

DEEP FORK NATIONAL WILDLIFE REFUGE

Okmulgee, Oklahoma

ANNUAL NARRATIVE REPORT

Calendar Year 2001

U.S. Department of the Interior

Fish and Wildlife Service

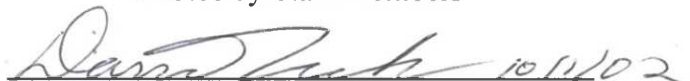
NATIONAL WILDLIFE REFUGE SYSTEM


Deep Fork National Wildlife Refuge Annual Narrative



Okmulgee, Oklahoma Calendar Year 2001

Photos by Staff Members


Darrin Unruh, Refuge Manager Date


Refuge Supervisor, OK/TX Date

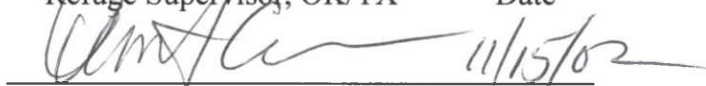

Regional Director Date

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INTRODUCTION

The Deep Fork National Wildlife Refuge was authorized in 1992, under the authorities of the Emergency Wetlands Resources Act of 1986 and the Migratory Bird Conservation Act of 1929. Establishment of the Refuge serves 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 January 01, 2001, the Refuge contained 8,606 acres. The original acquisition approved in 1992 would bring the total acreage figure to 16,213 if all land was acquired. A proposal for Refuge expansion was written up by June of 2001 which would add an additional 2,146 acres within the proposed Refuge boundary. This latest proposal allows for a total of 18,359 acres to be purchased from willing sellers. All of the total land acquisition is located within Okmulgee County.

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. 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.

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.

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.

Some portions of this narrative contain several years of information. An original narrative was written in 1994, however one has not been written since that time. The information written in this document will include all efforts up to the year 2001.

Highlights

- Beginning of a new support group, "Friends of the Deep Fork NWR. See page 23
- Proposed refuge boundary expansion plan signed and sent to Washington, D.C. for approval. See page 28
- Refuge adds two new hunts: Youth muzzleloader hunt. See page 36
Duck hunt See page 39
- Construction of elevated boardwalk and parking lots. See page 41
- Damage and restoration from the Ice storm of winter, 2000. See page 44

Climate Data

Refuge headquarters are based out of the federal postal building in down town Okmulgee, therefore climate data is not kept. The following is a summary of climate conditions based on seasonal changes around Okmulgee county.

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 for the Refuge, and is also the season when severe local storms and tornados are most likely to occur. Summer promotes long hot spells eased by cool nights and a good breeze. Autumn is characterized by mild sunny weather interspersed with periods of cool weather and gentle, soaking rains.

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.

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 per hour, but wind gusts from 25 to 45 miles and hour accompany the passage of most frontal systems, and gusts of 70 to 80 miles per hour accompany violent thunderstorms.

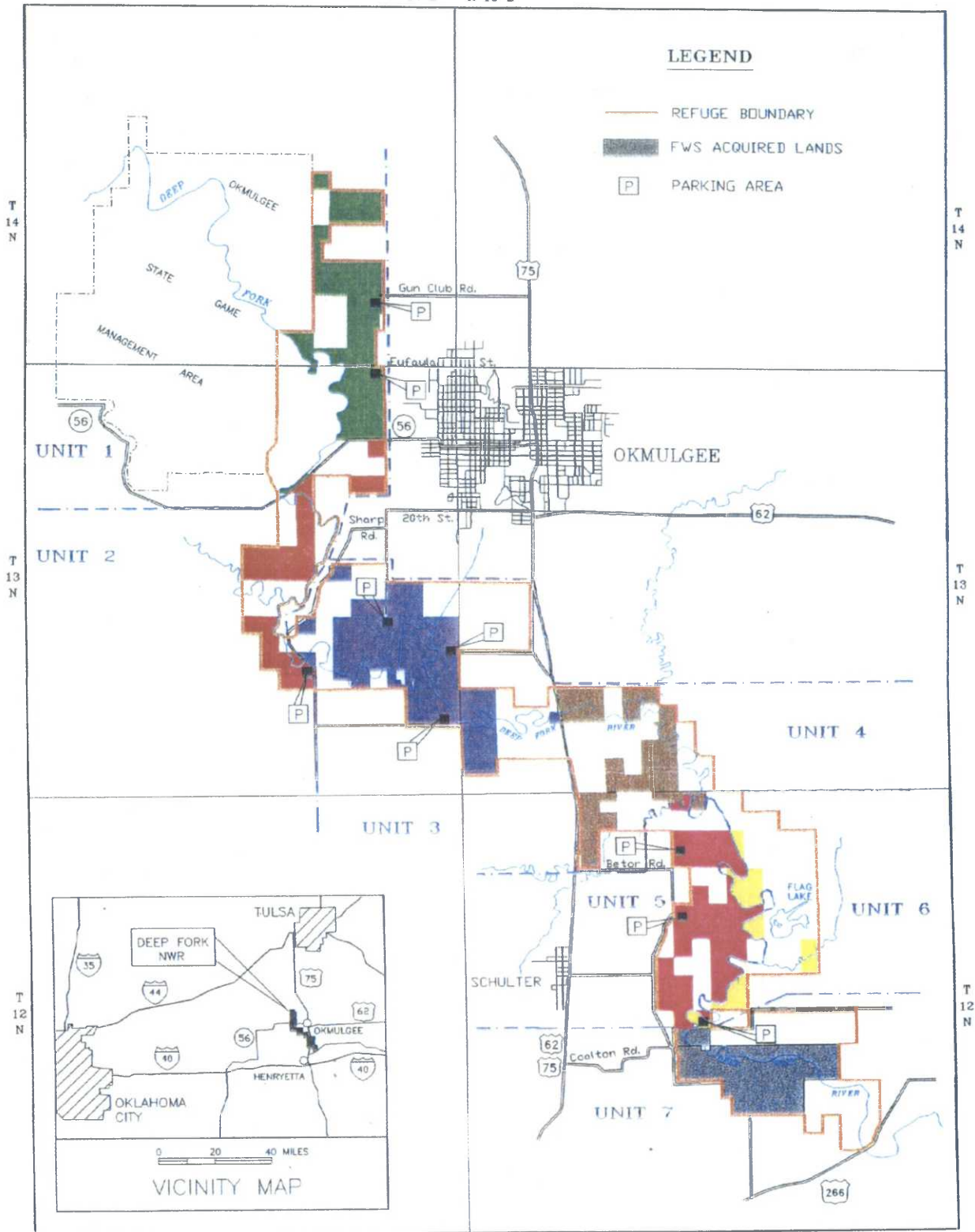
DEEP FORK NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

OKMULGEE COUNTY, OKLAHOMA

UNITED STATES
FISH AND WILDLIFE SERVICE

R 12 E R 13 E



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

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INDIAN PRINCIPAL MERIDIAN

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Monitoring and Studies

1a. Surveys and Censuses

■ White-tailed Deer Survey

During the spring of 1998 , a FWS pilot and photography specialist tested the use of a Forward Looking Infrared (FLIR) camera on the refuge. Flights were conducted along transects covering the refuge to see if the FLIR system would prove useful for surveying deer. Twenty four deer were counted during the survey. Preliminary conclusions are that the system will be a useful tool for surveying deer and other ungulates on Deep Fork and other refuges.

The FLIR system is not currently owned by the USFWS, therefore annual surveys are not being conducted with the system. If the system can be purchased and used, FLIR will become an annual survey conducted for deer on Deep Fork.

■ Breeding Bird Survey Point Count- Audubon Society

The Refuge was assisted by members of the Audubon Society during the years of 1998 - 2001 to conduct breeding bird surveys. The following table represents four years of data produced from the surveys.

Table1-1: Breeding Bird Survey Data for Deep Fork NWR, 1998 - 2001.

Year Species	1998		1999		2000		2001	
	Number Counts	Total Birds	Number Counts	Total Birds	Number Counts	Total Birds	Number Counts	Total Birds
Barn Swallow	0	0	0	0	2	3	1	1
Barred Owl	1	3	0	0	1	1	4	4
Bell's Vireo	0	0	1	2	0	0	0	0
Black and White Warbler	0	0	1	1	1	1	7	7
Blue-gray Gnatcatcher	13	19	14	15	10	11	25	53
Blue Grosbeak	0	0	0	0	1	1	0	0
Brown-headed Cowbird	4	6	2	2	7	11	8	13
Canada Goose	1	1	0	0	0	0	0	

Carolina Chickadee.	11	22	9	13	7	14	9	16
Carolina Wren	8	8	7	7	5	5	1	1
Cattle Egret	0	0	2	6	5	14	0	0
Chimmney Swift	0	0	2	2	2	5	2	2
Chipping Sparrow	0	0	0	0	0	0	1	1
Cliff Swallow	0	0	0	0	2	2	0	0
Common Grackle	1	3	0	0	0	0	0	0
Common Yellowthroat	1	1	2	2	2	2	0	0
Dickcissel	1	1	0	0	2	6	0	0
Downy Woodpecker	3	4	2	2	5	5	7	7
Eastern Bluebird	1	1	0	0	5	6	1	1
Eastern Kingbird	0	0	0	0	3	4	1	1
Eastern Meadowlark	0	0	1	1	2	3	0	0
Eastern Pewee	0	0	0	0	2	3	1	1
Eastern Pheobe	0	0	1	1	3	3	0	0
Eastern Tufted titmouse	14	21	18	29	10	12	23	55
Field Sparrow	6	10	9	18	12	18	7	10
Fish Crow	6	7	2	3	1	1	3	3
Gray Catbird	1	1	0	0	0	0	0	0
Great-crested Flycatcher	3	4	5	5	4	6	10	12
Great Blue Heron	1	1	4	4	5	5	2	2
Great Egret	1	1	1	1	2	3	0	0
Green Heron	2	2	0	0	0	0	0	0
Hairy Woodpecker	0	0	0	0	0	0	1	1
Indigo Bunting	11	12	12	15	15	24	25	54
Kentucky Warbler	2	2	3	3	2	2	6	6
Killdeer	0	0	0	0	2	3	0	0
Least Flycatcher	0	0	0	0	0	0	3	3
Little Blue Heron	0	0	0	0	4	6	0	0
Louisiana-eared Owl	0	0	2	4	0	0	0	0
Mourning Dove	0	0	0	0	1	1	2	3
Mourning Warbler	0	0	0	0	0	0	1	1
Northern Bobwhite Quail	2	2	0	0	4	5	0	0
Northern Cardinal	20	40	17	28	19	38	18	39
Northern Flicker	2	2	0	0	0	0	1	1
Northern Parula	1	1	7	9	3	3	11	12
N. Rough-winged Swallow	0	0	0	0	2	2	0	0
Olive-sided Vireo	0	0	0	0	0	0	2	2
Ovenbird	0	0	0	0	0	0	1	1
Painted Bunting	1	1	3	5	3	3	3	3
Pileated Woodpecker	1	2	0	0	0	0	6	6

Prairie Warbler	0	0	0	0	1	1	0	0
Prothonotary Warbler	3	6	4	5	2	3	8	9
Purple Martin	2	3	0	0	0	0	1	1
Red-bellied Woodpecker	4	4	5	6	4	6	10	12
Red-eyed Vireo	3	6	7	8	4	5	26	37
Red-shouldered Hawk	3	4	2	2	0	0	7	7
Red-winged Blackbird	0	0	0	0	0	0	1	6
Ruby-throated Hummingbird	1	1	3	5	4	8	4	5
Scissor-tailed Flycatcher	0	0	0	0	2	2	0	0
Snowy Egret	0	0	0	0	0	0	1	2
Solitary Vireo	0	0	0	0	0	0	1	1
Summer Tanager	6	8	3	3	0	0	7	7
Swainsons Thrush	0	0	0	0	0	0	6	6
Tennessee Warbler	0	0	0	0	0	0	1	1
Turkey Vulture	2	2	2	2	5	8	9	12
Warbling Vireo	1	1	0	0	0	0	3	3
White-breasted Nuthatch	3	4	1	1	0	0	1	1
White-eyed Vireo	4	4	6	7	7	7	10	13
Wood Thrush	0	0	1	1	0	0	0	0
Yellow-bellied Cuckoo	11	15	5	5	6	10	11	18
Yellow-brested Chat	1	1	1	1	0	0	4	8
Yellow-throated Warbler	0	0	0	0	0	0	8	10
Yellow -throated Vireo	0	0	0	0	0	0	5	8

■ Waterfowl Surveys

Waterfowl numbers were unusually low for the 2001 - 2002 migration season due to a dry summer and fall. Many of the wetland areas contained no water until January 2002.

Annual waterfowl surveys are conducted throughout the fall, winter, and early spring during the months of October - March. Aerial surveys are conducted with pilot Jim Bredy once a month during this time period. Waterfowl numbers are sent to biologists with the Oklahoma Department of Wildlife Conservation (ODWC), where numbers are projected along with state totals. Aerial surveying is not a good method for counting waterfowl in heavily wooded areas like Deep Fork. Waterfowl are difficult to see and do not flush consistently. The numbers below are likely a severe underestimation of the waterfowl present during the surveys. The best way to survey waterfowl in this habitat type is to use both ground counts and aerial counts. Refuge staff will experiment with different methods of ground-counting over the next few years.

Table 1-2: Aerial Waterfowl Surveys Reported on Deep Fork NWR, 2001-2002.

Species	Survey Dates					
	10/07/01	11/07/01	12/17/01	01/14/02	02/04/02	03/06/02
Canada Goose		25	40	70	48	28
Mallard	45	250	2013	1500	1000	950
Gadwall	18	195	87	100	50	250
Green-winged Teal	3	200				40
Blue-winged Teal						8
Wood Duck	150		275	300	500	400
American Widgeon		12				35
Northern Shoveler		75				
Northern Pintail						30
Ring-necked Duck						15

■ Christmas Bird Count

The Audubon Society participated with refuge staff in conducting the annual Christmas Bird Count on varied dates during the 1999, 2000 and 2001 year. Observations during the 2001 year yielded the highest total of birds (N = 1322), as well as the highest number of species (N = 49). Estimates for the year 2000 show a total number of 465, and the total species at 41. Estimates for the year 1999 show a total number of 685, and the total species at 37.

Christmas Bird Count Deep Fork National Wildlife Refuge January 22, 1999

<u>Species</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 3, 4, 5</u>	<u>Unit 6, 7</u>	<u>Total</u>
Great Blue Heron				2	2
Mallard				41	41
Turkey Vulture			4	4	8
Sharp-shinned Hawk			1		1
Cooper's Hawk			1		1
Red-shouldered Hawk				3	3
Red-tailed Hawk			1		1
Mourning Dove			1	3	4
Great Horned Owl			1		1
Red-headed Woodpecker				5	5
Red-bellied Woodpecker			4	7	11
Yellow-bellied Sapsucker				1	1
Downy Woodpecker			4	3	7
Hairy Woodpecker				1	1
Northern Flicker				5	5
Pileated Woodpecker			1		1
Blue Jay			4	14	18
American Crow			19	5	24
Carolina Chickadee			10	21	31
Tufted Titmouse			3	8	11
White-breasted Nuthatch				1	1
Carolina Wren				1	1
Winter Wren				1	1
Marsh Wren				1	1
Golden-crowned Kinglet				8	8
Eastern Bluebird			6		6
American Robin			50		50
Northern Mockingbird				1	1
Northern Cardinal			9	34	43
Field Sparrow			16	6	22

<u>Species</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 3, 4, 5</u>	<u>Unit 6, 7</u>	<u>Total</u>
LeConte's Sparrow			3		3
Song Sparrow			43	28	71
Swamp Sparrow				5	5
White-throated Sparrow				39	39
Dark-eyed Junco			173	64	237
Eastern Meadowlark			15	2	17
American Goldfinch				2	2
Total Number :					685

Total Number of Species: 37

Note: There were no surveys conducted for Units 1 and 2 during the 1999 year.

