

DRAFT

EMERGENCY WETLANDS RESOURCES ACT

REGION 2 WETLANDS

REGIONAL CONCEPT PLAN

U. S. FISH AND WILDLIFE SERVICE
REGION 2, ALBUQUERQUE, NEW MEXICO
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DRAFT

EXECUTIVE SUMMARY

The Emergency Wetlands Resources Act of 1986, Public Law 99-645, was enacted by the United States Congress to:

"Promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes".

In compliance with the Act, the U.S. Fish and Wildlife Service, acting for the Secretary of the Interior, has prepared the National Wetlands Priority Conservation Plan.

The National Plan provides the framework, criteria, and guidance for identifying wetlands warranting priority attention for Federal and State acquisition using Land and Water Conservation Fund appropriations. Its primary purpose is to help decision-makers focus their acquisition efforts on the more important, scarce, and vulnerable wetlands in the Nation. It can also be used to identify wetlands warranting protection through measures that do not require land acquisition. The National Plan requires each of the seven Fish and Wildlife Service Regions to prepare Regional Wetlands Concept Plans that address the wetlands of each State within each Region.

The Regional Concept Plans are developed to assure that national priorities for wetlands acquisition are addressed within each State in compliance with the Act. Each of the Regional Concept plans will step-down the guidance provided in the National Plan and provide specific information for the wetlands in each State in each Region.

Region 2 of the U.S. Fish and Wildlife Service encompasses the States of Arizona, New Mexico, Oklahoma and Texas. The Regional Concept Plan addresses the wetland issues of each State separately. Following the narrative report on the status of each State's wetlands, are two appendices. The first appendix contains a list of priority wetland sites that have been evaluated through the wetlands assessment threshold criteria of the National Wetlands Priority Conservation Plan and qualify for acquisition under the Emergency Wetlands Resources Act. The second appendix contains a list of candidate wetland sites that have not been evaluated through the threshold criteria, but may be added to the acquisition list (of appendix one) after they have been evaluated through the threshold criteria.

The lists of wetland sites in appendices one and two for each State are not all inclusive, and probably never can be. Funding and manpower will limit the number of wetland sites that can be acquired and protected. Wetland sites will be acquired from willing sellers only, and at fair market value, in accordance with all applicable laws, rules and regulations. All wetlands, whether specifically identified in the Regional Concept Plans or not, are an important part of the nation's natural heritage and worthy of some form of protection.

REGION 2 WETLANDS REGIONAL CONCEPT PLAN

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INTRODUCTION

Region 2 of the U.S. Fish and Wildlife Service (Service), the Southwest Region, encompasses the States of Arizona, New Mexico, Oklahoma and Texas. Wetland habitats within this region run the gamut from wet meadows in the high mountains of Arizona and New Mexico to the coastal marshes along the Gulf Coast of Texas. These wetlands provide the necessary ingredients to support many of the plants and animals found in the region.

The Southwest Region contains 150 species of plants and animals that are listed as either threatened or endangered by the Service. Many of these species are totally dependent on wetland habitats for their existence, and many more are dependent on wetlands during some period of their life cycle.

The value of wetlands to our wildlife resources has been fairly well documented over the past several decades. More recently the social and economic values that wetlands provide for man are being recognized. Wetlands protect our cities from flooding, shorelines from erosion and storm surges, as well as helping to preserve our surface and groundwater quality and quantity for domestic and industrial uses.

The Service estimates that more than half of the wetlands present at the time of European settlement have been lost in the conterminous United States. In spite of the numerous values that we can attribute to wetlands, we as a Nation are still losing them at a steady rate. The enactment of the Emergency Wetlands Resources Act (Act) by the U.S. Congress in 1986 was in response to the recognized need to protect, enhance and restore our wetland heritage.

In accordance with the Act, the Service produced the National Wetlands Priority Conservation Plan (Priority Plan). The Priority Plan provides guidance for identifying the more important, scarce and vulnerable wetlands that qualify for State or Federal acquisition. A wetlands assessment threshold criteria is included in the Priority Plan (see Appendix A) which is used to determine if a particular wetland site qualifies for acquisition under the Act.

The Priority Plan requires each of the Service's seven Regions to prepare Regional Concept Plans. The Regional Concept plans will step down the National Priority Plan to the local, site specific level. This document is the Regional Concept Plan (Concept Plan) for Region 2.

This Concept Plan discusses the wetland functions, values, threats and other issues on a state by state basis. Following this discussion for each state are two appendices. The first appendix contains a list of priority wetland sites that have been analyzed in depth and meet the threshold criteria for acquisition. The second appendix contains a list of candidate wetland sites that will eventually be analyzed and added to the first appendix.

PURPOSE AND AUTHORITY

The purpose of this Regional Wetlands Concept Plan is to review the wetland resources within the four States and produce a list of wetlands that should be given priority consideration for Federal and State acquisition. All wetlands must meet specific criteria specified in the Act and the Priority Plan.

This Regional Wetlands Concept Plan was prepared under the authority of the Emergency Wetlands Resources Act of 1986, Public Law 99-645, and the National Wetlands Priority Conservation Plan. Acquisition of wetlands will be conducted under the authority contained in the Act and the Land and Water Conservation Fund Act of 1965 (16 U.S.C.; 78 Stat. 897), as amended (LWCF).

IMPLEMENTATION GUIDANCE

Wetlands acquired by the Service with LWCF monies must be evaluated against the established threshold criteria contained in the National Wetlands Priority Conservation Plan. States may modify the threshold criteria to meet specific needs, but the modification should not result in standards that are below the threshold criteria in the Priority Plan unless documentable information is available to warrant departure from the minimal criteria.

Wetlands proposed for acquisition by the Service will be evaluated and ranked on a national priority scale through the Service's Land Acquisition Priority System (LAPS). Those projects that receive funding authority will then be subjected to National Environmental Policy Act (Public Law 91-190) compliance and complete public review and comment.

REVIEW AND REVISION

This Concept Plan is scheduled for review by all interested and affected government agencies, special interest groups and private individuals. The Concept Plan will be revised as wetland sites are added or deleted from the candidate and priority wetland lists, and to reflect any revisions that may be made to the National Wetlands Priority Conservation Plan.

APPENDIX

A

NATIONAL WETLANDS PRIORITY CONSERVATION PLAN WETLANDS ASSESSMENT THRESHOLD CRITERIA

APPENDIX A

NATIONAL WETLANDS PRIORITY CONSERVATION PLAN WETLANDS ASSESSMENT THRESHOLD CRITERIA

INSTRUCTIONS: Complete this page to determine whether a wetland site (refer to Wetlands Profile guidance) qualifies for acquisition consideration under the National Wetlands Priority Conservation Plan.

Use the attached guidance for estimating wetland losses, threats and functions and values thresholds. The guidance is organized in the same sequence as the threshold criteria and will direct the user to an appropriate conclusion. Complete all questions and statements.

1. WETLANDS PROFILE:

- a. Wetland Site Name: _____ File No: _____
- b. USGS 1:24,000 Map Quadrangle Name: _____
- c. Township: _____; Section: _____
- d. Longitude: _____; Latitude: _____
- e. City: _____; County: _____; State: _____
- f. Ecoregion: _____ (refer to Cowardin *et al.*, 1979, p.27).
- g. Size: _____ (acres). Date of wetlands assessment: _____

2. WETLAND LOSS PRIORITY: (circle one) 1 2 3 4 5

Must be priority level 1, 2 or 3 to meet threshold.

3. IS THE WETLAND SITE THREATENED? (refer to the attached guidance under Wetland Threats) Must be circled "yes" to meet threshold.

YES NO

4. WETLAND FUNCTIONS AND VALUES

Check all that apply. Must check at least two to meet threshold.

- ☐ a. Wildlife
- ☐ b. Fisheries
- ☐ c. Water Supply/Quality, Flood and Erosion Protection
- ☐ d. Outdoor Recreation
- ☐ e. Other Areas or Concerns _____

5. CONCLUSION

----- Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Priority Conservation Plan.

----- No, wetland site does not meet all threshold criteria and therefore does not qualify for acquisition consideration under provisions of the National Wetlands Priority Conservation Plan.

GUIDANCE FOR ESTIMATING WETLAND LOSSES, THREATS AND VALUES THRESHOLDS

1. WETLANDS PROFILE

Complete items (a) through (g) to give a name and address to each wetland site.

For the purpose of the National Wetlands Priority Conservation Plan, a wetland site is an identifiable property, tract, area, or region containing wetlands or a complex (aggregation) of physically- or functionally-related wetlands. A wetland site may contain a variety of wetland types, interspersed habitat of other types and associated upland buffer areas. The boundary of the site should be specific and as geographically restricted as practical, determined by application of sound acquisition principles. In other words, regardless of size, a wetland site should be treated in terms of a unit which would generally fit the acquisition goals, process and needs of the user.

2. WETLAND LOSSES

Wetlands will be classified as follows: System, subsystem, class and water regime according to Cowardin *et al.*, 1979 (refer to key on next page). Estimate percent of site for each type.

TYPE	PERCENT OF SITE
<i>system</i>	
<i>subsystem</i>	
<i>class</i>	
<i>water regime</i>	
a. ____ : ____ : ____ : ____	____ %
b. ____ : ____ : ____ : ____	____ %
c. ____ : ____ : ____ : ____	____ %
d. ____ : ____ : ____ : ____	____ %
e. ____ : ____ : ____ : ____	____ %
f. ____ : ____ : ____ : ____	____ %
g. ____ : ____ : ____ : ____	____ %
h. ____ : ____ : ____ : ____	____ %
i. ____ : ____ : ____ : ____	____ %
j. ____ : ____ : ____ : ____	____ %
k. Upland	Total 100 % ____ %

Example:

E:2:E M:N System: Estuarine
 Subsystem: Intertidal
 Class: Emergent
 Water Regime: Regularly Flooded

Letter and number key for classification of wetlands to the level of water regime:

SYSTEMS AND SUBSYSTEMS

M Marine	R Riverine
1 Subtidal	1 Tidal
2 Intertidal	2 Lower Perennial
	3 Upper Perennial
	4 Intermittent
	5 Unknown Perennial
E Estuarine	L Lacustrine
1 Subtidal	1 Limnetic
2 Intertidal	2 Littoral
P Palustrine	
No Subsystem	Upland

CLASSES

AB Aquatic Bed	RS Rocky Shore
EM Emergent	SB Streambed
FO Forested	SS Scrub-Shrub
ML Moss/Lichen	UB Unconsolidated Bottom
RB Rocky Bottom	US Unconsolidated Shore
RF Reef	

WATER REGIME MODIFIERS

A Temporary	J Intermittently Flooded
B Saturated	L Subtidal
C Seasonal	M Irregularly Exposed
F Semipermanent	N Regularly Flooded
G Intermittently Exposed	P Irregularly Flooded
H Permanent	

Wetland losses by type. Determine whether the wetland types identified above are decreasing, stable or increasing. Apply to the formula and priority table on the next page.

If supportable information is available to substantiate trends for various wetland types other than that shown by the NWI trends study, this

information may be used to support departures from the trends groupings presented above.

Explain: _____

In the absence of more reliable data, the following conclusions based on Frayer et al. (1983) may be used:

Decreasing: Palustrine emergent
Palustrine forested
Palustrine scrub-shrub
Estuarine intertidal emergent
Estuarine intertidal forested
Estuarine intertidal scrub-shrub
Marine intertidal

Stable: Estuarine intertidal non-vegetated
Estuarine subtidal
Lacustrine

Increasing: Palustrine open water
Palustrine unconsolidated shore
Palustrine non-vegetated

Decreasing wetland types	_____ % OF SITE X 1 = _____
Stable wetland types	_____ % OF SITE X 2 = _____
Increasing wetland types	_____ % OF SITE X 3 = _____
Uplands	_____ % OF SITE X 3 = _____
	TOTAL _____

a.	Priority 1 (0-139)	
b.	Priority 2 (140-179)	
c.	Priority 3 (180-219)	WETLAND LOSS PRIORITY =

d.	Priority 4 (220-259)	
e.	Priority 5 (260-300)	

3. WETLANDS THREATS

For the purpose of the National Wetlands Priority Conservation Plan, threat is defined as the likelihood that a wetland site, or portion thereof, will be destroyed or degraded, directly or indirectly, through human actions.

In establishing the threat threshold, a wetland site is considered to be threatened if an estimated > 10 percent of the site's wetland functions and values are likely to be destroyed or adversely affected through direct, indirect, or cumulative impacts over the next ten years considering:

1. the array of potential wetland threats; and
2. the probable degree of protection provided by the various relevant laws, ordinances and regulations.

At a minimum, the following items should be considered when evaluating wetland threat (indicate activities that either destroy or degrade wetlands at the site):

- a. ☐ Drainage or filling
 - b. ☐ Agricultural conversion or use
 - c. ☐ Livestock grazing
 - d. ☐ Groundwater withdrawal/depletion
 - e. ☐ Loss of instream flows
 - f. ☐ Residential or commercial development
 - g. ☐ Oil, gas, mineral development
 - h. ☐ Power plants
 - i. ☐ Transportation (roads and bridges)
 - j. ☐ Navigation project, port, marina or pier
 - k. ☐ Water development project(s)
 - l. ☐ Water pollution
 - m. ☐ Other, (e.g., timber or vegetation removal, mosquito control practices, diverse ownership with no individual commitment to protection): _____
-

Indicate all laws, ordinances or programs that have some degree of wetland protection potential for this site:

- a. ☐ Clean Water Act (Corps section 404 regulatory program)
 - b. ☐ River and Harbor Act (Corps section 10 regulatory program)
 - c. ☐ Endangered Species Act
 - d. ☐ Water Resources Development Act of 1986
 - e. ☐ Food Security Act of 1985
 - f. ☐ Local zoning or ordinances (e.g., local wetland or floodplain zoning)
-

-
- g. ☐ State ordinances or authorities (e.g., State wetland protection laws, State permit program for activities in wetlands)
- h. ☐ Coastal Wetlands Protection Law
- i. ☐ Inland Wetlands Protection Law
- j. ☐ Owner(s) favors protection
- k. ☐ Other: _____

Considering the relative effectiveness of the combination of the above factors to protect the public values and services of the wetlands, is the wetland site threatened using the definition of threat?

YES NO

If yes, explain type, degree and imminence of threat: _____

4. WETLAND FUNCTIONS AND VALUES

It is assumed that virtually all wetlands provide important public benefits in several functions and values categories. Many wetlands, however, have been recognized, identified and/or listed as having certain of these functions and values. In order to lead to greater objectivity and provide a technique for use by persons of many disciplines, this wetlands assessment method relies on documented data or information rather than allowing for interpretation by users across many disciplines.

Indicate all functions and values which can be attributed to the wetland site. If any of the statements within a category (wildlife, fisheries, water supply/quality, flood and erosion protection, outdoor recreation and other areas or concerns) is affirmative, check that category on the cover sheet, under item 4.

A. Wildlife (endangered and threatened species, migratory birds and resident species)

1.Y N Are Federal or State threatened or endangered plants or animals known to use the wetland site on a regular basis? If yes, list species names: _____

-
2. Y N Have any wildlife resources of the wetland site been recognized, identified, or listed by a Federal or State agency, conservation organization, institution (educational or research) or private group due to specific legislation, designations or management or planning documents (e.g., high wildlife value, declining populations/numbers, edge of range, Audubon Blue List, list(s) or species of special concern or emphasis)? If yes, list recognition: _____

3. Y N Has the wetland site been specially designated, or is it part of a region specially designated, by a Federal or State agency or private group as important for migratory birds or resident wildlife (e.g., referenced in the North American Waterfowl Management Plan or a State Waterfowl Concept Plan or on a list maintained by The Nature Conservancy? If yes, list designation: _____

B. Commercial and Sport Fisheries

1. Y N Does commercial fishing occur on the site? If so, name the fishery: _____

2. Y N Does sport fishing occur on the site? If so, name the fishery: _____

3. Y N Does the wetland site have fishery resource value(s) (e.g. anadromous fishery, spawning, nursery, juvenile or foraging habitat) that is recognized, identified or listed by a Federal or State agency, conservation organization, institution or private group due to specific legislation, designations, or management or planning documents? If so, name recognition: _____

C. Surface and Ground Water Quality and Quantity and Flood Control

1. Y N Are the groundwater recharge and/or discharge (water supply) functions of the wetland site recognized, identified or listed by a

Federal, State, or local agency, conservation organization, institution or private group due to specific legislation, designations, or management or planning documents (e.g., sole source aquifer, municipal water supply)? If so, name recognition: _____

2. Y N Are the water quality functions (e.g., nutrient assimilation, sediment trapping, toxic substance uptake and transformation) of the wetland site recognized, identified or listed by a Federal, State, or local agency, conservation organization, institution or private group due to specific legislation, designations, or management or planning documents (e.g., presence of a downstream dredged channel or reservoir which requires periodic dredging, eutrophic waterbodies downstream, low dissolved oxygen problems, fish kills)? If so, name recognition: _____
- _____
- _____

3. Y N Are the flood control, erosion and/or shoreline damage reduction functions of the wetland site recognized, identified or listed by a Federal, State, or local agency, conservation organization, institution or private group due to specific legislation, designations, or management or planning documents (e.g., flood control project, wetland site within the 100-year floodplain, identified by a city as important for coastal shoreline protection)? If so, name recognition: _____
- _____
- _____

D. Outdoor Recreation

1. Y N Is there a recognized or documented demand for the recreational opportunities available in the wetland site? If yes, explain: _____
- _____

2. Y N Is the wetland site within 50 miles of a Metropolitan Statistical Area or within 50 miles of a tourist area receiving more than 100,000 visitors per year? If yes, name location: _____
- _____
- _____

E. Other Areas or Concerns

1. Y N Does the wetland site have ecological or geological features consistently considered by regional scientists to be rare for wetlands in the region (e.g., fens in the midwest, cypress swamps in northern States, spring communities in various regions)? If yes, name the feature: _____

2. Y N Is the wetland site included in a national or statewide listing of historical or archaeological sites? If yes, name list: _____

3. Y N Is the wetland site being used, or could it be used, for educational or research purposes (e.g., used by a nature center, school, camp, or college, essential to an on-going environmental research or monitoring program)? If yes, name use: _____

4. Y N Does the wetland site have other public values of concern to the Secretary of the Interior? If yes, name and document: _____

5. Conclusion

To qualify for acquisition consideration under the provisions of the National Wetlands Priority Conservation Plan, a wetland site must: 1) include predominantly (50 percent or greater) wetland types which are rare or declining in the ecoregion; 2) be threatened with loss and/or degradation; and 3) offer important values to society in two identifiable functional categories. References, literature citations, agency contacts and personal communications must be provided to support the assessment and conclusions made in this checklist.

ARIZONA WETLANDS

INTRODUCTION

Naturally occurring wetlands in Arizona are limited resources that are experiencing irreversible losses at an alarming rate. They include floodplain marsh, cienegas, wet meadows, and other shallow water and moist soil/gravel habitats. The rapid growth of the State's population and economy have put demands on all available waters in this arid environment. Unfortunately, the availability of adequate water supplies is critical to agriculture, industry, mining, power production, and business and residential growth in Arizona. Just as the State's economy is dependent on water, so is nearly all of Arizona's native wildlife and plant life. Passage of the Emergency Wetlands Resources Act in 1986 recognized the value of wetlands and the need to take steps to protect the Nation's remaining wetlands.

This Arizona Wetlands Concept Plan identifies specific priority wetlands which warrant consideration for Federal and State acquisition with Land and Water Conservation Fund monies.

Appendix AZ-1 identifies priority wetlands that met the Wetlands Assessment Threshold Criteria included in the National Wetlands Priority Conservation Plan. These criteria consider the functions and values of wetlands, historic wetland losses, and threats of future wetland losses. This list will be revised periodically to reflect new information, including changes in regional wetland losses and threats to specific sites.

CONSULTATION

This document was developed in consultation with the Bureau of Land Management, Bureau of Reclamation, Arizona Game and Fish Department, and the Fish and Wildlife Services' National Wildlife Refuges in Arizona. Also, U.S. Forest Service Forest Plans, Environmental Protection Agency's National Priority List, and the Arizona Wetlands Priority Plan were reviewed and used.

WETLANDS ASSESSMENT CRITERIA

Wetland Losses

In the last hundred years, Arizona has lost 90-95 percent of its wetland resources. Once a common scene along the State's drainageways, riparian habitat is now Arizona's most rare and threatened natural community. Old growth cottonwood-willow gallery forests were once a dominant feature creating lush canopies along all of Arizona's major desert river systems. River impoundments, channelization, groundwater pumping, and agricultural development have reduced these areas to mere vestiges of their former abundance. From early explorer accounts, 50 separate cienega sites have been

identified. Today, only 15 remain and several of these have been greatly impacted by overgrazing and groundwater pumping.

Arizona has no long-term, well-documented accounts of its historic wetland resources and the rate of loss of the different wetland types. However, over the last hundred years Arizona has experienced a steady decline in the diversity and abundance of grasses, the removal of the majority of riparian trees from all major rivers, a significant loss of perennial instream flow in major rivers, and substantial changes in fish and wildlife populations dependent on wetland habitats.

Although past studies are incomplete, it is apparent that the State's wetlands are in jeopardy and have sustained significant decreases in both quantity and quality.

Wetland Threat

Historically wetland destruction has occurred as a result of overgrazing by livestock, prheatophyte clearing, dam construction, water diversion, groundwater pumping, and conversion to pasture and cropland. These actions continue to threaten the remaining wetlands in Arizona.

The impacts of livestock overgrazing on riparian vegetation are magnified in arid and semi-arid regions. Most riparian areas in Arizona are grazed, producing aging cottonwoods or hardwood galleries with concurrent lack of vegetative regeneration, diminished wildlife and recreational values, and erosion and water quality problems.

Arizona's landscape contains limited perennial streams and wetland resources. Of the various ecosystems in the state, riparian areas occupy the smallest land area-less than 0.75 percent (Babcock, 1968). Management of Arizona's riparian habitat is difficult because most of these valuable ecosystems occur on private lands.

Federal water management projects on desert river systems constitute the greatest threat to riparian habitat in Arizona (Todd 1978). Most of Arizona's major rivers have dams constructed at various places along their lengths to control the flow of water for hydroelectric power generation, flood control, and irrigation. These controlled flows alter riparian areas by eliminating the periodic flooding necessary for cottonwood-willow regeneration.

Saltcedar, an exotic shrub that was established in Arizona in the early 1900's has replaced native riparian vegetation along substantial portions of many streams and rivers. Man's manipulations of rivers and streams favor saltcedar due to its adaptive capabilities towards increased salinities and its inherent phenology.

Farming practices continue to adversely affect all wetland habitats by modifying water tables, salinity levels, influencing erosion, and converting riparian vegetation into farmland.

"Water farms" are a new threat to the State's wetlands. In recent years, many of the larger metropolitan cities have purchased land in rural areas to secure water rights for future urban development in cities that may be located many miles away.

Wetland Functions and Values

No part of Arizona's landscape provides so many benefits at so little cost to the public as does Arizona's wetlands. The inherent values of these unique environments are usually taken for granted and often overlooked. Because of this, many of these habitats have been drained, filled, or otherwise destroyed.

Arizona's wetland values include fish and wildlife production, recreation, aesthetics, agricultural uses, groundwater replenishment, pollution and sediment control, flood prevention, and educational and scientific uses. The intrinsic qualities and resource values provided by wetlands can vary significantly from one wetland to another.

Wildlife and Fisheries

Wetlands are among the most biologically productive ecosystems and are crucial habitats for fish and wildlife. Wetlands provide essential breeding, nesting, feeding, and predator escape habitats for many forms of waterfowl and other birds, mammals, and reptiles and amphibians. Similarly, they are extremely important for maintenance of fishery resources.

Due to their uniqueness and diversity, wetland communities constitute a fauna disproportionate to their limited acreage. Regardless of species, wetlands are the most valuable wildlife habitats in Arizona (USFWS, undated). Research has demonstrated that wetlands of less than one acre in size support an abundance of life forms. The loss of wetlands, both large and small, therefore, impacts a broad array of plants and animals.

According to the National Wildlife Federation (1985), in North America 41-43% of the mammal species, 38% of the bird species, 30-35% of the reptiles and 13-14% of the amphibians are found in riparian areas. Over 40% of the State's wildlife species depend on riparian habitats for their survival (NWF, 1985). Riparian areas in Arizona can contain up to 25 times as many spring migrant birds per acre as found on adjacent non-riparian habitats. Significantly, 47% of the 161 bird species frequenting certain studied riparian habitats in Arizona are dependent on these areas for nesting. Other avian studies in Arizona have inventoried 80 pairs of nesting birds per 100 acres of partially cleared riparian areas, but the number dramatically jumped to 1,322 pairs per 100 acres on uncleared riparian areas. Arizona riparian areas provide nationally unique habitat for many wildlife species. Several species of wildlife that are totally or largely dependent upon Arizona's riparian habitat include Arizona gray squirrel, river otter, bald eagle, zone-tailed hawk, gray hawk, black hawk, great blue heron, water ouzel or dipper, yellow-billed cuckoo, Bell's vireo, sulphur-bellied flycatcher, elegant trogon, Bullock's oriole, yellow warbler, canyon tree frog, and many more.

The value of a wetland depends upon the following factors: the vegetation species and structural diversity; the amount of open water; the association of the vegetation to the water; the relationship of the wetland to topographic features, lakes, streams, and other wetlands; the size of the wetland and surrounding habitat; water chemistry; permanence; diverse wildlife species composition; and wildlife numbers and populations (USFWS, 1987).

A large number of federally listed threatened and endangered species rely on wetlands for their survival. As of July 1986, 209 animals and 109 plants were listed as threatened or endangered in the United States. Forty-five % (94) of these animals and 26% (29) of these plants depend directly or indirectly on wetlands to complete their life cycles successfully. In addition, of the more than 2,500 plants in need of federal protection, as many as 700 are wetland-dependent or related.

Many of Arizona's federally and state listed threatened or endangered species rely on wetland habitats for survival. A partial list includes the southern bald eagle, peregrine falcon, gray hawk, thick-billed parrot, American bittern, buff-breasted flycatcher, black-bellied whistling duck, narrowheaded garter snake, tropical vine snake, humpback chub, Apache trout, woundfin, Gila topminnow, Yuma clapper rail, water shrew, Hualapai Mexican vole, river otter, and jaguar. Also, certain plants, such as the lemon-lily (Candidate, category 2) require wetlands.

Surface and Groundwater Quality and Quantity and Flood Control

Wetlands are increasingly important as a source of ground and surface water with the growth of urban centers and dwindling ground and surface water supplies. The movement of groundwater into surface water supplies is more important than the movement of surface water into groundwater aquifers. Manipulation of the watershed or intensive use of groundwater can drastically influence a wetland. Redirection of surface flows can eventually result in a reduction of the size of a wetland, and over utilization of groundwater in an area often results in the complete elimination of a wetland. The socioeconomic value of wetlands is higher when the public derives its water supply from the wetland or related groundwater aquifer. The water supply of wetlands provides various public benefits, such as water for public use, irrigation, livestock watering, and fish and wildlife uses (USFWS, 1987; USFWS and EPA, 1981).

Wetlands effect water quality by removing, transforming, and retaining nutrients, sediments, and other natural and man-made pollutants. Wetland vegetation filters sediment, organic matter, and chemicals from the water while microorganisms utilize dissolved nutrients to aid in breaking down organic matter. Therefore, wetlands function as natural water purification mechanisms. It is important to recognize that wetlands have a finite capacity to perform these functions (USFWS, 1987; USFWS and EPA, 1981).

Wetlands within river floodplains form natural floodways that convey flood waters. Floodplains have been created by scouring action and create a natural floodwater conveyance system. Artificial structures located within natural floodways impede flows, causing floods. Wetlands store water during times of

flood and slowly release it downstream, thus lowering flood peaks. Riparian vegetation can be particularly valuable in decreasing flood peaks. Riverine wetlands with adjacent open or relatively open flood-plains often have high flood storage capacities. Important factors influencing the flood reduction role of wetlands include size, location within the basin, texture of substrate, and connection with other wetlands (USFWS, 1987; USFWS and EPA, 1981).

Outdoor Recreation

Wetlands provide recreational opportunities in Arizona. Wetland-related outdoor recreation activities includes hunting, fishing, boating, birdwatching, nature observation, ORV (off-road-vehicle) riding, recreational placer mining, picnicking, hiking, and horseback riding. The non-consumptive use of wetlands have greatly increased in recent years. Historically, hunters, fishermen and trappers were the primary users of wetlands, but today there are many birdwatchers and wildlife observers, students and teachers, artists, and others who regularly visit wetlands. During 1978, nonresident wildlife observers made over 46,000 visits to just three riparian areas in southern Arizona: Ramsey Canyon, Madera Canyon, and Cave Creek in the Chiricahua Mountains. This resulted in over \$5 million in tourist revenue or approximately \$12,370.00 per acre in revenue generation (USFWS, undated).

The use of wetlands in Arizona for recreation has been uncontrolled in many cases. These habitats are highly desirable as recreation sites, but as a whole, they have been poorly managed for that activity. Varied land ownership, accessibility, and lack of facilities all contribute to the situation.

Other Areas of Concern

There are many agricultural uses of wetlands. The most prominent is grazing. Historically in Arizona, riparian vegetation has been cleared to make way for crops such as cotton, alfalfa, and grains. Certain wetlands can produce hay crops and riparian and meadow areas can provide grazing under properly managed conditions. Because of the abundance of flowering vegetation, riparian lands are important for honey production (USFWS, undated).

Wetlands provide excellent educational opportunities for nature observation and scientific study. Riparian habitats are unparalleled as environmental study areas. They are accessible, and offer a wide variety of habitats which contribute to a diverse flora and fauna.

