

**NATIONAL WETLANDS INVENTORY**

**MAP REPORT OF SOUTHWEST COLORADO**

**FOR THE 1:100,000 MAP UNITS OF:**

**MOAB NE, MOAB SE, MONTROSE NW, MONTROSE NE, MONTROSE SW,  
CORTEZ NE, CORTEZ SE, DURANGO NW, DURANGO SW**

**U.S. Fish and Wildlife Service  
Denver, Colorado  
November 1993**

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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 Southwest Colorado study area is located in the Rocky Mountain Forest Province and the Colorado Plateau Province in Southwest Colorado. Field reconnaissance covered the area of each 1:100,000: Moab NE, Moab SE, Montrose NW, Montrose NE, Montrose SW, Cortez NE, Cortez SE, Durango NW and Durango SW. (Appendix A Locator Map).

Field Personnel

- Renee Whitehead - U.S. Fish and Wildlife Service
- Lynn Ashby - Geonex, Inc.
- Marty Ryan - Geonex, Inc.
- Karl Schultz - Geonex, Inc.
- Monique Zarindast - Geonex, Inc.

Field Dates

July 16 - 26, 1993

Aerial Photography

Primary Source Data (100.0%)

Type: NHAP Color Infra-Red High Altitude

Scale: 1:58,000

Moab SE: 10/04/82, 10/06/82, 09/11/83, 09/12/83

Moab NE: 10/04/82, 10/06/82, 09/11/83, 09/12/83, 09/20/83

Montrose SW: 06/27/82, 07/31/82, 09/12/83, 09/20/83,  
09/09/84

Montrose NW: 06/27/82, 07/31/82, 09/12/83, 09/20/83

Montrose NE: 09/22/83, 09/08/85, 09/18/87, 09/30/87

Cortez NE: 09/20/83, 10/04/83, 09/18/87

Cortez SE: 09/20/83, 10/04/83, 08/16/85, 07/27/86,  
09/18/87

Durango NW: 07/27/86, 09/19/87, 09/29/87, 09/16/88

Durango SW: 07/27/86, 09/19/87, 09/29/87, 10/04/87,  
09/16/88

Collateral Data

United States Geological Survey (USGS) Quadrangles

Soil Conservation Service Soil Surveys

Bailey's Description of the Ecoregions of the United States

National List of Plant Species That Occur In Wetlands:  
Central Plains (Region V) and Intermountain (Region VIII)

Wetland Plants of the State of Colorado

Hydric Soils of the State Of Colorado

United States Fish and Wildlife Service Wetland Plant Keys

Cowardins Classification of Wetlands and Deepwater Habitats  
of the United States

### III. PHYSICAL DESCRIPTION OF PROJECT AREA

#### Geography

The study area is located in the southwestern portion of Colorado. The Rocky Mountain Province is covered by the Gunnison, San Juan, Uncompahgre and Grand Mesa National Forests. The San Juan Mountains lie within these forests and range in altitude from 8,000 to 14,000 feet. The Ute Mountain Indian Reservation, Southern Ute Indian Reservation and Mesa Verde National Park lie within the Colorado Plateau Province. Altitude in this region ranges from 5,000 to 10,000 feet.

Numerous saturated emergent areas cover these mountains and beaver activity is abundant throughout. Irrigated hayed fields were found in the northern portion. The San Juan, Dolores, San Miguel, Mancos, La Plata, Arkansas, Gunnison and Uncompahgre Rivers flow through the study area.

#### Climate

The Colorado Plateau Province is characterized by cold winters. Summer days are usually hot with nights being cool. Average annual temperatures are 40°F and 55°F. Average annual precipitation is about 20 inches although some parts receive less than 10 inches.

The climate in the Rocky Mountain Province varies with altitude. Precipitation ranges from 20 inches to 40 inches with a considerable portion falling as snow. Permanent snow fields and glaciers cover only small areas. Average annual temperatures are 35°F and 45°F.

#### Vegetation

In the Colorado Plateau Province the area is covered by arid grasslands with many bare areas. Sagebrush is dominant over extensive areas. Cottonwoods and, more rarely, other trees such as alder, grow along some of the permanent streams.