Christmas Bird Count
Deep Fork National Wildlife Refuge
December 07, 2000

Note: During the 2000 count, the number of birds was recorded, but location was not specifically identified. The following list represents the total species found within all seven units of Deep Fork Refuge.

<u>Species</u>	<u>Unit 1, 2, 3, 4, 5, 6, 7</u>
Great Blue Heron	2
Mallard	5
Turkey Vulture	2
Northern Harrier	1
Red-shouldered Hawk	4
Red-tailed Hawk	2
Unknown Buteo spp.	1
American Kestrel	1
Wild Turkey	30
American Woodcock	3
Mourning Dove	3
Unknown Owl spp.	1
Red-headed Woodpecker	36
Red-bellied Woodpecker	14
Yellow-bellied Sapsucker	2
Downy Woodpecker	10
Hairy Woodpecker	1

<u>Species</u>	<u>Unit 1, 2, 3, 4, 5, 6, 7</u>
Northern Flicker	18
Pileated Woodpecker	1
Eastern Phoebe	4
Blue Jay	71
American Crow	60
Carolina Chickadee	37
Tufted Titmouse	25
Red-breasted Nuthatch	1
White-breasted Nuthatch	5
Carolina Wren	12
Ruby-crowned Kinglet	2
Eastern Bluebird	12
Hermit Thrush	5
American Robin	1
Northern Mockingbird	4
Brown Thrasher	1
Northern Cardinal	30
Song Sparrow	2
Swamp Sparrow	1
White-throated Sparrow	33
Dark-eyed Junco	11
Eastern Meadowlark	1
Rusty Blackbird	2
American Goldfinch	8
Total Number :	465

Total Number of Species: 41

Christmas Bird Count
Deep Fork National Wildlife Refuge
January 03, 2002

<u>Species</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 3, 4, 5</u>	<u>Unit 6</u>	<u>Total</u>
Great Blue Heron	1				1
Canada Goose			16		16
Wood Duck		1			1
Mallard	3	65			68

<u>Species</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 3, 4, 5</u>	<u>Unit 6</u>	<u>Total</u>
Sharp-shinned Hawk		1	1		2
Red-shouldered Hawk	3	2	1	3	9
Red-tailed Hawk	1	2	3	1	7
American Kestrel				1	1
Northern Bobwhite		12	12		24
Killdeer	3				3
Red-headed Woodpecker	18	6	1	31	56
Red-bellied Woodpecker	2	5	3	2	12
Yellow-bellied Sapsucker		1			1
Downy Woodpecker	3	5	7	7	22
Hairy Woodpecker			1		1
Northern Flicker	4	6	8	10	28
Pileated Woodpecker	2	5	5	1	13
Eastern Phoebe	2				2
Blue Jay	31	20	17	42	110
American Crow	28	12	22	26	88
Carolina Chickadee	14	12	14	13	53
Tufted Titmouse	18	16	9	20	63
White-breasted Nuthatch		1		3	4
Brown Creeper	3			1	4
Carolina Wren	2	5	1		8
Golden-crowned Kinglet		1	1		2
Ruby-crowned Kinglet	3	4	2	1	10
Eastern Bluebird	2	4	4	3	13
Hermit Thrush	2	2		1	5
American Robin	12	9		2	23
Northern Mockingbird	2	2	1	1	6
Brown Thrasher			1		1
Cedar Waxwings			1	70	71
Yellow-rumped Warbler	12	3	5		20
Northern Cardinal	7	7	20	25	59
Eastern Towhee			1		1
Savannah Sparrow	5				5
Field Sparrow	5		1		6
LeConte's Sparrow		2			2
Fox Sparrow		2	1	2	5
Song Sparrow	1	18	10	4	33
Lincoln's Sparrow	4			1	5
Swamp Sparrow	1	1		12	14
White-throated Sparrow	16	14	20	62	112
White-crowned Sparrow	1		2		3
Dark-eyed Junco		15	63	25	103

<u>Species</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 3, 4, 5</u>	<u>Unit 6</u>	<u>Total</u>
Red-winged Blackbird		36	150		186
Rusty Blackbird	12				12
American Goldfinch	<u>6</u>	<u>1</u>	<u>17</u>	<u>4</u>	<u>28</u>
Total Number :	228	299	421	374 =	1322

Total Number of Species: 49

1b. Studies and Investigations

■ Investigation on Sewage Spill in Deep Fork River.

This survey has been initiated as a data collection service based upon sewage discharge from the Okmulgee Wastewater Treatment Plant (WWTP). The investigation on impacts to the river and wildlife brought staff from the following agencies: U.S. Fish and Wildlife Service, Oklahoma Dept. of Wildlife Conservation, Dept. of Environmental Quality, U.S. Environmental Protection Agency, and the City of Okmulgee. Civil action against the City of Okmulgee is still pending at this time.



Sewage discharge from Okmulgee Wastewater Treatment Plant into Deep Fork River

The sewage spill was discovered on August 26, 2000 by the report of a bad odor smell at highway 75 bridge and the Deep Fork River. The investigation of the smell led to the

discovery of raw sewage pouring into Okmulgee Creek, which is a tributary of the Deep Fork River. Numerous dead fish and aquatic invertebrates were found in the impacted area which reached nearly 11 miles below the confluence of Okmulgee Creek and the Deep Fork River. The investigation indicated that the river had experienced a large kill of fish, freshwater mussels, and other aquatic life. Field efforts to assess damage were based on the following three issues: 1) Assess length, magnitude, and composition of the fish and mussel kill. 2) Collect relevant water quality data. 3) Collect sediments for possible analysis.

Data results available at this time:

U.S. Fish and Wildlife Service - David Martinez, biologist for the Tulsa Ecological Services Office (USFWS) has provided the following information on damage to freshwater mussel populations. Personnel from Deep Fork Refuge and the Ecological Services Field Office worked jointly to assess mussel kill between September 7 - 15, 2000.

Sampling Procedure: Mussel surveys were conducted from near the mouth of Okmulgee Creek and the River, and continued downstream at most good access points into seemingly unaffected sites. A second unaffected site (control) was chosen for sampling to estimate correct background numbers. At each sample site, mussels and mussel shells were collected for a 100 yard reach. The mussels/shells were collected from one side of the river bank to the center of the river. Information collected was based on species, size and condition. Information was collected at 12 mussel sampling stations, 12 water quality sampling stations, and 7 sediment sampling stations.

Results: No mussels were found to inhabit water between the wastewater discharge point and the mouth of Okmulgee Creek. Mussel community below the confluence of Okmulgee Creek and river found to be chronically depressed due to pollution over long periods of time. High mussel mortalities continued downstream at each survey station. Seemingly natural mussel community conditions were found at survey station approximately 11 ½ miles downstream. Mussel conditions at mile 11 ½ were similar to conditions at control site above confluence of Okmulgee Creek and River in unaffected river reach. The estimate is that approximately 7,000 - 11,000 mussels were killed throughout nearly 11 miles of the Deep Fork River.

Results also conclude that some of the eldest mussels found to inhabit surveyed portions of the Deep Fork are 9 to 11 years old. Mussels are more likely to live a total of 20 or more years, which suggests the river experienced a similar sewage discharge approximately 10 - 11 years ago.

During the survey, a total of 16 native freshwater mussel species were found. Evidence was found at that time adding two other bivalve mollusks (clams) to the list.

<u>Common Name</u>	<u>Scientific Name</u>
Bleufer	<i>Potamilus purpuratus</i>
Fawnsfoot	<i>Truncilla donaciformis</i>
Fragile Papershell	<i>Leptodea fragilis</i>
Giant Floater	<i>Pyganodon grandis</i>
Mapleleaf	<i>Quadrula quadrula</i>
Pimpleback	<i>Quadrula pustulosa</i>
Pink Papershell	<i>Potamilus ohioensis</i>
Pistolgrip	<i>Tritogonia verrucosa</i>
Pondhorn	<i>Unio merus tetralasmus</i>
Rock Pocketbook	<i>Arcidens confranosus</i>
Slough Sandshell	<i>Lampsilis teres</i>
Three ridge	<i>Amblyma plicata</i>
Wabash Pigtoe	<i>Fusconaia flava</i>
Washboard	<i>Megaloniaias nervosa</i>
White Heelsplitter	<i>Lasmigona complanata</i>
Yellow Sandshell	<i>Lampsilis teres</i>
Asian Clam	<i>Corbicula fluminea</i>
Long Fingernail Clam	<i>Musculium transversum</i>

Oklahoma Department of Environmental Quality - The following results were received from sampling done by personnel from the Department of Environmental Quality. The samples were taken between September 6, and September 28, 2000.

All information gathered thus far indicates that a short term discharge from the Okmulgee WWTP containing excess solids and soluble pollutants caused a high oxygen demand which created low dissolved oxygen conditions in Okmulgee Creek and the Deep Fork River and lead to the fish kill. Visual observations and samples taken on September 8 found some high BOD, black sludge deposited in Okmulgee Creek downstream of the WWTP outfall. Also, at the confluence of Okmulgee Creek and the Deep Fork River, accumulations of solids were indicated by dark brown water color, bad odor, and gas bubbling up from the stream bottom. Dissolved oxygen levels were low (1.6 mg/l). Observations at the highway 75 bridge on September 8 found an algal bloom and supersaturated dissolved oxygen conditions indicative of high nutrient levels. Field measurements taken on September 28 showed the Deep Fork River still adversely affected but beginning to recover.

Search, Inc. - Water quality sampling is also being conducted on several locations along the Deep Fork River by Search, Inc., Norman, Oklahoma. Results of sampling procedures are not yet available.

Search Inc. is in the process of developing a water quality model for the Deep Fork River beginning at US Highway 75, and extending 12.5 miles upstream. To date, some water quality, hydrologic, and climatological data has been collected. A report containing the results will be sent to the Oklahoma Department of Environmental Quality. The model will be used to predict the Deep Fork's water quality under different conditions. The model will insure that the Oklahoma Water Resource Board's Water Quality Standards will be enforced and protected.

The CP Kelco facility in Okmulgee presently discharges its wastewater to the City of Okmulgee's wastewater collection system, where it is treated and discharged to Okmulgee Creek. CP Kelco is taking steps to design and build a wastewater treatment system. The new wastewater treatment plant will allow CP Kelco to have more control over their wastewater treatment and disposal.

Oklahoma Department of Wildlife Conservation (ODWC) - Fisheries personnel from ODWC were available during September 6 - 7, 2000 to assess the results of the fish kill due to the WWTP spill. Refuge personnel accompanied the fisheries biologists in the surveying process.



One of Several flathead catfish discovered during the fish kill survey.

A total of 12 species were found dead as a result of the contaminated water. The species found were smallmouth buffalo, longnose gar, river carpsucker, flathead catfish, darter spp., minnow spp., channel catfish, shiner spp., madtom spp., sunfish spp., brook silversides, mosquito fish, and pimephales spp. The survey concluded that a fish kill had occurred for

a distance of nearly 9 miles below the confluence of Okmulgee Creek and the river. The total fish kill could be estimated at several thousand.

Investigation Follow-up - Water quality monitoring and spot inspections at the discharge site are on-going.

■ **Malformed Amphibian Initiative**

A study was initiated on Deep Fork Refuge in 2001 to study malformations in different amphibian species. The study has already been a national concern since the discovery of a malformed frog in Minnesota in 1995. The study is being conducted by FWS Biologist Ron Brinkley of the Clear Lake ES Office, Houston, TX. Ron Price (Refuge administrator) has accompanied Mr. Brinkley on each night-time survey held on the refuge. The study will continue in the summer of CY 2002. **Initial results of the study have not yet been released.**

This study is concerned with the malformation, not deformation of amphibians. Deformations occur to a part of the existing body after the development stage (injury or loss of limbs). Malformations occur as problems during the developmental stage of the amphibian. Malformations can cause the abnormal development of organs, limbs, or other parts of the body. The malformation of amphibians is thought to be the result of a decline in ecological health. The study will consider climate change, disease and fungal infections, parasites, water pollution, and other climate factors as the cause of amphibian malformations.

2

Habitat Restoration

2a. Wetland Restoration: On-Refuge

Wetland restoration on Deep Fork is an actively managed program based upon refuge resource management goal number #1(CCP): Protection and Enhancement of Wetlands. Most of the refuge lies within the flood plain of the Deep Fork River, and is covered by bottomland hardwoods regenerated in part by the disturbance of overbank flooding. All wetlands on Deep Fork are sustained by runoff from storm water, and from overbank flooding by the Deep Fork River. Beavers are abundant on the refuge and play a large role in maintaining wetland areas through a network of dams. Beaver dams with the potential to inundate important hardwood tracts were removed as necessary from March through September to protect timber from long-term flooding and harm during the growing season. Beaver dams were removed with Kinepak explosives or by hand. The majority of dewatering efforts were conducted in Unit 1. Winter dams were left in place where they provide good wetland habitat.

Many of the large open water wetlands were developed as the remains of old river channels (oxbow), or ponds dug out during the early part of the 1900's. These large wetlands need very little maintenance. The smaller and more shallow wetlands were developed due to beaver activity on small drains and creek channels. These more shallow wetlands are normally inundated by cattail, willow, and swamp privet and are more likely to dry up during hot summer months. Both the small and large wetland are extremely important to migratory waterfowl during the winter months. Mallard and wood duck populations make up the largest percentage of waterfowl that utilize refuge wetlands.

2b. Upland Restoration: On Refuge

The refuge does not have an active upland restoration program at this time. Less than 15 percent of the refuge is considered upland prairie type habitat. Woody species such as pecan, winged elm, oak and locust continue to choke out upland areas by spreading into these upland areas. The refuge will have an approved fire management plan in CY 2003, and will begin to prescribe burn upland areas to control the spread of woody vegetation.

2c. Wetland Restoration: Off-Refuge

Nothing to report.

2d. Upland restoration: Off-Refuge

Nothing to report.

3

Habitat Management

3a. Manage Water Levels

■ Greentree Reservoirs

Storm water runoff and overbank flooding cause forested tracts to flood during the winter months. The flooding process makes mast crops of acorns available to a number of different waterfowl species. Water can remain impounded in these areas during the winter months, but must be drawn off during the growing season to prevent timber kill. The removal of beaver dams from around these shallow wetland areas will allow water levels to drop. There are no water control structures to manage on the refuge at this time.

3b. Manage Moist Soil Units

The refuge currently has two wetland areas that are considered moist soil units. The naturally occurring wetlands are flooded by storm water runoff, and overbank flooding by the river. Water control structures have not been installed on these wetlands, therefore water levels must be manipulated by the removal of areas of beaver dam at one end of the wetland. The refuge has abandoned the use of riser-board type water control structures due to beaver activity. Both wetlands are heavily used by waterfowl during the winter months.



Pawhuska Area Moist Soil Wetland

3c. Graze/Mow/Hay

Deep Fork Refuge is made up of bottomland hardwood forest habitat, and has no association with farming practices. Refuge staff mowed approximately 7 miles of trails leading from parking areas utilized by the public for hunting, fishing and outdoor recreation. The refuge mows and maintains only those roads in the refuge that are used strictly by staff. All other roads that pass through the refuge are county roads or oil lease roads maintained by others.

3d. Farming

Nothing to report.

3e. Forest Management

Approximately 85% of the refuge consists of bottomland hardwood habitat. Hardwoods were harvested from the Deep Fork bottomlands with the Refuge boundary about 50-60 years ago. Consequently, most of the trees on the refuge are relatively young.

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. Once the majority of forests reach a mature state, the long-range forest management strategy will likely be modified to include selective cutting. 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 use of herbicides. Pecan orchards on the refuge will be returned to a mixed species condition. Natural regeneration commonly occurs throughout the forested habitats, but in large open areas or converted pecan orchards, active reforestation may be necessary.

