

CRAB ORCHARD NATIONAL WILDLIFE REFUGE

Post Office Box J

Cartersville, Illinois - 62918

ANNUAL NARRATIVE REPORT

Calendar Year 1984

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

NATIONAL WILDLIFE REFUGE SYSTEM

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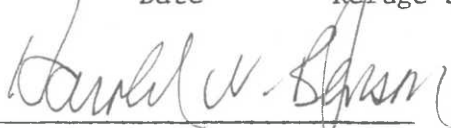
REVIEW AND APPROVALS

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Carterville, Illinois

ANNUAL NARRATIVE REPORT

Calendar Year 1984

<u></u>	<u>2-22-85</u>	<u></u>	<u>2/26/85</u>
Refuge Manager	Date	Refuge Supervisor Review	Date
<u></u>	<u>3/12/85</u>		
Regional Office Approval	Date		

INTRODUCTION

Crab Orchard NWR has 43,550 acres extending into Jackson, Williamson and Union counties of southern Illinois. The topography varies from gentle rolling slopes through most of the refuge to slopes exceeding 24° in the southern portion.



Broad habitat types include: water (9300 ac.), hardwoods (12,200 ac.), brush (8500 ac.), pine plantations (3,000 ac.) grassland (3,000 ac.), and agricultural (5,000 ac.).

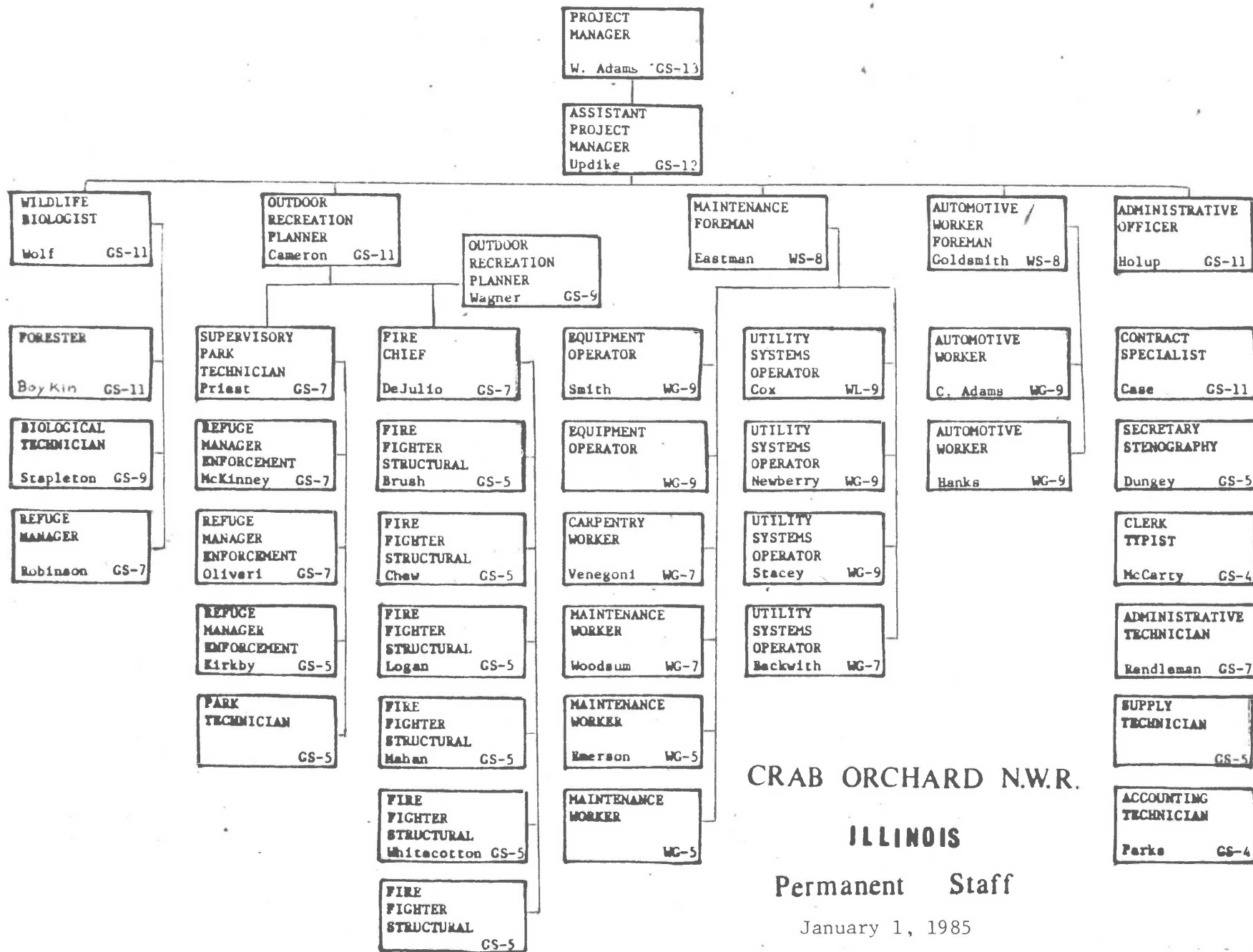
The refuge was established in 1947 by an Act of Congress, Public Law 361, which transferred to the Fish and Wildlife Service lands administered by the War Department and the Soil Conservation Service. During the 1930's these lands, which consisted of small farms, were sold by their private owners to the federal government. During World War II the War Department constructed the Illinois Ordnance Plant on these lands, which after the war became part of the Crab Orchard Refuge.

