MAP REPORT:

MIDDLE RIO GRANDE

WETLAND RIPARIAN MAPPING PROJECT

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This report will be divided into six sections to accurately inform the user of the different classification systems and the special mapping conventions created for this project.

Section I will describe the study area.

Sections II, III, and IV will discuss the National Wetlands Inventory classification, riparian classification, and upland land use classification.

Section V will provide localized information concerning specific imagery and interpretation discussions and assist the user with a descriptive crosswalk from the different classification codes on the map to plant species and communities and upland land use practices.

Section VI will provide map preparation and acquisition information.

I. STUDY AREA

A. LOCATION

The location of this project falls within the floodplain of the Rio Grande and stretches from Valarde, New Mexico south to the upper part of Elephant Butte Reservoir, about twenty miles north of Truth or Consequences, New Mexico. The work area is between latitude 34° 30' 00" N and 36° 10' 00" N and between longitude 106° 0' 00" W to longitude 107° 15' 00" W.

The extent and variability of urban and agricultural land use prevents accurate determination of the 100 year floodplain. For this reason the project area will not coincide with the 100 year floodplain.

B. PHYSICAL CHARACTERISTICS

According to Bailey, Descriptions of the Ecoregions of the United States, (1980), the study area winds through the Great Plains Short Grass Steppe Province (Semiarid Division) in Raton SW, Aztec SE, Albuquerque NE and SE and Socorro NE and SE, and moves into the Chihuahuan Desert Province (Arid Division) in Socorro SE and Tularosa NE, NW, and SW. The vegetation throughout the region is dominated by short prairie grasses. Juniper is also common in the rolling plains outside the floodplain and in the higher elevations. Shrubs like creosote bush and sagebrush are more prevalent in the southern part of the work area.

C. CLIMATE

The area experiences hot days and cool nights in the summer and cool winters with cold spells. The average annual temperature is approximately 54° F. The average annual relative humidity is approximately forty-three percent (43%), which varies throughout the day. The average annual precipitation is approximately 8 inches, with most of this falling from July to October. The average annual snowfall in the Valley is near 10 inches. Precipitation and snowfall amounts are higher in the mountains, and northern part of the work area where temperatures are cooler.

II. NATIONAL WETLANDS INVENTORY CLASSIFICATION DESCRIPTION

A. INTRODUCTION

The United States Fish and Wildlife Service's National Wetlands Inventory is producing maps showing the location and classification of wetlands and deepwater habitats of the United States. The Classification of Wetlands and Deepwater Habitats of the United States by Cowardin et al. is the classification system used to define and classify wetlands. Photo-interpretation conventions, hydric soils lists and wetland plant lists are also available to enhance the use and application of the classification system.

B. BIOLOGICAL CHARACTERISTICS AND CLASSIFICATIONS

Wetland communities in the northern part of the work area, along the Rio Grande, are dominated by Fremont cottonwood (Populus fremontii), willow (Salix sp.) and Russian olive (Elaeagnus augustifolia). Also, salt cedar (Tamarix sp.) can be found in isolated areas. As you move further south in the work area, the cottonwood and Russian olive thins out and the salt cedar dominates the wetland communities.

Possible determinations for palustrine forested and scrub/shrub wetland habitats are:

PFO1C,A,J	cottonwood
PSS1C,A,J	Russian olive, willow
PSS2C,A,J	salt cedar
PSS1/2C,A,J	Russian olive - salt cedar mix
PFO1/SS1C,A,J	cottonwood - Russian olive mix
PFO1/SS2C,A,J	cottonwood - salt cedar mix

The wetter water regime "C" (seasonally flooded) is associated with hydric soils and impounded areas along the river. The water regime of "J" (intermittently flooded) will be the most commonly used with the "A" (temporarily flooded) found occasionally, throughout the project area.

Several Palustrine emergent wetland communities were found throughout the length of the study area. These communities occurred in sloughs and impounded areas.

Seasonally and temporarily flooded emergent wetland species (PEM1C,A) include Juncus sp. and Eleocharis sp. Semipermanently and seasonally flooded emergent wetland species include cattail (Typha latifolia), bulrush (Scirpus sp.), Phragmities sp. and Cyperus sp.

Aquatic beds consisted of duckweed (Lemna sp) (L1AB4, L2AB4) and Parrot feather (Myriophyllum brasiliense) (PAB3). This was found in isolated areas in the diversion canals that run along the Rio Grande.