Vegetation in the Rocky Mountain Province varies with different zones. The uppermost zone is the alpine, which is characterized by alpine tundra and the absence of trees. The subalpine is next and is dominated by subalpine fir and Englemann spruce. The montane zone is characterized by ponderosa pine and Douglas-fir. Usually after a fire the original forest is replaced by aspen or lodgepole pine.

## Soils

In the Colorado Plateau Entisols occur along the floodplains of major streams. Aridisols occupy the plateau tops, older terraces and alluvial fans. Bad lands of rough broken lands are extensive in the mountains and on plateaus.

In the Rocky Mountains, soil orders occur in zones corresponding to the vegetation zones. These range from Mollisols and Alfisols in the montaine zone to Aridisols in the foothill zone. In addition, because of steep slopes and recent glaciation, there are also areas of Inceptisols.

## IV. DESCRIPTION OF WETLAND HABITATS IN PROJECT AREA

### Riverine

Major rivers flowing through the work area are the Arkansas, Dolores, La Plata, Mancos, San Miguel, Gunnison and Uncompahgre Rivers. These are classified as R3UBH.

Small streams in the mountains will be classified as R3UBG. Signature may be camouflaged by tree canopy. In the lower elevations these will be classified as R3UBF.

Riverine bars and flats will be classified as R3USC and R3USA.

Intermittent streams will be classified as R4SBC and R4SBA.

### Lacustrine

Mountain lakes with a bedrock shoreline will be classified as L1UBH. Lakes in the lacustrine system with an aquatic bed signature will be classified as L2ABG.

Reservoirs will be L1UBHh and flats associated with these will carry the L2USCh or L2USAh classification. Reservoirs with a photo signature of aquatic bed will be classified as L2ABGh.

Large mining pits will be classified as L1UBGx.

## Palustrine

The majority of wetlands in the study area are palustrine. Saturated emergents are numerous throughout the higher elevations. Hayed fields can be found primarily in the northern portion of the study area.

Emergents classified as PEMF, PEMC, PEMB and PEMA were found throughout with the PEMB and PEMC being the dominant cover types. Areas of aquatic bed PABG and PABF were seen, as well as an abundance of beaver ponds (PABGb). Areas of scrub-shrub PSSC, PSSB and PSSA were more commonly found than wet forested PFOA.

Field check sites were documented where problems existed; i.e., wetland areas that were not readily recognizable on the photography. Vegetation observed in these wetland habitats were grouped according to class and water regime. The following plant species were identified on check sites and represent only a fraction of all wetland plant species occurring in the project area.

TABLE I  
OBSERVED WETLAND VEGETATION

Palustrine Temporary Emergents: PEMA

<u>Agropyron smithii</u>	western wheat
<u>Agrostis alba</u>	red top
<u>Hordeum brachyantherum</u>	meadow barley
<u>Hordeum jubatum</u>	foxtail barley
<u>Juncus</u> sp.	rushes
<u>Phleum pratense</u>	timothy
<u>Rumex verticillatus</u>	water dock

Palustrine Seasonal Emergents: PEMC

<u>Carex</u> sp.	sedge
<u>Carex utriculata</u>	beak-nosed sedge
<u>Juncus</u> sp.	rushes
<u>Scirpus pungens</u>	American three square
<u>Triglochin</u> sp.	arrow-grass

Palustrine Semipermanent Emergents: PEMF

<u>Scirpus</u> sp.	bulrush
<u>Scirpus acutus</u>	hardstem bulrush
<u>Scirpus americanus</u>	Olney's bulrush
<u>Typha</u> sp.	cattail
<u>Typha latifolia</u>	broadleaf cattail

Palustrine Saturated Emergents: PEMB

<u>Aconitum columbianum</u>	monkshood
<u>Carex</u> sp.	sedge
<u>Carex aquastatirallis</u>	water sedge
<u>Carex utriculata</u>	beak-nosed sedge
<u>Castilleja</u> sp.	Indian paintbrush
<u>Equisetum</u> sp.	horsetail
<u>Fragaria ovalis</u>	strawberry
<u>Hippuris</u> sp.	mare's tail
<u>Iris missouriensis</u>	iris
<u>Juncus</u> sp.	rushes
<u>Juncus compresses</u>	flattened rush
<u>Mertensia</u> sp.	chiming bells
<u>Pedicularis groenlandica</u>	elephant's head
<u>Sphagnum</u> sp.	sphagnum
<u>Rhodiola integrifolia</u>	kings crown
<u>Taraxacum</u> sp.	dandelion
<u>Typha latafolia</u>	cattail



