

KIRWIN NATIONAL WILDLIFE REFUGE
KIRWIN, KANSAS

ANNUAL NARRATIVE REPORT
Calendar Year 1985

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM



PERSONNEL

1. Lee A. Wright, Refuge Manager, GS 11/10, PFT, EOD 8/19/84.
2. Eugene C. Williams, Assistant Refuge Manager, GS 9/2, PFT, EOD 07/22/84.
3. Doris E. Hagman, Refuge Assistant, GS 5/10, PFT, EOD 05/22/61
4. Richard S. Erdahl, Maintenance Worker, WG 7/4, PFT, EOD 03/21/83.
5. Howard L. Stephens, Automotive Mechanic, WG 10/5, PFT, EOD 02/28/55.

Review and Approvals

Eugene Williams 2-4-86 Philip W. Norton 3/6/86
 Submitted By Date Regional Office Review Date

Mason L. Allen 3-7-86 _____
 Regional Supervisor Review Date Washington Office Review Date



YCC PERSONNEL

YCC Personnel entered on duty June 10, 1985, and terminated August 3, 1985. Pictured left to right are:

William G. Patton
James W. Reneberg
Jerrod L. Hanchett
Patricia A. Hubbard, Group Crew Leader
Barbara E. Stegmaier
Jennifer L. Soodsma

INTRODUCTION

The Kirwin National Wildlife Refuge, authorized under a General Plan approved by the Secretary of the Interior on June 17, 1954, was established to provide habitat for and facilitate the management of the Nation's migratory bird resource. Basic authority for the existence of the refuge stems from the Migratory Bird Treaty Act, the Migratory Bird Conservation Act, and the Fish and Wildlife Coordination Act. The refuge is an overlay project on the Bureau of Reclamation's Kirwin Reservoir, fed by the North Fork of the Solomon River and Bow Creek. Fee title to the land is held for the United States by the Bureau of Reclamation. Control of the reservoir rests with the Kirwin Irrigation District and the Bureau of Reclamation. The watershed of these two sources extends into Western Kansas and covers approximately 800,000 acres. The 10,778 acre refuge is located 4 miles west of Kirwin, Kansas, in Phillips County in Northcentral Kansas.

The primary management purpose of the refuge is to provide food and resting habitat for spring flights of migratory waterfowl. Secondary objectives are: (1) to feed and protect fall flights of migrant waterfowl; (2) to provide food and protection for wintering ducks and geese; (3) to protect and maintain indigenous species of upland game birds, small game, and big game; (4) to provide public hunting of waterfowl, upland game, small game, and big game; (5) to cooperate with the Kansas Fish and Game in furnishing a warm water fishery; and (6) to provide the public an opportunity to enjoy, through observation, the aesthetic values of the wildlife resource.

The topography of the refuge is rolling with grass covered hilltops nearly 200 feet higher than the wooded creek bottoms. When the refuge was established the lake covered over 5,000 acres at conservation pool elevation. Land above the conservation pool was cropland and grassland with shelterbelts of cedar and deciduous tree. The lake has been below the conservation pool elevation of 1,728 feet since 1971. Changes in the watershed have largely caused the decline in water levels. Conservation tillage, terraces, the oil refinery, and numerous farm ponds have considerably reduced stream flow. An increase in agricultural use of groundwater for irrigation purposes in the western portions of the watershed have lowered the water table, further reducing stream flow.

The primary purposes of the reservoir are to provide flood control and irrigation water for the Kirwin Irrigation District. The Kirwin Irrigation District irrigates over 4,000 acres of cropland below the reservoir. The combined effects of reduced stream flow and irrigation release are that the lake level has steadily decreased in recent years. Lake bottom land exposed by the receding water levels has grown up into brushland and riparian timber. This decline in water levels and brush

invasion has led to a decline in waterfowl use. In an effort to halt this decline, the refuge has used cooperative farmers to clear brushland and keep this land open by farming. At present, the refuge has nearly 2,780 acres in timber and brushland, 1,700 acres of water, 2,800 acres of cropland (alfalfa, cane/milo, corn, wheat) and nearly 3,500 acres of grassland.

A. HIGHLIGHTS

1. A major winter storm struck Northcentral Kansas on January 8 and 9, dumping as much as 18 inches of snow in the area. Early May saw many tornadoes in the vicinity of Kirwin Refuge. Heavy rains in mid-July pushed the north fork of the Solomon River well out of its banks. (Section B.1)
2. Consideration was given to implementing competitive bidding on the cleared bottomlands. (Section F.4)
3. A first-draft Public Use Management Plan for Kirwin NWR was submitted to the Regional Office for review. (Section D.2)

B. CLIMATIC CONDITIONS

The year started out with a bang on January 8 and 9. A major winter snowstorm dumped 10-18 inches of snow in Northcentral Kansas. Many highways were blocked for two days following.

A total of 32.88 inches of precipitation was received at the refuge during the year. Most fell as heavy spring/summer thundershowers. Average pre-cipitation for this part of Kansas is 24 inches.

Moisture, normally a welcome sight in this part of Kansas, created a dismal harvest picture for 3rd cutting of alfalfa and cane crops. Winter wheat seeding was delayed as a result of the heavy September showers/snowfall. Goose browse was not as abundant as in previous years because of the late seedings.

During 1985, the Kirwin Irrigation District did not withdraw any water from the reservoir for irrigation purposes. During July, when drawdown usually begins, there was not enough water present above dead storage level to supply needs of irrigators. Late summer and fall precipitation pushed the reservoir level to over 22,000 acre feet by year's end (elevation 1,706+). This is the highest the reservoir has been in five years. The Irrigation District will undoubtedly draw down the pool in 1986.

The last spring frost occurred on 4/14 with 21°F. The first killing frost of 27°F. was experienced on 9/30. Daily temperatures of 100°F were not uncommon. Despite the heat, there were enough breaks in the scorching temperatures created by the soothing rain showers to make the summer of 1985 an enjoyable one.

The following table provides a month-by-month summary of weather conditions during the year.

	PRECIPITATION				TEMP. AVERAGE				LAKE ELEVATION	
	Amt	% of Normal	This Year	% of Normal	High	Low	High	Low	1985	1984
Jan.	.86	169	.86	169	58	-16	33.3	9.4	1,697.26	1,697.00
Feb.	.87	116	1.73	137	63	-15	35.6	12.0	1,697.99	1,697.08
March	1.41	107	3.14	122	74	15	58.4	27.2	1,698.92	1,697.83
April	2.67	114	5.81	118	90	23	70.0	38.0	1,699.48	1,700.54
May	5.25	163	11.06	136	90	41	78.0	48.0	1,702.22	1,702.64
June	1.81	48	12.87	108	104	42	83.4	52.5	1,702.13	1,706.10
July	7.02	250	19.89	135	106	48	93.0	60.0	1,702.30	1,702.83
August	2.11	75	22.00	126	96	45	84.0	56.0	1,705.14	1,697.34
Sept.	7.58	354	29.58	151	102	29	72.4	52.0	1,705.31	1,696.88
Oct.	2.85	204	32.43	154	88	25	65.0	35.0	1,705.77	1,697.01
Nov.	.40	51	32.83	150	71	0	40.0	19.0	1,705.97	1,696.79
Dec.	.05	10	32.88	147	63	-8	37.0	12.0	1,706.27	1,697.06

Dead storage at or below 1,697.00

10-12 inches of snow on Sept. 29

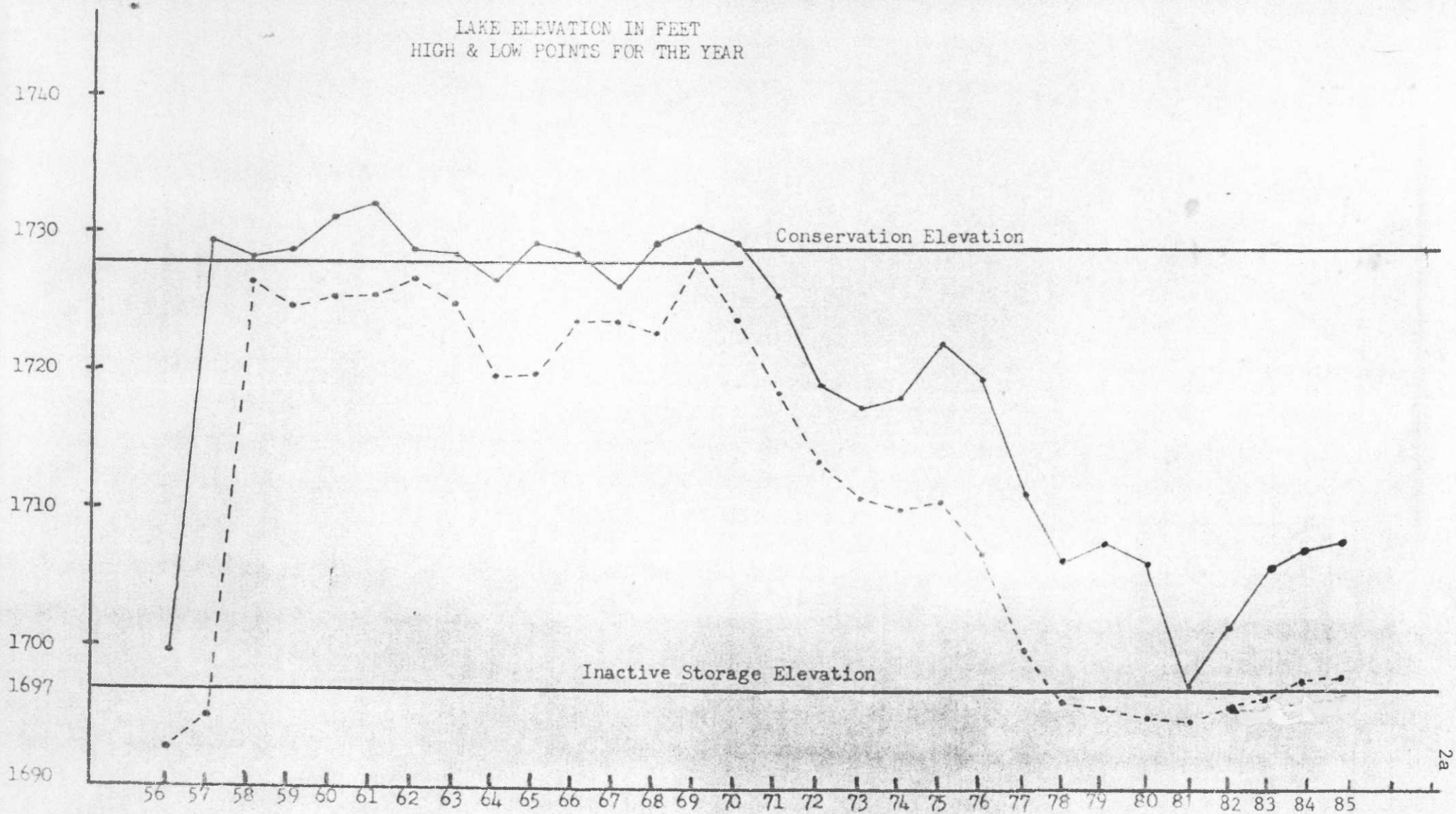


7/85

ECW

North Fork of Solomon River running out of its banks at east end of the Refuge Special Archery Unit.

LAKE ELEVATION IN FEET
HIGH & LOW POINTS FOR THE YEAR



D. PLANNING1. Master Plan

Kirwin National Wildlife Refuge functions without a Master Plan. The refuge is an overlay of a Bureau of Reclamation irrigation/flood control reservoir.

2. Management Plan

Work began on a draft Grasslands Management Plan for Kirwin Refuge. Prescribed burning and grazing are the two essential elements of the Plan. Tree control will be necessary in refuge units to be designated as grassland management units. A draft will be submitted to the Regional Office for review in 1986. A first draft Public Use Management Plan was prepared and submitted to the Regional Office. Key elements of the plan include rezoning of designated camping areas, restrictions on vehicular traffic and development of a new tour route. It is hoped the Kirwin Refuge will be able to provide quality programs in the near future as well as improve the public appreciation for Kirwin as a wildlife refuge. Kirwin Refuge has an image problem. For 30 years it functioned as a recreation area with little supervision/guidance from regional or area office. Changes are in order.

The station Sign Plan was revised and approved by the Regional Office.

E. ADMINISTRATION1. Personnel

There were no changes in PFT personnel during the course of the year. One temporary appointee was hired to serve as Youth Conservation Corp Crew Leader.

	<u>Permanent</u>		
	<u>Full-Time</u>	<u>Part-Time</u>	<u>Temporary</u>
FY 1985	5	0	1
FY 1984	5	0	0
FY 1983	4	0	0
FY 1982	4	0	0
FY 1981	5	0	0

2. Youth Programs

Kirwin Refuge hosted a 6-member YCC crew from June 10 through August 2. Numerous projects were accomplished. Our crew leader proved to be unexcelled at keeping her team busy.

Some of the more important (and labor-intensive) tasks completed by the YCC crew include:

- o Rehabilitation of nature trail
- o cutting and stacking of trees and brush along roads and overlooks
- o reposting refuge boundary
- o hoeing 4,050 cedar seedlings
- o hand digging of musk thistle
- o dismantling of old grass seed bins



7/85

ECW.

YCC removing Chinese Elm from road shoulders



7/85

ECW

YCC caring for 4,050 cedars planting in Bottomlands.

5. Funding

Fiscal Year	1210	1220	1240	1260	1994(8610)	Rehab	TOTAL
1986	0	0	0	212,550 ^{a/}	3,400	0	215,950
1985	0	0	0	193,000 ^{b/}	2,300	0	195,300
1984	0	0	0	171,000 ^{c/}	2,500	0	173,500
1983	118,000	5,000	20,000	0	950	0	143,950
1982	117,425	1,050	25,025	0	0	2,000	145,500
1981	112,000	500	18,000 ^{d/}	0	0	12,000	142,500

a/ \$57,300 Small ARMM plus \$8,000 Resource Problem Funds

b/ \$20,000 Small ARMM

c/ \$28,000 Small ARMM

d/ \$10,000 Cyclic Maintenance

6. Safety

Several Safety meetings were held throughout the year:

Date	Topics
January 3	Front End Loader Safety
March 3	Winter Driving Safety
July 22	Chain Saw Safety/ATV Safety
August 12	Tornadoes - How to Survive Them
November 19	Proper Use of Fire Extinguishers

On November 1, a refuge pickup was involved in an auto/deer collision. The pickup received approximately \$150.00 damage and was repaired force account.

