

**Deep Fork  
National Wildlife Refuge**

**Comprehensive Conservation Plan  
1999-2009  
and  
Environmental Assessment**


**September 1999**

**U.S. Fish and Wildlife Service  
P.O. Box 1306  
Albuquerque, New Mexico 87103**

**COMPREHENSIVE CONSERVATION PLAN APPROVAL**  
**for the**  
**Deep Fork National Wildlife Refuge**  
**1999**

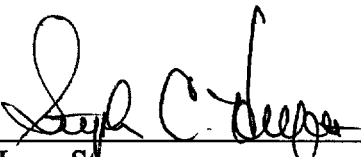
The attached Comprehensive Conservation Plan for the Deep Fork National Wildlife Refuge has been reviewed and approved by the manager of the Deep Fork National Wildlife Refuge.

Submitted by:

  
\_\_\_\_\_  
Jon Brock, Refuge Manager  
Deep Fork National Wildlife Refuge

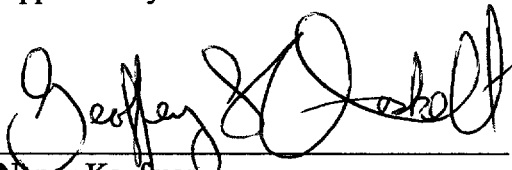
9-27-99  
Date

Approved by:

  
\_\_\_\_\_  
For Lynn Starnes  
Geographic Assistant Regional Director  
Oklahoma and Texas

11/01/99  
Date

Approved by:

  
\_\_\_\_\_  
for Nancy Kaufman  
Regional Director, Region 2  
U.S. Fish and Wildlife Service

11/2/99  
Date

UNITED STATES FISH AND WILDLIFE SERVICE  
ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the action of: Approval and Implementation of the Comprehensive Conservation Plan for the Deep Fork National Wildlife Refuge:

- \* is a categorical exclusion as provided by 516 DM 2 Appendix 1, and 516 DM 6, Appendix 1. No further NEPA documentation will therefore be made.
- \* is found not to have significant environmental effects as determined by the attached Environmental Assessment and Finding of No Significant Impact.
- \* is found to have special environmental conditions as described in the attached Environmental Assessment. The attached Finding of No Significant Impact will not be final nor any actions taken pending a 30 day period for public review (40 CFR 1501.4(e)(2)).
- \* is found to have significant effects and, therefore, further consideration of this action will require a Notice of Intent to be published in the Federal Register announcing the decision to prepare an Environmental Impact Statement.
- \* is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife service mandates, policy, regulations or procedures.
- \* is an emergency situation within the context of 40 CFR 1506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

**Other supporting documents: Finding of Now Significant Impact, Environmental Assessment for the Comprehensive Conservation Plan for Deep Fork National Wildlife Refuge, and Comprehensive Conservation Plan for Deep Fork National Wildlife Refuge..**

(1) John Sloan 11-10-99  
Originator Date

(3) John B. Sloan 12/20/99  
GARD, Oklahoma/Tx Date

(5) Thomas C. ... 12/21/99  
Regional Director Date

(2) C. Deane ... 12/19/99  
Acting RO-EO Date

(4) ... 11/12/99  
GARD-RW Date

ACTING

# **Finding of No Significant Impact**

## **Environmental Assessment and Comprehensive Conservation Plan for the Deep Fork National Wildlife Refuge**

To: All Interested Governmental Agencies and Organizations

In the proposed agency action, as outlined in the attached Deep Fork National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment, the U. S. Fish and Wildlife Service establishes a set of management strategies to promote the conservation goals of the Deep Fork National Wildlife Refuge (the Refuge) during a period of 10 to 15 years. The Refuge lies primarily within the flood plain of the Deep Fork of the North Canadian River, in Okmulgee County in eastern central Oklahoma. The proposed refuge boundary incloses 18,228 acres of land; currently the Service has acquired a fee interest in approximately 8,140 acres of this land. Additional privately held lands within the proposed refuge boundary will be acquired by the Service as they become available from willing sellers.

This Comprehensive Conservation Plan (CCP) and Environmental Assessment (EA) have been prepared as required by the National Wildlife Refuge System Improvement Act of 1997 and the National Environmental Policy Act of 1969 (NEPA) and its implementation regulations (40 CFR 1500 *et seq.*). The CCP establishes ten goals for management of the Refuge: 1) Protection and enhancement of wetlands; 2) Protection, restoration, and maintenance of the bottomland hardwood forest community; 3) Protection and enhancement of habitat for migratory birds; 4) Protection and enhancement of Refuge habitat to sustain healthy populations of native fish and wildlife in addition to migratory birds; 5) Restoration of native threatened and endangered species on Refuge lands; 6) Development of a database of pertinent scientific information regarding Refuge habitats and wildlife; 7) Provision of quality consumptive and non-consumptive wildlife-dependent public use; 8) Development of education and outreach programs that enable the public to 1- understand, enjoy and value the fish and wildlife resources found on and off the Refuge, 2- understand events and issues related to these resources, and 3- act to promote fish and wildlife conservation; 9) Compliance with historic and archaeological resource protection laws and regulations; and 10) Institution of an efficient administration that supports accomplishment of Refuge objectives. The CCP outlines long-range management strategies to be implemented to achieve these goals. The strategies address management of habitats, forests, waters, grassland, wildlife, administration and public use within the Refuge. Each strategy includes a summary of existing conditions, identifies any ongoing data needs and recommends actions to achieve one or more of the ten refuge goals.

The CCP also divides the Refuge into seven discrete management units, based upon existing natural and artificial boundaries (e.g., the Deep Fork River channel, roadways) and documents existing conditions in each unit. Management strategies are applied differently in the various management units, depending upon physical conditions, such as ground level elevation, frequency of flooding and plant cover, as well as cultural considerations such as ease of access.

The EA evaluates the five alternative scenarios for overall management of the Refuge, as proposed in the CCP. The effects of each alternative upon the physical, biological and human environment are examined, as well as each alternative's potential to achieve the goals of the CCP. Analysis of these alternatives is summarized below:

**Alternative 1: No Action**

This alternative considers no change in current Refuge management practices, funding or staffing. Few of the management strategies proposed would be implemented, due to a lack of funding. No increase in public use would occur and hunting of deer, squirrel and rabbit would continue at current levels. Alternative 1 was not selected because management strategies to enhance, monitor, and protect Refuge habitats and wildlife populations would have been limited. The Refuge's ability to offer public use and economic benefit to the local economy would have been minimal as well.

**Alternative 2: Refuge Operated as Inviolate Wildlife Sanctuary with Minimal Management of Habitat and No Development.**

Under this alternative no public access to the Refuge would be allowed. There would be no recreational or educational opportunities. This alternative provides maximum protection to habitats and wildlife, but would provide only limited enhancement of existing habitats. Similar to Alternative 1, this alternative would offer only limited opportunities to enhance and monitor Refuge habitats and wildlife. Additionally, the prohibition of public use proposed in this alternative would not conform to the encouragement of compatible wildlife-dependent public uses on Refuges per the National Wildlife Refuge System Improvement Act of 1997. For these reasons, Alternative 2 was not selected for implementation.

**Alternative 3: Refuge Operated as Wildlife Sanctuary with Moderate Level of Habitat Management Development; Non-consumptive Recreational and Educational Activities Allowed.**

Under this alternative the Refuge would be operated as an inviolate sanctuary, but would be open to the public for non-consumptive recreational and educational activities. Hunting and trapping would not be allowed. Trails and interpretive materials would be developed and a visitor contact station would be necessary. Active wetlands' development and reforestation would be implemented to enhance degraded habitats. Alternative 3 was not selected due to the prohibition of hunting, a major traditional public use of the Refuge lands. Such prohibition would also remove the potential use of hunting as a management tool in maintaining healthy game species populations.

**Alternative 4: Refuge Operated with Moderate Levels of Habitat Management and Development; Non-consumptive and Consumptive Recreational Activities Allowed (Proposed Alternative).**

Under this alternative the Refuge would be operated with emphasis on protection of habitats and

wildlife populations but would offer controlled hunting and fishing in addition to non-consumptive recreational and educational activities. Refuge trails and interpretive materials would be developed and a visitor contact station would be necessary. To limit wildlife disturbance and interference with non-consumptive recreational activities, hunts would occur in only designated management units and restricted in number and timing to prevent excessive impacts. Active wetlands' development and reforestation would be implemented to enhance degraded habitats. Alternative 4 was selected because it emphasizes protection of wildlife and habitats while offering the full range of preferred wildlife-dependent public uses identified in the National Wildlife Refuge System Improvement Act of 1999.

**Alternative 5: Refuge Operated Primarily as Public Hunting Area with High Levels of Habitat Management and Development; Non-consumptive Recreational Uses Allowed.**

Under this alternative the Refuge would be operated as a public hunting area open to all state-sanctioned hunting activities and seasons in addition to non-consumptive recreational and educational activities. Refuge trails and interpretive materials would be developed and a visitor contact station would be necessary. This alternative offers good protection for migratory birds and their habitats during non-hunting season, but extreme disturbance of those native wildlife species that are hunted or share habitats with hunted species during hunting seasons. Intense management of habitat for waterfowl and other game species could result in degradation of habitat for other migratory birds and non-game wildlife species. Alternative 5 was not selected because of the Refuge does not have adequate acreage to accommodate heavy consumptive use. Wildlife populations would be negatively impacted by high hunting pressure and human disturbance. Time and space limitations would create conflicts among users.

**Summary:**

Adoption and implementation of the proposed alternative, as described the in the CCP and EA, will formally establish a set of programmatic comprehensive goals, objectives and strategies for management of the Refuge. Based on a review and evaluation of the information contained in the CCP and the EA, I have determined that the formal approval of refuge public use goals and objectives as described in the Proposed Alternative of the EA (Alternative 4) is not deemed a major Federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2) (c) of NEPA. Therefore, an Environmental Impact Statement is not required. However, it is the intent of the Service to revisit questions of significant environmental consequences in accordance with NEPA upon consideration of the implementation of site specific proposals called for and discussed in the final CCP document.

Acting

  
Regional Director, Region 2  
U.S. Fish and Wildlife Service

  
Date

# DEEP FORK NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN

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# I. Introduction, Planning Approach, and Regional History and Setting

## Introduction

This comprehensive conservation plan is prepared for the Deep Fork National Wildlife Refuge in Okmulgee County in east central Oklahoma. It is written to provide for continuity of management of Refuge lands for the continuing benefit of wildlife and the people of the United States.

The Refuge is located largely in the floodplain of the Deep Fork of the North Canadian River, commonly known as the Deep Fork River, extending along approximately 34 miles of the river in a northwest-southeast direction. (See map, Appendix A). The Refuge is approximately 100 miles east of Oklahoma City and 35 miles south of Tulsa. U.S. Highway 75 runs north and south through the Refuge, and Interstate 40 runs east and west roughly 2.5 miles south of the southern Refuge boundary. The Refuge is bounded on the west by the Okmulgee Wildlife Management Area and on the south by the Eufaula Wildlife Management Area, both of which are administered by the Oklahoma Department of Wildlife Conservation.

When acquisition is complete, the Refuge, as originally proposed, would incorporate 16,104 acres of overflow bottomland hardwood forest and emergent wetland habitat and some adjacent upland prairie and post oak forest. Currently, the Refuge contains 8,140 acres in scattered parcels within the proposed boundary, and Refuge lands are interspersed with many privately owned tracts. Privately held lands within the proposed Refuge boundary will be acquired as they become available *from willing sellers*.

Several small boundary changes have been proposed since the original Refuge plans were approved. These changes are needed to provide protection for important wetland sites bisected by the initial boundary, to avoid splitting ownerships, and to provide needed access to the Refuge. The proposed boundary changes would add 2,124 acres to the Refuge and increase the area within the proposed boundary to 18,228 acres.

Historically, the bottomland hardwood forest community of the Deep Fork River was a complex, diverse, and interrelated association of plants and animals, created and maintained by periodic, natural flooding. However, years of development and habitat alteration by humans have significantly modified the dynamic and pristine floodplain ecosystem. Today, Refuge lands are a mixture of regenerating bottomland forest, drained and natural wetlands, agricultural lands (mostly pastureland and pecan orchards with a small acreage of cropland), and some upland hardwood forest and prairie. Given time, protection, and proper management, the Refuge bottomlands should regain much of the character of a mature riparian forest ecosystem, including the diverse assemblage of plants and animals representative of these vanishing habitats.

## The Purpose of and Need for Planning

Prior to the early 1800s, over two million acres of bottomland hardwood forests occupied the river corridors of eastern Oklahoma. By 1985, only about 15 percent, or 328,700 acres, remained. The existing

floodplain forests make up only a small fraction of the total land area of the State of Oklahoma, and at the current rate of loss, less than ten percent of the presettlement total will remain by the year 2015. The decline of bottomland hardwood forests is due primarily to development for agriculture (both cropland and pastureland) and inundation resulting from reservoir construction. Protection, restoration and maintenance of the bottomland hardwood forest along the Deep Fork River will contribute significantly to the survival of the complex bottomland forest ecosystem and to the diversity of plant and animal communities in eastern Oklahoma.

Planning is essential to provide direction and continuity for the Refuge's management and development so as to enhance its contribution to the ecological health of the area of ecological concern<sup>1</sup>. The Service's task is to plan for the achievement of objectives that protect and enhance the bottomland hardwood forest/wetlands community, migratory birds, and other native fish and wildlife species and to encourage compatible wildlife-dependent recreational and educational opportunities on Refuge lands.

This document describes the general conservation strategy which will guide Refuge management and development for the next ten years. Individual management plans containing more detail will be completed for each activity or development proposed for the Refuge. Interim plans already have been

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<sup>1</sup> An area of ecological concern can be defined as: "An essentially complete ecosystem (or set of interrelated ecosystems of which one part cannot be discussed without considering the remainder." [*Malheur National Wildlife Refuge Master Plan and Environmental Assessment*, 1985, p. 7]. For purposes of the Deep Fork National Wildlife Refuge Comprehensive Conservation Plan, the entire bottomland hardwood forest region of the Mississippi, Arkansas, and Red Rivers and their tributaries is considered the area of ecological concern.

completed for deer, squirrel, and rabbit hunting and for fishing on the Refuge.

As each individual plan is completed, an Environmental Assessment and a Section 7 (Endangered Species Act) consultation will be necessary. In addition, Section 404 (Clean Water Act) permits must be obtained from the U.S. Army for proposed activities that could affect wetlands.

## Planning Perspectives

This comprehensive conservation plan specifies goals and objectives for the management of the Refuge, and identifies strategies by which those goals and objectives will be achieved. The plan establishes a practical foundation for preparing realistic and justifiable budget requests. Implementation of the plan will ensure consistency of management over time while providing the flexibility needed to address individual issues as they arise.

The comprehensive conservation plan is designed to enhance and sustain the bottomland hardwood community on the Refuge through an approach to management that considers factors beyond the immediate Refuge boundaries that may affect or may be affected by the Refuge and its management. This plan:

1. Relates the Service's responsibilities for protecting and restoring Refuge habitat for the benefit of migratory birds and other wildlife to regional and area concerns regarding the overall health of the bottomland hardwood forest ecosystem in eastern Oklahoma.

2. Relates Refuge management to matters of environmental and social concern, including contaminants, water quality and watershed management, endangered species, biological diversity, community needs, socioeconomic development, and other considerations.
3. Relates activities on the Refuge to policies and legal and regulatory responsibilities of the Service.
4. Focuses on the needs of the lands and wildlife of the Refuge to ensure that Refuge purposes and objectives are met and to promote optimal productivity and health of the Refuge bottomland hardwood forest communities.
4. To provide a framework for monitoring progress and evaluating accomplishments at the Refuge.
5. To provide for evaluation of compatibility of existing and potential recreational activities and other public uses of the Refuge.
6. To ensure National Environmental Policy Act compliance for proposed management actions.
7. To ensure that other agencies and the public have opportunities to contribute to management planning for the Refuge.
8. To provide a framework for budget requests for operation, maintenance, and capital development programs for the Refuge.

### **Objectives of Comprehensive Conservation Planning**

The objectives of comprehensive conservation planning are:

1. To identify goals and objectives for management of the Refuge, and to specify strategies for achievement of these goals and objectives.
2. To ensure that management actions address and support 1) the purposes for which the Refuge was established, 2) national policy and the goals of the Refuge System, and 3) the Service's legal and regulatory responsibilities.
3. To provide a systematic process for collection, organization, and analysis of data to facilitate management decision-making.
9. To provide continuity in the management of the Refuge.
10. To ensure that Refuge management considers the ecological context in which the Refuge exists and to help define its future role in maintaining ecosystem health.

### **Refuge Resource Management Goals**

The following goals have been identified for the Deep Fork National Wildlife Refuge:

- GOAL 1. Protection and enhancement of wetlands.
- GOAL 2. Protection, restoration, and maintenance of the bottomland hardwood forest community.
- GOAL 3. Protection and enhancement of habitat for migratory birds.

- GOAL 4. Protection and enhancement of Refuge habitat to sustain healthy populations of native fish and wildlife in addition to migratory birds.
- GOAL 5. Restoration of native threatened and endangered species on Refuge lands.
- GOAL 6. Development of a database of pertinent scientific information regarding Refuge habitats and wildlife.
- GOAL 7. Provision of quality wildlife-dependent recreation.
- GOAL 8. Development of education and outreach programs that enable the public to (1) understand, enjoy, and value the fish and wildlife resources found on and off the refuge, (2) understand events and issues related to these resources, and (3) act to promote fish and wildlife conservation.
- GOAL 9. Compliance with historic and archaeological resource protection laws and regulations.
- GOAL 10. Institution of an efficient administration that supports accomplishment of Refuge objectives.

### **The Area of Ecological Concern**

Waters from the Deep Fork River flow into the North Canadian River and eventually into the Arkansas River which enters the Mississippi River in eastern Arkansas. Thus the Deep Fork River floodplain forest is part of an historically extensive system of bottomland hardwood forests supported by the

ivers and streams that drain the Mississippi River watershed. The area of ecological concern is the entire bottomland hardwood forest ecosystem of the Mississippi River and its tributaries, and includes all of the bottomland forest habitat in the state of Oklahoma.

Historically, the vast bottomland hardwood ecosystem of eastern Oklahoma encompassed an estimated 2.2 million acres. By the early 1980s, roughly 85 percent of these floodplain forests had been cleared,<sup>2</sup> leaving approximately 328,700 acres, much of which is in small, isolated tracts that are of little value to wildlife.

The bottomland hardwood ecosystem of eastern Oklahoma is maintained by dynamic processes. Periodic flooding keeps the lower elevations of the floodplain in nearly continuous flux. The Deep Fork River meanders through its floodplain, changing its course as the force of flood waters gouges away the river banks and creates cutoffs that form oxbow lakes. Erosion and deposition of silt from flood waters raise and lower land elevations and leave behind both seasonal and "permanent" ponds and rich, saturated soils that accommodate only those plants most tolerant of high soil moisture. On better drained bottomland sites, different but similarly varied plant communities thrive.

Periodic inundation results in a bottomland hardwood community in various stages of succession, with younger plant associations usually occupying the lower, most recently flooded parts of the floodplain. Flooding is essential to the maintenance of many plant species native to bottomland forests.

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2 Brabander, J.J., R.E. Masters, and R.M. Short. 1985. Bottomland hardwoods of eastern Oklahoma: A special study of their status, trends, and values. U.S. Dept. of the Interior, Fish and Wildlife Service, Ecological Services, Tulsa, OK. 158 pp.

The Deep Fork River floodplain is characterized by temporarily flooded bottomland hardwood forests with oxbows, sloughs, marshes, and small drainages scattered throughout. It contains some relatively mature stands of oak-pecan, but much of the timber has been harvested and the area now supports regenerated, variable-age stands of oak, pecan, elm, hickory, river birch, willow and other hardwood tree species with understory shrubs, vines, forbs, and grasses. Most of the hardwoods are less than 50 years old.

Forested wetlands cover approximately 85 percent of the Refuge. Shrubby wetlands, emergent wetlands (those that support cattails, sedges, and other aquatic plants), open water, forested uplands, and abandoned and currently active agricultural fields make up the remaining 15 percent.

The banks of the Deep Fork River are seriously eroded, high, and steep, and its waters run brown with silt. Although the Deep Fork always has been a deeply entrenched stream, agricultural activities and flood control endeavors upstream of the Refuge reportedly have increased erosion and the sediment load transported by the river.

The majority of the wetland habitats along the Deep Fork River have been identified as rare and/or declining habitats in the National Wetlands Priority Conservation Plan. The Deep Fork River floodplain is recognized as a nationally important riparian ecosystem, and is listed in the Lower Mississippi Valley Joint Venture of the North American Waterfowl Management Plan as an area of wetland habitat critical to waterfowl in the Central Flyway. It is one of 17 priority-one sites listed in the 1985 Texas and Oklahoma Land Protection Plan. It was identified as the number one wetland site in Oklahoma in the Regional Wetlands Concept Plan because of its high quality, important wetland functions, and excellent fish and wildlife values.

The Deep Fork River floodplain is rich in biological diversity and of value to a variety of migrating and wintering waterfowl, especially mallards. It is an important breeding and wintering area for wood ducks. A wide variety of resident and migratory songbirds also are supported by the bottomland hardwood habitat along the Deep Fork River. Many game species such as white-tailed deer, gray and fox squirrels, and cottontail and swamp rabbits inhabit the area. Furbearer populations, particularly those of raccoon, coyote, and beaver are among the highest in the state.<sup>3</sup>

### **History of the Deep Fork National Wildlife Refuge**

The Refuge was authorized in 1992, under the authorities of the Emergency Wetlands Resources Act of 1986 and the Migratory Bird Conservation Act of 1929, to protect and enhance the valuable freshwater wetlands and wildlife habitats along the Deep Fork River. Land acquisition began in June, 1993, with the purchase of 4,681 acres using Land and Water Conservation funds appropriated by Congress. As of June, 1998, the Refuge contained 8,140 acres. When land acquisition is complete, the Refuge, as originally proposed, would include 16,104 acres, most of which has the potential for full restoration to a mature and biologically diverse bottomland hardwood forest ecosystem.

In 1996, the U.S. Fish and Wildlife Service proposed several boundary revisions and additions to the Refuge. These changes were proposed to safeguard important wetland tracts bisected by the original boundary, to include additional high quality wetlands, to complete ownership boundaries, and to

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<sup>3</sup> Oklahoma Department of Wildlife Conservation. 1980. Upland game investigations. Performance Report. Project No. W-82-R-19, Oklahoma City, Oklahoma.

provide needed access to the Refuge. Failure to include the additional lands within the Refuge boundary would leave large wetland tracts unprotected and could place important Refuge habitats in jeopardy. The proposed additions total 2,124 acres and increase the area within the proposed Refuge boundary to 18,228 acres. A map of the proposed changes is included in Appendix A.

Two public scoping meetings were held in Okmulgee on September 4, 1996, to initiate the planning process for the proposed conservation plan. The Service held an open house concurrently with the meetings to provide information on the boundary proposal, respond to questions, and receive comments. A draft environmental assessment of the proposed boundary changes was completed and issued in October, 1996.

### **Climate**

Stanley Holbrook, climatologist for the U.S. Department of Commerce, Weather Bureau, described the climate as follows:<sup>4</sup> "Okmulgee County has a temperate, continental climate of the moist, subhumid type. As the movement of warm, moisture-laden air from the Gulf of Mexico alternates with the movement of either cool, dry air from the West Coast or cold, dry air from around the Arctic Circle, significant fluctuations in temperature, cloudiness, wind, and precipitation take place.

"The changes between seasons are gradual, but each season has well-defined characteristics that vary only in intensity from year to year. The open, sunny winters are broken occasionally by periods of cold, blustery weather. Spring is the wettest season...It is also the season when severe local storms and tornadoes are most likely to

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4 Soil Survey, Okmulgee County, Oklahoma, USDA, SCS, in cooperation with Oklahoma Agricultural Experiment Station. May 1968, pages 4-5.

occur...In summer...the long hot spells are eased by cool nights and a good breeze." Autumn "is characterized by mild sunny weather interspersed with periods of cool weather and gentle, soaking rain.

"The average precipitation is 38 inches a year in the northwestern corner of the county and 41 inches in the southeastern part." The average annual precipitation in the City of Okmulgee is 40.68 inches. Approximately 32 percent of the precipitation occurs in spring, 28 percent in summer, 25 percent in fall, and 15 percent in winter. Snowfall averages about 5 inches per year in the southern part of Okmulgee County, and about 6.3 inches in the northeastern part. "Even a heavy snow usually melts within two to four days..."

The winds are from the south for most of the year but northerly winds prevail during January and February. "The average annual wind speed is about 11 miles an hour," but "winds of 25 to 45 miles an hour accompany the passage of most frontal systems, and gusts of 70 to 80 miles an hour accompany violent squalls and severe thunderstorms. The most destructive storms are tornadoes," but tornadoes are relatively rare events in the Okmulgee County portion of Tornado Alley.

### **Hydrology**

The Deep Fork River drains a watershed of approximately 2,548 square miles. The river originates in western Oklahoma County, Oklahoma, and flows generally easterly for 230 miles through Lincoln, Creek, Okfuskee, and Okmulgee Counties to its confluence with the North Canadian River in Eufaula Reservoir in McIntosh County. At least thirteen named streams (i.e., Salt, Little Deep Fork, Negro, Honey, Okmulgee, Cussetah, Fourmile, Montezuma, Burgess, Moore, Coal, Wolf and Grave Creeks) feed the Deep Fork River within Okmulgee County.

The Deep Fork River is a sluggish,

muddy, meandering, deeply entrenched stream. Historical reports indicate that it may be significantly more turbid now than it was in the past.<sup>5</sup>

The Deep Fork watershed is comprised of hilly terrain that accelerates runoff and causes frequent flooding. Reservoir construction, channelization, conversion of the floodplain to agricultural uses, and the addition of numerous, small floodwater-retarding structures have significantly moderated the natural flooding regime of the river. Major flooding along the Deep Fork occurs roughly once every five years, moderate flooding once every 1.5 years, and minor flooding twice per year.

The Deep Fork River streamflow gaging station closest to the Refuge is located three miles west of the western Refuge boundary and roughly six river miles upstream of the Refuge, near the town of Beggs. The gage elevation is 633 feet above sea level. The 100-year flood elevation at this site as reported by the U.S. Geological Survey is 667 feet above sea level, and the 100-year flood discharge is estimated at 62,000 cubic feet per second. The highest discharge of record at the Beggs station occurred in 1945, and peaked at 66,800 cfs.

Ground elevations on the Refuge range from nearly 900 feet above sea level on the highest upland site to 590 feet above sea level along the river channel in the bottoms near the southern Refuge boundary. Most of the Refuge is located within the 100-year floodplain, and over 80 percent of it floods at least once a year except during very dry periods. On some parts of the Refuge, watermarks on the trees are ten feet high.

Standing water is often evident across

much of the Refuge even in the absence of flooding. The river bottom is relatively flat with numerous depressions and flood-generated swales that pool water for long periods after rainfall events.

Approximately 50 miles of the Deep Fork River in Oklahoma and Lincoln Counties have been channelized to reduce flooding. The channel improvements were begun in 1910 and completed in 1923. Channelization accelerated bank erosion and increased sedimentation and flooding downstream. These problems were exacerbated by vegetation clearing for agricultural purposes along the upper reaches of the river. In many areas upstream of the Refuge, the land currently is plowed and planted to the edge of the riverbank. The practice of farming to the riverbank has further increased erosion and surface runoff, and contributed to the sediment load of the river. As a result, the lower portion of the channelized reach has silted in, and the river regularly overflows its channel in the affected area. This flooding has created swamps and marshes over extensive portions of the floodplain in eastern Lincoln County.<sup>6</sup>

The Natural Resources Conservation Service (formerly the Soil Conservation Service) has constructed numerous flood water retarding structures in the Deep Fork River watershed. Little Deep Fork Creek is virtually cut off from the Deep Fork River during high flows by 56 such structures in its watershed. Arcadia Lake, completed in 1986 and located in the upper portion of the Deep Fork drainage, also contributes to floodwater regulation.

The various flood control measures installed throughout the Deep Fork watershed have altered significantly the frequency,

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5 Harper, H.J. 1937. Effect of silting on tree development in the flood plain of Deep Fork of the North Canadian River in Creek County. Proceedings of the Oklahoma Academy of Science 1937:46-49.

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6 Chesemore, D.L. 1975. Ecology of fox and gray squirrels (*Sciurus niger* and *Sciurus carolinensis*) in Oklahoma. Ph.D. theses, Oklahoma State Univ. 348 pp.



elevation, and duration of most flood events along the Deep Fork River. However, these measures were not intended to handle catastrophic flooding (i.e., 50-year floods or greater). Very little control currently is exerted over floods of such magnitude.

Eufaula Reservoir, completed in 1964, inundated the southernmost reach of the Deep Fork River. The reservoir backs up into the southern part of the Refuge during floods as the water level approaches the limits of the reservoir's flood pool.

Whether the human-made alterations in the natural hydrology of the Deep Fork River floodplain will ultimately change the composition of the bottomland hardwood association on the Refuge remains to be seen.

### ***Soils***

Flooding patterns largely have determined the nature of soils in bottomland hardwood forest ecosystems. The floodplain soils associated with the Deep Fork River bottom are the Verdigris, Pulaski, Roebuck, and Lightning series.<sup>7</sup>

Verdigris soils are deep soils that formed in recent alluvium under hardwood forest. Areas supporting Verdigris soils along the Deep Fork River flood frequently, and sometimes remain inundated for several days. The surface layer of grayish-brown or dark grayish-brown loam or silt loam is about 16 inches thick. The substratum is clay loam or silty clay loam and is mottled with brown or yellowish-brown. Verdigris soils have good water-holding capacity and are moderately high in fertility.

Pulaski soils are deep soils that developed in fine, sandy loam under the hardwood forests of the Deep Fork River bottoms. They

flood often and sometimes remain submerged for several days at a time. Pulaski soils generally consist of fine sandy loam throughout the profile, sometimes with 4 to 6 inches of recently deposited sand on the surface. The surface soil layer is brown, fine sandy loam with fine, faint mottles of reddish-brown and yellowish-red. The subsurface is faintly mottled with dark brown and brown, and may be more than 60 inches thick.

Roebuck soils are deep, poorly-drained clays of the Deep Fork River floodplain. They flood often, and sometimes remain inundated for several days. Roebuck clays absorb water very slowly, and water pools in low areas for long periods after rain events. The surface and subsoil together are roughly 5 feet deep; both are reddish-brown mottled with yellowish-red.

Roebuck soils are very fertile but difficult to work.