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

A. EMERGENT

<u>Agropyron smithii</u>	western wheat
<u>Agrostis alba</u>	red top
<u>Carex</u> sp.	sedge
<u>Carex aquastatirallis</u>	water sedge
<u>Carex utriculata</u>	beak-nosed sedge
<u>Castilleja</u> sp.	Indian paintbrush
<u>Equisetum</u> sp.	horsetail
<u>Hordeum brachyantherum</u>	meadow barley
<u>Hordeum jubatum</u>	foxtail barley
<u>Hippuris</u> sp.	mare's tail
<u>Iris missouriensis</u>	iris
<u>Juncus</u> sp.	rushes
<u>Juncus compresses</u>	flattened rush
<u>Mertensia</u> sp.	chiming bells
<u>Pedicularis groenlandica</u>	elephant's head
<u>Phleum pratense</u>	timothy
<u>Rumex</u> sp.	dock
<u>Rumex verticillatus</u>	water dock
<u>Scirpus</u> sp.	bulrush
<u>Scirpus acutus</u>	hardstem bulrush
<u>Scirpus americanus</u>	Olney's bulrush
<u>Scirpus pungens</u>	American three square
<u>Sphagnum</u> sp.	sphagnum
<u>Triglochin</u> sp.	arrow-grass
<u>Typha</u> sp.	cattail
<u>Typha latifolia</u>	broadleaf cattail

B. SHRUBS

<u>Salix</u> sp.	willow
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C. FORESTED

<u>Populus angustifolia</u>	narrowleaf cottonwood
<u>Populus deltoides</u>	eastern cottonwood

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

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
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	Streambed
L1UB (G,H)	Lacustrine, littoral, unconsolidated shore	Deep lakes, mining pits	Unconsolidated bottom
L2AB (G)	Lacustrine, littoral, aquatic bed	Shallow lake marshes	Aquatic bed
L2US (C,A)	Lacustrine, littoral, unconsolidated shore	Flats	Unconsolidated shore
PUB (F,K)	Palustrine, unconsolidated bottom	Open water, fish hatcheries	Unconsolidated bottom
PAB (F,G)	Palustrine, aquatic bed	Deep basins, impoundments, beaver ponds, excavated ponds, or sewage treatment settling ponds	Aquatic bed
PEM (A,B,C,F)	Palustrine, emergent	Basins, depressions, marshes, meadows, springs, seeps, or drainage areas	<u>Agropyron smithii</u> (western wheat) <u>Agrostis alba</u> (red top) <u>Carex</u> sp. (sedge) <u>Carex aquatilis</u> (water sedge) <u>Carex utriculata</u> (beak-nosed sedge)

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

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PEM (cont.)			<u>Castilleja</u> sp. (Indian paintbrush) <u>Equisetum</u> sp. (horsetail) <u>Hordeum brachyantherum</u> (meadow barley) <u>Hordeum jubatum</u> (foxtail barley) <u>Hippuris</u> sp. (mare's tail) <u>Iris missouriensis</u> (iris) <u>Juncus</u> sp. (rushes) <u>Juncus compresses</u> (flattened rush) <u>Mertensia</u> sp. (chiming bells) <u>Pedicularis groenlandica</u> (elephant's head) <u>Phleum pratense</u> (timothy) <u>Rumex</u> sp. (dock) <u>Rumex verticillatus</u> (water dock) <u>Scirpus</u> sp. (bulrush) <u>Scirpus acutus</u> (hardstem bulrush) <u>Scirpus americanus</u> (Olney's bulrush) <u>Scirpus pungens</u> (American three square) <u>Sphagnum</u> sp. (sphagnum) <u>Triglochin</u> sp. (arrow-grass) <u>Typha</u> sp. (cattail) <u>Typha latifolia</u> (broadleaf cattail)

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

NWI CODE WATER REGIME	COWARDIN DESCRIPTION	COMMON DESCRIPTION	VEGETATION
PSS (C,B,A)	Palustrine, scrub-shrub	Willow thicket, river banks, or drainage areas	<u>Alnus</u> sp.(alder) <u>Salix</u> sp. (willow)
PFO (A)	Palustrine, forested	River banks, floodplains, or drainage areas	<u>Alnus</u> sp.(alder) <u>Populus deltoides</u> (eastern cottonwood) <u>Populus angustifolia</u> (narrowleaf cottonwood)
PUS (C,A)	Palustrine, unconsolidated shore	Dug outs, 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.

