

**NATIONAL WETLANDS INVENTORY**

**MAP REPORT**

**NEWCASTLE NE, NEWCASTLE SE**

**GILLETTE NE, GILLETTE SE**

**BLACK HILLS, WYOMING**

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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 the 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 Black Hills study area is located in the Great Plains-Shortgrass Prairie Province in North Eastern Wyoming. Field reconnaissance covered the area of each 1:100,000: Newcastle NE, Newcastle SE, Gillette NE, Gillette SE and Cody NE (Appendix A, Locator Map).

Note: The Cody NE 1:100,000 was included in this mapping effort but because of it's geographical location, the description of it's climate, soils, etc., will not be included in this report. Cody NE will be described in the Map Report for the Big Horn, Wyoming, along with Cody SE and Thermoplis NE.

### Field Personnel

Bill Pearson - U.S. Fish and Wildlife Service  
Renee Whitehead - U.S. Fish and Wildlife Service  
Lynn Ashby - Geonex, Inc.  
Carolina Perea - Geonex, Inc.  
Dan Jones - Geonex, Inc.

### Field Dates

July 29, 1990 - August 8, 1990

### Aerial Photography

Data Source (100%)

Type: NHAP Color Infra-Red High Altitude

Scale: 1:58,000

Newcastle NE: 7/6/81, 9/13/81, 9/18/81, 8/6/82, 9/20/82, 9/24/82

Newcastle SE: 7/6/81, 9/13/81, 8/6/82, 9/20/82, 9/24/82

Gillette NE: 7/6/81, 9/18/81, 8/6/82, 9/20/82

Gillette SE: 7/6/81, 9/13/81, 9/18/81, 8/6/82, 9/20/82, 10/7/82

Percent Coverage: All 128 USGS quadrangles were covered with the NHAP photography.

### Collateral Data

United States Geological Survey (USGS) Quadrangles

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

Bailey's Description of the Ecoregions of the United States

Wyoming General Soil Map

United States Fish and Wildlife Service Wetland Plant Keys

Water Resources Data Wyoming, WY-84

National List of Plant Species That Occur In Wetlands: Northwest (Region IX)

Wetland Plants of the State Of Wyoming

Peterson's Fieldguide to Rocky Mountain Wildflowers

A Handbook of Wetland plants of the Rocky Mountain Region

### III. PHYSICAL DESCRIPTION OF PROJECT AREA

#### Geography

Newcastle NE, SE and Gillette NE, SE are located on the eastern border of Wyoming and South Dakota (Appendix A, Locator Map). According to Bailey's Description of the Ecoregions of the United States this study area falls into 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 elevation 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.

A significant portion of the Black Hills National Forest is located within the study area.