Forested wetland areas are an important source of fuelwood and hardwood lumber. Under sustained management, riparian forests in Arizona could produce between \$60 and \$120 per acre per year in fuel wood. Mesquite bosques represent a marketable product and, under suitable environmental conditions, could be managed as a renewable resource (Olson, 1940). However, sound forest management and utilization practices must be implemented for a sustained yield of mesquite products. Historically, mesquite bosques in Arizona have not been managed but have been cleared for firewood and cropland. On selected sites in

Arizona, the potential sustained yield of walnut and nut crops could be substantial (USFWS, undated).

WETLAND ACQUISITION ISSUES, CONFLICTS AND PRIORITIES

The National Wetlands Priority Conservation Plan indicates that wetlands acquired under the authority of the Emergency Wetlands Resources Act will be those that are representative of a declining wetland type, have significant functional values, and are threatened. A number of other factors will effect the rate and selection of wetlands for acquisition.

Other factors which must be considered include the availability of willing sellers, and the diverse ownership of a number of those wetlands listed for acquisition.

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APPENDIX

AZ-1

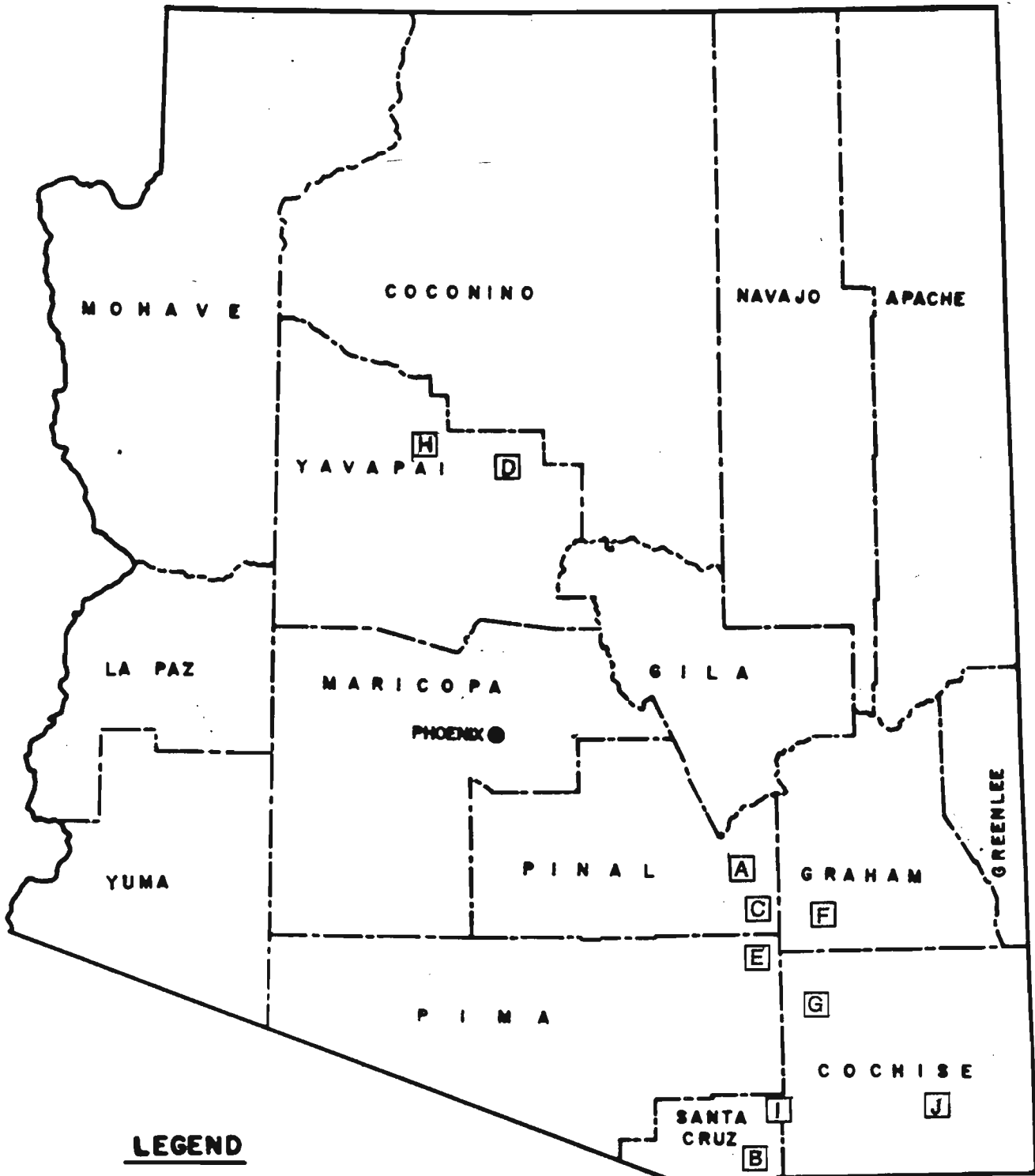
ARIZONA PRIORITY WETLANDS

ARIZONA PRIORITY WETLANDS FOR ACQUISITION CONSIDERATION

Map ID	Site Name	County(s)	USGS Quad(s)	Est. Acreage
A	Cook's Lake	Pinal	Lookout Mt.	140
B	Sheehy Spring	Santa Cruz	Lochiel	25
C	Lower San Pedro River	Pinal	Clark Ranch, Mammoth	600
D	Tavasci Marsh	Yavapai	Page Springs	320
E	Bingham Swamp	Pima	Redington	15
F	Hooker Cienega	Graham	Winchester Mts.	80
G	Kiper Springs	Cochise	Galleta Flat West	160
H	Meadow Valley	Yavapai	Sullivan Buttes, Simmons	120
I	Babocomari Cienega	Santa Cruz, Cochise	Mustang Mts.	960
J	Leslie Canyon	Cochise	Leslie Canyon	1,360

ARIZONA PRIORITY WETLAND SITES

ARIZONA



LEGEND

● STATE CAPITAL

□ FWS WETLAND ACQUISITION SITE
(Letter denotes map identifier)

SCALE

10 0 10 30 50 MILES

Map ID: A

Wetland Site Name: Cook's Lake

State: Arizona

Location: Pinal County, Arizona (10 miles south of Winkelman)

Purpose of Acquisition: Protection of valuable marsh and riparian habitat.

Acreage when completed: 140

Cook's Lake is a well-developed wooded swamp characterized by very old and large specimens of cottonwood (Populus fremontii), ash (Fraxinus velutina), and willow (Salix sp.) which form a nearly closed canopy over much of the marsh. The surface waters are spring-fed. Federally listed species are Peregrine falcons which occasionally use the area, and yellow-billed cuckoo, a candidate species.

A number of State listed species use the Lake. Cook's Lake is a candidate site for inclusion in the State Natural Area Program. The threats on the Lake's value are from grazing, agricultural development, groundwater pumping, surface water diversions, and fill operations. The area is included in the Arizona Wetlands Priority Plan.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Agricultural conversion; (2) Livestock grazing; (3) Groundwater withdrawal; (4) Water pollution.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreation values do meet threshold criteria. Other areas/concerns meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: B

Wetland Site Name: Sheehy Spring

State: Arizona

Location: Santa Cruz County, Arizona (3.5 miles east of Lochiel)

Purpose of Acquisition: Protection of one of the few remaining natural wetlands in Arizona supporting native and endangered fish.

Acreage when completed: 25

Sheehy Spring is actually a series of small springs that form a wetland habitat east of the mainstream of the Santa Cruz River. It is surrounded by one of the finest native grasslands remaining in Arizona. The Gila topminnow (Poeciliopsis occidentalis occidentalis) a federally listed endangered species and the Gila chub (Gila intermedia), a federally listed candidate species occupy the pools formed by the spring. The wetland is highly valuable for educational and research purposes. Grazing, groundwater withdrawal, and residential development are threats to the value of the wetlands.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THIS WETLAND SITE THREATENED:** This site is threatened by: (1) Grazing; (2) Groundwater withdrawal; and (3) Residential development.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria. Recreation values do not meet threshold criteria. Other areas/concerns do meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: C

Wetland Site Name: Lower San Pedro River

State: Arizona

Location: Pinal County, Arizona (1.2 miles east of Mammoth)

Purpose of Acquisition: To save one of the best remaining forest bottomlands in Arizona.

Acreage when completed: 600

The Lower San Pedro River is an excellent example of a dense, mature river bottom forest. The forest is composed of walnut (Juglans major), ash (Fraxinus), cottonwood (Populus fremontii), and willow (Salix Gooddingii). Many of the trees are over 100 years old. The water at the site comes from an artesian discharge of hot water (41.2 degrees C). Many biologists believe this water is the reason for what is believed to be the richest vertebrate fauna in the United States at the site. The Lower San Pedro River site has excellent educational and scientific values.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Livestock grazing; (2) Loss of instream flows; and (3) Residential development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Fisheries values do not meet the threshold criteria. Recreation values do meet threshold criteria. Other areas/concerns do meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: D

Wetland Site Name: Tavaschi Marsh

State: Arizona

Location: Yavapai County (0.6 miles southeast of Peck's Lake)

Purpose of Acquisition: To preserve an important marshland and riparian area; and historical old oxbow of the Verde River.

Acreage when completed: 320

Tavaschi Marsh is marshland, which is notably scarce in Arizona. This riparian area consists of cattails (Typha sp) and open water with intermittent submerged meadows. The marsh provides habitat for a diversity of plants and animals. The Arizona Nature Conservancy has identified the site as significant because it supports portions of one of five Fremont cottonwood-Goodding willow riparian forests in the southwest. Part of the marsh is within the Tuzigoot National Monument. Tavaschi Marsh is of outstanding regional importance as an educational and scientific study center.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THIS WETLAND SITE THREATENED:** This site is threatened by: (1) Draining; (2) Residential development; (3) Road construction; (4) Water pollution.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria. Recreation values meet threshold criteria. Other areas/concerns meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: E

Wetland Site Name: Bingham Swamp

State: Arizona

Location: Pima County (1.5 miles north of Redington)

Purpose of Acquisition: Preservation of a significant remnant example of a wooded swamp and important wildlife habitat.

Acreage when completed: 15

Bingham Swamp is a rare artesian spring-fed swamp. The habitat found in these cienegas appear to belong in an Eastern Deciduous Forest and not in an arid state. The swamp has unusual aquatic habitat used by many species of waterfowl and birds. It is one of the best areas in Arizona to find the black-bellied whistling duck (Dendrocygnus sp.).

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Drainage; (2) Groundwater withdrawal; (3) Road development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreation values do meet threshold criteria. Other areas/concerns do meet the threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: F

Wetland Site Name: Hooker Cienega

State: Arizona

Location: Graham County, Arizona (Sulphur Springs Valley)

Purpose of Acquisition: Preservation of an important cienega within an agricultural valley.

Acreage when completed: 80

The Hooker Cienega supports cottonwood (Populus fremontii), cattails (Typha domingensis), and willows (Salix gooddingii). The cienega is a valuable stopover area for waterfowl including the whooping crane. The pronghorn (Antilocapra americana) is a notable big game animal found in the area.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)
2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Drainage; (2) Livestock grazing; and (3) Groundwater withdrawal.
3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreation values do meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: G

Wetland Site Name: Kiper Springs

State: Arizona

Location: Cochise County (15 miles northwest of Benson)

Purpose of Acquisition: To preserve this unique combination of hydrologic processes and vegetation that has formed the Kiper Springs wetlands.

Acreage when completed: 160

The Kiper Springs area includes one of the most rare vegetation types in the southwest where a bog, broad-leaf riparian forest, and semi-desert grassland with spots of Sonoran and Chihuahu desert are in contact. The spring is inhabited by many riparian trees including velvet ash (Fraxinus velutina), walnut (Juglans major), mulberry (Morus microphylla), and cottonwood (Populus Fremontii). Wildlife, especially birdlife, is abundant within the area. Kiper Springs has recreational value in terms of high scenic, interpretive, and research values for geology and hydrology.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Livestock grazing; (2) Groundwater withdrawal; (3) Residential development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreational values do meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: H

Wetland Site Name: Meadow Valley

State: Arizona

Location: Yavapai County, Arizona

Purpose of Acquisition: Preservation of this important wetland site and wildlife habitat within the Upper Verde River Basin.

Acreage when completed: 120

Meadow Valley is a riparian cienega along an alluvial stream. It is an example of aquatic and riparian community integration. The area is an excellent example of a riverine wetland frequented by a number of migrating waterfowl.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Agricultural conversion; (2) Livestock grazing; (3) Groundwater withdrawal; (4) Residential development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreation values meet threshold criteria. Other areas/concerns meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under the provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: I

Wetland Site Name: Babocomari Cienega

State: Arizona

Location: Santa Cruz and Cochise Counties (7.8 miles northwest of Fort Huachuca)

Purpose of Acquisition: Preservation of the largest natural marsh remaining in southern Arizona.

Acreage when completed: 960

The extraordinary size of the Babocomari Cienega among Arizona's extremely rare marshlands and its well preserved ecological, scientific, educational and wildlife values point to its importance and need for protection. The cienega supports a large gallery forest. It provides habitat for the gray hawk (Buteo nitidus) a state listed threatened species. The site is on the migratory route of the great blue heron and snowy egret and serves as a waterfowl refuge for other migratory and nesting birds.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THIS WETLAND SITE THREATENED? This site is threatened by: (1) Livestock grazing; (2) Groundwater withdrawal; (3) Loss of instream flows; and (4) Residential development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreation values meet threshold criteria. Other areas/concerns do meet the threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

Map ID: J

Wetland Site Name: Leslie Canyon

State: Arizona

Location: Cochise County (30 miles north of San Bernardino NWR)

Purpose of Acquisition: Protection of the endangered Sonoran topminnow and the equally endangered Yaqui Chub.

Acreage when completed: 1,360

Leslie Canyon contains one of only three remaining localities in the U.S. for the Sonoran topminnow. The canyon is only the second location of occurrence for the Yaqui Chub. It supports the larger of the two chub populations. The Chub only occurs in approximately six locations in Mexico. The stream and canyon are unique in supporting the assemblage of three or four native fish species. The riparian corridor is an outstanding example of an Ash-Willow-Cottonwood community, a community that has declined seriously in the nation. This riparian community is also in excellent condition, well worth preserving.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THIS WETLAND SITE THREATENED: This site is threatened by: (1) Agricultural conversion; (2) Water Pollution; (3) Residential development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria. Recreation values do meet threshold criteria. Other areas/concerns meet threshold criteria.

CONCLUSION

YES, Wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: McKinstry/PESFO

Date: 2/13/90

APPENDIX

AZ-2

ARIZONA CANDIDATE WETLANDS

NO CANDIDATE WETLAND SITES HAVE BEEN IDENTIFIED FOR ARIZONA

NEW MEXICO WETLANDS

INTRODUCTION

The Emergency Wetlands Resources Act was enacted in 1986 to promote the conservation of the Nation's wetlands for the public benefits they provide. It contains a wide variety of measures to promote wetland conservation and offset or prevent wetland losses. These include new options to generate revenues for wetland acquisition and protection, establishing a National Wetlands Priority Conservation Plan, and requiring Statewide Comprehensive Outdoor Recreation Plans to specifically address wetlands, among others.

The National Wetlands Priority Conservation Plan, prepared by the U.S. Fish and Wildlife Service (1989) in compliance with the Act, provides a framework for the identification, selection and acquisition of priority wetlands. This Plan establishes assessment criteria concerning wetland functions and values, historic wetland losses and threats of future wetland losses. It also addresses important wetland acquisition issues, and assists states in complying with Section 303 of the Act. However, it does not supercede or replace other wetland protection or regulatory programs established by Federal, State or local laws.

Other Federal legislation applicable to wetlands protection in New Mexico include the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act, the Water Resources Development Act, the Endangered Species Act, the National Environmental Policy Act, the Clean Water Act, the Federal Power Act, as amended by the Electric Consumers Protection Act, the Watershed Protection and Flood Prevention Act, and the Food Security Act.

Other administrative authorities for wetland protection include Executive Order 11990 - Protection of Wetlands, and Executive Order 11988 - Floodplain Management (U.S. Department of the Interior 1988).

Section 404 of the Clean Water Act confers a certain degree of protection on the waters and adjacent wetlands of the United States. It is the strongest legislation protecting wetlands. However, wetlands protection under Section 404 is contingent on the assumption of jurisdiction by federal regulatory agencies and the aggressive enforcement and prosecution of the regulatory provisions of the Act. Moreover, there are certain regulated activities specifically exempted from the public environmental review process under the Act. The U.S. Government Accounting Office (1988) found that Section 404 does not provide the Corps of Engineers the authority to regulate the activities that result in the majority of wetland losses. Conversion of wetlands to agricultural uses is one such exemption. The GAO also found that resource agency perceptions of the Corps' administration of the 404 program differ from the Corps' own view of the program's success. These agencies believe that, in general, the Corps does not delineate wetland boundaries broadly enough, consider cumulative impacts of permit decisions, or require permit applicants to consider other practicable alternatives to development in wetlands. The

Corps is also perceived as reluctant to deny a permit or impose mitigation provisions which require modification of the project.

The Food Security Act of 1985 (Farm Bill) encourages removal of fragile lands from agricultural production and provides various opportunities for wetland protection and restoration. The Farm Bill has a special wetland conservation provision known as the "Swampbuster" provision which removes some of the economic incentives for developing wetlands by eliminating most agricultural subsidies to persons who produce agricultural commodities on wetlands converted to agriculture after the enactment of the Bill.

The North American Waterfowl Management Plan is a policy document which recognizes North American waterfowl as a significant resource that can and must be conserved through cooperative planning and coordinated management. Conservation of wetlands essential as breeding habitat for waterfowl is a paramount objective of the Plan. The Conservation Reserve Program, under the Food Security Act, provides for acquisition, protection and enhancement of wetlands and adjacent upland habitats.

Executive Order 11990 directs each Federal agency to provide leadership and take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of these resources in carrying out agency responsibilities. However, this Executive Order does not provide for protection of wetlands through acquisition.

Executive Order 11988 directs Federal agencies to consider floodplain management when formulating or evaluating water or land use plans. This Executive Order is applicable because of the interrelationship between wetlands and floodplains.

New Mexico is situated within two major Ecoregions: The Steppe Ecoregion comprises about 75 to 80 percent of the state, while the Desert Ecoregion represents the remaining 20 to 25 percent. Within the Dry Steppe Division, there are four different subdivisions represented in New Mexico: 1) Rocky Mountain Forest Province in north-central New Mexico; 2) Colorado Plateau Province in west-central New Mexico; 3) Great Plains-Shortgrass Prairie Province in eastern New Mexico; and 4) Mexican Highland Shrub Steppe Province in southwestern New Mexico. The Chihuahuan Desert Province occupies the south-central and southeastern portions of the state (Cowardin et al. 1979).

Wetlands provide a sharp contrast to the otherwise arid landscape of the desert southwest, where water is a critical factor in determining the structure of biological communities. A variety of wetland types exist in the State of New Mexico. Riverine and riparian ecosystems are the most extensive wetlands and are especially important as migration corridors for a variety of migratory waterfowl and other wildlife. Desert springs and cienegas provide essential habitat for many rare, threatened and endangered species, as well as other indigenous fish and wildlife. The playa lakes of eastern New Mexico are vital links in a chain of wetlands along the Central Flyway extending from central Canada to the Texas Gulf Coast.

The National Wetlands Priority Conservation Plan states that palustrine emergent, forested and scrub-shrub wetlands in the Desert Ecoregion should be accorded high priority consideration for acquisition due to the inherent rarity and recognized historical and recent losses of these wetland types. Although the Plan assigns a lower index of loss to these wetland types in the Steppe Ecoregion, the dependence of agricultural and urban development on the precious surface water resources of New Mexico suggests palustrine wetlands should be given a high priority for acquisition throughout the state.

This Wetlands Concept Plan identifies specific priority wetland sites in the State of New Mexico which warrant consideration for acquisition with monies from the Land and Water Conservation Fund. Appendix NM-1 lists these priority wetlands by county and other political jurisdiction, wetland size, type, and functional significance. A New Mexico State map depicting the location of priority wetland sites is also included in Appendix NM-1.

These sites meet the Wetlands Assessment Threshold Criteria outlined in the National Wetlands Priority Conservation Plan, which consider site-specific wetland functions and values, historic wetland losses and threats of future wetland losses. These criteria have been modified in certain cases to allow for consideration of important sites which otherwise would have been omitted. Individual wetland profiles and threshold criteria are included in Appendix NM-1. There may be significant wetlands in addition to those listed in Appendix NM-1 for which there is insufficient information to warrant listing at this time. The priority wetland list will be revised periodically as new information becomes available, such as changes in regional wetland losses and threats to specific sites.

CONSULTATION

Priority wetland sites were compiled by field biologists from the U.S. Fish and Wildlife Service, Division of Ecological Services, Albuquerque Field Office in consultation with the Division of Refuges and Wildlife, the New Mexico Department of Game and Fish, the Bureau of Land Management, the Bureau of Reclamation, the U.S. Forest Service, other State and Federal agencies and private natural resource and land trust organizations. Site selection is consistent with the objectives of the New Mexico Statewide Comprehensive Outdoor Recreation Plan (SCORP).

This New Mexico Wetlands Concept Plan was distributed to Federal, State and private natural resource organizations for review and comment. The list of reviewers is included below. Any comments received will be addressed or incorporated into this Wetlands Concept Plan, as it will be revised periodically to reflect changes in listed wetland sites and/or any revisions in the National Wetlands Priority Conservation Plan.

Distribution

Federal

U.S. Army Corps of Engineers
Southwest Division
Albuquerque District

U.S. Department of Agriculture
Agricultural Stabilization and Conservation Service
New Mexico State Office
Soil Conservation Service
New Mexico State Office
U.S. Forest Service
Southwest Region
U.S. Department of the Interior
National Park Service
Southwest Region
U.S. Department of the Interior
U.S. Bureau of Land Management
Albuquerque District
Las Cruces District
Roswell District
U.S. Bureau of Reclamation
Salt Lake Regional Office
Rio Grande Project Office
U.S. Environmental Protection Agency
Region IX

State of New Mexico

Governor Garrey Carruthers
Department of Game and Fish
Energy, Minerals and Natural Resources Department
Forestry Division
Health and Environment Department
Environmental Improvement Division
State Parks and Recreation Department

Private

The Nature Conservancy

WETLANDS ASSESSMENT CRITERIA

Wetland Functions and Values

For many years wetlands have been viewed mainly as obstacles to development. Fortunately, during the growth of the environmental movement, wetlands have been increasingly recognized as multifunctional dynamic ecosystems. These essential elements of the natural landscape are among the most biologically productive systems on earth and provide habitat for an incredibly diverse variety of fish and wildlife. Wetlands improve water quality by trapping sediment, nutrients and other pollutants, alleviate flooding by storing overbank flows, control erosion by reducing stream water velocities and dispersing wave energy, recharge groundwater, and provide a variety of outdoor recreational opportunities for birdwatching, hunting, fishing, boating, photography, and many other uses.

Wetlands are particularly valuable in the desert southwest because they are scarce and provide essential year-round habitat and migratory pathways for a

variety of wildlife. In New Mexico, many wetland acres occur within the floodplains of large river systems, such as the Rio Grande, Pecos, Canadian, Gila and San Juan. Because of their north-south alignment, the Rio Grande and Pecos River systems, in particular, provide food, water, cover and resting habitat for vast flocks of snow geese, sandhill cranes, shorebirds and ducks during fall and spring migrations. The Bosque del Apache National Wildlife Refuge (NWR) on the Rio Grande and Bitter Lake NWR on the Pecos, provide winter habitat for a wide variety of waterfowl and other birds. Big game, small mammals, furbearers and a diverse resident avifauna also occur on these refuges and throughout the riparian zone of all major river systems in New Mexico. Hink and Ohmart (1984) documented no less than 246 species of birds, 10 species of amphibians, 38 species of reptiles and 60 species of mammals from the Middle Rio Grande Valley.

More than 25,000 basins known as playas are scattered across 5 states on the Southern Great Plains. Playa lakes, found in twelve counties of eastern New Mexico, also provide habitat for waterfowl migrating, wintering and nesting in the Central Flyway. From 500,000 to 2,800,000 ducks and from 100,000 to 750,000 geese have been estimated to use the playa lakes region. Described as "islands" of wildlife habitat in a "sea" of intensive agriculture, playa lakes also provide habitat for other avian species, such as sandhill cranes, ring-necked pheasants, short-eared owls, northern harriers and a variety of shorebirds. Cottontails, raccoons, coyotes and several small mammal species also are associated with playas (U.S. Fish and Wildlife Service 1988).

Many rare, threatened and endangered species occur only in wetlands. Their scarcity may be due, in part, to the degradation of the specialized habitats on which they depend. Desert springs and cienegas, for example, are insular habitats which promote genetic isolation and limit geographical distribution of some species of fish and invertebrates endemic to only one small spring or spring system. The Socorro isopod, for example, is a relict of a once widespread prehistoric population, now restricted to Sedillo Spring by the natural recession of its optimal habitat. Other species are limited to closed basins for which there is no surface connection to other watersheds. The Chihuahua chub and White Sands pupfish, for example, occur only in the Guzman and Tularosa closed basins, respectively. While this isolation helps to protect some species from interspecific competition and hybridization, it also makes them vulnerable to adverse impact or extinction from both natural and man-caused events.

Wetland Losses

Wetland losses nationwide have been estimated to be 458,000 acres a year, 87 percent (399,000 acres) of which is due to agriculture and 8 percent of which is due to urban development. Much of the arable land in New Mexico is found within the floodplains of major river systems, which also provide a convenient source of water essential for agricultural development. As a result, floodplain wetlands have been extensively converted to agricultural production in New Mexico. Most of the centers of commerce in New Mexico also have developed immediately adjacent to these rivers. Water conveyance and conservation, water supply and irrigation storage reservoirs, flood

protection, phreatophyte control, exploration and development of energy and mineral resources, sand and gravel mining, timber and fuelwood harvesting, highway construction, pipelines, powerlines and other projects in support of urban development also have had cumulatively devastating impacts on New Mexico's wetland resources. During a 20-year period, the Service (1987) estimates at least 20,000 acres of high quality wetland habitats were lost from the Rio Grande floodplain in New Mexico alone from federal projects to support agriculture and to provide flood protection for urban development. Additional wetland acreage is degraded each year by surface water diversion and groundwater pumping, livestock grazing, timber and fuelwood harvesting, solid waste disposal, wildfires, municipal sewage disposal, urban and agricultural run-off and other non-point source pollutants. These losses are particularly significant in the arid southwest considering wetlands are extremely scarce and invaluable for both resident and migratory wildlife.

Wetland Threats

The principal threats to wetlands in New Mexico are from future agricultural and urban development. Increasing demand for food and fiber, construction materials, energy and mineral resources, transportation and utility rights-of-way, housing and commercial development sites will continue to place pressure on fragile wetland resources. Wetlands will be eliminated or adversely impacted by water conservation and conveyance projects, dams and reservoirs, other flood control projects, highway projects, groundwater and surface water depletion, timber and fuelwood harvesting, livestock grazing, agriculture, domestic and industrial sewage, urban and agricultural run-off and other non-point source pollutants.

WETLAND ACQUISITION ISSUES, CONFLICTS AND PRIORITIES

According to the 1989 National Wetlands Priority Conservation Plan, wetlands acquired under the authority of the Emergency Wetlands Resources Act will be those that represent a declining wetland type, have significant functional value and are threatened by development, degradation or loss. Other factors may enter into the site selection process. Acquisition of a site in fee is preferred because it generally offers the greatest opportunity for land use management and control. However, acquisition of a lesser interest, such as easement or deed restriction, may suffice if use restrictions are adequate to secure the desired public interest values. Uplands adjacent to wetlands may also be considered for acquisition if they are essential to maintaining the functional integrity of the wetland and comprise less than 50 percent of the total acquisition. Long-term preservation of wetlands and associated uplands may best be achieved through obtaining easement in perpetuity.

In general, wetlands that can be acquired from willing sellers should be given priority over those requiring the powers of condemnation or eminent domain. Section 305 of the Emergency Wetland Resources Act specifically prohibits the use of condemnation or eminent domain to acquire wetlands constructed for the purpose of farming or ranching (e.g., stock ponds) or resulting from conservation activities incidental to farming or ranching (e.g., wetlands incidental to irrigation practices).

