COLORADO WETLAND INVENTORY
U. S. FISH AND WILDLIFE SERVICE
1:100,000 MAP NARRATIVE REPORT
-LAMAR SE-

INTRODUCTION

In 1974, the U. S. Fish and Wildlife Service directed its Office of Biological Services to complete an inventory of the Nation's wetlands. As part of this overall objective, an effort began in September 1978, to delineate and classify photo-interpretable wetlands within the eastern five-sevenths of Colorado.

Wetland maps at 1:100,000 scale and wetland overlay maps at 1:24,000 scale are produced at National Wetlands Inventory headquarters in St. Petersburg, Florida. Final Colorado wetland maps are available at the U. S. Fish and Wildlife Service's Regional Office located in Denver, Colorado. An integral part of all final wetland maps is the completion of narrative reports for each 1:100,000 quadrangle inventoried. The following narrative report provides both basic and specific data which aids the user in understanding not only the general area of the Lamar SE quadrangle but also representative details of its wetland habitat.

MAP PREPARATION

Contractor for this wetland inventory was Colorado Division of Wildlife, 317 West Prospect, P. O. Box 2287, Fort Collins, Colorado 80526. Richard Hopper was the contract officer. Photo-interpretation was done by the subcontractor, Colorado State Forest Service, Foothills Campus, Colorado State University, Fort Collins, Colorado 80523. Photo-interpreters were Thomas Owens and Alexander Kosinski. Preparation of this narrative report was completed by Thomas Owens. Regional Wetland Coordinator was Charles Elliott, U. S. Fish and Wildlife Service, Denver Federal Center, P. O. Box 25486, Denver, Colorado 80225.

Wetland delineation and classification for Lamar SE 1:100,000 quadrangle was done on 1:80,000 black and white aerial photographs taken in June 1975 and June, July 1976. Photography covered 100 percent of the quadrangle. Wetland classification was done in accordance with Cowardin, et. al., December 1979. Specific mapping conventions developed at National Wetland Inventory headquarters were used to assist in photo-interpretation. Field checking for the quadrangle was done May 22, 1979.

Map users are cautioned that mapping with aerial photography has limitations. Wetlands are identified and classified through stereoscopic examination of photography on the basis of tone, texture, pattern, site,

size, local ecology, and cultural patterns. Aerial photographs reflect conditions during the year and season they are taken. In addition, the 1:80,000 black and white photography used on this project was photographed for purposes other than wetland mapping. The small scale precludes delineating very small wetlands (less than 1/4 acre) and narrow linear wetlands (less than 15 feet wide). Black and white emulsion makes distinguishing between classes of vegetation (and non-vegetation) difficult. Some imagery was not photographed during the best season for wetland delineation and classification. If photographed too early or too late in the season, moist (dark) tones are not evident. The photography was four to five years old when it was interpreted and land use changes have occurred.

Any discrepancies noticed regarding wetland omissions, inclusions, or errors should be given to the U. S. Fish and Wildlife Service Regional Wetland Coordinator who is located in Denver, Colorado, and whose address is on the previous page.

Special Mapping Problems

This quadrangle has many small depressions scattered across the plains. There are two types of depressions: wetlands with emergent species and non-wetlands without emergents. Non-wetland depressions without emergents are often dark in tone and conspicuous on the imagery, which is due to slightly more moisture and lusher vegetation than surrounding areas, but have no lighter toned ring. Depressions with wetland species (usually) have a lighter toned ring in them which shows the extent of inundation after rain. Depressions receive water from local summer thunderstorms, are dry most of the time, and are not part of drainage systems. These wetlands are locally important, but are often difficult to see on the imagery, unless flooded after a thunderstorm.

AREA DESCRIPTION

Bailey's Ecoregions

Lamar SE 1:100,000 quadrangle falls into one province in Bailey's Description of the Ecoregions of the United States, 1978, which classifies land into a hierarchal system based upon bioclimatic, geologic, and geomorphic criteria. The province is Great Plains-Shortgrass, Grama-Buffalo Grass Section (3113L) and is characterized by bunched short grasses, with scattered trees.

Hammond's Land-Surface Forms

Lamar SE falls into two Hammond Land-Surface Forms which systematically characterizes United States topography (Ecoregions and Land-Surface Form Map, 1975). Both forms are in the Interior Division (III). The first

form is in the High Plains Subdivision (14) and is called Smooth Plains (III-14A2c) which has more than 80 percent of area gently sloping, local relief 100 to 300 feet, and 50 to 75 percent of gentle slope on upland. This form covers 55 percent of the quadrangle in the north and east. The rest of the quadrangle is covered by Tablelands of Moderate Relief (III-13B3c) in the Rocky Mountain Piedmont Subdivision (13) and is characterized by 50 to 80 percent of area gently sloping, local relief 300 to 500 feet, and 50 to 75 percent of gentle slope on upland.