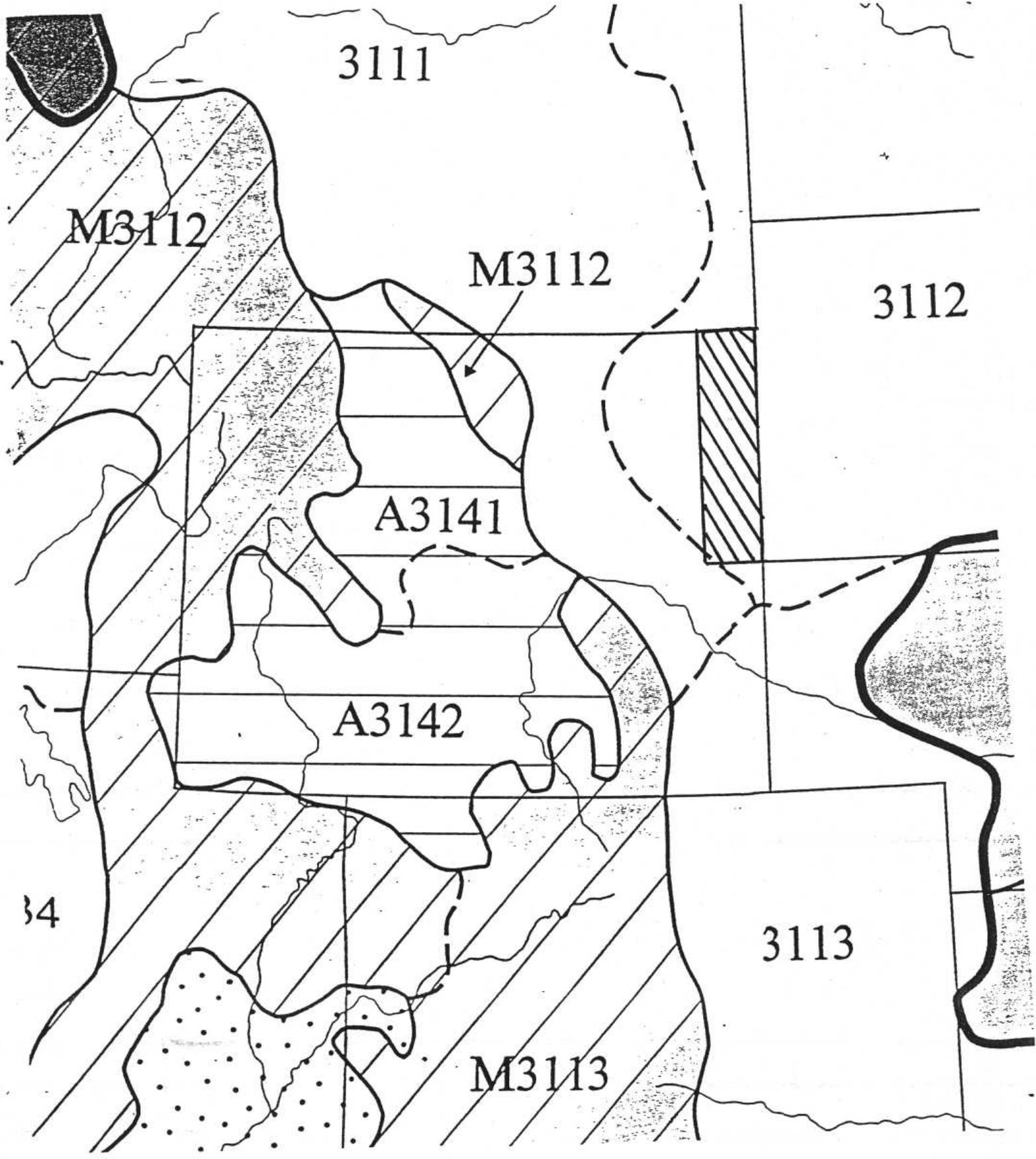
#### Climate

The combination of high elevation and dry air cause wide variations in both daily and seasonal temperatures resulting in a semi-arid climate. Precipitation ranges from 12 to 18 inches. A major portion of the precipitation occurs during April, May and June. The higher amounts occur in the Black Hills and near the Nebraska border in the southeast. The frost-free season varies from about 110 to 140 days. Extended dry periods are common during summer and early fall.