Lightning soils are deep, somewhat poorly drained, fertile soils on bottom lands. They flood occasionally but usually for periods of only a few hours. Absorption and runoff are slow, and water pools in low places during wet weather. Gray silt loam about 11 inches thick makes up the surface layer. The subsurface consists of about 9 inches of gray silty clay loam that changes to gray clay with light gray mottles at a depth of about 20 inches and becomes dark-gray clay at a depth of about 3 feet.

### **Vegetation**

The bottomland hardwood forest ecosystem of eastern Oklahoma is characterized by a great diversity of plant species and communities. Woodlands in areas with regularly saturated soil contain a variety of water-tolerant species, including black willow, river birch, cottonwood, sycamore, swamp privet, and buttonbush. A complex mixture of oaks, black walnut, pecan,

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<sup>7</sup> Soil Survey, Okmulgee County, Oklahoma, USDA, SCS, in cooperation with Oklahoma Agricultural Experiment Station, May 1968, pages 17-23.

hickories, sugarberry, cottonwood, boxelder, green ash, and other hardwood species of all ages occupy somewhat higher ground. The vegetative communities present today have been altered from the mature hardwood forest ecosystem that once existed in the Deep Fork River floodplain. Today the river bottomlands are a mosaic of open river, streams, oxbows, sloughs, marshes, beaver ponds, bottomland hardwood forest, cut-over areas regenerating with dense brush, pastureland, and pecan groves.

Plant associations occurring on the Refuge currently consist of:

- (1) Emergent wetlands where floating aquatic vegetation, sedges, bulrushes and smartweed predominate, and buttonbush, swamp privet, and black willow comprise the woody component, usually growing around the edges of the wetlands.
- (2) Seasonally flooded areas with permanently saturated soils that support predominantly brushy species such as swamp privet, hawthorn, and buttonbush with a ground cover of sedges, smartweed, and water-tolerant grasses in some places.
- (3) Seasonally flooded bottomlands where soils are not permanently saturated that support a mix of hardwoods, shrubs, vines, and herbaceous plants typical of floodplain forests in the area.
- (4) Steep upland slopes dominated by post oak/blackjack oak forest.
- (5) Gently sloping or level sites above the floodplain that support grassland or grassland/oak savannah. Grasslands in the area are composed of species representative of the tallgrass prairie.

## Wildlife

Systematic wildlife surveys have not been conducted on the Deep Fork Refuge; thus no comprehensive wildlife inventories currently are available. Members of local Audubon Societies are compiling bird lists for lands within the proposed boundary, and surveys are planned for wildlife and plants on refuge property.

The threatened bald eagle is the only federally listed species known to occur on the Refuge. Migratory eagles from the northern states and Canada usually arrive in Oklahoma during November and depart by the end of February. Bald eagles forage from perches along the Deep Fork River. As many as six bald eagles have wintered on refuge land, but there are no known communal winter roosts on the Refuge.

The nesting population of southern bald eagles in southeastern Oklahoma is rapidly increasing, due largely to highly successful reintroduction efforts carried out by the Sutton Avian Research Center in Bartlesville, Oklahoma. Although no eagle nests have been found on the Refuge, active nests are known from several adjacent counties. One of these is located downstream of the dam at Lake Eufaula approximately 30 miles downstream of the southern boundary of the Refuge. As the southern bald eagle population increases, nesting eagles could be attracted to mature stands of timber on Refuge lands.

There are no known records of the federally listed endangered American burying beetle from Okmulgee County; however, records exist for adjacent Tulsa County to the north and for counties to the east and south. Surveys for the beetle will be undertaken on the Refuge as funding and staffing levels permit.

Historical records exist for the Arkansas River shiner, proposed for listing as endangered, from the Deep Fork River west

of Okmulgee; however, the species has not been reported from the Deep Fork since 1962, and may no longer occur in the stream.

The alligator snapping turtle is the only species of state concern known from the Refuge. Species of state concern whose ranges include or approach Okmulgee County and which could occur on the Refuge include the prairie mole cricket, goldeye (a fish), northern scarlet snake, Louisiana milk snake, Swainson's hawk, prairie falcon, barn owl, loggerhead shrike, Bell's vireo, Bachman's sparrow, mountain lion, river otter, long-tailed weasel, woodchuck, rice rat, meadow jumping mouse, and eastern harvest mouse.

A total of 149 species of birds - nine game species and 140 nongame species - are known or thought to use the bottomland forests and associated habitats in eastern Oklahoma.<sup>8</sup> The numerous sloughs and streams support large numbers of great blue, little blue, and great and snowy egrets. Four great blue heron rookeries are located on the Refuge; these rookeries are used by snowy egrets after the young herons fledge. Raptors, woodpeckers, and songbirds use the area in great numbers. The Refuge is a very important migration stop for many species of neotropical birds, and provides suitable nesting habitat for many others.

The wetlands nourished by the Deep Fork River are important wintering habitat for numerous waterfowl species, and are particularly important for wintering mallards. Depending on existing environmental conditions, particularly weather patterns, peak populations of wintering waterfowl using the Refuge have been estimated at 5,000-20,000 mallards, 1,000-5,000 wood ducks, and 1,000-2,000 other miscellaneous duck species. The

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8 Brabander, J.J., R.E. Masters, and R.M. Short. 1985. Bottomland hardwoods of eastern Oklahoma. U.S. Fish and Wildlife Service. Tulsa, OK. 145 pp.

sloughs, marshes, and overflow areas in the river bottoms also furnish vital nesting and rearing habitat for wood ducks.

Fifty-one species of mammals have been recorded in the Deep Fork River basin.<sup>9</sup> Common game and furbearing mammals in the basin include white-tailed deer, gray and fox squirrels, beaver, eastern cottontail, swamp rabbit, raccoon, coyote, and opossum. Furbearer populations, especially those of the raccoon, are among the highest in the state. Swamp rabbits are regularly seen in the Deep Fork River bottoms.

The bottomland hardwood forest is especially productive as fox squirrel and gray squirrel habitat. Observations by Refuge personnel indicate squirrel populations may be as high as two squirrels per acre on portions of the Refuge.

Fifty-nine fish species have been identified from the river, streams, and reservoirs of the Deep Fork River basin,<sup>10</sup> and many are likely to be found in Refuge waters. The Deep Fork River provides feeding and spawning habitat for many sport fish native to east central Oklahoma. The most important species to anglers are the channel catfish, flathead catfish, blue catfish (a.k.a. Mississippi white catfish), crappie, white bass, and largemouth bass.

Approximately 54 species of reptiles<sup>11</sup> and

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9 Oklahoma State University. 1973. Environmental Statement, Arcadia Lake, Deep Fork River, Oklahoma. Contract No. DACW-56-73-C-0066. Prepared for the U.S. Army Corps of Engineers, Tulsa District, Tulsa, OK. 90pp.

10 Fish data supplied by Jimmie Pigg, Oklahoma Department of Environmental Quality.

11 G. Sievert and L. Sievert. Undated. A field guide to reptiles of Oklahoma. Oklahoma Department of Wildlife Conservation, Oklahoma City, OK. 96pp.

22 species of amphibians<sup>12</sup> have been reported from Okmulgee County. Many of these likely occur on Refuge lands; however, surveys have not been completed and species lists for the Refuge are not currently available. Species observed by Refuge staff include Blanchard's cricket, southern leopard, green, and bull frogs; three-toed box, red-eared, Mississippi mud, and alligator snapping turtles; five-lined skink and fence lizard; western ribbon snake, flathead snake, eastern hognose snake, western pygmy rattlesnake, and western cottonmouth. The cottonmouth is commonly encountered on the Refuge.

### **Air Quality**

Air quality in east central Oklahoma is excellent, as would be expected in a primarily rural area that has limited industry.

Accordingly, no permanent air monitoring stations have been established in Okmulgee County. The Refuge is designated as Class 1 land under the guidelines provided in the 1977 Clean Air Act, a classification that contains provisions to maintain high air quality. All Refuge activities and facilities that may impact air quality must be conducted in accordance with the Act, comply with state air quality standards, and, where appropriate, be monitored according to state requirements.

### **Human History and Cultural Resources**

#### *Prehistoric*

No systematic archeological or historic site surveys have been conducted on the Refuge. No cultural resource assessments or overviews are currently available for the Refuge. As such, inferences about the archeological and historic contexts of the

Deep Fork area can be extrapolated only from published reports of field investigations in neighboring districts of Oklahoma.

#### *Historic*

Much of our knowledge of the conditions that existed in Oklahoma prior to settlement by United States' citizens is based on written journal descriptions of early explorers. Game was plentiful in the lands west of the Mississippi River. The frontiersmen reported bear, wolves, bobcat, elk, foxes, raccoons, skunks, opossum, and beaver. White-tailed deer abounded in the river bottoms, and vast herds of strange "hunchback cows" roamed the prairies. Turkeys, quail, and prairie chickens were abundant. Mallards, coot, herons, and gulls were common along rivers and lakes. Woodpeckers, including the now extinct ivory-billed woodpecker, flourished in the floodplains.

The Deep Fork River bottoms supported wildlife in abundance, and likely had been hunted periodically by Native Americans for hundreds of years. Between 1550 and 1800, European explorers documented tribal groups throughout the Southern Plains and eastern Oklahoma, including the Wichita, Caddo, and Osage. By 1800, the Osage had driven most of the other native groups of eastern Oklahoma out of the area.

By the early 1800s, Native Americans in the eastern United States were faring poorly. They were viewed by white settlers as savages and obstacles to continued settlement and development. As the population of whites grew, political and social pressures were exerted on the Native Americans to relinquish their lands.

Eventually, Congress mandated the removal of eastern Native Americans to the West. Oklahoma was designated Indian Territory, and in 1820, an area of land in central Oklahoma was conveyed by treaty to the Creek Nation of Alabama and Georgia.

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12 J.H. Black and G.S. Sievert. 1989. A field guide to amphibians of Oklahoma. Oklahoma Department of Wildlife Conservation. Oklahoma City, OK 80pp.

The new Creek Territory encompassed all of the lands now contained within the designated boundary of the Deep Fork National Wildlife Refuge.

The Creek Constitution, agreed upon after the Civil War, established a bicameral legislative body and authorized election of a principal chief by popular vote. The Creek Nation was divided into districts, each with its own judge, prosecuting attorney, and lighthorse company. The lighthorsemen served as policemen and game wardens. Under Creek law, Creeks could kill as much game as needed for their personal use, but were prohibited from "destroying" game simply for sport.

The resources of the Deep Fork bottomlands were important to the Creeks. They bartered pelts of raccoon, fox, skunk, wolf, opossum, badger, beaver, and otter for merchandise at stores in the village of Okmulgee. Bottomland streams were favored locations for fish killings -- community social events in which fish were driven to a designated part of a stream and stunned with the ground roots of a plant known as the devil's shoestring.

Okmulgee was founded by the Creek Nation in 1868 to serve as its capital. In spite of frequent tribal meetings, the town remained a small trading center until the turn of the century.

The sovereignty of the Creek Nation was terminated in 1899, when the Creeks voted to accept U.S. government jurisdiction. Under the resultant treaty, each adult was awarded an allotment of 160 acres of land. Deep Fork Refuge lands were among those included in the original Creek allotments. (Creek Nation sovereignty was restored gradually, beginning in 1936 with the Oklahoma Indian Welfare Act, which authorized the tribes to organize. The tribe currently holds the status of a Sovereign Nation and its tribal government offices are located in the City of Okmulgee.)

In 1900, the town of Okmulgee was incorporated and railroad service was initiated. Okmulgee, still primarily a trading center, boasted 300-400 residents, most of whom were Native Americans.

The completion of the railroad in 1900, and the discoveries of oil near Okmulgee and coal in the southern part of the county heralded a period of phenomenal growth that rapidly altered the face of the county. Oilmen, coal miners, and other entrepreneurs were attracted by the area's rich supply of natural resources, and by 1906, white men and women outnumbered Native Americans in the Creek Nation by seven to one.

In 1907, David Griffith, an avid hunter and fisherman, moved his family to Okmulgee. He reported plenty of quail, duck, wild geese, raccoons, squirrels, and opossums. Area streams were still clear at that time, and fish were abundant. Plums and blackberries were plentiful.

The height of the oil boom in Okmulgee County occurred from 1918 through 1920, when production in county oil fields reached 45,000 barrels a day. In 1921 alone, 5,715 oil wells were drilled inside the county line. Many wells were located in the Deep Fork bottomlands on what is now Refuge land.

By 1920, the City of Okmulgee had grown to 17,340 residents. During its heyday, Okmulgee was reported to have more millionaires than any other city of comparable size in the world.

Petroleum reserves were soon depleted, however, and production in the oil fields slowly dwindled; by 1935, production had fallen to roughly 5,000 barrels per day. The end of the oil boom signaled the beginning of a serious economic decline for the Okmulgee County area. Industry in particular was significantly affected as refineries, coal mines, and related industries gradually closed.

As production in the oil fields declined, the number of farms and ranches increased,

and soon almost half of the Okmulgee County population lived on farms. Pecans were surpassed only by cotton as the major cash crop. Native pecans were abundant along river and stream floodplains throughout the county. Most pecan orchards were established by simply clearing oaks and other trees and brush from the bottoms to create optimal conditions for growth and harvest of the nuts. Pecan groves are still scattered throughout the Deep Fork bottomlands, both within and outside the defined Refuge boundary.

Most of the timber in the Deep Fork bottomlands was removed after the arrival of white settlers. In addition to pecan production, the forest was logged for timber, cut for firewood, and cleared for grazing. Today, most of the forest within the proposed Refuge boundary is composed of second growth timber that appears to be roughly 50-60 years old. Some inaccessible tracts are older and a few trees on the Refuge are probably greater than 100 years old.

### **Socioeconomic Setting**

Okmulgee County encompasses 698 square miles of prairie, upland woodland, and bottomland forest in east central Oklahoma. The county is predominantly rural, and agriculture, particularly grazing, is the primary land use. In 1987, the county contained 1,009 farms averaging 248 acres in size. Roughly 62 percent of the farm operators in Okmulgee County reported that farming was their secondary occupation. The main cash crops, as determined by acres in production, were pecans, soybeans, and wheat.

The 1990 census reported the population of Okmulgee County to be 36,490 persons; roughly 37 percent of these lived in the City of Okmulgee. The per capita income was \$8,799.00, with 24 percent of the population living below the poverty level. The population of the city of Okmulgee decreased by

approximately 17.35 percent during the decade from 1980-1990.

In 1990, the civilian labor force in the City of Okmulgee was estimated at 5,248, and of these, about 4,684 (roughly 89 percent) were employed. Currently the largest employer in the city is the Creek Nation government. Other major employers include Oklahoma State University, Okmulgee Public Schools, NutraSweet Kelco Company, the City of Okmulgee, and Alliance America.

## II: Legal and Regulatory Mandates and Guidelines

### Legal Mandates

Administration of national wildlife refuges is governed by various federal statutes, as well as by regulations and Presidential executive orders. A list of the most pertinent statutes establishing legal parameters and policy direction to the National Wildlife Refuge System is included in Appendix B, along with a summary of those laws that provide special guidance and have strong implications for the U.S. Fish and Wildlife Service and for Refuges. For the bulk of laws and other mandates, legal summaries are available upon request.

### Agency-Wide Policy Directions

#### The Fish and Wildlife Service Mission

The origins of the Fish and Wildlife Service date back to 1871, when Congress established the U.S. Fish Commission to pursue investigations and inquiries regarding food fishes of the coast and lakes of the United States. Additional agencies were created in quick succession to study economic impacts and life histories of insects, birds and mammals in relation to agriculture, horticulture, and forestry. In 1896, Congress established the Division of Biological Survey in the Department of Agriculture to investigate the geographic distribution, migration, food habits, and economic implications of North American birds and mammals. In 1939, the Biological Survey was transferred to the Department of the Interior, and a year later the Biological Survey and Bureau of Fisheries were consolidated into one agency within the Interior Department to

be known as the Fish and Wildlife Service. In 1956, the Fish and Wildlife Act created two bureaus within the Service -- Commercial Fisheries and Sport Fisheries and Wildlife. The Bureau of Commercial Fisheries was transferred to the Commerce Department in 1970, and in 1974, the Bureau of Sport Fisheries and Wildlife was renamed the U.S. Fish and Wildlife Service.

President Theodore Roosevelt established the first national wildlife refuge in 1903 by Executive Order; Pelican Island became a refuge for herons and egrets--then under threat of extinction due to the demands for their plumes for the millinery trade. Establishment of several other refuges to preserve nesting islands and rookeries or special habitat followed in rapid succession. In 1905, two years before Oklahoma became a state, Wichita Mountains Wildlife Refuge joined Yellowstone National Park (established 1872) as a second preserve for the American bison, whose numbers had diminished during the 19th century from millions to a few hundred.

The Service's responsibilities broadened during the 1930s. As a result of drought, drainage of wetlands for agriculture, and liberal bag limits for hunters, waterfowl populations nationwide were severely depressed. Passage of the Migratory Bird Hunting and Conservation Stamp Act in 1934 made funds available to purchase acreage for waterfowl habitat. During the next several decades, the Service emphasized the restoration of critically depleted migratory waterfowl populations.

The passage of the Endangered Species Act in 1973 again refocused the activities of the Service and other government agencies. This Act mandated the protection and

conservation of threatened and endangered species of fish, wildlife, and plants, both through federal action and by encouraging the establishment of state programs. A myriad of other conservation-related laws soon followed, including the Fish and Wildlife Conservation Act of 1980, which emphasized the conservation of nongame species and refocused and broadened management responsibilities for all the national wildlife refuges. In 1974, the Service was assigned new responsibilities for endangered and nongame species. Lands continued to be added to the refuge system -- sometimes specifically for the preservation of endangered species.

The mission of the U.S. Fish and Wildlife Service is working with others, to conserve, protect, and enhance fish and wildlife and plants and their habitats for the continuing benefit of the American people. The Service's major responsibilities are for migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish.

The Service has three basic objectives:

1. To assist in the development and application of an environmental stewardship ethic for our society, based on ecological principles, scientific knowledge of fish and wildlife, and a sense of moral responsibility,
2. To guide the conservation, development, and management of the Nation's fish and wildlife resources, and
3. To administer a national program providing the public opportunities to understand, appreciate, and wisely use fish and wildlife resources.

### **National Wildlife Refuge System: Mission and Goals**

The National Wildlife Refuge System is the only existing system of federally-owned lands in the nation managed chiefly for the conservation of wildlife. The System has grown to include over 500 refuges totaling more than 92 million acres. There is at least one refuge in every state (Oklahoma currently boasts nine refuges) and five U.S. territories.

The mission of the System was defined in The National Wildlife Refuge System Improvement Act of 1997:

“The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

### **Refuge Purpose Statements**

The specific purpose(s) of a national wildlife refuge is mandated by the authority(ies) under which the refuge lands are purchased. The initial acquisition of 6,805 acres of the Deep Fork National Wildlife Refuge was purchased with Land and Water Conservation Funds under the Emergency Wetlands Resources Act of 1986. Further land purchases were made with funds provided through the Migratory Bird Hunting Stamp Act of 1934 (commonly called the Duck Stamp Act). Future land purchases may be made with funds provided by the Duck Stamp Act and/or Land and Water Conservation funds. The purposes of lands on the Deep Fork Refuge reflect the provisions of these legislative acts, and different portions of the Refuge have slightly different purposes, depending upon the



legislation that funded the acquisition of individual tracts of land.

The legally defined purpose of Refuge lands acquired with funds provided through the Emergency Wetlands Resources Act is "the conservation of the wetlands of the Nation ...and to help fulfill international obligations contained in various migratory bird treaties and conventions..."<sup>13</sup> The purpose of lands purchased with revenues generated through the Migratory Bird Conservation Act is to provide an "inviolate sanctuary, or for any other management purpose, for migratory birds." Lands subsequently purchased with Duck Stamp monies will retain the purpose of the initial land purchase made under the Emergency Wetlands Resources Act. Simply stated, the Deep Fork National Wildlife Refuge was established to protect valuable freshwater wetlands and wildlife habitats by preserving an important tract of bottomland forest and wetlands habitat for the benefit of waterfowl, other migratory birds, and other fish and wildlife species native to the area.

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13 Specific purposes identified in the establishing legislation are found in the following legislative acts:

Migratory Bird Conservation Act, 16 U.S.C. 715d: "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

Emergency Wetlands Resources Act of 1986, 16 U.S.C. 390(b), 100 Stat 3583: for "the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions. . ." and

Fish and Wildlife Act of 1956, 16 U.S.C. 742f(b)(1 and 16 U.S.C. 742f(a)(4): "for the development, advancement, management, conservation, and protection of fish and wildlife resources.. for the benefit of the United States Fish and Wildlife Service, in performing its activities and Services . . . ."

### III: Long-range Management Strategy

#### Introduction

As stated in previous sections, Oklahoma has lost roughly 60 percent of its wetlands habitat and 85 percent of its bottomland hardwood forest habitat through reservoir inundation or conversion to other uses. The Deep Fork National Wildlife Refuge was established to preserve and restore wetlands and bottomland forest habitat for migratory birds and other native wildlife. Thus, the primary goal of management on the Refuge is to protect and enhance these habitats and their wetland functions. A second important goal is provision of compatible, wildlife-dependent public recreation.

This section briefly describes the Refuge units and general plans for their management over the next ten years. The specific goals, objectives, and strategies for implementation of the long-range management plan for the Refuge are detailed in the Objective Documentation Record. Implementation will be discussed further in specific management plans that must be formulated for each activity or development proposed for the Refuge.

Public use facilities and habitat management developments such as moist soil impoundments and greentree reservoirs will be phased in over the 10-year planning period, contingent upon availability of funds and the acquisition of additional land within the proposed boundary.

#### Description and General Management Strategy for Refuge Units

##### Unit 1.

*Description:* Unit 1 extends from the northern Refuge boundary south to State Highway 56. It is the narrowest part of the Refuge; distances from the east to the west boundaries range from just over 1½ miles to as little as ⅛ mile. The proposed Refuge boundary encompasses roughly 2,700 acres in Unit 1. Approximately 1,440 acres within the unit have been purchased to date.

Most of Unit 1 is low and wet - a mosaic of streams, sloughs, wetlands, and moist bottomland forest comprised of hardwood species typical of the area. Some of the wetlands were created or expanded by beaver dams. Electrical transmission lines, operated by a public utility, run north and south through the middle of the unit, and an eight-inch, high pressure, underground gas transport line parallels the high line. The pipeline carries jet and diesel fuel. Both utilities maintain cleared rights-of-way.

There is good access into this unit. The northernmost part of the unit can be entered from Airport Road (County Road #93). Gun Club Road (94th Street or County Road #94) passes through the Refuge from east to west near the middle of the unit. Gun Club Road may be flooded with a foot or more of water after heavy or prolonged rains, and is often impassable. Eufaula Street leads from the northern part of the city of Okmulgee westward to the eastern Refuge boundary, and County Road #394 runs north from Eufaula Street along parts of the eastern boundary.

Highway 56 comprises the southern unit boundary. Two graveled parking lots are located along County Road #394, one at the end of Eufaula Street and another ¼ mile south of Gun Club Road. Parking areas are planned for at least two locations adjacent to Hwy 56.

Much of the area north of Airport Road is grassland composed of a mixture of native and Bermuda grasses and wildflowers with hardwood species invading in many places. The area contains two small impoundments.

The northwestern part of the unit features a prominent sandstone ridge that supports rocky post oak/blackjack oak forest and degraded grassland. The eastern portion is low and wet. Several oil and gas wells are located north of Airport Road, including three that are still in production. Some of the non-producing wells in this area have not been capped.

Except for a rocky, forested hill in the northwest corner, the land between Airport Road and Gun Club Road is low and wet. Negro Creek flows through the area, and beaver dams along the creek and smaller drainages have increased ponding throughout the bottoms. Much of the area floods annually. Some grasslands north of Gun Club Road are reverting back to brush and timber.

Between Gun Club Road and Eufaula Street, Refuge lands support bottomland hardwood forest or potential forest. Hawthorns, shumard oaks, and pin oaks are abundant. The area also contains a large wetland, enhanced and maintained by beaver. A 120-acre pecan orchard is located on private land inside the proposed western boundary.

Refuge lands between Eufaula Street and Highway 56 contain moist forest and wetland habitats and a large slough known as Blue Gar Slough. Two oil wells are located on Refuge land in this area; there is a nonproducing well west of the Eufaula parking lot and an active

well east of the Deep Fork River on the south end of the unit.

South of Eufaula Street all lands west of the Deep Fork River within Unit 1 are still in private ownership. Most of the private land has been converted to pasture and pecan orchards. Several oil wells are located on the private tracts.

#### *Long-range Management Strategy.*

Bottomland forest in this unit will be allowed to mature. If and when acquired, pecan orchards within the proposed boundary will be restored to a mix of bottomland hardwood forest and wetlands. Two water control structures - one north of Gun Club Road and one north and west of Eufaula Street - will be installed in existing beaver dams to regulate winter flooding for waterfowl. The water control structures proposed are essentially drains though the dams, protected by a grating to prevent the beavers' fouling the drains' inlets and equipped with a drop log structure. at the inlet. Such water control structures require little maintenance and allow manipulation of water levels in beaver impoundments.

Deer, squirrel, and rabbit hunting currently are allowed in Unit 1. These activities will continue, and parts of the unit will be open to raccoon hunting by special permit beginning in 1999. Waterfowl hunting will be permitted when additional lands are purchased and waterfowl populations increase. Non-consumptive use will be permitted except during special hunts.

A footbridge is planned for the area east of the river between Gun Club Road and Highway 56 to provide access for Refuge visitors during wet periods when entry into the unit is limited and difficult.

## Unit 2.

*Description:* Unit 2 is bounded by Highway 56 to the north and Sharp Road and the Deep Fork River on the east. The western boundary is irregular; the westernmost part of the boundary runs along the western edges of sections 15 and 22. The unit consists of approximately 1,700 acres of bottomland hardwoods, sloughs, emergent wetlands, and some native prairie. The Service currently owns roughly 930 acres within the unit. Unit 2 is somewhat lower and wetter than Unit 1, and beaver activity is not as conspicuous. The electrical transmission lines and gas transport line that traverse Unit 1 continue in a southwesterly direction through Unit 2.

The area just south of Highway 56 now consists of lowland forest and mixed uplands supporting some native prairie with scattered oaks. Much of this area has been converted to pasture. About half of the area floods annually, and Highway 56 is sometimes inundated and impassible.

The Okmulgee water treatment plant is located south of Highway 56 and will be surrounded by Refuge land when purchases are complete; water lines from the treatment plant to the city run along the south side of the highway on Refuge property.

The western and southern parts of the unit are extremely wet and feature numerous sloughs and wetlands that support thick stands of sedges and rushes. Salt Creek crosses an inholding near the middle of the unit and enters the Deep Fork River from the west. The western part of the unit contains about 40 acres of uplands that were converted to pasture and now are reverting to brush and timber.

Access into Unit 2 is limited. Two vehicle pull-offs are located off Highway 56 along the northern unit boundary where fishermen often park to access the Deep Fork River, immediately north of the highway. No roads

cross the area, and the only entry into the western part of the unit is across private property. A strip of private land separates Sharp Road from the Refuge, and access from the road is limited to an area south of the Deep Fork River bridge where a graveled parking lot has been established.

There are no operating oil or gas wells on currently-owned Refuge land in Unit 2. One unplugged, nonproducing well may exist on current Refuge land. At least 4 operating wells exist on land proposed for acquisition.

### *Long-range Management Strategy.*

Since existing conditions in the area provide excellent habitat for a variety of migratory birds including waterfowl, no water control structures are planned for this unit. Existing forest will be allowed to mature. As private lands are acquired from willing sellers, lowland pastures will be restored to wetlands by damming drainage channels to reestablish natural hydrologic conditions.

Unit 2 is extremely low and wet. Access into the unit is limited and is not expected to improve significantly even with the acquisition of the remaining land within the proposed boundary. For these reasons, Unit 2 will be closed to waterfowl hunting and managed as a waterfowl sanctuary. Portions of the unit with available access will be open to upland game hunting and non-consumptive recreation.

The Oklahoma Department of Transportation (ODOT) has proposed relocating Highway 56 where it crosses Refuge land to reduce highway flooding and eliminate two dangerous curves. The proposed realignment would move the highway up to 500 feet south of its current location. If the plan is implemented, the Unit boundary would be shifted to coincide with the new road alignment. Preapplication consultation for this project between the Service and the ODOT already has begun, and

potential mitigation for project effects includes wetlands development, removal of the existing highway from Refuge land, and maintenance of the natural flooding regime in the area. There is also a possibility that visitor parking lots could be established during highway construction near the eastern and western Refuge boundaries.

### Unit 3.

*Description:* Unit 3 consists of all Refuge lands located between Sharp Road to the west and Highway 75 on the east. The proposed boundary encompasses roughly 3,800 acres. The Service currently owns approximately 1,715 acres in this unit and recently has exercised an option to purchase an additional 240 acres.

Most of the northern and eastern parts of Unit 3 are still in private ownership, including most tracts adjacent to Highway 75. A sizable wetland and the largest pecan orchard within the proposed Refuge boundary, comprising roughly 500 acres, are located on private land in the northwestern part of the unit. Okmulgee Creek flows south through the middle of the unit; the creek has been channelized and straightened, and receives discharge from city sewers that includes street runoff and tertiary treated sewage water, all of which enters the Deep Fork River on the Refuge. A large, privately-owned, wetland, known as Thousand-Acre Lake, occupies the northeast corner of the unit between Okmulgee Creek and Highway 75. Thousand-Acre Lake was drained in the 1970s, but the current owner has enhanced approximately 80 acres of the wetland to benefit waterfowl.

The north-central part of the unit contains an upland area of approximately 120 acres that supports a mix of native prairie, bermuda grass, and post oak/blackjack oak woodland. A small cemetery, which will remain in

private ownership, is located on the upland site.

The Deep Fork River meanders erratically through the unit, generally from west to east. Scattered wetlands and sloughs, including some permanently wet areas, are located along the river channel.

The south side of Unit 3 contains the largest upland site on the Refuge - a 240-acre tract of native grassland and post oak/blackjack oak savannah. Honey Creek flows northward along the western edge of the upland, and enters the Deep Fork River inside the southern Refuge boundary. East of the upland site, in the south-central part of the unit, a rocky, forested hillside drops abruptly to the river.

Another upland site with a mix of grassland and oak/hickory woodland is situated above the river in the east-central part of Unit 3. The southeastern part of the unit is low and wet, and supports floodplain forest and wetlands.