The only loss-time accident to occur on the refuge involved one of our cooperators. (See photo below)



A forlorn refuge cooperator who got caught up in his work.
8/85

ECW

All station fire extinguishers were hydro-statically tested in August and refilled as necessary.

First aid kits were purchased for each work area and to replace older kits in vehicles.

7. Technical Assistance

Mechanic Howard Stephens participated in a Fire Safety Program held for the Kensington School System in October during Fire Prevention Week.

8. Other Items

Seven Special Use Permits were issued allowing limited firewood cutting on the refuge.

A Phillipsburg Scout Troop was issued a SUP to hold a winter campout in a remote area of the refuge during January.

The number of occupied sites at the Kirwin Trailer Park Village was reduced by one. Twenty-two occupied sites remain. Receipts generated by the Trailer Park totalled \$3,300.00. Any such revenue generated by this station is turned over to the Bureau of Reclamation.

Two cooperative farmers still hold SUP's for upland alfalfa at \$6.66 per acre. The 116.4 acres of alfalfa ground generated \$775.22 in receipts. These permits remain valid through 1986.

A local farmer was issued a SUP to transport equipment, using a refuge road, to a private field adjoining the refuge.

F. HABITAT MANAGEMENT

2. Wetlands

The USFWS has no control of reservoir water level. The Kirwin Irrigation District draws water from the reservoir from mid-July to mid-August. The surface acres of the reservoir pool varies from 800 to 2,200 depending upon irrigation needs and precipitation amounts.

There is some grass roots interest in dissolution of the Irrigation District. Several farmers would like to return to a dryland tax base. Others now have deep well irrigation systems. Under current contract, the Irrigation District makes payment to the Bureau of Reclamation whether or not there is sufficient volume to supply irrigation needs. Payment is required irregardless of whether or not the water is used. The possibility of changing how the District pays the Bureau is currently being explored. Instead of an annual payment, water would be paid for as it is used.

Kirwin Reservoir experienced its highest water level in five years. Total surface acres was 1,708 on 12/31/85. Minimum surface acreage of 878 was recorded on 01/31/81.

3. Forests

Approximately 3,500 acres of refuge consists of riparian timber/brush. This acreage provides excellent habitat for white-tailed deer, Rio Grande turkey and pheasant.

Forty acres of mature shelterbelts also provide excellent cover for resident wildlife. These eastern red cedars were planted in the refuge's "early years".

Between April 9 and 12, 4,050 eastern red cedars were planted in shelter-belt fashion in the cleared bottomlands. Equipment and most of the manpower were supplied by Kansas Fish and Game. The 4.5 miles of shelterbelts will provide escape cover and travel lanes for resident wildlife. Survival rates, to date, look very good for the young trees.



4/85

ECW

Kansas Fish and Game crew provided the equipment and manpower to plant 4,050 eastern red cedar in the bottomland farmground.

4. Croplands

During 1985, 2,557.5 acres of crops were produced on Kirwin Refuge. An additional 315.8 acres of fall planted winter wheat provided valuable goose browse for the fall migration.

The following table shows breakdown by Unit of refuge farmland and crops produced:

<u>Farm Unit</u>	<u>Crop</u>	<u>Cooperator's Share(acres)</u>	<u>Refuge</u>
1	Wheat	26	-
	Milo	-	13
2	Alfalfa	37	-
	Peas	-	20
	Cane/Corn	19	-
	Wheat	61.5	-
	Alfalfa	35.9(SUP)	-
3	Corn	-	30.5
	Milo	21.5	10.7
	Wheat	30.3	15.1
	Alfalfa	31.0(SUP)	-
4	Wheat	40.5	20.5
	Corn	-	30.0
	Millet	26.0	13.0
5	Corn	-	14.6
	Wheat	56.9	29.2a/
	Milo	42.4	-
7	Corn	-	18.9
	Wheat	51.3	25.7
	Alfalfa	49.5(SUP)	-
	Milo	33.3	-
15	Wheat	48.0	-
	Corn	-	36.0
	Milo	23.5	-
16	Alfalfa	47.0	-
	Wheat	15.3	7.7
17	Wheat	42.3	21.3
	Sunflowers	42.3	21.3
19	Wheat	-	31.8
20	Milo	60.4	30.2
	Wheat	41.0	13.6b/
21	Wheat	33.5	16.8
	Milo	19.0	-
	Corn	-	9.4
	Sunflowers	44.0	11.0
22	Alfalfa	30.9	-
	Corn	-	30.9
23	Barley	13.0	4.4a/
	Cane	17.5	-
24	Corn	-	6.0
	Barley	24.4	8.1a/
	TOTAL	1,064.2	489.2

a/ Harvested and delivered to Gov't bins.

b/ Wheat cut with Hesston stacker and deposited near timber for utilization by resident wildlife.

The following table shows breakdown of refuge bottomlands and crops produced:

<u>Cleared Lake Bottom</u>	<u>Crop</u>	<u>Cooperator's Share(acres)</u>	<u>Refuge</u>
Cooperator 1	Wheat	63.1	31.6
Cooperator 2	Alfalfa	80.9	-
Cooperator 3	Corn	-	29.8
	Alfalfa	127.4	-
Cooperator 4	Corn	-	38.7
	Alfalfa	113.2	-
	Cane	17.4	-
Cooperator 5	Barley	-	26.6
	Alfalfa	53.4	-
Cooperator 6	Corn/Milo	-	26.6
	Alfalfa	53.4	-
Cooperator 7	Milo	108.0	12.0
Cooperator 8	Alfalfa	100.0	-
	Corn	-	38.2
	Barley	-	11.8
Food Plots(upland)	Cane/Milo	-	16.0
Food Plots(upland)	Cane	-	20.0
Food Plots(upland)	Corn	-	36.0
TOTAL		716.8	287.3

The following table compares 1984 crops and acreages with 1985 figures:

	<u>1984</u>	<u>1985</u>
Winter Wheat	491	722.6
Milo	617	387.3
Corn	66	299.3
Summer fallow	552	315.8
Upland alfalfa	247	231.3
Bottomland alfalfa	788	528.3
Millet	-	39.0
Spring barley	-	88.3
Cane	-	50.9
Peas	-	20.0
Sunflowers	-	118.5
Food plots	29	72.0
TOTAL	2,790	2,873.3

A portion of refuge's share of wheat and barley crops was harvested and delivered to refuge bins. The remaining share of these crops and others was left in the field for wildlife use.



8/85

ECW

A large portion of refuge's share of wheat crop was left in the field.

Fall planted wheat, millet, and rotary mowed corn was utilized 100% by migratory waterfowl and resident game. Milo and alfalfa fields also received intense use by wildlife. The wet fall months promoted the development of a rank growth of weeds in the unharvested wheat and barley. Utilization of these food sources was minimal. Sunflowers and food plots are used exclusively by resident game species and migratory non-game birds. It is evident that there will be a sunflower surplus going into the spring of 1986. The refuge pea crop failed to mature and was disced under as a green manure crop.

Crops left standing within the public hunting area remain relatively untouched by waterfowl until the close of the hunting season.

Special use permits covering the farming operation in the cleared lake bottom expired in calendar year 1984. These permits had been issued at minimum cost as an incentive to operators to clear the overgrown bottomlands and to put this land into crop production.

The possibility of implementing competitive bidding was explored in 1985 as a means of insuring an equitable return to the government. The idea was dropped when it was determined implementation would weaken most of our operators. We did not want to add additional burden to top off the impacts of the poor farm economy.

*Done in NW
KS & NE
w/o weakening
anyone!*

As an alternative, standard cooperative farming agreements were issued. The government now receives a crop share and refuge operators do not have to worry about the burden of a bidding process.



8/85

ECW

One of the many small food plots planted to milo/
cane/sunflowers for benefit of wildlife use.

A new refuge cooperator was selected by lottery on July 29. The former cooperator decided he was no longer interested in farming on the refuge if he would be required to plant corn as part of the government's share.

Two Special Use Permittes hold permits valid thru 1986. The alfalfa acreage covered by these permits will be incorporated into Cooperative Farming Agreements in 1987.

5. Grasslands

Seventy acres of wheat stubble in the extreme west end of the refuge in the refuge bottomlands was seeded to a mixture of native grass. Heavy litter and volunteer wheat may negatively impact the quality of the stand produced.

A twenty-five acre block of weedy river bottom, which had been mowed and burned in the fall of 1984, was seeded to sweet clover at 3 lbs per acre.

8. Haying

The haying program of Kirwin Refuge was terminated with the close of CY 1984. Annual haying served as the chief grassland management tool from 1960 through 1984. Up until 1974, all lands capable of being hayed were cut annually. Beginning in 1975, tame grasslands were cut every year and natives were cut in alternate strips with uncut strips harvested the following year.

No haying was permitted in 1985. It is unlikely that it will play a significant role in grassland management at Kirwin in the future. A Grassland Management Plan is currently being developed which will rely primarily on prescribed fire and grazing as tools for grassland management.

Grasslands are generally in poor condition--a situation which will be reversed in the future. The following photograph taken in Unit 10, is typical of a large portion of Kirwin's grasslands. The 1 decimeter mark is clearly visible on the range pole in the photo.



8/85

ECW

A representative photo of much of Kirwin Refuge grasslands.

A serious problem which will be dealt with in 1986, is the invasion of Chinese elm in some tracts of the refuge grasslands. The grassland management plan currently being developed will identify major grassland tracts in which elm trees will be systematically removed.



8/85

ECW'

Chinese elm will grow where other tree species will not. These are scheduled for removal.

9. Fire Management

No wildfires occurred on Kirwin NWR during 1985.

During the month of April, 553 acres of grassland was burned under prescription. Our goal of 1,095 acres was not achieved as a result of a lack of precipitation and strong winds. The maps on the following pages document particular burn areas. (Shaded in red)

Prescribed fire in year's past was never an integral part of grassland management program at Kirwin Refuge. In earlier years, grassland burning was considered detrimental. In 1982, 560 acres of grassland was burned under prescription--the first time fire was used in such a manner.

In anticipation of public backlash to our burn program, we seized every opportunity to attempt to educate the public in the important role that fire plays in grassland ecology. Oral presentation before clubs, newspaper articles, radio announcements, and a local television news broadcast all served to disseminate information on grassland ecology/burning. In spite of these efforts, many local "arm chair biologists" claimed we did not know what we were doing.

The only problem we experienced in our spring burn program was that on one occasion smoke settled in behind Kirwin Dam and sifted into residences in that small community.

127

MISSOURI

PACIFIC

25

30

29

28

WT

Kirwin

Refuge Headquarters

Picnic Area

Boat Ramp

Campground

Boat Ramp

Campground

Kirwin Cem

Campgrounds

Picnic Area

RAILROAD

GRAD

KIRWIN DAM

36

31

32

33

KIRWIN RESERVOIR
ELEVATION 1729

T4S
T5S

1

6

5

4

Bluegill Point

Picnic Area

Boat Ramp

Picnic Area

Crapple Point

Picnic Area

Picnic Area

DOG TOWN

12a.

21

22

23

24

9

MISSOURI

PACIFIC

28

27

26

25

Refuge Headquarters

Picnic Area

River

North Fork

Solomon

OLD RAILROAD GRADE

33

34

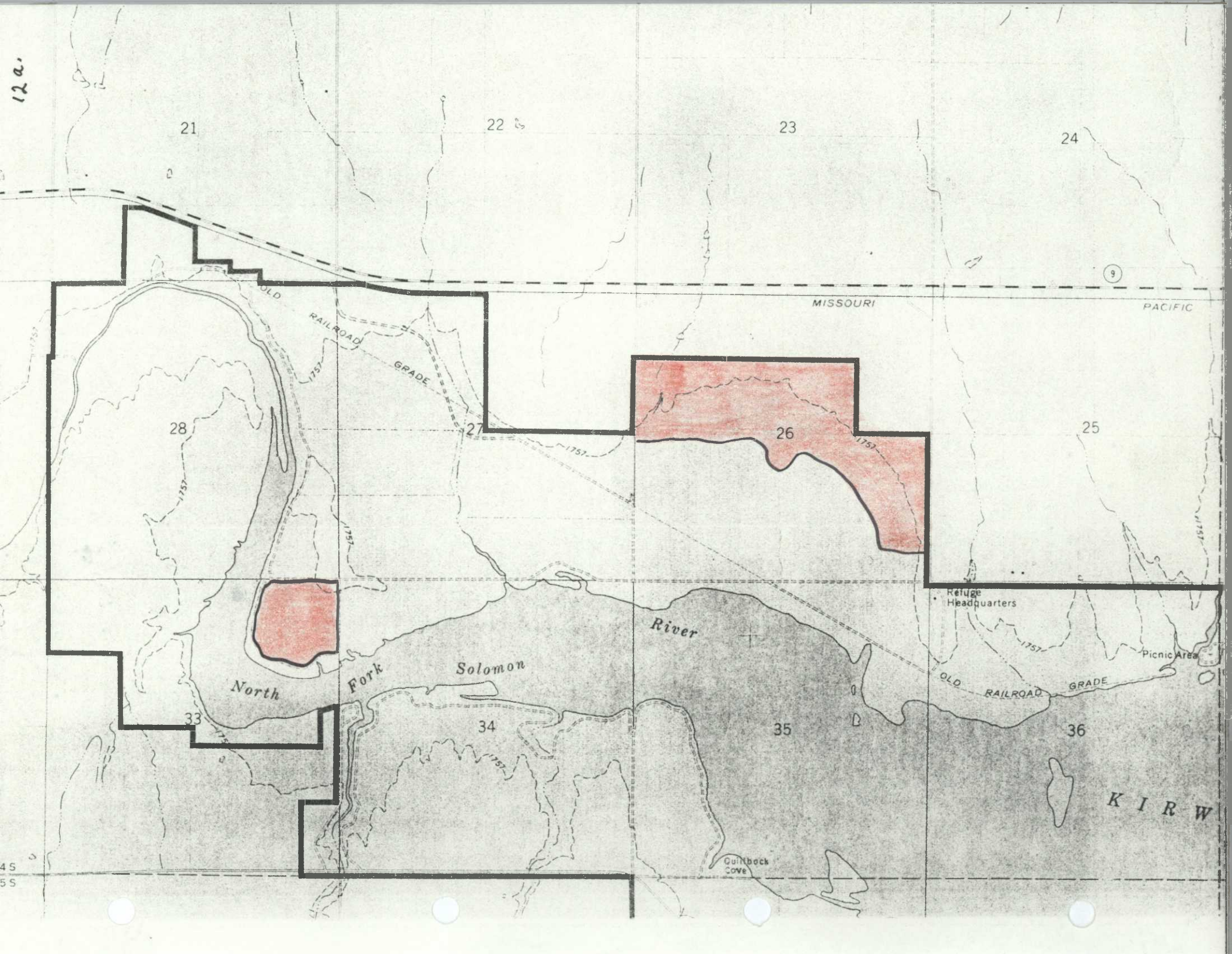
35

36

K I R W

Quilbeck Cove

45
55





8/85

ECW

Billows of smoke arising from Prescribed Burn in Unit 7.