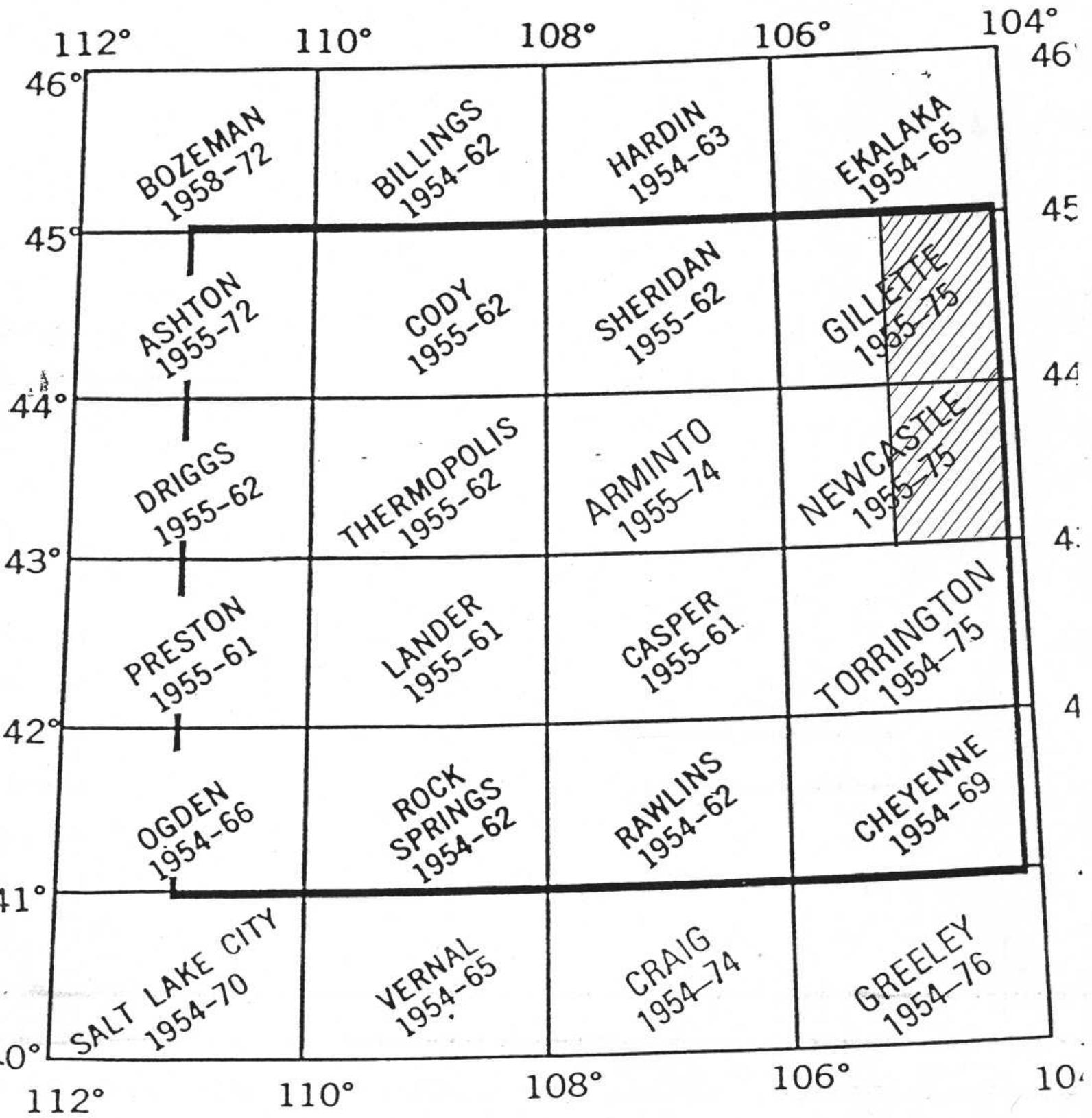
#### Vegetation

Short and mid grasses predominate in most of the area. Tall grasses and shrubs are found in areas of high precipitation. Scattered areas of ponderosa pine are adjacent to the Black Hills and in smaller scattered areas in Campbell, Niobrara, Platte, and Goshen Counties. Streams and valley bottoms are lined with willow, cottonwood and sedges while wet meadows support a mixture of sedges, rushes and grasses.

Locator Map (A)



LOCATOR MAP (B)



## Soils

Soils within the study area all fall into one group, defined as a Great Group by the "Wyoming General Soil Map", Soils of the High Plains of Eastern Wyoming. This classification is further broken into climate zones and soil associations.

Soils of three of the ten soil orders are represented in the High Plains area. These are the Entisols, Aridisols and Mollisols. The Entisols are represented by the Torriorthents, Torrifluvents and Torripsamments. The Aridisols are represented by Haplargids, Paleargids and Camborthids. The Mollisols are represented by Haplustolls and Argiustolls.

## **IV. DESCRIPTION OF WETLAND HABITATS IN PROJECT AREA**

### Riverine

The major perennial drainage in this study area is the Belle Fourche River, located in Gillette NE, and is classified as lower perennial, unconsolidated bottom, intermittently flooded (R2UBG).

Several major intermittent drainages such as the Cheyenne River, located in Newcastle SE, and the Little Missouri River, located in Gillette NE, are found within the study area. Intermittent streams are classified as intermittent, streambed R4SB. These intermittent streams can be flooded temporarily (R4SBA), seasonally (R4SBC) or occasionally on a semi-permanent basis (R4SBF). The excavation modifier is used with irrigation ditches (R4SBFX) and on streams that have been diverted and channelized by man.

Riverine bars are classified as R2USC.