The Service is in the process of acquiring 240 acres, including most of the mineral rights, in the northern part of Unit 3. There are 10 unplugged, nonproducing wells on this tract. An additional 10 to 12 wells remain in production elsewhere within the unit, approximately four of which are on existing refuge land. Numerous small electric lines supply power to the oil and gas wells, and a number of small gas lines connect to the wells.

There is good access into this unit. Cemetery Road (County Road 394) runs due south from 20th Street in Okmulgee to the northern edge of the current Refuge boundary where a graveled parking area has been established. Refuge entry also is available from Highway 75 via County Road 99; a parking area is located on high ground east of the Deep Fork River at the end of this road. The southern part of the unit is accessible from a graveled parking lot off Whitehill

Road (County Road 100) just west of the river.

*Long-range Management Strategy:*

When additional lands are purchased, Unit 3 will have the highest potential for wetlands development on the Refuge. Up to 500 acres within the unit may be suitable for moist soil units. Thousand-Acre Lake, located in the northeastern part of the unit and currently in private ownership, would be an excellent site for a water control structure; about 300 acres of the lake are suitable for wetlands development.

Lowlands that have been converted to pasture will be allowed to return to a mix of forest and wetlands. Uplands will be converted to native prairie or oak/hickory savannah. Prescribed fires will be used to control invading brush on upland prairie sites to maintain a mix of native prairie and oak.

Parts of Unit 3 currently are open to deer, rabbit, and squirrel hunting. These activities will continue, as well as raccoon hunting by special permit in the unit, initiated in 1999. Other areas may be opened to hunting as lands are acquired. A hiking trail with interpretive signs is planned for the eastern part of the unit. An observation point with an interpretive display overlooking moist soil units is being considered for the western part of the unit when additional lands are acquired.

**Unit 4.**

*Description:* The boundary of Unit 4 is highly irregular. The unit is defined by Highway 75 on the west and Montezuma Creek to the south. Part of the proposed boundary to the north and east of the unit proceeds from northwest to southeast in an irregular, stairstep fashion to an imaginary westward extension of County Road 101, which runs east and west but does not cross the eastern Refuge boundary. South of County Road 101,

the eastern unit boundary is defined by the Deep Fork River.

When acquisition is complete, Unit 4 will contain roughly 2,300 acres. The Refuge currently owns approximately 1,120 acres within the proposed boundary, most of which lies along the Deep Fork River. Refuge holdings are comprised of bottomland dominated by shallow wetlands, various aged stands of floodplain forest, sloughs, and pecan orchards. Much of the land on the north side of the river has been cut over recently and is regenerating with thick stands of brush.

Unit 4 is generally lower and wetter than Unit 3. The Deep Fork River meanders southeasterly from the northwest corner through the southeastern part of the unit. Five ponds, ranging in size from about 2 to 10 acres, are situated in a north-south line inside the western boundary. A gas pipeline runs roughly north and south through the western half of the unit.

A large oxbow, known locally as Horseshoe Slough, borders Highway 75 north of the river, and a small pecan orchard, roughly 20 acres in size, lies immediately east of the highway and south of the river.

In the northeast part of the unit, the Refuge boundary bisects a large, shallow impoundment that was created as a result of beaver damming activity. This wetland contains at least 80 acres of standing dead timber, flooded to depths up to three feet. Cussetah Creek skirts the eastern and southern edges of the wetland and enters the Deep Fork River from the north. The wetland receives heavy waterfowl use in winter, and wintering bald eagles are attracted to the abundant food supply and favorable perch sites in the area.

The western central part of the unit contains a large pecan orchard of roughly 200 acres with Bermuda grass ground cover. The orchard and associated property, including at least 20 acres of abandoned farmland and 6 to 8 oil wells, lie adjacent to Highway 75 and

comprise one of the largest private inholdings in the unit. Another large inholding spans Montezuma Creek and extends into Unit 5; it is made up mostly of bottomland hardwood forest intermixed with some cleared pastures and pecan groves, and currently is being used for cattle grazing and pecan production.

A large oxbow, not yet completely cut off from the river, is located on the southeastern boundary of Unit 4. The oxbow receives a continuous supply of water from Montezuma Creek to the west and periodic flushes from the Deep Fork River during high flows. It maintains a deep channel, and the land between the slough and river channel comprises an "island" that contains one of the most mature forest stands on the Refuge.

The Refuge owns no oil or gas rights in Unit 4. There are two active oil and gas wells on Refuge property north of Horseshoe Slough. Small electric and gas lines connect to wells in the area.

Currently, access into Unit 4 is limited. The only entry from Highway 75 is via an oil field road that skirts Horseshoe Slough north of river; south of the river, a strip of private land adjacent to the highway prevents access.

#### *Long-range Management Strategy.*

All bottomland hardwood forest in Unit 4 will be allowed to mature. As inholdings are acquired, pecan orchards and cleared bottomland will be returned to floodplain forest or will be converted to moist soil units or wetlands.

Non-consumptive activities such as wildlife observation and photography will be concentrated in Unit 4, and the unit will be closed to hunting. Non-consumptive facility development will include interpretive trails, boardwalks, kiosks, and other exhibits that explain and/or demonstrate the value and functions of bottomland forests and wetlands, reasons for past harvest of bottomland timber, and reforestation activities to reclaim

bottomland habitat. Unit 4 provides opportunities for establishing trails proximate to Highway 75 and in remote parts of the Refuge.

#### **Unit 5.**

*Description:* Unit 5 is bounded on the north by Montezuma Creek. Betor Road crosses Montezuma Creek in an east/west direction and forms almost ¼ mile of boundary between the creek and County Road 398 to the east. County Road 398 defines most of the western Refuge boundary; it runs generally south from Betor Road and along the top of a steep, forested slope that drops to the Deep Fork River floodplain.

County Road 398 also extends northward for a short distance to provide access to a small, private cemetery located inside the western Refuge boundary. A gated, unimproved, private access road extends northward from the cemetery entrance and comprises much of the western boundary north of Betor Road. The Deep Fork River delineates much of the eastern unit boundary. Coalton Road comprises the southern perimeter of the unit.

The proposed Refuge boundary encompasses approximately 1,700 acres composed predominantly of bottomland forest dominated by shumard oak, pin oak, pecan, ash, and hawthorn with wetlands and sloughs scattered throughout. The Refuge currently owns roughly 1,370 acres, mostly in the western and central sections of the unit.

In the northern part of the unit, the private access road skirts the southern and eastern edges of a wide slough that feeds a 20-acre emergent wetland located on Refuge land east of the road. The wetland was created by beaver; it supports dense stands of smartweed and is ringed with bulrushes.

Pawhuska Cemetery, roughly 3 acres in size, is located southwest of the wetland and

adjacent to County Road 398, which also provides cemetery access. This road becomes a private access road, and is gated beyond the cemetery entrance. A 20-acre tract of native grassland lies immediately south of the cemetery. The cemetery and grassland occupy a small, sandy, upland site.

The Deep Fork River meanders widely but flows generally southward along the eastern unit boundary.

An abandoned railroad grade that currently supports an unimproved road runs southward from Unit 6 on the eastern side of the Deep Fork River, crosses the river, continues southwesterly through the middle of Unit 5, and turns south to curve along the base of the steep slope that parallels the western Refuge boundary. The west central edge of the unit contains roughly 160 acres of upland post oak/blackjack oak woodland that is contiguous with the northern end of this forested slope. A 20-acre pecan orchard is located below the upland site. An intermittent stream drains the pecan grove, but it floods frequently.

A large area in the southwestern part of the unit is underlain by Robuck clay and is slightly lower and wetter than the surrounding bottomland. It supports thick stands of hawthorn, swamp privet, and other shrubs and brush, and is dotted with emergent wetlands and small sloughs.

A shallow slough, covering approximately 25 acres, is located east of the shrub wetland in the southern half of the unit. This slough exhibits excellent smartweed production. Although the slough is wholly within the proposed boundary, only about ¼ of it is on land currently owned by the Refuge.

Oil and gas exploration and development are more prevalent in Unit 5 than in other parts of the Refuge. Most of the wells are concentrated in the west-central part of the unit. Three non-producing but uncapped wells exist on a recently-purchased 80-acre tract in

the north central part of the unit. An electrical transmission line crosses the area from northeast to southwest in the northern part of the unit and small electric and gas lines connect to wells in the area. The Refuge owns none of the oil or gas rights in Unit 5.

Refuge personnel access Refuge lands in Unit 5 primarily via oil field roads. One such road begins at a gate through Refuge boundary fencing off Coalton Road and runs northeast for about 2 miles across Refuge lands and private property.

Public access into Unit 5 is limited. There are three graveled parking areas in the unit, and all are located on the western side - one north of the intersection of Betor Road and County Road 398, one about half mile south of this intersection, and the other just west of the Deep Fork River at the Coalton Road bridge.

#### *Long-range Management Strategy.*

Existing bottomland hardwood forest in Unit 5 will be allowed to mature. In the northern part of the unit, a water control structure will be installed at the site of the beaver dam that currently maintains a 20-acre emergent wetland; this area will be managed as a moist soil unit. A greentree reservoir will be established in the pecan grove below the railroad grade in the western central part of the unit to benefit waterfowl. Native grassland in the northern part of the unit will be maintained with prescribed fire.

The unit currently is open to deer hunting for special hunts and squirrel and rabbit hunting during state seasons. Hunting for these species will continue, and the unit will be open to waterfowl hunting when additional lands are purchased. Non-consumptive use will be permitted in the unit except during special hunts. The abandoned railroad grade that crosses the unit and parallels the western boundary can be used as a hiking trail, although it will not be improved for that use.



## Unit 6.

*Description:* Unit 6 is bounded by the Deep Fork River to the west and an imaginary westward extension of County Road 101 on the north. Coalton Road forms the very short southern unit boundary. The eastern boundary is highly irregular; the easternmost section of the boundary runs north/south for about two miles along the eastern edges of sections 2, 11, and 14.

Unit 6 consists of approximately 1,600 acres of very low emergent and forested or potentially forested wetlands situated in generally a north/south orientation along the Deep Fork River. Most of the unit remains in private ownership. The Refuge currently owns only about 350 acres in the unit including a 120-acre tract adjacent to the river near the center of the unit.

The central part of the unit features a relatively large, private impoundment known as Flag Lake. The impoundment covers roughly 100 acres of open water and emergent wetland. The Fish and Wildlife Service completed a Partners for Wildlife project in cooperation with the owner of Flag Lake in 1995; the project included a water control structure to manipulate water levels for the benefit of waterfowl and to prevent the loss of hardwoods due to flooding during the growing season.

Approximately 200 acres of privately-owned farmland are located on cleared bottomland to the east and north of Flag Lake. This is the largest contiguous tract of farmland within the proposed refuge boundary.

The Refuge owns an 80-acre tract southeast of Flag Lake on the eastern Refuge boundary. Moore Creek flows across this property and adjacent private land within the proposed boundary and enters the Deep Fork River from the east.

A county road abuts the proposed Refuge

boundary at the north end of Unit 6. There is no public access into the interior of this unit. The only access for Refuge personnel into the central and southern parts of the unit is an unimproved road across a mile of private land.

There are two inactive, unplugged wells on Refuge land in Unit 6 that have been abandoned for some time. Providing access to plug these wells will be difficult because the area is extremely wet.

### *Long-range Management Strategy.*

Bottomland hardwood forest/wetlands habitats in Unit 6 will be allowed to mature. If and when acquired, Flag Lake would be managed as a moist soil unit, and the large tract of farmland northeast of Flag Lake would remain in production of crops that benefit waterfowl, through a cooperative agreement with an area farmer. Other areas currently in cropland, pastureland, or cleared for other human uses will be restored to a bottomland forest/wetlands mix.

Access into Unit 6 is extremely limited. Public access is unlikely to be developed, as most of the unit is surrounded by private land. Much of the northern part of the unit, where public access could be provided, will be maintained as farm lands to benefit waterfowl. For these reasons, Unit 6 will be managed as a wildlife sanctuary with no public use.

## Unit 7.

*Description:* Unit 7 is bounded on the north by Coalton Road. The eastern and western boundaries are highly irregular; County Road 398 borders part of the unit to the west and County Road 105 runs east and west through the area and forms parts of the southeastern and southwestern boundaries. U.S. Highway 266 and County Road 106 comprise the narrow boundary at the southern end of the Refuge. The western limit of Unit 7 lies along

the western edge of section 22 and the eastern limit runs through the eastern half of section 29.

Unit 7 consists of about 2,300 acres of bottomland currently dominated by pecan orchards and improved pastureland with some scattered tracts of floodplain forest and wetlands. The Deep Fork River flows southeasterly along gentle meanders through the unit. Coal creek flows north across proposed refuge land and enters the Deep Fork River in the eastern part of the unit. With the exceptions of about 600 acres in the northern end and a hill on the eastern edge, the entire unit is subject to flooding.

The Refuge currently owns about 1,215 acres in Unit 7, most of which were recently purchased. Refuge lands within the unit are composed mainly of improved pasture and pecan orchards with small interspersed tracts of floodplain forest. There is some high ground in the northwest corner of the property that supports post oak/blackjack oak woodland. The previous landowners maintained the pastureland through intensive grazing and the use of herbicides; however, oaks regenerated rapidly when the cattle were removed. Some previously cleared bottomlands are reverting to hardwoods and currently support thick stands of brush.

There are several oil and gas wells in Unit 7. A cluster of wells is located in the northwest part of the unit and others are scattered throughout the area within the proposed boundary. Two of these, one producing well and one unplugged, non-producing well, are located north of the Deep Fork River. The Refuge acquired none of the oil or gas rights in Unit 7.

Refuge lands in Unit 7 can be accessed from Coalton Road at the northern unit boundary and from Donegny Road (an unsurfaced, southward extension of County Road 198 for roughly ½ mile, Donegny Road proceeds southeasterly and eventually feeds

into U.S. Highway 266). Donegny Road is subject to flooding and is impassable for long periods after heavy or prolonged rains.

#### *Long-range Management Strategy.*

Pecan orchards and floodplain pastureland in Unit 7 will be restored to a bottomland hardwood forest/wetlands mix. Forest restoration will be accomplished via natural regeneration or through planting oaks and other native hardwood species. Moist soil units will be established in low areas to benefit waterfowl. Upland pasture will be allowed to revert to post oak/blackjack oak forest or forest/native grassland mix. Grasslands and grassland/oak savannah will be maintained with prescribed fire.

Refuge lands in Unit 7 will be open for special muzzleloader and archery hunts for white-tailed deer and for squirrel and rabbit hunting when boundary posting is complete. Raccoon hunting by special permit will be allowed beginning in 1999. Waterfowl hunting will be allowed when wetlands have been restored and bottomland habitat rehabilitated. The unit also will be open to non-consumptive use except during special hunts.

At least three public parking areas are planned within the unit.

### **Habitat Management Strategies**

The Fish and Wildlife Service's approach to wildlife conservation is to manage for ecosystem integrity. The bottomland hardwood forest community is one of the most diverse and productive components of the Arkansas/Red River Ecosystem; it is also one of the most imperiled. Thus, habitat management on the Deep Fork Refuge will focus on establishing, maintaining, and enhancing mature bottomland forest. Other management strategies - such as development

of forest/prairie edge or controlled harvest for uneven aged forest stands - can produce greater wildlife diversity in a particular area than management for mature forest; however these approaches to wildlife management do not provide for wildlife species that are adapted to or rely upon mature forest communities. For these reasons, management for a mature bottomland forest community, which naturally includes scattered wetland areas, is a high priority in the Arkansas\Red River Ecosystem and for the Deep Fork Refuge.

The general management strategy for the Refuge will be to encourage development of a mosaic of bottomland hardwood forest and wetlands in lowlands and a mix of post oak/blackjack oak/hickory forest and/or native grasslands on upland sites.

### **Forest Management**

Hardwoods were harvested from the Deep Fork bottomlands within the Refuge boundary about 40 to 50 years ago. Consequently, most of the trees on the Refuge are relatively young. The scouring action of flood waters prevents litter buildup in the bottomlands, and grasses and sedges predominate on the forest floor. Shrubs are found throughout the bottoms, but are particularly dense in naturally wet areas unsuitable for timber.

The goal of forest management will be to protect existing hardwood forest and allow it to grow to a mature condition with a diversity of bottomland hardwood species. Natural regeneration will be permitted to occur, and where necessary, trees may be planted to accelerate recovery. Trees will be protected from fire and timber harvesting. Natural dead standing and fallen timber, which provides habitat for cavity-nesting birds, small mammals, reptiles, amphibians, and invertebrates, will not be disturbed.

In several places on the refuge, bottomland hardwood forests were converted to commercial pecan orchards by selective removal of oaks, ash, and other hardwood species. Hardwood regeneration in these areas was inhibited by heavy grazing, mowing, and/or the use of herbicides. Pecan orchards on the Refuge will be returned to a mixed-species condition through reforestation with oaks and other native hardwood species. Mast production from oaks and pecans will serve as important food sources for wildlife including waterfowl, turkeys, deer, and squirrels.

### **Water Management**

The U.S. Army Corps of Engineers' Wetlands Delineation Manual defines wetlands as areas that (1) are saturated continuously for a significant part of the growing season, (2) exhibit hydric soil (soil that formed in saturated conditions in the absence of oxygen), and (3) support a preponderance of water-tolerant vegetation. Under this definition, approximately 90 percent of the Refuge would be classified as wetland.

Wetlands are further defined by length of inundation or soil saturation as 'permanent', 'seasonal', or 'temporary' and by the types of vegetation they support - bottomland hardwood forest is termed 'forested wetlands'; shallow water areas with cattails, bulrushes, smartweed, or other water-tolerant plants that are rooted in saturated soil are termed 'emergent wetlands'. These are the predominant types of wetlands on the Refuge.

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers regulates activities that could impact wetlands. U.S. Army permits will be required for all wetland development projects proposed for the Refuge.

Moist soil units and greentree reservoirs are the only types of wetland developments currently planned for the Refuge. These

involve construction of water control structures to regulate water levels in specific areas to benefit waterfowl.

Water control structures will be constructed only where there is an adequate natural water supply so that no pumping will be needed and where they will not inundate private property or county roads.

Beaver dams with the potential to inundate important hardwood tracts will be removed as necessary from March through September each year to protect timber from long-term flooding and harm during the growing season. Winter dams will be left in place where they provide good wetland habitat. Where beaver activity results in flooding of private property or public roads, dams will be removed year-round.

### ***Deep Fork River***

Very little management is planned for the Deep Fork River. Natural flooding of the river bottoms is essential to maintenance of the bottomland hardwood forest community. River bank vegetation will be protected to the degree possible. Cattle will be removed as Refuge lands are acquired, and overgrazed riverbank areas will be allowed to revegetate naturally.

Currently there are no large logjams in the river channel on Refuge property or lands proposed for acquisition from willing sellers that could cause diversion of the river. Large drifts of wood and debris that occur in the future will be removed to protect the channel banks and prevent prolonged flooding during the growing season.

### ***Streams***

Perennial streams that vary considerably in size are scattered throughout the Refuge. The larger streams were discussed in the unit descriptions.

Little management is planned for streams on the Refuge. Preservation of bottomland forest vegetation and removal of cattle from Refuge lands as they are acquired will protect streambanks from erosion. Preservation and enhancement of wetland functions on the Refuge will serve to enhance the quality of water in streams that flow through wetlands. Undesirable beaver dams that restrict streamflow will be eliminated.

### ***Sloughs***

Sloughs are old river channels or major tributaries that were cut off from the river by natural channel alterations or beaver activity. Most of the sloughs on the Refuge have steep banks and contain water from one to four feet deep. Sloughs fill with runoff from spring rains or flood water and lose water through evaporation during the summer. Autumn rains usually replenish them during October and November. The sloughs support floating aquatic vegetation such as duckweed and azolla, but little emergent vegetation. They are subject to algae blooms and decreased oxygen levels which sometimes causes fish kills during warm weather. Fish are often stranded in the sloughs after floods, but most don't survive the summers.

Sloughs are an important natural component of the bottomland forest ecosystem. They provide habitat and food for waterfowl, wading birds, some neotropical migratory birds, aquatic furbearers, amphibians, and some reptiles. Sloughs on the Refuge will not be modified; they will be protected from drainage and dumping.

### ***Permanent Shallow Water***

Shallow water wetlands form in depressions created by the scouring action of flood waters or behind old, silted-in beaver dams. Wetlands that form in naturally-occurring

depressions usually are found in areas with poorly drained soil. They are filled with runoff water and river overflows. In open areas, summer evaporation encourages the development of emergent vegetation important to dabbling ducks; in shady conditions produced by timber canopy, vegetation growth is inhibited.

Because they are frequently inundated, management of these areas will not be necessary. They are particularly important to wintering waterfowl and will be protected.

In Unit 4, about 100 acres are flooded year-round as a result of beaver dams. This permanently-flooded area and the resultant standing dead timber is excellent wintering habitat for waterfowl and will not be modified.

### ***Greentree Reservoirs***

Greentree reservoirs are forested tracts that are flooded during the winter to make the mast crop, usually acorns, available to wintering waterfowl. Water is drawn off these areas during the growing season to protect the timber.

At least three green tree reservoirs of approximately 20 acres each will be installed using low level dikes and water control structures to benefit dabbling ducks and other inhabitants of forested wetlands. These will be maintained with natural runoff from rainfall from November through February. Reservoirs will be flooded only once every two or three years to protect timber from long-term soil saturation. Reservoir impacts will be monitored and evaluated to ensure that timber is not harmed and that vegetation composition is not altered significantly as a result of flooding.

### ***Moist Soil Units***

Moist soil units are areas managed for the production of smartweed, millet, nutgrass, and sedges which provide food and cover for waterfowl. Moist soil units are flooded to depths of eight inches or less, and saturated conditions are maintained year-round through manipulation of water levels.

Most lands suitable for moist soil units within the proposed Refuge boundary currently remain in private ownership. Approximately 100 acres on currently-owned Refuge land will be converted to moist soil units using stop log structures and low-level dikes. Future land acquisition from willing sellers could provide suitable sites for the establishment of at least 300 additional acres of moist soil units.

In areas where permanent beaver ponds have destroyed standing timber, beaver dams will be replaced with water control structures that allow water manipulation; these areas will be managed as moist soil units to enhance aquatic and emergent vegetation to benefit waterfowl.

In Unit 6, a water control structure was installed on privately owned Flag Lake as a partnership project with the Fish and Wildlife Service in 1995; this area is currently operated as a moist soil unit and used for waterfowl hunting by the landowner.

### ***Artificial Impoundments***

A number of small impoundments exist both on currently-owned and on proposed Refuge lands. Most are less than three acres in size. All were constructed by private landowners, prior to the purchase of Refuge land. Six impoundments are located on land immediately east of Highway 75, and are clearly visible from the roadway. These may have been created as the result of borrow activity for highway construction.

Impoundments provide open water habitat important to waterfowl, herons and egrets, and cormorants. A wintering bald eagle has been observed at one of the privately-owned impoundments along Highway 75.

No additional human-made impoundments are planned for the Refuge. Existing impoundments will be maintained for the benefit of waterfowl, wading birds, and eagles. As lands are acquired, cattle will be removed from areas that currently support grazing, and native plants will be allowed to vegetate the impoundment banks to provide food, cover, and perching and nesting sites for migratory songbirds, wood ducks, and other native wildlife species.

### **Grassland Management**

All low-lying pasture lands will be restored to bottomland hardwood forest or wetlands. Upland grasslands, representing less than 10 percent of the refuge, will be maintained and restored to native tallgrass prairie communities, with some areas being allowed to revert to savannah with post oak, blackjack oak, and hickory intermixed with native grasses and herbaceous species. All grazing will be terminated as lands are acquired.

Restoration of native grasslands will be accomplished via natural regeneration and prescribed fire. No trees will be planted on any existing grassland or grassland/savannah areas. Herbicides will not be used to accelerate restoration to native grassland communities.

### **Wildlife Management Strategies**

Most management activities conducted on the Deep Fork Refuge are directed toward habitat and are not species-specific. Waterfowl is the primary focus of wildlife management on the Refuge.

### ***Waterfowl***

Wood ducks are the only resident waterfowl species on the Refuge. Wood ducks nest in tree cavities. The young jump from the nest shortly after hatching and walk to the nearest brood-rearing habitat which typically exhibits dense aquatic vegetation.

Wood duck nest trees will be protected and nest boxes will be constructed and erected in appropriate habitat to increase nesting opportunities. Creation of new wetlands and management of existing ones will increase and improve brood-rearing habitat. Annual wood duck spot counts will be conducted during the summer to monitor population trends and reproductive success.

Many of the best waterfowl wintering areas within the proposed Refuge boundary are still in private ownership. The current wintering population on the Refuge usually peaks at around 5,000 ducks, most of which are mallards.

Waterfowl hunting will be initiated after sufficient wintering habitat has been acquired to sustain hunting and when wetland creation and/or enhancement has been completed in those units where habitat improvements are planned. A maximum of 40 percent of the Refuge will be open to waterfowl hunting, and hunting will be limited to mornings during state seasons. Areas designated waterfowl sanctuaries will be closed permanently to hunting.

### ***Other Migratory Birds***

#### **Bald Eagles**

Two populations of the federally-listed threatened bald eagle are found in Oklahoma: the wintering population migrates to the area from the northern United States and Canada, and a smaller, resident population remains in the area year-round.

The resident or nesting bald eagle population in eastern Oklahoma recently was enhanced by a reintroduction project carried out by the Sutton Avian Research Center in Bartlesville, Oklahoma. The project was a remarkable success and the population of nesting eagles in eastern Oklahoma is rapidly increasing. Nests have been found in several counties to the east and south of the Refuge. Large perch trees are an essential component of bald eagle habitat; the birds forage from high perches and often return to the perches to consume their prey. Eagles also require large trees for nesting; in eastern Oklahoma, they often chose mature cottonwoods or sycamores along major rivers and reservoirs.

Bald eagle use of the Refuge currently is limited; however, use is expected to increase as wetlands and waterfowl populations increase. Although nesting has not been documented on the Refuge, suitable habitat and food resources are available, and nesting eagles could be attracted to the Refuge in the future.

Management for bald eagles on the Refuge will consist primarily of protection of eagles and mature trees adjacent to aquatic habitats where food resources such as fish and waterfowl are abundant. Should nesting occur on the Refuge, buffer zones will be established around nest trees consistent with recommendations in the Bald Eagle Recovery Plan.

#### Other Raptors

The Refuge is home to barred owls, screech owls, and red-shouldered hawks year-round. Red-tailed hawks and American kestrels also are found in the area year-round but are more common in winter than in summer. Cooper's hawks, sharp-shinned hawks, and northern harriers winter in the area.

Management for mature bottomland forest will improve habitat for cavity-nesting species (e.g., barred owls and screech owls) and

species that prefer open woodlands, such as red-shouldered hawks, Cooper's hawks, and sharp-shinned hawks. Northern harriers, which forage over open prairie, may benefit from management of upland sites for native prairie communities, although prairie sites on the Refuge are relatively small. Red-tailed hawks and kestrels, which prefer upland habitats and usually are found near the forest/prairie interface on the Refuge, should be unaffected by bottomland forest maturation, although nesting kestrels could be attracted to tree cavities near the forest edge.

Seasonal nocturnal surveys for owls will be conducted to determine their status and population trends on the Refuge, but no specific management for raptors is planned.

#### Neotropical Migrants

Neotropical migrants are birds that spend the winters in tropical or subtropical Central and South America and migrate to temperate and/or arctic North America to nest and raise their young. Many migrants (e.g., most of the colorful warblers and thrushes) travel through eastern Oklahoma on their way between breeding grounds and wintering areas, but do not remain locally for prolonged periods; the Refuge provides valuable stopover habitat for these species. Other neotropicals such as prothonotary, Kentucky, and parula warblers; red-eyed and white-eyed vireos; indigo buntings; and summer tanagers nest on the Refuge.

Some species (e.g., white-throated sparrows, winter wrens, cedar waxwings, golden-crowned kinglets) migrate from northern climes to winter in Oklahoma. Still others such as robins, bluebirds, and some blackbirds are found here year-round, but are more abundant in winter than summer due to an influx of northern birds in the autumn.

Some neotropical forest dwellers, most notably the cerulean warbler in Oklahoma, are experiencing serious population declines

thought to be related to destruction of mature forest communities. Management for mature habitat may benefit the cerulean warbler, and reforestation will provide additional habitat for all woodland birds.

Standing and fallen dead timber will be protected to provide habitat for cavity nesters and food resources for insectivorous species. The exclusion of cattle and other livestock will prevent disturbance of ground-nesting birds during the nesting season. Species adapted to tallgrass prairie could benefit from proposed prescribed burns of upland grassland sites. Species that prefer old fields and brushy habitat are likely to decline as plant communities mature.

Wildlife management activities that deal specifically with neotropical migrants are not planned for the Refuge. Breeding and wintering populations will be monitored via annual winter bird surveys to be conducted in December and Breeding Bird Surveys planned for May and June of each year. Volunteers will be sought from local Audubon societies and other groups to conduct or assist in these surveys.

#### Resident Songbirds

Resident songbirds are those species such as cardinals, mockingbirds, blue jays, and Carolina wrens that live in the area year-round. No management specific to these species is planned for the Refuge. Spring breeding bird surveys and winter bird counts will include resident birds as well as migrants. Management for mature forest and prairie conditions will benefit species adapted to mature habitats; species that prefer younger plant communities are expected to decline.

#### Wading Birds, Marshbirds, and Shorebirds

The wading birds known from the Refuge are the least bittern, American bittern, great blue heron, little blue heron, green heron, yellow-

crowned night heron, black-crowned night heron, great egret, snowy egret, cattle egret, and white-faced ibis. Great blue herons use the area year-round; the other wading birds migrate south for the winter. Great blue herons and snowy egrets nest in rookeries, generally constructed in large sycamore trees, along the Deep Fork River. Currently, four rookeries, containing 15-40 nests each, are located within the proposed Refuge boundary; one of these is on private property. Trees in these rookeries will be protected and great blue heron nesting will be monitored during February-March aerial waterfowl counts. Maturing riparian timber will provide additional nesting habitat on the Refuge. Wetland development on the Refuge will benefit wading birds.

The marsh birds most likely to inhabit the Refuge are king, Virginia, and sora rails and common moorhens. All are found in emergent wetland habitats. Reports indicate the king rail has suffered recent widespread population declines, and several states (not including Oklahoma) now list the species as endangered, threatened, or of special concern. Wetland restoration on the Refuge should benefit these species.

Shorebird use of the Refuge is limited due to the lack of exposed mud flats favored by many of these species. Notable exceptions are the killdeer which is found in pastures and meadows and the common snipe which favors moist soils and shallow wetlands. Shorebirds may benefit indirectly from Refuge habitat management for waterfowl. For example, species that inhabit wet meadows may be attracted to moist soil units and long-legged shorebirds may use shallow wetlands for foraging. Sporadic shorebird use also is expected in summer when water levels drop and mud flats are exposed.