Grassland response to the prescribed burns was variable, depending upon site aspect and moisture limitations. In low-lying areas, the response was tremendous.



8/85

ECW

Big bluestem stand following a spring burn. Range pole is 1.5 meters in length.

10. Pest Control

The following table summarizes pesticide use on Kirwin Refuge during 1985:

<u>Site</u>	<u>Target Pest</u>	<u>Herbicide</u>	<u>Acres</u>
Grassland	Musk Thistle	2,4-D @ 1 lb/A	20
Winter Wheat	Broadleaf Weeds	2,4-D @ 1 lb/A	82
Corn	Broadleaf Weeds	2,4-D @ 1/2 lb/A	69
Corn	Grass Weeds	Atrazine @ 1 lb/A	69
Grassland	Musk Thistle	Picloram @ 1/8 lb/A	52
Grassland	Bindweed	Dicamba @ 2 lb/A	8
Alfalfa	Weevil	Malathion @ 1.2 lb/A	688
Milo	Aphid	Malathion @ 1.2 lb/A	44

Musk thistle infestation is a serious problem which will require much attention in the years ahead. The plant is a pioneering species in the dry river bottoms where detection is really tough.

The weed also occurs sporadically throughout refuge grasslands. Our control efforts involve mowing of plants as they bolt (spring-early summer) followed by chemical treatment of rosettes (fall). Eradication of rosettes by spraying is nearly 100% effective, but multiple sprayings are required as new rosettes form from germinating seeds.

Bindweed can be found along roadsides and food plot field edges. Dicamba appears to be very effective in keeping the weed in check.

Marijuana grows in the timbered bottomlands. Control efforts involve pulling plants as they are discovered.

A serious alfalfa weevil infestation plagues refuge cooperators and threatens the future of this crop. The weevil larvae can denude a field practically overnight. Warm weather which promoted plant growth and larvae metamorphosis coupled with a timely spraying of malathion saved a large portion of the first cutting this spring.

12. Wilderness and Special Areas

The 120-acre Solomon River Grasslands Natural Area - K69, was established on the refuge in 1969. No management techniques have been applied to the bluestem-grama prairie but serious attention need be given to the area if it is to remain a productive grassland. Prescribed burning and some degree of tree control effort will be applied in the near future. It is interesting to note that this 120-acre tract was agricultural land at one time and does not represent native prairie.

G. WILDLIFE

2. Endangered and/or Threatened Species

Bald eagles are winter residents at Kirwin NWR. From mid-November thru February, these birds can be seen in the vicinity of the partially frozen reservoir. The birds feed almost exclusively on crippled Canada geese. As many as one dozen birds are to be found here at any one time.

Peregrine falcons were not sighted on or near the refuge this year. Sightings have always been very uncommon.

3, Waterfowl

Kirwin's summer resident goose flock totalled 75 birds this year. Total production for the year was 24 young. During those years when the reservoir pool was at conservation level and the refuge maintained nesting structures, production was in excess of 300 young! Pool fluctuation of 7-9 feet have essentially eliminated the possibility of significantly increasing goose production.



11/85

ECW

Canada (?) geese utilizing refuge crops.

Kirwin's primary function is to serve as a migration refuge for waterfowl. Canada geese are the most abundant and most obvious of species present. A peak population of 48,000 birds was noted during month of November. During the spring migration, the population peaked at 30,000, the last week of February. The number of white-fronted geese using the refuge was more modest. This species peaked at 8,000 birds during the third week of November. A peak of 4,500 snow geese was recorded for month of November. In recent years, these two species have by-passed Kirwin on their spring migration.

Total ducks during the spring migration was 22,700 with a peak fall flight of 18,730 during November. Duck numbers during spring and fall migrations were half of what they were in 1984. Fewer mallards was the primary reason.



11/85

ECW

A small segment of Kirwin's fall goose population.

4. Marsh and Water Birds

Use days are on a steady increase for double-crested cormorants and sandhill cranes. Peak populations were 6,000 for cormorants and 1,300 for cranes. Maximum number of white pelicans using the refuge dropped from 675 in 1984 to 350 in 1985.

Other species noted during course of year include: eared grebe; great blue heron; snow egret; and American bittern.

5. Shorebirds, Gulls, Terns, & Allied Species

Lack of suitable habitat keeps shorebird use at a minimum. Ring-billed gulls (peak population 5,500) and Franklin's gull (peak population 300) are the two most common species. Other species present include killdeer (200), common terns (100), and avocets (6).

6. Raptors

For a second year, an overall decline was noted in use of refuge by raptors. One notable exception was red-tailed hawk, sightings were up 300%. Another exception was number of turkey vultures. On September 10, 63 birds were counted on south side of refuge. This is the second year in a row that no peregrine falcons were observed.

8. Game Mammals

Kansas continues to experience an increase in number of white-tailed deer. Kirwin's deer herd is a healthy one with late fall population estimated at 800 animals. Habitat conditions are excellent. The brush/timber of the bottomlands and associated farm program have attributed to today's carrying capacity. At one time, there were no deer on Kirwin NWR.

Mule deer are transient visitors to Kirwin. Fewer animals were noted on the refuge this year as compared to last. No more than 12 animals were seen during the fall.

Cottontail rabbit and fox squirrel are present on the refuge. Apparently no one in this part of the world has developed a taste for these critters as they remain unhunted. There are an estimated 2,000 cottontail and 200 squirrels on refuge.

10. Other Resident Wildlife

The pheasant population was at an all-time low in 1985. Based on crow counts and observed male/female ratios, we entered the breeding season with 250 birds.

Bobwhite quail numbers remain very low. Three birds were seen in spring and two coveys observed through the course of summer.

Greater Prairie chicken are common south of refuge. They are transient visitors to Kirwin refuge.

Rio Grande turkey population is estimated to be in excess of 160 birds. This species is showing a remarkable increase in numbers across Kansas. Hunting permits are becoming more abundant as well. One of the few birds in the Kirwin flock which exhibited white coloration was removed for examination in 1984 to determine whether any cross breeding with domestic birds had occurred. Tissue analysis completed in 1985, indicated this was not the case.



9/85

ECW

These wary birds are really tough to photograph!

Coyotes are abundant on Kirwin. As many as eight animals at one time could be observed zeroing in on geese on the reservoir. The fall population is estimated at 24 animals.



11/85

ECW

One of Kirwin refuge's most successful goose hunters.

Bobcats are present on the refuge, though infrequently seen they are common throughout this part of Kansas. Refuge farmers/permittees reported six sightings of these animals during course of year. Several were trapped just off refuge this fall.



.11/85

ECW

A common resident of Kirwin Refuge though infrequently seen.

Black-tailed jackrabbits have been on a steady decline in this part of Kansas for years. Though no sightings were recorded on the refuge, a few individuals were seen on private ground to the south.

The refuge maintains a 50-acre black-tailed prairie dog town of approximately 1,200 animals.

11. Fishery Resources

All fishery management work at Kirwin reservoir is handled by Kansas Fish and Game. Annual stocking continues to maintain sport fishing on the reservoir. This past spring 180,000 wiper (white bass/striped bass hybrid) were stocked. One dozen mature cedar trees were donated for use as "fish habitat" in the reservoir. Test netting this past fall indicated the spring walleye/crappie fishing should be excellent!

15. Animal Control

The 1984 and 1985 archery hunts in the west end of the refuge have eliminated all deer-related depredation complaints. This special archery unit has provided many hours of consumptive-oriented recreation as well as dispersed deer from the area. Prior to fall of 1984, deer would amass in this area and move out into private farmground to devastate haystacks.

A neighboring rancher continues to pursue "refuge" coyotes with trap and snare. During the '84 - '85 season, this individual caught 44 coyotes in the vicinity of his headquarters. Entering the '85 - '86 season, he reported that his success rate is considerably lower than at this same time last year. Casual observation would indicate that he has made an impact on the refuge coyote population.

H. PUBLIC USE

1. General

The number of refuge visits fell to 61,832 in 1985. Visitation in 1984, for comparison, was 70,438 -- a 5-year high. No reasons can be identified to account for the drop in 1985.

Kirwin Refuge is currently developing a Public Use Plan which will address present inadequateness of facilities/programs. This refuge has functioned as a local recreation area for 30 years. Existing facilities were developed during an era when the reservoir was at conservation pool level and public use approached 220,000 visits per year. As the reservoir dropped through the 1970's, so did public use. Many of these facilities are no longer used and are in various states of disrepair.

The following is a list of the major changes we hope to make:

- o Rezoning of camping/picnic areas with a reduction in number of sites and elimination of non-essential vehicle access trails.
- o Phase out trash barrels on refuge and implementation of a "pack in/pack out" trash policy.

- o Renovation of Nature Trail.
- o Development of visitor information/orientation station.
- o Development of new auto tour route with strategically located interpretive materials.

The user public has been promised that they will be given a chance to review our proposals and address them in a formal meeting. It has become evident in recent months that a segment of one local community is adamantly opposed to any changes at Kirwin. Selling our proposals to these folks is going to take some doing!

4. Interpretive Foot Trails.

The chief responsibility of Kirwin's YCC crew in 1985 was to rehab the nature trail. Old benches, bird houses, and interpretive signs were taken down. The entire trail system was re-surfaced with crushed rock--a monumental task! Brush and tree limbs were trimmed where they encroached upon the trail. The Nature Trail is very popular with local school groups during the spring. A variety of plant, bird, and mammal species can be found in the area.



4/85

ECW

A group of fourth graders out for a "Nature Walk" on Kirwin Refuge.

A group of 46 fourth graders visited Kirwin refuge in April. The assistance of Soil Conservation Service and Kansas Fish and Game personnel proved invaluable in providing the group with a quality program and "outdoor experience".

5. Interpretive Tour Routes

The old tour route was closed to vehicular traffic because it received little use. What use did occur coincided with the hunting season. Vehicular traffic was determined to be disruptive to Canada geese which feed heavily in fields in the immediate vicinity.

A new tour route will be developed along the north shore of the reservoir and will utilize existing roads. Interpretive panels will be erected at strategic spots in FY 86 to explain refuge management programs. An attempt at making some adjustments in physical layout and traffic flow patterns during FY 85 proved to be a failure. We will try again.

6. Interpretive Exhibits/Demonstrations

In addition to interpretive panels to be erected along new tour route, a 3-panel display will be developed along the west side of the refuge's main access road. Text and artwork for these panels was developed during FY 85. Each panel will deal with subjects pertaining to refuge history/management/wildlife.

7. Other Interpretive Programs

In February, Manager Wright addressed the Sunshine Club at Agra. Refuge programs were discussed and a film was shown. Managers Wright and Williams were luncheon guests of the Phillipsburg Kiwanis in February. The full range of refuge programs was discussed. In May, Williams provided the biology class of Hill City with a guided tour of the refuge. Williams was luncheon guest of the Phillipsburg Kiwanis in July. A program on "America's Wetlands" was presented.

8. Hunting

For a second year, Kirwin's fall Canada goose population was significantly higher than in years past. Late season waterfowl hunting was excellent with a peak population of 48,000 birds on the refuge.

On refuge hunting consists primarily of "firing-line" pass shooting. For the hunter with decoys, quality hunting could be found a mile or two from the refuge.

The refuge is ringed with private and commercial pits. For the hunter with the bucks, a heated goose pit could be had for \$10.00 per gun per day.

The Bow Creek Arm of the reservoir was partially flooded this year. This area provides the only opportunity for "over-water" hunting. Duck hunting was excellent until freeze-up.

Upland game bird populations remain extremely low. Most birds harvested were taken on opening day. Hunter activity then soon dropped to zero. Hunter interest in rabbit and squirrel populations is negligible. Apparently, native Kansans consider these species to be inedible.



12/85

ECW

Two happy goose hunters with their early season limit of birds.

Archery deer hunting remains extremely popular. The addition of 2,500 acres to the hunt program in 1984, was applauded by many. Deer hunting is a young sport in Kansas and it would appear that archery hunting is just as popular as firearms deer hunting. The archery hunt at Kirwin drew hunters from across the entire state. Hunter success was high, but not anywhere near the 1984 harvest figure. Twenty-eight deer were known to have been taken this past fall.



Largest buck taken at Kirwin Refuge in 1985.

11/85

Unknown

Two tom turkeys were harvested during the spring gobbler/gun season. Birds were abundant but, apparently, permit holders chose to hunt elsewhere. The fall archery season drew interest from a few hunters. One bird was harvested.

Dove hunting pressure remains low at Kirwin despite fine opportunities.

9. Fishing

During 1985, total fishing visits at Kirwin equaled 19,849. Fish & Game estimates place total fish harvested at 4,038. Test-netting this past fall indicates the spring prospects for walleye and crappie are very good.

