USER NOTES: ALBUQUERQUE, NEW MEXICO, NATIONAL WETLANDS INVENTORY MAP

Map Preparation

The wetland classifications that appear on the Albuquerque National Wetlands Inventory (NWI) Base Map are in accordance with Cowardin et al. (1977). The delineations were produced through stereoscopic interpretation of 1:80,000-scale black-and-white aerial photographs taken from 1975-1976. The delineations were enlarged using a zoom transferscope to overlays of 1:24,000-scale and 1:62,500-scale. These overlays were then transferred to 1:100,000-scale to produce the Base Map.

Limited field checks of the delineated wetlands of the Albuquerque NWI Base Map were conducted in July, 1981 to determine the accuracy of the aerial photointerpretation and to provide qualifying descriptions of mapped wetland designations.

The user of this map is cautioned that, due to the limitation of mapping primarily through aerial photointerpretation, a small percentage of wetlands may have gone unidentified. Changes in the landscape could have occurred since the time of photography, therefore some discrepancies between the map and current field conditions may exist. Any discrepancies that are encountered in the use of this map should be brought to the attention of Warren Hagenbuck, Regional Wetlands Coordinator. U. S. Fish and Wildlife Service, Region 2, P. O. Box 1306, Albuquerque, New Mexico, 87103.

Geography

The area covered by the Albuquerque NWI Base Map is situated in north central New Mexico. It lies within two provinces of Bailey's Ecoregion Classification (1978): Rocky Mountain Forest Province, Ponderosa Pine-Douglas Fir Forest Section (3113M) and Colorado Plateau Province, Grama-Galleta and Juniper-Pinyon Woodland Mosaic Section (3132P). The latter was mislabeled on the Base Map as 3142P and should be corrected.

The city and suburbs of Albuquerque account for a substantial portion of the area covered by the Base Map. Lying on both sides of the Rio Grande, it is the largest city in New Mexico with a population of 350,000 people. The most predominant wetland features are the Rio Grande and the Jemez River, which join just north of Bernalillo.

The Rio Grande flows south at an elevation of 4850 feet and nearly bisects the area. The river's level floodplains are cultivated on deep, well-drained loamy soils that are formed on alluvium (Hacker 1977). Alfalfa is an important crop and livestock are grazed on small pastures.

East and west of the Rio Grande, mesas rise to elevations of about 5500 feet. The river terraces along the mesa margins are dissected by stream erosion but the mesas themselves are level or only moderately sloped. Their soils are well drained, loamy to gravelly (Hacker 1977).

Vegetation on these mesas and up to 6500 feet on mountain slopes, consists of galleta (Hilaria jamesii), black grama (Bouteloua eriopoda), mesa dropseed

(Sporobolus flexuosus), sand dropseed (S. cryptandrus), Indian ricegrass (Oryzopsis hymenoides), three-awn (Aristida sp.), winterfat (Eurotia lanata), four-winged saltbush (Atriplex canascens), rubber rabbitbrush (Chrysothamnus nauseosus) and sand sagebrush (Artemesia filifolia).

East of Albuquerque, the north-south oriented Sandia Mountains attain an elevation of 10,628 at Sandia Crest, the highest point in the range. Extending the mountainous topography south are the Manzanita Mountains separated from the Sandia Mountains by a low pass. The topography is steep with outcrops of limestone, schist, gneiss or granite. Soils are well-drained, rocky to loamy, derived principally from residuum of sandstone on limestone. The vegetation on these mountains is primarily Douglas fir (Pseudotsuga menziesii), white fir (Abies concolor), ponderosa pine (Pinus ponderosa), Gambel oak (Quercus gambelii), and New Mexico locust (Robinia neomexicana).

The transition zone between the mesa and mountain vegetation is represented by juniper-pinyon woodlands which occur at elevations from 6300 to 8300 feet.

Climate

The climate of the area is arid continental with variations dependent on elevation. The Rio Grande Valley is typically dry but cool during the fall, winter, and spring. Precipitation occurs mostly during the summer as brief isolated torrential thunderstorms which may cause flash floods and heavy runoff. The average precipitation is 7-9 inches along the valley and adjacent mesas. Snowfall is uncommon in the valley and usually very light. It seldom remains on the ground for more than a day or two. In the mountains, however, it may accumulate to depths of 10 feet. Average annual precipitation in the foothills region and the Sandia Mountains ranges from 15 to 30 inches per year (Hacker 1977).

Average annual temperatures vary with elevation, from 57^{o}F at Albuquerque to 50^{o}F in the foothills and 40^{o}F at Sandia Crest. South, San Pedro, and Ortiz Mountains form a line of mountains that extend northeast toward the town of Madrid. These mountains range from 7000 to 8900 feet in elevation. They are steep and dissected by stream erosion. The soils are shallow to moderately deep, loamy and very gravelly or very stony on alluvial fans. The vegetation is primarily oakbrush (Quercus sp.), and oneseed juniper (Juniperus monosperma) with a variety of grasses.