### Lacustrine

Reservoirs and impoundments greater than 20 acres such as Keyhole Reservoir located in Gillette SE are classified as limnetic, unconsolidated bottom permanently flooded (L1UBHh). Any exposed shoreline will be classified as littoral, unconsolidated shore, seasonally or temporarily flooded (L2USC/Ah). Aquatic bed found along these large reservoirs, as well as shallow impoundments over 20 acres are classified as littoral, aquatic bed, intermittently exposed (L2ABGh). Persistent emergents associated with these reservoirs are classified under the palustrine system. All wetlands and deepwater habitats associated with reservoirs are classified using the impounded modifier (h).

Natural, shallow lakes, in excess of 20 acres, with or without aquatic bed are classified as littoral, aquatic bed, intermittently exposed (L2ABG).

Dry basins, in excess of 20 acres, are classified as unconsolidated shore, seasonally or temporarily flooded (L2USC/A).

Large mining pits are classified as limnetic, unconsolidated bottom, permanently flooded with an excavated modifier (L1UBHx).

### Palustrine

Palustrine wetlands are found along streams and rivers in flood plains and oxbows, in fields, in and around impounded areas and in drainages.

Temporarily flooded emergent (PEMA), seasonally flooded emergent (PEMC) semipermanently emergent (PEMF) and semipermanently flooded aquatic bed (PABF) comprised the dominant wetland types observed. Areas of temporarily flooded, scrub-shrub, (PSSA) and temporarily flooded, forested (PFOA), were observed with less frequency. Also occasionally observed were mountain springs which create saturated emergent (PEMB) and saturated shrub-scrub (PSSB) wetlands. Wetlands classified with the saturated (B) water regime are located only on slopes. Numerous beaver ponds are found within the study area and are mapped as aquatic bed, intermittently exposed, beaver modifier (PABGb). Vegetation affected by these beaver dams will carry the beaver modifier (b). Field check sites were documented where problems existed; i.e., wetland areas that were not readily recognizable on the photography. Impoundments and excavated areas such as dugouts or clay mining pits, less than 20 acres in size, are classified in the palustrine system as aquatic bed, semipermanently flooded, excavated (PABFx) and unconsolidated shore, seasonally or temporarily flooded, excavated (PUSC/Ax) according to their photo signature. Mining pits associated with oil and gas are classified as unconsolidated bottom, semipermanently flooded, excavated (PUBFx). Dry basins and unvegetated shore areas are classified unconsolidated shore, seasonally or temporarily flooded (PUSC/A). The impounded (h) and excavated (x) modifiers will be applied where appropriate. Vegetation observed in these wetland habitats were grouped according to class and water regime. Table I lists plant species that were identified on check sites and represent only a fraction of all wetland plant species occurring in the study area. Table II lists characteristic vegetation for each water regime.

**TABLE I**  
**OBSERVED WETLAND VEGETATION**  
 (grouped by wetland class)

**Palustrine Temporary Unconsolidated Shore: PUSA**

<u>Suaeda</u> sp.	sea blight
<u>Distichlis spicata</u>	inland saltgrass
<u>Salicornia europaeae</u>	slender glasswort

**Palustrine Temporary Emergents: PEMA**

<u>Amaranthus</u> sp.	redroot
<u>Agropyron smithii</u>	western wheat
<u>Andropogon gerardii</u>	big blue stem
<u>Distichlis spicata</u>	inland saltgrass
<u>Hordeum jubatum</u>	foxtail barley
<u>Salicornia europaeae</u>	slender glasswort
<u>Triglochin maritima</u>	arrowgrass
<u>Phalaris arundinacea</u>	reed canary grass
<u>Phragmites communis</u>	phragmites

**Palustrine Seasonal Emergents: PEMC**

<u>Eleocharis</u> sp.	spikerush
<u>Rumex</u> sp.	dock
<u>Juncus</u> sp.	rush
<u>Scirpus americanus</u>	American three square
<u>Carex</u> sp.	sedge
<u>Polygonum</u> sp.	smartweed

**Palustrine Semipermanent Emergents: PEMF**

<u>Typha</u> sp.	cattail
<u>Scirpus acutus</u>	hardstem bulrush
<u>Scirpus fluviatilis</u>	river bulrush