11. Wildlife Observation

Wildlife observation accounts for a significant portion of Kirwin's public use. Opportunities abound. Most visitors are local residents who make repeat visits. During the fall waterfowl migration, folks who are situated some distance from Kirwin will make the trip to observe Canada geese.

12. Other Wildlife-Oriented Recreation

A half-dozen serious photographers can often be caught lurking behind bushes or sneaking through the grass in attempts to photograph resident and migratory wildlife species. Regional newspapers often utilize photographs taken at Kirwin.

13. Camping

Camping opportunities at Kirwin are presently more than adequate to meet the demand. With the exception of Memorial Day weekend, there is plenty of room for everybody. Camping is the most popular recreational activity at Kirwin. Our busy season is April-June. This activity coincides with the mild spring weather and the best time to catch fish!



2/85

ECW

A tough troop of Boy Scouts on a winter camping expedition.

It is hoped that we will be able to adjust the number of camping areas and reduce the amount of time spent in maintaining them. The most popular areas will be improved.

Many camper units are left parked at the refuge for the entire season--going unattended for a good share of the time. Enforcement of regulations limiting camping in previous years would have prevented the existing situation.

14. Picnicking

Picnicking is primarily associated with camping and/or fishing excursions. It is a popular activity for many who enjoy a meal in an outdoor setting. Some local groups hold get-togethers at Kirwin and roast goats/pigs/etc. on large rotisseries.

15. Off-Road Vehicling

Vehicle trespass is not a problem at Kirwin but does occasionally occur. Efforts are currently underway to succinctly define where the public may or may not drive. Off-road vehicle use currently poses more of a threat to the drivers than it does to wildlife habitat/resources in our public use areas.



-7/85

ECW

Failure to exercise common sense resulted in this predicament.

16. Other Non-Wildlife Oriented Recreation

Boating, skiing, and swimming occur at Kirwin but are limited in popularity. Enough boating and skiing occurs to interfere with fishermen as the reservoir pool lacks ample room to accommodate everyone. Restrictions on skiers are being considered.

Thirty-eight members of the Ft. Bissel Riding Club were given the opportunity to tour a portion of the refuge via horseback in October.

17. Law Enforcement

No acts of vandalism occurred at Kirwin in 1985. Patrols throughout the summer and during the hunting season were made. The refuge received a helping hand from Kansas Fish and Game and the Sheriff's Department. Personnel from these agencies made routine patrols of the refuge.

The following is a summary of cases made during the year by State and/or Federal personnel:

Waterfowl Hunting-Closed Area	5
Waterfowl Hunting-Unplugged Gun	4
No Waterfowl Stamp in Possession	1
Overbag(geese)	1
Driving Vehicle in Area Closed to Public access and No Driver's License	1
Driving Vehicle in Area Closed to Public Access	<u>1</u>
Total Violations	13

The use of permanent tree stands remains a problem at Kirwin. Numerous trees containing these elaborate structures fell victim to the mechanical beaver. Hunters either do not read or choose to ignore our regulation against the use of such structures.

There was no evidence of poaching in 1985. Illegal woodcutting, considered a problem in 1984, did not occur in 1985--primarily through effort of State Game Protector who issued several warnings during the previous year.

19. Concessions

A payment of \$3,300.00 was received for renewal of Special Use Permit issued to the Kirwin Trailer Village. One site occupant chose not to renew his lease for 1985. Perhaps, by the year 2000, Kirwin Refuge will be rid of them all.

I. EQUIPMENT & MAINTENANCE

1. New Construction

A garage stall immediately adjacent to the refuge office began a transformation during 1985. It is currently being converted into additional office space with conference room. By year's end, all work was complete except for trim, carpet, and furniture. The project is being handled force account by our capable maintenanceman.

2. Rehabilitation

All of the old routed directional/guide signs were replaced during the year with signs purchased through the FWS sign shop.

Boat launch capability was improved at Kirwin Reservoir through construction of a new boat ramp. The joint FWS/KFG project was sorely needed. The 80'x14' structure was assembled from railroad rail and concrete and then slid into position. An approach pad was then poured at its upper end as a finishing touch.

A concrete "wash pad" was poured in front of the mechanic shop.



9/85

ECW

Two dozers were needed to push the 40+ ton boat ramp into place.



9/85

ECW'

A concrete apron was the finishing touch to the new ramp.

Four new hunter information signs were fabricated and erected at strategic spots on the refuge.



10/85

ECW

One of refuge's new hunter information signs.

3. Major Maintenance

Early fall rains softened road surfaces to the point where hunter vehicle traffic did considerable damage. Several spots were re-rocked to keep roads passable in anticipation of the waterfowl season. Cold temperatures and lack of precipitation prevented roads from deteriorating further.

A boathouse, removed from Real Property in 1984, was sold for \$526.11 and removed from the refuge premise in a timely manner.

A 30-year accumulation of junk--fencing, scrap metal, batteries, oil drums, guard rail posts, tires, etc. was sold and removed from the refuge equipment yard.

4. Equipment Utilization and Replacement

A second hand 2-speed rear axle was purchased locally and installed in the refuge gravel truck.

A Champion 710A grader, on loan from Bear River, became a permanent addition to our equipment line. A 200-gallon trailer-mounted fire unit was also permanently transferred to this station from that refuge.

A skid-mounted weed sprayer was modified and mounted on a 2-wheel trailer. A PTO pump was added so the spray system could be controlled from within a tractor cab.

A 1964 Ford dump truck was transferred to Devils Lake WMD. A 1983 Ford Ranger pickup was transferred to Flint Hills NWR. A 1976 Dodge Club cab was received from Flint Hills NWR for use by our YCC crew. A Huber-Warco grader was transferred to Tishomingo NWR, Oklahoma. A 1955 boat/trailer and 1964-40 HP outboard motor were turned over to Kansas Surplus Property. A 1981 Plymouth Reliant-K car, on loan to Kirwin from the Regional Office was sent to LaCreek NWR. A 1985 Plymouth Reliant-K was received from GSA. It was replacement for a 1981 Ford Fairmont destroyed in collision in 1984. Upon receipt, an AM radio and air conditioner were installed.



4/85

ECW.

1985 Reliant on day of delivery.

After it was determined that the 1983 Ford Ranger was not suited to refuge needs, a 1985 1-ton Dodge 4x4 truck was ordered as a replacement.



7/85

ECW

Refuge's new 1-ton Dodge 4x4 truck.

The new truck will allow the refuge manager "to get around" and will also function well in hauling a slip-in unit while conducting prescribed burns.

The refuge currently is housing a boat and motor belonging to Kansas Fish and Game with the understanding that it is at our disposal if needed.

A trailer-type brush mower was given to the city of Kirwin after being offered to other refuges and GSA.

5. Communications Systems

The new car and 1-ton truck each received a refuge radio. One radio was on hand, the other purchased. A state-frequency (low band) radio was also purchased and installed in the 1-ton Dodge 4x4 truck.

6. Energy Conservation

The following table compares current energy consumption with the base year:

<u>Energy Conservation Table</u>					
	<u>Gas</u>	<u>Diesel</u>	<u>Electricity</u>	<u>Propane</u>	<u>Mileage</u>
<u>Base Year</u>	2,245	2,496	12,120	1,370	26,680
<u>1985 Use</u>	2,903	2,386	17,010	3,967	32,005
<u>Increase/ Decrease</u>	+ 658	- 110	+ 4,890	+2,597	+ 5,325
<u>% Increase/ Decrease</u>	+ 29	- 4	+ 40	+ 189	+ 19

J. OTHER ITEMS

1. Cooperative Programs

We have three cooperative agreements that affect the refuge. These agreements are:

- o A Cooperative agreement between the Bureau of Reclamation and the Fish and Wildlife Service was approved on June 17, 1954. This is the basic agreement which allows the refuge as an overlay on the reservoir for the management of habitat and wildlife resources.
- o A Cooperative agreement between the Fish and Wildlife Service and the Kansas Fish and Game Commission for the management of public hunting and public fishing on the Kirwin National Wildlife Refuge was approved on June 28, 1954. This agreement stipulates the U.S. Fish and Wildlife Service will manage the land for wildlife benefits and that areas will be opened for hunting and fishing when conditions permit. It also gives the State the responsibility for management of the fisheries resources.
- o A Cooperative agreement exists between the U.S. Fish and Wildlife Service and the Kansas Fish and Game Commission to improve upland habitat. This agreement requires the Service to maintain food plots totalling approximately 50 acres in the grasslands open to hunting. In return the Commission will establish and maintain woody habitat plantings for wildlife utilization in these same areas.

2. Items of Interest

Karen Cartlidge, Assistant Manager at Quivira, provided her expertise in the area of public use and helped us develop draft texts for six interpretive panels. Thanks, Karen!

One of the YCC projects this past summer was to replace badly faded boundary signs. The refuge was subsequently visited by a belligerent fellow who thought we were "trying to pull a fast one" by replacing badly faded signs. The refuge also received two inquiries from Congressman

Pat Robert's office in Washington, D.C., concerning Kirwin's new boundary signs. Apparently, a segment of the local population failed to realize that Kirwin was a National Wildlife Refuge and/or did not appreciate a sign that said "UNAUTHORIZED ENTRY PROHIBITED".

3. Credits

This narrative was written by Williams and Hagman, edited by Williams and typed by Hagman.

**MAMMALS
OF THE**



**Kirwin National
Wildlife Refuge**

Kirwin, Kansas

This checklist identifies the names, status, and preferred habitats of the native mammals of Kirwin National Wildlife Refuge. It does not include introduced species (such as house mice and barn rats), domesticated species (such as cattle and house pets), and species that formerly occurred in the region but have since been extirpated (such as wolves and bison). Accordingly, the list includes only those animals which presently comprise the native mammalian fauna of the Refuge.

A total of 34 species of native mammals have been documented as occurring on the Refuge at the present time. The status of these species is described as **common** (C), **uncommon** (U), or **rare** (R). "Common" species are so abundant in their preferred habitats that they can be found therein with little difficulty. "Uncommon" species are less abundant or widespread in their preferred habitats than are "common" species, and the one "rare" species has only recently dispersed into the region and is represented by very few individuals. Three **locally common** (LC) species are abundant in their preferred habitat in certain areas but rare or absent in others.

Seven additional species of mammals occur in the immediate region and **probably** (PR) occur on the Refuge, although their presence thereon has not been confirmed. Finally, nine species **possibly** (P) will be found on the Refuge although they are not presently known from the immediate region. The habitats on the refuge where these probable or possible inhabitants might be found are indicated.

Information on status and preferred habitats in this checklist pertains only to Kirwin National Wildlife Refuge and not the entire range of a particular species. As such, the checklist is intended as a field guide for use by visitors to the Refuge and by residents and educators in the immediate vicinity of the Refuge. It is hoped that the checklist will stimulate interest in the local mammals and add to the pleasure of visiting Kirwin National Wildlife Refuge.

SPECIES	STATUS	HABITAT
MARSUPIALS—Order Marsupialia		
OPOSSUMS—Family Didelphidae		
Virginia opossum, <i>Didelphis virginiana</i>	C	Riparian woodland
INSECTIVORES—Order Insectivora		
SHREWS—Family Soricidae		
Short-tailed shrew, <i>Blarina carolinensis</i>	U	Riparian grassland
Least shrew, <i>Cryptotis parva</i>	U	Riparian grassland, prairie
MOLES—Family Talpidae		
Eastern mole, <i>Scalopus aquaticus</i>	U	Riparian woodland
BATS—Order Chiroptera		
INSECTIVOROUS BATS—Family Vespertilionidae		
Keen's bat, <i>Myotis keenii</i>	PR	Migrates across region
Small-footed bat, <i>Myotis leibii</i>	P	Might roost in rock outcrops
Silver-haired bat, <i>Lasionycteris noctivagans</i>	PR	Migrates across region
Big brown bat, <i>Eptesicus fuscus</i>	U	Roosts in human habitation
Red bat, <i>Lasiurus borealis</i>	PR	Roosts in trees
Hoary bat, <i>Lasiurus cinereus</i>	PR	Roosts in trees
Evening bat, <i>Nycticeius humeralis</i>	P	Might migrate across region
FREE-TAILED BATS—Family Molossididae		
Braslian free-tailed bat, <i>Tadarida brasiliensis</i>	PR	Migrates across region
EDENTATES—Order Edentata		
ARMADILLOS—Family Dasypodidae		
9-banded armadillo, <i>Dasypus novemcinctus</i>	P	Pioneers wander in region
LAGOMORPHS—Order Lagomorpha		
HARES AND RABBITS—Family Leporidae		
Eastern cottontail, <i>Sylvilagus floridanus</i>	C	Riparian woodland, brush
Desert cottontail, <i>Sylvilagus audubonii</i>	P	Might occur on upland prairie
Black-tailed jackrabbit, <i>Lepus californicus</i>	C	Prairie
RODENTS—Order Rodentia		
SQUIRRELS—Family Sciuridae		
Franklin's ground squirrel, <i>Spermophilus franklinii</i>	LC	Riparian grassland, brush
13-lined ground squirrel, <i>Spermophilus tridecemlineatus</i>	C	Prairie
Prairie dog, <i>Cynomys ludovicianus</i>	LC	Prairie
Fox squirrel, <i>Sciurus niger</i>	C	Riparian woodland, windrows
POCKET GOPHERS—Family Geomyidae		
Plains pocket gopher, <i>Geomys bursarius</i>	C	Prairie, riparian grassland
POCKET MICE—Family Heteromyidae		
Plains pocket mouse, <i>Perognathus flavescens</i>	P	Might occur sparsely on prairie
Silky pocket mouse, <i>Perognathus flavus</i>	P	Might occur sparsely on prairie
Hispid pocket mouse, <i>Perognathus hispidus</i>	U	Widespread
Ord's kangaroo rat, <i>Dipodomys ordii</i>	C	Widespread in sandy soils
BEAVER—Family Castoridae		
American beaver, <i>Castor canadensis</i>	LC	Wooded tributaries
NEW WORLD RATS AND MICE—Family Cricetidae		
Plains harvest mouse, <i>Reithrodontomys montanus</i>	U	Prairie
Western harvest mouse, <i>Reithrodontomys megalotis</i>	C	Widespread
Deer mouse, <i>Peromyscus maniculatus</i>	C	Everywhere but woodland