TABLE 1

OBSERVED WETLAND VEGETATION

EMERGENTS	
Typha sp.	cattail
Scirpus sp.	bulrush
Juncus sp.	rush
Carex sp.	sedge
Polygonum sp.	smartweed
Phragmities sp.	common reed
Cyperus sp.	sedge
Eleocharis sp.	spike rush
SCRUB-SHRUB	
Cephalanthus occidentalis	buttonbush
Salix sp.	willow
Baccharis glutinosa	seepwillow
Tamarix sp.	salt cedar
Elaeagnus augustifolia	Russian olive
FORESTED	
Populus fremontii	cottonwood
Fraxinus velutina	velvet ash
Celtis reticulata	neatleaf hackberry
Salix sp.	willow
Platanus wrightii	Arizona sycamore
AQUATIC BED	
Myriophyllum brasiliense	Parrot feather
Lemna sp.	duckweed

C. WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

Table 2: Cowardin Classification Codes and Descriptions

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
L1UB (F,H)	Lacustrine, limnetic, unconsolidated bottom	Open water, lake	Unvegetated mud, sand, and gravel
L2UB (F,H)	Lacustrine, littoral, unconsolidated bottom	Shallow open water, lake, lake bottom	Unvegetated mud sand, and gravel
L2US (A,C)	Lacustrine, littoral, unconsolidated shore	Lake bed, lake shore	Unvegetated mud sand, and gravel
L1AB1 (F,H)	Lacustrine, limnetic, aquatic bed	Algal mat	Algae
L1AB3 (F,H)	Lacustrine, limnetic, aquatic bed	Rooted vascular, water weeds	Parrot feather Myriophyllum brasiliense
L2AB3 (F,H)	Lacustrine, littoral	Rooted vascular, pond weeds, water weeds	Parrot feather Myriophyllum brasiliense
L1AB4 (F,H)	Lacustrine, limnetic, aquatic bed	Floating pond weeds, water weeds	Duckweed (Lemna sp.)
L2AB4 (F,H)	Lacustrine, littoral, aquatic bed	Floating pond weeds, water weeds	Duckweed (Lemna sp.)

C. WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

Table 2: Cowardin Classification Codes and Descriptions

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
R2UB (H)	Riverine, lower perennial, unconsolidated bottom	Open water, river, stream	Unvegetated mud, sand, and gravel
R2US (A,J,C)	Riverine, lower perennial, unconsolidated bottom	River flat, bar	Unvegetated mud, sand, and gravel
R2AB3 (H)	Riverine, lower perennial, rooted vascular plant	Rooted vascular plant	Parrot Feather (Myriophyllum brasiliense)
R4SB (J,A,C,F)	Riverine, intermittent streambed	Intermittent stream	Unvegetated mud, sand, and gravel
PUB (F,H)	Palustrine, unconsolidated bottom	Open water, pond bottom	Unvegetated mud, sand, and gravel
PUS (J,A,C)	Palustrine, unconsolidated shore	Pond shore, pond bed	Unvegetated mud, sand, and gravel
PAB3 (F)	Palustrine, aquatic bed, rooted vascular	Aquatic bed	Parrot Feather (Myriophyllum brasiliense)

C. WETLAND CLASSIFICATION CODES AND WATER REGIME DESCRIPTIONS

Table 1: Cowardin Classification Codes and Descriptions

NWI CODE WATER REGIME	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION
PEM1 (A,B,C,F)	Palustrine, persistent emergent	Marsh, wet meadow	Bulrush (Scirpus sp.) Cattail (Typha sp.) Cockleburr (Xanthium sp.) Rush (Juncus sp.) Sedge (Carex sp.) Smartweed (Polygonum sp.)
PSS1 (J,A,B,C,F)	Palustrine, scrub-shrub, broadleaved deciduous	Shrub wetland	Buttonbush (Cephalanthus occidentalis) Willow (Salix sp.) Seepwillow (Baccharis glutinosa) Arizona sycamore (Platanus wrightii)
PSS2 (J,A,C)	Palustrine, scrub-shrub, needle-leaved deciduous	Shrub wetland	Salt cedar (Tamarix sp.)
PFO1 (J,A,B,C,F)	Palustrine, forested, broadleaved deciduous	Forested wetland	Cottonwood (Populus fremontii) Velvet ash (Fraxinus velutina) Neatleaf hackberry (Celtis reticulata) Willow (Salix sp.) Arizona sycamore (Platanus wrightii)

D. WATER REGIME MODIFIERS

(J) **Intermittently Flooded** -- Substrate is usually exposed, but surface water present for variable periods without detectable seasonal periodicity. Weeks or months or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change. Some areas exhibiting this regime do not fall within our definition of wetland because they do not have hydric soils or support hydrophytes.

(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 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 the 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 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.

E. SPECIAL MAPPING CONVENTIONS

As the Rio Grande flows south through the work area, it gradually decreases in elevation. To take advantage of this, irrigation canals were built to carry water further down stream to irrigate fields near the upper edge of the floodplain many meters above the river. Since this hydric situation is so strongly controlled by man, it was decided a "K" (artificially flooded) water regime modifier would be used for all irrigation canals. The large diversion canals, which parallel the Rio Grande most of the way through the work area, will not have the "K" modifier. Natural systems are also exempt from its use.

III. RIPARIAN CLASSIFICATION DESCRIPTION

A. INTRODUCTION

In a joint venture, on a previous NWI project, a riparian habitat classification system was created by U.S. Fish and Wildlife Service and Geonex, Inc. personnel to map riparian habitats in Arizona. This will be the same classification system used on this project.