### Palustrine Semipermanent Aquatic Bed: PABF

<u>Sagittaria</u> sp.	arrowhead
<u>Lemna minor</u>	duckweed

### Palustrine Temporary Scrub-shrub: PSSA

<u>Elaeagnus angustifolia</u>	Russian-olive
<u>Salix discolor</u>	pussy willow
<u>Salix</u> sp.	willow
<u>Potentilla fruticosa</u>	shrubby cinquefoil
<u>Tamarix pentandra</u>	salt cedar

### Palustrine Seasonal Scrub-shrub: PSSC

<u>Salix</u> sp.	willow
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### Palustrine Temporary Forested: PFOA

<u>Acer negundo</u>	box elder
<u>Fraxinus anomala</u>	single leaf ash
<u>Populus deltoides</u>	eastern cottonwood

**TABLE II**  
**OBSERVED WETLAND VEGETATION TABLE**  
 (grouped by sub-class)

**A. EMERGENT**

<u>Agropyron smithii</u>	western wheat
<u>Amaranthus</u> sp.	redroot
<u>Andropogon gerardii</u>	big blue stem
<u>Carex</u> sp.	sedge
<u>Distichlis spicata</u>	inland saltgrass
<u>Eleocharis</u> sp.	spikerush
<u>Hordeum jubatum</u>	foxtail barley
<u>Juncus</u> sp.	rush
<u>Phalaris arundinacea</u>	reed canary grass
<u>Phragmites communis</u>	phragmites
<u>Polygonum</u> sp.	smartweed
<u>Rumex</u> sp.	dock
<u>Salicornia europaeae</u>	slender glasswort
<u>Scirpus acutus</u>	hardstem bulrush
<u>Scirpus americanus</u>	American three square
<u>Scirpus fluviatilis</u>	river bulrush
<u>Suaeda</u> sp.	sea blight
<u>Triglochin maritima</u>	arrowgrass
<u>Typha</u> sp.	cattail

**B. AQUATIC BED**

<u>Lemna minor</u>	duckweed
<u>Sagittaria</u> sp.	arrowhead

**C. SCRUB-SHRUB**

<u>Elaegnus angustifolia</u>	Russian-olive
<u>Potentilla fruticosa</u>	shrubby cinquefoil
<u>Salix discolor</u>	pussy willow
<u>Salix</u> sp.	willow
<u>Tamarix pentandra</u>	salt cedar

**D. UNCONSOLIDATED SHORE**

Distichlis spicata

Salicornia europeae

Suaeda sp.

inland saltgrass

slender glasswort

sea blight

**E. FORESTED**

Acer negundo

Fraxinus anomale

Populus deltoides

box elder

single leaf ash

eastern cottonwood

TABLE III

WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

NWI CLASSIFICATION FOR WYOMING (1 of 3)

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
R2UB (G,H)	Riverine, lower perennial, unconsolidated bottom	Rivers, irrigation canals	Unconsolidated bottom
R3UB (H)	Riverine, upper perennial, unconsolidated bottom	Mountain rivers or streams	Unconsolidated bottom
R2US (C)	Riverine, lower perennial, unconsolidated shore	Flats	Sand or mud
R4SB (F,C,A)	Riverine, intermittent, stream bed	Streams or irrigation canals	Sand or mud
L1UB (H)	Lacustrine, limnetic, unconsolidated bottom	Lakes, reservoirs mining pits	Unconsolidated bottom
L2AB (G,F)	Lacustrine, littoral, aquatic bed	Deep Marsh, lakes, or reservoirs	Submerged and floating aquatics
L2US (C,A)	Lacustrine, littoral, unconsolidated shore	Lake flats, beach	Sand or mud
PUB (F)	Palustrine, unconsolidated bottom	Gravel pits, oil and gas pits	Unconsolidated bottom
PUB (H)	Palustrine, unconsolidated bottom	Hot springs	Unconsolidated bottom
PAB (F,G)	Palustrine, aquatic bed	Vegetated ponds, beaver ponds, or sewage ponds	<u>Lemna</u> sp. (duckweed) <u>Sagittaria</u> sp. (arrowhead)

TABLE III

WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

NWI CLASSIFICATION FOR WYOMING (2 of 3)

