography. However, the upland/wetland boundaries are well defined.

July 1982 (prairie) photography shows open water seasonal emergent basins which contain sparse wetland vegetation. Wetland vegetation photosignatures are varying tones of red. Open water seasonal have a very strong, well defined signature due to wet conditions at the time of photography. In the Black Hills emergent basins have a red/gray vegetated signature or a slate gray to open water signature. Black Hills seasonal basins are usually associated with linear wetlands.

September 1982 (prairie) seasonal emergent basins are a red/gray mottled

photosignature. Seasonal basins (Black Hills) have open water in the central zone ringed by a red mottled signature.

Seasonal lacustrine littoral basins, which often show light blue open water on the photography, are classified with the unconsolidated shore class.

Palustrine unconsolidated shore seasonal wetlands have a dark gray photosignature with a light gray to white border.

Seasonal oxbow basins are common along riverine and palustrine drainages. Photosignatures are open water, dark red or dark gray with distinct borders.

Semipermanent Water Regimes

Natural semipermanent basins are uncommon in this area. The majority of semipermanent wetlands are located within impoundments. Most unvegetated semipermanent impoundments are in the aquatic bed class. However, the periphery of some impoundment and in some cases the entire impoundment contain semipermanent emergent vegetation. Semipermanent vegetation is predominantly cattails. The photosignature is the typical emergent clumping with mottled tones of white/gray to red/gray.

Most natural palustrine emergent semipermanent wetlands exhibit an open water signature with some emergent clumping within the basin or on the periphery of the wetland. Even the dryer dates of photography have the characteristic clumped vegetation intermixed with open water. Some larger (> 20 acres) playa type lakes, which show open water on the photography, are classified as lacustrine littoral with the aquatic bed class, unless seen differently in the field.

Semipermanent oxbows along major rivers are also uncommon. These oxbows exhibit open water or a gray/white clumped signature and are classified semipermanent with an aquatic bed and/or emergent class.

CONVENTIONS FOR LINEAR WETLANDS

Linear wetlands are common. Delineation is determined by open water and/or emergents within the channel. On summer photography temporary palustrine linear wetlands with scrub-shrub and/or forested subclasses appear light red with a gray understory. Scrub-shrub and/or forested linears appear gray on the fall photography. Linears on the study area have a very limited floodplain. Most forested wetland are confined to the linear channel and do not extend into the surrounding riparian area, except for floodplains associated with major river systems. Temporary emergent linears are red/gray to deep/red on all dates of photography. However, on the July 1982 photography small pools of water are located within the linear channel. Fall photosignatures are light gray/red. Photointerpretation of these areas must take into account relative strength of the photosignature coupled with other collateral data such as watershed size and gradient. Temporary oxbows are crescent shaped with a light red photosignature. Semipermanent palustrine linears are uncommon.

Seasonal emergent linears have an open water channel or pools of water connected by a bright red vegetated photosignature. The Rapid City NE (1:100,000) quad has many seasonal linears containing with intermittent pools of water with light pink upland areas between the pools (check field sites). Seasonal oxbows are a deep red vegetated photosignature.

Semipermanent palustrine linears are uncommon on this study area. Photosignatures are aquatic bed or a clumped gray/red mottled signature indicative of cattails.

Waterways and runoff areas can be distinguished as upland by their pink photosignature and lack of discernable channel. These areas are often associated with agricultural land use.

Excavated linear wetlands are located within roadside ditches, particularly along roads which divide playa basins. These areas will usually be classified seasonal, however, some areas have a temporary or semipermanent water regime. Water regime photosignatures for excavated wetlands are the same as previously discussed for linear wetlands.

Linear intermittent riverine systems are classified by signature and watershed size. R4SBC linears generally exhibit an open water, unvegetated, streambed signature. Linears with a white substrate signature are classified R4SBA. Some R4SBA linears have small intermittent pools of water in the channel. Close examination of check sites and field sites aided in determining proper classifications of linear wetlands.

Perennial rivers are classified upper perennial or lower perennial with water regimes of F through H. Water regimes are determined by photosignature and the USGS Water Resources Data. Riverine sandbars with non-persistent vegetation are classified R2USA and braided channels associated with the main channel are classified R2USC.

SATURATED

Saturated areas are uncommon and restricted to the Black Hills portion of the study area. Saturated wetlands are located on hillsides and exhibit a mottled gray signature. These areas have indistinct boundaries indicative of seep areas. Check sites and field sites aided in proper classification of saturated areas.

MISCELLANEOUS

This section addresses obscure conventions that are uncommon throughout the work area.

Many vegetated and/or forested linears have a red photosignature similar to a temporary wetland signature. During field reconnaissance these areas were determined to be upland. Subtle differences in tone, watershed size, gradient of the linear, and in-field data were used to help distinguish these areas as upland.

Some small linear wetlands in the Black Hills were difficult to follow when they were forested or under a tree canopy. There courses were determined by slight differences in the forested photosignatures coupled with stream course data from the USGS quads.

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 summer and fall of 1981, 1982, and 1983.