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APPENDIX

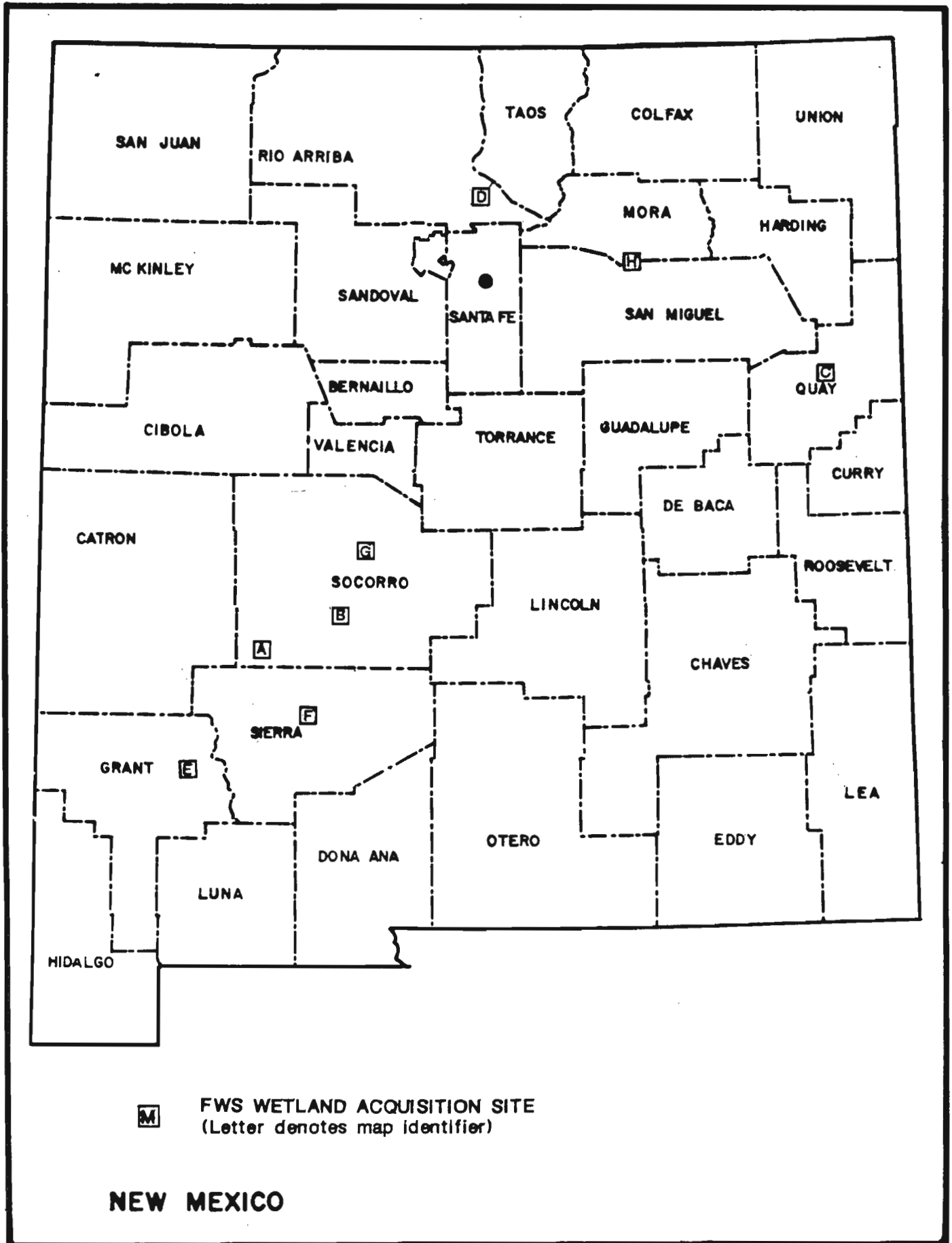
NM-1

NEW MEXICO PRIORITY WETLANDS

NEW MEXICO PRIORITY WETLANDS FOR ACQUISITION CONSIDERATION

Map ID	Site Name	County(s)	USGS Quad(s)	Est. Acreage
A	Alamosa Springs	Socorro	Montoya, Butte	1,000
B	San Marcial Lake	Socorro	Val Verde	500
C	Brissee Lake	Quay	Tucumcari SE	100
D	La Villita Marsh	Rio Arriba	San Juan Pueblo	15
E	Mimbres River	Grant	San Lorenzo	460
F	Mims Lake	Sierra	Elephant Butte	100
G	Sevilleta Grant	Socorro	La Joya	1,575
H	Doolittle Ranch	Mora, San Miguel	Watrous	11,500

NEW MEXICO PRIORITY WETLAND SITES



Map ID: A

Wetland Site Name: Alamosa Springs

State: New Mexico

Location: Socorro County, NM, 5 miles SE of the town of Dusty.

Administering Refuge: Bosque Del Apache

Purpose of Acquisition: Preservation of rare and declining desert spring and cienega riparian complex providing habitat for threatened and endangered species, native aquatic species and migratory birds.

Acreage when completed: 1,000

Alamosa Springs consists of five thermal springs, the largest of which, Ojo Caliente, is the second largest thermal spring in New Mexico. Combined flow from the five springs is about 1,200 gallons per minute with an average temperature of about 27°C (81°F). These springs are the only known habitat of the endangered Alamosa Spring snail (Tryonia alamosa). The typha marsh, wetlands, spring pools and runs also provide essential habitat for a variety of native fish species, leopard frogs, snakes, small mammals and birds.

Adjacent uplands consist of pinyon-juniper grasslands, which are currently grazed by cattle. Across an arroyo southwest of the springs there is an historical site known as Fort Harmony. Some sources identify the Alamosa Springs as Fort Harmony Springs, which are also used by people for bathing.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 2 (140-179)
- 2. IS THE WETLAND SITE THREATENED:** Yes
- 3. WETLAND FUNCTIONS AND VALUES:**

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under the provisions of the Emergency Wetlands Resources Act.

Map ID: B

Wetland Site Name: San Marcial Lake

State: New Mexico

Location: Socorro County, NM, at the town of San Marcial.

Administering Refuge: Bosque Del Apache

Purpose of Acquisition: Preservation of valuable palustrine wetlands and flooded timber in the Middle Rio Grande Valley.

Acreage when completed: 500

San Marcial Lake is a relict wetland currently maintained by seepage from the Rio Grande Low Flow Conveyance Channel. Located between Bosque del Apache NWR and the upper end of Elephant Butte Reservoir, San Marcial Lake is in jeopardy of being drained as the reservoir recedes. The Bureau of Reclamation also has plans to drain this wetland.

San Marcial Lake is an important area for wintering waterfowl, shorebirds, wading birds, doves and other migratory birds. It also supports breeding birds (e.g., redheads, woodducks, shorebirds, cormorants), serves as a nursery for warmwater fisheries and provides year-round recreational opportunities.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Yes

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water supply/quality, flood control values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: C

Wetland Site Name: Brissee Lake

State: New Mexico

Location: Quay County, NM, 10 miles SE of the city of Tucumcari.

Administering Refuge: Buffalo Lake

Purpose of Acquisition: To disperse waterfowl from limited, overused wetland areas.

Acreage when completed: 100

Brissee Lake is situated in a playa basin in an arid agricultural area. Runoff and groundwater from adjacent irrigated fields supplement natural precipitation to maintain permanent surface water in the playa. Numerous species of ducks and geese use this wetland during seasonal migrations. Adjacent stubble fields of corn and milo provide forage for both migrating and wintering waterfowl.

THRESHOLD CRITERIA

1. **WETLANDS LOSS PRIORITY SCORE:** Priority 3 (180-219)
2. **IS THE WETLAND SITE THREATENED:** Yes
3. **WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: D

Wetland Site Name: La Villita Marsh

State: New Mexico

Location: Rio Arriba County, NM, 1 mile north of the town of Alcalde.

Administering Refuge:

Purpose of Acquisition: To preserve a small perennial floodplain marsh in an agricultural area recently impacted by stream channelization and loss of riparian habitat.

Acreage when completed: 15

This small oxbow marsh is a remnant of a wetland type once prevalent along the Middle Rio Grande Valley of New Mexico. Draining, channelization, flood control projects, conversion to agriculture and urbanization have had significant cumulative impacts on this wetland type. The Bureau of Reclamation recently completed an irrigation diversion project in this area which further channelized the river. Additional proposed measures would remove a substantial portion of the remaining cottonwood gallery.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Yes

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water supply/quality, flood control values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: E

Wetland Site Name: Mimbres River

State: New Mexico

Location: Grant County, NM, above the town of Mimbres.

Administering Refuge: San Bernardino

Purpose of Acquisition: To protect wetland values and the site of the only known wild population of the threatened Chihuahua chub in the United States.

Acreage when completed: 460

The status of the Chihuahua chub in its native habitat is tenuous at best. Channelization regularly occurs on the Mimbres River following high flows. This parcel contains the best riparian habitat remaining in the Mimbres drainage. Acquisition of this parcel with its high biological diversity would insure recovery of the species in the foreseeable future.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Yes

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water supply/quality, flood control values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: F

Wetland Site Name: Mims Lake

State: New Mexico

Location: Sierra County, NM, at the city of Truth or Consequences.

Administering Refuge:

Purpose of Acquisition: To preserve valuable waterfowl habitat and palustrine wetlands declining in the Middle Rio Grande Valley.

Acreage when completed: 100

This shallow lake is fringed by emergent and riparian vegetation and nourished by seepage from Elephant Butte Reservoir. Situated between Elephant Butte and the City of Truth or Consequences, it is threatened with loss or destruction by both urban and recreational developments. Mims Lake supports waterfowl and shorebirds both in migration and as year-round residents and provides recreational opportunities not available at Elephant Butte or Caballo Reservoir downstream. Bald eagles are also known to forage in the area.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Yes

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water supply/quality, flood control values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: G

Wetland Site Name: Sevilleta Grant

State: New Mexico

Location: Socorro County, NM, near the town of La Joya.

Administering Refuge: Sevilleta

Purpose of Acquisition: To protect riparian habitat within existing refuge that serves as a vital link to other refuge lands.

Acreage when completed: 1,575

This tract contains the only remaining riparian habitat along the Rio Grande connecting the two units of Sevilleta NWR. Numerous sandbars at the confluence of the Rio Grande and the Rio Salado are an important waterfowl roosting area. Whooping cranes from Bosque del Apache NWR are among those species using the area. The tract proposed for acquisition contains part of this roosting habitat, the remainder of which has been acquired. Most of the proposed tract was included in the original 220,000 acre gift from the Nature Conservancy, but only a quit claim deed was delivered for the riparian parcel. Title information indicates that the U.S. does not own this parcel and that a court decision from an ongoing lawsuit may require the Federal government to pay funds to the claimant or relinquish its claim to the land. Major threats to the area are destruction of riparian habitat, overgrazing by livestock and uncontrolled public use.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Yes

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, water supply/quality, flood control values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: H

Wetland Site Name: Doolittle Ranch

State: New Mexico

Location: Mora and San Miguel Counties, NM, near the town of Watrous.

Administering Refuge: La Junta

Purpose of Acquisition: To preserve wetland and riparian habitats, wintering bald eagles, mallards, pintails and nesting woodducks.

Acreage when completed: 11,500

More than 5000 Canada geese, 2500 ducks and at least 20 bald eagles winter in the vicinity of this ranch. More than 200 other species of birds occur on the ranch seasonally or year-round. There are about 5-6 playa lakes on the property, which provide habitat for a variety of migrating waterfowl. Approximately 800 acres of irrigated cropland and pastureland, which occur in proximity to many acres of wetlands and riparian habitats, provide thousands of mourning dove nest sites. Pronghorn, mule deer, badger, coyote, gray fox, beaver and muskrat also reside on the ranch. The Mora River and Wolf Creek provide habitat for brown and rainbow trout, green sunfish, dace and a variety of native minnow species. The principal threat to this wetland is overgrazing which could result if land is sold to a less conservation oriented rancher.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Yes

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water supply/quality, flood control values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

APPENDIX

NM-2

NEW MEXICO CANDIDATE WETLANDS

NO CANDIDATE WETLAND SITES HAVE BEEN IDENTIFIED FOR NEW MEXICO

OKLAHOMA WETLANDS

INTRODUCTION

The Oklahoma Wetlands Priority Plan (State Plan) identifies wetlands warranting urgent attention for Federal and State acquisition with Land and Water Conservation Fund appropriations. The State Plan was prepared by the Fish and Wildlife Service under mandate of the 1986 Emergency Wetland Resources Act, P.L. 99-645. The Act increased Federal funding authorized for wetland acquisition, and established a national wetlands priority planning mechanism to promote coordination among public and private wetland interest groups. A primary purpose of the State Plan is to help Federal and State decision-makers focus acquisition efforts on the more important, scarce, and vulnerable wetland types and regions in Oklahoma. However, the plan also can be used by private sector and local, State, and Federal agencies, working alone or in concert, to target wetlands for protection by whatever means possible. Additionally, this plan helps the Oklahoma Tourism and Recreation Department meet the Act's requirement to address wetlands as important sources of outdoor recreation. Collectively, this plan should help coordinate a coherent, predictable, and efficient means to protect wetland resources within and among localities, counties, and regions of Oklahoma. The amount (acreage) of wetlands protected will measure the success of the strategy.

The State Plan consists of a narrative and appendices. The narrative considers (1) the extent to which various wetland types have declined from historic levels, (2) the threat of future wetland losses, and (3) functions and values of wetlands, including fish and wildlife; surface and groundwater quality, quantity, and flood control; and outdoor recreation. The narrative also describes assessment criteria used to qualify wetlands for potential acquisition. Appendices contain maps and unranked lists of priority wetlands. One list contains wetlands which have been run through and have passed minimum threshold criteria defined in the National Wetlands Priority Conservation Plan (U.S. Fish and Wildlife Service 1989). This "qualifier list" simply establishes wetland eligibility for acquisition consideration under section 301 of the Emergency Wetlands Resources Act. Any subsequent decision by government agencies to purchase property must rely on additional data, policy, and conditions separate from the National Wetlands Priority Conservation Plan. The other list, "candidates", contains wetlands which may meet the minimum criteria but have not yet been run through the threshold test. Both lists are dynamic and will be reviewed and revised periodically, with new wetlands added to the potential list, and acquired or protected wetlands deleted from the plan. Wetlands on the candidate list will be elevated to the qualifier list if they pass the threshold criteria, or deleted from the plan if they fail the criteria.

CONSULTATION

Only through cooperative efforts of all governmental agencies, private organizations, and individuals can public wetland resources be adequately protected for future generations. Therefore, this plan was developed by consultation with numerous groups, including the Oklahoma Department of Wildlife Conservation, Oklahoma Natural Heritage Inventory, Oklahoma Tourism and Recreation Department, Oklahoma Water Resources Board, Environmental Protection Agency, National Park Service, National Forest Service, Corps of Engineers, Bureau of Reclamation, Bureau of Land Management, Ducks Unlimited, and National Audubon Society. These organizations play an essential complementary role in protecting Oklahoma wetlands and providing public outdoor recreation.

WETLANDS ASSESSMENT CRITERIA

Wetland Types and Distribution

Oklahoma wetlands usually lie in a depression or along rivers and include a variety of ecosystems: cypress swamps and bottomland hardwood forests in the southeast, salt flats and intermittent playa lakes in the northwest, and marshes, streams, and riparian wetlands scattered statewide. Wetland diversity tends to be highest in southcentral and eastcentral Oklahoma, and lowest in the west and Panhandle (Heitmeyer and Vohs 1981). This trend mirrors the southeast to northwest precipitation gradient: an average of 56 inches in the southeast, diminishing to 16 inches in the Panhandle.

Oklahoma wetlands fall into three broad classifications under the system used in the Fish and Wildlife Service's National Wetland Inventory (Cowardin et al. 1979): riverine, lacustrine, and palustrine (Figure 1). Riverine wetlands are contained within a channel which periodically or continuously contains fast or slow moving water; they are stream related but do not include the trees, shrubs, and emergent vegetation in or adjacent to the stream. Oklahoma riverine wetlands lie in the Arkansas and Red River drainage basins (Figure 2). The Arkansas River drains the northern two-thirds of the State, collecting tributary waters primarily from the Salt Fork Arkansas, Chikaskia, Cimarron, North Canadian, Canadian, Verdigris, Neosho, Illinois, and Poteau Rivers. The Red River drains the southern third of the state, collecting tributary waters primarily from the North Fork, Washita, Muddy Boggy, Blue, Kiamichi, and Little Rivers.

Palustrine wetlands are usually vegetated, wet areas inside and outside of floodplains. They include floodplain forests (bottomland hardwoods), stream corridors (riparian areas), marshes, meadows, bogs, swamps, sloughs, ponds, and most of Oklahoma's playa lakes. Ponds lacking vegetation, and less than 20-acres-area and 2-meters-deep, are included in the palustrine system. Also included are vegetated wetlands which have been cleared or farmed but still maintain hydrology and soil characteristics typical of wetlands.

Reservoirs and some playa lakes (total area greater than 20 acres), having no more than 30 percent areal cover of trees, shrubs, and emergents, fall into

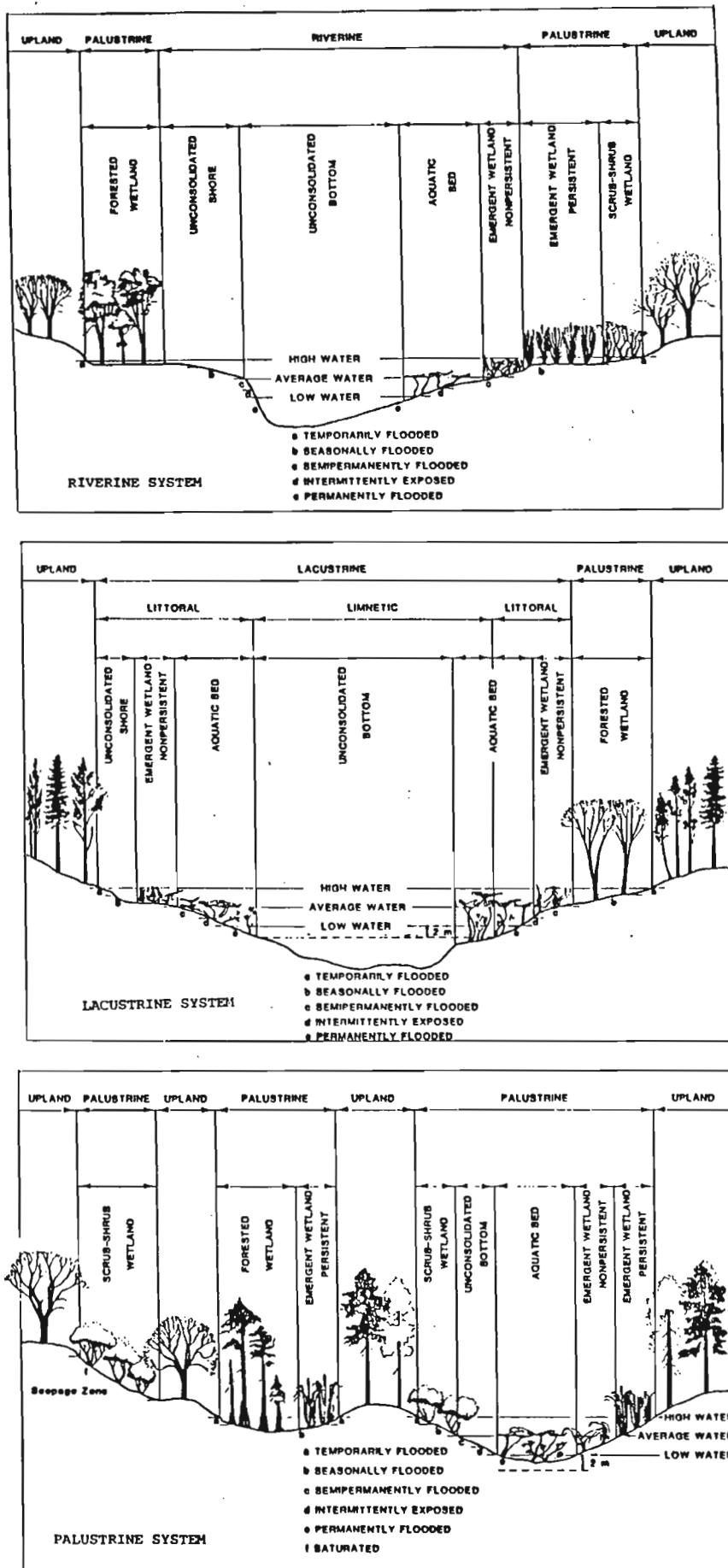


Figure 1. Distinguishing features and examples of wetland habitats in the riverine, lacustrine, and palustrine systems (from Cowardin et al. 1979).

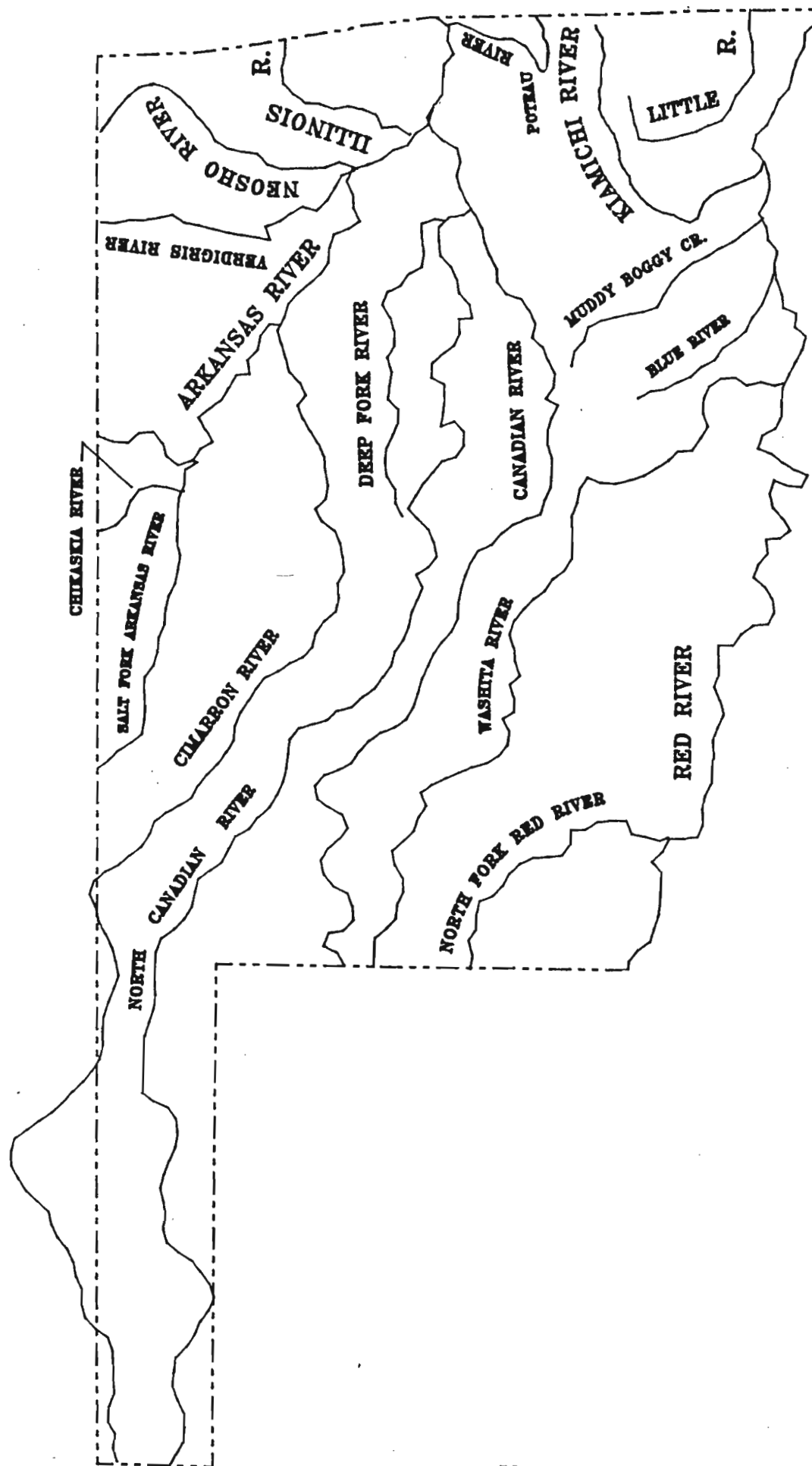


Figure 2. Major streams in the Arkansas and Red River drainages, Oklahoma.

the lacustrine system. These lake-like habitats sometimes are divided into near shore (littoral) zones of emergent plants and open, deepwater (lentic) zones. There are no large natural lakes in Oklahoma, but many impoundments have been constructed, including 35 major reservoirs ≥ 500 acres, and about 1,800 small impoundments ≤ 10 acres (Oklahoma Water Resources Board 1984a). An unknown number and acreage of wetlands have developed in the upper ends and arms of reservoirs.

The number of wetlands is dynamic, driven by seasonal precipitation trends favoring maximum numbers of wetlands in summer and minimum numbers in early winter (Heitmeyer and Vohs 1981). Accounting for seasonality during 1978-80, Heitmeyer and Vohs (1981) estimated that 66-80 percent of Oklahoma surface water was contained in large reservoirs, 15-25 percent in palustrine and small lacustrine wetlands, and 25-40 percent in streambeds.

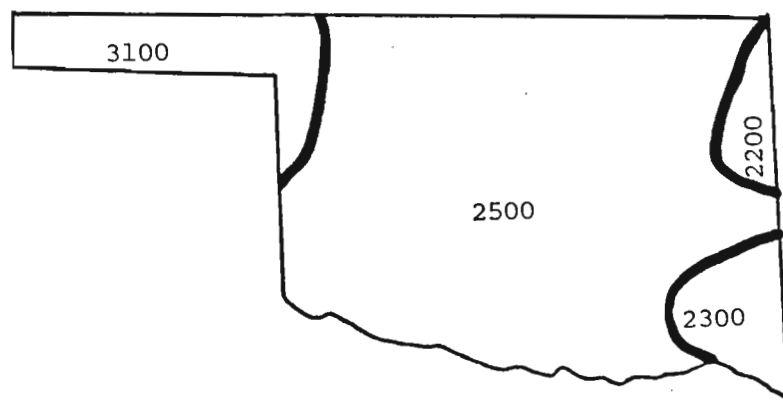
Generally, Oklahoma wetland vegetation forms a continuum, with woody species dominant in the east and nonwoody species dominant in the west. Poorly drained silty or clay floodplains in the east support forests dominated by oak (Quercus spp.) ash (Fraxinus spp.), elm (Ulmus spp.), and hickory (Carya spp.). These wetlands generally are underlain by sedges (Cyperus and Carex spp.), rushes (Eleocharis and Juncus spp.) and grasses, with few submergents or floating species other than duckweed (Lemna minor). The central and western prairie wetlands also have few submergents and tend to be dominated by nonwoody emergent plants.

Wetland Loss

Wetland types to be given priority consideration for acquisition are those that are rare or have declined within an ecoregion. Generally, palustrine emergent, forested, and scrub-shrub wetland types warrant priority consideration (Figure 3) for Federal and State acquisition nationwide (U.S. Fish and Wildlife Service 1989). Additionally, in Oklahoma, riverine wetlands have declined and degraded and merit priority consideration.

Extensive wetland loss has resulted from water development projects in Oklahoma. In a series of laws and resolutions dating back to the Rivers and Harbors Act of 1899, Congress directed Federal land and water development agencies to dam, channelize, and drain Oklahoma wetlands. The largest and probably most ecologically damaging channelization project in Oklahoma was the Kerr-McClellan Arkansas River Navigation Channel. Smaller-scale projects, however, cumulatively eliminated large areas of wetlands.

Brabander et al. (1985) estimated an 85 percent loss of bottomland hardwood acreage in eastern Oklahoma from presettlement (2.2 million acres) to the early 1980s (330,000 acres). Construction of large reservoirs inundated over 240,000 acres of floodplain soils suited for hardwood growth (Brabander et al. 1985). Agriculture and silviculture also took their toll. An estimated 1.65 million acres of bottomland hardwoods were converted to farming, ranching, and silvicultural purposes (Brabander et al. 1985). Most prime bottomland timber was cut over by the 1930s. In the southeast, clear cutting and conversion of hardwoods to pine plantations became the preferred practice. Urban and mineral resource development accounted for additional losses. The end result:



Ecoregion Division	Index of Loss, 1954-74		
	PFO	PSS	PEM
2200	Low	Low	Moderate
2300	High	High	High
2500	Low	Moderate	Moderate
3100	Low	Low	-

Figure 3. Index of loss by ecoregion for palustrine forested (PFO), scrub-shrub (PSS), and emergent (PEM) wetlands in Oklahoma, national trends study, 1954-74 (adapted from U.S. Fish and Wildlife Service 1989:15).

Large stretches of unexploited, timbered bottomlands no longer exist anywhere in the state (Brabander et al. 1985, Oklahoma Department of Wildlife Conservation 1990).

In western Oklahoma, Stinnett et al. (1987) estimated that 21-28 percent of presettlement riparian lands remain forested. Existing riparian woodlands were consistently small in size (8-29 acres) and sparsely distributed. They found a 38 percent loss of wetlands (1,200 - 1,400 acres annually) along 206 miles of the Canadian River from 1954 to 1984. The river corridor changed from barren river bottom to a channel choked by woody vegetation, primarily exotic salt cedar (Tamarix gallica). The change was attributed to lack of water releases from Sanford Dam in Texas and downstream conversion of floodplain land to crop and livestock production. Due to the changed hydrology, forested and scrub-shrub wetlands encroached and narrowed the river channel, resulting in a loss of emergent wetlands and barren sandbars.

As an example of the potential impacts of smaller-scale projects, Hedrick (1978) and Barclay (1978, 1980) reported on the Wildhorse and Rush Creeks small watershed project completed in the Washita River basin (southcentral Oklahoma) in the 1920s and 1930s. Floodplain lands of the Washita River have undergone perhaps the greatest degree of conversion to agricultural development of any western Oklahoma river (Stinnett et al. 1987). This basin was one of eleven watersheds selected nationwide for installation of extensive upstream flood control measures. Wildhorse and Rush Creeks were channelized and equipped with floodwater retarding structures, resulting in complete loss of 54 (1,794 acres) natural wetlands (Barclay 1980). "Floodproofing" facilitated clearing, draining, and farming of creek bottomlands, and conversion of upland native grass to tame pasture. Ultimately, 31 percent of the original channel length and 86 percent of bottomland hardwood forest was eliminated from Wildhorse and Rush Creeks (Barclay 1978, 1980). Similar, if less drastic, observations can be made in the majority of channelized Oklahoma floodplains (Brabander et al. 1985). In addition to direct losses of habitat, quality of remaining riparian lands in Oklahoma is changing due to water quality degradation, reduced streamflow, and progressive west-to-east invasion of introduced salt cedar (Tamarix gallica), a tree of low wildlife value (Stinnett et al. 1987).

In addition to significant impacts from agricultural conversion, wetlands have been affected by agricultural water withdrawals (Tiner 1984). In western Oklahoma and neighboring states, ground water withdrawal for irrigation and livestock watering has resulted in lowered water tables, declining stream flows, and destruction of springs (Brune 1975). The Oklahoma Panhandle is the largest user of irrigation water in the state (Oklahoma Economic Development Association 1985), and relies upon the Ogallala Aquifer to irrigate wheat, sorghum, and other crops by center-pivot sprinklers. Ditches for irrigation and livestock watering also divert surface water from rivers and collect natural runoff, preventing direct flow to recharge wetlands. Leveling for irrigation and installation of ditches has affected wetland quantity and quality by increasing sediment loadings in nearby wetlands. Moreover, Ogallala water levels have declined for decades because withdrawal exceeded natural recharge. Despite recent gains in the aquifer in the Northern Plains, drops of 10-25 feet per year continued in Oklahoma during 1980-87 (Kastner

1989).