## ***Small Game***

### **Squirrels**

Bottomland hardwood forest is excellent squirrel habitat. Forest management for mature timber will benefit squirrels through increased mast production and development of cavities in mature trees that are used for nesting and winter protection. No management specific to squirrels is planned for the Refuge.

Recreational squirrel hunting currently is permitted on approximately 4,200 acres of the Refuge during state seasons, and additional areas will be opened as land is acquired.

### **Rabbits**

Management for mature forest probably will result in a decrease in rabbit populations due to a reduction in brush that provides protective cover. Cottontail populations are expected to decline the most as timber matures. Swamp rabbit populations are expected to remain relatively stable in brushy wetlands that are unsuitable for timber. Rabbit hunting currently is permitted on roughly 4,200 acres of Refuge land, and additional areas will be opened as land is acquired.

### **Wild Turkey**

Management for mature forest and proposed burning of upland grassland will benefit wild turkey populations which are recovering from lows caused primarily by hunting pressure. The current Refuge population is estimated at about 60 birds.

Turkey populations will be monitored via incidental sightings, gobble counts, or roost counts. Efforts will be made to identify roost sites through early morning gobble counts. Law enforcement personnel will protect roost sites and prevent illegal take.

Turkeys are extremely susceptible to hunting pressure. Hunting will be allowed on the Refuge only on a permit basis when turkey populations increase to levels that will sustain hunting pressure. Hunting will not be allowed around roost sites.

## ***Furbearers***

### **Beaver**

Beaver are an integral part of the bottomland hardwood forest ecosystem. Historically, beaver were responsible for the creation of valuable moist soil and open water wetlands that supported vast numbers of wintering waterfowl.

Unfortunately, most of the beavers' natural predators have been eliminated from the bottomlands of Eastern Oklahoma, and currently, there are few natural controls of beaver populations. As a result, beaver populations have increased to a point where they are causing problems on parts of the Refuge. Uncontrolled, beaver would flood and kill large tracts of bottomland timber and eliminate the mast production that provides food for waterfowl and other bottomland wildlife species.

Beaver management on the Refuge involves the removal of beaver dams that cause permanent flooding of bottomland forest. Future management also may require a reduction in the number of beaver on the Refuge. Refuge personnel and/or Animal Damage Control officers will shoot or trap nuisance beaver with water-set Conibear traps on the Refuge. In setting traps, care will be taken to avoid areas used by otters, to reduce the chance of inadvertent catch of otters.

### **Raccoon**

Raccoon populations in Okmulgee County are reported to be among the highest in the state. Raccoon surveys have not been conducted on

the Refuge; however, lands within the proposed boundary are rich in the food resources (nuts, grapes, grubs, grasshoppers, crayfish, frogs, turtles, etc.) and wooded riparian habitats favored by this species. Raccoon tracks are abundant on mud flats and unimproved roads within the proposed boundary. Special permit hunts for raccoons on the Refuge will be initiated in 1999.

#### River Otter

The river otter is a species of state concern. Although little historical information exists concerning the presence or status of otters in the Deep Fork bottomlands, floodplain forest provides excellent otter habitat. A survey is planned for the presence of otters and/or otter sign (slides, rolling places, and tracks) on the Refuge. River otters will be protected on the Refuge.

#### Bobcat

Bobcats are nocturnal predators that are seen occasionally on the Refuge. Surveys for bobcats have not been conducted; however, bobcat tracks often are observed on the unimproved oil field roads that crisscross Refuge lands, and it appears that these medium-sized cats may be relatively common in the Deep Fork bottomlands. No specific bobcat management is planned for the Refuge.

#### Coyote

Oklahoma Department of Wildlife Conservation (1980) reports suggest that Coyotes are abundant in Okmulgee County, but no coyote census has been conducted on the Refuge. Surveys planned to establish baseline wildlife population data will likely confirm the presence and status of coyotes on the Refuge. Refuge coyotes roam freely and are not contained within Refuge boundaries. No coyote management is anticipated on the Refuge.

#### Fox

Foxes are nocturnal, shy, and seldom seen even when they are fairly common. The Refuge is within the range of both the red fox and the gray fox. Surveys have not been conducted to date for foxes on the Refuge, and no fox sightings have been made on Refuge lands since the Refuge was established. No management specific to foxes is planned for the Refuge.

#### Mink

Mink are found in riparian habitats throughout most of the United States and Canada. They prey upon amphibians, reptiles, birds, rabbits, and small mammals. The Deep Fork bottomlands provide ample habitat for mink, and the species is expected to occur in the area; however, no information on mink populations currently is available for the Refuge.

#### *Big Game*

##### White-tailed Deer

Bottomland hardwood forest provides excellent habitat for deer, and they are common on the Refuge. While management for mature forest will increase the mast production that provides food for deer in fall and winter, it may decrease the availability of some forbs (herbaceous plants other than grass) upon which deer rely in spring and summer. However, since the Refuge is composed of a relatively narrow strip of land along the Deep Fork River, most of the deer found within the boundaries are transient; that is, they wander on and off the Refuge at will. If a reduction of forbs occurs on the Refuge, the animals should easily find needed forage on adjacent lands. Thus, deer populations on the Refuge are expected to remain high.

No specific data currently exist for deer

use of the Refuge. Reliable census information is required in order to adequately manage deer hunting on the Refuge. The Refuge is planning to test the feasibility of using heat-sensitive aerial video surveys to determine deer populations. Herd Health Checks, performed in cooperation with the Oklahoma Department of Wildlife Conservation, also could provide information about the health of the deer population in the area.

The Refuge currently holds three special archery hunts and a special muzzle-loader hunt for deer each year. Approximately 4,200 acres currently are open seasonally for hunting. As land acquisition from willing sellers continues, the area open to deer hunting will increase.

### ***Other Resident Wildlife***

#### **Aquatic Organisms**

The Refuge is home to many aquatic organisms: invertebrates including worms, mussels, crayfish, dragonflies, and other insects; fish; amphibians (particularly frogs); and reptiles including various species of turtles and snakes. Restoration of wetlands will increase the habitat available to these species.

Aquatic organisms will benefit from several habitat management strategies that will improve water quality on the Refuge. Removal of livestock and protection of streambanks and streambank vegetation will reduce erosion and limit the amount of sediment entering aquatic habitats. Restoration and enhancement of wetlands and wetland functions will provide additional improvements to water quality that will benefit aquatic organisms.

Wetlands function as nature's water purification systems, trapping silt and other contaminants and converting them to simple organic compounds and nutrients that are then taken up by plants. The ability of wetlands to

clean and purify water is particularly important in places like the Deep Fork bottoms where the river carries a heavy silt load and frequently overflows its banks.

#### **Terrestrial Organisms**

Terrestrial organisms found on the Refuge include invertebrates (the most noticeable of which are butterflies and spiders); reptiles (land turtles, lizards, and snakes), and small mammals such as opossums, skunks, mice, and shrews. Species adapted to mature bottomland forest and wetlands will flourish as habitats mature. Species that prefer transitional communities will decline.

#### **Bats**

Bats often feed over water where flying insects are plentiful. In the vicinity of the Refuge, bats roost in the foliage of trees, under the bark of trees, inside hollow trees, or in crevices in rocks. Management for mature bottomland forest and wetland communities should increase the food supply for bats and nesting and roosting opportunities for those species that roost in trees or under bark.

Currently, no information exists concerning bats on the Refuge. Mist netting studies will be necessary to determine the species composition and status of bats on the Refuge. Initiation of these studies will depend upon funding levels.

### **Administrative Management Strategy**

#### ***Cultural Resources***

Preservation of the Refuge's cultural resources requires locating and evaluating archeological and historical sites. No formal archeological survey has been conducted on

the Refuge or any of the lands proposed for addition to the Refuge.

The cultural resources of Deep Fork will be accorded the standard protections mandated by Federal historic preservation legislation and Executive Order. The Refuge will follow the standards and policy guidelines of the U.S. Fish and Wildlife Service for Cultural Resources Management, as provided under Part 614 of the Service Manual.

Protection of archaeological, paleontological, and historical sites will be provided by Refuge personnel through enforcement of the Archeological Resources Protection Act, the National Historical Preservation Act, and Refuge regulations. Guidance for cultural resources management and enforcement is provided by the Service's Cultural Resources Management Handbook and section 5RM 16 of the Refuge Manual. Paleontological resources are protected, along with archaeological resources, by the Antiquities Act of 1906 and resultant regulations and management documents (43 CFR 3; 310 DM 7) and the Service Management Plan. Archaeological surveys will be conducted prior to the initiation of any major construction activity to prevent the disturbance or destruction of archaeological resources.

### ***Research and Investigations***

Investigations that are compatible with the purposes of the Refuge and supportive of Refuge goals and objectives will be permitted. The Service may provide logistical and financial support for research and field study projects pertinent to Refuge management programs.

Investigations may be conducted by Service employees, educational institutions, or private individuals. Priority will be given to projects which provide information needed for habitat and wildlife population

management on the Refuge.

The Service may provide logistical and financial support for research and field study projects which are needed or pertinent to Refuge management programs. Other priorities will include investigations which provide baseline information on existing habitat conditions, wildlife populations, and environmental quality or the presence of contaminants.

Information is needed on existing wildlife populations. Population estimates for waterfowl, upland game, and other migratory birds will be performed by service employees and/or volunteers. These types of investigations are perpetual with no end date. Vegetation inventories may be performed by Service employees or an educational institution. Detailed investigations such as the effect of raccoon hunting on migratory birds would have to be performed by an outside organization because of the time needed to complete the investigation. Contaminant research would be conducted by Ecological Services with the lab work contracted to private laboratories or universities.

Requests by educational institutions or private individuals to perform research on the Refuge will be evaluated according to compatibility with the purposes of the Refuge and whether the research is supportive of Refuge goals and objectives or the objectives of the National Wildlife Refuge System.

### ***Rights of Way***

A special use permit will be required if a current easement holder wishes to cross a section of the Refuge which was not part of the original easement.

Requests for new rights-of-way will be evaluated by the Fish and Wildlife Service to determine if they are compatible with the purposes of the Refuge. "Uses of wildlife refuge areas that make no contribution to the

primary objective of the program for an individual area or are in no way related to the objectives of the National Wildlife Refuge System are classed as non-program uses. Permission for such uses will be granted only when compatible with the major purposes for which such areas are established.”<sup>14</sup>

Applications for easements or rights-of-way must be submitted to the Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico. Applications “must state the purpose for which the right-of-way is being requested together with the length, width on each side of the centerline, and the estimated acreage.”<sup>15</sup> The application also must include “information concerning the impact of the proposed use of the environment including the impact on air and water quality; scenic and esthetic features; historic, architectural, archeological, and cultural features; wildlife, fish,... etc. The analysis shall include sufficient data so as to enable the Service to prepare an environmental assessment and/or impact statement...”<sup>16</sup> Generally an easement or permit will be issued for a term of 50 years or so long as it is used for the purpose granted...”<sup>17</sup>

All requests for rights-of-way will be evaluated to determine if they can be placed within existing rights-of-way. Multiple use of a single right-of-way would reduce impacts on the Refuge and wildlife resources.

### ***Mineral, Oil and Gas Resources and Economic Uses***

The Refuge acquired none of the oil and gas

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14 50 CFR 29.3

15 50 CFR 29.21-2

16 50CFR 29.21-2

17 50CFR 29.21-3

rights on all but 240 acres of the initial 8,140 acres of land purchased. Landowners who held the mineral rights were given the option to retain only the oil and gas rights. All other mineral rights were acquired by the Fish and Wildlife Service. Some surface owners who sold land to the Fish and Wildlife Service held none or only part of the mineral rights to their land; these rights still remain in third party ownership.

Future acquisition from willing sellers will include the purchase of all mineral rights except oil and gas with the property. It is mandatory that the Refuge acquire mineral rights to resources such as coal or gravel, the development of which could significantly detract from the purpose of the Refuge. Landowners will be given the option to sell all of their mineral rights with the surface.

Existing production will continue to operate under the regulations and guidelines of the Oklahoma Corporation Commission. No additional permits or regulations will be required by the Fish and Wildlife Service.

Current production of oil and gas on the Refuge consists primarily of stripper wells which produce only about one to three barrels of oil per day. The majority of these wells will be depleted within a few years unless more efficient or economical systems are developed to recover the remaining oil. Existing production is about 2,000 feet deep.

Exploration and development of new wells within the proposed Refuge boundary is unlikely unless a new production zone is discovered. Fish and Wildlife Service permits will be required for future exploration activities. The purpose of the permits is to protect the wildlife resources of the Refuge while allowing the mineral owner to extract the minerals.

Drilling and seismic activity will be restricted to March through September to reduce disturbance to waterfowl and other wintering birds. Archeological surveys of the proposed sites will be required to ensure

protection of historic sites or artifacts. Tank batteries will be located outside the floodplain to reduce the potential impact from oil or saltwater spills. Operators also will be required to post bonds to ensure that exploration sites are restored after exploration and extraction activities are complete.

There are currently non-producing wells on Refuge land and on private land within the proposed boundary which have not been operated for several years but have not been plugged. The Refuge will cooperate with the Oklahoma Corporation Commission to identify abandoned wells that need to be plugged. The current operator or lease holder will be responsible for plugging costs. In cases where the most recent operator or current lease holder cannot be identified or may not be financially able to pay plugging costs, these wells may be plugged using the state "Orphan Well" fund.

The Refuge Manager will work with project representatives to ensure that required roads, facilities, and surface activities associated with exploration and development of oil and gas resources are designed to minimize impacts on Refuge wildlife and habitats and that appropriate mitigation actions are taken.

The Refuge manager will monitor ongoing activities, and future activities as they develop.

### ***Refuge Staff***

Currently, the Refuge staff is composed of three permanent employees. These include a Refuge Manager, an Assistant Manager, and a program assistant.

The proposed Refuge staffing plan calls for eight permanent positions. Planned future development and direction of the Refuge will depend upon the addition of the five remaining staff members in permanent, full-time positions. These positions will be phased in as needed to implement the plan, and as

funding permits. Future Refuge operation also may involve the use of volunteers.

### **Public Use Management Strategy**

Compatible wildlife-dependent activities including hunting, fishing, photography, wildlife observation, interpretation, and environmental education are priority general public uses of the National Wildlife Refuge System. Opportunities for public involvement in these activities will be provided on the Refuge and encouraged where they are compatible with the purposes of the Refuge and consistent with sound principles of fish and wildlife management.

Public use and enjoyment of the Refuge will depend, in large part, upon acquisition from willing sellers of the remaining private land within the proposed boundary, funding and staffing levels, and the construction of a public contact station and interpretive trails. Currently only about 50 percent of the Refuge, roughly 4,200 acres, is accessible to the public; access to other Refuge lands is excluded by private property or a lack of access roads.

Refuge recreational programs will be designed to prevent major, long-term impacts on waterfowl populations and other Refuge wildlife. Hunting will be evaluated periodically to determine impacts on wildlife populations and to ensure public safety.

Consumptive and non-consumptive uses will be managed such that these activities will be separated in time and/or space, will not conflict with each other, and will not impact designated wildlife sanctuary areas.

### ***Recreation***

#### **Hunting**

The Refuge offers special archery and muzzleloader hunts for white-tailed deer.

These are controlled hunts; they are announced in the Controlled Hunt Application Booklet issued by the Oklahoma Department of Wildlife Conservation, and participants are drawn by the State. Currently three archery hunts and one muzzleloader hunt are conducted each fall.

In the future, the number of hunting permits issued for white-tailed deer will be based on planned deer population surveys (see wildlife management section) with consideration for safety and hunt quality. The Refuge objective will be to hold high quality hunts where the hunter will have a reasonable chance for success.

Squirrel and rabbit hunting are allowed during state seasons on lands having public access, except that squirrel season is closed from the beginning of archery deer season until the end of rifle deer season.

In 1999 the Refuge initiated raccoon hunting by special permit. The Refuge controls the number of hunters allowed in an area at any one time, and the seasons and sites for the hunts are determined so as to minimize impacts on other wildlife and prevent conflicts with other hunting and public use programs.

Other hunting programs for turkeys and waterfowl are being considered, and additional hunting opportunities will be available on the Refuge when wildlife populations increase to levels that will sustain hunting and when additional lands are acquired.

Shotguns only are allowed and non-toxic (steel) shot is required; lead shot is toxic to the waterfowl that forage throughout the flooded bottomlands. Rifles are prohibited as a safety consideration because of the proximity of the Refuge to populated areas and the current mix of public and private lands containing livestock within the proposed Refuge boundary.

Consumptive and non-consumptive uses will be separated in time and space to prevent

conflict and to provide for public safety. Areas open to controlled deer hunts will be closed to other public uses during the controlled hunts. At no time will the entire Refuge be open to hunting; some areas will remain closed to hunting to provide for non-consumptive recreational activities. Hunting will not be allowed in areas designated as wildlife sanctuaries.

### Fishing

Year-round fishing is permitted on the Deep Fork River, and fishing is allowed from March-October on sloughs and impoundments not connected to the river. Rods and line only are permitted in sloughs and impoundments; trot lines, jug lines, and limb lines are prohibited to protect wading birds and diving birds such as mergansers from becoming entangled or hooked.

The Refuge plans to improve parking and fishing access to the Deep Fork River at locations where Highway 56, Sharp Road, Highway 75 and Coalton Road span the stream. In addition, the Refuge will study the feasibility of constructing and operating a boat ramp(s) that will not wash away or silt in during floods on the river.

Signs containing information on public fishing will be erected at strategic points along the river, and a brochure containing information on fishing regulations and fisheries in the area will be produced and distributed to the public.

### Wildlife Observation

All areas with public access currently are open to the public for wildlife observation, hiking, and photography year-round except during special hunts. A 160-acre tract north of the river in Unit 4 is closed to hunting and open for non-consumptive use all year. Opportunities for non-consumptive recreation on the Refuge will increase with the

development of a system of trails allowing easier access to Refuge lands. Developments to facilitate non-consumptive recreation will be concentrated in Unit 4, which offers easy access from U.S. Highway 75.

### ***Interpretation***

The goal of Refuge interpretation will be to heighten visitor understanding and enjoyment of the Refuge and its natural resources. Interpretation will involve the development and placement on the Refuge of signs and exhibits that explain and/or depict the mission of the National Wildlife Refuge System, the purposes for which the Refuge was established, functions and benefits of the bottomland hardwood forest ecosystem, components of the bottomland hardwood forest ecosystem (e.g., wildlife, plants, water), and the role of humans in the environment. These aids to understanding the natural world will be available for use by the public in Refuge facilities and along self-guided trails where Refuge personnel are not available to interact with visitors.

### ***Education***

The goal of Refuge educational programs will be to promote the growth of an enlightened, informed public that values wildlife and the natural world and works to secure the conservation and protection of essential wildlife resources. Refuge educational activities will involve the interaction of the Public Use Specialist, other Refuge staff and members of the public both on and off Refuge property. Educational programs focusing on the functions and benefits of the bottomland hardwood forest ecosystem and on general wildlife conservation issues and strategies will be developed for various age groups from kindergarten through college level and adults.

### ***Public Use Inventories***

It will be necessary to estimate the number of visitors and activity hours on the Refuge to determine (1) potential impacts on Refuge resources, (2) impact on the local economy, and (3) opportunities presented to the public. A Public Use Inventory Plan will be completed and will use a combination of observations by Refuge personnel, number of permits issued, traffic counters, trail counters, and visitor records.



## IV. Objective Documentation Record

### GOAL 1

#### Protection and Enhancement of Wetlands.

##### Objective A:

**Create a network of permanent, emergent/shrub wetlands throughout the Refuge bottomlands to mimic the natural mosaic of wetland/forest habitat originally found in the floodplain forests of eastern Oklahoma.**

**Current Status:** Technically, roughly 90 percent of the Refuge can be considered wetland - a mix of forested, shrub, and emergent wetlands. Most of the forests have been cutover within the last 50-60 years, with some areas converted to pecan orchards and/or bottomland pasture. Several large emergent wetlands have been drained and smaller emergent wetlands and shallow, open water areas throughout the Refuge have been drained or filled. Approximately 80 percent of the area floods annually and temporary ponds are usually evident for a number of weeks after the Deep Fork River recedes.

**Rationale for Objective:** Mature bottomland forests characteristically contain numerous, scattered, small emergent wetland areas as well as larger shrub and emergent wetlands and open water areas that are important to an abundance of wildlife species and to the functioning of the ecosystem in general. These areas are especially important for waterfowl. The natural mosaic of shallow, open water/emergent wetlands/moist forest of the Deep Fork floodplain has been somewhat

homogenized, and the value of the area to waterfowl and other bottomland wildlife diminished, by the destruction of emergent and shrub wetlands. The creation of emergent wetlands and open water areas will reestablish a mix of habitats within the floodplain that mimics natural bottomland conditions and optimizes resources for waterfowl and other species adapted to floodplain forest habitat.

##### **Strategies for Accomplishing Objective:**

1. Fill in existing drainage ditches to reestablish wetland conditions.
2. Construct small dikes to create shallow wetlands.

##### Objective B:

**Maintain and improve water quality.**

**Current Status:** Many streams that flow across Refuge lands have been impacted by human activities and land use practices. Historical records indicate that the Deep Fork River and some area streams carry heavier sediment loads than in the past as a result of channelization and runoff from agricultural fields. In addition, some streams that enter the Refuge drain areas containing municipal sewage treatment plants or abandoned surface mines. Nevertheless, preliminary analyses of water and sediment samples from several Refuge streams identified no serious contaminant problems.

**Rationale for Objective:** Like humans, fish and wildlife depend upon clean water for their health and survival. An increase in stream

sediments can cause increased turbidity, elevated water temperatures, decreased amounts of dissolved oxygen in the water, and increased siltation downstream. Such changes in water quality often affect survival rates of aquatic plants and animals by limiting available oxygen and sunlight or increasing temperatures beyond an organism's tolerance levels. Siltation can eliminate fresh water mussels and other filter-feeding organisms that require relatively clean water for survival.

When pollution degrades water supplies, catastrophic effects sometimes result. Depletion of oxygen in rivers and streams caused by bacterial and algal blooms that result from nutrient pollution can result in serious fish kills. Frequently, however, contaminants cause gradual changes or population declines that often go unnoticed until severe effects become evident or populations are decimated.

#### ***Strategies for Accomplishing Objectives:***

1. Cooperate with other agencies and organizations (e.g., National Resources Conservation Service, Oklahoma Department of Wildlife Conservation, Cross Timbers Rural Conservation and Development Commission, Deep Fork Coalitions) and local landowners to improve the quality of water both on and off the Refuge within the Deep Fork River drainage basin.
2. Continue land acquisition from willing sellers with Land and Water Conservation Funds and Duck Stamp funds.
3. Pursue small boundary changes to allow inclusion within the Refuge boundary of portions of wetlands that currently extend beyond the proposed confines of the Refuge.
4. Create permanent and temporary wetlands

on the Refuge to assist in water quality improvement.

5. Prepare an emergency contaminant spill plan.

#### **GOAL 2.**

### **Protection, Restoration, and Maintenance of the Bottomland Hardwood Forest Community.**

#### **Objective A:**

**Manage beaver populations to control damage to bottomland hardwood habitat that results from permanent ponding behind beaver dams.**

***Current Status:*** The Refuge supports a healthy and possibly increasing beaver population. Beaver dams create impoundments that permanently flood bottomland timber and eventually destroy the flooded trees. Although some excellent natural wetlands are created in this manner, destruction of large tracts of timber is detrimental to the bottomland forest ecosystem.

Beaver problems on the Refuge are most prevalent in Unit 1. This unit contains many low streams that support a large beaver population. Beaver dams in this area often cause flooding of adjacent private property and a county road. Unit 5 also supports large numbers of beaver, but beaver problems in this unit are confined primarily to Refuge lands.

Destructive beaver dams on the Refuge are eliminated by hand or with explosives. However, beaver often reconstruct the dams in a matter of weeks or days.

***Rationale for Objective:*** Although many bottomland tree species are adapted to

periodic short-term flooding caused by heavy rains and subsequent runoff, flooding prevents the necessary uptake of atmospheric oxygen by the roots; prolonged flooding during the growing season can result in the loss of affected trees. Left unchecked, the pooling of water caused by beaver dams could destroy a significant portion of the forested habitat on the Refuge. Allowing beaver activities that result in the destruction of substantial tracts of bottomland hardwood forest habitat would conflict with the purposes for which the Refuge was established: to protect and enhance bottomland hardwood forest habitat for the benefit of migratory birds.

Wolves and cougars, the natural predators of beaver, largely have been eliminated from eastern Oklahoma; thus, it may become necessary for the Refuge staff or licensed beaver trappers to assume the role of predator in order to control beaver populations.

***Strategies for Accomplishing Objective:***

1. Remove dams as they are constructed during spring and summer except in areas where permanent flooding is desirable to maintain wetlands.
2. Replace existing beaver dams with water control structures in areas where managed wetlands, greentree reservoirs, or moist soil units would be beneficial.
3. Encourage winter beaver trapping, by permit, in cooperation with the Oklahoma Department of Wildlife Conservation.
4. Control beaver by other means (generally shooting or water-set Conibear traps), as necessary, to protect the bottomland forest ecosystem.

**Objective B:**

**Allow and encourage currently**

**regenerating bottomland hardwood forest tracts to develop into mature bottomland forest communities.**

***Current Status:*** Most tracts of bottomland forest on the Refuge are less than 50 years old and in various stages of regeneration. The tracts range from older stands where flooding has scoured the forest floor, creating a relatively open midstory and sparse ground cover, to areas more recently cleared that support thick stands of saplings, vines, and weeds (often referred to as 'rank vegetation').

In addition, several large privately-owned pecan orchards exist within the proposed Refuge boundary. Management of these pecan groves generally includes heavy grazing by cattle, mowing, and/or the use of herbicides to eliminate encroachment by other tree species, shrubs, and weeds. The existing pecan groves have little or no understory; the ground cover consists primarily of short-cropped native or exotic grasses.

***Rationale for Objective:*** Mature bottomland hardwood forest is one of the most diverse and productive ecosystems in North America. Oklahoma has lost over 85% of its mature bottomland hardwood forest habitat, and other states have experienced similar losses. As a result, many of the wildlife species that depend on bottomland forest are experiencing serious population declines; some (e.g., king rail, Bell's vireo, Bachman's warbler, river otter, alligator snapping turtle) already have been included on State or Federal endangered species lists or have been designated species of concern. Enhancement and protection of large tracts of mature bottomland forest will help preserve these species of concern and may prevent the need to list additional species in the future.

Pecan orchards provide habitat for some canopy-dwelling birds and food for species that consume pecans and insects sustained by the trees, but the orchards do not provide the diversity of plant species, layers of vegetation,

and scattered wetland areas that naturally occur in mature bottomland hardwood forests. Thus, they do not support the diversity of wildlife species or sheer numbers of animals normally found in mature floodplain forest ecosystems.

***Strategies for Accomplishing Objective:***

1. Plant oaks and other native tree and shrub species as necessary to restore bottomland hardwood forest diversity.
2. Protect regenerating bottomland forests from wildfire.
3. Prohibit the harvest of timber, including the harvest of standing dead and fallen timber that provides nesting and roosting sites for cavity-nesting birds and other native wildlife.
4. Allow natural encroachment of native tree and shrub species into pecan orchards.

**Objective C:**

**Convert all exotic grass pastureland to bottomland hardwood forest, wetland, or tallgrass prairie conditions that originally existed on the sites.**

***Current Status:*** Small remnants of native prairie exist on some upland and bottomland sites on the Refuge. Exotics such as Bermuda grass are found around old home sites and in improved pastures. Exotic grasses and native grasses are mixed on some grassland areas.

There are no high quality tallgrass prairie sites remaining on the Refuge.

***Rationale for Objective:*** Exotic grass pastureland is characterized by a lack of plant species diversity and does not provide habitat for most migratory birds or other native

wildlife species. The natural plant communities which historically existed on Refuge lands support a greater diversity of wildlife species including many species known to be declining, such as many songbirds of mature bottomland forest and tallgrass prairie.

Fire was an essential component of the original tallgrass prairie ecosystem. Periodic fires caused by lightning eliminated invading brush and trees, and maintained the open, expansive prairie vistas.

***Strategies for Accomplishing Objective:***

1. Eliminate grazing in bottomlands.
2. Allow native plant species to invade and replace exotic grasses and/or replant with native species as necessary.
3. Fill drainage ditches to restore former wetland sites as needed.
4. Create new wetlands to reestablish the former wetlands/forest mix.
5. Treat upland pastureland with prescribed burns to control brush and reestablish native grasses and wildflowers that are adapted to fire.

**GOAL 3.**

**Protection and Enhancement of Habitat for Migratory Birds**

**Objective A:**

**Provide quality habitat to support peak populations of waterfowl equivalent to 2 million waterfowl use days per year.**

***Current Status:*** Duck populations on the Refuge usually peak at 5,000-10,000,

depending on weather conditions. Current waterfowl use is estimated at 300,000-400,000 use days. Flooding normally occurs during the spring and/or late summer prior to the arrival of migrating waterfowl. Because of inadequate Refuge staffing, only aerial population counts are performed.

**Rationale for Objective:** One of the primary purposes of the Refuge is to protect and enhance waterfowl habitat. Over 50 percent of the wetlands in the United States have been filled or drained. Over 60 percent of the historic wetlands in Oklahoma have been converted to other uses. Wetland loss has caused a related decrease in waterfowl numbers by limiting nesting, migration, and wintering habitat.

Improving the quality and quantity of Refuge waterfowl habitat will provide for an increase in the number of waterfowl, particularly mallards, that the Refuge can support.

**Strategies for Accomplishing Objective:**

1. Continue acquisition from willing sellers of lands within the proposed Refuge boundary.
2. Develop moist soil management units and wetlands on desirable sites.
3. Construct at least three greentree reservoirs on suitable sites within the Refuge.
4. Continue restoration and enhancement of the bottomland hardwood forest/wetlands complex.
5. Enhance the Refuge wood duck population through the construction of wood duck nest boxes.

6. Protect standing dead timber for wood duck nesting habitat.

**Objective B:**

**Maintain and enhance habitat for migratory nongame birds and for resident bird species.**

**Current Status:** Surveys of Refuge habitats and the wildlife populations inhabiting them have not been accomplished due to lack of staff; therefore, habitat acreages and wildlife population estimates are not available.