The Congressional Act establishing the refuge mandated that the land would be managed with four broad objectives: wildlife management, agricultural development, recreational use and industrial operation.

Twenty-two thousand acres were designated a wildlife sanctuary and remain closed to general public use. Cooperative farming and permittee grazing are the primary management tools used to provide feeding and loafing areas for migrating and wintering waterfowl, the main wildlife management objective.

There is a wide spectrum of recreational opportunities on and around three man-made lakes which exceed 8,700 acres. Boating, skiing, fishing, swimming, hunting and wildlife observation are part of the public use program provided by concession camgrounds and marinas, and refuge picnic areas, walking trails and observation points.

Industrial activities on the refuge range from manufacturing and storage facilities to administrative offices. In excess of \$45 million is generated annually by the industrial tenants. The refuge is required to provide police, fire, water and sewer service to industrial tenants, and water and sewer service to a maximum security federal prison located adjacent to the refuge.



CRAB ORCHARD N.W.R.

ILLINOIS

Permanent Staff

January 1, 1985

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A. HIGHLIGHTS

Weather February snow interrupted refuge operations and November rains inflicted damage to impoundments. (Section G.17)

Dumpsites Sangamo dump and contaminants received excessive media attention. Implications and impacts were many, including numerous meetings, telephone conversations, environmental testing, and public use changes. (Sections J.3, F.1, H.1, I.2)

Eagle Nests The Little Creek Bald Eagle nest was blown from its tree in the fall. Rebuilding was performed on that and an inactive nest by two separate pairs of eagles. (Section G.2)

Marion Water A request by the City of Marion, to use Devils Kitchen Lake as their sole supply of raw water was denied. (Section J.3)

B. CLIMATIC CONDITIONS

Total precipitation was 53.54 inches, which exceeded the 46 inch average. Snowfall was approximately 23 inches. Temperatures ranged from 96 to -13 degrees fahrenheit.

A wet spring prohibited conducting the planned prescribed burning. A dry period in June and July was hard on late spring grass plantings on dikes and habitat rehabilitation sites. In February, 12 inches of snow in 24 hours stranded some refuge personnel for several days. Excessive fall rains delayed harvesting of crops in much of southern Illinois.