The refuge received delivery of 15,000 hardwood bareroot seedlings on March 2 from a private company called Environmental Synergy, Inc. (ESI). ESI has formed partnerships with the Service and other government agencies with the goal of reducing atmospheric carbon through reforestation efforts. The Clean Air Act requires that industrial and utility companies that emit carbon into the atmosphere must take certain steps to reduce carbon emissions. This process is known as carbon sequestration. One carbon sequestration method approved by EPA is the planting of tree species on lands that have been cleared of trees. The use of carbon sequestration on Service lands is a good strategy since many refuges have large tracts of farmland and open pasture that could be converted to native woody vegetation. This reforestation can be accomplished on refuges at little or no cost to the Service. The only requirement is that the area be completely void of all trees. Deep Fork Refuge had a 75-acre area in Unit 7 that had been cleared and converted to livestock pasture prior to refuge acquisition. The refuge manager worked with ESI forester Clyde Stewart to determine the

number and species composition of seedlings. A mechanical seedling planter was obtained from Cache River NWR in Arkansas and the trees planted March 20 through March 30 on the Northeast end of the Doneghy tract. The tree composition consisted of Pin Oak, Shumard Oak, Green Ash, and Persimmon.



Mechanical seedling planter used to plant 75 acres of hardwood seedings

Protecting bottomland resources from the detrimental effects of beavers is one of the most labor-intensive and critical aspects of forest management on the refuge. The staff removed several dams throughout the spring and summer months. Beaver are normally removed in problem areas, but due to the lack of staff time in 2001, efforts were concentrated on dewatering only.

3f. Prescribed Burning

Nothing to report.

3g. Control Pest Plants

■ *Lespedeza cuneata*

The plant has more commonly been known as sericea lespedeza, or Chinese bushclover. Lespedeza, a native to Japan, has been introduced into the U.S. and can now be found over most southeastern states, including as far west as Texas, Oklahoma and Kansas. Lespedeza is a nitrogen-fixing legume, and has been planted in the past for wildlife habitat improvement, erosion control, and bank stabilization on creeks and slopes. The plant does

have a positive value as a food source for deer, wild turkey, rabbits, birds and rodents during certain times of the year.

The plant is considered an exotic, and must be treated as such regardless of value. Lespedeza is an aggressive plant and takes over plant communities very quickly, and is capable of growing in various types of habitat. Staff have found Lespedeza in all refuge habitat to include wetland areas, hardwood areas and upland grass areas. The use of fire as a method of control is not recommended due to the plants fire tollerant nature. No action has been taken by the refuge at this point to control the invasive. The refuge will begin investigating the use of herbicides to control the plants spread.



Commonly known as Chinese Bushclover (*Lespedeza cuneata*)

4

Fish and Wildlife Management

4a. Bird Banding

Nothing to report.

4b. Disease Monitoring and Treatment

Nothing to report.

4c. Reintroductions

Nothing to report.

4d. Provide Nest Structures

▣ Wood Duck Nesting Boxes

As of 1998, a total of about 20 Wood Duck nest boxes have been constructed and up around wetlands on the refuge. An attempt is made annually to visit each nest box to record nest success and to make repair. The box checks were not made this year.

4e. Pest, Predator and Exotic Animal Control

▣ Beaver Control

The control of beaver populations in and around wetland areas is done so in coordination with water level control and moist-soil management. In most cases, it is only necessary to remove beaver dams to meet water level management needs. Beavers are removed from wetland areas when water level problems are negatively affecting private lands adjacent to refuge lands. No beavers were removed during the year.

▣ Feral Hog Control

Feral hogs were first observed on the southern refuge land tracts during the 2001 CY. Damage of wetland and forested habitat in the Donehy area became apparent during the fall and winter. Large areas of shallow wetland and wet grass areas were found with large holes

dug similar to wallows. Refuge staff will control hogs when necessary to protect refuge habitat.

■ Feral Dog and Cat Control

Feral dogs and cats are a constant problem on the refuge. Normally animals are abandoned on county roads adjacent to refuge lands, and end up scavenging or chasing animals within the refuge. Packs of dogs have been seen many times chasing deer and other animals. Dogs and cats are removed from the refuge if they are an obvious threat to wildlife, and if no owner can be contacted.

5

Coordination Activities

5a. Interagency Coordination

▣ Highway 56 realignment

The highway 56 realignment project is one of those projects that causes refuge managers to wake up in the middle of night in a cold sweat. This project has been in the works for several years. The previous manager began working with the Corps and ODOT back in 1995. Manager Unruh inherited the problems starting in 2000. The details of the NEPA process and the problems with the ROW's, and the mitigation on this project are given in 6g.

Another significant problem surfaced after project construction began in August 2001. Unruh and some of the upstream landowners became very concerned over the lack of flood relief structures in the roadbed. The Deep Fork river comes out of its banks between one and five times annually. Flood waters in the construction area are swift and deep. The refuge manager and some of the nearby landowners believed that the highway 56 project would create a severe backwater situation that would be slow to drain. This of course, would have very negative impacts on forest and wildlife resources on the refuge. The ODOT project supervisor was contacted and the situation explained to him. Unruh showed the supervisor 8-foot water marks on the trees next to the highway roadbed. After the color returned to his face, he assured us they would "re-run the hydrological numbers". A few weeks later, ODOT informed us that they had grossly underestimated flows through that area. They revised the contract by adding an additional bridge and several large culverts along the roadbed.

▣ Highway 266 realignment

Manager Unruh met with ODOT on the proposed highway 266 realignment. This proposed realignment site is not located on the refuge, but is located within the proposed acquisition boundary. The current status of this project is unknown.

▣ Water Quality Monitoring

The refuge continued to work with the Oklahoma Department of Environmental Quality (ODEQ), EPA, and the Tulsa ES office the water quality monitoring in the river, Okmulgee creek and the permitted discharge site for the City of Okmulgee. The cooperative effort was necessary after the illegal sewage discharge by the City of Okmulgee in September 2000. The details of this event are discussed in chapter 1 under Research and Investigation.

■ **Goose banding**

Dilsaver and Patterson assisted the Oklahoma Dept. of Wildlife Conservation (ODWC) with goose banding at a central Oklahoma lake.

5b. Tribal Coordination

Nothing to report.

5c. Private Land Activities

Nothing to report.

5d. Oil & Gas Activities

The Refuge owns the oil and gas rights on only 240 acres of the total refuge acreage. The number of active oil and wells on the refuge varies from year to year, and is normally based on crude oil prices. The refuge had 30 active wells during the calendar year. The refuge also contains an undetermined amount of abandoned wells. The refuge is working with engineering and ecological services regional office staff at developing a project for identifying well locations, well-plugging, and site clean-up. Refuge staff routinely monitor active well sites and contact operators when problems are identified.

5e. Cooperative/Friends Organizations

■ **Development of Friends of the Deep Fork NWR**

Steve Labuda and George and Dorothy Hoffmann facilitated a mentoring group meeting for the staff and potential friends board members. The meeting was held during November 9-10, 2001. The following items were key topics of discussion during the mentoring visit:

- Basic structure and operation of a friends group
- Role of a friends group with that of the Refuge
- Planning of work projects for the group

Board members were nominated and chosen to the positions of President (Jack Blair), Vice-President (Bruce Mabrey), Secretary (Gail Storey) and Treasurer (John LaChance).

Friends of the Deep Fork held its first official meeting on 12/13/01. Discussion branched into the following topics: Development of a Certificate of Incorporation, Mission Statement, Memorandum of Agreement with FWS, and By Laws. Also discussed was the potential for grant money and other funding sources to assist in the development of the friends group. The friends group will continue to hold monthly meetings to discuss support opportunities

to assist the refuge:

6

Resource Protection

6a. Law enforcement

A wide variety of Law Enforcement activities occurred this past year. Refuge public use is increasing as a greater number of people learn that the refuge exists. Also, an increasing number of people do not have a place to hunt and fish, and are using the refuge for consumptive uses. Refuge Manager Unruh was the only Refuge Officer until Assistant Manager Mike Oldham was hired in July and Full-time Law Enforcement Officer Vaughn was hired in mid-October.

The year began with the recovery of a body from the Deep Fork River. Officer Unruh assisted the Okmulgee County Sheriffs Office and the Oklahoma Highway Patrol with the recovery efforts. The body was that of a fugitive that was a target of a November Manhunt on the refuge in November 2000. The individual was not found and the manhunt was called off. Four months later the badly decomposed body was found in the river, approximately one mile upstream of Coalton Bridge. The cause of death was believed to be accidental.

The spring was marked by an above-average white bass spawning run. Fishing visits were high during a 2-week period in late march. Several checks were made on fisherman during this time

Cattle trespass continued to be a problem on the refuge. Three landowners were contacted and given warnings. The refuge tried to reduce the problem by helping adjacent landowners with new fence construction on the exterior boundary line on the south end of the Unit 7. These efforts resulted in a significant reduction in livestock trespass for the remainder of the year.

The refuge is open to squirrel, rabbit, raccoon, and waterfowl hunting. Archery and primitive deer hunts are offered as special draw hunts. Mandatory refuge briefings for deer hunts were initiated this year. These briefings were a definite improvement to the hunting program. These briefings reiterated and explained the specific refuge regulations. This was also an opportunity for the refuge staff to answer a wide variety of questions. The briefings made the hunts run better for the refuge staff and the hunters.

The refuge was a victim of a major theft over the thanksgiving weekend. The refuge's John Deere tractor and gooseneck trailer stolen from the equipment yard. The theft was reported to the Okmulgee County Sheriff's Office and the FBI. The equipment was placed on the

NCIC database. Interviews conducted with neighbors did not produce any leads. To date, the investigation into this theft has produced nothing.

A stolen vehicle was abandoned on the refuge in the Coalton bridge parking lot. The refuge contacted the Okmulgee County Sheriff's office who in turn contacted the owner. Patrols on the refuge were conducted sporadically on the refuge during the spring and summer months with an increase in patrols and more weekend work conducted during the fall hunting seasons.

On 11-24-01 Refuge Office Kevin Vaughn and Refuge Manager Darrin Unruh assisted Oklahoma State Warden David Robertson in apprehending three individuals for headlighting, shooting and in illegal possession of a white-tailed deer. The violation occurred on private land, which is surrounded by Deep Fork NWR.

The refuge is still working on refuge boundary posting. At last count, over 21 miles of boundary had not been posted for the first time. The large amount of inholdings and the heavy brush conditions make this a daunting task. Refuge staff were able to post several miles of lines in Unit 1 and the "Closed To Hunting" area in Unit 4.

Officer's Oldham and Unruh completed the 6-month firearms requalification at Sequoyah refuge. Unruh, Oldham, and Vaughn submitted physical fitness plans to the physical fitness coordinator.

Unruh and Oldham completed annual LE refresher training at Marana, AZ. Officer Vaughn was issued a Sig Sauer .40 given to the refuge by LE ARD Frank Shoemaker. Officer Vaughn completed semi-automatic pistol training at Sequoyah.

Several verbal and written warnings were issued during the year. See the table below for a list of NOV's issued for 2001.

■ The following violation notices were issued by refuge officers during the 2001CY.

<u>Date</u>	<u>Violation</u>	
5/23	Carry, possess or discharge a firearm -	50 CFR 27.41
10/01	Failure to comply with special regulations -	50 CFR 25.31
10/01	Failure to comply with special regulations -	50 CFR 25.31
10/06	Failure to comply with special regulations -	50 CFR 25.31
12/09	Hunting with shotgun capable of holding more than 3 shells -	50 CFR 20.21b
12/13	Travel on other than a designated route of travel -	50 CFR 27.31
12/15	Hunting with shotgun capable of holding more than 3 shells -	50 CFR 20.21b
12/15	Failure to comply with special regulations -	50 CFR 25.31

12/15	Failure to comply with special regulations -	50 CFR 25.31
12/15	Hunt without a state license -	50 CFR 32.2a
12/20	Use of toxic shot while hunting with shotgun on waterfowl production area -	50 CFR 32.2k

■ The following warnings were issued by refuge officers during the 2001 CY.

- 10/20 Carrying firearm other than approved for current season
- 11/24 Failure to comply with special regulations

6b. Wildfire Preparedness

■ Development of a Fire Management Plan

Refuge staff began working with fire staff at Wichita Mountains WR to draft and finalize a fire management plan for Deep Fork Refuge. The fire plan will be completed and sent in for approval by spring, 2002.

The only staff currently red carded for wildland firefighting are Manager Unruh, and Asst. Mgr. Oldham.

6c. Manage Permits and Economic Uses

A multitude of gas, oil, and power line right-of-ways ROW's exist on the refuge. The refuge staff worked with Duke Energy on access and special provisions for the maintenance of their ROW's in Unit 1. The refuge also coordinated access with PSO and East Central Rural Electric Cooperative on the maintenance of a variety of ROW's in units 1, 2, and 3.

6d. Contaminant Investigation and Cleanup

■ **Okmulgee Sewage Spill Investigation** - See Research and Investigations (Chapter 1,1b)

6e. Manage Water Rights

Nothing to report.

6f. Manage Cultural Resources

▣ Archaeological Resources

The refuge currently has six known archaeological sites within the refuge boundaries. The Oklahoma Archaeological Survey (Univ. of OK) has provided the information on the known sites based upon surveys conducted during 1948, and 1958. The information is kept in the refuge safe, and is not accessible by the public.

6g. Land Acquisition

▣ Background

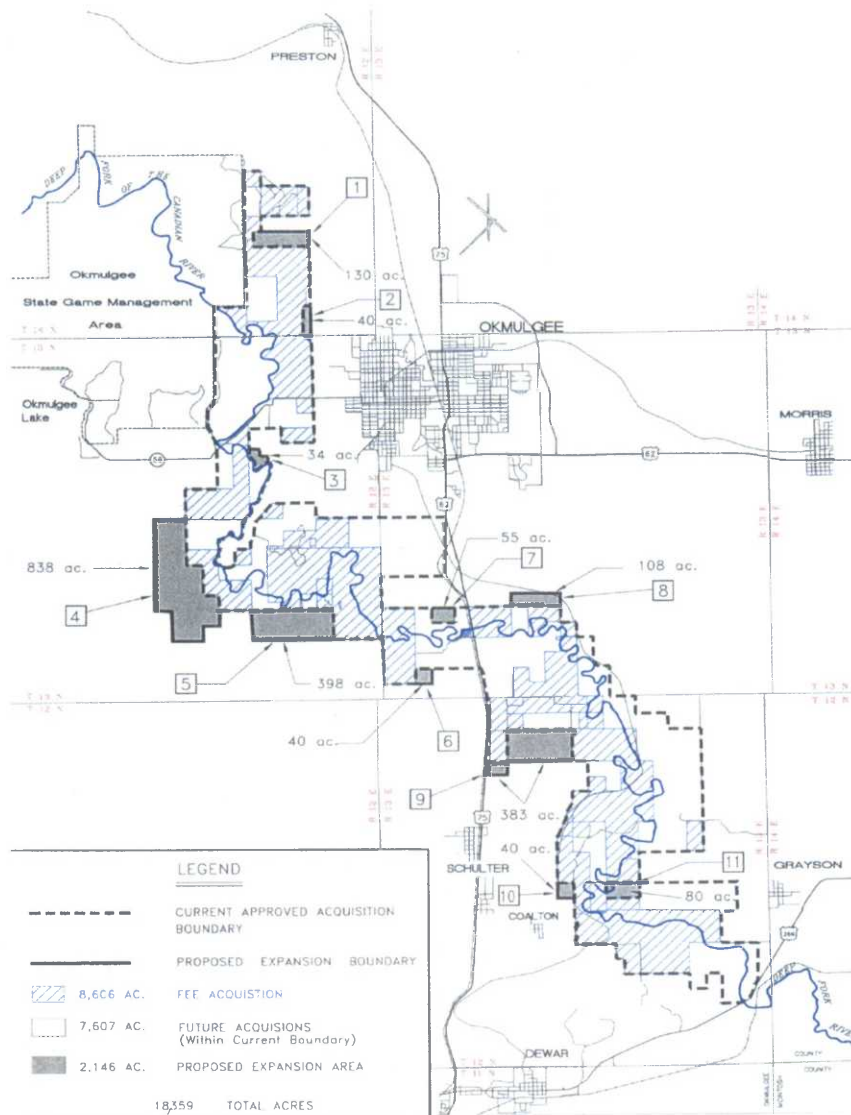
The purchase of Deep Fork was approved under the authorities of the Emergency Wetlands Conservation Act of 1986 and the Migratory Bird Conservation Act of 1929. The refuge was originally approved in 1992 to acquire 16,104 acres in fee and easement. Since then, 8,606 acres have been acquired from willing sellers.