East of the mountains lie the northern extent of the Estancia Valley, a gently sloping intermountain basin. The principle activity in the valley is agriculture. Crops such as corn, alfalfa, grain and potatoes are irrigated with ground water pumped to the surface which may be stored in small earthen impoundments.

Wetland Communities

The Rio Grande, conveyance channels, irrigation and drainage canals and ditches account for the majority of wetlands in the Rio Grande Valley. These are classified as Riverine systems. Water may be manipulated for flood control, agricultural use or waterfowl management. The user of this map will find that Open Water and Intermittent Streambed designations are dependent on such manipulations.

The Rio Grande is classified as Riverine Lower Perennial Open Water. Its highest channel flow is attained during spring and summer when snow melt and thundershowers occur, adding a considerable amount of runoff to the system. The channel of the Rio Grande is generally 200 to 300 feet in width with a shifting sand substratum. Within the Rio Grande Valley near Albuquerque, alluvial material may be at least 6000 feet deep. The water is turbid and carries a heavy sediment load. During low flow periods the channel becomes braided, creating a network of Beach Bars. In the segment of the river near Albuquerque, water flow within the channel remains relatively high during most of the year, with only a few days of no flow during the winter (U.S. Bureau of Reclamation 1977). Because of its high turbidity and sediment load the waters of the Rio Grande have very low productivity. Oxbows occur along the river that have since become isolated from the main channel's flow. They support an array of aquatic and emergent vegetation such as Chara, pondweed (Potamogeton sp.), cattails (Typha sp.), rushes (Juncus sp.), and bulrushes (Scirpus sp.) that create an important habitat for aquatic invertebrates, waterfowl and mammals such as muskrats (Ondontra zibethicus), beavers (Castor canadensis) and raccoons (Procyon lotor). These wetlands are labeled as Palustrine Emergent and represent Type 3 wetlands - Inland Shallow Fresh Marshes (Shaw and Fredine 1971).

Along the Rio Grande and especially in the oxbow areas, riparian vegetation can be found as Palustrine Forested or Scrub Shrub. These are phreatophytic growths of saltcedar (Tamarix chinensis), cottonwood (Populus fremontii, and P. angustifolia), and Russian olive (Elaeagnus angustifolia). Open areas usually consist of saltgrass and growths of willows (Salix sp.). These riparian forests or bosques are an important habitat for a variety of avifauna, such as mourning doves (Zenaidura macroura), Gambel's quail (Lophortyx gambelii) and many passerine species.

Drainage or irrigation canals and ditches are either Riverine Lower Perennial Open Water or Riverine Intermittent Streambed. The bottoms are composed of either Sand or Mud. These excavated systems should have the Artificial modifier added to their designations. The waterways used for irrigation, to bring water to crops, are well maintained for the efficient flow of water. Banks are often mowed, burned or sprayed, and consequently these irrigation systems are of less than optimal value to fish or wildlife than they could be. The canals and ditches that are used for drainage, to remove excess water from crops, on the other hand, may have emergent cattail (Typha sp.) stands that are well established. The banks have dense growths of shrubs, primarily willows, seepwillow (Baccharis glutinosa), saltcedar, and wolfberry (Lycium sp.). Waters can sometime support Aquatic Beds of parrot feather (Myriophyllum brasiliense). The existence of persistent emergents (i.e. cattails), by definition, takes many drainage ditches and canals out of the Riverine and places them into the Palustrine Emergent or Scrub Shrub wetland system.

Another important Riverine system is the Jemez River that flows southeast and it confluent with the Rio Grande just south of Angostura. It is classified as Riverine Lower Perennial Streambed but should be labeled as Riverine Lower Unconsolidated Bottom. Throughout its course, in the area covered by the Albuquerque NWI Base Map, the substrate is Sand.

The channel may be braided in some areas with considerable Beach Bar formations. Palustrine Scrub Shrub that occur along the river's course consists of pure stands of saltcedar.

Riverine Intermittent Streambeds also occur as dry drainages of Cobble-Gravel forming steep-sided gullies and ravines throughout the Sandia and Manzanita Mountains. At lower elevations of about 6500 feet, the mountain vegetation along streambeds is typically comprised of Gambel oak (Quercus gambelii), narrowleaf cottonwood (Populus fremontii), ash (Fraxinus velutina), quaking aspen (Populus tremuloides), elm (Ulmus sp.), hoptree (Ptelea sp.), Rocky Mountain maple (Acer glabrum) and New Mexico locust (Robinia neomexicana). At higher elevations, through the mixed conifer zone, streambeds range from Cobble-Gravel to Bedrock-Boulder. Ponderosa pine (Pinus ponderosa), sub-alpine fir (Abies lasiocarpa), aspen and willows (Salix sp.) become dominant along these streambeds. Springs may occur throughout the mountains but their flow is dependent on the level of the water table.