Additionally, many Oklahoma springs have been modified to enhance their use for water supply (Matthews et al. 1985). Twenty-two of 50 Oklahoma springs surveyed by Matthews et al. (1985) were modified, either dammed, dredged, or lined with rock or concrete.

Further, Oklahoma wetlands have been altered by soil erosion and siltation; pesticide and fertilizer runoff from crop and pasture land; overgrazing; road, pipeline, and powerline construction; oil and gas exploration and recovery; other sources of industrial pollution; and home construction (Heitmeyer and Vohs 1981).

Although the estimates vary, there is little doubt that destruction of wetlands has been extensive statewide. Shaw and Fredine (1956) estimated 18,503 acres of high quality wetlands, 133,802 acres of moderate quality wetlands, and 127,402 acres of low quality wetlands for wintering waterfowl in Oklahoma during the 1950s. Most of the high and moderate quality wetlands likely were natural (Heitmeyer and Vohs 1981). By the early 1960s, an estimated 72,000 acres of natural wetlands remained (Sanderson and Bellrose 1969): a 53 percent loss in one decade. Heitmeyer and Vohs (1981) calculated a 37 percent loss of Oklahoma wetlands between the early 1960s and early 1980s, and a 47 percent loss between the early 1950s and early 1980s. According to the Oklahoma Water Resources Research Institute (1980), however, statewide wetland loss approached 81 percent between the mid 1950s (276,450 acres) and 1980 (52,525 acres).

Wetland Threats

Wetlands to be given priority consideration for acquisition should be subject to identifiable threat of loss or degradation (U.S. Fish and Wildlife Service 1989). Most factors discussed under the Wetland Loss section continue to threaten the intricate balance of Oklahoma wetlands.

Specifically, about 430 miles of proposed stream channelization and nine authorized or proposed reservoir projects would destroy at least 80,000 acres of remaining bottomland hardwood wetlands in Oklahoma (Brabander et al. 1985). Silvicultural activities (clear-cutting and conversion of wetlands to pine plantations) threatened more than 30,000 acres of bottomland hardwoods in McCurtain County in 1985 (Brabander et al. 1985). Agricultural conversions also continued. At the present rate of destruction, one percent of bottomland hardwoods in eastern Oklahoma will be lost annually (Brabander et al. 1985).

Loss of instream flows, ground water withdrawal, cropping to the stream edge, overgrazing, and water pollution (e.g., pesticides, herbicides) continue on many Oklahoma rivers. Stinnett et al. (1987) predicted future floodplain wetland losses of 2 percent annually on the Canadian River.

Statewide, continued oil and gas exploration and production has the potential to contaminate ground and surface waters and lands from salt water, crude products, and chemicals. The Arkoma Basin in wetland rich southeast Oklahoma is recognized nationally as a priority area for natural gas development in the

1990s. Additionally, contamination of groundwater from active and abandoned mines has resulted in long-term and possibly irreversible damages to wetlands, especially those in far northeastern Oklahoma.

To make a threshold decision that a wetland site is threatened, the type of threat and laws, ordinances, or land use controls fostering protection of the wetland are considered (see Appendix 1). A number of federal laws directly or indirectly provide some protection for Oklahoma wetlands, but do not form a comprehensive or consistent wetland protection program. Some federal policies encourage wetland loss, whereas others encourage protection. (For a good summary, see Barton 1985, Berner 1988, Congressional Research Service 1982, U.S. Department of the Interior 1988). Regulatory programs are frequently cited for their limitations: restricted jurisdiction and limited statutory authority; divergent interpretation of statutes by the regulatory authorities; limited staffing for regulation and enforcement; and failure to properly assess developmental impacts, especially cumulative impacts. On the other hand, developers often criticize the regulatory programs as burdensome and intrusive, for delays in permit processing, for jurisdiction by more than one agency, and for inconsistent interpretations of statutes. A council on the environment, created by Governor Bellmon in 1988, formally acknowledged such problems in Oklahoma (Environmental Concerns Council 1989). The net result of such problems and loopholes in the law, is that Oklahoma wetlands continue to be lost.

Federal laws providing the greatest opportunities for wetland protection in Oklahoma include (1) Section 404 of the Clean Water Act of 1977 (Corps 404 regulatory program), (2) River and Harbor Act of 1899, as amended and supplemented (Corps section 10 regulatory program), (3) Endangered Species Act of 1973, as amended, (4) Water Resources Development Act of 1986, (5) Food Security (Farm Bill) Act of 1985, and (6) 1977 Executive Orders 11990 and 11998. Other Federal directives to protect wetlands include the North American Waterfowl Management Plan, the Emergency Wetlands Resources Act, and President Bush's "no net wetland loss" policy.

Some wetland protection is provided through State or local programs such as floodplain management and water quality certification. Statewide, local zoning ordinances, such as those in Tulsa, prohibit certain activities in floodplains; however, wetlands may still be lost provided construction occurs above flood level and does not cause flooding. Under Section 401 of the Clean Water Act, the Oklahoma Water Resources Board (OWRB) reviews application of all permits (e.g., the Environmental Protection Agency's National Pollutant Discharge Elimination System permits, and Corps 404 permits) for compliance with State Water Quality Standards. State Water Quality Standards, however, do not specifically address values of wetlands in maintaining water quality. The OWRB can deny 401 certification for those permits that would violate water quality standards, and has done so in the past, primarily for pollutant discharge to streams.

To determine the degree of wetland threat for a particular site, the array of potential threats must be weighed against the probable degree of protection provided by laws, ordinances, and regulations. A wetland site is considered threatened if greater than 10 percent of the wetland's functions and values

are likely to be lost or degraded within 10 years (U.S. Fish and Wildlife Service 1989).

Wetland Functions and Values

Wetlands to be given priority consideration for acquisition are those with diverse, important functions and values and/or high or special value for specific wetland functions. All wetland functions and the broadest range of values are considered in establishing priorities, without greater priority consideration given to one public value over another.

Wetlands functions and values include fish and wildlife habitat, surface and groundwater supply, water quality improvement, flood and erosion reduction, outdoor recreation, research and education, and aesthetics. Functions and values vary with wetland type, location, size, geology, hydrology, soils, and level of human modification. Because of these variations, individual wetlands do not necessarily have all values, perform all functions, or perform them well.

Land-water interfaces, including upland buffers, are among the richest wildlife habitats. These areas support diverse plant communities and provide food, water, and cover for many species of migratory and resident birds, mammals, reptiles, and amphibians, including endangered species. For example, at least 147 bird, 47 mammal, 38 amphibian, and 54 reptile species use bottomland hardwood wetlands in eastern Oklahoma (Brabander et al. 1985). About one third (135) of all birds species (349) known from western Oklahoma commonly reside, breed, or winter in riparian vegetation (Stinnett et al. 1987).

Oklahoma wetlands provide vital wintering habitat and some breeding habitat for waterfowl. Mallard (Anas platyrhynchos), widgeon (A. americana), gadwall (A. strepera), green-winged teal (A. crecca), common merganser (Merqus merganser), lesser snow goose (Chen caerulescens), Canada goose (Branta canadensis), and sandhill cranes (Grus canadensis) (Heitmeyer 1980) commonly winter in Oklahoma. Heitmeyer (1980) found that most dabblers (30-80 percent) wintered on small wetlands, selecting natural riverine and palustrine basins over man-made impoundments. Farm ponds comprised greater than 95 percent of palustrine and small lacustrine wetland basins, but wintered less than 10 percent of the Oklahoma duck population. Although Oklahoma is on the edge of most waterfowl breeding ranges, the state's wetlands produce some mallard, common pintail (A. acuta), and wood duck (Aix sponsa) broods (Heitmeyer 1980, Prokop 1981).

Raccoon (Procyon lotor), muskrat (Ondatra zibethicus), beaver (Castor canadensis), mink (Mustela vison), nutria (Myocastor coypus), swamp rabbit (Sylvilagus aquaticus), bobcat (Lynx canadensis), and other furbearers also use Oklahoma wetlands. Obligate wetland mammals made up 63 percent of the 1987-88 harvest of 78,200 pelts (Oklahoma Department of Wildlife Conservation 1988).

Many amphibians and reptiles depend on wetlands throughout all or part of their life cycle. All amphibians require water for breeding. Some reptiles

and amphibians spend most of the year in uplands but crowd into small, temporary wetlands for breeding. Many larval toads, frogs, and salamanders require water for development into adult stages, and adults of some species require water to avoid desiccation and respire cutaneously. Moreover, about 40 species of reptile in Oklahoma (50 percent) have wetland affinities (Webb 1975). Reptiles and amphibians depend on specific microhabitats such as surface litter, debris heaps, moist gravel beds, and trees in or near wetlands. For example, certain basking turtles can be extirpated from a pond if floating logs are eliminated (Jones 1988). The Oklahoma salamander (Eurycea tynerensis) depends on deep, mesic, gravelly streambeds and during drought follows the receding water table down into the gravel bed (Cline et al. 1989).

Fifty-four percent of threatened and endangered species in the U.S. occur in or depend on wetlands or deep water habitats for their continued existence (Endangered Species Information System computer data base). Almost two-thirds of Oklahoma's federally-listed threatened and endangered species spend all or part of their life cycle in wetlands. Endangered Indiana (Myotis sodalis), gray (M. grisescens), and Ozark big-eared (Plecotus townsendii ingens) bats forage in riparian stream corridors and other wetlands, and may use caves with subterranean streams. Threatened Ozark cavefish (Amblyopsis rosae) also reside in cave streams. Endangered bald eagles (Haliaeetus leucocephalus) winter near reservoirs and rivers with abundant prey (fish and waterfowl). Riparian timber with suitable perch trees is essential to the winter ecology of the eagle. Endangered whooping cranes (Grus americana) migrate through western Oklahoma, stopping to roost and feed at braided river channels, marshes, and wet meadows. Migrant threatened piping plovers (Charadrius melodus) also stop to feed and rest along braided river channels and at reservoir beaches and mudflats. Endangered interior least terns (Sterna antillarum) breed statewide in braided river channels near diverse wetland types containing small fish. American alligators (Alligator mississippiensis), also on the protected federal Endangered Species List, reside in rivers, oxbows, swamps, and marshes of the Red River system. The threatened leopard darter (Percina pantherina) resides in pools and riffles of the Little River system. The ivory-billed woodpecker (Campephilus principalis) and red wolf (Canis niger) formerly occupied Oklahoma bottomland hardwood wetlands but now are considered extirpated.

Additionally, Oklahoma wetlands support rare or sensitive species of concern, many of which are State-listed species or Federal candidates for listing. A total of 105 rare vertebrate and plant species occur in bottomland hardwoods of eastern Oklahoma (Brabander et al. 1985). A number of wetland-dependent nongame migratory birds also show danger of decline. National Breeding Bird Surveys for Oklahoma during 1966-1987 indicate that while lacustrine-associated migratory birds generally are increasing, palustrine and riverine-associated birds are decreasing (J. A. Ratzlaff, pers. comm.).

As wetland habitats diminish and are isolated from larger systems, they have increasingly served as refuges for a variety of declining plant and animal species which often become rare, unique, or endangered. Some isolated wetlands function as island ecosystems surrounded by large areas of dissimilar habitat. As islands, they are particularly prone to stress and disequilibria

when disturbed.

Catfish farming and other aquaculture activities occur in some of the deeper water wetlands of Oklahoma. Commercial fishing, bait minnow, and mussel harvest also are permitted on a few reservoirs and rivers. In 1985 (Oklahoma Department of Wildlife Conservation 1986), Oklahoma commercial fishermen harvested about 273,000 pounds of fish, 83,000 pounds of bait minnows, and 335,000 pounds of mussels valued at over \$295,000. Buffalo (Ictiobus spp.), paddlefish (Polyodon spathula), paddlefish eggs (caviar), and plains minnows were the principal catches. Harvest pressures and dollar values generally have decreased over the years as reservoirs have aged and as rivers have degraded and become less productive.

Sport fishing for bass, crappie (Centrarchidae), and catfish (Ictaluridae) is popular on Oklahoma's numerous reservoirs, ponds, and streams. Statewide in 1975, sportsmen spent an estimated 200,000 daylight hours fishing 64 Oklahoma reservoirs and stilling basins (Summers 1978). Stream fishing statistics are not available statewide. Many fishermen, however, place a high value on stream fishing and lament poor access to higher quality streams.

Streams, in combination with palustrine floodplain wetlands, are important to fish ecology. At least 8 species of game fish occur in Oklahoma bottomland hardwood wetlands (Brabander et al. 1985). These wetlands serve as spawning, nursery, and feeding grounds for largemouth bass and other species, some of which migrate from streams to reservoirs. Wetland vegetation along streams and reservoirs provides nutrient input, food for aquatic insects eaten by fish, cover for fish, and shade for water temperature regulation which triggers spawning responses in fish.

Hydrologic functions of wetlands are complex and not well understood. Consequently there is little information specific to Oklahoma. In general, wetlands function in surface and groundwater recharge and discharge, water quality, and floodwater conveyance and storage. These functions disappear or diminish with wetland loss and degradation.

Most Oklahoma wetlands likely are areas of groundwater discharge and some provide sufficient quantity for public use. There is considerable debate over the role of wetlands in recharge. Floodplain wetlands may recharge underground aquifers through overbank water storage. Because recharge rates may be affected by edge-to-volume ratios, recharge may be more important in basins containing many small wetlands than a single large one (Weillor 1981).

Surface water wetlands (particularly reservoirs) supply about 80 percent of the water used by cities and industries in Oklahoma (Oklahoma Geological Survey 1979). In western Oklahoma, however, groundwater is an important source of domestic water, supplying 50-60 percent of the total reported water use in the state (Oklahoma Water Resources Board 1984b, Stoner 1985). Some wetlands recharge groundwater supplies and serve as a constant water supply during dry seasons and drought. Over 80 percent of state irrigation needs are satisfied by groundwater and over 300 municipalities are solely dependent on ground-fed wells and streams. Although the eastern portion of the Arkansas River basin has a surplus of water, the western portion, overlying the

Ogallala Aquifer, experiences chronic surface water shortages. The Ogallala is tapped extensively for irrigation and domestic uses, and has a slow rate of recharge and a receding water table.

Wetlands further function in maintaining good water quality or improving degraded waters by (1) removing nutrients (especially nitrogen and phosphorus), (2) processing chemical and organic wastes, and (3) reducing sediment loads of waters. Their function is analogous to that of a kidney. Wetlands serve as settling ponds that absorb and chemically break down fertilizers, pesticides, wastewater run-off and other chemicals. Wetland clays and anaerobic soils can immobilize heavy metals and some toxic compounds. Wastewater treatment functions of bottomland hardwoods have been valued by several researchers at \$355 to \$1,250 per acre annually (Brabander et al. 1985). During overbank flooding, riparian ecosystems disperse the force of the water and intercept organic debris (Karr and Schlosser 1977). Thus wetland vegetation binds the soil and slows downstream movement of sediment.

Perhaps as a partial function of wetland loss, poor water quality now affects an estimated 56 percent of the nation's rivers, streams, and reservoirs (Judy et al. 1984). Recognition of the role of wetlands in controlling nonpoint source pollution is gaining, however, both nationwide and in Oklahoma. Section 319 of the Clean Water Act directed the Environmental Protection Agency and the States to assess and devise management plans for nonpoint source problems. Protection of wetlands likely will become a best management practice for alleviating nonpoint source water pollution (C. M. Scott, pers. comm.).

In addition to water quality benefits, many wetlands provide water quantity or flood control benefits. By storing flood waters and then releasing them slowly, wetlands reduce the height of downstream floods and lessen risk of flash floods. In the Tulsa metropolitan area, for example, floodplain development, largely during the 1950s and 60s, destroyed or severely altered watersheds. Removal of floodplain vegetation caused increased rates of run-off from local storm events. Initially, City planners channelized the streams and built detention basins, practices which removed last vestiges of bottomland hardwoods to less than 10 percent of presettlement area (Brabander et al. 1985). Unfortunately, most of the City's flood prevention measures only offer protection against the one percent probability (100-year) flood. When an estimated 300-year flood event occurred in spring 1984, over 5,000 homes and numerous businesses were inundated and 14 lives lost. Throughout Oklahoma, dams and channelization projects have given people a false sense of security leading to unwise development in floodplains.

Wetlands provide prime habitat for so many native plants and animals that man, too, is drawn to these areas for outdoor adventure. "Millions of Americans spend millions of hours annually mucking ... paddling, fishing, driving, and hunting in swamps and marshes, as American custom and culture have led them to do for almost four centuries ..." (Fritzell 1979). Add to this countless hours trapping, swimming, hiking, observing, studying, photographing, and sketching nature. In 1985, 86 percent of people taking trips for outdoor recreation visited lakes and streamsides within their state of residence, and 80 percent visited other wetland types (U.S. Fish and Wildlife Service 1988a).

For many, river corridors provide a close approximation of a wilderness experience (Wharton 1970), or at least a sense of solitude, or a special feel for the simplicity of a day gone by (Oklahoma Department of Wildlife Conservation 1990).

Man's enjoyment of wetlands annually generates billions of dollars in the U.S. and an estimated \$500 million in Oklahoma (U.S. Fish and Wildlife Service 1988a, U. S. Department of Interior 1982, U.S. Departments of Interior and Commerce 1983). Approximately 37 percent of Oklahomans, 16 years or older, fish or hunt and 92 percent participate in non-consumptive outdoor recreation activities, many enriched by or dependent on wetlands.

Nonconsumptive recreation, however, is becoming increasingly popular. Nationwide, between 1955 and 1985, the number of outdoor sportsmen doubled and their expenditures increased 15 times (U.S. Fish and Wildlife Service 1988a). During that same period, non-consumptive participation increased 45 percent compared to a 6 percent increase in fishing and a 2 percent decrease in hunting (U.S. Fish and Wildlife Service 1988a, U. S. Department of Interior 1982). A recent survey ranked nature-walking as third, and birdwatching as twelfth, in a list of the twenty most popular leisure activities (Kane 1987 as cited in Council on Environmental Quality 1988:80). Some of the best birding and nature walks occur in and around wetlands.

If properly managed to preserve the integrity of the ecosystem, wetlands can perpetuate renewable commodities. Some contain organisms or chemicals useful to medicine and agriculture. Shallow playa lakes in the Oklahoma Panhandle provide watering areas for livestock and holding ponds for crop irrigation. Sedge wetlands of the west provide considerable green standing crop in winter, and are comparable to grasses in forage value (Hermann 1970 as cited in Bernard and Gorham 1978). In eastern Oklahoma, properly managed bottomland hardwood wetlands have potential to produce income through selective timbering and leasing for hunting.

Additionally, wetlands may play a role in global chemical cycles. They accumulate organic matter, providing a sink for atmospheric carbon dioxide, and they produce oxygen as a byproduct of photosynthesis. Large wetlands, such as Oklahoma's numerous reservoirs, can influence local and regional weather patterns and moderate temperature extremes. In the heat of summer, the 10,000-acre Great Salt Plains Reservoir and adjacent 10,000-acre salt flat maintain slightly cooler ground and air temperatures than surrounding land (Purdue 1978).

Among other values, wetlands frequently harbor archaeological and historic sites, and serve as natural history labs for teaching and research. Further, wetlands hosting a variety of plants and animals provide people great aesthetic enjoyment as natural areas and open space.

WETLAND ACQUISITION ISSUES, CONFLICTS AND PRIORITIES

Since 1964 the Land and Water Conservation Fund (LWCF) has provided acquisition money to the Fish and Wildlife Service, Forest Service, National

Park Service, and Bureau of Land Management for national parks, forests, refuges, and other reserve areas, and grants to States and local governments for outdoor recreation areas. Some wetlands have been acquired with the fund but usually in connection with other lands. The Emergency Wetlands Resources Act of 1986 (EWRA) expanded the fund to include wetland acquisition explicitly. The LWCF, however, can now be used by the Fish and Wildlife Service to acquire migratory bird areas authorized for acquisition by the Migratory Bird Treaty Act. Therefore the EWRA provides an additional mechanism for wetlands acquisition, but wetlands must compete with other uses of the LWCF. At the State level, wetland acquisition will rival, or in some cases complement, proposals to acquire and develop urban parks, picnic areas, campgrounds, sports and play fields, trails, and swimming, boating, and fishing areas. At the Federal level, wetland acquisition will rival or complement acquisition proposals for wilderness areas, endangered species habitats, and other land reserves.

The LWCF is not a true trust fund, nor is it a plain authorization (Mantell et al. 1988). The fund is generated primarily from off-shore oil and gas lease revenues. It is authorized to provide up to \$900 million a year, but requires annual appropriations by Congress. The fund consists of two accounts: 1) a bookkeeping account that is part of the general treasury and included in the federal budget as an "off-setting receipt", and 2) an appropriations account for distributing grant and acquisition money. The bookkeeping account grows by \$900 million each year, less whatever is appropriated annually to the appropriations account. Once money is transferred to the appropriations account, it can be carried over from year to year to partially insulate the fund from the politics of annual appropriations. Between 1965 and 1986, the fund provided nearly \$3.6 billion dollars for Federal land acquisition (Mantell et al. 1988).

Despite these accomplishments, Mantell et al. (1988) cited uncertainty about the ability of the fund to respond to the next generation of land conservation needs, particularly due to fiscal constraints, skepticism about federal programs, and changing outdoor recreation needs. In short, the base for the LWCF is too uncertain and simply not big enough to support acquisition of most wetlands in the Oklahoma Wetland Priority Plan; however, benefits can be maximized by acquiring wetlands whose diverse values and functions complement outdoor recreation needs.

In many cases, acquisition may not be as cost effective as other protection mechanisms (Council on Environmental Quality 1988, Environmental Concerns Council 1989). To minimize the cost to taxpayers of land acquisition, the Council on Environmental Quality (1988) recommended Federal acquisition of only the minimum necessary to preserve wetland values. More wetlands likely can be protected for smaller near-term costs through easements, leases, deed restrictions, land donations and exchanges, and other methods, than through fee title purchase. Privately operated wetland preservation organizations (such as duck clubs, the Audubon Society, the Trust for Public Lands, The Nature Conservancy, etc.) often can produce the same environmental benefits as Federal or State acquisition. With the overwhelming majority of remaining wetlands in private hands, it is unrealistic to expect government acquisition and easement programs alone to solve the problem of conserving environmentally

important wetlands. The cost is simply too high, given other priorities and competing budgetary interests. To protect priority wetlands, efficiency and economic considerations dictate the importance of coordination and collaboration among and between governmental and private groups.

For those Federal and State acquisition efforts that do go forward, certain constraints or considerations will be evaluated. Further coordination is needed to track evolving acquisition and management priorities of Federal, State, and local agencies. Future operation and maintenance requirements must be addressed before acquisition. Off-site and on-site management constraints must be considered; for example, lack of water rights, environmental contaminants, soil erosion, extraction of energy or mineral resources, and overall ability to protect the functions and values of the wetland.

A number of conflicts have arisen over proposals for wetland acquisition in Oklahoma. Negative feelings toward government acquisition, particularly in Southeast Oklahoma, have hampered efforts to expand Federal and State lands. Opposition to wetland acquisition has stemmed from local people supporting economic growth and development. Other opposition has come from organized agriculture advocacy groups.

Within the conservation community, differences of opinion may result over control of public access to wetlands targeted for acquisition. There is increased interest to protect fragile natural areas, including wetlands, where conventional forms of recreation may not be feasible. Controlled access for education and research purposes also may conflict with open access for recreation purposes. Further, nonconsumptive and consumptive user groups may disagree about the type and level of recreational activities permitted on the area. Project accessibility to all segments of the public, including minorities, the elderly, and handicapped should be considered. A survey in the late 1960s indicated that most successful recreation areas were located within 50 miles of a city of greater than 10,000 people, and about half were located on, or within 1 mile of, a paved road (Heard and Badger 1967). In some cases, Federal agencies may have trouble providing public access to acquired lands without purchasing easements from private landowners, for which LWCF money may not be provided (Mantell et al. 1988).

To guide the Fish and Wildlife Service (Service) in prioritizing acquisitions, the National Wetlands Priority Conservation Plan (U.S. Fish and Wildlife Service 1989) lists many additional criteria for wetland acquisition. Service guidelines specify giving priority consideration for acquisition to wetlands whose public values and benefits can only be maintained or realized through acquisition. The most cost-effective methods to protect wetlands shall be considered, including fee title, perpetual easements, leases, deed restrictions, land donations and exchanges, and other methods. Upland and aquatic buffer zones necessary to preserve wetland functions and values shall be acquired. Priority shall be given to acquiring wetland interests through willing sellers. Pristine and restorable wetlands shall be given equal priority consideration, regardless of size. Wetland sites needing minimum operation and maintenance costs, however, shall have high priority.

Lists of priority wetlands have already been established by several agencies

through various Federal and State designations, including: unique ecosystems, scenic rivers, outstanding rivers, canoe routes, and exceptional value waters. Additionally, the Oklahoma Natural Heritage Inventory maintains an active list of exemplary wetland communities targeted for acquisition due to community uniqueness or importance for endangered species at global and state levels. Heritage areas most vulnerable to extinction globally or statewide are designated as critically imperiled (extremely rare: 5 or fewer occurrences) or imperiled (rare: 6 to 20 occurrences). The Heritage Inventory's (1988) preliminary 1988 list identified no exemplary wetlands communities in Oklahoma as critically imperiled or imperiled globally. A few wetland areas noted for their endangered species values (not exclusively for community uniqueness) received ratings of globally imperiled or critically imperiled. Statewide, certain acid seeps, saline marshes, playa wetlands, and pin oak and mixed oak-sweet gum bottomland forests were listed as critically imperiled. Certain bald cypress swamps, shrub swamps, seeps, shallow and deep marshes, playa wetlands, salt flats, pin oak and elm-ash-sugarberry bottomland forests, and a wet sandstone cliff were listed as state imperiled.

The Fish and Wildlife Service also has previously identified priority wetlands. The 1985 10-year Waterfowl Habitat Acquisition Plan ranked bottomland hardwood wetlands as protection priority number 3 nationwide, and a joint Service/State project (Brabander et al. 1985) identified 13 top-ranked eastern Oklahoma bottomland hardwood tracts as priority for protection. Many of these sites were listed as "important wetland/waterfowl habitat" in the Eastern Oklahoma Wetlands Plan (Forsythe and Aldrich 1989) developed as part of the North American Waterfowl Management Plan. The Service and State (Stinnett et al. 1987) also identified for protection 50 high value riparian areas in western Oklahoma. A survey of natural resource professionals highlighted six western streams as providing important riparian habitat: the Red, North Fork of the Red, Canadian, North Canadian, Cimarron, and Salt Fork of the Arkansas Rivers (Stinnett et al. 1987).

Additionally, about 75 Oklahoma playa lakes were identified as priority wetlands for protection under a draft playa lakes region waterfowl habitat concept plan (U.S. Fish and Wildlife Service 1988b). In 1989, the Playa Lakes Joint Venture was formed under the North American Waterfowl Management Plan. Under a January 1990 Memorandum of Understanding, Phillips Petroleum Company in combination with the Fish and Wildlife Service, five State wildlife agencies, National Wildlife Federation, and Duck's Unlimited, launched a five-year \$1.3 million program to protect, manage, and enhance the best of the playas in Oklahoma, Texas, Kansas, New Mexico, and Colorado. Depending on the success of this joint venture, specific playas in Oklahoma may be targeted for priority protection under the Oklahoma Wetlands Priority Plan.

In its most recent Statewide Comprehensive Outdoor Recreation Plan (SCORP), the Oklahoma Tourism and Recreation Department (1987) listed top ranked wetland areas previously identified by the Fish and Wildlife Service and Department of Wildlife. Previous SCORPs (Oklahoma Tourism and Recreation 1977) identified the most serious recreation deficiencies as wilderness and conservation areas near urban centers. There is a general trend of increasing population in metropolitan areas and decreasing population in rural areas. The latest SCORP (Oklahoma Tourism and Recreation 1987) identified rural

southcentral, southwest, and northwest Oklahoma as having the smallest percentage of total land open to public recreation; however, human population densities also tended to be lowest in these areas. The highest needs for recreation, including activities potentially compatible with preservation of wetland values (e.g., controlled access swimming, hunting, fishing, picnicking, canoeing, hiking, biking, and horseback riding) were associated with three population centers: Oklahoma City, Tulsa, and Stillwater/Oklahoma State University. The higher cost of buying urban lands, however, may outweigh the greater ease of buying lands on the metropolitan fringe or in remote areas. To protect special wetlands close to where urbanites live, greenways and trails may require mixed public and private ownership and purchase of less-than-fee interests.

SUMMARY

The Oklahoma Wetlands Priority Plan identifies priority wetlands for protection by whatever means possible, including Federal and State acquisition consideration with LWCF appropriations. The plan focuses attention on the more important, scarce, and vulnerable wetland types in Oklahoma; i.e., riverine, and palustrine emergent, forested, and scrub-shrub types. To be eligible for acquisition using the LWCF, wetlands must pass a standardized threshold criteria test that emphasizes wetland loss, threats, and an array of functions and values. Threshold wetlands which already have passed the test are listed and mapped in Appendix OK-1. Candidates yet to be run through the threshold criteria are identified in Appendix OK-2. Both lists are dynamic and will be revised regularly. Collectively, this plan should help Federal, State, and private groups coordinate a coherent, predictable, and efficient means of protecting the best of Oklahoma's remaining wetlands.