White-footed mouse, *Peromyscus leucopus*
 Northern grasshopper mouse, *Onychomys leucogaster*
 Hispid cotton rat, *Sigmodon hispidus*
 Eastern wood rat, *Neotoma floridana*
 Prairie vole, *Microtus ochrogaster*
 Muskrat, *Ondatra zibethicus*
 PORCUPINES—Family Erethizontidae
 American porcupine, *Erethizon dorsatum*

C Riparian woodland
 U Prairie
 U Riparian grassland
 C Widespread
 C Riparian grassland
 C Tributaries and along shores
 P Might occur in riparian woodland

CARNIVORES—Order Carnivora
 DOGS AND RELATIVES—Family Canidae

Coyote, *Canis latrans*
 Red fox, *Vulpes vulpes*
 Gray fox, *Urocyon cinereoargenteus*

C Widespread
 PR Riparian woodland
 P Might occur in riparian woodland

BEARS—Family Ursidae

Black bear, *Ursus americanus*

P Might wander into region

RACCOONS—Family Procyonidae

Raccoon, *Procyon lotor*

C Widespread, riparian woodland

WEASELS AND RELATIVES—Family Mustelidae

Long-tailed weasel, *Mustela frenata*

U Widespread

Mink, *Mustela vison*

C Riparian woodland, tributaries

Least weasel, *Mustela nivalis*

R Widespread

Badger, *Taxidea taxus*

C Prairie

Eastern spotted skunk, *Spilogale putorius*

PR Widespread

Striped skunk, *Mephitis mephitis*

C Widespread

CATS—Family Felidae

Bobcat, *Felis rufus*

C Widespread, rugged terrain

EVEN-TOED UNGULATES—Order Artiodactyla

DEER AND RELATIVES—Family Cervidae

Mule deer, *Odocoileus hemionus*

C Prairie

White-tailed deer, *Odocoileus virginianus*

C Widespread, riparian woodland

Information regarding unusual mammals on the Refuge should be directed to:

Refuge Manager
 Kirwin National Wildlife Refuge
 Kirwin, Kansas 67644

or

Museum of the High Plains
 Fort Hays State University
 Hays, Kansas 67601

**Mammals of the Kirwin
 National Wildlife Refuge**

Prepared in cooperation with

**Museum of the High Plains
 Fort Hays State University
 Hays, Kansas**

Compiled by

G. Karl Launchbaugh and Jerry R. Choate



RF6-64610

GPO 842-954



May 1984

Birds of **Kirwin**

National Wildlife Refuge



Kirwin, Kansas

Birding Notes

**Grebes—Pelicans—
Herons—Geese**

**Ducks—Hawks
Cranes**

**Rails—Shorebirds—
Gulls—Doves**

**Owls—Goat suckers—
Woodpeckers—Flycatchers—
Swallows—Thrashers**

**Thrushes—Vireos—
Warblers—Blackbirds**

**Grosbeaks—Buntings
Sparrows**

birding. Since the refuge is near the 100th meridian, both eastern and western species of birds overlap.

USING YOUR CHECKLIST

This leaflet lists 195 species which have been seen on the refuge at some time during the year.

The abundance of each bird is designated within the columns by the letters:

- a—abundant (a common species which is numerous)
- c—common (certain to be seen in suitable habitat)
- u—uncommon (present, but not certain to be seen)
- o—occasional (seen only a few times during a season)
- r—rare (seen at intervals of 2 to 5 years)

Birds known to nest on the refuge have a (•) in front of the name.

Seasonal appearances at Kirwin are listed by the columns:

- S—March-May
- F—September-November
- S—June-August
- W—December-February

Birding Notes

Grebes—Pelicans—
Hérons—Geese

Ducks—Hawks
Cranes

Rails—Shorebirds—
Gulls—Doves

~~Owls—Goat suckers—~~
Woodpeckers—Flycatchers—
Swallows—Thrashers

Thrushes—Vireos—
Warblers—Blackbirds

Grosbeaks—Buntings
Sparrows



PELICAN

S S F W

— Common Loon	r	r		
— Horned Grebe	o	o		
— Eared Grebe	c	o	c	
— Western Grebe	o	o		
— Pied-billed Grebe	c	o	c	
— White Pelican	c	c	c	
— • Double-crested Cormorant	c	c	c	o
— • Great Blue Heron	c	c	c	o
— Green Heron	o	o	o	
— Little Blue Heron	u	u	u	
— Cattle Egret	r			
— Great Egret (Common)	o	o	o	
— Snowy Egret	u	u	u	

— Black-crowned Night Heron	c	o	c	
— Yellow-crowned Night Heron	o	o		
— Least Bittern	o	o	o	
— American Bittern	o	o	o	
— White-faced Ibis	r	r		
— Whistling Swan	r	r		
— • Canada Goose	a	c	a	c
— White-fronted Goose	a	r	a	u
— Snow Goose (Snow & Blue)	o	r	u	o



Grebes—Pelicans—
Herons—Geese

Ducks—Hawks
Cranes

Rails—Shorebirds—
Gulls—Doves

Owls—Goat suckers—
Woodpeckers—Flycatchers—
Swallows—~~Thrushes~~

Thrushes—Vireos—
Warblers—Blackbirds

Grosbeaks—Buntings
Sparrows

— Black-crowned Night Heron	c	o	c
— Yellow-crowned Night Heron		o	o
— Least Bittern	o	o	o
— American Bittern	o	o	o
— White-faced Ibis	r		r
— Whistling Swan		r	r
— Canada Goose	a	c	a
— White-fronted Goose	a	r	a
— Snow Goose (Snow & Blue)	o	r	u



Grebes—Pelicans—
Herons—Geese

Ducks—Hawks
Cranes

Rails—Shorebirds—
Gulls—Doves

~~Owls—Boat suckers—~~
Woodpeckers—Flycatchers—
Swallows—Thrashers

Thrushes—Vireos—
Warblers—Blackbirds

Grosbeaks—Buntings
Sparrows

— Hooded Merganser	o	r	o	o
— Common Merganser	c	u	c	o
— Turkey Vulture	o	c	o	
— Mississippi Kite	r	r	r	
— Goshawk			r	
— Sharp-shinned Hawk	o	o	o	o
— Cooper's Hawk	o	o	o	o
— Red-tailed Hawk	c	c	c	c
— Red-shouldered Hawk	r	r		
— Swainson's Hawk	c	c	c	
— Rough-legged Hawk	o	o	c	
— Ferruginous Hawk	u	r	u	u
— Golden Eagle	o	o	c	
— Bald Eagle	o	o	c	
— Marsh Hawk	c	o	c	c
— Osprey	o	o		
— Prairie Falcon	u	u	u	u
— Peregrine Falcon	u	u	u	u
— Merlin (Pigeon Hawk)		r		
— American Kestrel (Sparrow Hawk)	c	o	c	u
— Bobwhite	c	c	c	c
— Ring-necked Pheasant	c	c	c	c
— Turkey	r	r	r	r
— Whooping Crane	r	r		
— Sandhill Crane	c	c		

Ducks—Hawks
Cranes

Rails—Shorebirds—
Gulls—Doves

~~Owls—Goatuckers—~~
Woodpeckers—Flycatchers—
Swallows—Thrashers

Thrushes—Vireos—
Warblers—Blackbirds

Grosbeaks—Buntings
Sparrows



KILLDEER

S S F W

— Virginia Rail	u	o	u
— Sora	u	o	u
— American Coot	c	u	c r
— Semipalmated Plover		o	r
— Piping Plover	o		o
— Snowy Plover	o	o	r
— • Killdeer	c	c	c r
— American Golden Plover	r		r
— Black-bellied Plover	o	u	o
— Ruddy Turnstone	r		r
— Common Snipe	u		u
— Long-billed Curlew	u		u
— Upland Sandpiper (Plover)	u		u
— Spotted Sandpiper	o	u	o
— Willet	o	o	o
— Greater Yellowlegs	u	u	u
— Lesser Yellowlegs	o	o	o
— White-rumped Sandpiper	u		u
— Baird's Sandpiper	c	o	c
— Least Sandpiper	o	u	o
— Dunlin	r		
— Long-billed Dowitcher	c	c	c
— Stilt Sandpiper	u		u
— Semipalmated Sandpiper	o		o

— Western Sandpiper	u		o
— Marbled Godwit	o	o	o
— Hudsonian Godwit	r		r
— Sanderling	r		r
— American Avocet	c	o	c
— Black-necked Stilt	r		
— Wilson's Phalarope	c	o	c
— Northern Phalarope	u		u
— Herring Gull	o	o	o
— Ring-billed Gull	c	o	c o
— Franklin's Gull	a	o	a
— Bonaparte's Gull	r		r
— Forster's Tern	o		o
— Common Tern	c		c
— • Least Tern		o	o
— Caspian Tern	u		u
— Black Tern	o	c	o
— • Mourning Dove	c	a	c r

Rails—Shorebirds—
Gulls—Doves

Owls—Goat suckers—

Woodpeckers—Flycatchers—

Swallows—Thrashers

Thrushes—Vireos—

Warblers—Blackbirds

Grosbeaks—Buntings

Sparrows



BROWN THRASHER

S S F W

—• Yellow-billed Cuckoo	o	o	o
—• Black-billed Cuckoo	u	u	u
—• Barn Owl	o	o	o
—• Screech Owl	u	u	u
—• Great Horned Owl	c	c	c
— Snowy Owl			u
—• Burrowing Owl	o	o	o
— Barred Owl		u	
— Short-eared Owl	o	o	o
—• Common Nighthawk		o	
— Chimney Swift		r	
— Belted Kingfisher	o	o	o
—• Common Flicker (Red & Yellow Shafted)	c	c	c
—• Red-headed Woodpecker	o	c	o
— Hairy Woodpecker			o
—• Downy Woodpecker	o	o	o
—• Eastern Kingbird	c	a	c
—• Western Kingbird	c	a	c
— Scissor-tailed Flycatcher	r	r	
— Great Crested Flycatcher	o	o	o
— Eastern Phoebe	o	o	o
— Say's Phoebe	o	o	o

—• Horned Lark	a	c	a	c
— Bank Swallow	c	c		
— Rough-winged Swallow	c	c		
—• Barn Swallow	a	c	a	
— Cliff Swallow	c	o	c	
— Purple Martin		o		
—• Blue Jay	c	c	c	c
—• Black-billed Magpie	c	c	c	c
— Common Crow	c	o	c	o
— Black-capped Chickadee	o	o	u	
— Brown Creeper		r		
—• House Wren	u	c	u	
— Winter Wren	r	r	r	
—• Mockingbird	c	c	c	
— Gray Catbird (Catbird)	u	u	u	
—• Brown Thrasher	c	c	c	



BLACK-BILLED MAGPIE

Owls—Goat suckers—
Woodpeckers—Flycatchers—
Swallows—Thrashers

Thrushes—Vireos—
Warblers—Blackbirds

Grosbeaks—Buntings

Sparrows



RED-WINGED BLACKBIRD

S S F W

— • American Robin (Robin)	c	c	c	o
— Eastern Bluebird	o	o	o	
— Mountain Bluebird	o			
— Golden-crowned Kinglet	r			
— Ruby-crowned Kinglet	r	r		
— Water Pipit	u	u		
— Cedar Waxwing				u
— Loggerhead Shrike	o	o	o	o
— • Starling	u	u	u	o
— Yellow-throated Vireo	o	o	o	
— Yellow Warbler	c	c	c	
— Yellow-rumped Warbler (Myrtle & Audubon's)	o	o		
— Prairie Warbler	u	u		
— Northern Waterthrush	o	o		
— Common Yellowthroat (Yellowthroat)	o	o		
— • House Sparrow	c	c	c	c
— • Eastern Meadowlark	o	o	o	o
— • Western Meadowlark	a	a	a	a
— Yellow-headed Blackbird	c	c	c	
— • Red-winged Blackbird	a	a	a	o
— • Orchard Oriole	o	o	o	
— • Northern Oriole (Baltimore & Bullock's)	c	c	c	
— Brewer's Blackbird	c	c	c	
— Common Grackle	o	o	o	
— Brown-headed Cowbird	c	c	c	



YELLOW-HEADED BLACKBIRD

Thrushes—Vireos—
Warblers—Blackbirds

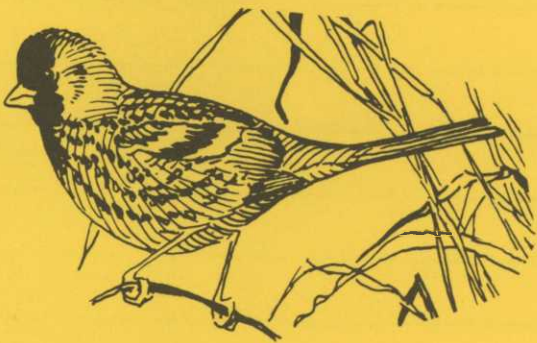
Grosbeaks—Buntings
Sparrows



CARDINAL

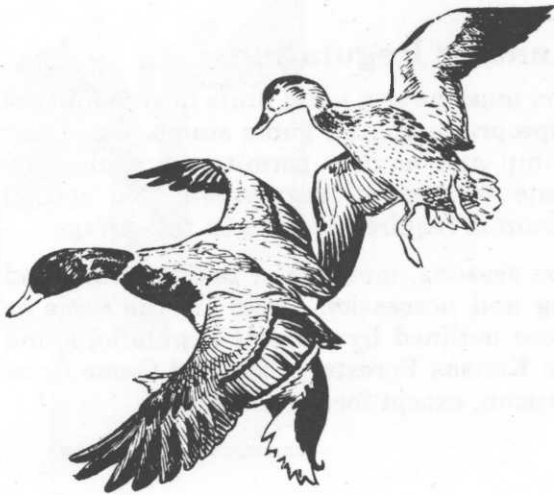
S S F W

— • Cardinal	c	c	c	c
— Black-headed Grosbeak	r			
— Blue Grosbeak	o	o	o	
— Indigo Bunting	r			
— • Dickcissel	o	o	o	
— House Finch	o	o	o	
— Common Redpoll	r			
— American Goldfinch	o	o	o	
— Rufous-sided Towhee	o	o	o	
— Lark Bunting	o	o	o	
— Vesper Sparrow	c	c	c	
— Lark Sparrow	c	c	c	
— Dark-eyed Junco (Slate-colored, Oregon & White-winged)				u
— Tree Sparrow	o	o	o	c
— Chipping Sparrow	o	o	o	c
— Clay-colored Sparrow	u	o	u	
— Harris' Sparrow	c	c		
— White-crowned Sparrow	o	o	c	
— Song Sparrow	u	u	u	
— Lapland Longspur				o
— Chestnut-collared Longspur	o	o		



HARRIS SPARROW

**Public
Hunting
on the**



**KIRWIN
NATIONAL WILDLIFE REFUGE**

Kirwin, Kansas

WELCOME TO THE KIRWIN NATIONAL WILDLIFE REFUGE. WE HOPE YOU HAVE A SUCCESSFUL HUNT WHILE YOU ARE HERE. HERE ARE A FEW TIPS TO REMEMBER.