On November 1, following a wet October, four inches of rainfall was recorded at refuge headquarters. Other areas in the refuge's three lake watershed received in excess of five inches. Flooding occurred in local communities and on the refuge. Water depth over spillways at the three dams was: 4.0 feet at Devils Kitchen Lake and 2.8 feet at Little Grassy and Crab Orchard lakes. Some pond dikes and emergency spillways were damaged, but the most serious damage was erosion under Little Creek impoundment structure.



Entrance road to main headquarters several days after 12 inches of snow fell during a 24-hour period in February.

3/3, 84-1, EFW

Below is a summary of temperature-precipitation:

<u>Month</u>	<u>Temperatures (F)</u>		<u>Precipitation in Inches</u>	
	<u>High</u>	<u>Low</u>	<u>(Snow-Fall)</u>	
January	58	-13	1.25	(4)
February	70	3	3.66	(12)
March	73	10	5.25	(2)
April	84	31	4.05	
May	88	41	4.37	
June	94	53	1.68	
July	94	57	2.60	
August	96	55	2.97	
September	94	42	5.41	
October	77	34	7.93	
November	70	22	7.94	
December	69	10	6.43	(5)
	<u>96</u>	<u>-13</u>	<u>53.54</u>	<u>(23)</u>

Lake Elevations Were:

	<u>Crab Orchard</u>	<u>Devils Kitchen</u>	<u>Little Grassy</u>
Spillway Elevation	405.0	510.0	500.0
Maximum Elevation	407.8	513.95	502.8
Date of Maximum	11-1-84	11-1-84	11-1-84
Minimum Elevation	404.78	509.50	498.0
Date of Minimum	8-31-84	8-31-84	9-21-84



The top of the outlet valve house below Little Grassy Dam. Creek levels rose 15 feet above normal during the November 1 downpour.

11/1, 84-2, GHU



Area residents walking the roadway at Devils Kitchen Lake emergency spillway.

11/1, 84-3, GHU

C. LAND ACQUISITION

3. OTHER

An agreement was executed with the Illinois Department of Conservation (IDOC), to exchange parcels of land adjacent to the Little Grassy Fish Hatchery. The state received 13.75 acres in exchange for 24.00 acres. The exchange corrected a trespass situation that occurred during construction of the hatchery facilities.

D. PLANNING

2. Management Plans

The Habitat Evaluation Procedures (HEP) Study at Crab Orchard NWR, was completed and the final report and recommendations sent to the Regional Office in late September. Ninety-four sample sites, distributed among 10 different cover types, were sampled by the HEP project. Four management alternatives were written and compared with one another. Each plan was examined over a 25-year period, and the predicted changes in habitat conditions resulting from management actions were documented.

On December 11, John Robinson and Joe Janecek, two members of the HEP team, presented a briefing to Regional Personnel.

An extensive revision of the 1967 Wildlife Inventory Plan was drafted.

Final approval of the Fish Management Plan was made by Director Jantzen in January.

5. Research and Investigations

Crab Orchard NR 84 - "White Tailed Deer Fawn Survival in Southern Illinois" (33610-43). A masters thesis was completed by Thomas A. Nelson. The study investigated the causes, timing and rate of fawn mortality and compared analytical methods for estimating fawn survival.

Crab Orchard NR 84 - "Effects of Swareflex Highway Warning Reflectors on Behavior and Mortality of White-Tailed Deer" (33610-44). A thesis was completed by John L. Griffin. The study described the effectiveness, variability of and behavioral response to highway reflectors by white-tailed deer.

Crab Orchard NR 84 - "Comparison of Stocking Swim-up Larvae versus Fingerlings on the Success of Walleye Survival". The results to date indicate that fingerling survival is between 8.5 and 51 times greater than Walleye stocked as three day old larvae.

Crab Orchard NR 84 - "Reproductive Status and Summer Whistling of Bobwhite Males" (33610-50). The study is intended to increase the accuracy of predicting fall abundance through male bobwhite whistling counts. Some problems occurred with mortality of wing marked birds.