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
PEM (F,C,B,A)	Palustrine, emergent	Meadows, depressions, swales, floodplains, seeps, oxbows, or springs	<p><u>Suaeda</u> sp. (sea blight)</p> <p><u>Distichlis spicata</u> (inland saltgrass)</p> <p><u>Salicornia europaeae</u> (slender glasswort)</p> <p><u>Amaranthus</u> sp. (redroot)</p> <p><u>Agropyron smithii</u> (western wheat)</p> <p><u>Andropogon gerardii</u> (big blue stem)</p> <p><u>Distichlis spicata</u> (inland saltgrass)</p> <p><u>Hordeum jubatum</u> (foxtail barley)</p> <p><u>Salicornia europaeae</u> (slender glasswort)</p> <p><u>Triglochin maritima</u> (arrowgrass)</p> <p><u>Phalaris arundinacea</u> (reed canary grass)</p> <p><u>Phragmites communis</u> (phragmites)</p> <p><u>Eleocharis</u> sp. (spikerush)</p> <p><u>Rumex</u> sp. (dock)</p> <p><u>Juncus</u> sp. (rush)</p> <p><u>Scirpus americanus</u> (American three square)</p> <p><u>Carex</u> sp. (sedge)</p> <p><u>Polygonum</u> sp. (smartweed)</p> <p><u>Typha</u> sp. (cattail)</p> <p><u>Scirpus acutus</u> (hardstem bulrush)</p> <p><u>Scirpus fluviatilis</u> (river bulrush)</p>

TABLE III

WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

NWI CLASSIFICATION FOR WYOMING (3 of 3)

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
PSS (C,B,A)	Palustrine, scrub-shrub	Shrub wetlands	<u>Elaeagnus angustifolia</u> (Russian-olive) <u>Salix discolor</u> (pussy willow) <u>Salix</u> sp. (willow) <u>Potentilla fruticosa</u> (shrubby cinquefoil) <u>Tamarix pentandra</u> (salt cedar)
PFO (B,A)	Palustrine, forested	Forested wetlands	<u>Acer negundo</u> (box elder) <u>Fraxinus anomala</u> (single leaf ash) <u>Populus deltoides</u> (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

The emulsion of the NHAP color infra-red photography is of high quality with the exception of that produced by flight line number 461, flown on 9/18/91. Flight line 461 provided 3% percent of the photography for Gillette SE, 12.5% percent for Gillette NE and 10% percent for Newcastle NE. Photography from this flight line has an emulsion that is quite bleached out.

Ground truthing revealed that water levels were below normal, information gathered from local sources indicated that the area was four years into a drought. Water levels were significantly lower than portrayed by the imagery.

## 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. The majority of the photography was taken during the fall of 1981 and 1982.

Field checks of areas within Newcastle NE, SE, Gillette NE and SE were made prior to the actual delineation of wetlands. Field check sites were selected to clarify varying signatures found on the photography. These photographic 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, 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 drafting were completed by Geonex, Inc., St. Petersburg, Florida with quality control conducted by the United States Fish and Wildlife Service.

## VIII. SPECIAL MAPPING PROBLEMS

Photography from flight line number 461 is quite bleached out, the overall color is a light brown and the image densities are very low. An emulsion of this low quality makes interpretation difficult, small wetland areas with light signatures are almost invisible and in general wetlands appear dryer. When delineating photographs in this series extensive comparisons were made with "tie photographs" from different flight lines with special attention given to areas of overlap and wetlands that continued from a tie photograph.

Flight line number 353 and 347 show different water levels, this was especially apparent on the photos of Keyhole Reservoir in Gillette SE. Both series of photography reflect a water level than that observed during ground truthing. Adjustments were made to indicate a probable average water level.

In general the correlation between photo signatures and observed field conditions is excellent.

## IX. MAP ACQUISITION

To discuss any questions concerning these maps or to place a map order, please contact:

Regional Wetland Coordinator  
U.S. Fish and Wildlife Service - Region 6  
Denver Federal Center  
P.O. Box 25468  
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.

## LITERATURE CITED

- Bailey, R.G., 1978. Description of the Ecoregions of the United States. United States Department of Agriculture, Forest Service.
- Cooper, D.J., A Handbook of Wetland Plants of the Rocky Mountain Region. 1989 United States Environmental Protection Agency, Region VIII.
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