Although most of the forest tracts on the Refuge are not mature, they support an abundant and diverse bird community. The interspersed emergent and forested wetlands on the Refuge provides habitat for many species of migrating and resident songbirds, woodpeckers, herons and egrets, owls and hawks, shorebirds, marshbirds, cormorants, and upland game birds. Standing dead timber is common on the Refuge and provides ample nesting sites for cavity-nesting species. Mast-producing trees such as oaks, pecans, and hickories furnish abundant food for wild turkeys, jays, and woodpeckers. Oldfields and forest edge harbor native sparrows and bobwhite quail.

**Rationale for Objective:** The protection of wetlands and bottomland hardwood forests are stated purposes of the Refuge. These habitats and many of the species they support are rapidly disappearing.

While managing bottomland hardwood forest for mature timber will cause a reduction in populations of some avian species that use old farm fields or brushy habitat, the populations of species requiring mature forest habitat will increase.

**Strategies for Accomplishing Objective:**

1. Protect, restore, and enhance wetland habitat for marshbirds and waterbirds.
2. Protect, restore, and enhance bottomland hardwood forest habitat for songbirds and raptors.
3. Protect, restore, and enhance native tallgrass prairie for migrant songbirds and upland game species.
4. Control wildfire to protect standing dead timber important to cavity-nesting species.
5. Conduct annual breeding bird and wintering bird surveys to determine species composition and population trends on the Refuge as indicators of habitat quality.
6. Provide special protection for existing heron rookeries.
7. Use law enforcement to protect turkey populations from illegal harvest.

**Objective C:**

**Establish three waterfowl sanctuaries, totaling 2,500 acres, which are closed to all public entry.**

**Current Status:** The Refuge currently is not open to waterfowl hunting. Many of the prime waterfowl wintering areas within the proposed boundary remain in private ownership. In addition, approximately 4,000 acres of currently-owned Refuge lands, including some of the best waterfowl habitat on the Refuge, are closed to public entry because of a lack of public access.

**Rationale for Objective:** By law, a maximum of only 40 percent of lands purchased with Duck Stamp funds may be opened to waterfowl hunting. Establishing inviolate sanctuaries on the Refuge will ensure that migrating and wintering waterfowl have safe places to feed, rest, and roost. Providing safe haven areas will help preserve these species for enjoyment by future generations of hunters, bird watchers, and other nature enthusiasts.

**Strategies for Accomplishing Objective:**

1. Continue acquisition from willing sellers of land within the proposed Refuge boundary.
2. Develop three waterfowl sanctuaries, one each in units two, three, and six.

**GOAL 4.**

**Protection and Enhancement of Refuge Habitat to Sustain Healthy Populations of Native Fish and Wildlife in Addition to Migratory Birds.**

**Objective A:**

**Maintain the white-tailed deer population density average at one deer per 25 acres.**

**Current Status:** Although observations indicate that the Deep Fork bottomlands currently support a healthy white-tailed deer population, deer censuses have not been conducted on the Refuge. Censuses on the adjacent Okmulgee Game Management area during the past 10 years found the white-tailed deer population density ranging from one deer per 20 acres to one deer per 30 acres.

It seems likely that the Refuge supports similar deer densities. The local deer population is transient and deer regularly move across Refuge/Management Area boundaries.

**Rationale for Objective:** White-tailed deer are the largest and most visible herbivores in the bottomland forests of eastern Oklahoma, and they play an important role in the ecosystem. In the past deer were the preferred prey of mountain lions and an important source of food for red wolves. Today, mountain lions are rarely reported in eastern Oklahoma, and wolves have been eliminated from the state. Coyotes occasionally take fawns, but heavy fawn predation by coyotes usually occurs only in very dry years when other sources of food are scarce.

Humans are currently the only major predators of white-tailed deer in eastern Oklahoma, and deer hunting is a popular and historically important pastime for residents living near the Deep Fork bottoms. Deer are also favorites of non-consumptive wildlife enthusiasts. Maintaining a healthy deer population in the area is essential to providing quality recreational hunting and wildlife viewing on the Refuge.

**Strategies for Accomplishing Objective:**

1. Test thermal imagery as a tool for censusing deer.
2. Design and implement an ongoing population monitoring scheme to determine deer population levels, age and sex ratios, and trends through time.
3. Cooperate with the Oklahoma Department of Wildlife Conservation to enforce game laws and regulations to prevent illegal taking (poaching) of deer.
4. Protect and enhance bottomland hardwood

forest which provides excellent deer habitat.

5. Coordinate deer hunting activity with the Oklahoma Department of Wildlife Conservation to ensure proper management of the herd on the Refuge and in the surrounding area.

**Objective B:**

**Restore and maintain bottomland forest, wetlands, and uplands on the Refuge to benefit small game species.**

**Current Status:** Refuge lands currently offer excellent food and cover for small game species. An abundance of oak and pecan trees in the bottoms support squirrel populations estimated by Refuge personnel to be as high as two squirrels per acre in some areas. Past reports by the Oklahoma Department of Wildlife Conservation estimated raccoon populations in the Deep Fork bottoms to be among the highest in the state. Rabbits are often seen on the Refuge, but rabbit censuses have not been conducted and population estimates are not available. It should be noted that planned management to restore a mature forest community will reduce, but not eliminate, rabbit populations in the future.

**Rationale for Objective:** Small game species are important components of the bottomland hardwood forest ecosystem. Squirrels bury acorns and other nuts for winter storage and many of these germinate to produce seedlings that replace old or dying trees. Squirrels and rabbits are important prey items for avian and mammalian predators. Omnivorous raccoons are major predators of frogs, crayfish, and other invertebrates, but much of their diet consists of acorns, persimmons, grapes, and other fruits. Thus, they also play a role in seed dispersal. The observation and hunting of

squirrels, rabbits, and raccoons provides important recreational opportunities for Refuge visitors.

***Strategies for Accomplishing Objective:***

1. Survey and monitor populations of small game species to determine their status and population trends on the Refuge.
2. Evaluate and monitor the impacts of management activities on small game species.

**Objective C:**

**Restore and maintain bottomland forest, wetlands, and uplands on the Refuge to benefit nongame species.**

***Current Status:*** Bottomland habitats on the Refuge range from relatively mature forest to thick stands of brush and vines to emergent wetlands and sloughs. Open pecan orchards occupy some bottomland areas within the proposed boundary. Upland sites on the Refuge consist of native tallgrass prairie or oak/hickory savannah. Where steep elevational gradients occur, the slopes are forested and rocky.

No surveys have been conducted to date to determine species composition or status of nongame wildlife on the Refuge; however, the varied habitats on the Refuge should support healthy populations of nongame mammals, reptiles, amphibians, and invertebrates.

***Rationale for Objective:*** Nongame species are those wildlife species that are not hunted for food or sport. On a world-wide basis, nongame species comprise well over 90 percent of all animal life.

Excluding nongame birds, which are discussed under Goal 3, nongame species on the Refuge include bats, rats, mice, voles,

moles, shrews, snakes, turtles, lizards, frogs, toads, salamanders, insects, and other invertebrates. Many of the most beautiful and interesting wildlife species on the Refuge belong to this group. They are integral components of the bottomland forest ecosystem, and they contribute to the enjoyment of all Refuge visitors.

***Strategies for Accomplishing Objective:***

1. Protect and enhance bottomland forest and emergent wetlands to benefit nongame species adapted to mature floodplain forest habitats.
2. Protect and enhance upland sites on the Refuge to benefit nongame species adapted to tallgrass prairie or prairie/oak savannah.
3. Survey and monitor nongame wildlife to determine species composition and status on the Refuge.

**Objective D:**

**Maintain minimum instream flows in the Deep Fork River and other perennial streams that flow across the Refuge to provide for the needs of native fish and other aquatic species and to ensure maintenance of the bottomland hardwood forest ecosystem on the Refuge.**

***Current Status:*** The Deep Fork River, and a number of creeks that cross the Refuge are perennial streams that maintain water flow year-round. They provide a necessary and reliable water source for plants and animals and habitat for fish and other aquatic organisms.



**Rationale for Objective:** Substantial water withdrawals from the Deep Fork River or other perennial streams that flow through the Refuge for the generation of hydroelectric power or other human uses could alter the entire character of the Refuge; water withdrawals would reduce the amount of water in the streams and could modify the frequency and elevation of flood flows.

The ecology of the Deep Fork bottomland hardwood forest is dependent upon flooding and the availability of water. Out-of-bank flood flows restore wetlands and sloughs and deposit rich soil that nourishes the system.

Water from the river and other streams replenishes the aquifer in the flood plain and maintains the water table at or near the soil's surface. Maintenance of a high water table is crucial to the health of area wetlands.

Providing suitable habitat for fish and other aquatic organisms that inhabit the Deep Fork River and other Refuge streams requires maintenance of minimum instream flows to meet their needs.

**Strategies for Accomplishing Objective:**

1. Complete an instream flow needs determination for the Deep Fork River.
2. Survey and monitor aquatic species on the Refuge to determine species composition and status.

**GOAL 5.**

Restoration of Native Threatened and Endangered Species on Refuge Lands

**Objective A:**

**Enhance and Protect Bald Eagle Populations on the Refuge**

**Current Status:** The threatened bald eagle is the only federally-listed species known to occur on the Refuge. Wintering bald eagles use large trees along Refuge waterways for foraging and perching. No communal winter roost has been found on Refuge property. Although eagles are not known to have nested on the Refuge, there is an increasing population of resident bald eagles in eastern Oklahoma, and future nesting on Refuge land is a distinct possibility.

**Rationale for Objective:** The Fish and Wildlife Service has the responsibility for protection and restoration of all federally-listed species including the bald eagle. In addition, the Endangered Species Act requires that federally-listed species be protected on all Federal project sites.

Although bald eagle populations currently are increasing, habitat destruction remains one of the greatest threats to our national symbol. Bald eagle recovery plans stress habitat protection as essential to ensuring the survival of the species. Bald eagles require mature trees along waterways as foraging perches and nesting sites; these habitat elements are crucial to the ecology and continued existence of the birds.

The presence of bald eagles on the Refuge will greatly enhance the richness of the wildlife experience of visitors to the facility.

**Strategies for Accomplishing Objective:**

1. Initiate Section 7 consultation on any proposed Refuge activities that may affect the bald eagle, as required of all Federal actions.
2. Protect mature sycamore and cottonwood trees (preferred bald eagle perch trees) located along the Deep Fork River and other large water bodies on the Refuge from harvest and fire.

3. Conduct annual mid-winter bald eagle surveys on the Refuge to determine numbers and locations of eagles using Refuge lands.
4. Search for bald eagles and eagle nests during aerial waterfowl counts.
5. If bald eagle nests are found on the Refuge, establish buffer zones around nest trees as recommended in the Bald Eagle Recovery Plan.

**Objective B:**

**Determine if other federally-listed species or species of State concern are found on the Refuge.**

**Current Status:** The Refuge has not been surveyed for federally-listed endangered and threatened species or species of State concern. The endangered American burying beetle is known from counties adjacent to Okmulgee County, but the species has not been reported from Okmulgee county. The alligator snapping turtle is the only species of State concern known from the Refuge. The river otter, also a species of state concern, is strongly suspected to occur on the Refuge.

**Rationale for Objective:** The Fish and Wildlife Service has the responsibility for protection and restoration of federally-listed endangered and threatened species. In addition, preservation, restoration, and enhancement of endangered and threatened species is one of the stated objectives for all National Wildlife Refuges.

**Strategies for Accomplishing Objective:**

1. Conduct surveys for the American burying beetle on the Refuge.

2. Determine other wildlife species of Federal or State concern that could be found on the Refuge and survey areas of appropriate habitat for these species. Surveys will be conducted by refuge personnel, university scientists, and knowledgeable volunteers.

**GOAL 6.**

**Development of a Database of Pertinent Scientific Information Regarding Refuge Habitats and Wildlife.**

**Objective A:**

**Map and monitor Refuge habitats.**

**Current Status:** No maps have been generated depicting habitats on the Refuge. The Service possesses complete sets of both standard color and infrared aerial photographs of the entire Refuge; the most recent aerial photographs were taken in 1994.

**Rationale for Objective:** Monitoring and mapping updates provide detailed pictures of general habitat changes and changes in vegetative cover through time. Management decision are based upon habitat distribution maps and monitoring reports.

**Strategies for Accomplishing Objective:**

1. Update aerial photography every five years to assist in monitoring vegetation changes.
2. Develop vegetation and species distribution maps for use in making management decisions and to identify areas of high use such as heron rookeries.

3. Establish permanent plant transects to determine changes in plant communities through time.
4. Establish baseline data of plant species found on the Refuge through extensive plant collection and identification.

### **Objective B:**

**Create and maintain a database of Refuge wildlife resources for use in making management decisions and documenting changes in wildlife composition.**

**Current Status:** No sufficient database exists for any Refuge resource. Aerial wintering waterfowl counts were begun in 1994. Breeding bird survey routes were established in 1997, and the first breeding bird survey was completed in the spring of 1998.

**Rationale for Objective:** A knowledge of the current population densities and trends of wildlife species found on the Refuge is important for making management decisions about activities and management practices that could affect those species.

#### **Strategies for Accomplishing Objective:**

1. Conduct annual wintering waterfowl inventories and wood duck production surveys.
2. Conduct winter bird counts and breeding bird surveys to obtain baseline bird information.
3. Initiate annual deer censuses.
4. Evaluate the use of aerial thermal video for deer counts.

5. Conduct annual censuses for small game species actively hunted on the Refuge (currently squirrel and rabbits).
6. Conduct surveys of reptiles and amphibians to determine species composition.
7. Conduct surveys of fish and aquatic invertebrates to determine species composition.
8. Establish baseline data for endangered and threatened species and other species of concern.
9. Enlist the assistance of researchers, universities, natural resource agencies, and conservation organizations for inventory and monitoring efforts.

### **Objective C:**

**Prepare and implement a monitoring plan for environmental quality on the Refuge.**

**Current Status:** Water samples and sediments from several locations on the Refuge, including Okmulgee Creek and the Deep Fork River, have undergone preliminary contaminants analyses. These analyses did not indicate significant contamination. No contaminants monitoring plan exists for the Refuge.

**Rationale for Objective:** Contaminants such as crude oil and gas, pesticides, herbicides, heavy metals, fertilizers and raw sewage can cause serious problems for wildlife, fish, and the habitats on which they depend.

Contaminants affect fish and wildlife resources in different ways. At high enough levels, many contaminants are toxic; at lower concentrations, they can cause birth defects,

reproductive failure, cancers, lesions, reduced resistance to diseases, and/or detrimental genetic mutations. Sewage and fertilizers contain high nutrient concentrations that foster algal blooms that deplete the water of dissolved oxygen required by fish and aquatic invertebrates.

Potential sources of contaminants that could affect the Refuge are farming operations along the Deep Fork River upstream of the Refuge, municipal sewage treatment plants, oil and gas extraction operations, oil and gas pipelines that cross the Refuge, and zinc and lead from a smelter Super Fund site near Henryetta (clean-up of this site was completed in 1997).

Monitoring of contaminants on the Refuge would help identify potential problems as they occur and allow environmental cleanup before concentrations reach critical levels.

Determination of contaminant levels in Refuge streams prior to serious contaminant spills would establish baseline data that could be used to compare conditions before and after spills occur. Such information is invaluable in determining the extent of damage and cleanup costs.

#### ***Strategies for Accomplishing Objective:***

1. Conduct baseline contaminants surveys on the Refuge and initiate a contaminants monitoring program, repeated at 5-year intervals, to document changes. The program would include analyses of the presence and concentration of contaminants in water, sediments, and fish and aquatic invertebrates.
2. Monitor wildlife and fisheries populations as indicators of environmental quality.
3. Monitor oil and gas operations on the Refuge.

4. Survey all existing wells on the Refuge to determine if they are active, inactive, plugged, or abandoned.
5. Coordinate with the Oklahoma Corporation Commission to ensure cleanup and oil and gas well closures as appropriate.
6. Develop an emergency contaminant spill plan.

#### **GOAL 7.**

### **Provision of Quality Consumptive and Non-consumptive Wildlife-oriented Recreation.**

#### **Objective A:**

**Establish high quality hunting programs on Refuge lands in cooperation with the Oklahoma Department of Wildlife Conservation.**

***Current Status:*** The Refuge currently holds three special archery hunts and one muzzle-loader hunt for white-tailed deer annually. In addition, approximately 4,200 acres of the Refuge (those areas with public access) have been opened to squirrel and rabbit hunting during the state seasons with one exception; the Refuge is closed to squirrel and rabbit hunting from the beginning of archery deer season through the rifle season.

The Oklahoma Department of Wildlife Conservation provides assistance for these hunts.

***Rationale for Objective:*** The Deep Fork River bottomlands historically were used for subsistence hunting by Native Americans for hundreds of years. Contemporary local inhabitants have continued the tradition, and

hunting remains a very important recreational activity in the area.

***Strategies for Accomplishing Objective:***

1. Modify big game and upland game plans as land is acquired, the habitat changes or the wildlife population changes. Modify seasons and the number of permits issued annually based upon population estimates.
2. Continue small game hunting (squirrel and rabbit) on the Refuge.
3. Hold a waterfowl hunt on Refuge lands, contingent upon acquisition from willing sellers of prime wintering waterfowl areas.
4. Construct green tree reservoirs and/or moist soil units in units 1 and 5.
5. Hold raccoon hunts by permit only. Permits will specify the number of hunters allowed on the Refuge per day. Seasons and sites for raccoon hunts will be determined so as to minimize impacts on other wildlife and conflicts with other hunting and public use programs. Design maps and permits for this use.
6. Hold annual turkey hunts when the Refuge turkey population increases to huntable levels.
7. Update maps annually to designate areas open for hunting.

**Objective B:**

**Provide fishing opportunities along the Deep Fork River at existing, easily accessible areas.**

***Current Status:*** The Deep Fork River was

opened to year-round fishing in 1994. Bank fishing access is provided where the river crosses existing public roads. Boat access currently is limited to small boats which can be launched from the steep banks of the Deep Fork River. Many stretches of the river are too shallow to permit boat travel during dry periods. Motor boat traffic over several rock riffle areas on the Refuge is not possible during low stream flows.

Sloughs separated from the river are open to fishing from March to October. Trot lines, limb lines, and bank lines are prohibited on sloughs and wetlands separated from the river to prevent marsh birds and waterbirds from becoming entangled in the lines.

***Rationale for Objective:*** Providing Refuge visitors with safe, enjoyable, compatible, wildlife-oriented recreation is a goal of the Refuge System. Fishing is one of the priority general public uses of Refuge lands as designated by Executive Order 12996 and by the National Wildlife Refuge System Improvement Act of 1997. Recreational fishing has long been an important pastime for area residents, and there is considerable local interest in maintaining access to traditional fishing areas.

***Strategies for Accomplishing Objective:***

1. Enhance the parking facilities for fishing access to the Deep Fork River at Coalton Bridge and Highway 75, and develop a total of two more parking areas for fishing access along Sharp Road (after acquisition), and Highway 56 (after highway reconstruction).
2. Develop handicapped-accessible fishing sites.
3. Investigate the feasibility of constructing a boat ramp on the Deep Fork River for universal accessibility. Determine if it is

possible to design and build a ramp that would not wash away or be silted in during the extreme floods that occur on the Deep Fork River.

4. Develop a universally accessible fishing area, if feasible.
5. Install informational signs on fishing at parking areas that provide fishing access.
6. Develop a fishing brochure.

### **Objective C:**

**Provide enhanced opportunities to view and enjoy wildlife on the Refuge.**

**Current Status:** Nine graveled public parking areas have been established adjacent to county roads on the Refuge, and five of these are located near existing oil well access roads which are available for use by the public as hiking trails. However, public access to the Refuge is severely limited; permanent Refuge trails have not been designed or constructed, and staffing and funding problems currently prevent establishment and maintenance of trails, blinds, or other enhancements to viewing wildlife on the Refuge.

**Rationale for Objective:** Wildlife observation and photography are among the compatible, wildlife-dependent recreational activities mandated as priority general public uses of the Refuge System under Executive Order 12996 and by the National Wildlife Refuge System Improvement Act of 1997.

The abundance and diversity of wildlife, particularly birds, in the Deep Fork bottomlands, makes the Refuge an ideal potential site for meeting growing demands for good wildlife viewing and photographic opportunities.

### **Strategies for Accomplishing Objective:**

1. Improve existing parking areas by replacing barbed wire fences with pipe fencing, adding additional gravel, and installing leaflet boxes and informational signs to provide information on recreational activities.
2. Establish three interpretive trails in units 3 and 4.
3. Construct a universally accessible trail.
4. Construct a parking lot containing a kiosk with interpretive panels and a connecting interpretive trail (3-4 miles long) off Highway 75 for wildlife and wildlands viewing.
5. Construct a foot bridge in Unit 1 to permit access into the unit when area creeks are high. This access would be available to consumptive and non-consumptive users.
6. Construct a kiosk with interpretive panels and a short trail (about ½ mile long) in Unit 4.
7. Develop an interpretive site, complete with a paved parking area, kiosk with interpretive panels, and a spotting scope, overlooking moist soil units off Sharp Road in Unit 3.
8. Construct a 1-mile trail with interpretive signage and waterproof benches in Unit 3.
9. Remove all structures and buildings not needed for Refuge operations as lands are acquired to improve aesthetics and the natural experience for Refuge visitors.

## GOAL 8.

**Development of Education and Outreach Programs That Enable the Public to (1) Understand, Enjoy, and Value the Fish and Wildlife Resources Found on and off the Refuge, (2) Understand Events and Issues Related to These Resources; and (3) Act to Promote Fish and Wildlife Conservation.**

### Objective A:

**Provide opportunities for the public to learn about key Refuge wildlife species and representative habitat characteristics of the Deep Fork National Wildlife Refuge, and promote a conservation ethic.**

*Current Status:* Those areas of the Refuge that have existing public access are open to wildlife viewing, photography, hiking, and other non-consumptive, compatible recreational activities in addition to squirrel and rabbit hunting. However, no permanent trails have been established to facilitate wildlife viewing. The present staff of three permanent employees is not sufficient to allow accompanied tours or educational outings requiring staff assistance. No interpretive information currently is available.

*Rationale for Objective:* Wildlife refuges offer the public exceptional opportunities to experience and to learn about nature 'up close and personal' in natural but relatively nonthreatening surroundings that provide maximum enjoyment. Most Americans currently are generations removed from any significant, first-hand experience with the natural world. A knowledge and appreciation of the aesthetic value of plants and animals and the importance of their roles in the ecosystem, fostered by Refuge visits and educational programs, will motivate people to

support critical conservation issues or legislation crucial to the protection of these resources.

### *Strategies for Accomplishing Objective:*

1. Evaluate potential interpretive sites.
2. Determine interpretive message content
3. Establish three interpretive sites (one each in units 3, 4, and 5) to educate visitors about bottomland hardwood forest resources. Include at each site a kiosk with three interpretive panels.
4. Establish three public parking areas near interpretive sites.
5. Acquire remaining privately-held property within the proposed Refuge boundary to provide maximum opportunities for viewing wildlife and habitat diversity on the Refuge.
6. Establish a visitors' center complex including a trail, kiosk, and interpretive/orientation signs.
7. Hire a public use specialist to develop and manage educational and public use programs for a variety of audiences and age groups.

### Objective B:

**Develop high quality environmental education programs centered around Refuge resources and bottomland hardwood forest ecosystems.**

*Current Status:* Refuge educational materials and programs have not been developed.

**Rationale for Objective:** Environmental education is one of the priority general public uses of the Refuge System. Educational opportunities on and off the Refuge would be seriously limited without the development of educational materials and programs appropriate for the various age groups of Refuge visitors.

**Strategies for Accomplishing Objective:**

1. Hire a public use specialist to coordinate the development of educational programs.
2. Cooperate closely with area educators in the development of suitable programs for various educational levels (Kindergarten through college), and provide quality learning opportunities on the Refuge. Prepare environmental education materials for use on the Refuge.
3. Identify locations appropriate for use as outdoor classrooms.
4. Create programs on the importance of bottomland hardwood forest habitat to be presented at schools and colleges.
5. Develop teaching materials on bottomland hardwood forests, including 4 trunks with customized curricula, to be used by teachers in local school systems.
6. Develop a portable exhibit on bottomland hardwood forest values.
7. Conduct teacher workshops drawing on the expertise of interpretive staff from other refuges and/or personnel from the Regional Office.

**Objective C:**

**Public Outreach**

**Current Status:** No Refuge public outreach programs are currently in place.

**Rationale for Objective:** The National Wildlife Refuge System is not recognized or known by a majority of the American public. Although the first Refuge was established in 1903, many people are not aware that refuges exist or why they are important.

The Deep Fork Refuge must have the support of the local community and the general public if it is to thrive.

**Strategies for Accomplishing Objective:**

1. Involve the media to (1) inform the public about bottomland hardwood forest ecology and the role of the Refuge in protecting bottomland resources and (2) notify the public about proposed actions and activities on the Refuge.
2. Prepare and implement a sign plan that includes Refuge entrance signs, Refuge signs on highways, directional signs on county roads, trailhead signs, and fishing information signs.
3. Create a general Refuge brochure.
4. Develop slide presentations about bottomland hardwood forests and Refuge habitats and wildlife.
5. Contract the development of a video program about the Refuge.
6. Develop partnerships with area landowners to enhance wildlife habitat on private lands.



## **GOAL 9.**

### **Compliance with Historic and Archaeological Resource Protection Laws and Regulations**

#### **Objective A:**

##### **Provide Protection for Refuge Archaeological and Cultural Resources to Prevent their Inadvertent Loss or Destruction.**

*Current Status:* No systematic archaeological or historic site surveys have been conducted on the Refuge. No formal archaeological survey has been conducted on the Refuge or any of the lands proposed for addition to the Refuge. It is believed that past land use practices and erosion from periodic flooding likely have disturbed, altered, or destroyed most archaeological and historical sites.

#### ***Rationale for Objective***

To comply with the National Historic Preservation Act of 1966 and Departmental and U.S. Fish and Wildlife Service policy, the Refuge is required to follow established policies and procedures as identified in the Service Manual, Chapter 614 with respect to the following areas: (1) Refuge construction projects, (2) law enforcement, (3) visitor use, (4) special use permits, research referral, (5) special use permits, non-Service land use, (6) reporting new cultural resources, (7) reporting maintenance, stabilization, and protection needs, (8) National Register nominations, and (9) archives and collections.

#### ***Strategies for Accomplishing Objective:***

1. Comply with provisions outlined in 5 RM 16 of the Refuge Manual and the 1984

Cultural Resources Management Policy Statements regarding the preservation-in-place objective.

2. Coordinate with the Regional Historic Preservation Officer for assistance with cultural resource surveys and formal consultations prior to any construction that could impact known or unknown cultural resources.
3. Provide law enforcement as needed against unauthorized removal of cultural remains.
4. Contact the State Historic Preservation Officer and get detailed reports on any archeological sites that have been found within the proposed Refuge boundary.
5. Refer all special use permit requests for archeological investigations to the Regional Historic Preservation Officer.
6. Consult the Regional Historic Preservation Officer regarding any cultural resource sites or objects found by or reported to Refuge personnel.
7. Provide recommendations to the Regional Historic Preservation Officer for stabilizing, maintaining, or protecting sites that are being impacted by natural events or human actions.

## **GOAL 10.**

### **Institution of an Efficient Administration That Supports Accomplishment of Refuge Objectives.**

## **Objective A:**

### **Design and Construct a Visitor Contact Station and Headquarters.**

**Current Status:** The Refuge currently is headquartered in a single room on the third floor of the Post Office/Federal Building in Okmulgee, Oklahoma. No buildings have been constructed on Refuge lands. No restroom facilities are available on the Refuge.

Acquisition of Refuge land is not complete and the site of the future Refuge headquarters and visitor contact station has not been determined. The site will be located on or near Highway 75 due to the larger volume of traffic and accessibility from the roadway.

**Rationale for Objective:** The current headquarters is inadequate and inconvenient. The closest access to Refuge land is approximately three miles from the office. No vehicle storage facilities are available on site (the vehicle storage facility is roughly 1.5 miles from the office), and there are no parking facilities for Refuge staff or visitors at the Federal Building. Space is limited; there is no room to display brochures or educational materials and no area dedicated to greeting visitors. Groups wishing to meet in Okmulgee to visit the Refuge currently must assemble in a commercial parking lot adjacent to Highway 75.

The lack of restroom facilities makes it inconvenient for families and school groups to enjoy the Refuge.

### **Strategies for Accomplishing Objective:**

1. Complete land acquisition from willing sellers and identify the best location for a Refuge headquarters/visitor contact station.

2. Design and construct a headquarters/visitor contact station near Highway 75.
3. Construct restroom facilities at one additional location.

## **Objective B:**

### **Acquire a Staff Adequate to Operate and Maintain the Refuge and Conduct Environmental Educational Programs both on and off the Refuge premises.**

**Current Status:** Although the Refuge staffing plan calls for eight permanent employees, the Refuge Manager, Assistant Manager, and a program assistant are currently the only permanent staff on the Refuge.

**Rationale for Objective:** The current Refuge staffing level is barely adequate to maintain the Refuge and conduct the special hunts already instituted on Refuge land. Planning and improvements needed to provide habitat improvements, increased consumptive recreational uses, and non-consumptive recreational and educational opportunities on the Refuge will require additional staff.

### **Strategies for Accomplishing Objective:**

1. Add the following personnel in priority order:

Outdoor Recreation Planner  
Maintenance Worker  
Biologist  
Maintenance worker  
Refuge Officer  
Interpretive Specialist

## **Objective C:**

### **Acquire Sufficient Equipment to Adequately Manage the Refuge.**

**Current Status:** The Refuge currently owns two 4X4 vehicles, one backhoe, one trailer, two ATVs, one small boat, one small tractor, one dump truck, and one Case 450 bulldozer. The backhoe, tractor, and bulldozer were acquired from excess property and are in various stages of disrepair. The 4X4 vehicles and ATVs are worn and soon will need to be replaced.

**Rationale for Objective:** Efficient management of Refuge lands requires adequate equipment. Most of the Refuge is wet year round. Four-wheel drive vehicles are necessary to traverse Refuge roads and all terrain vehicles must be used to cross Refuge lands. A boat is needed to navigate the Deep Fork River and for search and rescue operations. Restoration of wetlands, development and maintenance of moist soil units, greentree reservoirs, roads, and trails cannot be accomplished without appropriate equipment.

#### **Strategies for Accomplishing Objective:**

1. Acquire 4-wheel drive vehicles for staff as they are hired.
2. Purchase an outboard motor boat.
3. Purchase a lowboy trailer, or acquire one from excess property.
4. Replace a worn bulldozer.
5. Purchase a brush hog, mower, and box blade.

6. Purchase a bobcat loader with tree shearer, post hole digger, and tree planter.
7. Purchase adequate tools and shop equipment.