VI. IMAGERY

Overall the emulsion of the NHAP color infra-red photography is of high quality. The majority of our photography was flown in 1982, 1983, 1984, 1985, 1986, 1987 and 1988. Ground truthing revealed field conditions similar to those portrayed on imagery.

## PHOTOGRAPHIC CONVENTIONS

### Riverine Systems

Permanent rivers in the study area will be classified as R3UBH. Photo signature will be open water. Some examples of this classification are the Dolores, Gunnison and La Plata Rivers. Small streams in the mountains may be camouflaged by tree canopy. We will use the topo as a guide to determine where these streams are located. These will be classified as R3UBG.

Smaller stream channels in lower elevations with an open water signature will be classified as R3UBF. Intermittent streams with little to no water present in channel will be labeled R4SBC and R4SBA.

Sand and mud flats along perennial rivers will be classified as R3USC and R3USA. Signature will vary from white to blue gray mixture.

### Lacustrine System

Mountain lakes, regardless of size, with any part of the shoreline as bed rock will be classified as L1UBH.

Lakes over twenty acres with an aquatic bed signature will be classified as L2ABG.

Reservoirs will be L1UBHh and flats associated with reservoirs over (20) twenty acres will be classified as L2USCh and L2USAh. Signatures will vary from a bluish gray to white.

Large mining pits with an open water signature will be classified as L1UBGx.

### Palustrine System

Temporarily flooded emergents (PEMA) were seen mostly in the lower elevations. Hayed fields in the northern portion of the study area contained the largest area of temporary emergents observed. Signatures varied from bluish mottled to a variety of pink and reddish tones. There were also areas with a mixture of pink and white, light brown and yellow flesh-toned signatures.

Seasonally flooded emergents (PEMC) were also found more in the lower elevations. These usually were in drainages, swales and pockets. Signatures range from pink, red, brown and dark green and usually consisted of a mixture of two or more of these signatures.

Semipermanently flooded emergents (PEMF) were found as swales and pockets and in shallow lakes. Signatures vary from dark red/black, reddish purple, dark green/brown, and a textured red. The key for PEMF is the rough texture that the cattail and hardstem produce which is absent in the seasonally flooded signature.

Saturated emergents PEMB were sometimes difficult to distinguish and have varying signatures depending on the location within the study area. These areas are found as springs, on slopes and in the mountains. While ground truthing we found that the majority of emergent wetlands regardless of slope were saturated in the higher elevations. Signatures varied from a light pink to mottled deeper shades of pink, red, green and brown. Emergents associated with beaver dams will be classified as saturated and will carry the beaver (b) modifier.

The aquatic bed classification is used on a variety of wetlands. Areas of pockets, swales, basins and oxbows will be classified as PABF. Impoundments and man-made ponds will also carry this classification but will have the appropriate special modifiers assigned to their classification. Mountain ponds with a vegetated shoreline will be labeled PABG, beaver ponds will also be labeled PABG but will carry the beaver (b) modifier. Sewage ponds will be classified as PABK and have the excavated modifier (x). Signatures on these wetlands will be open water or an aquatic bed signature, usually a pink return.

Scrub-shrub, temporarily flooded (PSSA) were found in swales, pockets, stream channels and next to rivers. Signature is a pink/red with a fluffy texture. Seasonally flooded shrubs PSSC were seen more in oxbows and pockets. Signature was deeper in color and will have an emergent understory. Saturated shrubs (PSSB) were found on slopes, springs and in the higher elevations. Signature will be similar to the temporary and seasonal shrubs with the exception of saturated shrubs in the mountains. Shrubs here were smaller, less textured and signature was a pale pink/green/ brown.

## 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 1982, 1983, 1984, 1985, 1986, 1987 and 1988.

Field checks of areas found within Moab NE, Moab SE, Montrose NW, Montrose NE, Montrose SW, Cortez NE, Cortez SE, Durango NW and Durango SW photography 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, 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 drafting were completed by Geonex, Inc., St. Petersburg, Florida with quality control conducted by the USFWS.