Hunting Regulations:

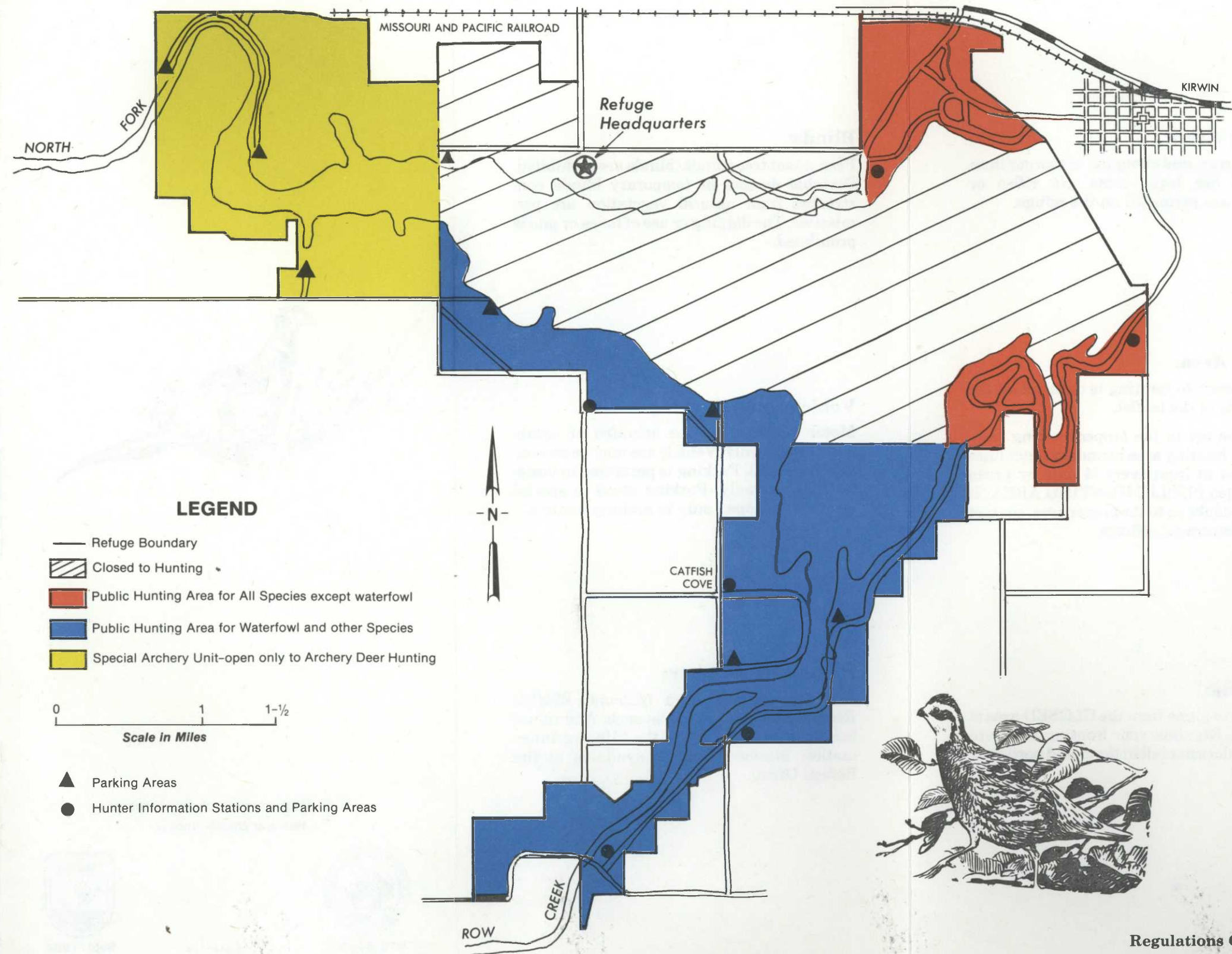
You must have a valid State license and the appropriate upland game stamp, waterfowl stamp and/or deer permits as required by State or Federal regulations. No special permit is required to hunt on this refuge.

The seasons, methods of taking game, and bag and possession limits are the same as those outlined by Federal Regulations and the Kansas Forestry, Fish and Game Commission, except for the following:

Legal Species:

Waterfowl, doves, pheasants, quail, turkey, cottontail rabbits, fox squirrels, and archery deer hunting. No hunting of other wildlife is permitted.

Cottontail rabbits may be hunted only on those days on which the season is open for pheasant and/or quail. Fox squirrels may be hunted only on those days on which the season is open for pheasant and/or quail and is limited to the State squirrel season.



Regulations Continue →

Sporting Arms:

Bow and arrow and shotguns not larger than 10 gauge are legal arms. No rifles or handguns are permitted on the refuge.

Hunting Area:

The area open to hunting is outlined on the reverse side of the leaflet.

Be sure you are in the proper hunting area. The public hunting area boundary fence lines are marked at least every $\frac{1}{4}$ mile by green signs labeled PUBLIC HUNTING AREA. If you are in doubt as to the proper area, contact refuge enforcement officers.

Retrieving:

Retrieving of game from the CLOSED area is prohibited. Regulate your hunting to insure that game does not fall in the closed portion of the refuge.

Blinds:

Permanent tree stands/blinds are prohibited. Portable devices or temporary blinds constructed from natural vegetation are permissible. The digging or use of holes or pits is prohibited.

Vehicles and Parking:

Motor vehicles may be operated on established roads only. Vehicle use may be seasonally restricted. Parking is permitted in designated areas only. Parking areas in special archery unit open only to archery hunters.

Please Remember:

You are hunting on a *National Wildlife Refuge*, please respect it as such. Additional information is posted at the "Hunter Information Stations" and is available at the Refuge Office.



U.S. Department of the Interior
Fish and Wildlife Service



RF6-64610

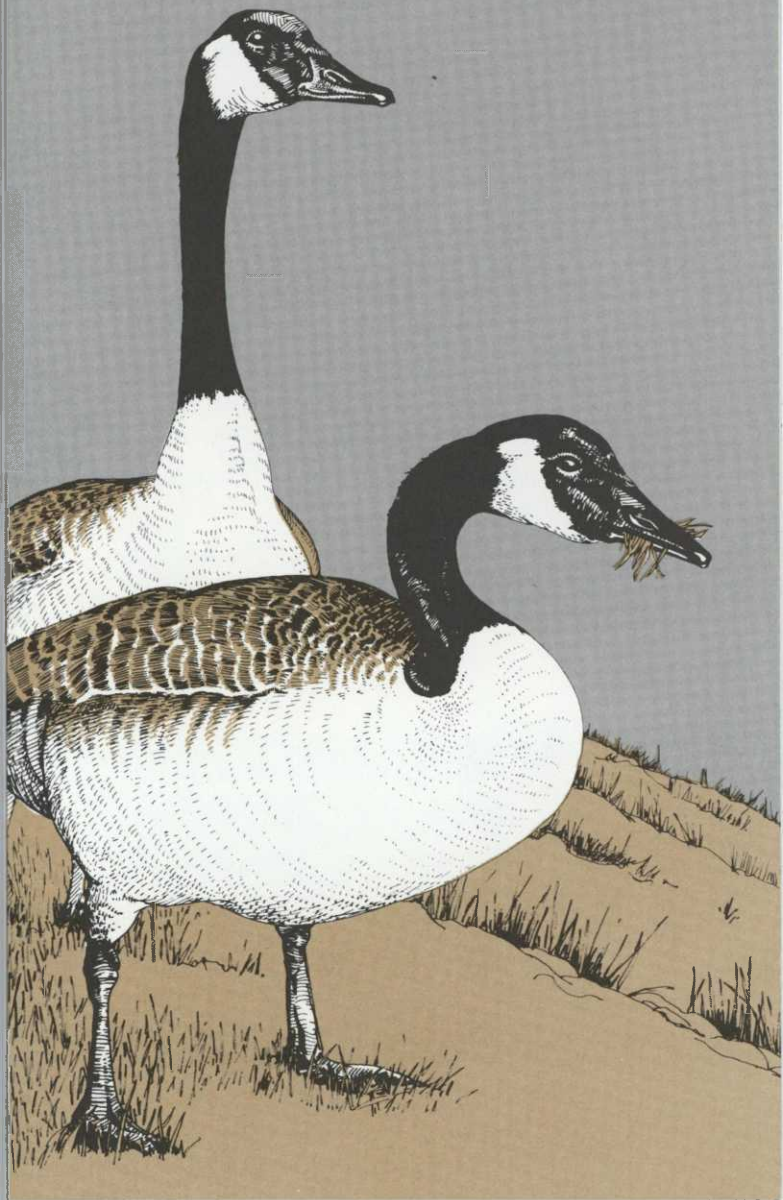
GPO 844-324



Sept. 1984

KIRWIN

NATIONAL
WILDLIFE
REFUGE



WELCOME TO KIRWIN

Kirwin National Wildlife Refuge, located in north-central Kansas, lies in an area of broken and rolling hills in the narrow North Fork of the Solomon River Valley. The area is part of the transition zone between the tall-grass prairies of the east and the short-grass plains of the west. As a result, grasses, as well as wildlife which are common to both zones are found on the refuge. Historically, great herds of bison roamed the grasslands, often followed by wolves and later, Indians who depended on the buffalo for their livelihood. Waterfowl were virtually unknown in the area until large reservoirs were built in the early 1950's. This newly developed wetland habitat soon began to attract migrating waterfowl.

Kirwin, the first Federal refuge in Kansas, was established in 1954, as an overlay project on a Bureau of Reclamation irrigation and flood control reservoir. The reservoir is fed by the North Fork of the Solomon River and Bow Creek, both being intermediate streams which carry water only in periods of high rainfall. Kirwin Refuge is 10,778 acres in size, and is primarily grassland, open water, and cropland.

Canada geese, blue and snow geese. USFWS photo.



MANAGING FOR WILDLIFE

The primary objective of the refuge is to provide nesting cover, food, and shelter for waterfowl, upland game birds, and mammals. The refuge uses a variety of management practices to meet the needs of wildlife. Crops such as corn, wheat, and milo are grown through a cooperative farming program. A portion of the crop is used to provide feed for the thousands of ducks and geese which use the area during the spring and fall migrations. Brush control, haying, mowing, and controlled burning are also used to provide food, cover, and needed habitat for a variety of wildlife.

FUR AND FEATHERS

Waterfowl may be seen any time of the year on Kirwin, but their numbers are most impressive during the fall and spring migrations. The late September arrival of pelicans, cormorants, and gulls heralds the beginning of the fall migration. Later arrivals include mallards, Canada geese, white-fronted geese, gadwalls, pintails, and other dabbling ducks. As many as 15,000 mallards and 20,000 Canada geese normally winter on the refuge. Some ducks and geese find refuge

Killdeer, USFWS photo.



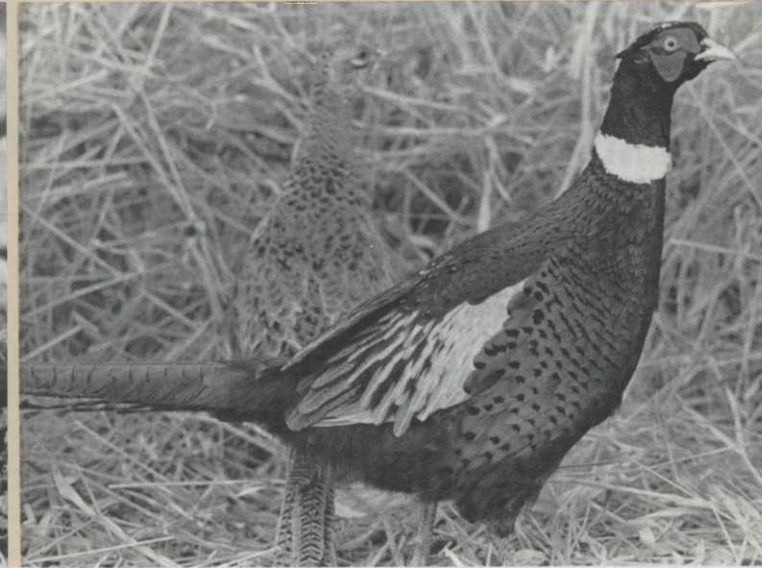
conditions so attractive that they no longer fly any farther south. In the late fall and early winter, both the golden and bald eagles soar over the landscape. Small numbers of peregrine falcons are also present through this period. Marsh hawks, redtails, and kestrels are common to the area.

Spring migration is marked by the arrival of pintails, shovelers, gadwall, and both the green and blue-winged teal, as well as numerous shorebirds. Species that nest on the refuge include Canada geese, mallards, great blue herons, and cormorants.

The refuge is rich in its variety of resident species. It is home for 34 mammals, 31 species of reptiles and amphibians, and 197 species of birds. Upland game birds include pheasant, bobwhite quail, greater prairie chicken, and Rio Grande turkey. Pheasants are extremely plentiful, while the prairie chicken is the least common species.