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APPENDIX

OK-1

OKLAHOMA PRIORITY WETLANDS

OKLAHOMA PRIORITY WETLANDS FOR ACQUISITION CONSIDERATION

Map ID	Site Name	County(s)	USGS Quad(s)	Est. Acreage
A	Deep Fork River	Okmulgee, Okfuskee Creek, Lincoln	Beggs, Okmulgee Lk., Okmulgee S., Gypsy Newby, Nuyaka, Mason, Rittson Jtn., Stroud S., Davenport, Chandler, Wellston	60,000
B	Clear Boggy Creek	Atoka, Choctaw, Bryan	Boswell NW, Boswell SW	6,000
C	Muddy Boggy Creek	Atoka, Choctaw	Darwin, Boswell	6,000
D	Gaines Creek	Latimer	Gowen	1,400
E	Glover River	McCurtain	Battiest, Bear Mtn., Bethel, Golden, Rocky Cr., White Rock	43,000
F	Salt Fork River Eagle Roost	Alfalfa, Grant	Manchester SW, Nash, Sand Cr., Pond Cr. NW	4,500
G	Cimarron Terrace	Kingfisher	Parvin, Lacey	15,000
H	McKinney Creek	McCurtain	Tom, Foreman	1,400
I	Illinois River	Adair, Cherokee, Delaware	Watts, Siloam Sp., Siloam Sp. NW, Moody, Chewey, Tahlequah	16,000
J	Little/Glover Rivers	McCurtain	Golden SW	20,000
K	Castor Playa (#20)	Cimarron	Keyes W, Keyes SW	150
L	Gate Playa (#1054 & 1059)	Beaver	Gate, Gate NE	500
M	Four Corners Playa (#402 & 405)	Texas	Eva SE	450

Map ID: A

Wetland Site Name: Deep Fork River

State: Oklahoma

Location: Lincoln, Creek, Okmulgee, and Okfuskee Counties, OK, between Chandler and Okmulgee in central/east central Oklahoma.

Administering Refuge:

Purpose of Acquisition: To preserve a unique ecosystem.

Acreage when completed: 60,000

The Deep Fork River is recognized nationally as an important riparian ecosystem, and meets the Regina Criteria for wetlands of international importance. It is (1) listed in the Lower Mississippi Valley Joint Venture as an area of bottomland hardwood wetland habitat critical to waterfowl in the Central Flyway, (2) one of 17 Priority 1 sites listed in the 1985 Texas and Oklahoma Land Protection Plan, (3) listed for priority acquisition and preservation by the State in its 1987 Comprehensive Outdoor Recreation Plan.

This area is rich in diversity and of great value to a variety of migrating and wintering waterfowl, especially mallards. These bottomland forests also are essential as breeding areas for wood ducks. The area provides wintering habitat for the endangered bald eagle.

The Deep Fork is moderately to imminently threatened by (1) ongoing conversion of bottomland hardwood forests to pecan orchards and introduced pasture, (2) ongoing pollution from oil, gas, and mineral production and development, (3) proposed inundation of bottomland hardwood forests and alteration of existing floodplain hydrology due to Corps of Engineers reservoir and channelization projects, and (4) ongoing illegal trespass and poaching.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agricultural conversion, (2) pollution from oil, gas and mineral development, (3) proposed water development projects, and (4) illegal trespass and poaching.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, ground water/flood control values meet threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: B

Wetland Site Name: Clear Boggy Creek

State: Oklahoma

Location: Atoka, Choctaw, and Bryan Counties, western southeast OK.

Administering Refuge:

Purpose of Acquisition: To restore and protect one of the last remaining bottomland hardwood sites in Oklahoma for migratory waterfowl and other species.

Acreage when completed: 6,000

The Clear Boggy once was a high quality oak floodplain but now is only in fair condition due to alterations. Greentree reservoirs and marsh restoration are needed to improve the distribution of permanent water. The Clear Boggy is listed by the State and Fish and Wildlife Service (1) in the Lower Mississippi Valley Joint Venture as an area of bottomland hardwood habitat important to waterfowl in the Central Flyway, and (2) as one of 13 top-ranked bottomland hardwood sites remaining in Oklahoma.

The Clear Boggy project will restore and protect 6,000 acres of riverine, palustrine forested, scrub/shrub, and emergent wetlands. With proper management, the area will provide high quality habitat for a variety of game and nongame species, such as wintering and breeding waterfowl, white-tailed deer, turkey, squirrel, furbearers (including the rare swamp rabbit), raptors, and songbirds. Public use includes fishing, hunting, camping, and hiking.

The Clear Boggy is imminently threatened by near term logging, grazing, and drainage, and by far term water development (an authorized but inactive Corps of Engineers reservoir).

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) timber removal, (2) over grazing, (3) drainage and conversion to agriculture, and (4) authorized impoundment.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meets threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: C

Wetland Site Name: Muddy Boggy Creek

State: Oklahoma

Location: Atoka and Choctaw Counties, western southeast OK.

Administering Refuge:

Purpose of Acquisition: To protect one of the last remaining bottomland hardwood sites in Oklahoma for migratory waterfowl and other species.

Acreage when completed: 6,000

The Muddy Boggy once was a prime oak bottomland with a variety of other wetland types. Quality now is poor to fair due to alterations. Restoration of former values would require plugging drainage ditches, managing the forest for biological diversity, establishing greentree reservoirs, and restoring and creating marshes. The Muddy Boggy is listed by the State and Fish and Wildlife Service (1) in the Lower Mississippi Valley Joint Venture as an area of bottomland hardwood habitat important to waterfowl in the Central Flyway, and (2) as one of 13 top-ranked bottomland hardwood sites remaining in Oklahoma.

The Muddy Boggy project will restore and protect 6,000 acres of riverine, palustrine forested, scrub/shrub, and emergent wetlands. With proper management, the area will provide high quality habitat for a variety of game and nongame species, such as wintering and breeding waterfowl, white-tailed deer, turkey, squirrel, furbearers raptors, and songbirds. Public use includes fishing, hunting, camping, and hiking.

The Muddy Boggy is imminently threatened by ongoing logging, clearing, and drainage, and by far term water development (an authorized but inactive Corps of Engineers reservoir). Partial ownership by the State (McLeod Correctional Institution) could present an obstacle to protection.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THE WETLAND SITE THREATENED:** This site is threatened by: (1) removal of timber and other vegetation, (2) drainage and conversion to agriculture, and (3) authorized impoundment.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meets threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: D

Wetland Site Name: Gaines Creek

State: Oklahoma

Location: Latimer County, adjacent to Eufaula Lake Wildlife Management Area, east central OK.

Administering Refuge:

Purpose of Acquisition: To restore and protect one of the last remaining bottomland hardwood sites in Oklahoma for migratory waterfowl and other species.

Acreage when completed: 1,400

The Gaines Creek riparian corridor is an almost continuous block of temporarily flooded pin oak-ash bottomland hardwood and scrub/shrub wetlands, with a few aquatic bed wetlands. Most bottomland hardwood habitat is a good quality subclimax stand, but some has been high graded and then grazed. The site needs marsh or greentree reservoir development to increase waterfowl use. Gaines Creek is listed by the State and Fish and Wildlife Service (1) in the Lower Mississippi Valley Joint Venture as an area of bottomland hardwood habitat important to waterfowl in the Central Flyway, and (2) as one of 13 top-ranked bottomland hardwood sites remaining in Oklahoma.

The Gaines Creek project will restore and protect 1,400 acres of riverine, palustrine forested, scrub/shrub, and emergent wetlands. With proper management, the area will provide high quality habitat for a variety of game and nongame species, such as wintering and breeding waterfowl, white-tailed deer, turkey, squirrel, furbearers (including the rare swamp rabbit), raptors, and songbirds. Public use includes fishing, hunting, camping, and hiking.

Gaines Creek is imminently threatened by ongoing conversion to pasture and degradation from oil development/production. Many small private parcels could present an obstacle to protection.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THE WETLAND SITE THREATENED:** This site is threatened by: (1) conversion of wetland vegetation to pasture, and (2) pollution from oil facilities.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, ground water/flood control values meet threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: E

Wetland Site Name: Glover River

State: Oklahoma

Location: McCurtain County, southeast corner of OK, entire Glover River main stem above Highway 198, plus East and West Forks.

Administering Refuge:

Purpose of Acquisition: To protect a unique ecosystem.

Acreage when completed: 43,000

The Glover River corridor includes a diverse bottomland forest of oak, hickory, sweetgum, maple, elm, and hackberry that is uneven aged due to past logging. Most is temporarily flooded but contains small open water areas, rare cypress swamps, and drainages. The area is heavily grazed. Although quality is reduced, it has good potential for recovery if protected. The Glover River is listed by the Fish and Wildlife Service (1) as a unique ecosystem, and (2) as one of 13 top-ranked bottomland hardwood sites remaining in Oklahoma. The State Water Quality Board recognizes the river for its exceptional water quality.

The Glover project will protect 43,000 acres of riverine, palustrine forested, scrub/shrub, and emergent wetlands. Most of the river is designated critical habitat for the endangered leopard darter. Additionally the river corridor provides habitat for many species of fish, amphibians, reptiles, mammals, and plants considered rare in Oklahoma. Moreover, with protection, the area will provide high quality habitat for a variety of wintering and breeding waterfowl. Public use includes fishing, hunting, camping, canoeing, picnicking, and hiking.

The Glover River corridor is imminently threatened by logging and clearing for pasture.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) timber removal, and (2) conversion to pasture.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, ground water/flood control values meet threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet threshold criteria,

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: F

Wetland Site Name: Salt Fork River Eagle Roost **State:** Oklahoma

Location: Alfalfa and Grant Counties, west northcentral OK, below Great Salt Plains Dam to State Highway 81.

Administering Refuge:

Purpose of Acquisition: To protect a unique ecosystem.

Acreage when completed: 4,500

The Salt Fork of the Arkansas River, below Great Salt Plains Dam and adjacent to Salt Plains National Wildlife Refuge, provides important riparian habitat for endangered bald eagles and whooping cranes, and other species which are listed as rare or endangered in Oklahoma. Two major roosting sites for eagles occur in the area. The river corridor includes wooded riparian habitat and bottomland forest plus a diverse upland buffer of sand sage grassland, blackjack oak and black locust forest, pasture, and cropland. Public use includes hunting, fishing, and hiking. The site is recognized by Federal and State agencies as a Unique Ecosystem and one of the highest quality riparian areas in western Oklahoma.

The Salt Fork project will protect 4,500 acres from the imminent threat of overgrazing and additional land clearing for agriculture. The eagle roosts in particular are threatened by human disturbance. A proposed but inactive desalination project (Corps of Engineers) poses long term threats.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) timber removal and conversion to pasture and cropland, (2) overgrazing, (3) human disturbance, and (4) a proposed water development project.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, ground water/flood control values meet threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: G

Wetland Site Name: Cimarron Terrace

State: Oklahoma

Location: Northwest Kingfisher County, central OK.

Administering Refuge:

Purpose of Acquisition: To protect a diverse groundwater wetland ecosystem.

Acreage when completed: 15,000

Due to a rise in the water table of the Cimarron River Terrace, formerly dry depressions and playas have become inundated and numerous small marshes have reappeared since 1975. Study of the geology, hydrology, and soils of the area indicates that these wetlands, although sometimes periodic in appearance, have probably existed for centuries. Cattail is the dominant aquatic plant species. The wetland complex is important to many waterfowl species, shorebirds, amphibians, and fur-bearing mammals. Public use includes fishing, hunting, and bird-watching. Terrace deposits of the river are mapped by the U.S. Geological Survey as a major groundwater aquifer. The site is recognized by Federal and State agencies as one of the highest quality riparian areas in western Oklahoma.

The Cimarron Terrace project would protect 15,000 acres of a diverse riverine and palustrine wetland ecosystem important to the maintenance of a valuable groundwater basin. The groundwater reservoir is threatened by ongoing alteration of Terrace marshes and playas: poor grazing practices, intensive farming, and petroleum derived pollutants.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) timber removal and conversion to pasture and cropland, (2) overgrazing, and (3) oil pollutants.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, ground water/flood control values meet threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: H

Wetland Site Name: McKinney Creek

State: Oklahoma

Location: McCurtain County, southeast corner of OK.

Administering Refuge:

Purpose of Acquisition: To protect a bottomland hardwood wetland with high waterfowl and other values.

Acreage when completed: 1,400

McKinney Creek floods regularly and water is retained in many swales plus a large area of semi-permanent water. The northern half, although selectively logged, is diverse, good quality bottomland hardwood habitat with high value for the rare swamp rabbit. Willow oak, water oak, and sweetgum are dominant. Part of the southern half has been heavily logged; it is a mixture of semi-permanently flooded open water, marsh, and trees. The area has high value for wintering and breeding waterfowl (especially wood ducks) and squirrels, and could harbor several plant and animal species considered rare in Oklahoma. Public use includes fishing, hunting, bird-watching, and camping. The site is recognized by Federal and State agencies as one of the highest quality bottomlands in Oklahoma and is listed for protection in the Lower Mississippi Valley Joint Venture.

The McKinney Creek project would protect 1,400 acres of a diverse riverine and palustrine wetland ecosystem. The area is imminently threatened by logging and clearing for pasture by 2-3 private owners.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 2 (140-179)
- 2. IS THE WETLAND SITE THREATENED:** This site is threatened by: (1) timber removal and conversion to pasture and cropland, (2) overgrazing, and (3) oil pollutants.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: I

Wetland Site Name: Illinois River

State: Oklahoma

Location: Adair, Cherokee, and Delaware Counties, northeast OK.

Administering Refuge:

Purpose of Acquisition: To protect a state scenic river with high recreation values.

Acreage when completed: 16,000

The Illinois River, a state designated scenic river, is characterized by a fairly wide valley between towering rock bluffs and forested hills of oaks, sycamore, dogwood, and loblolly pine. The river corridor provides habitat for a variety of fish and wildlife, including the endangered bald eagle. The site is recognized by State agencies as one of the most treasured canoe routes in Oklahoma. In addition to canoe and floats trips, fishing, swimming, and hiking are popular. Public use is high and recreational land-use development is increasing. Moreover, the river flows into and affects water quality in Tenkiller Reservoir.

The Illinois River project would protect the entire river corridor in Oklahoma (about 70 miles) and would add additional leverage for alleviating ongoing threats. Pollution from treated sewage and septic tanks, fertilized pastures, and food processing plants threaten water quality. Increasing commercialization threatens the values that attract visitors and area residents to the river.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) over commercialization, and (2) non-point and point source pollution.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, ground water/flood control values meet threshold criteria, recreation values meet the threshold criteria, other areas/concerns meet threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: J

Wetland Site Name: Little/Glover Rivers

State: Oklahoma

Location: McCurtain County, southeast corner of Oklahoma, at junction of Little and Glover Rivers, south of Highway 198.

Administering Refuge: Little River

Purpose of Acquisition: To protect and restore one of the last remaining bottomland hardwood sites in Oklahoma for migratory waterfowl and other species.

Acreage when completed: 20,000

The confluence of the Little and Glover Rivers supports a diverse bottomland forest. Oak, hickory, sweetgum, maple, elm, hackberry, mulberry, and ash comprise the overstory. Understory shrubs include coralberry, dogwood, black gum, serviceberry, green briar, black haw, and St. Johns wort. Sedges, mints, panicum, and longleaf uniola dominate the groundcover. Due to past logging and heavy grazing, the seral stage varies from less than 10 years to subclimax. Most of the area is temporarily flooded but contains small open water areas, drainages, and rare cypress swamps. Although quality is reduced, it has good potential for recovery if protected. The site is listed by the Service as one of 13 top-ranked bottomland hardwood sites remaining in Oklahoma. The State Water Resources Board recognizes Little and Glover Rivers for high water quality.

This project will protect 20,000 acres of riverine and palustrine forested wetlands. The area provides habitat for many species of fish, amphibians, reptiles, mammals, and plants considered rare in Oklahoma. Moreover, with protection, the area will provide high quality habitat for a variety of wintering and breeding waterfowl, white-tailed deer, turkey, squirrel, furbearers, raptors and songbirds. Public use includes fishing, hunting, canoeing, and hiking.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 3 (180-219)
- 2. IS THE WETLAND SITE THREATENED:** The site is threatened by timber removal and conversion to pasture.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife, fishery, ground water/flood control, recreation, and other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: K

Wetland Site Name: Castor Playa (#20)

State: Oklahoma

Location: Cimarron County, far western Panhandle of Oklahoma, between Keyes and Boise City.

Administering Refuge:

Purpose of Acquisition: To protect important habitat for migratory birds and resident wildlife.

Acreage when completed: 150

Castor Lake is a seasonally flooded playa in an area dominated by mixed range and grassland. An intermittent stream drains out of Castor Lake into another playa (Willow Bar Lake) several miles downstream. Castor Lake is listed by the Oklahoma Department of Wildlife Conservation as a priority playa for acquisition, protection, and management, and is included in the playa lakes concept plan under the North American Waterfowl Management Plan.

The Castor project will protect 150 acres of palustrine emergent wetlands. Regional scientists recognize playas as unique ecological features in the semi-arid plains. Playas of the Southern High Plains are second only to the Texas Gulf Coast in importance as waterfowl wintering areas, especially for mallard, northern pintail, teal, and American wigeon. They also provide important feeding and breeding habitat for waterfowl. Ring-necked pheasants, sandhill cranes, short-eared owls, and a variety of raptors and shorebirds are abundant in the playa lakes region. Cottontails, raccoons, pronghorns, coyotes, badgers, and small mammals associate with playa environments. In addition, toads and salamanders use playas as singing and mating grounds. Public use includes hunting nature photography, and bird watching.

The project area is threatened by farming and ranching activities.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: The site is threatened by drainage or filling, agricultural conversion, livestock grazing, groundwater depletion, and water pollution from siltation and pesticides.

3. WETLAND FUNCTIONS AND VALUES: Wildlife, water quality/quantity, recreation, and other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: L

Wetland Site Name: Gate Playa (#1054 & 1059) **State:** Oklahoma

Location: Beaver County, far east Panhandle of Oklahoma, about 1.5 miles east and 1 mile north of Gate.

Administering Refuge:

Purpose of Acquisition: To protect important habitat for migratory birds and resident wildlife.

Acreage when completed: 500

Gate Lake is a seasonally to temporarily flooded playa in a landscape of mixed range and grassland. About 1% of the playa area has been excavated and another 33% has been farmed during dry periods. Gate Lake receives drainage from a large watershed, including Hog Creek, an intermittent, ponded stream. Gate Lake is listed by the Oklahoma Department of Wildlife Conservation as a priority playa for acquisition, protection, and management, and is included in the playa lakes concept plan under the North American Waterfowl Management Plan.

The Gate Playa project will protect 500 acres of palustrine emergent wetland. Regional scientists recognize playas as unique ecological features in the semi-arid plains. Playas of the Southern High Plains are second only to the Texas Gulf Coast in importance as waterfowl wintering areas, especially for mallard, northern pintail, teal, and American wigeon. They also provide important feeding and breeding habitat for waterfowl. Ring-necked pheasants, sandhill cranes, short-eared owls, and a variety of raptors and shorebirds are abundant in the playa lakes region. Cottontails, raccoons, pronghorns, coyotes, badgers, and small mammals associate with playa environments. In addition, toads and salamanders use playas as singing and mating grounds. Public use includes hunting nature photography, and bird watching.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 3 (180-219)
- 2. IS THE WETLAND SITE THREATENED:** The site is threatened by drainage or filling, agricultural conversion, livestock grazing, groundwater depletion, and water pollution from siltation and pesticides.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife, water quality/quantity, recreation, and other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Map ID: M

Wetland Site Name: Four Corners Playa (#402 & 405) **State:** Oklahoma

Location: Texas County, middle Panhandle of Oklahoma about 1.6 miles east of Four Corners.

Administering Refuge:

Purpose of Acquisition: To protect important habitat for migratory birds and resident wildlife.

Acreage when completed: 450

Four Corners Playa is a seasonally to temporarily flooded playa in a landscape of mixed range and grassland. It receives runoff from an intermittent stream. Four Corners is listed by the Oklahoma Department of Wildlife Conservation as a priority playa for acquisition, protection, and management, and is included in the playa lakes concept plan under the North American Waterfowl Management Plan.

The Four Corners Project will protect 450 acres of palustrine emergent wetland. Regional scientists recognize playas as unique ecological features in the semi-arid plains. Playas of the Southern High Plains are second only to the Texas Gulf Coast in importance as waterfowl wintering areas, especially for mallard, northern pintail, teal, and American wigeon. They also provide important feeding and breeding habitat for waterfowl. Ring-necked pheasants, sandhill cranes, short-eared owls, and a variety of raptors and shorebirds are abundant in the playa lakes region. Cottontails, raccoons, pronghorns, coyotes, badgers, and small mammals associate with playa environments. In addition, toads and salamanders use playas as singing and mating grounds. Public use includes hunting nature photography, and bird watching.

The project area is threatened by farming and ranching activities.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 3 (180-219)
- 2. IS THE WETLAND SITE THREATENED:** The site is threatened by drainage or filling, agricultural conversion, livestock grazing, groundwater depletion, and water pollution from siltation and pesticides.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife, water quality/quantity, recreation, and other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

APPENDIX

OK-2

OKLAHOMA CANDIDATE WETLANDS

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Black Mesa (Cimarron R., N. Carrizozo Cr., CM-1 Cave)	Cimarron	Kenton	7,000	PFO, PSS, PEM, R4SB	a, d, e	UE, EVW
Warren Br. Spring R. and Cave	Ottawa	Peoria	5,800	PFO, PSS, POW, R4SB	a, b, c, e	UE, EVW
Keystone Eagle Roost (Spring Cr. Canyon)	Osage	Wekiwa	700	PEM, PUS, L2UB PUB, L2US	a, b, e	UE; part owned by CE
Cave Cr. and GR/HR-1 Cave	Greer, Harmon	Reed, Vinson, Shrewder, Russell	8,000	PFO, PSS, PEM, PUS, R4SB	a, c, e	UE
Blue River Caddo S.	Johnston, Bryan	Blue, Bokchoto, Caddo NW., Durant N	40,000	PFO, PEM, R2OW EVW,	a, b, d, e	CUE, NRI, SORL, SCORP
Caddo Canyons (Canadian R. and tribs.)	Canadian, Caddo	Geary S., Hinton, Rock Mary, Cogar NW	unknown	PFO, PSS, PEM, PUB, PAB, POW, R2UB, R2US, R2OW, R4SB, L10W, L1UB	a, d, e	CUE, WRS

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Red R./Mesquite Brushland	Harmon, Jackson, Tillman, Cotton	Augur Cr., Ayers Is., Burkburnett, Byers, Chillicothe, Cowboy Spr., Davidson, Devol, Elmer, Eldorado, Frederick SW., Grandfield, Hastings NW., Hastings NE., N. Grandfield, Odell, Taylor, Oklaunion, Quanah E., Quanah NE., Randlett, Riverland Cem., Sunshine Hill, Thornberry, Waurika W.	90,000	PSS, PEM, PUB, POU, R2UB, R2US R20W	a, d, e	CUE, WORA; part owned by BLM
DL-91 Cave and underground streams	Delaware	Chloeta	unknown	R4SB?	a, b, c, e	CUE; TNC cave- add'l land

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Cimarron R., from Buffalo Cr, to SH 23	Woods, Beaver, Harper	Gate NE, Gate NW, Rosston NW., Selman SE., Selman W., Lookout, Gate NW	40,000	PFO, PSS, PEM, R20W, R2US	a, d, e	NRI, WORA, WRS
Upper Mtn. Fork R. above Broken Bow Res.	McCurtain	Cove, Hee Cr., Smithville NW	8,300	PFO, PEM, R4SB, R20W, R2US	a, b, d, e	NRI, CR CUE SWSR
Ewers Cr. and MJ-1 Cave	Major	Belva	unknown	PFO, PSS, PEM, PUB, R4SB	c, e	CUE, NRI, TRD
Spavinaw Cr. and DL-Caves	Delaware	Cherokee City Colcord, Chloeta, Lk. Euchla W., Lk. Euchla E.	10,200	PFO, POW, R4SB, R2US, L2US	a, b, c, d, e	UE, NRI, EVW
Grassy Slough	McCurtain, Hawarth	Idabel SE.,	700	PFO, PSS, PEM	a, b, c, d, e	WRS
Verdigris R.	Rogers	Inola, Catoosa	3,000	PFO, PSS, PEM, R4SB, L10W	a, b, c, d, e	WRS, MVJV, BLH, SCORP

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Mud Cr.	Stephens, Jefferson	Comanche SE., Ringling NW., Ryan NE.	3,000	PFO, PSS, PEM	a, b	S. Tully pers. comm.
Alex Marsh	Grady	Pauls Valley	120	PSS, PEM	a, b, d, e	S. Tully pers. comm.
Boggy Cr. Salt Plains	Beckham	Retrop NW., Delhi NE.	200	PSS, PEM, R4SB	a, e	WRS
Salt Cr. Plains	Blaine	Southard	1,000	PEM, PUB, R4SB	a, c, e	WRS
Bennington Bog	Bryan	Boswell SW.	700	PFO, PSS, PEM, R30W	a, b, c, e	WRS
Whitegrass Cr.	Bryan, Choctaw	Lake W., New Oberlin	1,200	PFO, R20W	a, b, d, e	WRS, MVJV
Clear Cr., seep and marsh	Choctaw	Swink	300	PFO, PSS, PEM, R4SB	a, b, c, e	WRS, MVJV
Hamden Seep	Choctaw	Antlers E.	300	PFO, PSS, PEM, POW, R4SB	a, b, c, e	NHI, MVJV
Swink Marsh	Choctaw	Swink	300	PFO, PSS, PEM, POW, PAB	a, b, c, e	WRS

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Big Eagle Cr.	McCurtain, LeFlore	Smithville NW, Octavia	3,000	PFO, POW, R20W	a, e	WRS, EVW
Boktuklo Cr.	McCurtain	Smithville	1,500	PFO, POW, R30W, R4SB, R3US	a, e	WRS, EVW
Buffalo Cr.	McCurtain	Watson, Hee Cr., Smithville	4,000	PEM, R20W	c, e	WRS, EVW
Cut-off Lake (Red R.)	McCurtain	Cerrogrado	500	PFO, PEM, R20W, L10W	a, b, c, d, e	WRS
Dry Creek	McCurtain	Watson	1,000	R30W	a, e	WRS
Carney Cr.	Choctaw	Shoals, Slate Shoals	3,500	PFO, PEM, PSS, POW	a, d, e	MVJV
Six Mile Cr.	McCurtain	Cove, Watson	500	R30W	a, e	WRS
Black Fork Cr.	Pushmataha	Albion SW., Nashoba, Wildhorse Mtn.	4,800	PFO, PSS, PEM, R20W, R4SB, POW	a, e	WRS, EVW
Harrison Bog (Hee Cr.)	Pushmataha	Antlers W.	300	PFO, PSS, PEM, R4SB, POW	a, e	WRS
Honobia Cr.	Pushmataha, LeFlore	Honobia	800	PFO, R30W, R4SB	a, e	WRS

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Kiamichi R., below Muse	Pushmataha, LeFlore	Frogville, Hugo Dam, Antlers E, Kiomatia, Dunbar, Kosoma, Moyers, Stanley, Clayton, Kiamichi, Albion, Whitesboro, Muse	45,000	PFO, PSS, PEM, R2US, L10W, L2US R20W	a, b, c, d, e	MVJV, NRI, WRS
Lamey Slash (seep & marsh)	Pushmataha	Antlers W.	300	PFO, PSS, PEM, POW	a, e	WRS
Little R., above Pine Cr. Res.	Pushmataha, LeFlore	Nashoba, Caney Mtn., Clebit, Albion SE., Honobia	1,500	PFO, PSS, PEM, R4SB, L10W, POW	a, b, c, d, e	WRS, EVW
Little R., east of Mountain Fork	McCurtain	Goodwater	4,200	PFO, PEM, POW, R20W	a, b, d, e	BLH, MVJV, SCORP
Terrapin Cr.	Pushmataha	Alikchi, Signal Mtn.	400	R20W, L10W	a, e	WRS, EVW
			100			

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Beaver R.	Texas	Guyman	1,700	PFO, PSS, PEM, R4SB	a, c, d, e	WRS, WORA
North Fork Red R.	Tillman, Jackson	Tipton	500	PFO, PSS, PEM, PUS, R2US	a, d, e	WRS, WORA SCORP
Lower Arkansas R.	Tulsa, Wagoner, Muskogee, Sequoyah	Wekiwa, Sand Springs, Tulsa, Jenks, Bixby, Leonard, Coweta, Haskell, Taft, Ft. Smith, Ft. Chaffee	15,000	PFO, PSS, PEM, R20W, R2US, POW	a, b, d, e	MVJV, WRS
Little Salt Plains	Woods	Sellman NW.	2,000	PSS, PEM, POW, R2US	a, c, e	WRS
Barren Fork	Adair, Cherokee, Delaware	Tahlequah, Proctor, Parkhill, Christie, Westville	9,600	PFO, PSS, PEM, R20W, R2US, R4SB, L2US, L10W, POW	a, b, d, e	SWSR
Lee Cr.	Sequoyah	Nicut, Uniontown, Natural Dam	5,000	PFO, PEM, PSS, R2US, R20W	a, b, d, e	NRI, SWSR, CR

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Flint Cr. Siloam	Delaware	Siloam Springs, R20W, R4SB Springs NW.	3,500	PFO, PSS, POW, R2US, R20W, R2US, FWSSR	a, b, c, e	CR, SWSR,
Lukfata Cr.	McCurtain	Old Glory Mt., Steel Jct., Idabel	5,000	PFO, PEM, POW, R4SB, R20W	a, e	EVW
McGee Cr.	Atoka	Redden, Lane, Lane NE, Farris	5,000	PFO, PEM, R20W, R30W	a, b, e	EVW
Wolf Cr. and N. Canadian R. (Shinnery Oak Savannah)	Woodward	Ft. Supply	34,000	PFO, PSS, PEM, R2UB, R2US, R4SB, PUS	a, b, c, d, e	UE, EVW, WORA
Canadian R., western Ok.	Blaine	Hydro, Squaw Cr., Bridgeport	6,400	PFO, PSS, PEM, PUS, R2US, POW	a, d, e	WORA
Canadian R., eastern Ok.	Hughes, McIntosh, Pittsburg	Allen, Calvin W., Calvin E., Lamar, Hanna, Wetumka SE., Carson, Indianola	10,000	PFO, PEM, PSS, R2US, POW, R20W	a, d, e	MVJV

Oklahoma candidate wetlands for acquisition consideration.