## **Objective D:**

### **Acquire Adequate Equipment Storage Facilities and Maintenance Shop Building**

**Current Status:** The Refuge currently leases a 2,000-square-foot storage building in Okmulgee, Oklahoma, which doubles as a storage facility for some vehicles and a maintenance shop. The building is located approximately 1.5 miles from the headquarters.

Fencing supplies and some equipment are stored on the Okmulgee Wildlife Management Area, roughly 6 miles from the office.

The current storage facility is inadequate for present needs, and will not accommodate the additional equipment needed for the Refuge.

**Rationale for Objective:** Providing a locked, indoor storage and maintenance area protects equipment from weather, vandalism, and theft, and affords secure, comfortable working conditions in all kinds of weather.

#### **Strategies for Accomplishing Objective:**

1. Build adequate equipment storage facilities on the Refuge.
2. Construct a maintenance shop and chain link enclosure at the site of the storage facility.

## Objective E:

### Identify the Refuge boundary and protect the Refuge from trespass.

**Current Status:** Refuge lands are surveyed after acquisition of individual tracts is complete and as Fish and Wildlife Service surveyors are available to conduct surveys. Surveyors and Refuge personnel clear brush from boundary lines, which are then identified with Refuge boundary signs or white carsonite markers.

Fences are constructed along proposed external boundaries as necessary to prevent trespass and as funds are available. Interior boundaries usually are not fenced, but are cleared and marked with signs or carsonite posts.

The proposed exterior Refuge boundary is roughly 61.5 miles long. Refuge fencing priority is given to areas where trespass is likely.

There is no open range on the Refuge. Although the State of Oklahoma requires livestock owners to contain their animals, adjacent landowners will be allowed to use external boundary fencing to contain their livestock. Where Refuge fencing is employed to keep livestock off the Refuge, the adjacent landowner or lessee will be required to help maintain the fences.

**Rationale for Objective:** Accurate marking of boundaries is necessary to prevent land disputes and to maintain good relations with adjacent landowners. Refuge boundaries must be clearly marked to prevent trespass by Refuge visitors onto adjacent private property. Adjacent landowners need to be aware of boundary locations so that they do not inadvertently intrude onto the Refuge while hunting or accidentally degrade Refuge habitat during farming, timber harvesting, or other activities. For purposes of law

enforcement, well-marked boundaries often are necessary to successfully pursue violations that occur on the Refuge.

### *Strategies for Accomplishing Objective:*

1. Survey exterior and interior boundaries as lands are acquired.
2. Continue fencing and marking exterior boundaries, giving priority to areas where trespass is likely.
3. Continue clearing and marking interior boundaries with Refuge boundary markers and carsonite posts.
4. Maintain fencing and perimeter markers around exterior Refuge boundaries as needed. (This will involve maintenance of approximately 61.5 miles of boundary when Refuge acquisition is complete.)

## Objective F:

Form a partnership with Okmulgee County to ensure that roads leading to Refuge access points and parking lots are maintained in good condition.

**Current Status:** Most Refuge access points and parking lots are located off graveled, all-weather surface county roads. Where these roads traverse bottomlands, they flood frequently and sometimes are impassible. Four-wheel drive vehicles carve deep ruts in the road surfaces during wet weather, and the roads require frequent regrading.

**Rationale for Objective:** Refuge visitors are expected to increase traffic on Okmulgee county roads. If the Refuge is to provide enjoyable outdoor experiences for visitors, it is important to keep access roads in good repair. Okmulgee County has limited capital

for road maintenance. Assisting the County with maintenance of Refuge access roads will benefit the Refuge, foster a good working relationship with Okmulgee County officials, and promote favorable attitudes about the Refuge among area residents.

***Strategy for Accomplishing Objective:***

1. Provide funding to assist Okmulgee County with maintenance of approximately 10 miles of county roads used to access the Refuge.

**Objective G:**

**Maintain two residences on land proposed for acquisition to be used as housing for Refuge employees or volunteers.**

***Current Status:*** There is no housing available within the current Refuge boundaries.

***Rationale for Objective:*** Housing Refuge personnel on site maintains a law enforcement presence on Refuge lands after the conclusion of normal working hours and ensures that help is close at hand when emergencies arise.

***Strategy for Accomplishing Objective:***

1. Maintain two existing residences on lands slated for acquisition from willing sellers to be used as housing for Refuge employees or volunteers. New residences would not be constructed.

**Objective H:**

**Eliminate economic uses of Refuge lands that do not benefit Refuge**

**habitat, except those that are mandated.**

***Current Status:*** Economic uses of privately-owned lands within the proposed Refuge boundary include grazing, pecan production, oil and gas production, and some farming operations. With the exception of oil and gas operations, these economic uses are terminated as Refuge lands are acquired, and previously-cleared lands are restored to native bottomland or upland habitat.

***Rationale for Objective:*** All economic uses of current or proposed Refuge lands involve the degradation of bottomland habitat. Restoring the land to a mature forest/wetland mix will increase plant diversity and boost the carrying capacity of Refuge bottomlands for waterfowl, other migratory birds, and other native wildlife species that require mature bottomland forest habitat.

***Strategies for Accomplishing Objective:***

1. Eliminate grazing as Refuge lands are acquired and restore pasture lands to natural conditions.
2. Restore all pecan orchards to a bottomland forest/wetlands mix.
3. Prohibit pecan harvesting in existing orchards on the Refuge; pecans are an important food resource for many native wildlife species including waterfowl, woodpeckers, some songbirds, turkeys, deer, squirrels, and rodents.
4. Eliminate timber harvest, including harvest of standing or fallen dead timber.
5. Issue permits for exploration and development of mineral and energy resources (i.e., oil and gas) as required on lands where the Refuge does not own

mineral rights (See 5 RM 13 of the Refuge Manual).

6. Prohibit oil and gas development in areas where the Refuge owns the mineral rights.
7. Allow trapping by permit to reduce beaver populations in areas where beaver dam construction causes problem flooding.
8. Eliminate farming operations as farm lands are acquired, except for those in Unit 6 where cooperative farming may be allowed to provide food crops for waterfowl.

## V. Management Action Plan Synthesis by Fiscal Year

### Ongoing:

1. Continue land acquisition from willing sellers with Land and Water Conservation Funds and Duck Stamp funds to ensure protection of the entire 16,000 acres contained within the proposed Refuge boundary.
2. Survey Refuge boundaries as lands are acquired.
3. Clear and mark Refuge boundaries as lands are acquired, and fence exterior boundaries as necessary.
4. Remove beaver dams as they are constructed during spring and summer except in areas where permanent flooding is desirable to maintain wetlands.
5. Encourage winter beaver trapping, by permit, in cooperation with the Oklahoma Department of Wildlife Conservation, and control beaver by other means as necessary.
6. Conduct monthly aerial waterfowl surveys from October-February.
7. Search for bald eagles and eagle nests during aerial waterfowl counts.
8. Provide protection for bald eagles using the Refuge and establish buffer zones around eagle nests located on the Refuge as recommended in the Bald Eagle Recovery Plan.
9. Initiate Section 7 consultation on any proposed Refuge activities that may affect the bald eagle.
10. Protect mature timber along the Deep Fork River and other large water bodies on the Refuge; large trees provide important foraging perches for eagles and nesting sites for eagles and herons.
11. Protect bottomland forest on the Refuge from wildfire and timber cutting.
12. Coordinate deer hunting activity with the Oklahoma Department of Wildlife Conservation to ensure proper management of deer on the Refuge and on the adjacent game management area, and enforce game laws and regulations to prevent illegal taking of deer.
13. Continue small game hunting (squirrel and rabbit) on the Refuge.
14. Update maps annually to designate areas open for hunting.
15. Use law enforcement to protect turkey populations from illegal harvest.
16. Work with the media to inform the public of proposed actions and activities on the Refuge and to educate the public about the importance of the Refuge in the preservation of bottomland hardwood forest values, functions, and wildlife.
17. Monitor oil and gas operations on the Refuge and coordinate with the Oklahoma Corporation Commission to ensure cleanup of well sites and well closures as

appropriate.

18. Prohibit mineral development on lands where the Refuge owns the mineral rights. Cooperate with oil and gas developers to allow exploration for and development of mineral and energy resources with a minimum of habitat disturbance on lands where the Refuge does not own mineral rights.
19. Encourage research activities and field studies on the Refuge that will provide resource data.
20. Cooperate with other agencies, organizations, and local landowners to improve the quality of water both on and off the Refuge within the Deep Fork River drainage basin.
21. Comply with the provisions outlined in 5 RM 16 of the Refuge Manual and the 1984 Cultural Resources Management Policy Statements regarding the preservation-in-place objective.
22. Provide law enforcement as needed against unauthorized removal of cultural remains.

#### **FY2000**

1. Pursue small boundary changes that would allow inclusion within the Refuge boundary of portions of wetlands that currently extend beyond the proposed confines of the Refuge.
2. Revegetate 10 acres of bottomland with oaks and/or other native tree and shrub species to speed restoration of forest diversity.

3. Restore pecan orchards to a bottomland forest/wetlands mix.(O) (A)<sup>18</sup>
4. Enhance the Refuge wood duck population through the construction of 20 wood duck nest boxes.
5. Initiate annual breeding bird surveys. (O)
6. Protect, restore, and enhance wetland habitat for marsh birds, waterbirds, and other wildlife. (O)
7. Initiate Refuge control of beaver populations in areas where beaver dam construction causes problem flooding.
8. Initiate annual deer censuses. (O)
9. Evaluate aerial thermal imagery as a tool for censusing white-tailed deer.
10. Conduct surveys for the endangered American burying beetle on the Refuge. Repeat surveys every five years. (O)
11. Enlist the assistance of researchers, universities, natural resource agencies, and conservation organizations for inventory and monitoring efforts. (O)
12. Create a general Refuge brochure.
13. Hire an office assistant and acquire a vehicle for his use.
14. Purchase a small, outboard motor boat.
15. Purchase a lowboy trailer, or acquire one from excess property.

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<sup>18</sup> O = Ongoing Activity suitable for implementation at any time. A = Acquisition Triggered Activity, require acquisition of additional Refuge land prior to implementation.



16. Purchase a brush hog, mower, and box blade.

**FY2001**

1. Replace existing beaver dams with water control structures in areas where managed wetlands, greentree reservoirs, or moist soil units would be beneficial.
2. Revegetate 10 acres of bottomland with oaks and/or other native tree and shrub species to accelerate restoration of forest diversity.
3. Encourage winter beaver trapping, by permit, in cooperation with the Oklahoma Department of Wildlife Conservation. (O)
4. Construct at least three greentree reservoirs on appropriate sites within the Refuge. (A)
5. Enhance the Refuge wood duck population through the construction of 20 wood duck nest boxes.
6. Establish a white-tailed deer monitoring scheme to determine population levels, age and sex ratios, and trends through time. (O)
7. Develop a waterfowl hunting plan for the Refuge. (A) (O)
8. Begin annual mid-winter bald eagle surveys to determine numbers and locations of eagles using Refuge lands. (O)
9. Develop a schedule for surveys for species of Federal or State concern likely to occur on the Refuge, and establish baseline data for endangered and threatened species and other species

of concern. (O)

10. Update aerial photography of the Refuge and repeat every 5 years to assist in monitoring vegetational changes. (O)
11. Initiate annual wood duck production surveys. (O)
12. Conduct baseline contaminants surveys on the Refuge.
13. Enhance the parking facilities for fishing access to the Deep Fork River at Coalton Bridge and Highway 75, and construct a parking area for fishing access along Highway 56.
14. Develop a parking area for fishing access along Sharp Road. (A)
15. Investigate the feasibility of constructing a boat ramp on the Deep Fork River for universal accessibility. See Item No. 3 in FY2003.
16. Improve existing parking areas.
17. Establish a visitors' center/headquarters complex near Highway 75, to include a trail, interpretive kiosk, and interpretive/orientation signs. (This project depends upon appropriations and land acquisition; it will require 2-3 years to complete construction once funds are appropriated.)
18. Construct restroom facilities at one additional location apart from the visitors' center. (This project also is dependent upon appropriations and land acquisition, and will require some time to complete once appropriations are approved.)
19. Construct a trail and footbridge in Unit 1 to facilitate access.

20. Construct a kiosk with interpretive panels and a short trail in Unit 4.
21. Construct a one-mile trail with interpretive signage and waterproof benches in Unit 3.
22. Establish three interpretive sites, each with a kiosk with three interpretive panels, to educate visitors about bottomland hardwood forest resources. (A)
23. Determine interpretive message content.
24. Establish parking areas near interpretive sites.
25. Hire a public use specialist, biologist, and maintenance worker.
26. Prepare environmental education materials for Refuge use.
27. Develop teaching materials on bottomland hardwood forests, including four trunks with customized curricula, to be used by teachers in local schools.
28. Develop a portable exhibit on bottomland hardwood forest values.
29. Conduct teacher workshops using interpretive staff from other refuges and/or personnel from the Regional Office.
30. Prepare and implement a sign plan that includes Refuge entrance signs, Refuge signs on highways, directional signs on county roads, trailhead signs, and fishing information signs.
31. Acquire 4-wheel drive vehicles for staff as they are hired. (O)

32. Purchase a bobcat loader with tree shearer, post hole digger, and tree planter.
33. Build adequate equipment storage facilities on the Refuge.
34. Construct a maintenance shop and chain link enclosure at the site of the storage facility.
35. Provide funding to assist Okmulgee County with maintenance of approximately 10 miles of county roads used to access the Refuge.

#### **FY2002**

1. Create permanent and temporary wetlands on the Refuge to assist in water quality improvement. (A)
2. Revegetate 20 acres of bottomland with oaks and/or other native tree and shrub species to speed restoration of forest diversity. (A)
3. Construct small dikes to create shallow wetlands. (A)
4. Restore and enhance native tallgrass prairie for migrant songbirds and upland game species through treatment with prescribed burns to control brush and reestablish native grasses and wildflowers that are adapted to fire. (O)
5. Enhance the Refuge wood duck population through the construction of 20 wood duck nest boxes.
6. Survey and monitor populations of small game species and furbearers to determine their status and population trends on the Refuge. (O)

7. Conduct surveys of reptiles and amphibians to determine species composition.
  8. Establish permanent plant transects for use in determining changes in plant communities through time.
  9. Compile an extensive plant collection and identification to provide baseline data for species found on the Refuge.
  10. Develop vegetation and species distribution maps for use in making management decisions.
  11. Survey all existing wells on the Refuge to determine status (active, inactive, abandoned, plugged, unplugged). Begin cleanup and capping of all abandoned and unplugged wells. (O)
  12. Formulate an emergency spill plan.
  13. Install informational signs on fishing at parking areas that provide fishing access.
  14. Cooperate closely with area schools (Kindergarten through college) to develop suitable programs for various educational levels and provide quality educational opportunities on the Refuge.
  15. Replace a worn bulldozer.
  16. Hire an additional maintenance worker.
3. Develop handicapped-accessible fishing sites.
  4. Construct a boat ramp and accessible fishing area if feasible.
  5. Develop a fishing brochure.
  6. Develop Refuge orientation video.
  7. Conduct surveys of fish and aquatic invertebrates to determine species composition, and continue sampling at 5-year intervals to monitor population trends. (O)
  8. Hire a law enforcement officer.
  9. Construct a parking lot, kiosk with interpretive panels, and a long trail (3-4 miles long) for wildlife and wildlands viewing off Highway 75.
  10. Identify appropriate locations for use as outdoor classrooms.

#### **FY2003**

1. Enhance the Refuge wood duck population through the construction of 20 wood duck nest boxes.
2. Develop moist soil units in Unit 3. (A)

#### **FY2004**

1. Fill in existing drainage ditches to reestablish wetland conditions in areas where wetlands have been drained. (A)
2. Enhance the Refuge wood duck population through the construction of 20 wood duck nest boxes.
3. Establish waterfowl sanctuaries. (A)
4. Hire an interpretive specialist/volunteer coordinator. (A)
5. Develop an interpretive site, complete with a paved parking area, kiosk with interpretive panels, and a spotting scope, overlooking moist soil units off Sharp Road in Unit 3. (A)

**FY2005**

1. Create programs to be presented at schools and colleges.

**FY2006**

1. Initiate contaminants monitoring, including analyses of the presence and concentrations of contaminants in water, sediments, and fish and aquatic invertebrates on the Refuge. Repeat every five years to determine changes in contaminants levels. (O)

The projected accomplishment of the following action item is difficult to assign to a particular year; initiation of this project is dependent upon circumstances beyond the control of the Refuge or the Fish and Wildlife Service.

1. Maintain two existing residences on lands slated for acquisition from willing sellers to be used as housing for Refuge employees or volunteers.

## **Appendix A: Legal, Policy, and Administrative Guidelines And Other Special Considerations**

Administration of national wildlife refuges is governed by bills passed by the United States Congress and signed into law by the President of the United States, and by regulations promulgated by the various branches of the government. Following is a brief description of some of the most pertinent laws and statutes establishing legal parameters and policy direction for the National Wildlife Refuge System:

### **A. Acts of Congress:**

**Section 10 of the River and Harbor Act approved March 3, 1899 (20 Stat.1151; 33 U.S.C. 403).** Prohibits unauthorized obstruction or alteration of any navigable water of the United States. Construction of any structure in or over any navigable water of the United States, excavation from or depositing of material in such waters, or accomplishment of any other work affecting the course, location condition, or capacity of such waters are unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. Authority of the Secretary of the Army to prevent obstructions to navigation in navigable waters of the United States was extended to artificial islands and fixed structures located on the Outer Continental Shelf by Section 4 of the Outer Continental Shelf Lands Act of 1953 [67 Stat. 463; 43 U.S.C. 1333 (f)].

**Refuge Trespass Act of June 28, 1906 (18 U.S.C. 41; 43 Stat. 98, 18 U.S.C. 145).** Provided first Federal protection for

wildlife on national wildlife refuges. This Act made it unlawful to hunt, trap, capture, willfully disturb, or kill any bird or wild animal, or take or destroy the eggs of any such birds, on any lands of the United States set apart or reserved as refuges or breeding grounds for such birds or animals by any law, proclamation, or executive order, except under rules and regulations of the Secretary. The Act also protects government property on such lands.

**Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 50 CFR Subchapter B),** as amended. Implements treaties with Great Britain (for Canada) and Mexico for protection of migratory birds whose welfare is a federal responsibility. Provides for regulations to control taking, possession, selling, transporting, and importing of migratory birds and provides penalties for violations.

**Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-s, 45 Stat.1222),** as amended. Authorizes acquisition, development, and maintenance of migratory bird refuges; cooperation with other agencies in conservation; and investigations and publications on North American birds. Authorizes payment of 25 percent of net receipts from administration of national wildlife refuges to the country or counties in which such refuges are located.

**Migratory Bird Hunting Stamp Act of 1934 (16 U.S.C. 718-718h; 48 Stat. 51), as amended.** Requires that all waterfowl hunters, sixteen (16) years of age or older, possess a valid duck stamp. Net revenues from the sale of duck stamps are used to acquire migratory bird refuges and waterfowl production areas.

**Criminal Code of Provisions of 1940 as amended, (18 U.S.C. 41).** States the intent of Congress to protect all wildlife within federal sanctuaries, refuges, fish hatcheries, and breeding grounds. Provides that anyone, except in compliance with rules and regulations promulgated by authority of law, who hunts, traps, or willfully disturbs any such wildlife, or willfully injures, molests, or destroys any property of the United States on such land or water, shall be fined up to \$500 or imprisoned for not more than 6 months or both.

**Bald Eagle Act of 1940 (16 U.S.C. 668-668d; 54 Stat. 250; 50 CFR Subchapter), as amended.** Provides for protection of the bald eagle (the national emblem) and the golden eagle.

**Fish and Wildlife Act of 1956 (70 Stat. 1119; 16 U.S.C. 742a- 742J), as amended.** Approved August 8, 1956, this Act establishes a comprehensive fish and wildlife policy and directs the Secretary to provide continuing research; extension and information service; and directed development, management, and conservation of fish and wildlife resources.

**Wilderness Preservation and Management (50 CFR 35; 78 Stat. 890; 16 U.S.C. 1131-1136; 43 U.S.C. 1201).** Provides procedures for establishing wilderness units under the Wilderness

Act of 1964 on units of the National Wildlife Refuge System.

**National Historic Preservation Act of 1966 (16 U.S.C. 470- 470b, 470c-470n, 80Stat. 915), as amended.** Provides for preservation of significant historical features (buildings, objects, etc.) through a grant-in-aid program to the states. Establishes a National Register of Historic Places. Federal agencies are required to take into account effects of their actions on buildings, etc., included or eligible for inclusion on the National Register.

**National Wildlife Refuge System Administration Act of 1966 (Public Law 89-669; 80 Stat. 929; 16 U.S.C. 668dd-668ee), as amended.** Authorizes the Secretary of the Interior to "permit the use of any area within the System for any purpose including, but not limited to, hunting, fishing, public recreation and accommodations, and access whenever he determines that such uses are compatible with the major purposes for which such areas were established." Consolidates authorities for the various categories of areas previously established that are administered by the Secretary of the Interior for conservation of fish and wildlife, including species that are threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, etc., which are hereby designated as the National Wildlife Refuge System. Provides that the Secretary may authorize hunting and fishing to the extent practicable and consistent with State fish and wildlife laws and regulations.

**The National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347).** Declares national policy to encourage a productive and enjoyable harmony between humans

and their environment. Section 102 of that Act directs that "to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall . . . insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations. . . ."

Section 102(2)c of NEPA requires all federal agencies, with respect to major federal actions significantly affecting the quality of the human environment, to submit to the Council on Environmental Quality a detailed statement on:

- (i) The environmental impact of the proposed action;
- (ii) Any adverse environmental effect which cannot be avoided should the proposal be implemented;
- (iii) Alternatives to the proposed action;
- (iv) The relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- (v) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action, should it be implemented.

**Fish and Wildlife Recreation Act of 1972 (Public Law 87-114; 76 Stat. 653-654; 16 U.S.C.).** Authorizes appropriate, incidental, or secondary recreational use on conservation areas administered by the

Secretary of the Interior for fish and wildlife purposes.

**Section 401 of the Federal Water Pollution Control Act of 1972 (Public Law 92-500; 86 Stat. 816, 33 U.S.C. 1411).**

Requires any applicant for a Federal license or permit to conduct any activity which may result in a discharge into navigable waters to obtain a certification from the state in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over navigable waters at the point where the discharge originates or will originate, that the discharge will comply with applicable effluent limitations and water quality standards. A certification obtained for construction of any facility must also pertain to subsequent operation of the facility.

**Section 404 of the Federal Water Pollution Control Act of 1972 (Public Law 92-500, 86 Stat. 816).**

Authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearings, for discharge of dredged or fill material into navigable waters at specified disposal sites. Selection of disposal sites will be in accordance with guidelines developed by the Administrator of the Environmental Protection Agency in conjunction with the Secretary of the Army. Furthermore, the Administrator can prohibit or restrict use of any defined area as a disposal site whenever she/he determines, after notice and opportunity for public hearings, that discharge of such materials into such areas will have an unacceptable adverse effect on municipal water supplies, shellfish beds, fishery areas, wildlife, or recreational areas.

**Endangered Species Act of 1973 and recent amendments (16 U.S.C. 1531-1543; 87 Stat. 884), as amended.**

Provides for conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging state programs. Specific provisions include: (1) the listing and determination of critical habitat of endangered and threatened species and consultation with the Service on any federally funded or licensed project that could affect any of these agencies; (2) prohibition of unauthorized taking, possession, sale, transport, etc., of endangered species; (3) an expanded program of habitat acquisition; (4) establishment of cooperative agreements and grants-in-aid to states that establish and maintain an active, adequate program for endangered and threatened species; and (5) assessment of civil and criminal penalties for violating the Act or regulations.

**Refuge Revenue Sharing Act of 1978 (Public Law 95-469, approved October 17, 1978, which amended 16 U.S.C. 715s; 50 CFR, part 34).** Changed the provisions for sharing revenues with counties in a number of ways. It makes revenue sharing applicable to all lands administered by the Service, whereas previously it was applicable only to areas in the National Wildlife Refuge System. The new law makes payments available for any governmental purpose, whereas the old law restricted the use of payments to roads and schools. For fee (acquired) lands, the new law provides a payment of 75 cents per acre, 3/4 of 1 percent of fair market value or 25 percent of net receipts, whichever is greater, whereas the old law provided a payment of 3/4 of 1 percent adjustment cost or 25 percent of net receipts, whichever was greater. The new law makes reserve (public domain) lands entitlement

lands under Public Law 94- 565 (16 U.S.C. 1601-1607), and provides for a payment of 25 percent of net receipts. The new law authorizes appropriations to make up any shortfall in net receipts, to make payments in the full amount for which counties are eligible. The old law provided that if net receipts were insufficient to make full payment, payment to each county would be reduced proportionately.

**National Wildlife Refuge System Improvement Act of 1997. (Public Law 105-57, October 9, 1997).**

This Act amends and builds upon the National Wildlife Refuge System Administration Act of 1966 in a manner that provides an "Organic Act" for the Refuge System. It ensures that the Refuge System is managed as a national system of related lands, waters and interests for the protection and conservation of our Nation's wildlife Resources.

The main components of the Act include:

1. A strong and singular wildlife conservation mission for the Refuge System;
2. A requirement that the Secretary of the Interior maintain the biological integrity, diversity and environmental health of the Refuge System;
3. A new process for determining compatible uses of refuges;
4. A recognition that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when determined to be compatible, are legitimate and appropriate uses of the Refuge System;



5. That these compatible wildlife-dependent recreational uses are the priority general public uses of the Refuge System; and
6. A requirement for preparing comprehensive conservation plans for national wildlife refuges.

## B. Regulations:

**Rights-of-Way General Regulations (50 CFR 29.21; 34 FR 19907, December 19, 1969).** Provides for procedures for filing applications. Provides terms and conditions under which rights-of-way over, above, and across lands administered by the Service may be granted.

**Use of Off-Road Vehicles on Public Lands (Executive Order 11644, Federal Reg. Vol. 37, No. 27, February 9, 1972).** Provides policy and procedures for regulating off-road vehicles.

**National Wildlife Refuge Regulations for the most recent fiscal year (50 CFR 25-35, 43 CFR 3103.2 and 3120.3-3).** Provides regulations for administration and management of national wildlife refuges including mineral leasing, exploration, and development.

## Mission and Goals:

The mission of the National Wildlife Refuge System as defined by the National Wildlife Refuge System Improvement Act of 1997, is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

The broad goals of national wildlife refuges are:

1. To preserve, restore, and enhance in their natural ecosystems (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered.
2. To perpetuate the migratory bird resource.
3. To preserve a natural diversity and abundance of plants and animals on refuge lands.
4. To provide an understanding and appreciation of fish and wildlife ecology and humans' role in the environment. To provide Refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent these activities are compatible with the purposes for which the Refuge was established.

## C. Relationship to Other Plans

**North American Waterfowl Management Plan.** The North American Waterfowl Management Plan guidelines were published in May 1986. The Plan is a broad policy framework that describes the overall scope of requirements for management of migratory waterfowl in Canada and the United States. Implementation of this Plan requires that these nations establish national, provincial, territorial, state, and flyway plans which convert international objectives to operational plans. A committee known as the North American Waterfowl Management Plan Committee would be established and, among other responsibilities, would update the Plan in

1990 and every 5 years thereafter.

The overall goal of the continental habitat program is to maintain and manage an appropriate distribution and diversity of high quality waterfowl habitat in North America that will maintain current distributions of waterfowl populations and, under average environmental conditions, sustain an abundance of waterfowl consistent with listed goals. (In broad terms, this Plan is designated to insure habitat for 62 million breeding ducks on the continent and to achieve a fall flight objective of more than 100 million ducks. Habitat also will be necessary to support more than 6 million overwintering geese.) Deep Fork National Wildlife Refuge will contribute to this goal.

#### **Endangered/Threatened Species Recovery Plans**

There are national recovery plans for bald eagles, but no plan provides guidance applicable to Deep Fork National Wildlife Refuge. Eagle recovery plans deal mainly with nesting habitat, whereas the Refuge provides wintering habitat.

### **D. Administrative Considerations**

#### **Easements and Rights-of-way**

The Refuge consists of 7,005 acres as of January 1, 1998. There are numerous highway, road, water pipeline, oil and gas pipeline, telephone, telegraph, railroad and flowage easements on and across the Refuge. Many of these date back to the early part of the 19<sup>th</sup> century. A record of existing easements and rights-of-way is maintained in the Refuge office.

#### **Outstanding Mineral Reservations**

All oil and mineral rights on lands purchased to date were reserved by prior owners.

#### **Commercial Beehives**

Bees are important pollinators with no known harmful effects on aesthetics or on the environment if hives are placed out of the public view. Applications for beekeeping permits on the Refuge will be considered on a case-by-case basis.

#### **Candidate Species for Endangered and Threatened Status**

Candidate species and species of special concern are currently listed in Biological Report 87(2), September 1987, "Synopsis of Wetland Functions and Values: Bottomland Hardwoods With Special Emphasis on Eastern Texas and Oklahoma" by the National Ecology Center, U.S. Fish and Wildlife Service.

#### **Land Acquisition**

The purpose of land acquisition at Deep Fork National Wildlife Refuge is to preserve overflow bottom land hardwoods and other wetland habitats along the Deep Fork River for their many benefits, including: economic; food supply; water supply and quality; flood control; fish, wildlife, and plant resources; and outdoor recreational values. The authority of the Emergency Wetlands Resources Act of 1986 was used to establish the refuge. As of October 1998, 7,005 acres had been acquired, or less than half of the land within the proposed acquisition boundary. Such acquisition has been, entirely on a willing seller basis. Acquired lands are in a checkerboard ownership pattern with

private lands. (See map, App.C)

The refuge was originally approved in 1992 to acquire 16,104 acres in fee and easement from people who want to sell their lands to the Fish and Wildlife Service. Soon afterwards, the Service identified several potential problems in managing the refuge lands.

In October, 1996 the Service proposed a 2,124-acre expansion over the original approved acreage. The proposed new boundary of the refuge was redrawn to include additional habitats important to wildlife and/or tracts necessary to complete ownership boundaries. Prominent wetland sites were included which were left out of the original boundary. The old boundary went through the middle of some permanent wetlands and bottom land forest tracts in several areas. Exclusion of part of the wetland in these locations could place the entire wetland in jeopardy.

The 1996 proposal was intended to correct those problems. Two land exchanges were also included in the land acquisition strategy that would benefit both the refuge and the private landowners. Two unacquired land ownerships would be removed from within the previously approved refuge boundary. The boundary adjustments were identified from new infrared photos and on site inspection by the refuge manager. With the approval of this CCP, the boundary expansion has completed all necessary compliance to begin acquisition efforts.