#### VIII. 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.

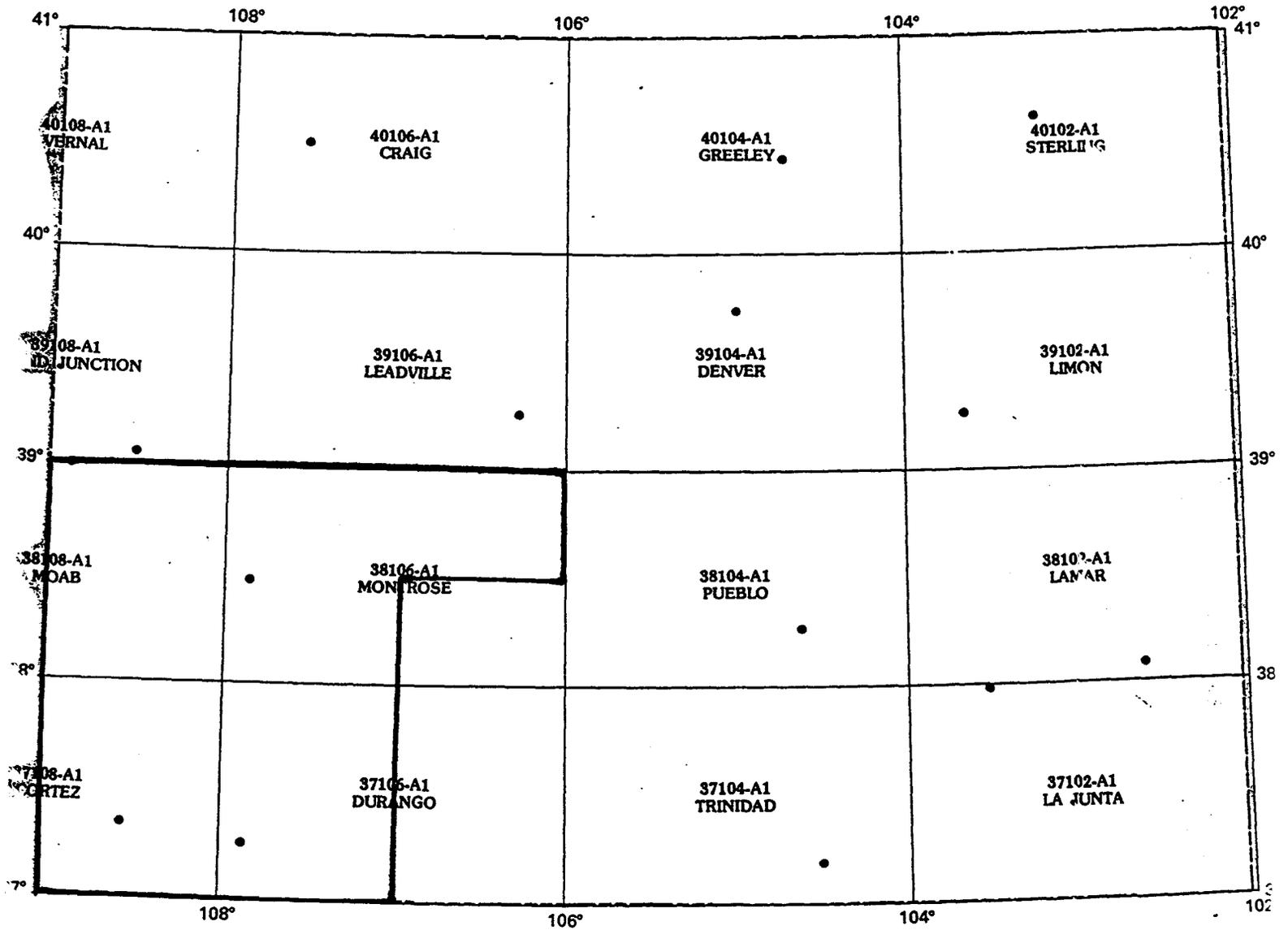
Maps are identified by the name of the corresponding USGS 1:24,000 scale topographic quadrangle name. Topographic map indices are available from the USGS.

IX. LITERATURE CITED

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APPENDIX A  
LOCATOR MAP

SOUTHWEST COLORADO PROJECT AREA



APPENDIX B  
LOCATOR MAP

SOUTHWEST COLORADO PROJECT AREA