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Playa Lakes	Cimarron, Texas, Beaver		2,000	PEM	a, c, d, e	PLCP, WRS, SCORP
Washita R., above Foss Res.	Custer, Roger Mills	Reydon 15' Cheyenne 15' Hammon 15' Butler 15'	10,000	PFO, PEM, PSS, L2US, L1UB, R2UB	a, b, c, d, e	WORA, NRI
Neosho R.	Ottawa	Miami NW., Miami SW	4,600	PFO, PSS, PEM, R2OW, R2US, POW	a, b, d, e	BLH, MVJV
Caney R.	Washington	Bartlesville SE, Ramona	1,300	PFO, PSS, PEM, R2OW	a, b, d, e	BLH, MVJV
Waterfall- Gilford Creeks	McCurtain	Idabel SE	6,000	PFO, PEM, PAB, R2OW, R2US, L1OW, POW	a, b, d, e	SCORP
Red Slough	McCurtain	Tom, Bokhoma, Haworth	2,000	PFO, PSS, R2OW	a, b, c, d, e	SCORP
Garrison Cr. and Moffett Bottom	Sequoyah	Ft. Smith, Muldrow	1,300	R4SB	a, d, e	SCORP
Sallisaw Cr.	Sequoyah	Sallisaw	2,200	PFO, PEM, POW, R2US, L1OW, R2OW	a, b, d, e	SCORP

Oklahoma candidate wetlands for acquisition consideration

Site Name	County	USGS Quad.	Est. Acres	NWI Classification	Wetland Function	Notes
Upper-Lower Bayou (Walnut Bayou)	Carter, Love	Healdton SE., Lone Grove	6,500	PFO, PSS, PEM, R4SB, PUB	a, b, c, d, e	SCORP
Poteau R.	LeFlore	Poteau E., Poteau W., Panama, Spiro	10,000	PFO, PEM, R2US	a, b, d, e	MVJV

Function: a-wildlife, including threatened and endangered species,
b-commercial and sport fisheries,
c-hydrology,
d-recreation,
e-other

Notes:

- UE** - Unique Ecosystem - Fish and wildlife communities and habitats that are significantly different from other habitats in the region or the best representative example in the region or larger geographic area. Designated by the U.S. Fish and Wildlife Service - Unique Wildlife Ecosystems of Oklahoma, 1979.
- CUE** - Candidate Unique Ecosystem - site for further study. Unique Wildlife Ecosystems of Oklahoma, 1979.
- EWV** - Exceptional Value Waters - Streams with outstanding water quality recognized by the OK Water Resources Board.
- NRI** - Nationwide Rivers Inventory - River segment identified by the National Park Service as having outstanding resource value (1982).
- SORL** - State Outstanding Rivers List, Oklahoma Tourism and Recreation Department
- SCORP** - Wetland identified as a priority candidate for acquisition in the 1987 State Comprehensive Outdoor Recreation Plan.
- WRS** - Wetland/Riparian Sites identified by the Oklahoma Natural Heritage Inventory for the Environmental Protection Agency (1988).
- BLH** - High valued bottomland hardwood tract identified in 1985 Federal/State study: Bottomland Hardwoods of Eastern Oklahoma.
- WORA** - High valued riparian area identified in 1987 Federal/State study: Western Oklahoma Riparian Areas.
- CR** - Canoe route designated or noted by Oklahoma Tourism and Recreation Department.
- SWSR** - State Wild and Scenic River designated by Oklahoma Scenic Rivers Act.
- FWSSR** - Federal Wild and Scenic Study River - studied for possible inclusion in the National Wild and Scenic Rivers System.
- MVJV** - Eastern Oklahoma Wetlands Plan (1989) for the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan.
- PLCP** - Playa Lakes Region Waterfowl Habitat Concept Plan - 1988.

[illegible]

TEXAS WETLANDS

INTRODUCTION

The Wetlands Concept Plan for Texas has been prepared to catalog important wetland habitats in the state. This is the beginning of a process to identify wetlands, or interests in wetlands, which could be acquired by Federal or State governments. Updates to this document will be made as often as practical to include additional wetland tracts identified through interagency coordination and to incorporate new status and trends information on wetlands as it becomes available.

Assessments to determine if a wetland site qualifies for acquisition have been conducted using threshold criteria in the National Wetlands Priority Conservation Plan (USDOI 1989). Criteria include a consideration of losses to a particular wetland type within an ecoregion, future threats of losses that are identifiable, and demonstrated functions and values of a wetland to wildlife, commercial and sport fisheries, water quality and quantity, outdoor recreation, and other areas of concern to resource managers including the Secretary of the Interior.

The Service relied extensively on wetland maps developed by the National Wetlands Inventory (NWI) which follow the classification of Cowardin et al. (1979). Wetland loss assessments closely follow the conclusions of Frayer et al. (1983) about the status and trends of wetlands on a national basis. Literature reviews and field work were conducted by biologists of the Service.

Although the size of a wetland tract is not one of the assessment criteria, size was nevertheless a consideration since good acquisition principles presently do not allow for the incorporation of small, isolated parcels into Federal and State public land reserves. For this reason, the initial prioritization effort has concentrated on areas of reasonable size or smaller areas adjacent to existing public holdings. Additional efforts will include a look at parcels which are small or isolated but still have a high degree of public benefit and are expected to meet the threshold for acquisition.

Sound acquisition principles also require the consideration of the purchase of upland habitat associated with a wetland tract either because it is interspersed and impractical to separate or because it provides a buffer needed to maintain the values of the wetlands. The goal is to identify a discreet unit that is practical for acquisition. This is accounted when applying the threshold criteria.

CONSULTATION

Consultation with interested and affected public and private organizations generally took two forms. Informal consultation was used to apprise them of the concept plan effort and to solicit contributions to the wetlands catalog, as well as obtain supporting documentation to evaluate threats, losses, and functions and values. After the concept plan was drafted, it was formally reviewed by these organizations for completeness and to assure consistency with the planning efforts of others.

Several related planning efforts providing information for the cataloging of wetlands include:

- (1) the Texas Bottomland Hardwood Preservation Program of the Service;
- (2) North American Waterfowl Management Plan Joint Ventures involving the Texas Bottomland Hardwoods Initiative, the Chenier Plain Initiative, the Texas Mid-Coast Initiative, the Laguna Madre Initiative, and the Playa Lakes Initiative;
- (3) the Texas Gulf Coast Land Protection Plan for existing National Wildlife Refuge complexes of the Service;
- (4) the Texas Wetlands Plan of the Texas Parks and Wildlife Department, an Addendum to the 1985 Texas Outdoor Recreation Plan;
- (5) Regional Priority Wetland Lists of the Environmental Protection Agency (in draft);
- (6) the National Natural Landmark Program of the National Park Service;
- (7) state Nature Conservancy wetland lists and wetlands included in state National heritage programs;
- (8) forest plans of the U.S. Forest Service; and
- (9) others.

WETLANDS ASSESSMENT CRITERIA

Wetlands in Texas can broadly be grouped into six categories -- (1) Gulf coast salt and freshwater marshes; (2) bottomland hardwood forests in the river valleys of East Texas; (3) Playa lakes of the panhandle region; (4) freshwater springs and their headwater streams of Central and Southwest Texas; (5) West Texas riparian areas; and (6) Coastal Pothole Wetlands. Each is addressed below in terms of the three criteria used for prioritization.

1. GULF COAST SALT AND FRESHWATER MARSHES

Gulf coast marshes are a recent geological phenomena, created from the late Pleistocene to the present by the deposition and reworking of river sediments and, along the southeast Texas coast, by gulf-deposited sand ridges. The configuration and elevation of most marsh systems is the result of geological processes at work since sea level stabilized about 4,500 years ago. The predominant marshes that have developed along the Texas Gulf coast, using NWI classification, are the intertidal non-vegetated, emergent, and scrub-shrub marshes along the periphery of the coastal estuaries and the freshwater emergent and scrub-shrub marshes found in river deltas and rice fields. The impact of nature in modifying coastal marshes has been far overshadowed by the impact of man's endeavors during the last 100 years to recover oil and gas reserves, provide a water-based transportation system, protect land from storms so that it could be occupied or industrialized, and modify drainage for crop and livestock forage production.

Wetland Loss

In 1956, the U.S. Fish and Wildlife Service estimated that Texas coastal marshes totaled about 937,400 acres. In the absence of other earlier estimates, this figure must serve as a baseline although by 1956 Texas had sustained losses of coastal wetlands due to the dredging of the Gulf Intracoastal Waterway, other ship channels, agricultural drainage, and industrialization and urbanization. The 1980 estimate was 611,760 acres of coastal marshes. It is likely that this estimate included some rice field acreage that could not be differentiated from naturally occurring wetland vegetation on the Landsat imagery used for those estimates. If the estimate of 611,760 acres is used, then a 35 percent loss of coastal marshland acreage occurred in Texas between the mid-1950's and the mid-1970's. It is also certain that much of the remaining acreage has been seriously degraded by saltwater intrusion due to canals, channels, drainage ditches and by land subsidence and groundwater depletion; by inadequate freshwater inflows due to upstream water projects (dams) and the alteration of natural hydrology; and by pollution from industry, shipping, and urbanization. Additional marsh acreage has been lost since the mid 1970's.

Wetland Threats

Wetland destruction on the Texas coast is proceeding at a regulated rate. Petroleum development facilities, nuclear powerplants, pollution, recreational home development, highway construction, channeling, and spoil disposal are the

most obvious forces acting to destroy coastal habitat. The best indicator of the rate of habitat loss along the coast is a scientific paper prepared by Charles Chapman of the Bureau of Commercial Fisheries in 1968. Chapman estimated that the loss due to channelization and spoil of the whole Texas estuarine area from navigation channels alone was 98,000 acres. It is believed that these dredging and spoiling activities continue to have the largest impact on Texas tidal marshes. According to the "National Estuary Study," essentially all embayments along the Texas coast had been moderately or severely modified by 1969. The study estimates that 1,750 acres are expected to be destroyed annually during the upcoming years. Additionally, remaining estuarine habitat will decline in quality and value as a result of increased human activities in coastal areas and decreased freshwater inflow due to water resource development.

Additionally, remaining estuarine habitat will decline in quality and value as a result of increased human activities in coastal areas and decreased freshwater inflow due to water resource development.

Wetland Functions and Values

Texas coastal wetlands provide important public benefits which include fish and wildlife habitat; surface and groundwater supply; water quality; flood, erosion and shoreline damage reduction; outdoor recreation; education and research; and consumptive uses such as cattle grazing.

The Texas gulf coast is one of the most important waterfowl areas on the North American Continent supporting seasonal waterfowl concentrations far exceeding those of any other single ecological or geographic unit in the Central Flyway. Millions of waterfowl and a large segment of the North American population of migratory birds, other than waterfowl, are dependent on coastal habitat during annual migration and wintering periods. Several threatened and endangered species are dependent on the coastal wetlands; they include: eastern brown pelican, whooping crane, arctic peregrine falcon, piping plover, Attwater's greater prairie chicken, Atlantic ridley turtle, loggerhead turtle, southern bald eagle, ocelot, and jaguarundi. The only naturally occurring, wild flock of whooping cranes winter on the Texas coast.

In addition to its biological values, the coastal wetlands provide a buffer between the Gulf of Mexico and the densely populated areas inland such as Houston, Beaumont, Corpus Christi, and Brownsville, during periods of high tides and excessive rainfall associated with hurricanes and tropical depressions.

2. BOTTOMLAND HARDWOOD FORESTS IN THE RIVER VALLEYS OF EAST TEXAS

Texas bottomland hardwood forests occupy river valleys from the Louisiana border westward to the Black Prairie region and include river valleys passing through the lower coastal plain as far south as the Brazos river. They are the site of many Texas reservoirs and the source of most privately owned hardwood timber reserves. Most can be divided into discreet forest cover types depending upon their elevation in relation to the stream

channel. This ranges from the permanent-water cypress swamps to the transitional oak-pine forest on the upper terrace. Interspersed among the forest are oxbow lakes, freshwater bogs and marshes, and occasionally very shallow depressions supporting aquatic beds. The predominant wetland types of east Texas river valleys, using NWI classification, are palustrine emergent, palustrine forested, and palustrine scrub-shrub.

Wetland Loss:

The amount of bottomland hardwood and other forested wetlands occurring prior to the settlement of Texas is estimated at 16 million acres. This estimate is based on acreage of geologic floodplains in Texas and assumes that all or most of these floodplains were originally forested. Remaining bottomland vegetation (excluding swamps) inventoried by Landsat was 5,973,000 acres in 1980, indicating a 63 percent loss of the original bottomland component. This remaining bottomland acreage would superficially appear significant, but actually constitutes only 3 percent of the total land area of the state and comprises just 7 percent of all occurring woody vegetation. A land-use change detection study contracted by the Texas A&M University Remote Sensing Center was completed for Texas Parks and Wildlife Department in 1985. The study measured changes in land-use over 11 regions of Texas. The change detection study indicated that clear-cut forests resulting from on-going commercial timber industry practices increased by as much as 64 percent during the period between 1974 and 1983. The Service has reported that available data on trends contained within the Forest Service's forest statistics reports indicate that commercial bottomlands have decreased by 18 percent between 1935 and 1975 with a 10 percent decrease occurring during the period 1975-1985. Future declines in bottomland hardwoods are expected from continued land use changes.

Wetland Threats

The principle threats to bottomland hardwoods in east Texas are from water control structures, primarily reservoirs. The Texas Water Plan (1984) has identified 44 reservoirs for construction to satisfy projected water needs through the year 2030. A total of 262,000 acres (4 percent) of remaining bottomland hardwoods will be lost statewide to these reservoirs. Total losses of bottomland hardwoods from reservoirs already built or proposed is estimated to exceed 860,000 acres. Additional losses from indirect impacts will also occur. Crop production, stimulated residential and commercial development, increased market potential of timber below dams and long-term biological modification of downstream riparian ecosystems are all influencing factors which may produce more loss and/or modifications to the riparian communities than resulted from direct impacts. Notwithstanding reservoir development, additional losses are expected to occur to riverine systems from ongoing timber harvest operations which are being sustained by a demand for hardwood products and a continuing desire from timber owners to market timber within floodplain areas that have previously been unattractive.

Wetland Functions and Values:

The bottomland hardwoods of east Texas are important habitat for wildlife, including endangered and threatened species, migratory birds and resident

species, and sport and commercial fish species. These bottomland hardwood wetlands contribute to surface and ground water quality and quantity, flood control, outdoor recreation, education, and research. From a biological perspective, bottomland hardwoods are critical wintering areas for migratory waterfowl, particularly mallards and wood ducks. In an area that averages 40-60 inches of rainfall a year, the bottomland hardwood forests provide important flood water and sediment retention functions and contribute substantially to recharging both the Gulf Coast and Carrizo-Wilcox aquifers.

3.PLAYA LAKES OF THE PANHANDLE REGION

Playa lakes are the most prevalent and ecologically significant wetland habitats of the Texas Panhandle. The playas occur in one of the most intensively cultivated regions of the United States, thus they are often referred to as "islands" of wildlife habitat in a "sea" of agriculture. Much of the cultivated acreage in the playa region, however, consists of winter wheat, corn, and other grain crops which provide an abundant food source for waterfowl and other wildlife species. Under the NWI classification, the majority of playa wetlands are classified as either lacustrine open water, palustrine open-water, or palustrine emergent.

Wetland Loss

In 1965, less than one percent (%) of the 19,339 playas in the High Plains of Texas were modified for agricultural or other purposes. However, by 1981 approximately 43% had been modified (Nelson et al. 1983). Other studies indicate that greater than 70% of the playas over 10 acres in size have been modified with pits and that 20% of all playas have been modified to concentrate water for livestock use (Guthery et al. 1981). The bulk of the modifications to playas have occurred within the irrigated cropland zone of the High Plains, centered around the Lubbock area.

Wetland Threats

The majority of the impacts to wetlands in the Playa Lakes Region of Texas are related to agricultural interests (FWS 1988). As previously discussed, over 43% of all playas have been modified, including about 70% of all playas 10 acres or larger. The bulk of these modifications have resulted from the construction of pits and dikes in order to increase the capture, storage, and utilization of rainfall and agricultural runoff for irrigation. In many instances the pits are also used as a source of permanent water for livestock.

Modifications of playas have increased significantly in the past several years due to the rapid depletion of the Ogallala Aquifer and escalating groundwater pumping costs. Concentration of water in pits effectively reduces the littoral zone of the playas thus negatively impacting the production of natural waterfowl foods and cover vegetation for a variety of wildlife species.

In addition to the modification of playas for water conservation and irrigation purposes, playas have been extensively impacted by cultivation, cattle grazing, and polluted runoff from cattle feedlots and petroleum

production facilities. In 1980, 13% of the playas surveyed by the Fish and Wildlife Service had over 50% of their basins cropped (Curtis and Beierman 1980). Over 50% of all playas are grazed by livestock, and this increases to at least 67% of all playas over 10 acres (Guthery et al. 1981). Heavy grazing of playas negatively impacts natural plant communities and also contributes to poor water quality. Many cattle feedlot operators use playas to impound livestock wastes. This organic pollution drastically reduces water quality and has been linked to a variety of waterfowl diseases, especially waterfowl cholera and botulism.

In the southern portion of the Playa Lakes Region, saltwater produced as a by-product of oil field operations is often stored in playa basins or open pits. The saltwater increases the salinity, dissolved solids, and hydrocarbons within the playa basins which often results in high bird mortalities, particularly migratory waterfowl and shorebirds.

Wetland Functions and Values

Estimates, based on surveys by the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department, indicate that the playas have supported as many as 2.8 million ducks and 750,000 geese in a high-use year. Ducks of several species utilize the playas, but mallards, northern pintails, green-winged teal, and American wigeon comprise most of the wintering population. Texas is the second-most important state in the Central Flyway for wintering mallards, with the playa region in the Texas Panhandle being the most significant wintering area within the State. More than 750,000 mallards have been reported to winter in the region during an excellent year. The area has also historically wintered a large portion of the Shortgrass Prairie Canada goose population.

In addition to overwintering, extensive nesting of some waterfowl species occurs in the playas. Some estimates indicate that 250,000 ducks, especially mallards, blue-winged and cinnamon teal, may be produced in favorable years.

Other wildlife species rely heavily on the habitats associated with playa basins in the Texas Panhandle as well. Ring-necked pheasants and sandhill cranes are two of the most important game species. In the past several years, hunting leases on playas for pheasants, ducks, geese, and sandhill cranes have provided a substantial economic boost to the local economy.

Playas provide excellent habitat for a variety of other game and non-game wildlife species including quail, mourning doves, cottontails, raccoons, coyotes, rodents, passerine birds, shorebirds, and raptors. They also provide significant wintering habitat for the federally-listed endangered bald eagle, and are used by the whooping crane during its annual fall and spring migration between the Texas coast and its Canadian nesting grounds.

In addition to providing significant fish and wildlife habitat values, playas are extremely important for their contributions to agriculture through the direct storage of water for irrigation, recharge of aquifers, crop cultivation, and cattle grazing. Playas are also used extensively for wastewater treatment and disposal.

4. FRESHWATER SPRINGS AND THEIR HEADWATER STREAMS OF CENTRAL AND SOUTHWEST TEXAS

Freshwater springs and their associated headwater streams are a significant wetland resource in central and southwest Texas. The bulk of the springs with high ecological value originate from the Edwards (Balcones Fault Zone) and Edwards-Trinity (Plateau) aquifers and are considered upper perennial riverine wetlands under the NWI classification system.

Wetland Loss

Many springs have ceased to flow due to over utilization of aquifer waters by cities and agricultural users or have been vulnerable to pollution. Of the 281 major and historically significant springs described by the Texas Water Development Board in 1975, 65 no longer exist or have been inundated by reservoirs (Brune 1975). It is likely that the number of springs in Texas will continue to decline at a rapid pace due to increased groundwater pumping and land-use modifications.

Wetland Threats

The greatest threat to freshwater springs continues to be over-pumping of aquifers for industrial, municipal, and agricultural use. Irrigation alone accounts for about 80 percent of the total groundwater used in Texas. As a result, many springs have dried up and ceased flowing or have suffered major decreases in flow due to the lowered water table. Additional factors threatening these springs include a reduction in water infiltration through soil compaction or impervious surfaces, inundation by reservoirs, and contamination from a variety of point and non-point sources. Agricultural runoff containing pesticides may be a problem in some localized areas, especially those with porous limestone or gypsum formations (Brune 1975).

Wetland Functions and Values

Springs and their headwater streams often provide important habitats for a variety of fish and wildlife species. A number of springs in the Edwards Plateau and Trans-Pecos region support federally listed threatened and endangered species. Protection of the springs and their outflow streams is imperative to assure the continued survival of these species. In addition to providing critical habitat for endangered or rare species, springs are used by numerous other wildlife as a source of water, food, and refuge. Often springs are the only dependable water source for wildlife in large portions of these semi-arid regions.

5. WEST TEXAS RIPARIAN AREAS

Riparian habitats are another critical wetland type, especially in the western portions of the State. Their hydrologic regimes are greatly influenced by proximity to an aquatic ecosystem, and they usually occur as an ecotone between aquatic and upland ecosystems (FWS 1980). As with bottomland hardwoods, most riparian habitats can be categorized into discrete forest

cover types according to their elevation above water level and vegetation structure within the community. Riparian habitats which meet the characteristics of wetlands are usually classified as palustrine forested, palustrine scrub-shrub, or palustrine emergent under the NWI classification system.

Wetland Loss

Nationwide, it is estimated that more than 70% of all original riparian ecosystems may have been cleared (Council on Environmental Quality 1978). Although there are no adequate data or information concerning the extent of losses of riparian habitats in Texas, an inventory by Texas Parks and Wildlife Department in 1987 (Frye 1987) indicated that forested wetlands, which include bottomland hardwood and riparian habitats, have decreased 63% since settlement of Texas. Only an estimated 1.8 million acres of riparian forests remain outside of the east Texas bottomland hardwood area.

Wetland Threats

The primary reasons for the loss of riparian habitats in west Texas include clearing for pasture and agriculture, cattle grazing, and reservoir development. In some instances, water withdrawal for irrigation has also impacted flows and water availability within stream channels.

Wetland Functions and Values

Riparian vegetation provides the same basic functions and values as bottomland hardwoods. These include their high value as fish and wildlife habitat as well as their importance in the maintenance of water quality, water supply, and flood control. Riparian ecosystems are especially significant to wildlife resources because of their vegetative and structural diversity and high productivity (Johnson and Jones 1977).

6.COASTAL POTHOLE WETLANDS

The potholes of coastal Texas collectively include small depressional wetlands formed by wind erosion of surface soils. Most coastal potholes are circular to elliptical, shallow, wind-deflated depressions or basins varying from 0.1 to greater than five acres in size. Water depths within these depressions vary according to geographic location and season and range from 0.5 to greater than three feet. Texas coastal pothole wetlands extend northward along the coast from southern Cameron County to Matagorda Bay. Potholes in the valley of the Rio Grande vary somewhat with respect to soil and vegetative associations from the basins found in the more sandy soils to the north.

Rio Grande Valley potholes; found in Cameron, Hidalgo, Starr, and Willacy Counties; occur in soils which typically have a high clay content, low permeabilities, and a high water table (Spiller and French, 1986). These "Valley" potholes support emergent and aquatic vegetation with buttonbush and willows growing along the upper margins (Spiller and French, 1986). Potholes located in the Lower Rio Grande Valley are classified as palustrine wetlands according to NWI classifications.

Pothole wetlands found in association with live oak brush occur along the Pleistocene Strandplain sand formation which extends from Matagorda Bay south to Baffin Bay and includes all or portions of Encinal, Live Oak, Blackjack, and Lamar Peninsulas. Aquatic and wetland vegetation grows in and around these depressions with a live oak brush community present on the upland borders. Potholes found within the sand plains are primarily classified as palustrine open-water and emergent type wetlands.

Wetland Loss

No comprehensive figures exist for historical or current numbers and acreage of potholes in either the sand plains or in the Lower Rio Grande Valley. However, two separate status and trend studies have examined losses of these wetland types in small areas within each region. Collins (1987) reported a loss of 439 potholes (62% loss) and 1,438 potholes (58% loss) on the Encinal and Live Oak Peninsulas, respectively, between 1956 and 1979. Spiller and French (1986) reported a 41% decrease in numbers (713 of 1,724 potholes lost) with a 30% loss of acreage (1,032 of 3,444 acres lost) over an area of approximately 250 thousand acres in the Lower Rio Grande Valley during the same period. Industrial, residential, and agricultural development has eliminated or modified much of the pothole habitat along the Texas coast.

Wetland Threats

Due to the small size and variable water regimes of potholes, these wetlands are vulnerable to draining, filling, and associated activities. The principal threat to Lower Rio Grande Valley potholes is drainage and conversion to cropland. Spiller and French (1986) attributed seven-eighths of the reduction in Valley potholes to agricultural conversion.

The potholes of the eolian sand plain remain relatively undisturbed at present, largely because the majority are located on large ranches. The primary activity adversely affecting the ranch potholes is overgrazing. In some cases this can eliminate stabilizing vegetation which decreases cover for numerous wildlife species and may result in modification of the pothole itself. Partitioning of these large landholdings and subsequent residential development, particularly along the coastline, constitutes a future threat to the potholes of the South Texas eolian sand plain.

In contrast to the situation on the more southern sand plain, the live oak brush pothole complex on the strandplain has been severely reduced and altered by human activities. Potholes on the southern tip of Live Oak Peninsula and the Aransas National Wildlife Refuge (Blackjack Peninsula) are the only major concentration of these wetlands which remain relatively undisturbed. Industrial, residential, and agricultural activities have eliminated or changed much of this habitat.

Wetland Functions and Values

Potholes are a major wintering habitat for migratory waterfowl of the Central Flyway. These wetlands also support nesting waterfowl such as mottled ducks

and black-bellied whistling ducks. In addition to waterfowl, other migrating and resident bird species such as songbirds, shorebirds, and waders depend on these fresh water basins for drinking, resting, and feeding purposes. The potholes often supply the only available fresh water for the resident terrestrial wildlife community while the surrounding vegetation provides roosting, nesting, and escape cover for upland wildlife species as well. Two rare amphibians listed as endangered by the State of Texas and as candidate species by the Fish and Wildlife Service, are closely associated with the potholes.

Pothole wetlands function to convey flood waters and to delay and moderate runoff as well as to recharge groundwater. Pothole vegetation traps sediments, pollutants, and nutrients, helping to decrease agriculture-related non-point source pollution (Spiller and French, 1986). Pesticides, herbicides, and fertilizers decompose during storage in the potholes preventing eventual contamination of the coastal estuaries.

WETLAND ACQUISITION ISSUES, CONFLICTS AND PRIORITIES

In accordance with the National Wetlands Priority Conservation Plan, wetlands acquired under authority of the Emergency Wetlands Resources Act will be those that are representative of a declining wetland type, have significant functional values, and are threatened with loss or degradation. In addition, priority consideration will be given to wetlands whose public values and benefits cannot be maintained or realized except through acquisition. Acquisition can occur through several avenues such as fee title purchase, perpetual easements, leases, deed restrictions, donations, and exchanges.

Land and Water Conservation Fund monies are distributed to several Federal agencies, including the U.S. Fish and Wildlife Service, and to all States. With these monies, land may be acquired for conservation or recreation purposes. At the State level, acquisition of wetlands will compete with the acquisition and development of urban parks, swimming pools, etc. At the federal level, acquisition of wetlands will compete with the acquisition of wilderness areas, critical habitat, and other non-wetland natural areas.

A further constraint is the lack of an adequate funding base. A number of wetlands listed in Table B-2 which may eventually warrant consideration for acquisition with monies from the Land and Water Conservation Fund will never be acquired. Acquisition of more wetland sites will be possible only if more monies from the Fund are distributed to State and Federal agencies.

Other factors which must be considered when planning possible acquisitions include the acquisition and management priorities established by states, local governments, private land trust organizations, and Federal agencies; future operation and maintenance requirements; availability of willing sellers, etc.

More specific information about State wetlands acquisition programs can be found in the wetlands addenda to State Comprehensive Outdoor Recreation Plans. These addenda were prepared in compliance with the Emergency Wetlands Resources Act. Additional information about wetland types, values, losses and threats can also be found in each state wetlands addenda.

The development of the Wetlands Concept Plan is subject to National Environmental Policy Act (NEPA) compliance, in accordance with Service NEPA procedures. Because this Concept Plan does not lend itself to a meaningful environmental analysis and because future actions will be subject to NEPA compliance on a case-by-case basis, the development and issuance of these plans is categorically excluded under Service and Departmental NEPA procedures. Since the final plan will be released to the public by the Regional Director, and since Regional Directors must ensure compliance with NEPA for documents they release, an Environmental Action Memorandum has been prepared and signed by the Regional Director for the Region 2 Concept Plan to establish the administrative record for compliance with NEPA.

Many of the priority wetlands identified in the Regional Wetlands Concept Plan have undergone a Level I Contaminant Survey by the Service to insure that acquired wetlands do not contain hazardous substances which may result in an

undue expenditure of funds for cleanup. Where such sites have been identified, they have been included with the information for each priority wetland so that more detailed contaminant evaluation may be done when priority wetlands undergo ranking.

In the Playa Lakes of Texas, less than one percent of all playa wetlands are publicly owned. This factor, coupled with the playas' importance to nationally significant wildlife resources (e.g., migratory birds) and their heavy use and modification for agricultural purposes, dictates that they be given high priority by the Service for fee title acquisition. Due to the large amount of Farmers Home Administration inventory properties and the private ownership of playas in general, acquisition of playa wetlands should also stress the development of deed restrictions and conservation easements as a cost-effective way to protect playa wetlands.