In 1996, land acquisition with Migratory Bird Conservations funds was all but shut down when the State Wildlife Commission refused to approve refuge acquisitions. The shut-down occurred because of disagreements over the opening of Oklahoma refuges to raccoon hunting. The stalemate continued for 4 years. During this period, no refuge acquisitions occurred with MBC funds. Deep Fork was able to acquire the 220-acre Willis tract with emergency/inholding funds in 1998. In early 2000, the stalemate was worked out and the Wildlife Commission approved MBC acquisitions for Deep Fork and Little River.

▣ Proposed Refuge Expansion

A proposed expansion boundary package was prepared and submitted in 1996. About the same time, land acquisition with MBC acquisitions was shut down due to the conflicts between the State Wildlife Commission and the Service. Apparently, the proposed expansion package never went completely through the approval process in 1996, and was eventually just forgotten. Once the Service and the State Commission were back on the same page, the fact was discovered that we did not have an approved boundary expansion. Unfortunately, the three MBC proposals submitted in 2001 were all in the proposed expansion. The refuge manager and the planning staff got together quickly and prepared a new Boundary Expansion Plan and Environmental Assessment. The work was done in a very short amount of time and a high quality document put out for public comment. The public, the wildlife commission, and the congressional folks did not seriously object, nor did they seem to adamantly support the plan; so the plan moved on to the Washington office level. The plan is sitting in Washington as this annual narrative is being written. The Regional Office Planning Division submitted this document a year ago and the refuge still has no approved acquisition plan.

The specifics of the 2001 plan called for the proposed exterior boundary to be expanded to include 2,146 additional acres. This would increase the proposed refuge size from 16,213 acres to 18,359 acres.



Proposed boundary expansion map

One of the reasons for proposing the boundary expansion was to ensure the wetlands were acquired in a complete form. Portions of the original 1992 approved boundary went through the middle of wetland areas. Another reason for the expansion was to improve access for the refuge and the public. Some boundaries were some distance from the nearest county road and could only be accessed by crossing private land. New boundaries were drawn that used country roads as the exterior boundary. The new plan was definitely more management friendly and also good for the public user.

■ Migratory Bird Submissions

Unruh prepared three land acquisition packages for possible submission to the Migratory Bird Conservation Commission. The packages prepared included the Chevron (199 acres), The Nadine Sanders (137 acres), and the Helen Manual (20 acres). These tracts are located in Unit 3 and are connected. The Chevron and the Sanders tracts border the refuge. The purchase of these tracts would have resulted in a larger and more contiguous refuge tract that would have been easier to manage. The packages were presented to Richard Hatcher, Assistant Director of the ODWC. Mr. Hatcher approved of the packages and presented the proposals the Oklahoma Wildlife Commission. The Commission approved the packages in the Spring of 2001. Unfortunately, these tracts were also located in the 2001 unapproved expansion boundary described above. The assumption was made that this boundary would be approved in time to make the 2002 MBCC spring meeting. As stated above the approval of the expansion still has not been approved, therefore, Deep Fork was unable to submit a proposal to the MBCC.

■ Other Acquisitions

The 1.5 acre Todd property was acquired in the fall of 2001. This purchase was small, but crucial. This acreage was located along highway 75 and was surrounded by refuge on three sides. The only access to the refuge was through this property. The property was owned by the Greensboro bank. The bank had foreclosed on the holder of the Mortgage (Mr. Tom Todd) and was looking for a quick sell. The Trust for Public Lands (TPL) was asked to purchase the property due to the difficulty of this type of purchase by the Service. TPL quickly acquired a private donation and purchased the property. The property was then conveyed to the refuge in August 2001.

Deep Fork submitted two properties to regional office for possible purchase with emergency/inholding funds; the Bryant (160 acres) and the Badger (90 acres) tracts. Since Deep Fork was not able to submit a tract for the MBCC meeting, the Bryant and Badger tracts were placed high on the regional ranking. Owners of both tracts signed the Permission to Appraise forms in November 2001. Results of the appraisal will be available by spring 2002.

■ Highway 56 Realignment Project

The refuge and the Tulsa ES office has been involved with the Highway 56 realignment project for several years. The environmental assessment was completed by the Oklahoma Department of Transportation ODOT and submitted and approved by the Service in November 1999. The Service agreed to the project subject to a wetland mitigation. The project would impact/destroy 18 acres of wetlands. In exchange for the lost wetlands, ODOT agreed to purchase 100 acres of private lands within the Refuge approved acquisition boundary. The catch came when ODOT wanted to maintain title to the property and give the Service a wetland easement only. Manager Unruh disapproved of this agreement.

Eventually ODOT agreed to transfer fee title the 100 acres.

ODOT was unsuccessful in purchasing the Mitigation (Crotty tract) property after several months of negotiations. Unruh approached Bill Milroy about selling. He agreed to open negotiations with ODOT. After much "haggling", Mr. Milroy sold 100 acres to ODOT. The Milroy property will serve as the mitigation property for this project. However, the problems with this project were not over.

ODOT had failed to include utility ROW's in with the highway ROW. They had apparently assumed that the highway ROW would cover all of the utility ROW's. ODOT contracted out the utility installation which began in the spring of 2001. Unruh contacted Realty about the problem. As of the end of 2001, Paul Cornes in Realty and Unruh are working with ODOT on resolving these problems. The transfer of the Milroy property to the Service will not take place, until all of the problems with ROW are solved.

■ Carbon Sequestration

Carbon Sequestration was discussed in detail in 3e. Forest Management. The refuge hopes to use carbons sequestration as a tool to acquire land. The refuge submitted three tract descriptions to Environmental Synergy (ESI) for possible acquisition using carbon sequestration funds. These tracts total 428 acres and consist of cleared pastureland. These tracts are owned by willing sellers and would meet the requirements for carbon sequestration. The refuge has not received a response from ESI regarding these acquisitions.

6h. Wilderness and Natural Areas

Nothing to report.

6i. Threats and Conflicts

Nothing to report.

7

ALASKA USE ONLY

Nothing to report.

8

Public Education and Recreation

8a. Provide Visitor Services

■ Visitation

The refuge received around 50,000 visitors during 2001 with the majority of the visitations in the form of hunting, fishing, and wildlife observation. Highway 75 runs through the middle of the refuge and has a large volume of traffic (14,000 cars a day) that is not included in our visitation figures.

Deep Fork NWR is strategically located within a highly populated area of Oklahoma. The refuge is 38 miles from Tulsa, 104 miles from Oklahoma City, and 120 miles from Fort Smith, AR. There are 70 school districts within a 50-mile radius of the refuge. There are approximately 2,785,000 residents within a 100-mile radius.

■ Volunteers

Volunteers logged numerous hours during the year on jobs such as filing, computer data entry, administrative work, outdoor education classes, and heavy equipment maintenance. All total volunteer hours added up to just less than 200 hour. No facilities are available at this time to host temporary volunteers.

8b. Outreach

Educational Programs

■ Outdoor Classrooms -

The refuge conducted several outdoor environmental education classes and staff- assisted nature hikes. Refuge staff provided instruction to the students on topics ranging from wetlands, flooding, trees, waterfowl, migratory birds, plants, mammals, reptiles, amphibians and invertebrates. Students also get to identify invertebrates and small fish they dip-net from our aquatic sampling platform. The outdoor education classes combined with nature hikes give the students an appreciation of a hardwood bottom forest. News releases are also sent out to help increase public awareness of the refuge.



AO Price and RM Unruh conduct outdoor education program to elementary class

The following classes attended environmental education classes conducted by AO Ron Price and RM Darrin Unruh.

Date	School	Students
April 12	Beggs HS Ecology Class	21
April 24	Henryetta Elementary School	21
April 25	Henryetta Elementary School	22
April 26	Henryetta Elementary School	25
May 18	Okmulgee County Conservation District Outdoor Classroom - Henryetta, Okemah, Dustin, Graham Schools	157
June 7	Okmulgee First Baptist Youth Group	21
June 13	Okmulgee Learning Center	65

September 18	Henryetta Elementary School	18
September 19	Henryetta Elementary School	23
September 20	Henryetta Elementary School	18
September 21	Okmulgee County Conservation District Outdoor Classroom - Beggs, Dewar, Wilson, Schulter Schools	145
October 12	Okmulgee County Conservation District Outdoor Classroom - Morris, Liberty, Mounds, Preston Schools	155

■ **Adult Programs -**

Deep Fork NWR is a relatively new refuge that is still in the acquisition phase. The outreach programs is critical in increasing the public's awareness of the Refuge.

The construction of trails, boardwalks, parking areas and other outdoor projects have increased our public use this year. Most of the projects were constructed at our outdoor education site including an aquatic sampling platform and an education table. Construction began on a 1,300' elevated disabled accessible boardwalk that runs through a bottomland hardwood forest and into a wetland near our outdoor education area. The boardwalk has two steel fabricated bridges, one 40' and another 60' spanning two creeks. The boardwalk also features two rest stop areas and a 20' X 25' observation deck overlooking the wetland. The boardwalk project should be completed in the fall of 2002. These projects were funded through force account and appropriated funds secured by U.S. Senator Don Nickles.

Outreach presentations are given to local civic groups and various agencies. The following presentations were conducted by RM Darrin Unruh and ROS Oldham

Date	Group/Agency	Attendance
June 17	Okmulgee Lions Club	16
August 14	Morris Lions Club	25
August 30	Tulsa Chapter Sierra Club	41

October 2	Osage Tribe and State Conservation District	18
October 15	Oklahoma State University Wildlife Society Chapter	25

■ **Hunting**

The refuge offers a variety of hunts. The squirrel and rabbit season is concurrent with the state season, but are closed from October 1 until the end of the state deer rifle season. The refuge once again participated in the state controlled hunt program by offering two weekend archery deer hunts, one youth primitive deer hunt and one adult primitive deer hunt. This was the first year for the youth deer hunt. The refuge conducted a non-drawing archery deer hunt after all of the draw hunts were completed. The harvest results of the deer hunts are as follows.



This young lady successfully harvested a white-tailed doe during the 2001 youth hunt

Year 2001 Deer Harvest Data for Deep Fork NWR

	<u># Hunters</u>	<u>Does</u>	<u>Bucks</u>
Hunt # 103 Archery Hunt (Oct. 5-7)	32	1	0
Hunt # 104 Archery Hunt (Oct. 12-14)	38	2	0
Hunt #703 Primitive Youth (Oct. 19-21)	22	3	5
Hunt #205 Primitive Hunt (Nov. 2-4)	39	2	2

Special Note: The refuge conducted a non-drawing archery deer hunt on November 5 -

16,2001 following the conclusion of all draw hunts. The hunt provided allowed more opportunity for archery hunters. All hunters participating in this hunt were required to complete and return a harvest information report back to the Refuge. The following harvest information was collected for that hunt.

Open Archery Hunt, Nov 5 - 16	<u># Hunters</u>	<u>Does</u>	<u>Bucks</u>
	144	5	12

A total of 144 hunters participated in the non-drawing archery hunt, 74 hunters had permits but did not hunt, and 100 hunters with permits did not return a questionnaire.

The Refuge opened its first duck hunt in 2001. The hunt opened December 1 to eliminate conflicts with the deer hunts. Hunting is allowed Friday through Monday and closes at 1:00 each day of the hunt. Participation in the refuge's first hunt was minimal. Only 10 people participated the first day. Participation will likely increase over the next couple of years.

Raccoon hunting was allowed during the month of January only, but was expanded from four to seven days a week this past season.

The refuge worked with the visitors services in developing a printed copy of a refuge hunting brochure. The refuge in past years had just developed a copy on the computer. The new printed hunting pamphlet was a definite improvement over the old ones. The new pamphlet also contained a free refuge permit on the front. This permit is now required of all refuge hunts and should improve compliance with refuge regulations.

■ Fishing

Fishing seasons and regulations mirror the state seasons and regulations. The refuge is a popular place for the local folks to catch catfish, crappie, and white bass. The white bass spawning run was exceptionally good this year. The quality of white bass runs is usually dependent on river flows. This year rainfall created the right amount of flows for the white bass.

Catfishing was poorer than average this year. This can be attributed to a lack of rainfall during the spring and summer months. The river did not have enough flows to trigger catfish spawning and feeding. High flows are necessary to bring catfish out of lake Eufaula to spawn in the Deep Fork River.

Normally, several large flathead catfish are caught out of the deeper holes in the river during the spring and summer months. Only a few of these fish were reported caught. This may be attributed to the sewer spill that occurred in 2000. Many brood-size flatheads died after the spill and it is possible that those that survived moved downstream back into lake Eufaula.

The refuge began work on a fishing brochure. This will be the first fishing brochure

available at the refuge. The brochure will have a map, a description of the fish species found on the refuge, and a description of the refuge regulations.

■ **Wildlife Observation**

Wildlife observation is becoming increasingly popular on the refuge. Several county roads run through and around the refuge, and the number of people viewing wildlife from these roads is growing. The construction of the boardwalk will also enhance viewing opportunities for the public in the future. The refuge began work on a watchable wildlife brochure this year. The text was contracted out to a professional interpretive writer. This brochure should be completed next year.

The Tulsa Chapter of the Audubon Society once again assisted with the spring breeding bird counts and the winter counts.

9

Planning and Administration

9a. Comprehensive Management Planning

The refuge CCP was written and signed in 1999.

9b. Nepa Compliance

■ Duck Hunting

A package was prepared for the opening of duck hunting on the refuge. The opening of this new hunt was in compliance with NEPA and the Refuge Improvement act. The documents submitted included a Waterfowl Hunting Plan, compatibility determination, a concurrence letter from the ODWC, an intra-service section 7 evaluation form, and an environmental action memorandum. In addition, duck hunting was a planned recreational activity in the approved CCP. A 30-day public comment period was conducted for the plan and the compatibility determination. Few comments were received during the comment period. The duck hunt was approved in the summer of 2001, and the hunt was opened for the first time on December 1, 2001.

■ CCP Amendments

Manager Unruh submitted a memo to the refuge supervisor advising that certain changes to the 1999 CCP were necessary. One change Unruh proposed was that limited deer hunting be allowed in Unit 5. According to the approved CCP, hunting is not allowed in Unit 5. The problem is that highway 75 runs through unit 5 and the deer numbers are increasing. The number of deer-related vehicular accidents are also increasing. Public safety is the best justification for the change with herd health following a close second.

Unruh also proposes to change the amount and locations of waterfowl sanctuaries on the refuge. The current CCP does not allow for sanctuaries in Units that should have sanctuaries. The need for sanctuaries is critical to waterfowl management. In addition, under the rules of the Migratory Bird Conservation Act, no more than 40% of lands purchased with duck stamp money can be hunted. Unruh proposes to increase the number of sanctuaries and to space them out throughout the refuge.

Changes to an approved CCP raises many questions regarding NEPA and the Refuge Improvement Act. The manager will work with the planning division over the next year to find the best way to make these changes within the boundaries of the law.