Hydrologic Mapping Units

Five hydrologic mapping units are found in Lamar SE (Hydrologic Unit Map of Colorado, 1974). Hydrologic units are part of an effort by the United States Geological Survey to provide a series of uniform, Nationally consistent maps which accurately delineate hydrographic boundaries for Federal and State water resource agencies. Units are designated by eight-digit numbers tied to a computer file (Catalog of Information on Water Data) which contains information on water data activities (Langford and Kapinas, 1979). All units in Lamar SE are in the Arkansas-Red-White Region (11). 11010002 covers 8 percent in the northeastern corner, 11030012 covers 7 percent on the northern edge, 11030011 covers 17 percent in the center, and 11030013 covers 2 percent on the southern edge. The rest of the quadrangle (66 percent) is covered by 11030009.

Geography

Lamar SE is covered by plains which have level to rolling topography. Elevations are from 3,350 (the lowest spot in Colorado) to 4,400 feet and vegetation is short grass prairie with cottonwoods and willows along streams.

The Arkansas is the quadrangle's major river. It flows through the southern portion of the quadrangle and supplies water to several large irrigation reservoirs.

Lamar and Holly are the quadrangle's largest towns and are supported by agriculture, which is Lamar SE's major economic activity. Intensive irrigated agriculture is found near the Arkansas. Dryland farming and ranching are practiced away from water sources.

The eastern edge, a strip 3 miles wide, is in Kansas.

Geology

Over half of Lamar SE is covered by Cretaceous (70 to 135 million years ago) shale, limestone, and sandstone deposited when eastern Colorado was under a sea. The northeastern corner is covered by the Ogallala aquifer, an important water-bearing sandstone formation deposited in the Tertiary Period (3 to 70 million years ago). Extensive areas are covered with Quaternary (present to 3 million years ago) eolian deposits of dune sand, silt, and loess. Scattered areas are covered with Quaternary alluvium and gravel. The Arkansas flood plain is covered with modern alluvium (Chronic and Chronic, 1972; Tweto, 1979).

Soils

Soil is an important element of wetlands; it is one criterion used to define wetlands. "The substrate of wetlands is predominately undrained hydric soil" (Cowardin, et. al.). The National Wetland Inventory, in cooperation with the U. S. Soil Conservation Service, is preparing a list of hydric soils to accompany the Cowardin, et. al., wetland classification system.

Two major wetland soil types are found in Lamar SE: soils associated with drainages and soils associated with flood-irrigated meadows.

Wetland soils in drainages vary greatly. These soils range in texture from gravels and sands to loamy clays, in permeability from excessively drained to impermeable. Wetland soils along the Arkansas are generally flooded every year, have textures ranging from sandy to loamy, are moderately saline, and have water tables less than 3 feet from the surface. They are used for pastures where possible. Native vegetation includes willows, cottonwoods, alkali sacaton, saltgrass, switchgrass, western wheatgrass, sedges, rushes, and in low pockets cattails. Where streams are intermittent, wetland soils are sandy and gravelly, unstable, excessively drained, subject to occasional flooding, and have low water tables. Native vegetation includes cottonwoods and annual forbs (Heil, et. al., no date).

Flood-irrigated soils are found near streams or reservoirs where there is a ready supply of water. These soils may not have been wetland soils originally, but since they have been irrigated the water table is less than 3 feet from the surface. These soils are deep, level, range in texture from sandy loam to clay loam, and are often saline. Vegetation includes saltgrass alkali sacaton, tall grasses, sedges, rushes and cattails in low pockets (Heil, et. al.).

Climate

Lamar SE's climate is semi-arid and continental, with cool dry winters and warm, relatively dry, summers. Lamar SE receives 14.1 inches of precipitation annually, 24 inches of this coming as snow. January's average maximum temperature is 45.6^{o}F, average minimum is 13.3^{o}F. July's average maximum temperature is 93.8^{o}F, average minimum is 63.4^{o}F (Benci and McKee, 1977). The growing season is 165 days (SCS data, 1978).

WETLANDS

Community Description

Lacustrine System

One lake type is found within Lamar SE which is reservoir (L1OWKZ)

(information in this section comes from field notes taken May 23, 1979). Reservoirs are found along the Arkansas River. Water levels fluctuate as much as 30 feet and the areal extent of the open water changes significantly during the year because of filling in spring with snow melt and drawing down during summer for agricultural irrigation. The exposed shore line is composed of rocks, gravel, sand, and mud. Reservoirs normally retain some water throughout the year.

Riverine System

On the plains permanent streams are called lower perennial rivers (R2OWZ). Lower perennial streams are characterized by slow moving water, sand or mud bottoms, well-developed flood plains, and low dissolved oxygen concentrations.

Another type of river delineated is irrigation canal (R2OWKZ, R2OWKY, R4SBKY). Canals that are large enough to be delineated (over 15 feet across) are feeder canals; that is, those that carry water to and from reservoirs and to irrigation ditches. Canals occasionally flow year round; their peak flow is during the growing season to transport water to irrigated fields.