It should be noted that the majority of the 19,339 playas occurring in the Texas High Plains provide, at least seasonally, significant habitat for many migratory and resident wildlife species. The specific playas identified in this concept plan have been recognized for their high value to wildlife species, especially waterfowl and other migratory birds, by State and Federal biologists or noted in various publications by the resource agencies. Additional playa wetlands may be evaluated on a case-by-case basis and considered for acquisition during future planning activities.

The major issue concerning the acquisition of springs and headwater streams in Texas involves the lack of control over the quantity of spring flow or external factors which control the amount of flow (e.g., groundwater pumping). For this reason, it may be preferable to acquire spring systems which provide critical habitat through the use of a perpetual conservation easement in lieu of fee title purchase. In some instances, genetic contamination from introduced species may threaten the existence of endangered species. Strict land use/access controls or fee purchase may be required under this circumstance to protect the biological integrity of the habitat and the imperiled population.

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APPENDIX

TX-1

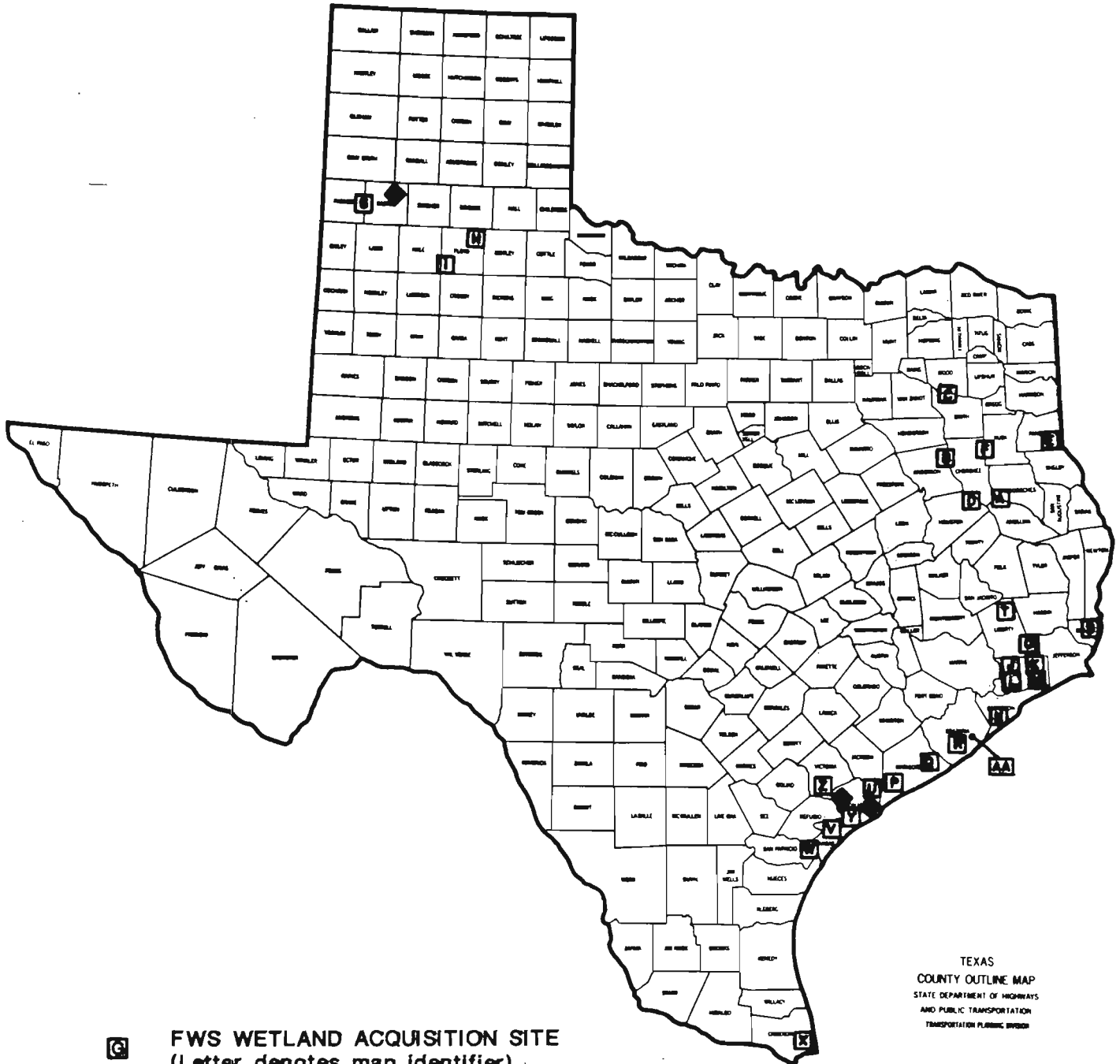
TEXAS PRIORITY WETLANDS

TEXAS PRIORITY WETLANDS FOR ACQUISITION CONSIDERATION

Map ID	Site Name	County(s)	USGS Quad(S)	Est. Acreage
A	Upper Angelina River	Cherokee, Nacogdoches, Angelina	Redland, Clawson, Durst Lakes	16,640
B	Neches River North	Anderson, Cherokee	Neches, Todd City	25,304
C	Middle Sabine Bottom	Wood, Smith	Lindale, Crow, Hawkins	13,798
D	Middle Neches River	Cherokee, Houston, Trinity, Angelina, Polk	Sloacum, Weches Kenard NE, Wells, Wells SW, Keltys, Apple Springs, Dibold, Forest	71,782
E	Lower Sabine River Bottom	Harrison, Panola	Carthage, Darco, Deadwood	88,576
F	Mud Creek	Cherokee, Rusk	Reklaw, Atoy, New Summerfield	6,784
G	Nelson-Kemp Playas	Castro	Dimmit SW	150
H	Neff Playa	Floyd	Lockney SW	90
I	Cone Playa	Floyd	Floydada SE, Cone	150
J	Middleton Marsh	Chambers	High Island, Stanolind	3,700
K	Horseshoe Marsh	Chambers	High Island	1,000
L	Lower Marsh	Chambers	High Island	5,200
M	Robinson Bayou Marsh	Chambers	Frozen Point, Lake Stephenson	13,300
N	Pierce Marsh	Galveston	Virginia Point	1,360
O	Delhomme Marsh	Chambers	Cove	2,176
P	Smith Marsh	Matagorda	Cedar Lake W	3,652
Q	Baer Ranch	Matagorda	Matagorda, Wadsworth	4,500

Map ID	Site Name	County(s)	USGS Quad(s)	Est. Acreage
R	Freshwater Lake	Brazoria	Freeport	1,100
S	Blue Elbow	Orange	Orange, LA, Echo	5,320
T	Wirt-Davis	Liberty	Davis Hill	20,500
U	Rancho La Bahia	Calhoun	Seadrift NE, Port Lavaca E	3,764
V	Lamar Peninsula	Aransas	St. Charles Bay	3,644
W	McC Campbell's Slough	Aransas, San Patricio	Aransas Pass	2,440
X	Playa Del Rio	Cameron	Port Isabel, Palmito Hill, Mouth of the Rio Grande	12,000
Y	Welder Flats	Calhoun	Long Island Mosquito Pt.	4,608
Z	Guadalupe River Bottom	Calhoun, Refugio	Austwell	15,000
AA	Hoskins Mound	Brazoria	Christmas Point Danbury, Hoskins Mound, Oyster Creek	32,000

TEXAS PRIORITY WETLAND SITES



Map ID: A

Wetland Site Name: Upper Angelina River

State: Texas

Location: Eight miles southwest of Nacogdoches, Texas in Nacogdoches, Angelina, and Cherokee Counties.

Administering Refuge: Angelina

Purpose of Acquisition: Preserve bottomland hardwood habitat for migratory waterfowl and other native wildlife.

Acreage when completed: 16,640

The upper Angelina River is a complex of palustrine forested, scrub-shrub, and emergent wetlands and open water areas that provides very high quality habitat for migratory and resident wildlife species, especially waterfowl such as wood ducks and mallards. This bottomland hardwood tract is an important migratory corridor for waterfowl, raptors, passerines, and waterbirds which migrate to and from northern breeding grounds and southern wintering areas. Colonial waterbird rookeries occur within the project area and the site is potential habitat for the endangered bald eagle and red-cockaded woodpecker.

The upper Angelina River has been recognized as one of the highest quality bottomland hardwood tracts in Texas by the U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, and Texas Nature Conservancy. The area is located within the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan and the Texas Bottomland Hardwood Initiative.

Bottomland hardwoods such as this tract are being cleared for their timber and converted to pine plantation, pasture, or agriculture production. Water development projects are also a threat to the bottomland forest.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) timber removal.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/04/90

Map ID: B

Wetland Site Name: Neches River North

State: Texas

Location: Three miles east of Palestine, Texas in Anderson and Cherokee Counties.

Administering Refuge: Neches River

Purpose of Acquisition: Preserve bottomland hardwood habitat for migratory waterfowl and other native wildlife.

Acreage when completed: 25,304

This portion of the Neches River is a complex of palustrine forested, scrub-shrub, emergent wetlands and open water areas that provides habitat for migratory and resident wildlife species, especially waterfowl. This bottomland hardwood dominated tract encompasses approximately 75 miles of floodplain on both sides of the river and is an important migratory corridor for waterfowl, raptors, passerines, and waterbirds which migrate to and from northern breeding grounds and southern wintering areas.

The Neches River has been recognized as one of the highest quality bottomland hardwood tracts in Texas by the Service, Texas Parks and Wildlife Department, and Texas Nature Conservancy. The area is located within the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan and the Texas Bottomland Hardwood Initiative.

Bottomland hardwoods such as this tract are being cleared for their timber and converted to pine plantation, pasture, or agriculture production. Water development projects are also a threat to the bottomland forest.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) timber removal, (4) oil, gas, and lignite development, and (5) water development including loss of instream flows.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/04/90

Map ID: C

Wetland Site Name: Middle Sabine Bottom

State: Texas

Location: Twenty-five miles north of Tyler, Texas on the Sabine River in Smith and Wood Counties.

Administering Refuge: Little Sandy

Purpose of Acquisition: Preserve bottomland hardwood habitat for migratory waterfowl and other native wildlife.

Acreage when completed: 13,798

The proposed area is dominated by palustrine forested wetlands that provide very high quality habitat for migratory and resident wildlife species, especially waterfowl. This bottomland hardwood tract also contains two large lakes and numerous oxbow lakes that provide stable habitat conditions for migratory waterfowl and waterbirds which migrate to and from northern breeding grounds and southern wintering areas. Colonial waterbird rookeries occur within the project area and the site is potential habitat for the endangered bald eagle. Over 200 species of birds are known to occur in the area, many of which breed on site. The area is recognized as one of the better breeding areas in Texas for the wood duck. The area is located within the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan and the Texas Bottomland Hardwood Initiative.

Bottomland hardwoods such as this tract are being cleared for their timber and converted to pine plantation, pasture, or agriculture production. Water development projects are also a threat to the bottomland forest.

THRESHOLD CRITERIA

1. **WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)

2. **IS THE WETLAND SITE THREATENED:** This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) timber removal, (4) oil, gas, and lignite development, and (5) water development including loss of instream flows.

3. **WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/08/90

Map ID: D

Wetland Site Name: Middle Neches River

State: Texas

Location: Ten miles west of Lufkin, Texas in Angelina, Cherokee, Houston, Trinity, and Polk Counties.

Administering Refuge: Neches River

Purpose of Acquisition: Preserve bottomland hardwood habitat for migratory waterfowl and other native wildlife.

Acreage when completed: 71,782

This portion of the Neches River is a complex of palustrine forested, scrub-shrub, and emergent wetlands and open water areas that provides very high quality habitat for migratory and resident wildlife species, especially waterfowl. This bottomland hardwood dominated tract is an important migratory corridor for waterfowl, raptors, passerines, and waterbirds which migrate to and from northern breeding grounds and southern wintering areas. Colonial waterbird rookeries occur within the project area and the site is potential habitat for the endangered bald eagle and red-cockaded woodpecker.

The Middle Neches River has been recognized as one of the highest quality bottomland hardwood tracts in Texas by the Service, Texas Parks and Wildlife Department, and Texas Nature Conservancy. The area is located within the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan and the Texas Bottomland Hardwood Initiative.

Bottomland hardwoods such as this tract are being cleared for their timber and converted to pine plantation, pasture, or agriculture production. Water development projects are also a threat to the bottomland forest.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) timber removal, (4) oil and gas development, and (5) water development including loss of instream flows.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/18/90

Map ID: E

Wetland Site Name: Lower Sabine River Bottom **State:** Texas

Location: Eight miles east of Carthage, Texas in Panola and Harrison Counties.

Administering Refuge: Little Sandy

Purpose of Acquisition: Preserve bottomland hardwood habitat for migratory waterfowl and other native wildlife.

Acreage when completed: 88,576

The proposed area is dominated by palustrine forested wetlands that provide very high quality habitat for migratory and resident wildlife species, especially waterfowl. This bottomland hardwood tract also contains numerous oxbow lakes that provide excellent habitat conditions for migratory waterfowl and waterbirds which migrate to and from breeding and wintering areas. Colonial waterbird rookeries occur within the project area and the site is potential habitat for the endangered bald eagle. The area is recognized as one of the better breeding areas in Texas for the wood duck.

The Lower Sabine River bottom is recognized as a priority one bottomland hardwood site in the State of Texas by the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department. The area is located within the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan and the Texas Bottomland Hardwood Initiative.

Bottomland hardwoods such as this tract are being cleared for their timber and converted to pine plantation, pasture, or agriculture production. Water development projects are also a threat to the bottomland forest.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) timber removal, (4) oil, gas, and lignite development, (5) residential development, and (6) water development including loss of instream flows.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/18/90

Map ID: F

Wetland Site Name: Mud Creek

State: Texas

Location: Ten miles northeast of Rusk, Texas in Cherokee and Rusk Counties.

Administering Refuge: Angelina

Purpose of Acquisition: Preserve bottomland hardwood habitat for migratory waterfowl and other native wildlife.

Acreage when completed: 6,784

The project area is dominated by diverse palustrine forested wetlands that provide very high quality habitat for migratory and resident wildlife species, especially waterfowl such as wood ducks and mallards. This bottomland hardwood tract also contains several large tributaries and braided stream channels with sloughs which provide excellent habitat conditions for migratory waterfowl and waterbirds which migrate to and from northern breeding grounds and southern wintering areas. The site is potential habitat for the endangered bald eagle.

Mud Creek is recognized as a priority one bottomland hardwood site in the State of Texas by the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department. The area is located within the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan and the Texas Bottomland Hardwood Initiative.

Bottomland hardwoods such as this tract are being cleared for their timber and converted to pine plantation, pasture, or agriculture production. Water development projects are also a threat to the bottomland forest.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) timber removal, (4) oil, gas, and lignite development, and (5) water development including loss of instream flows.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, fishery values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/18/90

Map ID: G

Wetland Site Name: Nelson-Kemp Playas

State: Texas

Location: Approximately four to six miles west of Dimmitt, Texas in Castro County.

Administering Refuge: Buffalo Lake

Purpose of Acquisition: Provide wetland wintering, breeding, and nesting habitat for waterfowl and other migratory birds.

Acreage when completed: 150

This playa lake complex consists of two large and several smaller basins which contain permanent open water and emergent vegetation. These basins occur within an intensively cultivated region of small grains and corn which provide a major food source for waterfowl wintering in the High Plains Region. Both major basins have pumps which could be used to manage playa water levels for optimum habitat conditions.

Estimates of waterfowl numbers using the playas of Texas range from 500,000 to 2,800,000 for ducks and 100,000 to 750,000 for geese. Mallards, pintails, teal, and American wigeon are the most common waterfowl species using the playas, however, many other migratory birds also depend upon these wetland habitats for wintering, breeding, nesting, and resting during their annual migrations.

The playa region of Texas is recognized by the Service as a significant waterfowl area and has been approved as a joint venture of the North American Waterfowl Management Plan. Major threats to playa lakes primarily include human activities such as agricultural modification and contamination.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) oil and gas development, and (4) water pollution.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/22/90

Map ID: H

Wetland Site Name: Neff Playa

State: Texas

Location: Approximately seven miles northeast of Floydada, Texas in Floyd County.

Administering Refuge: Muleshoe

Purpose of Acquisition: Provide wetland wintering, breeding, and nesting habitat for waterfowl and other migratory birds.

Acreage when completed: 90

This playa lake consists of a large basin which contains permanent open water and emergent vegetation. The basin occurs within an intensively cultivated region of small grains and corn which provides a major food source for waterfowl wintering in the High Plains Region. The basin has a pump which could be used to manage playa water levels for optimum habitat conditions. Estimates of waterfowl numbers using the playas of Texas range from 500,000 to 2,800,000 for ducks and 100,000 to 750,000 for geese. Mallards, pintails, teal, and American wigeon are the most common waterfowl species using the playas, however, many other migratory birds also depend upon these wetland habitats for wintering, breeding, nesting, and resting during their annual migrations.

The playa region of Texas is recognized by the U.S. Fish and Wildlife Service as a significant waterfowl area and has been approved as an individual joint venture of the North American Waterfowl Management Plan. A major objective of the Joint Venture is to identify and seek protection of high quality wetland sites. Major threats include human activities such as agricultural modification and contamination.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THE WETLAND SITE THREATENED:** This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) oil and gas development, and (4) water pollution.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/22/90

Map ID: I

Wetland Site Name: Cone Playa

State: Texas

Location: Approximately nine miles south of Floydada, Texas in Floyd County.

Administering Refuge: Muleshoe

Purpose of Acquisition: Provide wetland wintering, breeding, and nesting habitat for waterfowl and other migratory birds.

Acreage when completed: 150

This playa lake consists of a large basin which contains permanent open water and emergent vegetation. The basin occurs within an intensively cultivated region of small grains and corn which provides a major food source for waterfowl wintering in the High Plains Region. The basin has a pump and dikes which could be used to manage playa water levels for optimum habitat conditions. As many as 40,000 pintails have been observed at this playa which is surrounded by several other playas and Conservation Reserve Program lands.

Estimates of waterfowl numbers using the playas of Texas range from 500,000 to 2,800,000 for ducks and 100,000 to 750,000 for geese. Mallards, pintails, teal, and American wigeon are the most common waterfowl species using the playas, however, many other migratory birds also depend upon these wetland habitats for wintering, breeding, nesting, and resting during their annual migrations.

The playa region of Texas is recognized by the Service as a significant waterfowl area and has been approved as a joint venture of the North American Waterfowl Management Plan. Major threats to playa lakes primarily include human activities such as agricultural modification and contamination.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: (1) agriculture conversion or use, (2) livestock grazing, (3) oil and gas development, and (4) water pollution.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria, water quality values meet the threshold criteria, recreation values meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

Completed by: Cloud/ES

Date: 01/22/90

Map ID: J

Wetland Site Name: Middleton Marsh

State: Texas

Location: West of SH 124 and north of GIWW in Chambers Co.

Administering Refuge: Anahuac

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 3,670

The Middleton Marsh is a large field of estuarine emergents with potholes increasing southward toward the GIWW. Water courses, a highway, and uplands provide a natural boundary, and also pose a threat of development due to good public access.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: Yes, the area is strategically located for commerce.

3. WETLAND FUNCTIONS AND VALUES: Occasional use by large raptors; important to migratory waterfowl, particularly geese; anastomosing streams and potholes support juvenile fish and shellfish; high value in tertiary treatment of agricultural runoff.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 2, 1990

Map ID: K

Wetland Site Name: Horseshoe Marsh

State: Texas

Location: West of SH 124 and south of GIWW in Chambers Co.

Administering Refuge: Anahuac

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 1,029

Horseshoe Marsh is a small tract of estuarine emergents with a pond complex in the center. It is extremely threatened by gas development and its location near High Island between the GIWW and SH 124. It may already be too segmented for acquisition unless Middleton Marsh is also acquired on the other side of the GIWW.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THE WETLAND SITE THREATENED:** Yes - cattle grazing; gas reserves; spoil disposal sites; commercial development.
- 3. WETLAND FUNCTIONS AND VALUES:** Occasional use by large raptors; important to migratory waterfowl, particularly geese; high value in tertiary treatment of agricultural runoff.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 2, 1990

Map ID: L

Wetland Site Name: Lower Marsh

State: Texas

Location: West of SH 124 and south of GIWW in Chambers Co.

Administering Refuge: Anahuac

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 5,200

Lower Marsh is a tract of estuarine emergents with a conglomerate of ponds in the middle and several bayous flowing to the GIWW. It is fragmented with an oil field development and several long cattle walks, but is still an exceptional wetlands for waterfowl refuge and hunting.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: Yes - cattle grazing; gas reserves; spoil disposal sites.

3. WETLAND FUNCTIONS AND VALUES: Occasional use by large raptors; important to migratory waterfowl, particularly geese; high value tertiary treatment of agricultural runoff

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 2, 1990

Map ID: M

Wetland Site Name: Robinson Bayou Marsh **State:** Texas

Location: North of East (Galveston) Bay in Chambers Co.

Administering Refuge: Anahuac

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 13,300 acres

Robinson Bayou Marsh is a large site of predominantly estuarine emergents containing large impoundments and many small enclosed flats. The area contains a ridge of high ground along the shore of East Bay and several other small upland tracts. It would be a logical extension of the Anahuac Refuge to the east.

THRESHOLD CRITERIA

1.WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2.IS THE WETLAND SITE THREATENED: Yes - levees and roads throughout; impoundments for hunting; oil and gas development; heavy livestock use.

3.WETLAND FUNCTIONS AND VALUES: Very valuable to geese and other migratory waterfowl; nursery habitat for fish and shrimp; tertiary treatment of agricultural runoff

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 22, 1990

Map ID: N

Wetland Site Name: Pierce Marsh

State: Texas

Location: North of Highland Bayou Diversion Canal in Galveston, Co.

Administering Refuge: Anahuac

Purpose of Acquisition: Protect threatened wetlands values

Acreage when completed: 1,361 acres

Pierce Marsh is now held by the TNC for transfer. Although containing considerable open water, it is an excellent marsh site close to many small towns with many threats. It should be given high priority consideration for acquisition.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)**
- 2. IS THE WETLAND SITE THREATENED: Yes** - already contains several spoil areas; bordered by road & railroad; nearby oil development, adjacent sand operation
- 3. WETLAND FUNCTIONS AND VALUES: Excellent** nursery habitat for migratory birds and large wading birds' receives water from upstream runoff of towns and blind canals for treatment; provides storm tide flood storage.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 8, 1990

Map ID: 0

Wetland Site Name: Delhomme Marsh

State: Texas

Location: Forty miles east of Houston in Chambers County.

Administering Refuge: Anahuac

Purpose of Acquisition: To protect valuable palustrine emergent and estuarine emergent coastal marsh habitats for fish and wildlife.

Acreage when completed: 2,176

Delhomme marsh is made up of mostly palustrine emergent (fresh water) marsh with lesser amounts of estuarine emergent marshes. Significant concentrations of wintering northern pintails, teal, scaup, mallards and other dabbling ducks occur on the property together with snow and Canada geese. A myriad of species of wading birds, shore birds, hawks, falcons, and passerine birds occur there seasonally. Shrimp, redfish, crab, and a variety of other estuarine fishes, shellfish, and crustaceans spawn in the waters on the property. The American alligator occurs there in abundance, the same is true for mink, otter, muskrat, racoon and nutria.

The property's wetlands are among those identified as declining and which warrant priority consideration for Federal and State acquisition in National Wetlands Priority Conservation Plan. The area also is within the region of the Gulf Coast Joint Venture of the North American Waterfowl Management Plan.

The area is threatened with partial inundation by the proposed Wallisville water development project. The owners have placed the property on the market for sale.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by: Development and/or destruction via USA Corps project

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria
Fishery values meet the threshold criteria
Water quality values meet the threshold criteria
Recreation values meet the threshold criteria

CONCLUSION

Area meets at least two of the threshold criteria for qualification under NWPC provisions.

Completed by: Ault/RE

Date: 02/15/90

Map ID: P

Wetland Site Name: Smith Marsh

State: Texas

Location: Beach and back wetlands southwest of Anahuac

Administering Refuge: San Bernard

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 3,100

This tract includes the remaining wetlands between San Bernard NWR and Caney Creek including remains of unpurchased Smith Marsh. It is in a highly erosive area now under study by the Corps of Engineers in two separate studies and is now in the Coastal Barriers Resources System.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: Yes - at the edge of the exposed Caney Creek community includes oil and gas development roads site; spoil disposal from GIWW

3. WETLAND FUNCTIONS AND VALUES: Important waterfowl area with good mix of emergents and open water; important for protection against erosion and improvement of water quality, particularly the scattered oyster populations.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 24, 1990

Map ID: Q

Wetland Site Name: Baer Ranch

State: Texas

Location: West of Big Boggy NWR in Matagorda Co.

Administering Refuge: Big Boggy

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 4,500

The Baer Ranch would complete the Big Boggy NWR acquisition and provide a complete unit of emergent wetlands north of East Matagorda Bay.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)**
- 2. IS THE WETLAND SITE THREATENED: Yes - encroachments from cattle grazing and oil exploration**
- 3. WETLAND FUNCTIONS AND VALUES: Most valuable for dabbling waterfowl and for storage of upstream storm runoff plaguing inland communities**

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 24, 1990

Map ID: R

Wetland Site Name: Freshwater Lake

State: Texas

Location: Adjacent to Oyster Creek at the GIWW, Brazoria County

Administering Refuge: Brazoria

Purpose of Acquisition: To protect wildlife and wetland values.

Acreage when completed: 1,100

Freshwater Lake provides feeding and resting habitat for the same populations of wintering migratory waterfowl that use the adjacent Brazoria National Wildlife Refuge. It is a particularly valuable area for puddle ducks; i.e. Mallards and Northern Pintails. Major wetland functional values are nutrient assimilation and flood/storm surge protection and storage.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 3 (180-219)

2. IS THE WETLAND SITE THREATENED: Freshwater Lake is surrounded by encroachments from housing development, oil and gas activities, and dredged material disposal. Being located adjacent to the GIWW and Oyster Creek, it is a prime location for waterborne commerce operations.

3. WETLAND FUNCTIONS AND VALUES: High values for wildlife, particularly migratory waterfowl. Functions as a storm surge buffer area, flood control and nutrient assimilation.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Bruce G. Halstead

Date: February 15, 1990

Map ID: S

Wetland Site Name: Blue Elbow

State: Texas

Location: Immediately north of Orange in Orange, Co.

Administering Refuge: New

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 5,320

Blue Elbow Swamp is a large block of cypress swamp immediately north of the city of Orange. It is great potential for wildlife use, support of fisheries, and outdoor recreation but must be cleaned up to include removal of urban wastes, improvement of pipeline roads, clean up of development industry (Portland cement), and buy out of several, small backwoods communities.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: Yes - fill for pipeline routes, commercial development and roads; canals for decks and pipelines; budding housing development; oil exploration

3. WETLAND FUNCTIONS AND VALUES: High values for flood storage and water quality improvement; valuable to the fresh water fishery of the Sabine River, providing fishing recreation all around the periphery; excellent potential for additional outdoor recreation; contains isolated ponds valuable to migratory waterfowl.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 10, 1990

Map ID: T

Wetland Site Name: Wirt-Davis Estate

State: Texas

Location: Approximately 30 mi north of Liberty on west bank of Trinity River

Administering Refuge: New Acquisition

Purpose of Acquisition: Protect threatened wetland values

Acreage when completed: 20,500

The Wirt-Davis lands are one of only a few large block tracts along east Texas rivers that, although threatened, retain very high fish and wildlife values. The site contains good examples of most types of palustrine forest and associated habitat types.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: Yes - cutting of large trees; clearing for cattle; subdivision sites at edge of area; gravel mining potential.

3. WETLAND FUNCTIONS AND VALUES: Contains the highest concentration of wintering waterfowl in the lower Trinity; excepted for wood ducks, wintering mallards, and colonial nesting birds. Very important for water quality improvement and flood control for downstream communities and irrigation withdrawals.

CONCLUSION

Yes, wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Frederick T. Werner

Date: January 22, 1990

Map ID: U

Wetland Site Name: Rancho La Bahia

State: Texas

Location: Calhoun County, Texas (Indianola, also near Port Lavaca)

Administering Refuge: Aransas National Wildlife Refuge

Purpose of Acquisition: Preservation of a valuable freshwater and salt marsh coastal wetland complex which provides important wildlife habitat.

Acreage when completed: 4,400

The La Bahia property is strategically located on Matagorda Bay, 30 miles north of Aransas NWR. A 640 acre freshwater lake, interspersed with emergent marsh, provides a roosting and foraging area for migratory and wintering waterfowl and other wetland dependent birds. Large numbers of geese, ducks, sandhill cranes, ibis, and other wading birds forage, roost, and/or loaf in the adjacent marshes and farm fields. The endangered whooping crane has been recorded from the site.

This site has been recognized as a priority acquisition site in the North American Waterfowl Management Plan and is a component of the Texas Wetland Plan.

The primary source of fresh water to this site is rice field drainage and restriction of this water source would result in a drying of the palustrine wetlands. Oil and gas development currently exists on site. Water development projects are planned for the Matagorda Ship Channel, adjacent to the project area, which could result in changes in water chemistry and plant and animal composition of the area. At least two of the property owners are willing sellers and have contacted the Service.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by drainage & conversion to agriculture and adjacent navigation projects.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the Threshold Criteria.

Fishery values meet the Threshold Criteria.

Water quality values meet the Threshold Criteria.

Recreation values meet the Threshold Criteria.