9c. General Administration

■ General Administration Funding FY2001

<u>Funding Source</u>	<u>Amount (\$)</u>
Base1261	209,533
RON1261	128,800
Watchable Wildl. 1261	<u>9,000</u>
Total 1261	347,333
DEF1262	175,000
EQ1262	34,000
AM1262	<u>39,000</u>
Total 1262	248,000

■ Staffing

Deep Fork NWR started CY 2001 with 2 FTEs Refuge Manager Darrin Unruh and Administrative Asst. Ron Price and 2 Temporary Maintenance Workers. The vacancy announcement was advertised for the ROS position and the establishment of an additional FTE (Park Ranger) position was approved. The two vacant position were filled this year. The Refuge Operations Specialist position was filled by Walter Oldham from Bosque del Apache NWR and the Park Ranger position was filled by Kevin Vaughn from the Oklahoma Department of Wildlife Conservation.

The refuge does not have any funded Maintenance Worker FTEs and all Maintenance Worker positions must be filled by temps.

Personnel

<u>EMPLOYEE</u>	<u>POSITION</u>	<u>EOD</u> (for Deep Fork)	
1. Darrin B. Unruh	Refuge Manager	9-30-97	GS-12/13 PFT
2. Walter M. Oldham	Refuge Operation Spec.	7-01-01	GS-9/11 PFT
3. Kevin W. Vaughn	Park Ranger	10-15-01	GS-9 PFT
4. Ron D. Price	Administrative Asst.	5-24-98	GS-7 PFT
5. Brent Bains	Maintenance Worker	1-02-01	WG-7 TEMP
6. Patrick M. Dolan	Maintenance Worker	12-02-00	WG-7 TEMP
7. Michael J. Hames	Maintenance Worker	7-31-01	WG-7 TEMP
8. Jimmy W. Smith	Maintenance Worker	8-12-01	WG-7 TEMP
9. Seth P. Patterson	Maintenance Worker	5-29-01	WG-6 TEMP
10. William L. Dillsaver	Maintenance Worker	5-29-01	N/A Summer Hire



Staff from left to right: Darrin Unruh, Mike Oldham, Pat Dolan, Kevin Vaughn, Joe McGlocklin, Ron Price, Michael Hames

Seth Patterson and Jimmy W. Smith were special need appointments not to exceed 30 days hired to assist with the construction of our 1200' elevated boardwalk. Their appointments were extended for another 30 days. Pat Dolan, Brent Bains, and Michael Hames are NTE 1 year appointments.

William Dillsaver was a Creek Indian Nation Summer Employment placement and was funded by the Creek Indian Nation. This was William Dillsaver's second summer to work on the refuge. The Creek Indian Nation Summer Employment program helps area Creek youth find employment during the summer months.

▣ Training

The following is a listing of trainings attended by staff during the year.

Aircraft safety training - Unruh,
Law enforcement refresher - Unruh, Oldham, Vaughn,
Administrative conference - Price
Visitor services and communications workshop - Vaughn
Compatibility training - Unruh
Commercial drivers license training and test - Dolan,
CAT backhoe / excavator safety and maintenance training - all staff.

▣ Accomplishment Reporting

A total of 16 accomplishments were written up and submitted into ARS.

9c. Facilities, Structures, Construction, and Equipment

■ Development of Elevated Boardwalk, and Parking Lots.

Funds were appropriated, with the help of Senator Don Nickles (OK), for the improvement of public use facilities at Deep Fork. These funds were first available in 1998, but as of spring 2000 no work had been completed. The project consisted of two parts, the construction of refuge parking lots, and the construction of an elevated boardwalk. In 2000 and 2001, nine parking lots were constructed or rehabilitated. These parking lots are enclosed by a pipe fence, a brochure distribution box, and a gravel parking area. Future plans are to place an information sign at each parking lot.



Gravel parking lots enclosed by pipe fencing

The original proposed location for the elevated boardwalk was at the Hunter tract along highway 75. Unruh made the decision in May 2000 to change the proposed location of the trail from the hunter tract to a location near the old cussetah farm site. The new location did not have highway and train noise and contained an excellent bottomland hardwood site. The trail planning process took nearly 6 months. The refuge drew its own site plan and began purchasing materials. The trail location was marked and a dozer was used to clear the trail location. The area was then surveyed. Unruh worked with engineering on the construction details. By June 2000, all the planning was over and construction began. Construction came to a screeching halt by fall, when wet weather set in. However, refuge staff were able to beat the weather and place the two prefabricated bridges across the two sloughs along the trail.



Portions of the elevated boardwalk

The new 315 Cat excavator and the new 420 Cat Backhoe were used to place the steel bridges on the pilings. Construction resumed in the spring of 2001. The target completion date is August 1 2002. When complete, the trail will be 1300 feet in length, 1000 feet of the trail will consist of the wooden elevated boardwalk, 300 feet will be an asphalt trail. The trail will take the visitor from a parking lot in an upland area and down through a bottomland hardwood area. The trail will end at a 16-foot by 24-foot elevated deck, overlooking a small wetland area. The refuge is currently working with Wilderness Graphics on the development of eight educational panels for the trail.

The refuge staff also constructed a wetland sampling deck. This deck is part of the continual development of the refuge's environmental education site. This deck is located near the boardwalk, and allows the visitor to get out over a wetland. One side of the deck is open so that visiting school groups can sample the wetland muck and invertebrates from the shallow wetland.



Wetland Sampling Deck

■ Construction of Exterior Boundary Fenceline

The refuge contracted out the construction of three livestock fences totaling 13,000 feet. The bid was awarded to Bob Risley of Vian, OK. The three lines constructed were; 1) South Donegny tract, Unit 7, 2 miles, 2) Unit 3, next to the chamber of commerce land, 0.5 miles, and 3) North end of the LeDoux tract, Unit 3, 0.5 miles. The refuge dozed the line prior to fence construction. Clearing the line with a dozer reduces the price of building the fence and results in a better fenceline.

■ Road Construction/Maintenance

A 0.5-mile stretch of county road was reconstructed by the refuge staff. The county had all but abandoned the maintenance of 250 road years ago. This short piece of road was impassible during the winter months, and the ice storm of 2000 had only made things worse. A utility company donated the gravel and the refuge did the job of rebuilding the road. The road is now an all-weather road.



250 road construction and repair

■ Ice Damage

A severe ice storm hit eastern Oklahoma on December 25-26, 2000. This storm did significant damage to refuge roads, trails, and fences. Okmulgee County was one of 39 counties that was declared a disaster area in Oklahoma.



Damage to refuge roads as a result of Ice storm

Assessment following the storm revealed that damage had occurred to 15 miles of fence, 6 miles of roads, and eight parking lots. The refuge submitted a plan to repair the damages, and a few months later the refuge received supplemental appropriations in the amount \$654,490 to repair the damages. Repairs to damaged refuge resources will take at least two years.

The refuge hauled and loaned (one month) Little River Refuge a John Deere 450 dozer to help with cleanup efforts following the ice storm. The refuge dump truck was loaned (one month) to Sequoyah Refuge for hauling gravel during their road maintenance project.

■ Equipment Purchased/Received

John Deere 6210 Tractor with loader (purchased in 2000, received in 2001)
2001 Chevrolet 4X4 model 2500 HD - Law enforcement vehicle received in 2001.
2002 Chevrolet 4X4 model 2500 HD (purchased in 2001)
Caterpillar 420 D Backhoe (purchased and received in 2001)
Caterpillar 318 Excavator (purchased and received in 2001)
Caterpillar D5M Dozer (purchased in 2001; to be received in 2002)
Fontaine Lowboy Equipment Trailer (purchased in 2001, to be received in 2002)
Freightliner Tractor Truck (purchased in 2001, to be received in 2002)

F-600 Tractor Truck (Used, Acquired from DRMO, 2001)
1988 1 ton pickup, Chevrolet, Flatbed (Acquired from Sequoyah Refuge)
A 1970 GMC dump truck was excessed

Feedback – Nothing to report.

Appendix - Nothing to report.

Credits

Darrin Unruh: 1a, 1b, 2a, 3a, 3b, 3e, 4d, 4e, 5a, 5d, 6a, 6c, 6g, 8b, 9b, 9c,

Mike Oldham: 1a, 1b, 2a, 2b, 3a, 3b, 3c, 3g, 4d, 4e, 5e, 6a, 6b, 6f, 8a, 8b, 9a, 9c,

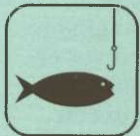
Ron Price: 8a, 8b, 9c,



Deep Fork

National Wildlife Refuge

Fishing Regulations



General Information

Deep Fork National Wildlife Refuge was established in 1993 to protect and enhance the bottomland hardwood forests of the Deep Fork River floodplain and their associated fish and wildlife resources. The U.S. Fish and Wildlife Service administers the refuge system and is responsible for conserving, protecting, and enhancing the nation's fish and wildlife populations and their habitats for the continuing benefit of people.

The Deep Fork River

The Deep Fork River meanders through its floodplain, changing its course as the force of flood water gouges away the river banks and creates cutoffs that form oxbow lakes. Erosion and deposition of silt raise and lower land elevations, leaving behind seasonal and "permanent" ponds and rich, saturated soils that accommodate plants adapted to high soil moisture. Flooding is essential to the maintenance of many plant, animal and fish species native to bottomland forests.

The Deep Fork River floodplain is rich in biological diversity and of value to a variety of migrating and wintering waterfowl. 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. The Deep Fork River as well as the bottomland hardwood ecosystem is the vital habitat that supports the fish and other wildlife species occupying the Deep Fork River system. Water quality is essential to maintain a healthy ecosystem, and is closely monitored by refuge staff.

General Refuge Regulations

Major objectives of the Refuge are to provide habitat for wintering waterfowl and nongame migratory birds, wintering and production habitat for wood ducks, and habitat for the natural diversity of wildlife native to the area. Management objectives also emphasize opportunities for environmental education, interpretation, and wildlife recreation such as hunting, fishing, bird watching, and photography.

Over 8,000 acres of the proposed refuge have been acquired. Additional land will be purchased from willing sellers as funds are available. The proposed Refuge boundary is shown on the map on the reverse side of this brochure. The Refuge eventually will encompass over 16,000 acres.

Currently, a checkerboard ownership of public and privately-held tracts exists within the proposed Refuge boundary. Hunters, fishermen and other visitors to the Refuge are not authorized to trespass on private land; private property rights should be respected at all times.

In the field, the Refuge boundary is indicated by white fiberglass posts marked with boundary stickers and/or 11 X 14-inch metal boundary signs.

By law, national wildlife refuges are closed to all public use activities unless expressly permitted. Hunting, fishing and certain other public uses are permitted on most areas of the refuge. The regulations listed below supplement the general regulations that govern public use on national wildlife refuges as set forth in Title 50, Code of Federal Regulations. When permitted, hunting, fishing, and other public uses will be in accordance with applicable State laws unless otherwise listed.

To ensure your safety and enjoyment while visiting Deep Fork NWR, please take the time to become familiar with the following regulations. Contact the refuge manager for current regulations and authorized activities before entering the refuge.

Pets Pets are not allowed to run loose, but may be kept in a vehicle or under control on a leash.

Motorized Vehicles All vehicles must remain on existing county roads or in designated parking areas. Blocking gates or roadways is prohibited. All terrain vehicles (ATV's and ATC's) are prohibited, except by disabled individuals possessing a refuge special use permit

Boats Boats used for any recreational activity; i.e., hunting, fishing, and wildlife viewing, must be removed from the refuge daily. Boats must comply with all state regulations.

Disabled Access Disabled persons are encouraged to participate in fishing on the Refuge and other activities. Contact the refuge manager for guidelines to obtain special use access.

Camping and Fires Camping and fires are prohibited on the refuge. The nearest campground is located at Okmulgee/Dripping Springs State Park, west of Okmulgee along Highway 56.

Prohibited Activities

Littering

Carrying firearms of any kind, unless authorized to do so while hunting.

Target Practice

Taking of wildlife or plants (including cutting trees or brush) unless authorized to do so.

Searching for or removing any object of antiquity.

Blocking cattle guards, gates, or roadways with vehicles.

Marking trails with paint or leaving flagging tape, ribbons, or trail tacks.

Only the species listed in this brochure as open to fishing may be taken on the refuge.

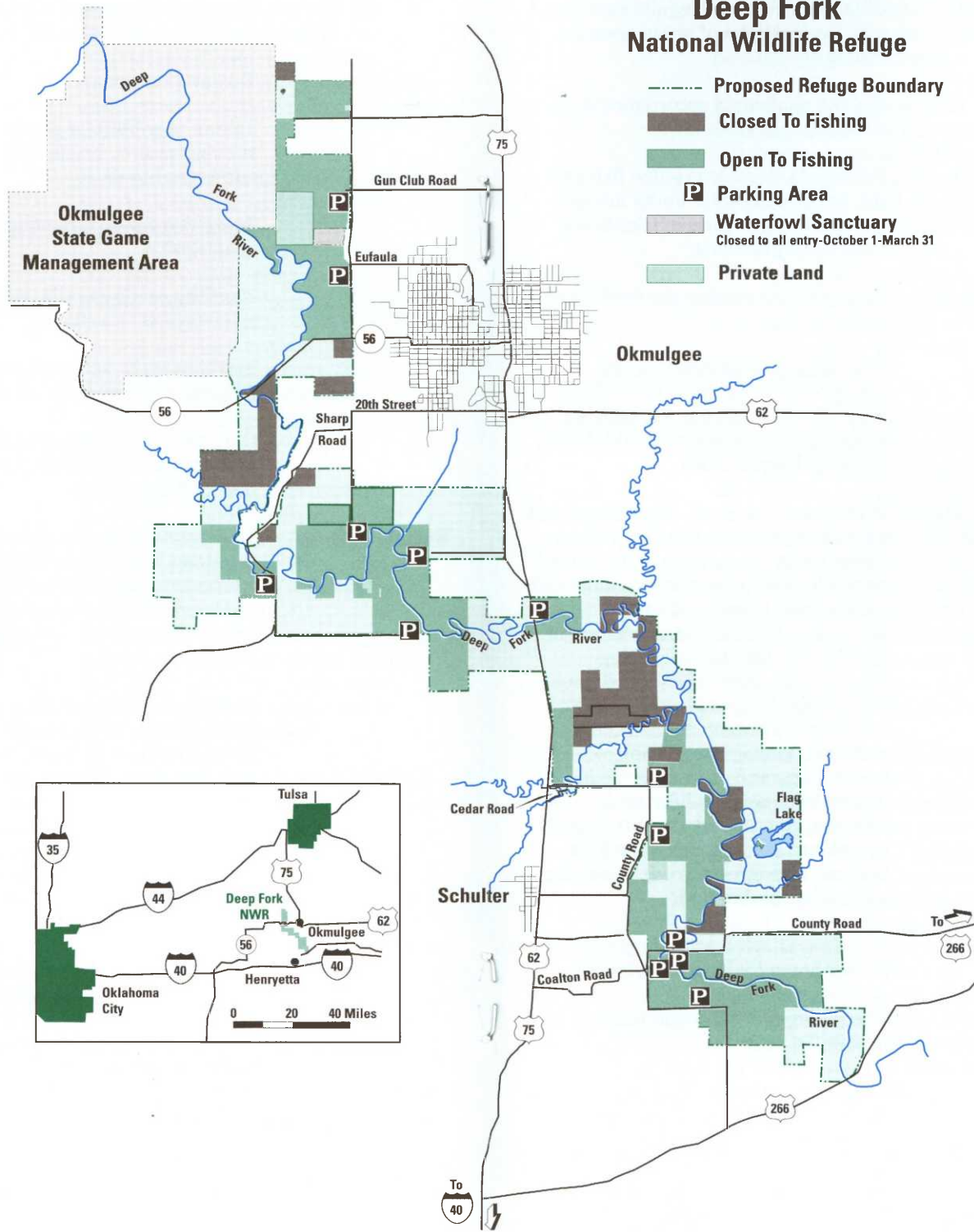
General Fishing

Year round fishing is permitted on the Deep Fork River, and fishing is allowed from March 1-October 31 on sloughs, farm ponds and impoundments not connected to the river.