Shortly after the release of the draft environmental assessment on the additions proposal, public concerns about public uses on Deep Fork and some of the other national wildlife refuges in Oklahoma caused the Service to put further acquisition efforts on hold at Deep Fork until those concerns are resolved.

The Service would use the Migratory

Bird Conservation Fund (largely derived from "duck stamps") and the Land and Water Conservation Fund (derived from royalties on offshore oil wells) to purchase additional lands for the refuge. By law, landowners would receive fair market value for their lands or easements and the federal government must compensate residents, farms, businesses and tenants for relocation costs. The Service would attempt to acquire mineral rights if feasible and available from landowners. If the Service can not acquire mineral rights, the refuge manager works cooperatively with the operators to minimize environmental damages. Operators must also abide by regulations of the Oklahoma Corporation Commission, which also seek to minimize environmental damages. The Service pays counties Refuge Revenue Sharing payments yearly to help offset the loss of property taxes on formerly private lands acquired for the refuge.

### **Contaminants**

Possible sources of contaminants on the Refuge include oil and gas facilities and illegal dumping of household trash. Trash cleanup efforts are ongoing. The Okmulgee County Sheriff's office assists the Refuge in reducing illegal dumping and in cleanup.

Contaminants investigations are conducted by the Fish and Wildlife Service, Tulsa Ecological Services Field Office as part of the land acquisition process. The Refuge will develop a spill contingency plan.

### **Animal Trespass**

Livestock can damage refuge habitats and associated species. Livestock trespass has been an intermittent problem on the Refuge since the Refuge was established. All incidents of livestock on the Refuge to date have involved cattle. Other possible

trespass livestock include hogs, emu, goats, horses, and sheep.

The problem of livestock trespass will be reduced to some extent by fencing of the Refuge's exterior boundary. Under Oklahoma State Law, landowners are required to fence their livestock in.

#### **Refuge Revenue Sharing Act of 1978**

The Refuge Revenue Sharing Act affected Deep Fork National Wildlife Refuge for the first time in 1993. The payment for Refuge lands is based on a rate of 75 cents per acre, 3/4 of 1 percent of market value or 25 percent of net receipts, whichever is greater. Payments to date are listed on the following page.

<b>Refuge Revenue Sharing Act Payments for Deep Fork Refuge</b>		
<b>Year</b>	<b>Acres</b>	<b>Amount</b>
1993		\$ 6,291
1994		8,954
1995		7,631
1996		8,551
1997		7,807

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**Document prepared by:**

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## Appendix C: Maps

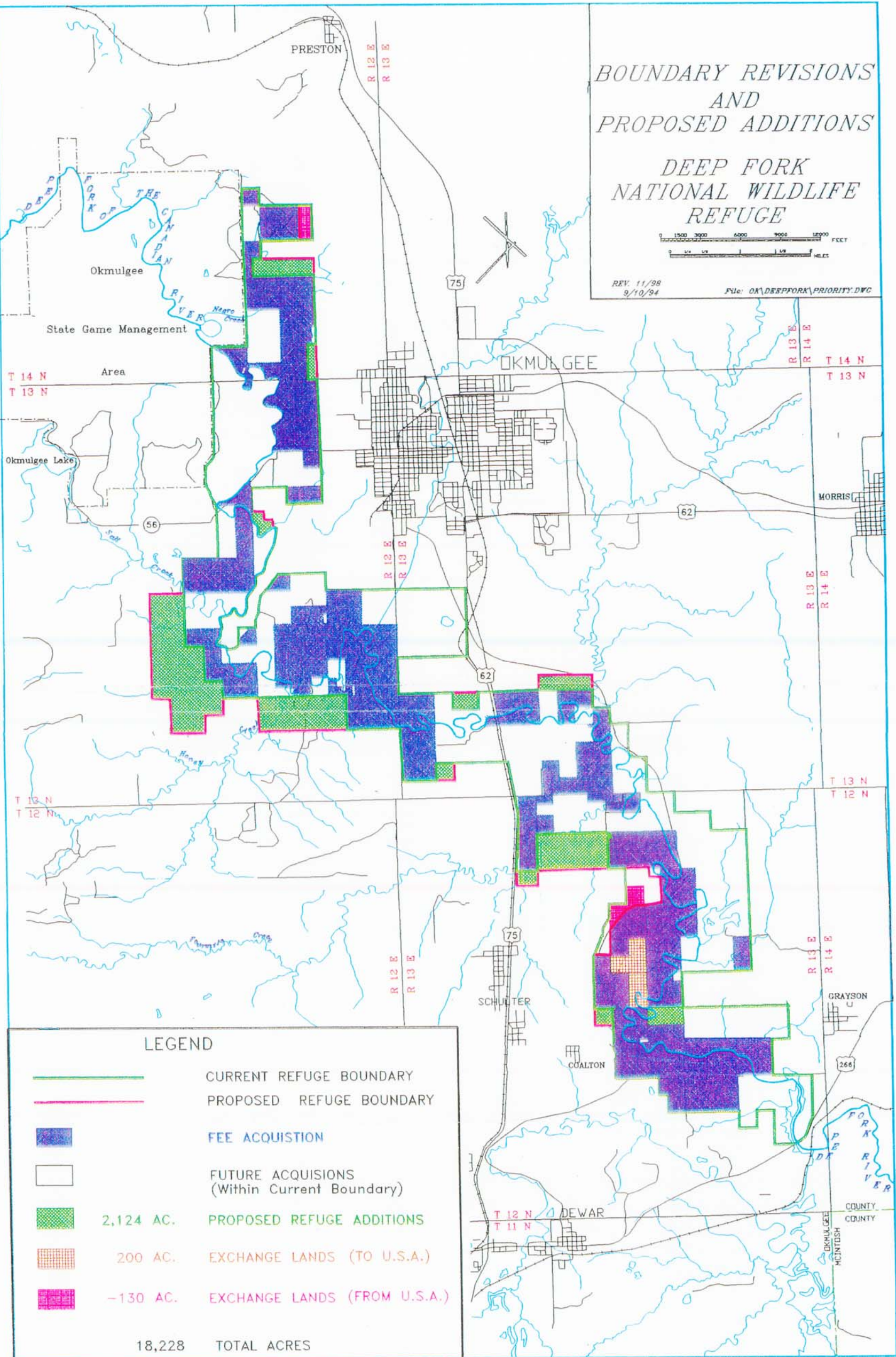
*BOUNDARY REVISIONS  
AND  
PROPOSED ADDITIONS*

*DEEP FORK  
NATIONAL WILDLIFE  
REFUGE*










REV. 11/98  
9/10/94

File: OK\DEEPFORK\PRIORITY.DWG



**LEGEND**




-  CURRENT REFUGE BOUNDARY
-  PROPOSED REFUGE BOUNDARY
-  FEE ACQUISITION
-  FUTURE ACQUISITIONS  
(Within Current Boundary)
-  2,124 AC. PROPOSED REFUGE ADDITIONS
-  200 AC. EXCHANGE LANDS (TO U.S.A.)
-  -130 AC. EXCHANGE LANDS (FROM U.S.A.)

18,228 TOTAL ACRES



R 12 E R 13 E

LEGEND

-  REFUGE BOUNDARY
-  FWS ACQUIRED LANDS
-  PARKING AREA

T 14 N

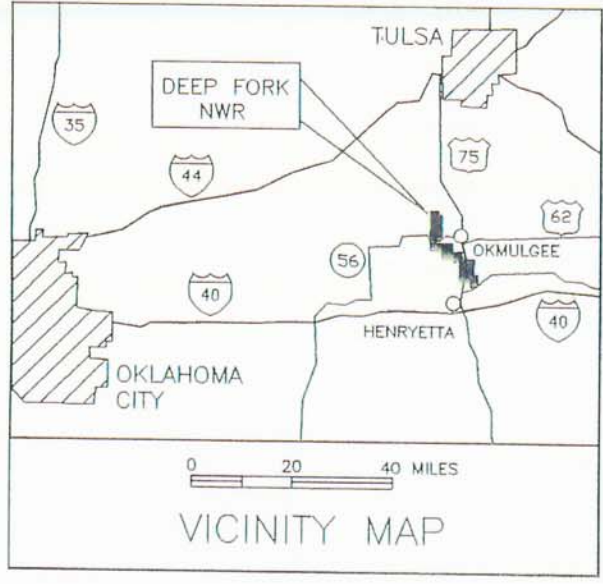
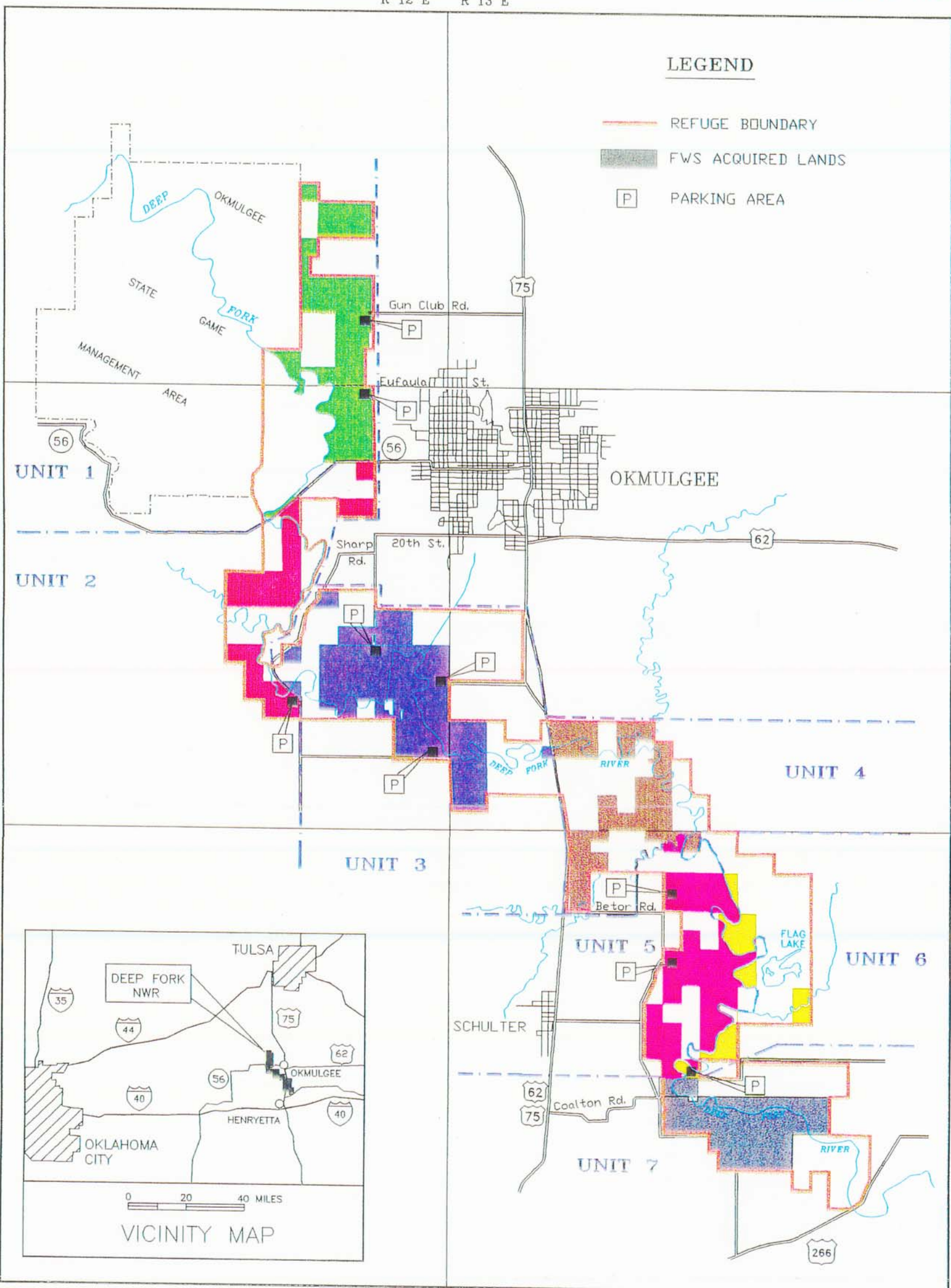
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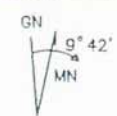
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R 12 E R 13 E  
INDIAN PRINCIPAL MERIDIAN



MEAN DECLINATION  
1971

COMPILED IN THE DIVISION OF REALTY  
FROM U.S.G.S. QUADRANGLE MAPS,  
G.L.O. PLATS, U.S.F.W.S. SURVEYS,  
AND OTHER OFFICIAL INFORMATION.  
ALBUQUERQUE, NEW MEXICO 5/98  
REVISION 10/98

**Appendix D: Deep Fork National Wildlife Refuge  
Refuge Operating Needs**

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 97009

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PUBLIC EDUCATION & RECREATION

People

7.a. Provide Visitor Services

MEASURES: 100,000 new visitors will be served  
 20,000 existing visitors will be served  
 100 % will support the top 6 priority public uses  
 0 % will support non-priority public uses

TITLE: Construct and maintain trails and parking areas

Construct and maintain two hiking trails to better meet the demand for wildlife dependent recreational opportunities on the refuge. Interest in the refuge is growing and there is a potential for 100,000 visitors per year or more. This project calls for the development and maintenance of two trails, interpretive signs and kiosks, a foot bridge and associated parking lots. As visitation increases, the maintenance of these visitor facilities and existing facilities will increase. Based on the latest Fish and Wildlife Service data available, the additional visitors this trail would attract are expected to contribute \$278,813 annually to the local economy.

**Permanent Staff Needed (FTEs)**

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need
FTEs: Managers.....			\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Biologists/Biotechnicians.....			\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Resource Specialists.....			\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Education/Recreation Staff.....			\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Law Enforcement.....			\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Clerical/Administrative.....			\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	1.0	WG-08	\$43	<input checked="" type="radio"/> Yes <input type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
TOTAL FTEs Needed.....	1.0		\$43	

First Year Need \$ .....\$3.10

RANK - STATION: ...002...

DISTRICT: .....

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	\$43	
Equipment Cost.....	\$30		
Facility Cost.....	\$138		
Services/Supplies.....	\$1	\$10	
Miscellaneous Costs.....	\$83	\$5	
TOTAL Operations Cost..	\$252	\$58	\$310

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 97003

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: RESOURCE PROTECTION

People

6.a. Law Enforcement

- MEASURES:
- 0 incidents will be documented
  - 0 other public contacts will be made
  - 0 cases will be assisted
  - 15 miles of boundary posted/maintained
  - 0 sites will be better secured

TITLE: Post and survey refuge boundaries

Maintain boundary fences, post boundaries, and assist with surveying existing refuge property at this new refuge which is still in an ongoing acquisition status. Also includes cleanup of trash, removal of unwanted structures, and implementing the Comprehensive Conservation Plan. The refuge bottomlands and wildlife resources will be protected by this project.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Biologists/Biotechnicians.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Resource Specialists.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Education/Recreation Staff.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Law Enforcement.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Clerical/Administrative.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	1.0	WG-08	\$43	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
TOTAL FTEs Needed.....	1.0		\$43		

First Year Need \$ .....\$203

RANK - STATION: ...003...

DISTRICT: .....

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....	.....	.....
Operations: Personnel Cost.....	.....\$40	.....\$43	
Equipment Cost.....	.....\$30		
Facility Cost.....	.....		
Services/Supplies.....	.....\$5	.....\$10	
Miscellaneous Costs.....	.....\$75	.....	
TOTAL Operations Cost..	.....\$150	.....\$53	.....\$203

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 97010

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PLANNING & ADMINISTRATION

Gen. Admin

8.b General Administration

MEASURES:

TITLE: Construct maintenance facility

Construction of a maintenance facility is necessary to store Refuge equipment to protect it from theft and the weather. This equipment is necessary for the protection and restoration of the Refuge which is predominantly bottomland hardwoods and wetlands.

Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Biologists/Biotechnicians.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Resource Specialists.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Education/Recreation Staff.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Law Enforcement.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Clerical/Administrative.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
TOTAL FTEs Needed.....	<input type="checkbox"/>	<input type="checkbox"/>	\$0		

First Year Need \$ .....\$457

RANK - STATION: ...004...

DISTRICT: .....

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	.....	
Equipment Cost.....	.....\$25		
Facility Cost.....	.....\$350		
Services/Supplies.....	.....\$25	.....\$20	
Miscellaneous Costs.....	.....\$34	.....\$3	
TOTAL Operations Cost..	.....\$434	.....\$23	.....\$457



21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 99003

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: RESOURCE PROTECTION

People

6.a. Law Enforcement

- MEASURES:
- 100 incidents will be documented
  - 100 other public contacts will be made
  - 20 cases will be assisted
  - 30 miles of boundary posted/maintained
  - 20 sites will be better secured

TITLE: Increase law enforcement activities

Deep Fork Refuge has a high incidence of law enforcement violations including trash dumping, marijuana cultivation, illegal take of wildlife, trespass, and violent crimes. Currently only two officers are available to patrol the refuge that encompasses 32 miles of the Deep Fork River with difficult terrain. This project calls for increasing law enforcement patrols and updating law enforcement equipment. The refuge will enter into a memorandum of understanding with the local sheriff's office to reduce incidents on the refuge. Boundary posting and operating existing hunting and fishing programs would also fall under this project. The visiting public and important resources of this refuge will be protected.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Biologists/Biotechnicians.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Resource Specialists.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Education/Recreation Staff.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Law Enforcement.....	1.0	GS-09	\$48	<input checked="" type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Clerical/Administrative.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
TOTAL FTEs Needed.....	1.0		\$48		

First Year Need \$	\$181
--------------------	-------

RANK - STATION: ...005...

DISTRICT: ...999...

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	\$48	
Equipment Cost.....	\$40		
Facility Cost.....	.....		
Services/Supplies.....	\$10	\$10	
Miscellaneous Costs.....	\$73	.....	
TOTAL Operations Cost..	\$123	\$58	\$181

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 99004

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: HABITAT RESTORATION

Habitat

2.a. Wetland Restoration

MEASURES: 1,000 refuge acres will be restored

0 off-refuge acres will be restored

TITLE: Bottomland Hardwood restoration

Deep Fork Refuge is primarily bottomland hardwood wetlands. However, some of the area was converted to pecan orchards or drained for cattle grazing activities. This project calls for reforestation of pecan orchards and cleared bottomland pastures to a natural stand of oaks and other native species. Structures will be installed in 6 sites to create green-tree reservoirs and moist-soil areas. This project will restore an historical hydrology to the area and benefit wildlife species dependent on wetlands.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need
FTEs: Managers.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Biologists/Biotechnicians.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Resource Specialists.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Education/Recreation Staff.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Law Enforcement.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Clerical/Administrative.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	0.0		\$0	<input type="radio"/> Yes <input checked="" type="radio"/> No
				<input type="radio"/> Yes <input checked="" type="radio"/> No
TOTAL FTEs Needed.....	0.0		\$0	

First Year Need \$ .....\$60

RANK - STATION: ...006...

DISTRICT: ...999...

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	.....	
Equipment Cost.....	.....\$50		
Facility Cost.....	.....		
Services/Supplies.....	.....\$1	.....\$5	
Miscellaneous Costs.....	.....\$4	.....	
TOTAL Operations Cost..	.....\$55	.....\$5	.....\$60

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 97002

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: MONITORING & STUDIES

Wildlife

1.b. Studies & Investigations

MEASURES: 4 studies will be conducted

1 % of effort will be off-refuge

TITLE: Conduct baseline wildlife surveys and implement a monitoring program

Conduct wildlife and plant surveys on the Refuge to develop information needed for better management of wildlife species on the refuge. Surveys conducted would include surveys for threatened or endangered species on the refuge. These data would also contribute substantially to development of sound goals and objectives for the refuge for the Comprehensive Conservation Plan. Since Deep Fork is a relatively new refuge, baseline data for all wildlife species is lacking. Adding a permanent biologist would contribute to meeting minimum staffing.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	<input type="text"/>	<input type="text"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Biologists/Biotechnicians.....	1.0	GS-11	\$58	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Resource Specialists.....	<input type="text"/>	<input type="text"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Education/Recreation Staff.....	<input type="text"/>	<input type="text"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Law Enforcement.....	<input type="text"/>	<input type="text"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Clerical/Administrative.....	<input type="text"/>	<input type="text"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	<input type="text"/>	<input type="text"/>	\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	<input type="text"/>	<input type="text"/>		<input type="radio"/> Yes	<input checked="" type="radio"/> No
TOTAL FTEs Needed.....	1.0		\$58		

First Year Need \$ .....\$17.1

RANK - STATION: ...007...

DISTRICT: .....

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	\$58	
Equipment Cost.....	\$30		
Facility Cost.....	.....		
Services/Supplies.....	.....	\$10	
Miscellaneous Costs.....	\$73		
TOTAL Operations Cost..	\$103	\$68	\$171

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 99005

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: RESOURCE PROTECTION

People

6.a. Law Enforcement

- MEASURES:
- 0 incidents will be documented
  - 0 other public contacts will be made
  - 0 cases will be assisted
  - 35 miles of boundary posted/maintained
  - 0 sites will be better secured

TITLE: Boundary line maintenance and construction

Equipment will be purchased to assist in boundary line and exterior fence maintenance and construction. A Bobcat loader with attachments is needed to clear lines, carry supplies, and dig post holes. The purchase of this equipment would reduce man hours on these lines, and allow equipment to do unsafe work rather than employees. This action will protect sensitive bottomland hardwoods and undergrowth from trespass cattle.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Biologists/Biotechnicians.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Resource Specialists.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Education/Recreation Staff.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Law Enforcement.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Clerical/Administrative.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
Maintenance/Equipment Operation.....	0.0		\$0	<input type="radio"/> Yes	<input checked="" type="radio"/> No
				<input type="radio"/> Yes	<input checked="" type="radio"/> No
TOTAL FTEs Needed.....	0.0		\$0		

First Year Need \$	\$62
--------------------	------

RANK - STATION: ...008...

DISTRICT: ...999...

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	.....	
Equipment Cost.....	.....\$50		
Facility Cost.....	.....		
Services/Supplies.....	.....\$2	.....\$5	
Miscellaneous Costs.....	.....\$5	.....	
TOTAL Operations Cost..	.....\$57	.....\$5	.....\$62



21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 97004

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PUBLIC EDUCATION & RECREATION

People

7.a. Provide Visitor Services

MEASURES: 100,000 new visitors will be served
20,000 existing visitors will be served
100 % will support the top 6 priority public uses
0 % will support non-priority public uses

TITLE: Construct visitor center

Construct a headquarters complex and visitor center to provide visitors with information they need to enjoy their visit and learn about key refuge resources. According to the most recent census, the estimated population within 100 mile radius of the refuge is 2,785,000. A major highway passing through the refuge carries over 16,000 vehicles a day. Tulsa is within 40 miles and Oklahoma City is within 100 miles. The construction of a visitor center/office will increase annual public visitation to the refuge to no less than 100,000. The center will allow the refuge to conduct environmental education programs with teachers and students at no less than 50 schools. Based on the latest Fish and Wildlife Service data available, the additional visitors this center would attract would contribute \$278,813 annually to the local economy.

Permanent Staff Needed (FTEs)

Table with 5 columns: Staff Category, Number (1/10s), Grade, FTE Cost, and Critical Staffing Need (Yes/No). Rows include Managers, Biologists/Biotechnicians, Resource Specialists, Education/Recreation Staff, Law Enforcement, Clerical/Administrative, Maintenance/Equipment Operation, and TOTAL FTEs Needed.

First Year Need \$ .....\$538

RANK - STATION: ...009...

DISTRICT: .....

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	\$5,000		
Operations: Personnel Cost.....	\$40	\$88	
Equipment Cost.....	\$50		
Facility Cost.....	\$200		
Services/Supplies.....		\$50	
Miscellaneous Costs.....	\$100	\$10	
TOTAL Operations Cost..	\$390	\$148	\$538

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 99006

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PUBLIC EDUCATION & RECREATION

People

7.a. Provide Visitor Services

MEASURES: 20,000 new visitors will be served
5,000 existing visitors will be served
100 % will support the top 6 priority public uses
% will support non-priority public uses

TITLE: Improve visitor orientation of the Refuge

Improve visitor orientation to the refuge by installing boundary, directional, and other informational signs as well as developing a sign plan. This project is necessary in educating the public about the refuge and to aid the visitor in observing the refuge.

Permanent Staff Needed (FTEs)

Table with 5 columns: Staff Category, Number (1/10s), Grade, FTE Cost, and Critical Staffing Need (Yes/No). Rows include Managers, Biologists/Biotechnicians, Resource Specialists, Education/Recreation Staff, Law Enforcement, Clerical/Administrative, Maintenance/Equipment Operation, and TOTAL FTEs Needed.

First Year Need \$ .....\$56

RANK - STATION: ...010...

DISTRICT: ...999...

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	.....	
Equipment Cost.....	\$40		
Facility Cost.....	.....		
Services/Supplies.....	\$5	\$7	
Miscellaneous Costs.....	\$4	.....	
TOTAL Operations Cost..	\$49	\$7	\$56

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 99002

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PUBLIC EDUCATION & RECREATION

People

7.a. Provide Visitor Services

MEASURES: 20,000 new visitors will be served
5,000 existing visitors will be served
100 % will support the top 6 priority public uses
% will support non-priority public uses

TITLE: Form road improvement partnership with county

Partner with the county to resurface 10 miles of roads that provide public access to refuge areas. The refuge will supply material and the county would provide the labor. This project would greatly enhance access to refuge and would greatly improve relations with the public and the local government.

Permanent Staff Needed (FTEs)

Table with 5 columns: Staff Category, Number (1/10s), Grade, FTE Cost, and Critical Staffing Need. Rows include Managers, Biologists/Biotechnicians, Resource Specialists, Education/Recreation Staff, Law Enforcement, Clerical/Administrative, Maintenance/Equipment Operation, and TOTAL FTEs Needed.

First Year Need \$ .....\$119

RANK - STATION: ...011...

DISTRICT: ...999...

REGIONAL: ...999...

ECOSYSTEM: .....

NATIONAL: .....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....		
Equipment Cost.....	.....		
Facility Cost.....	.....		
Services/Supplies.....	\$100	\$10	
Miscellaneous Costs.....	\$9		
TOTAL Operations Cost..	\$109	\$10	\$119

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 20001

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PLANNING & ADMINISTRATION

Gen. Admin

8.b General Administration

MEASURES:

TITLE: Refuge Administration - Operating Costs

Provide funds for general operations including vehicle maintenance, office supplies, office equipment maintenance, travel boundary signs, etc. Adequate base funding for the new refuge has never been provided.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Biologists/Biotechnicians.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Resource Specialists.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Education/Recreation Staff.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Law Enforcement.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Clerical/Administrative.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Maintenance/Equipment Operation.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
TOTAL FTEs Needed.....	0.0		\$0		

First Year Need \$ .....\$43

RANK - STATION: .....999....

DISTRICT: .....999....

REGIONAL: .....999....

ECOSYSTEM: 999.....

NATIONAL: .....999....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....		
Operations: Personnel Cost.....	.....	.....	
Equipment Cost.....	.....		
Facility Cost.....	.....		
Services/Supplies.....	.....	\$40	
Miscellaneous Costs.....	\$3	.....	
TOTAL Operations Cost..	\$3	\$40	\$43



21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 20002

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: PLANNING & ADMINISTRATION

Gen. Admin

8.b General Administration

MEASURES:

TITLE: Facilities Protection

Refuge equipment is subject to deterioration and theft causing unnecessary additional expense in operating the refuge. Equipment is currently stored on the state area. this increases transport costs and space is limited. The provision of protection for equipment involves construction of a 250' X 400' X 8' chain link fence enclosure for equipment storage and security and also includes the construction of an open shed for equipment storage, Costs include a perimeter alarm system and gravel for parking areas.

Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Biologists/Biotechnicians.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Resource Specialists.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Education/Recreation Staff.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Law Enforcement.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Clerical/Administrative.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Maintenance/Equipment Operation.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
TOTAL FTEs Needed.....	0.0		\$0		

First Year Need \$ .....\$32

RANK - STATION: .....999....

DISTRICT: .....999....

REGIONAL: .....999....

ECOSYSTEM: 999.....

NATIONAL: .....999....

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	\$25		
Operations: Personnel Cost.....			
Equipment Cost.....			
Facility Cost.....	\$25		
Services/Supplies.....			
Miscellaneous Costs.....	\$2	\$5	
TOTAL Operations Cost..	\$27	\$5	\$32

21592 Deep Fork NWR

OK

HQ: Deep Fork NWR

CD: OK02

Proj #: 20003

Type: NWR

District: Oklahoma

Main ecosystem: Arkansas/Red Rivers

ACTIVITY: HABITAT MANAGEMENT

Habitat

3.e. Forest Management

MEASURES: 0 acres will be harvested

250 acres will be treated

TITLE: Reforestation

Purchase and plant native hardwoods in old pecan orchards and areas cleared for pasture. The objective is to restore the area to inactive bottomland hardwoods. Reforestation should be accomplished on a five year plan due to planting restrictions from weather, staff shortage, and seasons. Costs should be \$10k per year for five years totaling \$50k. The action is a must to ensure that wintering waterfowl continue to use the refuge.

### Permanent Staff Needed (FTEs)

	Number (1/10s)	Grade	FTE Cost	Critical Staffing Need	
FTEs: Managers.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Biologists/Biotechnicians.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Resource Specialists.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Education/Recreation Staff.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Law Enforcement.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Clerical/Administrative.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
Maintenance/Equipment Operation.....	0.0		\$0	<input type="radio"/> Yes	<input type="radio"/> No
				<input type="radio"/> Yes	<input type="radio"/> No
TOTAL FTEs Needed.....	0.0		\$0		

First Year Need \$ .....\$22

RANK - STATION: ...999...

DISTRICT: ...999...

REGIONAL: ...999...

ECOSYSTEM: 999.....

NATIONAL: ...999...

	One-Time	Recurring Base	First Year Need
Construction Appropriation Costs.....	.....	.....	.....
Operations: Personnel Cost.....	.....	.....	.....
Equipment Cost.....	.....	.....	.....
Facility Cost.....	.....	.....	.....
Services/Supplies.....	.....\$10	.....\$10	.....
Miscellaneous Costs.....	.....\$2	.....	.....
TOTAL Operations Cost..	.....\$12	.....\$10	.....\$22

## **Appendix E: Comments on the Draft Deep Fork National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment**

In accordance with the National Environmental Policy Act of 1969 and Service policy, various agencies, municipalities, landowners and other interested parties were provided an opportunity to review and comment on the draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA). The review period for this document was between April 15 and June 15, 1999.