Other areas/concerns meet the Threshold Criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Cobb/ES

Date: 02-02-90

Map ID: V

Wetland Site Name: Lamar Peninsula

State: Texas

Location: Aransas County, Tx. (towns of Lamar & Holiday near Rockport)

Administering Refuge: Aransas NWR

Purpose of Acquisition: Preservation of valuable and productive coastal salt and freshwater wetland complex which provides important habitat for wildlife.

Acreage when completed: 3,727

Lamar Peninsula wetlands, adjacent to St. Charles Bay comprise an area of coastal marsh and oak mottes. This area includes approximately 3,700 acres of emergent salt marsh, tidal flats, and submerged seagrass, as well as uplands, interspersed with fresh water potholes and associated fresh marsh. This peninsula supports a large assemblage of coastal wildlife species, many which are peripheral and rare including American oystercatchers, roseate spoonbills, least terns, and white-tailed kites. The White-faced ibis, reddish egret, and diamond-backed terrapin, listed by the Texas Organization of Endangered Species, also occur in this area.

Lamar Peninsula has been recognized by the Nature Conservancy, the Texas Natural Areas Survey, the U.S. Fish & Wildlife Service (as a unique wildlife ecosystem), and the National Park Service in their publication, Potential Natural Landmarks of the western Gulf Coastal Plain.

Oil and gas development has already occurred to some degree on this site. The threat of subdivision for residential construction is considered imminent. Public use of the site is restricted, although hunting and fishing activities do take place on the bay adjacent to the eastern boundary.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by residential development, and oil and gas development

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria.
Water quality/erosion protection values meet the threshold criteria.
Recreation values meet the threshold criteria.
Other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, this wetland site meets at least two of the threshold criteria and qualifies for acquisition under provisions of the National Wetlands Conservation Plan.

Completed by: Cobb/ES

Date: 02-05-90

Map ID: W

Wetland Site Name: McCampbell's Slough

State: Texas

Location: Aransas, San Patricio Counties (town of Aransas Pass)

Administering Refuge: Aransas NWR

Purpose of Acquisition: Preservation of valuable coastal marsh habitat providing important habitat to wildlife and fish.

Acreage when completed: 1,910

McCampbell Slough is 1,900 acres of salt marsh, tidal flats, and brackish marsh. This area is noted as a productive and valuable wetland complex providing a nursery for shrimp, blue crabs, and finfish, as well as feeding, wintering, and migration habitat for waterfowl, shorebirds, wading birds, and other wetland-dependent species. The brackish and salt marshes and surrounding cordgrass meadows and brush-covered uplands provide foraging, denning, and escape cover for a variety of mammals, reptiles, and amphibians.

This area has been recognized by the Nature Conservancy, the Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service in its Wetland Preservation Program and Land Protection Plan. This wetland is located within the region of the Gulf Coast Joint Venture of the North American Waterfowl Management Plan.

One large landowner has been identified as a willing seller, having contacted the Service regarding his property. However, this landowner has also indicated that residential development of the area is being considered in lieu of a sale. Public use of the area is restricted to Port Bay and includes boating, fishing, and waterfowl hunting.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 1 (0-139)

2. IS THE WETLAND SITE THREATENED: This site is threatened by, residential and commercial development, and water pollution.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet the threshold criteria.
Fishery values meet the threshold criteria.
Water quality values meet the threshold criteria.
recreation values meet the threshold criteria.

CONCLUSION

Yes, wetland site meets at least two of the threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Cobb/ES

Date: 01/30/90

Map ID: X

Wetland Site Name: Playa del Rio

State: Texas

Location: Cameron County, Texas (east of Brownsville)

Administering Refuge: Lower Rio Grande Valley NWR

Purpose of Acquisition: Preservation of valuable coastal wetland complex providing important habitat for wildlife.

Acreage when completed: 12,300

Playa del Rio is a pristine area of tidal flats, a bay, resacas, mangrove forests, gabilans, lomas, and sand dunes, located at the most southern extent of Texas. The wetlands of this area are noted for providing valuable feeding, migration, and wintering habitat for wetland-dependent species such as wading birds and shorebirds; passerines; and a number of threatened and endangered species including brown pelicans, arctic peregrine falcons, and piping plovers. In addition to supporting migratory birds, a number of peripheral species inhabit the site including plain chachalacas, green jays, and olive sparrows. This area also provides resting, foraging, and escape cover for a diverse assemblage of reptiles, amphibians, and mammals including the endangered ocelot and jaguarundi.

Pressure for commercial and residential development of this site is high. The landowner is awaiting the outcome of a Corps of Engineer's Section 10/404 permit decision which will dictate the likelihood of the areas development. The uniqueness of this area, its unusual geologic features, pristine conditions, and diverse habitat mixture make it a priority for preservation.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by residential and commercial development, filling, power plants, transportation, water pollution.

3. WETLAND FUNCTIONS AND VALUES: Wildlife and fishery values meet the threshold criteria.
Ground water values meet the threshold criteria.
Recreation values and other areas/concerns meet the threshold criteria.
Other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, this wetland site meets all threshold criteria and qualifies for acquisition consideration under provisions of the National Wetlands Conservation Plan.

Completed by: Cobb/ES

Date: 02-06-90

Map ID: Y

Wetland Site Name: Welder Flats Marsh

State: Texas

Location: Calhoun Co., Texas (Mosquito Point quadrangle)

Administering Refuge: Aransas National Wildlife Refuge

Purpose of Acquisition: Preservation of unique, productive coastal wetland providing important wildlife and fisheries habitat.

Acreage when completed: 3,800

Welder Flats Marsh is a coastal salt marsh and wind-tidal flat wetland complex located along the margin of San Antonio Bay. Among the species known to use this area are the federally-listed brown pelican and whooping crane. Other peripheral species and species of concern found at this site include the olivaceous cormorant, reddish egret, diamond-backed terrapin, and Ross's goose.

Welder Flats has been recognized by the state, which has incorporated it into a coastal preserve system to protect the submerged lands which intertwine with private marsh. This area has also been recognized by TNC, National Park Service, and Texas Natural Areas Survey, and is listed as a priority acquisition site in the North American Waterfowl Management Plan.

Oil and gas wells presently exist on the property and continued future development is likely. The potential for industrial development on site in the future exists since the site is located adjacent to GIWW. The potential or contamination by oil or chemical spills from passing barges is an ever-present threat. Public use includes restricted access for fishing and hunting.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by oil and gas development, potential contamination and degradation and industrial development.

3. WETLAND FUNCTIONS AND VALUES: Wildlife values meet threshold criteria.
Fishery values meet threshold criteria.
Water quality and shoreline damage reduction values meet threshold criteria.
Recreation values meet threshold criteria.

CONCLUSION

Yes, wetland site meets at least two of the threshold criteria and qualifies for consideration under provisions of the National Wetland Conservation Plan.

Completed by: Cobb/ES

Date: 02/05-90

Map ID: Z

Wetland Site Name: Guadalupe River Delta

State: Texas

Location: Calhoun County, Texas

Administering Refuge: TP&WD-Guadalupe River Wildlife Management Area

Purpose of Acquisition: Preservation of valuable and productive fresh and estuarine wetland complex providing important habitat for wildlife and fisheries.

Acreage when completed: 12,000

The Guadalupe River Delta is an area where riverine, palustrine, and estuarine influences meet and produce a variety of habitat types which support a diverse assemblage of marine, freshwater, and terrestrial plant and animal species. The delta has been identified as an area of high natural productivity providing spawning, nursery, and foraging grounds for finfish, shrimp, and blue crabs. This area is noted for its high value to migratory and wintering waterfowl as well as for hosting a large nesting colony of fish-eating water birds. The delta also furnishes feeding, resting & escape cover for numerous mammals, reptiles, and amphibians.

Threats to the integrity of this wetland system are primarily due to potential loss of instream flows if proposed reservoirs are constructed upstream, and to the prospect of industrial development on the east side of the area adjacent to the Victoria Barge Canal. Additionally, tremendous damage to the fresh water system within the delta is projected if the Corps of Engineers were to reroute the Gulf Intracoastal Waterway to the west of its present location. Near-term threats include the possibility of additional agricultural diking and construction of riverside recreational homes.

THRESHOLD CRITERIA

1. WETLANDS LOSS PRIORITY SCORE: Priority 2 (140-179)

2. IS THE WETLAND SITE THREATENED: This site is threatened by Loss of instream flows and water development projects upstream, industrial development, recreational homesite construction, and agricultural conversion.

3. WETLAND FUNCTIONS AND VALUES: Wildlife and fishery values meet the threshold criteria.

Water quality and shoreline protection values meet the threshold criteria.

Recreation values meet the threshold criteria.

Other areas/concerns meet the threshold criteria.

CONCLUSION

Yes, wetland site meets at least two of the threshold criteria and qualifies for consideration under provisions of the National Wetland Conservation Plan.

Completed by: Cobb/ES

Date: 02/02/90

Map ID: AA

Wetland Site Name: Hoskins Mound

State: Texas

Location: Adjacent to Brazoria National Wildlife Refuge, Brazoria County.

Administering Refuge: Brazoria

Purpose of Acquisition: Preservation of important wetland functions and habitat for migrating and wintering waterfowl and nesting habitat for wood ducks.

Acreage when completed: 32,000

Hoskins Mound provides important feeding, resting and breeding habitat for migratory waterfowl, mottled ducks, and shore and wading birds. Due to its location the project area provides breeding and nursery habitat for finfish and shellfish. Hoskins Mound also acts as a storm surge buffer for inland developments during tropical storms and hurricanes.

In addition to its other values it has excellent all-weather road access and would provide outstanding opportunities for compatible public recreation use at the Brazoria refuge, e.g. hunting, fishing, birding, etc., for people in South Texas (Houston is only a 1-hour drive away). The coastal prairie associated with the project is considered to be the best place to attempt reintroduction of the endangered Attwater's prairie-chicken.

The site is threatened with oil and gas and commercial development.

THRESHOLD CRITERIA

- 1. WETLANDS LOSS PRIORITY SCORE:** Priority 1 (0-139)
- 2. IS THE WETLAND SITE THREATENED:** The site is threatened by overgrazing, and oil, gas, mineral and commercial development.
- 3. WETLAND FUNCTIONS AND VALUES:** Wildlife, fisheries, flood and erosion protection, outdoor recreation, and other areas or concerns meet the threshold criteria.

CONCLUSION

Yes, at least two of the threshold criteria are met by this wetland site which qualifies it for acquisition consideration under provisions of the Emergency Wetlands Resources Act.

APPENDIX

TX-2

TEXAS CANDIDATE WETLANDS

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Big Pine Creek	Red River	Manchester, Kiomatia	3,310	PFO, PSS, PEM	W, F, FC, OR	1
Sulphur River Bottom West including White Oak Creek	Red River, Titus, Morris, Bowie, Cass	Boxelder, Lydia, Coopers Chapel, Dalby Springs, Bassett, Naples, Wilkinson, Talco, Marietta, Corley, Bryans Mill	122,242	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR, E	1,3
Black Cypress Creek	Cass, Marion	Kellyville, Cunningham Creek	12,800	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	1
Caddo Lake	Marion, Harrison	Smithland, Karnack, Trees, Potters Point	12,800	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	1,4
Striker Creek	Rusk	New Salem, Reklaw	6,564	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	1
Little Creek	Red River, Bowie	English, DeKalb NW	14,387	PFO	W, F, FC, OR	
Applewhite Lake	Bowie	DeKalb, New Boston, Redbanks, Daniels Chapel, Foreman, Tom	11,187	PFO, PSS, PEM, POW, PAB	W, F, FC, OR, E	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Upper Sabine Bottom	Rains, Wood, Van Zandt, Smith	Grand Saline, Golden, Van Lake, Lindale	11,008	PFO, PSS, PEM, R	W, F, FC, OR	
Upper Big Sandy Creek & Glades	Wood	Cartwright, Shady Grove	5,478	PFO, PSS, PEM POW, PAB, R	W, F, FC, OR	5
Lower Big Sandy Creek	Wood, Upshur	Shady Grove, Big Sandy	4,994	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR,	
Confluence of Flat and Tenaha Creeks	Shelby	Logansport, Center	9,318	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	
Little Cypress Bayou	Marion, Harrison	Woodlawn, Marshall	5,452	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	
Big Cypress Bayou	Marion, Harrison	Woodlawn, Karnack	5,350	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	
Big Lake	Anderson	Long Lake, Butter	9,446	PFO, PSS, PEM, POW	W, F, FC, OR	
Kickapoo Creek	Henderson	Brownsboro, Chandler	7,680	PFO, PSS, PEM, POW, R	W, F, FC, OR	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Neches River South	Angelina, Polk, Tyler	Woodville, Camden, Zavalla, Diboll, Wakefield, Pluck, Bald Hill, Wolf Hill	43,520	PFO, PSS, PEM, POW, R	W, F, FC, OR	
Lower Angelina River Bottom	Nacogdoches, Angelina	Redland, Platt	17,920	PFO, PSS, PEM, POW, R	W, F, FC, OR, E	6
Navasota River Bottoms	Robertson, Leon, Brazos, Madison, Grimes	Canary, Edge, Clear Lake, Kurtson, Reliance, Ferguson Crossing, Millican, Navasota	60,416	PFO, PSS, PEM R	W, F, FC, OR, E	
Confluence of Catfish & Beaver Creeks	Anderson	Yard	1,510	PFO, PSS, PEM, POW, R	W, F, FC, OR,	
Confluence of Buffalo & Linn Creeks	Freestone	Dew	532	PFO, PSS, PEM,	W, FC, OR	7
Brushy Creek	Henderson, Anderson	Frankston, Palestine	8,960	PFO, PSS, PEM, POW	W, F, FC, OR	
Alazan Bayou	Nacogdoches	Redlands, Clawson, Douglass	1,792	PFO, PSS, PEM, R	W, F, FC, OR	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Forty Acres	Nacogdoches	Douglass, Clawson	440	PSS	W, FC, OR	
Turkey Creek	San Augustine	Bronson	2,252	PFO, PSS, R	W, F, FC, OR	
Bear Creek	Sabine	McGee, Bend, Brookland, Bronson	2,612	PFO, PSS, PEM, R	W, F, FC, OR	
Bois d'Arc Creek	Fannin	Bonham, Honey Grove	3,911	PFO, PSS, PEM, R	W, F, FC, OR	8
Horton Bottom	Delta, Hopkins	Cooper South, Klondike	8,294	PFO, PEM, POW, R	W, F, FC, OR	
Sulphur River Bottom East	Bowie, Cass	Lake Texarkana, Domino	12,264	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	
Attoyac Bottom	Nacogdoches, San Augustine	Broadus, Martinsville	13,414	PFO, PSS, PEM, POW, PAB, R	W, F, FC, OR	9
Scatter Creek	Red River	Line Branch, Clarksville	4,326	PFO, PSS, R	W, F, FC, OR	
Cuthand, Whiteoak & Flat Creeks	Red River	Clarksville, Cuthand, Boxelder	13,312	PFO, PSS, PEM, POW, R	W, F, FC, OR	
Middle Trinity Terrace	Navarro, Henderson	Kerens, Styx	13,516	PFO, PSS, R	W, F, FC, OR	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Hagen Bottoms	Anderson	Athens	921	PFO, PSS	W, F, FC, OR	
Tehuacana Creek	Freestone	Winkler, Young, Roustabout Camp	7,555	PFO	W, F, FC, OR	
Boone Fields	Anderson	Tennessee Colony	8,601	PFO	W, F, FC, OR	
Caney Creek	Freestone	Fairfield, Teague North, Kirvin, Stewards Mill	5,795	PFO	W, F, FC, OR	
Hanging Bog	Robertson	Camp Creek	5	PSS, PEM	W	
Cedar Lake	Gaines	Cedar Point, Welch SW	9,600	PEM, POW	W, OR	
Upper Striker Lake	Cherokee, Rusk	Griffin, Gum Springs	500	PSS, PEM	W, F, FC, OR	
Sand Lake	Reeves	Sand Lake	1,920	PSS, PEM, POW, LOW	W	
Caddo Creek	Anderson	Poynor, Berryville	500	PSS, PEM, POW	W, F	
Clear Lake	Brazos	Clear Lake	640	PFO, PSS, PEM, POW	W, F, OR	
Wickson Lake	Brazos	Clear Lake	640	PFO, PSS, PEM, POW, LOW	W, F, OR	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
East Fork Bottom North	Collin	Anna, Weston	200	PFO, R	W, F, FC, OR	
Falls County Bog	Falls	Lott	20	PEM	W	10
Parson's Slough	Dallas, Kaufman	India	2,560	PFO	W, F, FC, OR	
Illusion-Bull- Yellow Lakes	Lamb, Hockley	Bull Lake, Oklahoma Flat	1,460	POW, PEM, LOW	W	
Upper Little Cypress Bayou	Upshur	Glenwood	5,000	PFO, PSS, PEM, R	W, F, FC, OR	
Harrison Bayou	Harrison	Potters Point, Karnack	2,000	PFO, PSS, PEM, POW	W, F, OR	11
Winchester-Zahn- Russell Lakes	Haskell	Weinert, Rochester	500	PEM, POW	W, OR	
Spring Creek Forest	Dallas	Garland	500	PFO, R	W, F, FC, OR	12
Clear Creek Headspring	Menard	Clear Creek Lake	5	R	F, E	13
Phantom Lake Spring	Jeff Davis	Toyahvale	2	R	F, E	13
Lost Draw- Webb	Terry	New Moore	80	PEM, PSS, POW	W, F, OR	
			159			

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Diamond Y Spring and Leon Creek	Pecos	Diamond Y Spring, Fort Stockton West	1,500	R	F, E	13
North Randall County Playas	Randall	Bushland	200	PEM, POW, LOW	W, OR	
Rich-Mound Lakes	Terry, Lynn	Mound Lake, Meadow	1,000	PEM, POW, LOW	W, OR	
Hudspeth Playa	Terry	Mound Lake, Meadow, Brownfield E	100	PEM, POW, LOW	W	
Johnson Lake	Terry	Wellman, Gomez	40	PEM, POW, LOW	W, OR	
Martin Lake	Terry	Tokio	30	PEM, POW, LOW	W, OR	
Merritt's Playa	Castro	Hart NW	30	PEM, POW, LOW	W	
Gilbreath Draw	Castro	Hart NW, Dodd NE	50	PEM, POW	W	
Armstrong Playa	Parmer	Hub, Tam Anne	60	PEM, POW, LOW	W	
Bovina Playa	Parmer	Hub, Pamerton	80	PEM, POW, LOW	W	
Bovina Feedlot Playa	Parmer	Lariat NE	40	PEM, POW, LOW	W	
Olton Playa	Lamb	Olton	30	PEM, POW, LOW	W	
			160			

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Circle Playa	Lamb	Olton	30	PEM, POW, LOW	W	
Lakeview Playa	Floyd	Dougherty	200	PEM, POW, LOW	W	
Baker Playa	Floyd	Boothe	150	PEM, POW, LOW	W	
Floydada East and West Playas	Floyd	Boothe, Floydada	250	PEM, POW, LOW	W	
Vega Playas	Oldham	Everett, Vega S, Vega N, Jay Taylor Ranch	500	PEM, POW, LOW	W	
Frost Lake	Lynn, Dawson	Welch E	120	PEM, POW, LOW	W	
Knott Playa Area	Martin, Howard	Knott	500	PEM, POW, LOW	W	
Natural Dam Lake	Howard	Natural Dam Lake	3,000	PEM, PSS, LOW	F, W, FC, OR	
Red-Boggy Lakes	Howard	Natural Dam Lake	1,000	PEM, PSS, LOW	F, W, FC, OR	
Mustang Draw	Howard	Elbow	500	PEM, PSS	W	
Monahans Draw	Ector	Odessa SE	17	PEM	W	
Giffin Springs	Reeves	Toyahvale	5	R	F, E	13
Little Aguja Canyon	Jeff Davis	Little Aguja Mountain	1	POW	F, E	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Pecan Bayou	Red River	Dimple	10,000	PSS, PFO, PEM	F, W, FC, OR	14
Robertson Lake	Robertson	Hammond, Baileyville	100	PEM, LOW	F, W, OR	
Independence Creek	Terrell	Six Shooter Canyon, Oasis Ranch, Horsehead Canyon, Mitchell Draw, Seventeen Ranch, Hackberry Draw SE	10,000	PFO, R	F, W, E, OR	
Devil's River/ Dolan Creek	Val Verde	Telephone Canyon, Dolan Springs	5,000	PFO, R	F, W, E, OR	
Roy Creek	Hays	Hammetts Crossing	300	PFO, R	F, W, OR	
Big Meadow	Wheeler	Allison	400	PFO, PEM	W, OR	
Capote Falls & Creek	Presidio	Capote Falls	2,000	PFO, PEM, R	F, W, E, OR	
Big Thicket Bogs And Pinelands	Tyler	Warren	49	PEM, PSS, PFO	W, OR, OAC, E	15, 16 17
Roy E. Larsen Sandyland Sanctuary	Hardin	Silsbee, Deserter Baygall, Kountze North, Kountze South	2,275	PSS, PFO	W, OR, OAC, E	15, 16 17, 21
Evadale Natural Area	Jasper	Silsbee	600	PFO	W, OAC	16, 17

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Pierce Marsh	Galveston	Virginia Point	1,361	E2-EM, E2-FL	W, F, WS, FC	15
Wilson Preserve	Jefferson	Pine Forest, TX	43	PFO	W, OR, OAC	15
Tanner Bayou	Liberty	Rayburn, SE	21,478	PFO, PEM	W, F, E	19, 21
Devers Canal	Liberty	Moss Bluff	4,811	PFO, PEM	W, F, WS, FC, E	19, 20 21
Middle Neches River	Angelina, Cherokee, Houston, Polk, Trinity	Wells SW, Piboll	71,782	PFO, PEM	W, F, OR, OAC, E	18, 19 20, 21
Angelina-Neches Confluence	Tyler, Jasper	Curtis, Woodville	19,788	PFO, PSS	W, F, WS, FC, E	18, 19 20, 21
North of Cow Creek	Newton	Bon Wier Kirbyville	14,461	PFO	W, F, OR, OAC	19
Devil's Pocket	Newton	Bon Wier Bessman, Starks	17,894	PFO	W, F, OR	19, 21
North Orange County Bottoms	Orange	Echo	1,706	PFO	W, F, OR	19, 21
Neches River South	Polk, Tyler, Angelina	Wolf Hill, Pluck Diboll, Wakefield	43,520	PFO, PEM	W, F, OR, E	19, 20 21
Joe's Lake	Tyler, Jasper	Spurger	18,636	PFO, PEM	W, F, WS, FC	19, 20

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Giant Palmetto	Hardin, Jefferson	Sour Lake	10,982	PFO, PEM	W, F, WS, FC	19, 20 21
McCardell's Lake	Polk	Livingston	8,476	PFO, PSS	W, F, OAC	19, 20 21
Clear Fork Creek & Bog	Tyler	Woodville	5,063	PFO, PSS	W, F	19, 20
Laura Jackson Howe	Chambers	Frozen Point, Oyster Bayou	750	E2-EM	W, OR, OAC	
Mad Island Marsh	Matagorda	Palacious NE	6,500	E2-EM, EOW	W, F, OAC, E	15, 18
Ralph Jackson	Chambers	Frozen Point	53	POW, PEM-2	W, OR, OAC	15
Mad Island Lake Addition	Matagorda	Palacious NE, Palacious Point	1,000	E2-EM, EOW	W, F, OAC	18
White's Ranch	Chambers, Jefferson	Mud Lake, White's Ranch	100,000	E2-EM, EOW	W, F, OAC	21
Spindletop Marsh	Jefferson	White's Ranch, Star Lake	21,200	PEM, POW	W, OR, OAC	21
Halls Bayou Marsh	Brazoria, Galveston	Sea Isle, Hitchcock	13,745	E2-EM, EOW	W, F, OAC	18
Big Pasture Bayou Marsh	Galveston	Frozen Point, Caplan	4,500	E2-EM, EOW	W, F, OAC	
Bolivar Flats	Galveston	Flake, Jetties	900	E2-EM, EOW	W, F, OR, E	

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
Sabine Ranch	Jefferson	Star Lake, Alligator Hole Marsh	11,700	E2-EM, EOW	W, F, OAC, E	
Swan Lake Marsh	Jackson, Calhoun	Lolita, Point Comfort	5,244	E1-OWL, E2-FLP, E2-EMIP, E2-EMIN, E2-EM/FLN, E2-FLN, E2-EM/FLP	W, E	22, 23 25
Green Lake	Calhoun	Green Lake, Austwell	12,090	L1-OWH, PF06 (A,R,Y) E1-OWLY, PAB6F, POWF, PFLC, PSS6c, R2-OWH, PEMIF, PFLC, POWH, PEMIY, REMIC, PSS6Y, POWFX	W	2, 3
Potholes	E. Starr, N.W. Hidalgo			DUSA2, J, POWFX, PSS3J, CX, PFOI, PEMIJ, PEMIA, PEM (F,Y,C), E1-OWL, POW (F,H,G), E2-EMIP, L1-OWHhx, E2-EMIN, E2-FLN, E2-SS/FLN	W	29
Mission Bay Marsh	Aransas	Mission Bay	1,500	E2-EM/FLN, E2-FLP, NO NWI	W	23
Taft Drainage Ditch	San Patricio	Bayside,	1,730	E2-EM, E2-FL, E1-OW,	W	23, 34

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
San Jose Island Marshes	Aransas	St. Charles Bay St. Charles Bay SE St. Charles Bay, SW Esks Allyn's Bight, Port Aransas	24,700	E1AB2L, E1AB6L, E1OWL, E2EMIN, E2AB2L, E2EMIP, E2-EM/FL, E2-FLM, E2-FLN, E2-FLP, M2BB, PEM, PFL, POWF, POWH, L1OWH	W, E	22, 23 25, 26 21, 13
McGregor Ranch	San Patricio	Odem, Annaville	13,103	POW (Fx,H,F), L1OWHx, FLMI (Fx,Y A,C,F), E1OWL, E2EMIP, E2EMIN, R1OWV, R1OWT, E2FL (P,M,N)	W	22, 23 25
Held Tract	Nueces	Oso Creek, NE	45	E2EMP, E1OWL, E2EMN, PEMH	W	23, 32
Port Bay & Swan Lake Marshes	Aransas	Bayside, Aransas Pass	4,126	E1OW, E2EM, E2FL, PEM		22, 23 25
Backside of Mustang Island	Nueces	Crane Islands, SW Crane Islands, NW Port Aransas	12,247	E1OWL, E1AB2L, E2FLN, E2FLP, E2-EMI/FLN, E2EMIP, E2EMIN, E2, FL69, E2FL6Y, E2FL6N, E2BBP, E2-EMI/FLP	W	23, 28
King Ranch et. al. Complex	Nueces, Kleberg, Kenedy, Jim Wells, Brooks, Hidalgo, Willacy		88,865		W,E	22, 25 31

Texas Candidate Wetlands for Acquisition Consideration

Site Name	County(s)	USGS Quad(s)	Est. Acreage	NWI Classification	Wetland Functions	Notes
S. Padre Island Marshes	Cameron	N. of Port Isabel, SW Port Isabel, NW S. Padre Island		E1AB2L, E1OWL, E2FLM, E2FLN, E2FLP, E2FL6N, E2-EMI/FLP, E2EMIP, PEMIY, POWFhx, PEMIC	W, E	23
Buena Vista Ranch		La Coma, Three Islands	5,954	PEM, POW, P-AB/OW, P-EM/FL, E1OWL, E2FL, L1OW	W, E	30, 33
Tres Corales Potholes	Hidalgo			PUS, POW, PEM, L1OW, PSS	W	9
Comanche Lake, Bryd Ranch	Zavala	Carrizo Springs NW, Crystal City	100	No NWI Maps	W	23
Cameron Co. Resacas	Cameron	Palmetto Hill, E. Brownsville, W. Brownsville, Southmost, Los Fresnos, Olmiteo, La Paloma, Santa Maria, Progreso, Laguna Vista, Laguna Atascosa, Rio Hondo, Harlingen, La Feria		L1DWHL, PEMIA, POWF, PF06, PEMIC, R20WHx, PSX6A, R20WH, PEMIF, POWG, POWH	W, E	29
Brackish Wetlands	N. Cameron, Willacy	Hawk Island, La Leona, Port Mansfield, Willamar		PEM (F,Y,C), E1OWL, POW (F,H,G), E2EMIP, L10WHhx, E2EMIN, E2FLN, E2-SS/FLN, E2-EM/FLN, E2FLP, E2EMIP	W, E	29

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Laguna Larga	Nueces, Kleberg	D4 S. Bird Island NW, E4 Chapman Ranch, E3 Pita Island	9,092		W	35, 26
La Sal del Ray	Hidalgo	Linn		L10WH, L2USA, L2U5C, PEMIA, PSSIA, PUSAX, PF03J, POWF	W	29

Wetland Functions

E - Endangered Species Habitat
F - Fisheries habitat
FC- Flood Control
OAC- Other Areas of Concern
OR- Recreation
W - Wildlife Habitat
WS- Water Supply

Notes

1. Recognized by the U.S. FWS as a Priority 1 bottomland hardwood site of high value to waterfowl and other wetland dependent species.
2. Wetland site located adjacent to Upper Toledo Bend WMA operated by TPWD.
3. Approximately 25,500 acres of White Oak Creek and Sulphur River currently being acquired by the Corps of Engineers as mitigation for Cooper Lake.
4. Wetland site located adjacent to Caddo Lake State Park.
5. Site contains the 200 acre "floating glade", one of the largest freshwater marshes in Texas.
6. Portion of wetland site owned and managed by the U.S. Forest Service.
7. Extremely high quality bottomland hardwood site which has been recognized as a potential National Natural Landmark by the National Park Service.
8. Site located adjacent to the Bois D'Arc Unit of Caddo National Grasslands.
9. Majority of this site already owned by the Corps of Engineers and U.S. Forest Service.
10. One of the westernmost extensions of the east Texas bog-swamp flora and fauna.
11. Most of this wetland site located on Longhorn Army Ammunition Plant and is receiving management attention under the NAWMP.