Parking is limited at fishing access locations where Highway 56, Sharp Road, Highway 75 and Coalton Road span the river. Designated areas will be closed to fishing (see map for specific locations and closures). Some areas are closed to all forms of public entry. Other areas may be closed for special management or safety reason.

The refuge currently does not have any boat ramps. Although difficult, light-weight jon boats and canoes can be launched from the bank at river bridge locations.

Fishing Deep Fork National Wildlife Refuge



Refuge Specific Fishing Regulations

Game fishes allowed to be taken on refuge are those listed in the State of Oklahoma Fishing Regulations. See map for locations of areas open to fishing.

State Law Provisions

Fishing shall be in accordance with all applicable state laws.

Taking of the various game fish and the designated creel limits are as specified in the State of Oklahoma Fishing Regulations.

Snagging and Netting

Snagging and netting are prohibited on the refuge.

Bowfishing

Bowfishing is allowed on the refuge during daylight hours from May 15 – September 30, only as specified in the State of Oklahoma Fishing Regulations.

Trot lines, Jug lines, Limb lines and Yo-Yo's

Trot lines, jug lines, limb lines, and yo-yo's allowed in the Deep Fork River only. These type of lines must be marked with the owners name and address and must be attended according to time limits specified in the State of Oklahoma Fishing regulations guide. Abandoned lines are a hazard to people and wildlife and must be removed when the owner no longer intends on maintaining and attending the lines. **These lines are prohibited in sloughs, ponds and impoundments to protect wading birds such as herons, and egrets from becoming entangled or hooked.**

Noodling

Noodling allowed according to State of Oklahoma Fishing Regulations.

Turtles and Mussels

The taking of turtles and mussels is prohibited.

Sportsmanship and Ethics

Please respect other refuge users. Pick up trash including waste fishing line. Do not leave left over bait fish and fish parts to decay in refuge parking areas and trails.

Releasing long-lived fish like flathead catfish is not required, but is encouraged. Fisherman should consider taking only what they need for food consumption. Fish are not an unlimited resource.

Safety

Use caution when navigating refuge waters. Numerous submerged tree stumps exist in shallow waters. River currents can be very hazardous.

Fish Species

Fifty-nine fish species have been identified from the river, streams, and reservoirs of the Deep Fork River basin, 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 (less common).

Game Species

Channel Catfish – Adults normally occur near cover in larger pools and deep holes, while immature cats are more tolerant of fast current, riffles and shallow water. Common foods preferred are fish, mussels, snails, insects and crayfish. Spawning usually takes place in late May or early June at a water temperature of 75 degrees F. Hollow logs, overhanging underwater ledges or holes under mud banks are typical nesting places. Channel cats occur in the Deep Fork, but are not as common as blue cats.

Flathead Catfish – Adults are found near cover (such as brushy tangles and submerged logs) in larger pools and deep holes. Flatheads prefer to feed mainly on live fish and crayfish, however mussels, snails, and insects take up a portion of their diet. Spawning usually takes place in late May or early June at a water temperature of 75 degrees F. Hollow logs, overhanging underwater ledges or holes under mud banks are typical nesting places.

Blue Catfish (a.k.a. Mississippi White Catfish) – Cats are generally found in the larger rivers and major reservoirs in areas with sand, gravel or rock bottoms. Blue cats feed primarily on fish, mussels, snails, insects, earthworms and crayfish. Spawning usually takes place in late May or early June at a water temperature of 75 degrees F. Hollow logs, overhanging underwater ledges or holes under mud banks are typical nesting places. Blue cats migrate in great numbers out of Eufaula Lake up the Deep Fork River in the spring. These mass migrations are triggered by spring floods.

White Crappie and Black Crappie – It is possible to find both species inhabiting the rivers and impoundments of the refuge, but the white crappie is the most common. The white is quite tolerant of turbid, faster flowing waters associated with most larger river systems, as well as clear water impoundments. The black crappie are more common in larger, clear water bodies with less preference to flowing waters. In late winter and early spring crappie can be found in deep holes in the river. Crappie prefer natural food sources such as minnows, shad, crayfish, mollusks and insects.

White Bass – These fish are often found in large schools, and often travel in water over sandy shores during the day and in shallower areas at night. White bass prefer natural food sources such as minnows, shad, crustaceans, and insects. Spawning is triggered by water temperatures of 50 to 55 degrees F. White bass prefer an upstream migration for spawning over weeds, debris and rocks. White bass make an annual spawning “run” up the Deep Fork out of Eufaula Lake in the spring.

*Non-game
Species*

Other species of non-game fish known to inhabit water on the Deep Fork Refuge are river carpsucker, carp, buffalo spp., gar spp., sunfish spp., darter spp., madtom spp., and shiner spp. Historical records exist for the Arkansas River Shiner which is proposed for the endangered list. Many of these non-game species have no value as a game fish resource, but do play an important role as a food source for wading birds and diving ducks.

**For More
Information**

Refuge Manager
Deep Fork National Wildlife Refuge
P.O. Box 816
111 West 4th Street, Room 318
Okmulgee, OK 74447
918/756-0815
918/756-0275 Fax

**Deep Fork
National Wildlife Refuge
P.O. Box 816
Okmulgee, Oklahoma 74447
918/756-0815
918/756-0275 FAX**

<http://southwest.fws.gov>

**U. S. Fish and Wildlife Service
<http://www.fws.gov>
1 800/344-WILD**

August 2001



U.S. Fish & Wildlife Service

Deep Fork

*National Wildlife
Refuge*



The 8,372-acre Deep Fork National Wildlife Refuge is one of more than 500 refuges throughout the United States managed by the Fish and Wildlife Service. The National Wildlife Refuge System is the only national system of lands dedicated to conserving our wildlife heritage for people today and for generations yet to come.



**Welcome:
Forest Jewel**

Lush, hardwood forests surrounding oxbow lakes and a muddy river add up to precious remnants of a vanishing ecosystem in Oklahoma.

Deep Fork National Wildlife Refuge joined the National Wildlife Refuge System in 1993 as a crucial link for waterfowl migrating along the Central Flyway.

**A Flood-loving
Forest**

Just 35 miles south of Tulsa, the 8,372-acre refuge offers a wealth of wildlife viewing, photography, hunting, and fishing. Wood ducks nest in quiet sloughs off the Deep Fork River. Great blue herons flap in and out of a tree rookery. Flocks of blue-winged teal, gadwall, and mallards land in wetlands, wings flashing in the evening light. Thousands of mallard ducks call the refuge their winter home. Channel catfish and carp swim into river sloughs after floods.

*(Above) Aerial view of the flooded Deep Fork River. Photo by Jon Brock.
(Right) Mallards. Photo by Steve Berendzen*





Floods each year replenish the bottomland hardwood forests that flourish on Deep Fork NWR. Bur oak, southern red oak, pin oak, shumard oak, pecan, elm, cottonwood, sycamore, red mulberry, hackberry, black walnut, green ash, hawthorne, dogwood, and redbud take root in soils naturally fertilized by flood waters.

Each time the Deep Fork river swells over its banks, the waters deposit rich, alluvial soils throughout the adjacent hardwood forests.

Flood waters scour shallow wetland areas and cut off river meanders, creating oxbow lakes. Thanks to flooding, the refuge forests harbor homes for hundreds of kinds of wildlife.



(Above) Aerial view of the Deep Fork River with oxbow and lake. Photo by Jon Brock. (Right) Deep Fork River bank, USFWS Photo.



The Deep Fork flooding schedule runs about like this: major floods every 5 years, moderate floods every year and a half, and minor floods twice a year. Most of the refuge falls within the 100-year floodplain, and over 80 percent of it floods at least once a year, except during very dry periods. On some portions of the refuge, watermarks on the trees are 10 feet high.

Going, Going...?

Unfortunately, bottomland hardwood forests are rapidly disappearing. Historically, this forest ecosystem of eastern Oklahoma extended across an estimated 2.2 million acres. By the early 1980s, roughly 85 percent of the forests had been destroyed, leaving only about 330,000 acres. Many of the remaining bottomland hardwoods exist in small, isolated tracts that are of little value to wildlife.



(Above) Bottomland hardwoods. Photo by Jon Brock. (Right) Beaver. Photo by John and Karen Hollingsworth

Wildlife Watching Tips

Dawn and dusk are the best times to see wildlife.

In warmer climates, little is moving on hot summer afternoons or on windy days.

Observe from the sidelines. Leave "abandoned" young animals alone. A parent is probably close by waiting for you to leave. Don't offer snacks; your lunch could disrupt wild digestive systems.

Cars make good observation blinds. Drive slowly, stopping to scan places wildlife might hide. Use binoculars or a long lens for a closer look.

Try sitting quietly in one good location. Let wildlife get used to your presence. Many animals that have hidden will reappear once they think you are gone. Walk quietly in designated areas, being aware of sounds and smells. Often you will hear more than you will see.

Teach children quiet observation. Other wildlife watchers will appreciate your consideration.

Look for animal signs. Tracks, scat, feathers, and nests left behind often tell interesting stories.

Here, these valuable forests blanket about 85 percent of the refuge. Shrubby wetlands, emergent wetlands (those that support sedges, cattails, and other aquatic plants), open water, forested uplands, and abandoned agricultural fields make up the remaining 15 percent.

Wildlife: Warblers to White-tails

The prothonotary warbler, a bright yellow symbol of southern swamps, commonly nests on the refuge. Its clarion call, "twee! twee! twee!," rings throughout the bottomlands during spring and summer.

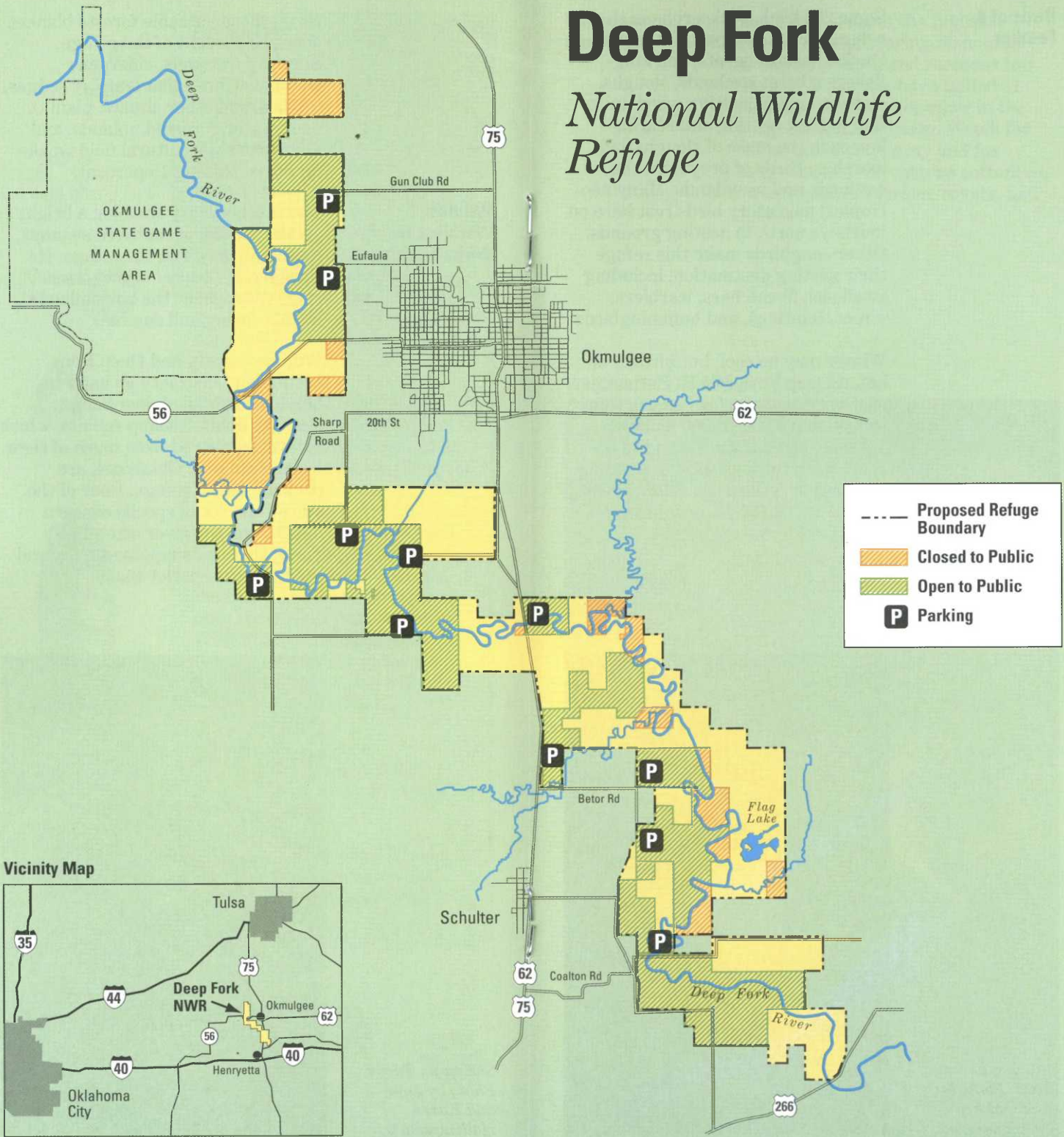
Wildlife variety and Deep Fork bottomland diversity go hand-in-hand. White-tailed deer bound through fields. Swamp rabbits, which have disappeared from much of their former range in Oklahoma, are common at the refuge. Four of the state's species of special concern dwell here: the river otter, Bell's vireo, alligator snapping turtle, and the northern scarlet snake.



*Snapping Turtle.
Photo by John
and Karen
Hollingsworth.*

Deep Fork

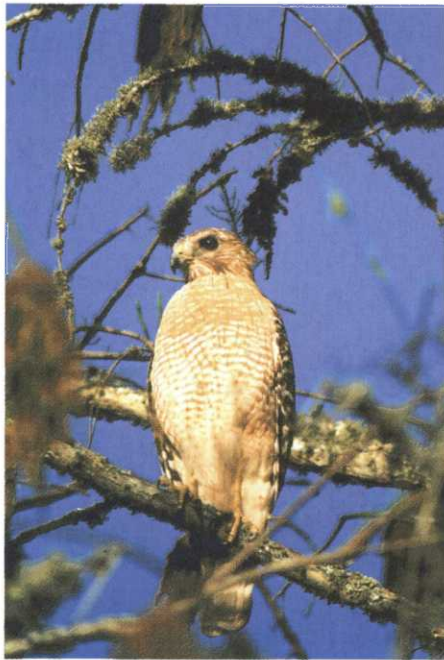
National Wildlife Refuge



Birds of a Feather

Some 254 bird species rely on the refuge for at least part of the year. Ducks, herons, egrets, and kingfishers inhabit wetlands, sloughs, and streams. Secretive wood ducks find perfect nesting and rearing homes in the maze of sloughs and marshes. Birds of prey hunt the wetlands and woodlands. Many neotropical migratory birds rest here on journeys north to nesting grounds. Other songbirds make this refuge their nesting destination, including swallows, flycatchers, warblers, vireos, buntings, and hummingbirds.

Winter may be cool, but birding is hot at Deep Fork NWR. Estimates of wintering waterfowl on the refuge range from 5,000-20,000 mallards, 1,000-5,000 wood ducks, and 1,000-2,000 other duck species, depending on weather conditions. Bald eagles keep a watchful eye for injured waterfowl from tree roosts.