Beaver find food and cover in aquatic habitats, raccoon and skunk work the lake edge, while coyotes hunt the uplands. White-tailed deer seek shelter in the windbreaks and brush of the lake bottom. Fields of native grass hide mice and rabbits, the prey of many species of hawks and owls.

Below: ring-necked pheasant. USFWS photo. Top right: fisherman. USFWS photo. Bottom right: white-tailed deer. USFWS photo.



"Men and nature must work hand in hand. The throwing out of balance the resources of nature throws out of balance also the lives of men." Franklin D. Roosevelt



Blue and snow geese. USFWS photo by Kent Olson.

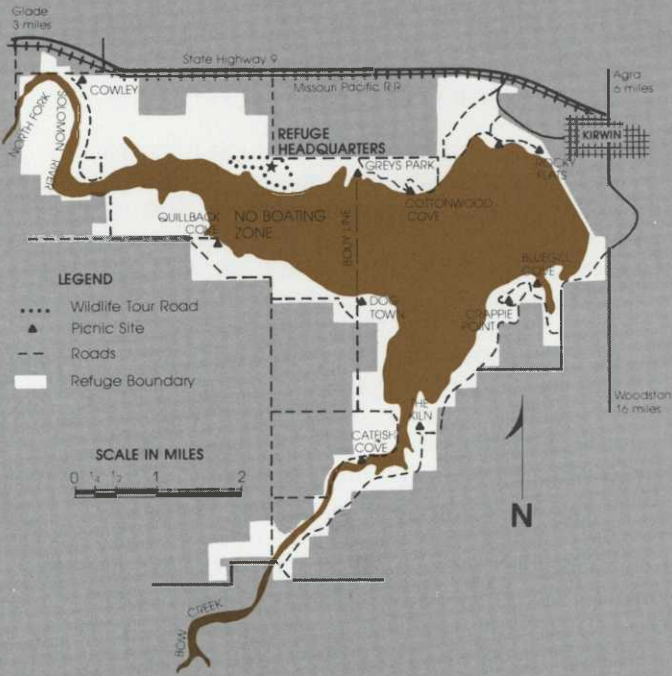
INVITATION TO KIRWIN REFUGE

Refuge headquarters is located 4 miles west and 1 mile south of Kirwin via State Highway 9. Office hours are 8:00 a.m. to 4:30 p.m., Monday through Friday.

Recreational facilities have been developed and camping and picnicking are permitted on most of the refuge. Fishing is one of the most popular recreational pastimes. Approximately 3,300 acres of the refuge are open to public hunting during the State seasons. Some roads are closed during the hunting seasons to minimize wildlife disturbances. A short tour route and nature trail are located close to the headquarters area.

For further information, contact the refuge manager, Kirwin National Wildlife Refuge, R.R., Kirwin, Kansas 67644.

Kirwin National Wildlife Refuge is one of a system of over 400 refuges administered by the U.S. Fish and Wildlife Service and dedicated to the preservation and conservation of wildlife. The financial base for this system was established in 1934 through the passage of the Migratory Bird Hunting Stamp Act. This Act requires waterfowl hunters to purchase an annual migratory bird or "duck stamp." Funds collected from duck stamp sales have been used to purchase numerous refuges that provide habitats necessary to sustain a variety of wildlife for both hunters and non-hunters to enjoy.



U.S. FISH and WILDLIFE SERVICE
 Department of the Interior



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Geese favor Kirwin as a landing area

By Brent Frazee
Outdoor Editor

During the summer the Kirwin National Wildlife Refuge resembles a ghost town. But come November it is transformed into a bustling airport.

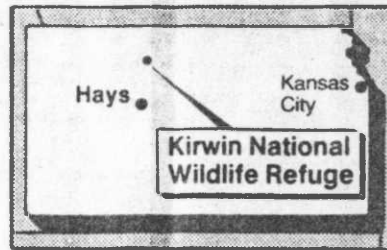
An airport for waterfowl.

It is not uncommon to see the fall sky above the refuge filled with Canada geese circling for a landing. On the cool, gray days of November, the incoming flights usually outnumber the departures. And Kirwin becomes a travel hub for the migrating waterfowl.

"Most years we get our big flights in mid-November," said Doris Hagman, refuge assistant at the Kirwin National Wildlife Refuge. "Around Thanksgiving the numbers usually are at their peak.

"There are days when you can watch them migrate here in waves. I've been here since 1961, and I can remember times when the sky was almost black with geese."

Many of those geese take a winter vacation at Kirwin in the years when the weather is mild. It isn't Florida or California, but it still offers comfortable surroundings for



Times' map

the geese. As long as there are open patches of water on the reservoir and the waterfowl are able to feed in the agricultural fields, they will stay in northern Kansas until it is time for them to migrate back to their nesting grounds in the spring.

But the geese aren't the only ones to flock to Kirwin each fall. The hunters also do.

The fields surrounding the 10,778-acre refuge have a reputation for producing some of the best goose hunting in Kansas. And this year's shooting opportunities did nothing to tarnish that image.

As usual, the refuge attracted an impressive concentration of geese; the count peaked at almost 50,000 in the third week of November. And, as usual, many hunters en-

joyed memorable days in the fields near Kirwin.

"There are a lot of private pits in the fields near the refuge, and they usually offer good hunting," Hagman said. "The farmers around here are reaping the benefits of being located near the refuge. They'll lease the pits out either by the day or by the season, and they usually don't have too much trouble filling them.

"At many of these pits hunters have the advantage of being able to pass shoot the geese as they go out to feed or as they are returning to the refuge. They'll put out spreads of decoys and call the geese in."

There also is public-hunting land on the south side of the reservoir. Although there are no blinds, some hunters have been successful by hiding in the weeds or brush along the edges of milo, corn and alfalfa fields where the geese are feeding.

"We had a snowstorm early this fall when the farmers didn't have their milo or corn harvested," Hagman said. "The snow knocked the grain down and gave the birds plenty to eat here in November and December. They've had a feast.

"That's one of the reasons why we

still have good concentrations of geese here."

The Canada goose season will close after Sunday's hunting, and most of the hunters have left. But the geese haven't. At a time when the birds have abandoned many of the other public-hunting areas in Kansas, they're still finding a comfortable winter home at Kirwin. Refuge officials report that about 20,000 geese continue to paddle around on the reservoir.

"Portions of the reservoir have frozen, but the geese have rafted up and kept patches open," Hagman said. "They still have plenty of food out in the fields, and they don't have any trouble getting to it because it isn't covered by snow or ice, so they're staying put.

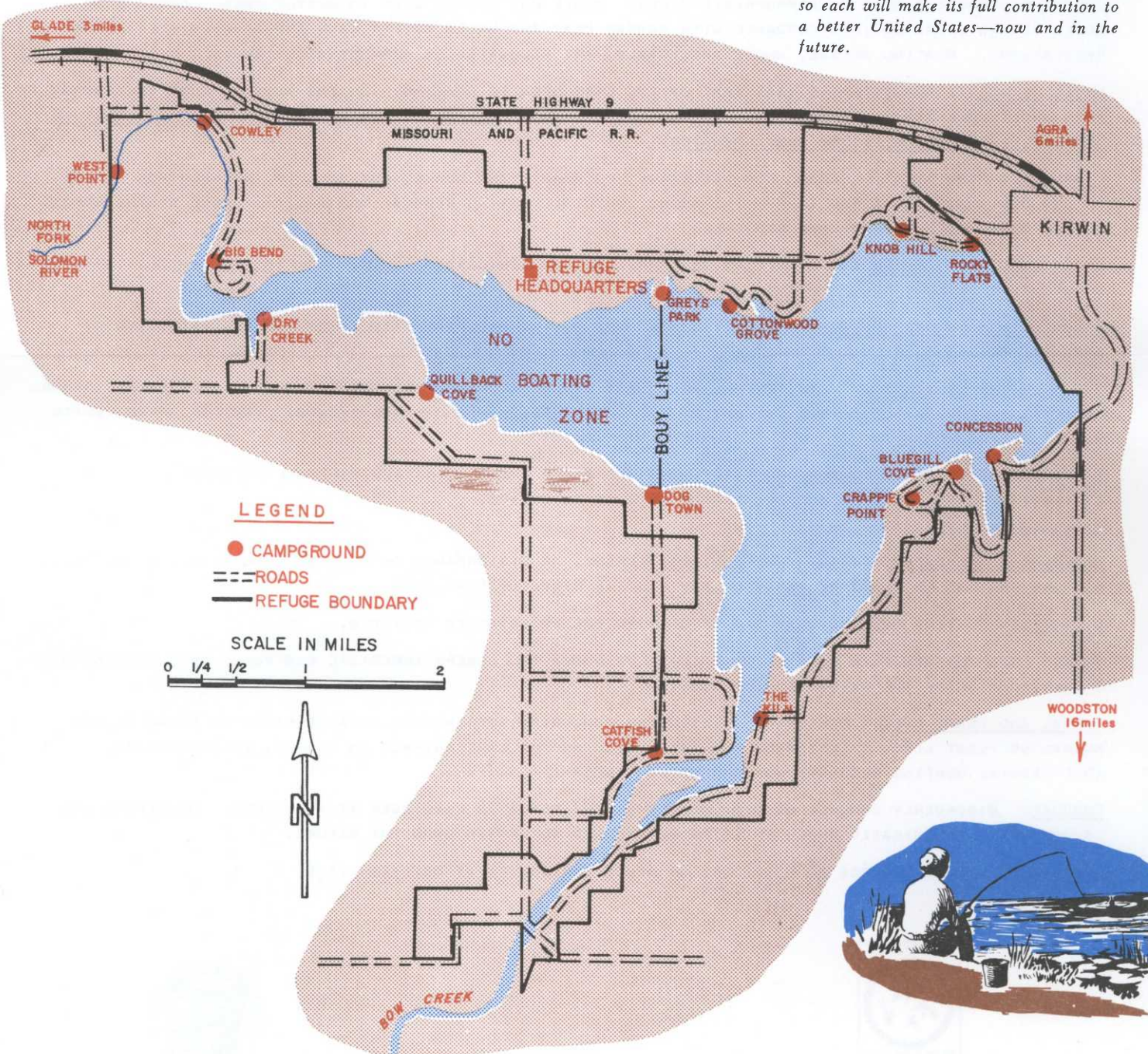
"The hunting pressure has dropped off lately. But a lot of the people who have been going out have been getting their geese."

● **How to get there:** From Kansas City, take Interstate 70 west to Hays, Kan. Go north on U.S. 183 to Kansas 9. Take Kansas 9 east to Kirwin Reservoir and the National Wildlife Refuge.



As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.



DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
KIRWIN NATIONAL WILDLIFE REFUGE

PUBLIC RECREATIONAL USES AND REGULATIONS

THE PRIMARY PURPOSE OF THIS REFUGE IS THE PRESERVATION AND PROPAGATION OF WILDLIFE, PARTICULARLY WATERFOWL, BUT INCLUDING ALL FORMS OF ANIMAL AND PLANT LIFE. WERE COMPATIBLE WITH THE PRIMARY PURPOSE OF THE REFUGE, CERTAIN RECREATIONAL ACTIVITIES ARE PERMITTED. THE ENTIRE AREA OF THE REFUGE IS OPEN FOR RECREATIONAL USES, EXCEPT THAT CERTAIN PORTIONS ARE CLOSED SEASONALLY TO SPECIFIC USES. IN ALL INSTANCES, ALL PUBLIC ACCESS, USE OR RECREATIONAL ACTIVITY NOT EXPRESSLY PERMITTED IS PROHIBITED.

FISHING IN ACCORDANCE WITH THE PROVISIONS OF KANSAS STATE FISHING REGULATIONS IS PERMITTED ON THE ENTIRE WATER AREA OF KIRWIN RESERVOIR, UNLESS CLOSED BY APPROPRIATE SIGNS.

BOATING IS PERMITTED ON ALL WATERS LYING EAST OF THE BUOY LINE FROM GRAY'S PARK TO PRAIRIE DOG TOWN, UNLESS OTHERWISE CLOSED BY APPROPRIATE SIGNS. BOATS MAY NOT BE USED IN BUOYED AREA. BOATS MUST BE EQUIPPED AND OPERATED IN ACCORDANCE WITH KANSAS BOAT AND WATER SAFETY LAWS AND APPROPRIATE FEDERAL REGULATIONS. BOATING SPEEDS, WHERE APPLICABLE, ARE REGULATED BY APPROPRIATE SIGNS.

WATER SKIING IS PERMITTED IN THAT PART OF THE LAKE OPEN TO BOATING. SKIING MUST BE DONE IN CONFORMITY WITH APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS. ALL BOATS TOWING WATER SKIERS MUST HAVE AN OBSERVER IN ADDITION TO THE BOAT OPERATOR.

HUNTING IS PERMITTED IN SEASON FOR WATERFOWL, PHEASANT, AND QUAIL, BUT ONLY IN THAT PORTION OF THE REFUGE DESIGNATED AS A PUBLIC HUNTING AREA. SPECIAL HUNTING REGULATIONS ARE AVAILABLE AT THE REFUGE OFFICE DURING THE APPROPRIATE SEASONS.

PICNICKING AND CAMPING ARE PERMITTED IN CAMPSITES AND DESIGNATED AREAS. CAMPING IS LIMITED TO SEVEN CONSECUTIVE DAYS.

SIGHTSEEING, NATURE OBSERVATION, PHOTOGRAPHY AND HIKING ARE PERMITTED EXCEPT WHERE RESTRICTED BY APPROPRIATE SIGNS.

USE OF MOTOR VEHICLES IS PERMITTED ON ALL ROADS EXCEPT AS SEASONALLY RESTRICTED BY APPROPRIATE SIGNS. VEHICLES INCLUDING MOTORBIKES MAY NOT BE DRIVEN ON GRASSLANDS OR FARM FIELDS. VEHICLE SPEED LIMITS ARE AS POSTED.

FIRES MAY BE BUILT IN CAMPGROUND FIREPLACES AND OTHER AREAS, PROVIDED THEY ARE PROPERLY EXTINGUISHED WHEN LEAVING AND/OR ARE NOT ALLOWED TO ESCAPE.