Among the foothills and alluvial fans of the mountain areas, arroyos having substrates of Sand and Gravel occur and are vegetated primarily by Russian olive (Eleagnus angustifolia), narrowleaf cottonwood, saltcedar and willow. These are also labeled as Riverine Intermittent Streambed. Throughout the lower elevations, drainages into the Jemez and Rio Grande also have substrates of Sand, but are more typically vegetated by Apache plume (Fallugia paradoxa), four-winged saltbush (Atriplex canescens), mesquite (Prosopis glandulosa), rubber rabbitbrush (Chrysothamnus nauseosus) and big sagebrush (Artemesia tridentata).

Palustrine Flat designations in upland areas are usually stock tanks used by domestic livestock. They have turbid water and Mud bottoms and are usually unvegetated. Some of these stock tanks are labeled as Palustrine Open Water but these are usually maintained by a spring or some other pumping device.

Loss and Vulnerability

Past flood control and irrigation storage measures such as channelization and damming of the Rio Grande have reduced the amount of area suitable for wildlife along the river. Existing wetland sites have thus become more valuable and efforts should be encouraged for their conservation and improvements to enhance their value to wildlife.

NWI Code	Description	Common Name	Circular 39 Type	Representative Plant Species and Physiographic Features
R2SB should be R2UB	Riverine Lower Perennial Unconsolidated Bottom	river	--	Unvegetated, Sand bottom
R4SB	Riverine Intermittent Streambed	dry riverbed, dry streambed, arroyo drain, canal	--	Unvegetated; substrata ranges from Mud and Sand to Bedrock-Boulder
R2OW	Riverine Lower Perennial Open Water	river	--	Unvegetated, Sand bottom
PSS,PFU	Palustrine Scrub-Shrub or Forested	bosque, riparian vegetation drainage ditches	--	Saltcedar (Tamarix chinensis), cottonwood (Populus fremontii, and P. angustifolia), Russian olive (Elaeagnus angustifolia), saltgrass (Distichlis stricta), squirrel-tail (Sitanion hystrix), willow (Salix sp.)
PFL	Palustrine Flat	stock tank playas	9	Unvegetated, Mud bottoms
PEM	Palustrine Emergent	drainage ditches	3	Cattails (Typha sp.), parrot feather (Myriophyllum brasiliense)
POW	Palustrine Open Water	stock tank	9	Unvegetated, Mud bottoms

BIBLIOGRAPHY

The purpose of this report is to provide general information about wetland classifications found within the area covered by the Base Map. There has been no attempt to describe all wetlands occurring in the area nor provide complete faunal and floral lists of those wetlands discussed. The references listed below refer to literature cited in the text of this report as well as sources of additional information.

Bailey, R. G. 1978. Description of the ecoregions of the United States. USDA For. Serv., Intermt. Reg., Ogden, UT. 77 p.

Campbell, C. J. and W. A. Dick-Peddie. 1964. Comparison of phreatophyte communities on the Rio Grande in New Mexico. Ecology 45:492-592.

Cowardin, L. M., V. Carter, F. C. Golet and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. USDI. Fish and Wildl. Serv. FWS/OBS-79/31. 103 p.

Follansbee, R. and H. J. Dean. 1915. Water resources of the Rio Grande Basin 1888-1913, including surface water supply of western Gulf of Mexico Basins, 1913. USDI Geol. Surv. Water Supply Pap. 358. 725 p.

Glinski, R. L. 1977. Regeneration and distribution of sycamore and cottonwood trees along Sonoita Creek, Santa Cruz County, Arizona. Pages 116-123 in R. R. Johnson, and D. A. Jones (eds.) 1977. Importance, preservation and management of riparian habitat: A symposium. USDA For. Serv., Rocky Mt. For. and Range Exp. Stn. Gen. Tech. Rep. RM-43. 217 p.

Hacker, L. W. 1977. Soil survey of Bernalillo County and parts of Sandoval and Valencia Counties, New Mexico. USDA. Soil Conserv. Serv. 101 p.

Hubbard, J. P. 1978. Revised check-list of the birds of New Mexico. New Mexico Ornithol. Soc. Publ. No. 6. McLeod Print. Co., Albuquerque, NM. 110 p.

Hubbard, J. P., M. C. Conway, G. H. Campbell, G. Schmitt, and M. D. Hatch. 1979. Handbook of species endangered in New Mexico. New Mexico Dept. Game and Fish. 187 p.

Jojola, J. R. Sr. 1977. Bird populations and habitat in a riparian woodland, Isleta Indian Reservation, Central New Mexico. Masters Thesis. New Mexico State Univ., Las Cruces, NM. 51 p.

Shaw, S. P. and C. G. Fredine. 1971. Wetlands of the United States, their extent and their value to waterfowl and other wildlife. USDI Fish and Wildl. Serv. Circ. 39. 67 p.

U. S. Bureau of Reclamation. 1977. Operation and maintenance program for the Rio Grande, Velarde to Caballo Cam, Rio Middle Grande Project, New Mexico. Final Environmental Statement. Amarillo, TX. Vol. I. 398 p.

U. S. Fish and Wildlife Service. 1954. Wetlands inventory - New Mexico. Off. River Basin Studies, Region 2. Field Work and Rep. 16 p.