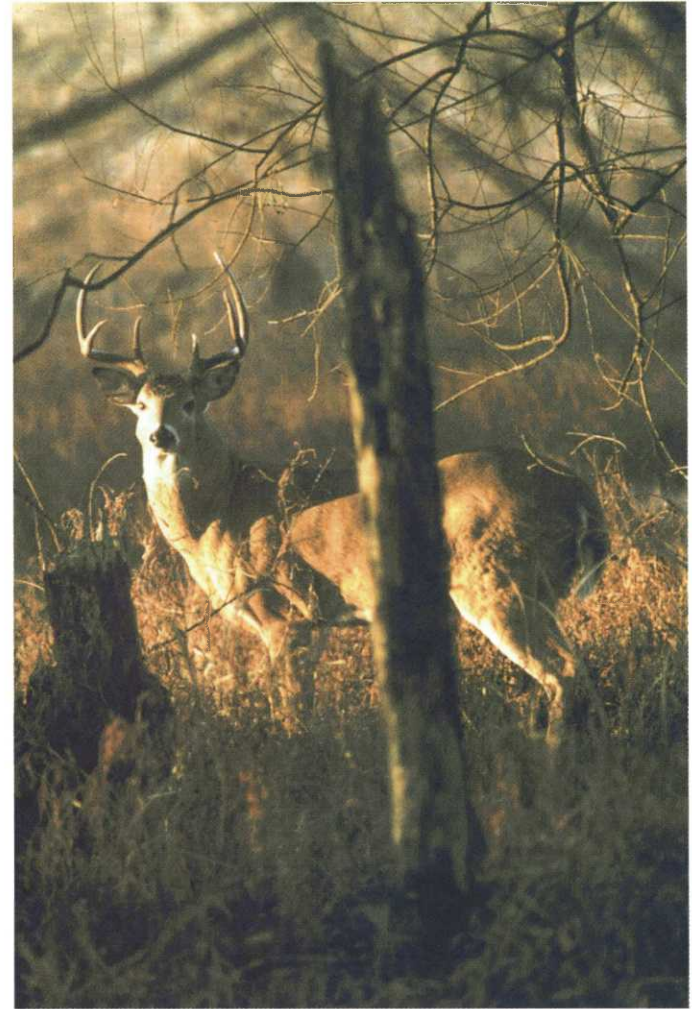


Red-shouldered Hawk. Photo by John and Karen Hollingsworth.

Raccoons on the Prowl

You'll find some of the highest numbers of furbearing mammals in the state here, and raccoons top the list. Biologists have tallied 51 mammal species altogether in the Deep Fork River basin. Watch for white-tailed deer, gray and fox squirrels, beaver, eastern cottontail, swamp rabbit, raccoon, coyote, and opossum.

White-tailed Deer. Photo by Greg Knadle



Snakes Live Here Too

Okmulgee County is home to roughly 54 species of reptiles and 22 species of amphibians. Snakes play an important role in the hardwood forest ecosystem, and would rather stay away from you, but do watch your step when exploring the refuge. Poisonous snakes include the western cottonmouth, copperhead, timber rattlesnake, western pygmy rattlesnake, and western diamondback rattlesnake.



Pygmy Rattlesnake. Photo by John and Karen Hollingsworth.

Things to Do at the Refuge



The refuge is new and facilities are few. However, the staff welcomes visitors to observe and photograph wildlife year-round on all parts of the refuge with public access. Visitors should see peak numbers of birds during spring migration. Dragonflies poise over wetlands, where turtles bask in sunshine on favorite logs. Colorful butterflies pollinate wildflowers.

Hunting: Check Regulations First



The refuge currently offers rabbit, squirrel, and white-tailed deer hunting during state seasons. A brochure that explains hunting programs and regulations is available at the refuge office on the third floor of the post office building in the city of Okmulgee.



*(Right) Little Blue Heron. Photo by John and Karen Hollingsworth.
(Below) Butterfly. Photo by Shawn Steffen.*



Young boy with first catch. Photo by Roger L. Hamman.



**Fishing:
Catfish
Destination**



Anglers will find excellent sport fishing within the refuge, including plentiful catfish, crappie, white bass and largemouth bass. The refuge limits boat access to small crafts that can be launched from the steep riverbanks. Fish from the bank where existing public roads cross the river. Sloughs separated from the river are open to fishing from March to October. To prevent marsh and water birds from becoming entangled, trot lines and bank lines are not allowed on sloughs and wetlands separated from the river.

**Deep Fork Land
Acquisition:
Completing
the Refuge**



*Argiope Spider.
Photo by Ginny
Brubeck.*

The job of securing this refuge is about half-way complete. Land and Water Conservation Funds and Migratory Bird Treaty Act funds will continue to be sources for adding to the refuge. The proposed Deep Fork NWR boundary encompasses over 16,000 acres. The U.S. Fish and Wildlife Service acquires refuge land only from willing sellers at fair market value.

Safeguarding one of the last places to experience a wild Oklahoma river and forest takes dedication and a willingness to save Deep Fork and its wild inhabitants.

**Deep Fork
NWR Facts**
Where is it?

The refuge is located in Okmulgee County, 35 miles south of Tulsa and 100 miles west of Oklahoma City. To reach the headquarters, take Highway 75 to Okmulgee, then 6th Street west to Grand. On Grand to 4th Street, headquarters are located in the Post Office at 111 West 4th Street, Room 318 (see map).

When was it established?

1993

How big is it?

8,372 acres.

Why is it here?

The Deep Fork NWR protects an important bottomland hardwood forest and emergent wetland habitat along the Deep Fork River for the benefit of migratory birds and other native fish and wildlife.



Barred Owl. Photo by John and Karen Hollingsworth.

Deep Fork
National Wildlife Refuge
P.O. Box 816
Okmulgee, Oklahoma 74447
918/756-0815
918/756-0275 Fax

<http://southwest.fws.gov>

U.S. Fish & Wildlife Service
1 800/344 WILD

January 2000



Cover photo by John and
Karen Hollingsworth

Deep Fork

National Wildlife Refuge

Hunting Regulations

2002-2003



**Deep Fork National Wildlife Refuge
General Hunt Permit 2002-2003**

When signed and in your possession, this portion of the brochure will serve as your permit for all refuge hunts (rabbit, squirrel, duck, and raccoon). Except those requiring limited permits (primitive firearms and archery deer).

Note: No permit required for sport fishing

I have read and understand these refuge regulations.

Signature of Hunter

This permit is valid only when signed above by the hunter and must be carried on hunter's person

General Information

Deep Fork National Wildlife Refuge was established in 1993 to protect and enhance the bottomland hardwood forests of the Deep Fork River floodplain and their associated fish and wildlife resources. The U.S. Fish and Wildlife Service administers the refuge system and is responsible for conserving, protecting, and enhancing the nation's fish and wildlife populations and their habitats for the continuing benefit of people.

General Refuge Regulations

Major objectives of the Refuge are to provide habitat for wintering waterfowl and nongame migratory birds, wintering and production habitat for wood ducks, and habitat for the natural diversity of wildlife native to the area. Management objectives also emphasize opportunities for environmental education, interpretation, and wildlife recreation such as hunting, fishing, bird watching, and photography.

Over 8,387 acres of the proposed refuge have been acquired. Additional land will be purchased from willing sellers as funds are available. The proposed Refuge boundary is shown on the map on the reverse side of this brochure. The Refuge eventually will encompass over 16,000 acres.

Currently, a checkerboard ownership of public and privately-held tracts exists within the proposed Refuge boundary. Hunters and other visitors to the Refuge are not authorized to trespass on private land; private property rights should be respected at all times.

In the field, the Refuge boundary is indicated by white fiberglass posts marked with boundary stickers and/or 11 X 14-inch metal boundary signs.

By law, national wildlife refuges are closed to all public use activities unless expressly permitted. Hunting, fishing and certain other public uses are permitted on most areas of the refuge. The regulations listed below supplement the general regulations that govern public use on national wildlife refuges as set forth in Title 50, Code of Federal Regulations. When permitted, hunting, fishing, and other public uses will be in accordance with applicable State laws unless otherwise listed.

To ensure your safety and enjoyment while visiting Deep Fork NWR, please take the time to become familiar with the following regulations. Contact the refuge manager for current regulations and authorized activities before entering the refuge.

Weapons

Carrying, possessing, or discharging firearms, fireworks, or explosives on national wildlife refuges is prohibited unless specifically authorized. Firearms must be unloaded *and* either dismantled or encased when transported in vehicles and boats while on the refuge. Loaded is defined as shells in gun or cap on muzzleloader. The use or possession of crossbows, bows and arrows, air guns, spears, gigs, and other weapons on national wildlife refuges is prohibited except as may be authorized by the refuge manager. Possession of center fire rifles and handguns on the refuge is prohibited.

Nontoxic Shot

All hunters using shotguns for hunting small game and migratory game birds on the refuge must use and possess ammunition containing non-toxic shot only. Non-toxic shot is not required for .22 rimfire rifles used for small game hunting.

Motorized Vehicles

All vehicles must remain on existing County roads or in designated parking areas. Blocking gates or roadways is prohibited. All terrain vehicles (ATV's and ATC's) are prohibited, except by disabled individuals possessing a refuge special use permit.

Boats

Boats used for any recreational activity; i.e., hunting, fishing, and wildlife viewing, must be removed from the refuge daily. Boats must comply with all state regulations.

Disabled Access

Disabled persons are encouraged to participate in refuge hunts and other activities. Contact the refuge manager for guidelines to obtain special use access.

Animals/Pets

Dogs are permitted for hunting squirrel, rabbit, raccoon, and migratory birds only during designated seasons. All dogs are required to wear a collar displaying the owner's name and telephone number. Dogs used for rabbit, squirrel, and raccoon hunting must be removed immediately after the hunt.

Closed Areas

Designated areas will be closed to hunting (see map for specific locations and closures). Some areas are closed to all forms of public entry. Other areas may be closed for special management or safety reasons. All refuge access is prohibited after dark unless specifically authorized by the refuge manager.







Camping and Fires

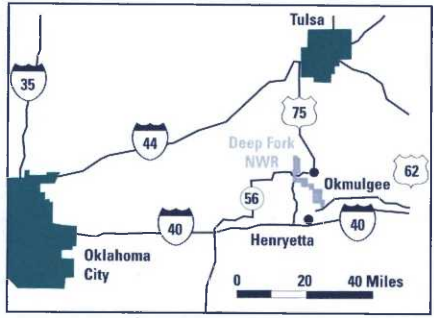
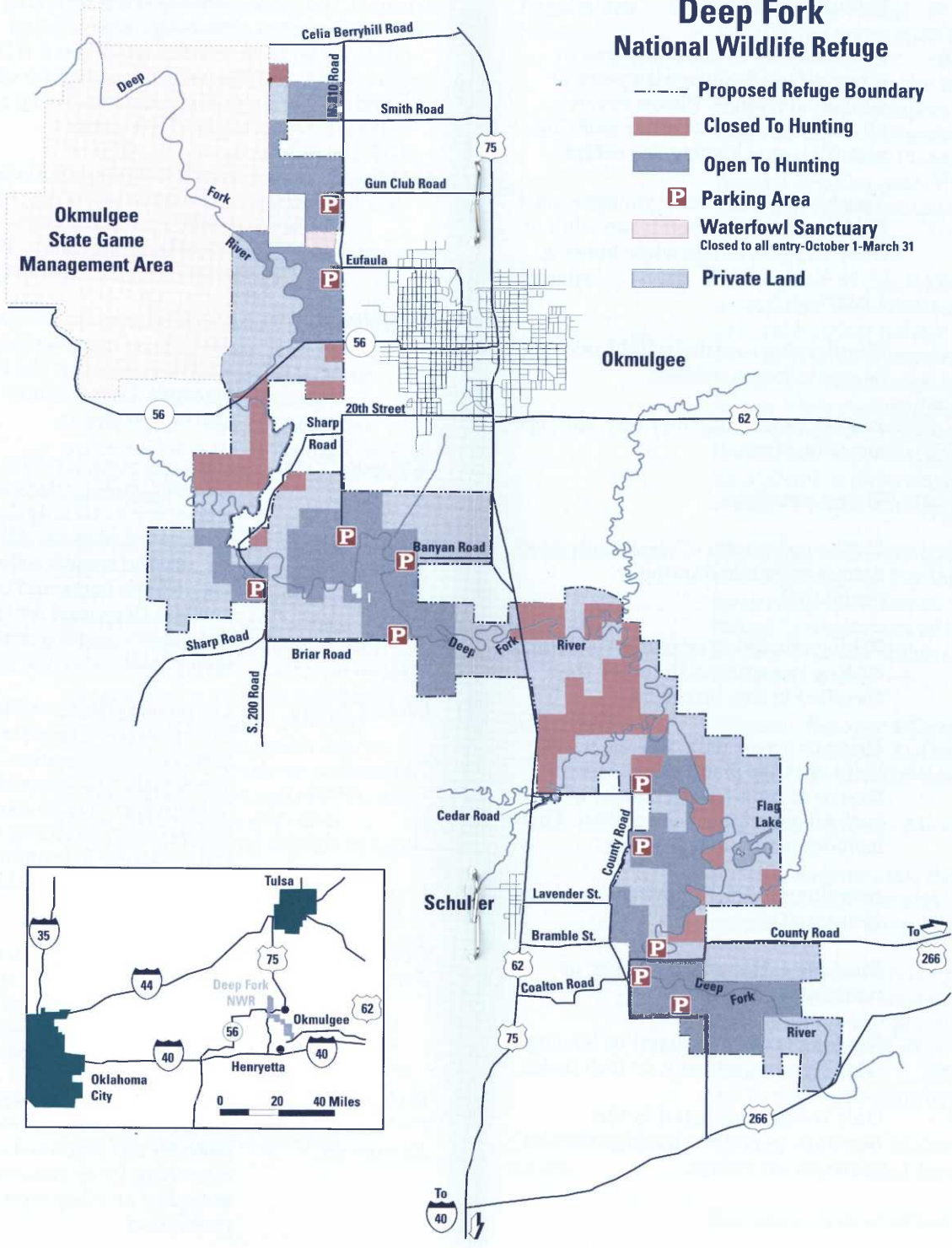
Camping and fires are prohibited on the refuge. The nearest campground is located at Okmulgee/Dripping Springs State Park, west of Okmulgee along Highway 56.

Refuge/ Cultural Resources

All government property including natural, historic, and archaeological features are protected by federal law. Searching for or removal of objects of antiquity or other value is strictly prohibited.

Hunting Deep Fork National Wildlife Refuge

-  Proposed Refuge Boundary
-  Closed To Hunting
-  Open To Hunting
-  Parking Area
-  Waterfowl Sanctuary
Closed to all entry-October 1-March 31
-  Private Land



Fishing Fishing is permitted on the refuge. Contact the refuge office for refuge fishing regulations.

Tree Marking It is unlawful to mark any tree or other refuge feature with paint or similar substance. Please remove all flagging tape and other marking material upon leaving the refuge.

Youth Supervision Youths 14-years-old or younger must be directly supervised by an adult at least 18 years of age while hunting.

Prohibited Activities

Littering

Spotlighting - artificial light may not be use to locate wildlife.

Baiting or hunting over bait, salt, or any attractant.

Target practice

Use or possession of alcohol beverages while hunting is prohibited.

Taking of wildlife or plants (including cutting trees or brush) other than specified in this brochure.

Drive or screw nails, spikes, wires, bolts or other metal objects into a tree or to hunt from a tree in which such an object has been driven. This includes screw-in tree steps.

Searching for or removing any object of antiquity.

Blocking cattle guards, gates, or roadways with vehicles.

Marking trails with paint or leaving flagging tape, ribbons, or trail tacks.

Only the species listed in this brochure as open to hunting may be taken on the refuge.

Refuge Specific Hunting Regulations
(see map)

Only the species listed in this brochure as open to hunting may be taken on the refuge. See map for locations of areas open to hunting.

Big game killed on the refuge must be tagged before transport and checked immediately at the nearest State Checking Station. Please specify the harvest location code (F98) for Deep Fork NWR on the hunter check station sheet.