A final stream type delineated is intermittent stream (R4SBW). This stream type is the most common stream type on the eastern plains where there is no permanent water source to supply moisture. Intermittent streams have a sandy substrate that is very well drained which is often scoured by flash floods. These streams flow after snow melt and after local summer thunderstorms.

Palustrine System

An important palustrine type is flood-irrigated meadow (PEMKC). Flood-irrigated meadows are found along streams and below springs. Ditches were built along the meadows' upper edges to allow water to flow from upper sources and spill out over the meadows. Standing water can be found for short periods early in the growing season; soil remains moist for extended periods through the growing season. Flood-irrigated meadows have not been cultivated and vegetation is native. Meadows are hayed or grazed by cattle. Vegetaion includes Juncus arcticus, Eleocharis acicularis (species identification was according to Harrington, 1955; Fasset, 1957; Weber, 1976; Nelson, 1977), along with grasses and forbs. Many flood-irrigated fields are cultivated; these were not delineated.

Scrub/shrub and scrub/shrub-emergent areas are found along streams in this quadrangle (PSSW, PSSY, PSS/EMW, PSS/EMY). The water regime is dependent upon the amount of water flowing in the stream. In the western portion, where water is relatively plentiful, the water regime tends toward the seasonal regime. In the east, where moisture is scarce, water regimes are drier. Shrub species are Salix spp.; understory emergents include Juncus arcticus, Carex spp., Eleocharis acicularis, as well as grasses and forbs.

Forested wetlands (PFOW, PFOY, PFO/EMW, PFO/EMY, PFO/SSW, PFO/SSY) are found throughout the quadrangle along streams. The water regime situation is the same as that of scrub/shrub areas. Tree species include Populus sargentii and Salix spp. Understory species are the same as those mentioned with scrub/shrub-emergent areas.

On the plains numerous areas (PFLW, PEMW) are delineated which are small dugouts or impoundments constructed to supply water to livestock. These flats are dependent upon local precipitation for their water supply and do not receive enough moisture to remain wet year round. They often have saline soils. Vegetation consists of sparse stands of Distichilis stricta, Sporobolus airoides, forbs, and grasses.

Intermittent depressions are also delineated on the plains (PEMJ) that are the result of: wind deflation or blowouts, solution-subsidence (leaching water removes limestone and subsequent deflation), or differential compaction of Tertiary sediments of the plains (Thornbury, 1965). Delineated depressions are generally a few feet in depth and from one hundred to several hundred feet across. There is not sufficient moisture in spring after snow melt to supply them with moisture; they are filled with water after local summer thunderstorms and hold water for a few days. They are dry most of the time, but do receive enough moisture to support stands of Eleocharis spp., as well as upland vegetation.

Wetland Values

An important wetland value is flood-irrigated hay meadow production of hay for cattle (information in values section is from Hopper, 1980). Flood-irrigated hay meadows produce hay at a much higher rate than dryland meadows do. Wildlife also benefit from wet hay meadows: ducks nest in them and shorebirds use them for forage and cover.

The Arkansas River and associated reservoirs (especially John Martin Reservoir) are not important duck or goose production areas, but do hold 50,000 wintering mallards and 25,000 lesser Canada geese. These areas are important resting areas for migratory waterfowl and shorebirds (including the lesser sandhill crane) and provide good hunting.

The reservoirs north of the Arkansas (the Great Plains Reservoirs) are classified as major warm water fishing reservoirs (Stream and Lake Evaluation Map, Colorado, 1979). These reservoirs also store water for agricultural irrigation.

Over 130,000 acre feet of water per year is diverted into the Arkansas from Western Slope rivers. Some of this water is removed before the Arkansas reaches Lamar SW, but these diversions increase the flow in river and increase its water supply to reservoirs (League of Women Voters in Colorado, 1975).

Bobwhite quail and whitetail deer are in the Arkansas River bottoms.

Semi-permanently flooded cattail stands in agricultural areas provide critical habitat for pheasants.

On the eastern plains intermittent depressions, streams, and windmills are important water sources for wildlife, such as scaled quail and antelope, and livestock in the semi-arid region.

Wetland Loss and Vulnerability

Wetland loss is not a major problem in Lamar SE. This quadrangle is sparsely populated and there were few wetlands originally.

Increased population in the Front Range to the west could have an effect on wetlands in this quadrangle. Urban water users can afford higher water costs than agricultural users can, and so financially pressed ranchers are selling their water rights to Front Range cities. Loss of water from irrigated fields reduces wet meadow and scrub/shrub habitat, diminishing its productivity for agriculture and wildlife.

Interbasin water diversion has both beneficial and detrimental effects. Recipients of diverted water have increased stream flow and increased water supply of urban and agricultural users, with attendant benefits for wetlands and wildlife. On the other hand, basins that lose water incur decreased stream flow and decreased water supplies for urban and agricultural users decreasing water supplies to wetlands, reducing their benefits for wildlife.

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