B. RIPARIAN HABITATS

Riparian communities consisted of cottonwood, Russian olive, salt cedar, and a small amount of mesquite near La Joya Wildlife Refuge. For this study the riparian classification system will be used on communities that fall outside of the diversion canals that run parallel with the river and are still within the 100 year floodplain. Areas that are impounded by roads or dams, outside of the canals, will be considered palustrine.

Riparian communities in the northern section of the work area consisted mainly of cottonwood and Russian olive with areas of salt cedar. As the work area moved south the salt cedar dominated with localized areas of cottonwood and Russian olive.

C. CLASSIFICATION SYSTEM

The riparian classification system used will be as follows:

Rp - Riparian
- FO - Forested
- SS - Scrub/Shrub
  - CW - Cottonwood
  - MB - Mixed Broadleaved; Cottonwood and Russian Olive
  - SC - Salt Cedar
  - MQ - Mesquite
  - JU - Juniper

IX. UPLAND LAND USE CLASSIFICATION DESCRIPTION

A. INTRODUCTION

Upland land use classification system based on A Land Use and Land Cover Classification System for use with Remote Sensing by Anderson et al. was developed in the field to identify general land use practices.

B. CLASSIFICATION AND DESCRIPTION

Agriculture will be broken into three categories:

UAc - cropland; hay and alfalfa
UAt - tilled land; corn, wheat, and peppers
UAo - orchards; apples etc.

Urban areas will be broken into two categories:

UUr - Residential and highly populated areas, commercial and industrial areas will also be included.
UUm - Usually rural areas with mixed agriculture and residential.

Rangeland or land with an undetermined use will be classified as Urm - rangeland mixed.

TABLE 3

OBSERVED RIPARIAN VEGETATION

SCRUB-SHRUB

Elaeagnus augustifolia	Russian olive
Tamarix sp.	salt cedar
Phosopis sp.	mesquite
Celtis reticulata	neatleaf hackberry

FORESTED

Populus fremontii	cottonwood

V. INTERPRETATION AND MAPPING PROBLEMS

A. PHOTO SIGNATURES VS. GROUND VERIFICATION

Wetlands and riparian areas - For the most part photo signatures for the three dominant wetland and riparian communities were easily distinguished.

A common wetland complex seen especially in the northern part of the work area, consisted of Russian olive located on river banks. The Russian olive, usually scrub/shrub height (6 meters or less), will have an almost olive green signature to it. The much taller cottonwoods behind the Russian olive will have a grey signature, due to being leaved off (March photo dates). Behind the cottonwood will come the salt cedar. These too are scrub/shrub height with a very dark green to almost black signature. Often these communities will intermix. With areas of good photo emulsion, the different species can be identified and delineated.

In the southern part of the work area dead inundated stands of salt cedar will give a bluish grey signature. Signatures for riparian communities were similar.

B. UPLANDS

The urban and rangeland signatures did not present much of a problem. At times distinguishing between the UUr and UUm classification was difficult.

Most of the upland difficulties fell in the upland agriculture classification. Determining the difference between cropland and tilled land became more difficult than first expected. At first it was thought that the small irrigation ditches and visible rows would distinguish the tilled land from the cropland. This was not the case. In few instances did we actually see the rows for planting and much of the cropland had irrigation ditches as well. Also, the Regional U.S. Fish and Wildlife Service personnel discovered that agricultural practices by farmers varied year to year further complicating upland agricultural delineations. When interpreting these areas careful attention will be given to identifying crop type and land use.

C. DARK PHOTOGRAPHY

Many photographs throughout the entire work area have dark emulsion. This made identification and differentiation of Russian olive, salt cedar, and sometimes even cottonwood very difficult, especially near edges. The difference between open water and emergents was also difficult under the dark photo conditions. Uplands were not affected to the same degree.

D. MAPPING PROBLEMS

There were a few mapping problems encountered during the project. Due to the way the photography was flown, areas of the 100 year floodplain were not covered resulting in photo holidays. Because of this, the 100 year floodplain boundary was added at the transfer stage of production using contours.

Also, at different locations, the 100 year floodplain was difficult to determine. This was usually due to very shallow gradients coming away from the river with no indicating vegetation, canals, or roads to use as breaks. These areas will be checked in the future and adjusted if necessary.

VI. MAP PREPARATION AND ACQUISITION

A. MAP PREPARATION

The delineations were produced for this project were produced through stereoscopic interpretation of 1:20,000 scale color infrared photography.

Field checks throughout the work area were made prior to the actual delineations of wetlands, riparian habitats, and uplands. Field check sites were selected to clarify varying signatures found on the imagery. The photographic signatures were then identified using vegetation types, upland land uses, soil types, and input from local field personnel.

B. MAP ACQUISITION

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

Regional Wetland Coordinator (ARD-E)
U.S. Fish & Wildlife Service- Region II
P.O. Box 1306
Albuquerque, NM 87103

To order maps only, contact:

National Cartographic Information Center
U.S. Geological Survey
National Center
Reston, VA 22092

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

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