Permits

The signing of this leaflet on the designated line validates it as your general hunting permit for Deep Fork NWR. It is required for all refuge hunting except for controlled hunts. Visitors engaged in permitted activities on the refuge must show the permit, valid state license, and identification upon request of any refuge or state wildlife officer.

Controlled Hunt

The refuge offers controlled hunts for white-tailed deer. For information concerning these hunts, contact the refuge headquarters or the Oklahoma Department of Wildlife Conservation at 405/521-6450.

Deer Archery

Season: October 4-October 6
October 11-October 13
Controlled hunts only

Bag limit: 2 deer either sex (bonus)

Specific Regulations: See state controlled hunt booklet for specific regulations for these hunts.

Note: A limited archery deer hunt will be offered November 4-22. A limited number of permits will be issued out of the Refuge office beginning October 1, 2002. Contact the Refuge office for more details.

Deer Primitive Youth

Season: October 18-October 20
Controlled hunt only

Bag limit: 2 deer either sex (bonus)

Specific regulations: See state controlled hunt booklet for specific regulations for these hunts.

Deer Primitive

Season: November 1-3
Controlled hunts only

Bag limit: 2 deer either sex (bonus)

Specific regulations: See state controlled hunt booklet for specific regulations for these hunts.

Rabbit

Season: State season except closed October 1-December 1

Bag limit: Same as statewide

Specific Regulations: Dogs allowed. Shotguns and .22 rimfire rifles allowed. Special archery hunts are allowed only by *Special Use Permit* issued by refuge manager.

Squirrel

Season: State season except closed October 1-December 1

Bag limit: Same as statewide

Specific Regulations: Dogs allowed. Shotguns and .22 rimfire rifles allowed. Special archery hunts are allowed only by *Special Use Permit* issued by refuge manager.

Raccoon

Season: December 1-January 31, 2003

Bag limit: Same as statewide

Specific regulations: Dogs allowed. Sunset to sunrise only. State firearms restrictions apply

*Waterfowl
(ducks only)*

Season: December 1, 2002 to end of state duck season, except closed during those days designated as closed in the Oklahoma Waterfowl Hunting Guide.

Bag limit: Same as statewide

Specific regulations: Open on Friday, Saturday, Sunday, and Monday. Half hour before sunrise to 1:00pm. Only portable blinds may be used. Blinds and decoys must be removed daily.

Beaver

Beavers may be trapped by *Special Use Permit* only. Contact the Refuge Manager for details.

Specific Closed Season

All other hunting is closed during controlled hunts.

For More Information

Refuge Manager
Deep Fork National Wildlife Refuge
P.O. Box 816
111 West 4th Street, Room 318
Okmulgee, OK 74447
918/756-0815
918/756-0275 Fax

Deep Fork
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<http://www.fws.gov>
1 800/344-WILD

June 2002



CELEBRATING A
CENTURY
of CONSERVATION

U.S. Fish & Wildlife Service

Birds of

*Deep Fork
National Wildlife
Refuge*



The Deep Fork National Wildlife Refuge is one of more than 500 refuges throughout the United States. These National Wildlife Refuges are administrated by the Department of the Interior, Fish and Wildlife Service. The Fish and Wildlife Service mission is to work with others "to conserve fish and wildlife and their habitat."

**Birds of
Deep Fork
National Wildlife
Refuge**

This leaflet lists 254 species of birds that may be seen on the refuge, and is in accordance with the sixth Edition of the A.O.U. checklist as amended. Accepted new names are used.

Symbols used in this list are defined as follows:

- Sp Spring March - May
- Su Summer June - August
- F Fall September - November
- W Winter December - February

- A Abundant
A common species that is very numerous.
- C Common
Certain to be seen in suitable habitats.
- U Uncommon
Present, not certain to be seen.
- O Occasional
Seen few times during the season
- R Rare
Seen at intervals of 2 to 5 years.
- X Accidental
Has been seen only once or twice.

	Sp	Su	F	W
GREBES				
___ Pied-billed Grebe	C		C	C
___ Eared Grebe			R	R
PELICANS				
___ American White Pelican	A	U	A	C
CORMORANTS				
___ Double-crested Cormorant	A	U	A	A
ANHINGAS				
___ Anhinga			R	
BITTERNs, HERONS, AND EGRETS				
___ American Bittern	O	R	O	
___ Least Bittern	O	O		

	Sp	Su	F	W
___ Snowy Egret	U	U	U	
___ Great Blue Heron	C	C	C	C
___ Great Egret	C	C	C	
___ Little Blue Heron	U	U	U	
___ Cattle Egret	U	U	U	
___ Green Heron	U	U	U	
___ Yellow-crowned Night-heron	O	O	O	
___ Black-crowned Night-heron	U	U	U	
IBISES				
___ White-faced Ibis			R	
DUCKS, GEESE, AND SWANS				
___ Greater White-fronted Goose	O		O	O
___ Snow Goose	O		O	O
___ Canada Goose	O		O	O
___ Wood Duck	C	C	C	C
___ Green-winged Teal	C		C	C
___ Mallard	C	C	C	C
___ American Black Duck	R		R	R
___ Northern Pintail	C		C	C
___ Blue-winged Teal	U		C	C
___ Northern Shoveler	U		C	C
___ Gadwall	U		C	C
___ American Wigeon	U		C	C
___ Canvasback	R		R	O
___ Redhead	R		R	O
___ Ring-necked Duck	R		R	O
___ Greater Scaup	R		R	O
___ Lesser Scaup	R		O	O
___ Common Goldeneye	O		O	O
___ Bufflehead	O		O	O
___ Hooded Merganser	O		O	O
___ Common Merganser	O		O	O
___ Red-breasted Merganser	O		O	O
___ Ruddy Duck	O		O	O
AMERICAN VULTURES				
___ Black Vulture	U	U	U	U
___ Turkey Vulture	C	C	C	U
KITES, EAGLES, AND HAWKS				
___ Osprey	O	O	O	O
___ Mississippi Kite	U	O	U	
___ Bald Eagle	U	R	U	U
___ Northern Harrier	U	O	U	U
___ Sharp-shinned Hawk	U		U	U
___ Cooper's Hawk	U	U	U	U
___ Red-shouldered Hawk	C	C	C	C
___ Broad-winged Hawk	U	U	U	
___ Swainson's Hawk	O	O	O	
___ Red-tailed Hawk	C	C	C	A
___ Rough-legged Hawk			R	R

	Sp	Su	F	W
FALCONS				
___ American Kestrel	U	O	C	C
___ Merlin	R		R	R
___ Prairie Falcon	R	R	R	R
___ Peregrine Falcon	R		R	R
TURKEYS AND QUAILS				
___ Wild Turkey	U	U	U	U
___ Northern Bobwhite	C	C	C	C
RAILS				
___ King Rail		R	R	R
___ Virginia Rail		R	R	R
___ Sora	U	R	U	
___ Common Moorhen		U		
___ American Coot	U	U	U	U
PLOVERS				
___ Killdeer	C	C	C	C
___ Black-bellied Plover			R	
___ Lesser golden-plover			R	
SANDPIPERS				
___ Greater Yellowlegs	O		O	
___ Lesser Yellowlegs	O		O	
___ Solitary Sandpiper	U		U	
___ Spotted Sandpiper	U		U	
___ Upland Sandpiper	R	R	R	
___ Semipalmated Sandpiper	R		R	
___ Least Sandpiper	R		R	
___ White-rumped Sandpiper		R		
___ Baird's Sandpiper	R		R	
___ Pectoral Sandpiper	O		O	
___ Dunlin	R		R	
___ Buff-breasted Sandpiper	R		R	
___ Long-billed Dowitcher	U		U	
___ Common Snipe	U		U	U
___ American Woodcock	U	R	U	U
___ Wilson's Phalarope	R		R	
GULLS AND TERNS				
___ Ring-billed Gull	R		R	
___ Franklin's Gull	R		R	
___ Forster's Tern	R		R	
___ Black Tern	R	R		
PIGEONS AND DOVES				
___ Rock Dove	C	C	C	C
___ Mourning Dove	C	C	C	C
CUCKOOS AND ROADRUNNERS				
___ Black-billed Cuckoo	R	R	R	
___ Yellow-billed Cuckoo	C	C	C	
___ Greater Roadrunner	O	O	O	O
BARN OWLS				
___ Barn Owl	R	R	R	R

	Sp	Su	F	W		Sp	Su	F	W	
TYPICAL OWLS						JAYS AND CROWS				
___ Eastern Screech-owl	U	U	U	U	___ Blue Jay	C	C	C	C	
___ Great Horned Owl	U	U	U	U	___ American Crow	C	C	C	C	
___ Barred Owl	C	C	C	C	___ Fish Crow	C	C	C		
___ Long-eared Owl	R	R	R	R	CHICKADEES AND TITMICE					
___ Short-eared Owl	R			R	___ Carolina Chickadee	C	C	C	C	
GOATSUCKERS						___ Tufted Titmouse	C	C	C	
___ Common Nighthawk	C	C	C		NUTHATCHES					
___ Common Poorwill	R				___ Red-breasted Nuthatch				R	
___ Chuck-will's-widow	C	C			___ White-breasted Nuthatch	C	C	C	C	
___ Whip-poor-will	C	C	U		CREEPERS					
SWIFTS						___ Brown Creeper	U		C	C
___ Chimney Swift	C	C	C		WRENS					
HUMMINGBIRDS						___ Carolina Wren	C	C	C	C
___ Ruby-throated Hummingbird	C	C	C		___ Bewick's Wren	O	O	O	O	
___ Rufous Hummingbird		R	R		___ House Wren	U	O	O		
KINGFISHERS						___ Winter Wren			U	U
___ Belted Kingfisher	C	C	C	C	___ Sedge Wren				U	O
WOODPECKERS						___ Marsh Wren	U		U	U
___ Red-headed Woodpecker	C	U	C	C	KINGLETS AND GNATCATCHERS					
___ Red-bellied Woodpecker	C	C	C	C	___ Golden-crowned Kinglet	U			U	U
___ Yellow-bellied Sapsucker	U		U	U	___ Ruby-crowned Kinglet	C			C	C
___ Downy Woodpecker	C	C	C	C	___ Blue-gray Gnatcatcher	C	C		U	
___ Hairy Woodpecker	C	C	C	C	THRUSHES					
___ Northern Flicker	C	C	C	C	___ Eastern Bluebird	C	C	C	C	
___ Pileated Woodpecker	U	U	U	U	___ Veery	U				
TYRANT FLYCATCHERS						___ Gray-cheeked Thrush	O			
___ Olive-sided Flycatcher	O		O		___ Swainson's Thrush	U			R	
___ Eastern Wood-pewee	U	C	U		___ Hermit Thrush	R			C	
___ Yellow-bellied Flycatcher	R		R		___ Wood Thrush	O	O			
___ Acadian Flycatcher	U	U			___ American Robin	C	C	C	C	
___ Alder Flycatcher	R		R		MOCKINGBIRDS AND THRASHERS					
___ Willow Flycatcher	R		R		___ Gray Catbird	C	C	C		
___ Least Flycatcher	U	R	U		___ Northern Mockingbird	C	C	C	C	
___ Eastern Phoebe	C	C	U	R	___ Brown Thrasher	C	C	C	C	
___ Great crested Flycatcher	C	C	C		PIPITS					
___ Western Kingbird	R	R	R		___ American Pipit	R		O	U	
___ Eastern Kingbird	C	C	C		___ Sprague's Pipit	R		R	R	
___ Scissor-tailed Flycatcher	C	C	C		WAXWINGS					
LARKS						___ Cedar Waxwing	C		C	C
___ Horned Lark	R	R	O	O	SHRIKES					
SWALLOWS						___ Loggerhead Shrike	U	U	C	C
___ Purple Martin	U	U			STARLINGS					
___ Tree Swallow	U	U	U		___ European Starling	C	C	C	C	
___ Northern Rough-winged Swallow	C	C	C		VIREOS					
___ Bank Swallow	U	R	U		___ White-eyed Vireo	C	C	U		
___ Cliff Swallow	U	U	U		___ Bell's Vireo	C	C	U		
___ Barn Swallow	C	C	C		___ Solitary Vireo	R				
					___ Yellow-throated Vireo	U	U	U		

	Sp	Su	F	W
Warbling Vireo	C	C	C	
Philadelphia Vireo	R		R	
Red-eyed Vireo	C	C	U	
WOOD-WARBLERS				
Blue-winged Warbler	R			
Golden-winged Warbler	R			
Tennessee Warbler	O		O	
Orange-crowned Warbler	O		O	
Nashville Warbler	O		O	
Northern Parula	C	C	U	
Yellow Warbler	C	C		
Chestnut-sided Warbler	O		O	
Magnolia Warbler	O		O	
Black-throated Blue Warbler			R	
Yellow-rumped Warbler	U		U	C
Black-throated Green Warbler	O		O	
Blackburnian Warbler	O		U	
Yellow-throated Warbler	U		U	
Pine Warbler				R
Prairie Warbler	O	R		
Bay-breasted Warbler	R	R		
Blackpoll Warbler	O			
Cerulean Warbler	R	R		
Black-and-white Warbler	C	C	U	
American Redstart	C	C		
Prothonotary Warbler	R		R	
Worm-eating Warbler	R		R	
Swainson's Warbler	R		R	
Ovenbird	O			R
Northern Waterthrush	O			O
Louisiana Waterthrush	C	C	C	
Kentucky Warbler	C	C	U	
Mourning Warbler	O		O	
MacGillivray's Warbler		R		
Common Yellowthroat	C	C	U	O
Hooded Warbler	U		U	
Wilson's Warbler	U		U	
Canada Warbler	U		U	
Yellow-breasted Chat	C	C	C	
TANAGERS				
Summer Tanager	U	U	U	
Scarlet Tanager	R			
CARDINALS, GROSBEAKS, AND BUNTINGS				
Northern Cardinal	C	C	C	C
Rose-breasted Grosbeak	O		O	
Black-headed Grosbeak		R	R	
Blue Grosbeak	C	C	C	
Lazuli Bunting		R		
Indigo Bunting	C	C	C	
Painted Bunting	C	C	U	
Dickeissel	C	C	C	

	Sp	Su	F	W
SPARROWS, TOWHEES, AND ALLIES				
Eastern Towhee	O		U	U
Spotted Towhee	O		U	U
Bachman's Sparrow	R	R	R	R
American Tree sparrow				U
Chipping Sparrow	O	R	O	
Clay-colored Sparrow	O		O	
Field Sparrow	C	C	C	C
Vesper Sparrow	O		O	R
Lark Sparrow	C	C	U	
Savannah Sparrow	C		C	C
Grasshopper Sparrow	O	O	O	
Henslow's Sparrow	R			
LeConte's sparrow	O			
Fox Sparrow	C		C	C
Song Sparrow	C		C	C
Lincoln's Sparrow	U		U	O
Swamp Sparrow	C		C	C
White-throated Sparrow	C		C	C
White-crowned Sparrow	C		C	C
Harris' Sparrow	C		C	C
Dark-eyed Junco	C		C	C
BLACKBIRDS AND ORIOLES				
Bobolink	O		O	
Red-winged Blackbird	C	C	C	C
Eastern Meadowlark	C	C	C	C
Western Meadowlark	O			R
Yellow-headed Blackbird	O			
Rusty Blackbird			U	U
Brewer's Blackbird	O		O	O
Great-tailed Grackle	U	O	U	U
Common Grackle	C	C	C	C
Brown-headed Cowbird	C	C	C	C
Orchard Oriole	U	U		
Baltimore Oriole	C	C	U	R
FINCHES				
Purple Finch	O		O	U
House Finch	O	O	O	O
Pine Siskin	O		O	O
American Goldfinch	C	U	C	C
Evening Grosbeak			R	R
House Sparrow	C	C	C	C

Deep Fork National Wildlife Refuge
P.O. Box 816
Okmulgee, Oklahoma 74447
918/756-0815

U.S. Fish & Wildlife Service
Southwest Region
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