OTHER INFORMATION:

GOVERNMENT PROPERTY: THE DESTRUCTION, DEFACEMENT, OR DISTURBANCE OF ANY BUILDING, SIGN, STRUCTURE, NATURAL FEATURE OR OTHER PROPERTY OF ANY KIND IS STRICTLY FORBIDDEN.

LITTERING: LITTER MUST BE DISPOSED OF ONLY IN THE RECEPTACLES PROVIDED.

PETS: DOGS AND ALL PETS MUST BE ON A LEASH OR UNDER THE OWNERS IMMEDIATE CONTROL. FREE ROAMING DOGS ON ANY PORTION OF THE REFUGE ARE PROHIBITED.

ANIMAL AND PLANT LIFE: MOLESTING, DISTURBING, INJURING, DESTROYING OR ATTEMPTING TO DO SO OF ANY ANIMAL OR PLANT LIFE, EXCEPT PROPERLY TAKEN FISH AND/OR GAME ANIMALS IN SEASON, IS PROHIBITED. (SEE SPECIAL HUNTING REGULATIONS FOR FURTHER INFORMATION.)

CONDUCT: DISORDERLY CONDUCT OR DISTURBANCE OF THE PEACE IS FORBIDDEN AT ALL TIMES. NO PERSON WHO IS OBVIOUSLY INTOXICATED SHALL ENTER OR BE ALLOWED TO REMAIN UPON THE REFUGE.

FIREWORKS: THE DISCHARGE OF FIREWORKS OR OTHER EXPLOSIVES IS NOT PERMITTED.



KANSAS

The Sunflower State



POPULATION: 2,249,071
 AREA: 82,264 sq. mi.
 ALTITUDE: 680-4,039 ft.
 HIGHEST POINT: Mount Sunflower (Wallace Co.)
 CAPITAL: Topeka
 SPEED LIMIT: as posted
 MOTTO: *Ad astra per aspera* (To the stars through difficulties)
 STATE FLOWER: Sunflower
 STATE BIRD: Western Meadowlark
 STATE TREE: Cottonwood

Trail drives from Texas ended at rail-head towns, Fort Hays, Abilene, and Dodge City, and left a colorful legacy to Kansas. Today the state has expansive fields of wheat, progressive cities, and friendly, down-to-earth people.

■ For More Information on points of interest write to Kansas Department of Economic Development, State Office Bldg., Topeka, Kansas 66612.

Kansas Department of Economic Development



The buffalo of Scott County State Park remind one of the plains of yesteryear.

- ABILENE, C-6.** President Eisenhower's boyhood home, the Eisenhower Memorial Museum, and the Eisenhower Presidential Library are here. The late president is buried at the Place of Meditation chapel. Old Abilene Town brings back the days of Marshal Wild Bill Hickok.
- ARGONIA, E-5.** A museum in the township building honors Susanna Madora Salter, world's first woman mayor, elected in 1887.
- ASHLAND, E-3.** The Santa Fe Railroad Museum is in an old railroad station.
- ATCHISON, B-8.** A steam locomotive can be seen at the Union Station.
- AUGUSTA, D-6.** The town's first building, a log house, is a pioneer museum.
- BALDWIN CITY, C-8.** Old Castle Museum at Baker University exhibits items found along the Santa Fe Trail. Rare Bibles are in the Case Library.
- BELLE PLAINE, E-6.** The Bartlett Arboretum covers 20 acres.
- CHANUTE, D-7.** The Safari Museum displays items brought back by explorers Osa and Martin Johnson.
- CIMARRON, D-2.** The famed Cimarron Crossing on the Santa Fe Trail is now a picnic grounds.
- COFFEYVILLE, E-7.** The Dalton Defenders Memorial Museum recalls the day in 1892 when the Dalton Boys tried to rob two of the town's banks.
- COUNCIL GROVE, C-6.** The Post Office Oak, the Last Chance Store, the Hays Tavern, and the cowboy jail are landmarks of the Santa Fe Trail. The Council Oak where Osage Indian chiefs and U.S. representatives arranged for caravans to go over the trail has been badly shattered by a storm.
- DODGE CITY, D-3.** The hell-raising trails-end town has a Boot Hill cemetery and a restoration of Old Front Street. The Beeson Museum shows Indian and pioneer objects. The Long Branch Saloon recreates a Wild West honkytonk.
- EMPORIA, C-7.** William Allen White edited the "Emporia Gazette" from an office on Market Street. A portion of the city park is dedicated to him.
- FORT RILEY, B-6.** The Historical Society Museum tells of the days when troopers protected Santa Fe Trail travelers. The 1st U.S. Cavalry Memorial and the First Territorial Capitol of Kansas are on the grounds.
- FORT SCOTT, D-8.** Army officers stayed in the Free State Hotel, now the Fort Scott Museum. The officers' quarters and Fort Blair are also standing.
- GARNETT, C-8.** The Public Library exhibits the Walker Collection of paintings by John Steuart Curry and other artists.
- GREENSBURG, D-3.** A well dug by railroad workers is the largest hand-dug well in the world.
- HANOVER, A-6.** An original Pony Express station stands beside the Pony Express Trail.
- HARPER, E-5.** Old Runnymede Church is a town landmark.
- HAYS, C-3.** The Fort Hays blockhouse and guardhouse are in Frontier Historical Park. Kansas State College has a geological and historical museum.
- HIGHLAND, A-7.** The Iowa, Sac, and Fox Indian Museum is east of town.
- HILL CITY, B-3.** Several working models of drilling rigs are in the Oil Museum.

Selected State Parks and Facilities

	ACREAGE	CAMPING	CABINS	HOTEL or LODGE	PICNICKING	HIKING	BOATING	FISHING	RIDING	SWIMMING	WINTER SPORTS
Bourbon Co. State Lake	394	X			X	X	X	X		X	
Cedar Bluff	2,000	X			X	X	X	X		X	
Chase Co. State Lake	360	X			X		X	X		X	
Cheney	9,000	X			X	X	X			X	
Clark Co. State Lake	1,243	X			X	X	X	X			
Douglas Co. State Lake	717	X			X	X	X	X		X	
Fall River	2,000	X			X	X	X	X		X	
Kanopolis	1,800	X			X	X	X	X		X	
Kingman Co. State Lake	1,562	X			X	X	X	X		X	
Lovewell	3,603	X			X	X	X	X		X	
Lyon Co. State Lake	582	X			X	X	X	X		X	
Meade	1,240	X			X	X	X	X		X	
Montgomery Co. State Lake	408	X			X	X	X	X		X	
Osage Co. State Lake	506	X			X	X	X	X		X	
Ottawa Co. State Lake	711	X			X	X	X	X		X	
Prairie Dog	1,315	X			X	X	X	X	X	X	X
Scott	1,280	X			X	X	X	X		X	
Sherman Co. State Lake	1,547	X			X	X	X	X		X	
Toronto	1,860	X			X	X	X	X		X	
Tuttle Creek	1,000	X			X	X	X	X		X	
Webster	3,485	X			X	X	X	X		X	
Wilson Co. State Lake	291	X			X		X	X		X	
State Park Entrance Fee \$10.00, Trailer Fees \$2.00-\$3.00, Utilities Charge.											

IOLA, D-7. The Funston Memorial Home and Museum, north of town, preserves the boyhood home of Spanish-American War hero Major General Frederick Funston.

KANSAS CITY, B-8. The Old Shawnee Mission, the Wells-Fargo express office, the first Territorial Jail, and the Grinter Place are all part of old Kansas. There are threshing and harvesting demonstrations at the Agricultural Hall of Fame.

KINGMAN, D-5. A buffalo herd lives in the Kingman County State Park west of town.

LARNED, D-4. Nine original buildings remain of a fort. They exhibit a collection of guns and Indian and pioneer things.

LAWRENCE, C-8. The Thayer Art Museum, the Dyche Natural History Museum, and the Snow Entomological Museum are on the University of Kansas campus. There is also a 53-bell carillon.

LEAVENWORTH, B-8. The Army Museum at old Fort Leavenworth shows pioneer vehicles, Indian relics, guns, and General Custer's pay wagon.

LINDSBORG, C-5. The Smoky Hill Mill Museum tells the story of this Swedish community that still celebrates the Svensk Hyllnings Festival, the Messiah Festival, and several other similar presentations. Birger Sandzen Memorial Gallery honors the internationally known Swedish American painter.

MEADE, E-2. The Dalton Boys holed up in the house on Pearlette St. between robberies. There is a tunnel leading from the house to the barn so that they could make a quick escape from lawmen.

MEDICINE LODGE, E-4. Carry Nation's home is a temperance shrine. Adjacent to it is an Indian museum and a reconstructed stockade built by settlers in 1874 to ward off Indian attacks. There is a log house on the grounds. A rope hanging from a tree in the city park reminds citizens of the day when four bank robbers were lynched in the town. West of town are the colorful Twin Buttes, red rock formations.

OSAWATOMIE, C-8. Abolitionist John Brown lived and hid runaway slaves in a cabin now in the John Brown Memorial State Park. In 1856 Brown's Free Staters and a pro-slavery group fought a bloody clash at this place.

PITTSBURG, D-8. Giant shovels strip coal from open pits. Visitors may watch.

PRATT, D-4. The Kansas State Fish Hatchery has 114 rearing ponds. The aquarium exhibits native midwestern fish and the museum shows mounted game and wildfowl of the region.

SALINA, C-5. The Smoky Hill Historical Museum exhibits evidence of man's early days in the vicinity. A pre-Columbian burial pit is east of town.

SCOTT CITY, C-2. Nearby Scott State Park protects the ruins of a pueblo built by Indians fleeing cruel Spanish rule in New Mexico. Later the same area became an Apache stronghold; the tent sites are being marked by the State Historical Society.

TOPEKA, B-7. The Kansas State House, the Kansas State Historical Society Museum, and the Mulvane Art Museum in Gage Park attract visitors. There is a museum at the Menninger Foundation.

WABAUNSEE, B-6. The Beecher Bible and Rifle Church has been so-called since the days of "Bleeding Kansas" when a shipment of rifles for Free Staters was packed in crates marked Bibles.

WELLINGTON, E-5. Once a Chisholm Trail camping place, the town recalls the past with a Community Museum and a Chisholm Trail Museum.

WICHITA, D-5. Once a trail town on the Chisholm Trail, the city is now the state's largest. The old days are recalled at the Wichita Historical Museum, the Fellow-Reeve Museum, and at reconstructed Cow Town. Visitors drink sarsaparilla in an old saloon. Visitors may tour both the Cessna Aircraft and Beech Aircraft factories on week days.

KANSAS

Population: 2,249,071
(1970 Census)
Area: 82,264 Sq. Miles
Capital: Topeka

Cities and Towns

Ablene.....E-6
Anthony.....E-5
Arkansas City.....E-3
Ashland.....E-6
Atchison.....B-8

Atwood.....A-2
Augusta.....D-6
Baldwin City.....C-8
Baxter Springs.....E-8
Belleville.....A-5
Beloit.....B-5
Blue Rapids.....B-6
Burlington.....D-7
Caldwell.....E-5
Caney.....E-7
Chanute.....D-7
Cherryvale.....E-7
Chetopa.....E-8

Cimarron.....D-2
Clay Center.....B-6
Elwood.....E-7
Colby.....B-2
Columbus.....E-8
Concordia.....B-5
Cottonwood Falls.....C-6
Council Grove.....C-6
Dighton.....C-2
Dodge City.....D-3
El Dorado.....D-6
Elkhart.....E-1
Ellinwood.....C-4

Ellis.....C-3
Ellisworth.....C-5
Emporia.....C-7
Erie.....D-8
Eureka.....D-7
Ft. Scott.....D-8
Fredonia.....D-7
Frontenac.....D-6
Garden City.....D-3
Garnett.....C-8
Girard.....D-8
Goessel.....C-5

Goodland.....B-1
Great Bend.....C-4
Greensburg.....D-3
Harper.....E-5
Hays.....C-3
Herington.....C-6
Hiawatha.....A-7
Hill City.....B-3
Hillsboro.....C-6
Holsington.....D-3
Holton.....B-7
Horton.....B-7
Hoxie.....B-2

Hugoton.....E-1
Humboldt.....D-7
Hutchinson.....D-5
Independence.....D-7
Iola.....E-7
Johnston.....D-1
Junction City.....B-6
Kansas City.....B-8
Kingsman.....D-5
Kinsley.....D-3
Kiowa.....E-4
La Crosse.....C-3
Lakin.....D-1

Larned.....D-4
Lawrence.....C-8
Leavenworth.....B-8
Leoti.....C-1
Liberal.....E-2
Lincoln.....B-5
Lindsborg.....C-5
Lyndon.....C-7
Lyons.....C-5
McPherson.....C-5
Manhattan.....B-6
Mankato.....B-5
Marion.....C-6

Marysville.....A-6
Meade.....E-2
Medicine Lodge.....E-4
Minneapolis.....B-5
Mulvane.....D-5
Neodesha.....E-7
Ness City.....C-3
Newton.....D-5
Norton.....A-3
Oakley.....B-2
Oberlin.....A-2
Olathe.....C-8
Osage City.....C-7

Osawatimie.....C-8
Osborne.....B-4
Oswego.....E-8
Ottawa.....C-8
Paola.....C-8
Parsons.....E-8
Sedan.....E-7
Seneca.....A-7
Sharon Spgs.....C-4
Smith Center.....B-1
Stafford.....D-4
Sterling.....B-5
Russell.....C-4
Sublette.....D-2

St. Francis.....A-1
St. John.....D-4
St. Marys.....B-7
Sallina.....C-5
Scott City.....C-2
Sedona.....E-7
Seneca.....A-7
Sharon Spgs.....C-4
Smith Center.....B-1
Stafford.....D-4
Sterling.....B-5
Sublette.....D-2

Syracuse.....D-1
Tonganoxie.....B-8
Topeka.....B-7
Tribune.....C-1
Troy.....D-1
Ulysses.....A-8
Uyvers.....B-3
WaKeena.....B-3
Wamego.....B-6
Washington.....A-6
Wellington.....E-5
Wichita.....D-5
Winfield.....E-6
Yates Center.....D-7