Field check sites were evaluated within Lemmon NW, Lemmon SW, Lemmon SE, Lemmon NE, Rapid City SW, Rapid City NW, Rapid City SE, Rapid City NE, Hot Springs NW, and Hot Springs SW, Hot Springs SE, and Hot Springs NE project areas prior to the actual classification and delineation of wetlands. Field check sites were selected to clarify varying photosignatures. Wetland photosignatures were identified in the field using vegetation types, soil types, and additional input from field personnel. Checksite wetlands have an asterisk (*) preceding the alphanumeric label. Wetlands visited but not checksited have the water regime in the alphanumeric label underlined.

Collateral data included USGS topographic maps, SCS soil surveys, USGS water resources data, vegetation, climate, 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 was taken during a particular time and season, there may be discrepancies between the maps and current field conditions. Changes in landscape which occurred after the photography was taken would result in such discrepancies.

Aerial photointerpretation and quality control was completed by the South Dakota Cooperative Fish and Wildlife Research Unit, SDSU, Brookings, S.D. with final quality control conducted by the FWS.

VIII. SPECIAL MAPPING PROBLEMS

The photosignatures generally correlated well with the wetlands observed. The 1983 (August and September) and 1982 (June) photography showed above normal water conditions for the particular photo dates. A slightly conservative approach was employed when determining wetland water regimes. Conversely, the September 1981 (dry) imagery presents temporary emergent signatures which are barely discernable. Adjoining photography was used as collateral data for these dry and indistinguishable signatures. Soil surveys 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.

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.

X. LITERATURE CITED

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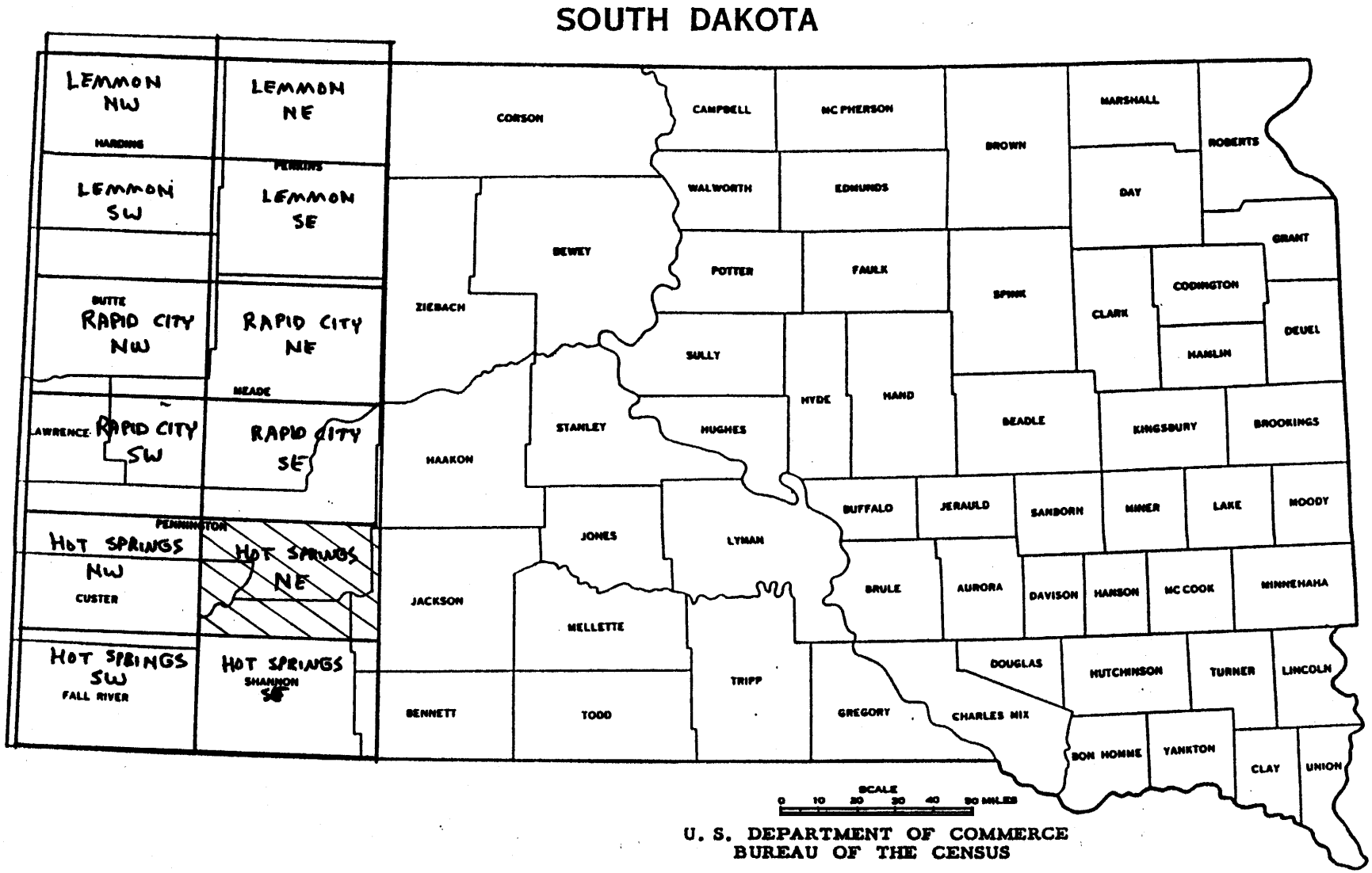
7.5 Minute, 7.5 X 15 Minute, and 1:250,000 USGS Topographic Maps.

Appendix A: Locator Map