Comments were received via electronic mail, telephone and in writing. Each of these comments was reviewed and addressed in the completion of the final CCP/EA for the Refuge. All comments received will be kept on file in the Planning Branch, Division of Refuges and Wildlife in the Albuquerque, New Mexico Region 2 Office of the Service. A summary of the comments received and the agency response is provided below.

**Comment:** The proposed replacement of beaver dams with artificial water control structures is questionable. While control of water levels in the bottomlands may benefit some species, overall Refuge diversity will likely suffer from this interference with natural systems. The efficacy of replacing natural, animal maintained, beaver dams with artificial water control structures is also questionable and may greatly increase maintenance work loads at the Refuge. Should beaver populations reach nuisance levels and cause excessive flooding, control through hunting and trapping may be preferable.

**Response:** It is important to consider the regional context of habitat management proposed for Deep Fork National Wildlife Refuge. Bottomland hardwood forested wetland habitat has declined approximately 85 percent from its historical abundance in eastern Oklahoma. A primary goal of the Refuge is conservation and restoration of this habitat type where feasible. While managing to emphasize one habitat type may result lower diversity within the Refuge boundaries, restoring bottomland hardwood forested wetlands within the Refuge should result in greater overall regional habitat diversity and richness.

The proposed water control structures make use of existing beaver dams to allow control of the depth and duration of flooding within the beaver impoundments. The goal of such controlled flooding is providing wetland habitat for waterfowl and other species, while also fostering growth of bottomland hardwoods. The water control structures are essentially drains running through the dams with drop-log water level controls on the inlet and screening to keep beavers from easily blocking the drains. Such structures are relatively simple, should require little

maintenance and allow management of the water regime. Refuge staff has encouraged beaver management through hunting and trapping, but has had difficulty in recruiting trappers and/or hunters, given the current low value of beaver pelts.

**Comment:** Raccoon hunts are contrary to the goals and objectives of the Refuge, due to their potential to disturb to migratory birds and other wildlife.

**Response:** Hunting is one of the six "wildlife dependent uses" identified in the National Wildlife Refuge system Improvement Act of 1997 as priority general public uses of the National Wildlife Refuge System. These uses are to be allowed when compatible with the fulfillment of the mission of the Refuge System or the purpose of the individual refuge. The Service has determined that limited, special permit hunting of raccoons on three of the seven units of the Refuge is compatible with the purposes of the Refuge. Use of a special permit system, rather than an open season, allows control of the total number of hunters allowed on the Refuge as well as the number of hunters per day. Seasons and sites of the raccoon hunts are selected to minimize impacts to other wildlife. Additionally, the hunts are monitored for affects on wildlife and habitats.

**Comment:** The electric, oil and gas lines that cross areas of the Refuge, as well as abandoned oil wells in several areas of the Refuge, are a concern. Hiring a biologist to manage the monitoring of these lines may be appropriate. Abandoned oil wells should be closed.

**Response:** The Service shares concern over the possibility of contamination from transmission lines and abandoned wells. Refuge staff coordinates with the operators of active oil, gas and other utility lines within the Refuge to assure proper maintenance. Refuge staff is also actively pursuing closure of abandoned oil wells on the site, either by the former operator or through the State of Oklahoma's Orphan Well fund.

**Comment:** The plan states that bald eagles use the Refuge in the winter, but that no known site on the Refuge serves as a communal winter night roost. Given the importance to bald eagle of having an undisturbed communal winter night roost, shouldn't the Refuge make efforts to identify the location of such a roost and possibly add it to the acquisition area?

**Response:** Current staffing levels at the Refuge do not permit off-refuge searches for a communal winter night roost. Should the existence of a such roost proximate to the Refuge be discovered, Refuge staff will work cooperatively with the landowner to develop a roost protection strategy.

**Comment:** No hunting or other lethal means of controlling wildlife populations should be used on the Refuge. Nuisance animals should be trapped and relocated.

**Response:** Hunting is one of the six "wildlife dependent uses" identified in the National Wildlife Refuge System Improvement Act of 1997 as priority general public uses of the National Wildlife Refuge System. These uses are to be allowed when compatible with the fulfillment of the mission of the Refuge System or the purpose of the individual refuge. The Service has determined that some hunting is appropriate on Deep Fork National Wildlife Refuge. Two of the seven management units are closed to all hunting, and hunting is restricted to assure compatibility with management goals on the other units.

The use of lethal means of control for animal populations which have reached nuisance densities is an established wildlife management practice practiced by the Service and other resource management agencies. Live trapping and relocation of problem animals requires considerably greater costs and labor than do lethal means of control. Relocation of animals also has the potential of disturbing ecological conditions in the receiving area and/or transporting wildlife diseases and parasites (often more prevalent in areas with high population densities) into areas not previously infested.

**Comment:** The Refuge should develop additional educational and research opportunities, as little environmental interpretation is available in the area.

**Response:** The Service agrees that additional research and educational opportunities are desirable. Opportunities for environmental education and interpretation will be developed, consistent with the National Wildlife Refuge System Improvement Act of 1997 and budgetary constraints.

**Comment:** Only limited areas within the Refuge are proposed to be open for hunting. All units of the Refuge should be open hunting, without special restrictions, subject to State of Oklahoma Department of Wildlife Conservation rules and regulations.

**Response:** The Service has determined that hunting (one of the six priority wildlife dependent public uses identified in the National Wildlife Refuge System Improvement Act of 1997) in some management units would not be compatible with the purposes of the Refuge. Under the preferred management alternative for Deep Fork National Wildlife Refuge, only two management units will be closed to hunting: Unit 4, devoted to non-consumptive wildlife dependent recreation (wildlife observation, wildlife photography, environmental education and interpretation), and Unit 6, managed as a wildlife sanctuary with no public use. The other five management units will be open to hunting under various restrictions established to ensure that a high quality outdoor experience is received by Refuge visitors. Safety is also a

factor in hunt regulations. Steel shot is required for all shotgun hunters to eliminated the threat of lead poisoning on the Refuge.

**Comment:** The Draft Comprehensive Conservation Plan calls for considerable fiscal investment to accomplish all objectives. What is the "fall back" position should full funding for plan implementation not be available?

**Response:** The facility development, management activities and staffing levels proposed in this CCP/EA represent those deemed appropriate to implement the purpose of the Refuge. The fiscal investments necessary to accomplish all objectives have been documented and requested through the Service' Refuge Operating Needs System. Unfunded activities will be deferred until funding is available. All developments that were considered possible in the next ten years were included in the CCP/EA.

**Comment:** No provision has been made for equestrian trails available for year round use. Area equestrian groups would like to see land set aside for trails.

**Response:** Riding is not one of the priority public uses of National Wildlife Refuges. Thus no provision for equestrian facilities has been made in the CCP/EA.



**Deep Fork  
National Wildlife Refuge  
Comprehensive Conservation Plan**

**Environmental Assessment**

**U.S. Department of the Interior  
Fish and Wildlife Service  
Deep Fork National Wildlife Refuge  
Okmulgee, Oklahoma**

**September 1999**

# Environmental Assessment

## I. Purpose:

The purpose of the Deep Fork National Wildlife Refuge Comprehensive Conservation Plan (CCP) is to provide for the protection, maintenance, and management of bottomland hardwood forest habitat to enhance wildlife for the benefit of people, and to facilitate continuity of management and sound decision-making to achieve these ends.

The plan is intended to provide for long-term management based on careful consideration of the physical and biological characteristics of the Refuge, and to ensure that the long-term needs of the Refuge and habitat are met. The plan is also designed to facilitate achievement of U.S. Fish and Wildlife Service and Refuge goals, provide for appropriate and compatible public recreation, and promote public appreciation of the bottomland hardwood ecosystem and its components.

## II. Needs:

This action is designed to address both the needs of the Service and the needs of the local community and the general public.

The Service has a need to meet its responsibilities for stewardship over endangered species and migratory birds, as well as other wildlife species that occupy Service lands. In addition, the Service has a responsibility for meeting its legal and regulatory responsibilities. (Appendix A of the Draft Comprehensive Conservation Plan outlines key legislation

and regulations that govern Service actions.)

The Refuge was established in 1992 under the authority of the Emergency Wetlands Resource Act of 1986 for "... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." Parts of the Refuge were also purchased under the authority of the Migratory Bird Conservation Act of 1929 "... to provide an inviolate sanctuary, or for any other management purpose, for migratory birds."

The Service has a need to comply with provisions of the National Wildlife Refuge Improvement Act of 1997. The Act mandates that the Service prepare a Comprehensive Conservation Plan for each national wildlife refuge. Also, under that Act, the Service has a responsibility for providing the public with wildlife-dependent recreational activities on national wildlife refuges when those activities are compatible<sup>1</sup> with the purposes for which the refuge was established. In the Act, Congress also identified six priority public uses on national wildlife refuges, they are 1) Hunting, 2) Fishing, 3) Wildlife observa-

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<sup>1</sup> Compatible recreational activities are those which will not have a detrimental effect upon fulfillment of the purposes of the refuge unit and the mission of the National Wildlife Refuge System.

contaminant problems, since the Refuge is located near industrial and urban areas.

***Alternative 3: Refuge Operated as Wildlife Sanctuary with Moderate Level of Habitat Management and Development; Non-consumptive Recreational and Educational Activities Allowed***

Under this alternative, the Refuge would be open to the public for non-consumptive recreational and educational activities and opportunities would be developed. Educational outreach would be heavily emphasized under this alternative. Hunting would not be allowed. Trails and a public contact station would be constructed.

This alternative includes some active habitat modifications. Pecan orchards would be reforested with native hardwood species. Wetlands (greentree reservoirs and moist soil units) would be constructed to enhance habitat for waterfowl. Prescribed burns would be conducted on upland prairie sites to maintain and enhance their value for native prairie plant and wildlife species (particularly neotropical birds).

***Alternative 4: Refuge Operated with Moderate Levels of Habitat Management and Development; Non-consumptive and Consumptive Recreational Activities Allowed (Preferred Alternative)***

This alternative would emphasize protection of habitats and wildlife populations, but would offer fishing and controlled hunting opportunities. In addition, non-consumptive recreational and educational activities, such as wildlife observation, wildlife photography, interpretation and nature trails would be available. A visitor contact station would

be constructed.

The Refuge would play a major role as an outdoor classroom for youth of all ages and for teachers.

Development of wetland habitat and reforestation of pecan groves and bottomland pastureland would be accelerated by construction of greentree reservoirs and moist soil units, and planting of hardwood species in pecan groves.

Beaver dams would be removed in the spring to protect bottomland hardwoods and private lands from permanent flooding.

***Alternative 5: Refuge Operated Primarily as Public Hunting Area with High Levels of Habitat Management and Development; Non-consumptive Recreational Uses Allowed***

Under this alternative the Refuge would be operated as a public hunting area which would be open to the public for all state-sanctioned and regulated hunting activities and seasons. Non-consumptive recreational uses would be allowed. However, the majority of Refuge trails, a visitor contact station, and other public use facilities would be concentrated in one area with a few smaller trails in other areas. In general, they would be kept away from key hunting areas. Parking facilities would be expanded.

Under this alternative, a more intensive habitat management strategy would be undertaken. Habitat developments such as moist soil units and greentree reservoirs would be constructed. However, more sites would be selected for these developments than under other alternatives. Prescribed burns on upland prairies sites would be conducted on more sites and monitored more closely. Habitat

for waterfowl would be improved by timber stand improvement, and habitat for white-tailed deer would be expanded by selected cuts to open up some areas to encourage brush species.

### III. Affected Environment

#### A. Physical Resources

##### 1. Climate

Okmulgee county has a temperate, continental climate of the moist, sub-humid type. As the movement of warm, moisture-laden air from the Gulf of Mexico alternates with the movement of either cool, dry air from the west coast of cold, dry air from around the Arctic Circle, wind and precipitation take place.

Okmulgee County has an average annual temperature of 61.2 degrees Fahrenheit. Average monthly temperatures range from 29 degrees in January to 81.9 degrees in July. Precipitation ranges from 38 to 51 inches per year.

##### 2. Air Quality

Okmulgee County as a whole has excellent air quality.

##### 3. Geology

The geologic formations that are at the surface, or immediately beneath the soils in Okmulgee county, are of sedimentary nature. Except for recent alluvium and quaternary terrace deposits, these formations belong to the Pennsylvanian system. The four major floodplain soils are the Verdigris series, Lightning series, Roebuck series, and the Pulaski series.

The banks of the Deep Fork River are

mostly eroded and steep. Most of the river's banks are six to ten feet high when the river is at low flow. The river channel is predominantly silty clay loam. A few areas have rock bottoms.

##### 4. Energy and Mineral Resources

Although relatively shallow coal deposits underlay a substantial portion of the county, only a small portion of the Refuge contains these deposits. All coal rights were purchased on Refuge lands.

Numerous oil and gas wells have been drilled on the Refuge in the past. Most are shallow wells with depths between 2,000 and 2,200 feet. Only about 50 wells remain within the proposed Refuge boundary. Most are near depletion and produce only a few barrels per day.

##### 5. Water

Very little information is known about existing water quality. Quality appears to be fairly high and no known parameters exceed water quality standards.

Wetland areas include the Deep Fork River, sloughs created by changes in the river channel, and shallow wetlands, flooded scrub/shrub, and flooded woodlands.

The Deep Fork River floods periodically, often covering up to 80 percent of the proposed Refuge area. River levels fluctuate at least 8 feet during any given year. Flood waters usually crest and recede within a week or two. Extreme floods may result in low timber areas having water up to a depth of 10 feet. Periodic flooding helps maintain the sloughs and wetlands along the river. Some wetlands have also been created by beaver dams on small creeks and drainages.

## 6. Vegetation

Approximately 85 percent of the Refuge consists of marshy and seasonally-flooded hardwood forest. Bottomland hardwoods species include bur oak, southern red oak, pin oak, shumard oak, pecan, American and winged elm, cottonwood, sycamore, red mulberry, hackberry, black walnut, green ash, dogwoods, and redbuds. The upland areas contain post oak and blackjack oak along with a mixture of grasses and perennial legumes. There is a good mix of hardwood trees on the majority of the area that provide a variety of wildlife food resources. This mixture of timber species ensures a consistent food supply season to season and a variety of den and nesting trees. Mast production is important for waterfowl, upland game and big game species.

The most common grasses are little bluestem, big bluestem, Indian grass, and switch grass which are indicative of tallgrass prairie. Exotic grasses such as Bermuda and Johnson grass are evident along the roads and old home sites. Scrub/shrub wetlands that support buttonbush, wahoo, swamp privet, and willow can be found on the overflow areas.

### *B. Wildlife*

The numerous wetlands located along the Deep Fork River are rich in diversity and of great value to a variety of wildlife. A total of 147 species of birds, 8 game species and 139 nongame species, occur in the bottomland forests and associated wetlands. The numerous sloughs support large numbers of great blue herons, little blue herons, snowy egrets, and cattle egrets. Raptors, woodpeckers, and passerine birds heavily utilize the area.

Fifty-one species of mammals have been recorded in the Deep Fork River basin. Common game and furbearing animals are whitetail deer, gray squirrels, fox squirrels, beaver, eastern cottontail, swamp rabbit, raccoon, coyote, and opossum. The Refuge provides abundant habitat for most of these species. The bottomland hardwood forest is especially productive as fox squirrel and gray squirrel habitat. The squirrel population may reach as high as 2 squirrels per acre on portions of the Refuge.

The Refuge provides important wintering habitat for various waterfowl species. Mallards are the most common. The area provides both wintering and production habitat for wood ducks. Estimates place peak populations on the proposed Refuge area at 20,000 mallards, 5,000 wood ducks, and 3,000 miscellaneous other ducks.

Wood ducks utilize the sloughs, wetlands, and overflow areas along the Deep Fork River for nesting habitat. These areas provide shallow water, cover, feed, and nest trees. Little nesting activity occurs on the River itself due to its steep banks and lack of cover.

Approximately 54 species of reptiles and 38 species of amphibians occur in the area. Fisheries in the Deep Fork River are contiguous with upstream population in the river and downstream populations in Eufaula Reservoir. Feeding and spawning habitat is provided in the Deep Fork River for many important sport fish native to east central Oklahoma. The most important fish to anglers are the channel catfish, flathead catfish, crappie, white bass, and largemouth bass.

The threatened bald eagle is the only federally-listed species known to occur on the Refuge. Eagles usually arrive in

November and depart by the end of February.

### ***C. Archeological and Historical Resources***

Creek Tribal government had its beginning in Okmulgee County in 1867. In 1907, Oklahoma became a state and tribal government was dissolved. Tribal government was re-instated in 1971. The state archeologist has indicated that 13 archeological sites, 2 historic homesteads, 6 marked cemeteries, and other unmarked plots exist within the proposed Refuge boundary.

### ***D. Socio-economic Resources***

Okmulgee County's 1989 population was estimated at 41,800. In addition, Tulsa is located approximately 30 miles north of the Refuge.

Outdoor recreational opportunities in the county include fishing, hunting, water sports, bird watching, and camping. The demand for activities continues to grow as the population grows. In addition, residents of surrounding counties such as Tulsa demand additional recreational opportunities.

Prior to establishment of Deep Fork National Wildlife Refuge, most of the area was leased for private hunting. Portions of the area were also leased for cattle grazing.

## **IV. Environmental Consequences**

### ***Alternative 1: No Action***

#### **A. Impacts on Physical Resources**

Under this alternative, permanent and semi-permanent wetlands would

eventually revert to a low quality wetland providing little benefit to waterfowl or other species that depend on seasonally flooded wetlands. Beaver populations would be subject to only limited control resulting in much of the Refuge land being subject to year-round flooding. Permanent water from beaver-caused flooding over tree roots would kill many of the existing hardwoods, resulting in hundreds of acres of standing dead forest. Flooding could affect private lands adjacent to the Refuge.

Some bird species, such as woodpeckers, might benefit from permanently flooded areas, but the habitat would have little value for waterfowl since dead trees do not produce nuts and would not provide food for waterfowl. Over a very long period of time, the flooded areas would fill in, resulting in meadow and brushland.

Pecan trees would remain the dominant species in old pecan orchards, since mixed hardwood reforestation would not be accomplished in those areas.

With the elimination of controlled burns on upland prairie areas, those areas would eventually convert to Post oak/ Blackjack oak. Wildlife species, such as neotropical migrants, that depend on prairie habitats would no longer use the Refuge.

Without periodic monitoring of water quality, the potential would exist of contamination from the nearby industrial and urban areas that could affect aquatic species before it was detected..

Air quality would not be affected under this alternative.

#### **B. Impacts on Fish and Wildlife**

Without active habitat management such as hardwood reforestation, controlled

burns of prairie areas, and moist soil and greentree reservoir development, the overall value of habitats for the wildlife species for which the Refuge was created would decline over time. However, species that require over-mature forests and upland blackjack/post oak sites would possibly benefit.

Since only basic wildlife surveys (i.e. waterfowl, winter bird count, and breeding bird count) would be conducted under this alternative, a lack of survey data for reptiles, amphibians and fish would hinder the manager's ability to monitor their population trends. Changes in wildlife and fish populations can be an indicator of damage occurring to Refuge lands or waters; without these data, the Refuge manager would be unaware of such damage occurring in time to take possible counter-action.

An increase in the Refuge deer herd could occur, and result in damage to Refuge habitats or adjacent private lands. However, since hunting also occurs off-Refuge, and much of the Refuge lands are near private lands, the impact would depend largely on deer harvest on those adjacent private lands.

With only 2 full-time law enforcement staff to patrol the entire Refuge, illegal take of game species, the use of lead shot, and trespass into closed areas could become problems.

Without access improvement or construction, fishing would not be likely to increase. All areas of the river would still be accessible by boat, however.

Since baseline surveys to determine the status of listed species on the Refuge would not be conducted, the presence of species such as the American burying beetle on the Refuge would remain speculative.

This alternative would not significantly impact the bald eagle, which occasionally uses and may nest on the Refuge.

#### C. Archeological and Historical Resources.

This alternative would have no known impact on archeological and historical resources.

#### D. Impacts on Socioeconomic Resources.

Under this alternative, the Refuge would not provide additional public use facilities to meet the demands of an expanding population. Without the support of local environmental education programs, the youth of nearby communities would have less understanding of the purposes and values of the Refuge. Local businesses would be unaffected as no significant increase in public use would occur.

### **Alternative 2: Refuge Operated as Inviolate Wildlife Sanctuary with Minimal Management of Habitat and No Development.**

#### A. Physical Resources

Under this alternative, permanent and semi-permanent wetlands would eventually revert back to low quality wetlands that provide limited benefit to waterfowl or other species that depend on seasonally flooded wetlands. Bottomland hardwood reforestation in old pecan groves would not be conducted, leaving them to develop slowly into stands dominated by pecan and a few invading species such as red maple and boxelder.

Upland grassland sites would convert to post oak/blackjack oak habitats.

Removal of beaver dams would reduce summer flooding of large areas of living trees and year-round flooding of adjacent private lands.

Under this alternative, there would be very little impact on vegetation from foot traffic and trails. Impacts of roads and existing parking lots would remain unchanged.

#### B. Wildlife

The lack of habitat management such as hardwood reforestation, controlled burns of prairie areas, and moist soil and greentree reservoir development would have a detrimental affect on the overall wildlife value of the Refuge. Grasslands would convert to upland blackjack/post oak sites. Some neotropical migrant species might benefit as the forest matures and blackjack and post oak invade, but those that depend on grasslands would decline.

Since recreational deer hunting would not be permitted, the Refuge would not contribute to population control to maintain herd health. However, since the population moves both on and off the Refuge, the herd would most likely be controlled by hunting on surrounding private and state land.

Wildlife would be subject to only minimal disturbance by the public under this alternative.

#### C. Archeological and Historical Resources.

This alternative would have no known impact on archeological and historical resources.

#### D. Impacts on Socioeconomic Resources.

Under this alternative, the Refuge would not be able to provide additional public use facilities to meet the demands of an expanding population. Without the support of local environmental education programs, the youth of nearby communities would have less understanding of the purposes and values of the Refuge. Local businesses would be unaffected since no significant increase in public use of the area would occur. Support for the Refuge could diminish locally since recreational opportunities would not be provided under this alternative.

#### Alternative 3:

#### *Refuge Operated as Wildlife Sanctuary with Moderate Level of Habitat Management and Development; Non-consumptive Recreational and Educational Activities Allowed.*

##### A. Physical Resources

Construction of greentree reservoirs could change species composition of flooded areas. Hardwood species that prefer seasonal flooding would benefit; those that prefer dryer areas would eventually disappear. Reforestation of pecan orchards would accelerate conversion of those areas to mixed bottomland hardwood species. Prescribed burns on upland grassland sites would maintain those areas as prairie grasslands, and enhance their value to neotropical migratory and resident grassland bird species.

Some possible damage to the Refuge would occur with the construction of public use facilities such as trails. A minimal amount of damage to the



bottomland hardwood ecosystem (e.g. soil compaction, erosion, plant destruction) could occur near trails and roads as visitation on the Refuge increases.

This alternative would not affect air or water quality.

#### B. Wildlife

This alternative would offer excellent protection for wildlife while providing non-consumptive recreational and educational opportunities that would result in minimal disturbance to wildlife and its habitat.

Habitat developments in bottomland hardwood forests and upland native prairie grasslands would benefit populations of wildlife dependent on these habitat types.

Wildlife disturbance along Refuge trails and roads would increase as Refuge visitation increased. Areas closed to the public would provide undisturbed sanctuary for wildlife.

Small game populations, such as squirrels and rabbits, would likely be unaffected by the elimination of hunting under this alternative. However, hunting is a management tool for maintaining healthy white-tailed deer populations and the Refuge could receive criticism for not contributing to their population control, particularly if hunting on private and state land fails to control populations and deer damage private lands.

#### C. Archeological and Historical Resources.

This alternative would have no known impact on archeological and historical resources.

#### D. Impacts on Socioeconomic Resources

The lack of consumptive uses (hunting and fishing) on the Refuge would minimally impact the local economy. The majority of economic benefits would come from an increase in non-consumptive users of the Refuge.

Under this alternative, the Refuge could greatly enhance the environmental education programs of schools within a 50 mile radius. This would have positive long-term effects on attitudes about bottomland hardwood forests, wildlife refuges and the environment.

The elimination of traditional uses of the area--such as hunting and fishing--would further limit the places that local citizens would have available, particularly those in the lower economic bracket. Most private land in the Deep Fork area is leased hunting only and is no longer available to the general public. Since fishing and hunting are strong traditions in the area, conflicts would probably develop between the Refuge, sportsmen, and the Oklahoma Department of Wildlife. When the State of Oklahoma passed a Bill authorizing the acquisition of the Refuge. The bill specified that hunting and fishing were essential uses of the Refuge. This alternative would conflict with this Bill.

An increase in law enforcement efforts would be necessary to prevent illegal trespass.

**Alternative 4:**

***Refuge Operated Primarily as Sanctuary with Moderate Levels of Habitat Management and Development; Non-consumptive and Limited Consumptive Recreational Activities Allowed (Preferred Alternative)***

**A. Physical Resources**

Moderate development and habitat management would enhance wildlife habitat under this alternative. Construction of greentree reservoirs and moist soil units would add to the total wetlands area of the Refuge. Reforestation would accelerate conversion of pecan orchards to bottomland hardwood forest. Prescribed burns on upland prairies sites would protect them from invasion by oak and non-native grassland species and would encourage restoration of native grassland species.

Construction of public use facilities, such as trails and parking lots, could have localized impacts, although an environmental assessment would be required for any such construction in accordance with the National Environmental Policy Act (NEPA). Potential impacts would thus be known prior to construction and mitigation measures could be taken.

Damage to the bottomland hardwood ecosystem (i.e. soil compaction, erosion, plant destruction) could occur near trails and roads as visitation on the Refuge increases.

Beaver dam removal would help protect bottomland hardwood forests and to reduce complaints from adjacent landowners resulting from flooding.

No permanent effect would be seen on air or water quality, although construction

of green-tree reservoirs could have local, temporary impacts on water quality during the construction phase.

**B. Wildlife**

This alternative would offer very good wildlife protection while providing high quality hunting opportunities.

Habitat developments in bottomland hardwood forests (e.g. greentree reservoirs and moist-soil units) and controlled burns to maintain and enhance upland native prairie grasslands would benefit waterfowl populations and other species of wildlife that depend on those habitats.

Wildlife disturbance along Refuge trails and roads could increase as Refuge visitation increases. However, by locating the majority of Refuge trails and public use facilities in one area, disturbance by non-consumptive users would be concentrated in one part of the Refuge.

Increased disturbance of wildlife would occur during hunting seasons, however closure of several areas to the public would provide some protection for habitat and limit that disturbance: Waterfowl sanctuaries would be established where no public entry would be allowed; Bald eagle nests, if any were identified on the Refuge, would be protected from human disturbance with established buffer zones.

Under this alternative disturbance of wildlife from hunting would be reduced by the design of hunting programs. Waterfowl and deer hunts would be designed to limit the length of the hunt and the number of hunters. Waterfowl "sanctuaries" where no hunting would be allowed would provide undisturbed areas for waterfowl. Raccoon hunts would be allowed only during a short time period during late winter. Raccoon hunters would

not be allowed to run dogs in the spring, summer, or fall when ground nesting birds are nesting and other wildlife species are reproducing.

Squirrel and rabbit hunts would not be operated as controlled hunts, but the number of squirrel and rabbit hunters is low enough that disturbance of wildlife should not be a problem. If numbers of hunters increase to a level that would result in disturbance, this policy would be reevaluated.

Refuge hunts for deer would contribute to control of populations, provide opportunities to monitor herd health, and reduce the number of deer depredation complaints from adjacent landowners.

#### C. Archeological and Historical Resources.

This alternative would have no known impact on archeological and historical resources

#### D. Impacts on Socioeconomic Resources

Under this alternative, increased visitation to the Refuge for both consumptive and non-consumptive uses of the Refuge would benefit the local economy. Given the proposed increase in public use facilities and programs, it is estimated that between 100,000 and 150,000 visitors would come to the Refuge annually, with an estimated \$700,000 contribution to the local economy. Visitors would be making purchases in stores, and using restaurants and hotels.

This alternative fits well with the local community's goals of increasing tourism and enhancing the local economy of the

area, while providing benefits to wildlife and bottomland hardwoods habitat.

#### *Alternative 5:*

#### ***Refuge Operated Primarily as Public Hunting Area with High Levels of Habitat Management and Development; Non-consumptive Recreational Uses Allowed***

##### A. Physical Resources

This alternative would result in a significant reduction in the total acres of bottomland hardwood forest on the Refuge. Construction of moist soil units and greentree reservoirs would seasonally increase the total open water acreage on the Refuge. More such sites would be selected for such developments than under other alternatives. Forest management would be more intensive, with a maximum number of selected cuts being made to enhance habitat for deer populations by encouraging brush species. Controlled burns on upland prairie sites would be more expansive than under other alternatives, resulting in an expansion of grassland habitat.

##### B. Wildlife

This alternative would provide good protection for migratory birds and their habitats during non-hunting season, but would result in extreme disturbance of those native wildlife species that are hunted or occupy habitats with hunted species during hunting seasons.

In general, this alternative would lower the value of the Refuge for many species such as some neotropical migrants that depend on mature bottomland hardwood forest, since the total acres of bottomland hardwood forest would be

reduced significantly by an increase in open brush areas and grasslands.

Intense management of habitat for waterfowl by construction of numerous green tree reservoirs and moist soil units would reduce habitat for other migratory birds and non-game wildlife species. Also, waterfowl would be disturbed by hunting activity in the winter months.

Wildlife disturbance along Refuge trails and roads would increase as Refuge visitation increases, but hunting pressure in areas open to hunting would create significant disturbance to both game and non-game species. Ground-nesting birds and young wildlife would be negatively impacted by spring and summer running of coon hounds.

The Refuge does not have adequate acreage to support uncontrolled hunting. Some populations of game species such as deer and turkeys could reach low levels.

Refuge law enforcement efforts would have to increase to protect the resource from illegal activities, reducing time that staff have for general wildlife habitat management.

#### C. Archeological and Historical Resources.

This alternative would have no known impact on archeological and historical resources. Law enforcement efforts would be increased to protect these resources.

#### D. Impacts on Socioeconomic Resources

A significant amount of revenue could be generated for the local economy by Refuge visitors under this alternative. However the Refuge does not have enough acreage to support a large number of consumptive and non-consumptive visitors. Conflicts

would arise among user groups. Non-consumptive use levels would not increase because of time and space conflicts with hunters.

#### **Environmental Assessment Documentation Preparation**

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