Crab Orchard NR 84 - "Comparative Survival of Bobwhites" (33610-51). This study is intended to compare the survival rates of wild, pen-reared, and off-spring of pen-reared and wild bobwhite quail. Two hundred forty-six quail were released in November.

Crab Orchard NR 84 - "Pilot Study on the Spatial and Temporal Distribution of Ticks on Crab Orchard National Wildlife Refuge" (33610-52). The study is intended to shed some light on the disease anaplasmosis, and its possible transmission between cattle and deer by ticks. Sampling from vegetational transects and from deer continued.

Crab Orchard NR 84 - "Ecology of Canada Geese: Southern Illinois Wintering Grounds, Flyway Routes and Breeding Ground Utilization" (33610-53). The refuge is part of the winter study area. The purpose is to establish a more precise analysis of migration of the southern Illinois Canada goose population. Activities on the refuge consist of radio collaring of 36 geese, and aerial monitoring of radio collared birds.

E. ADMINISTRATION1. PersonnelPermanent Personnel

Wayne D. Adams	Project Manager	GS-13	PFT
Gerald H. Updike	Assistant Project Manager	GS-12	PFT
Gregory A. Wolf	Wildlife Biologist	GS-11	PFT
George Stapleton	Biological Technician	GS-9	PFT
VACANT	Forester	GS-11	
John C. Robinson	Refuge Manager	GS-7	PFT
James T. Cameron	Outdoor Recreation Planner	GS-11	PFT
Edward F. Wagner	Outdoor Recreation Planner	GS-9	PFT
Lonnie S. Priest	Park Technician Supervisor	GS-7	PFT
Robert T. Oliveri	Refuge Manager-Enforcement	GS-7	PFT
Bradley W. McKinney	Refuge Manager-Enforcement	GS-7	PFT
David L. Kirkby	Refuge Manager-Enforcement	GS-5	PFT
VACANT	Refuge Manager-Enforcement	GS-5	
Joseph A. DeJulio	Fire Chief-	GS-7	PFT
James E. Brush	Firefighter-Structural	GS-5	PFT
Carl E. Chew	Firefighter-Structural	GS-5	PFT
Richard D. Logan	Firefighter-Structural	GS-4	PFT
VACANT	Firefighter-Structural	GS-5	PFT
John W. Mahan	Firefighter-Structural	GS-5	PFT
R. Bruce Whitecotton	Firefighter-Structural	GS-5	PFT
Daniel R. Eastman	Maintenance Foreman	WS-8	PFT
James L. Smith	Engineering Equipment Operator	WG-9	PFT
VACANT	Engineering Equipment Operator	WG-9	
Robert L. Venegoni	Carpentry Worker	WG-7	PFT
Robert L. Woodsum	Maintenance Worker	WG-7	PFT
VACANT	Maintenance Worker	WG-5	
John T. Emerson	Maintenance Worker	WG-5	PFT
James C. Cox	Utility System Operator	WL-7	PFT
George F.L. Beckwith	Utility System Operator	WG-7	PFT
James A. Newbury	Utility System Operator	WG-9	PFT
Bill J. Stacey	Utility System Operator	WG-9	PFT

Permanent Personnel (Cont.)

Raymond E. Goldsmith	Automotive Shop Foreman	WS-8	PFT
Charles W. Adams	Automotive Worker	WG-9	PFT
Gilbert L. Hanks	Automotive Worker	WG-9	PFT
Willard A. Holup	Administrative Officer	GS-11	PFT
Doyle T. Case	Contract Specialist	GS-11	PFT
Bonnie Dungey	Secretary-Stenography	GS-5	PFT
Marsolie McCarty	Clerk-Typist	GS-4	PFT
Terry W. Rendleman	Administrative Technician	GS-7	PFT
VACANT	Supply Technician	GS-5	PFT
Kay F. Parks	Accounting Technician	GS-4	PFT

Temporary PersonnelLaborer, WG-2

Jane Skropka, 7/29 - 9/30/84

Robert Beauseigneur, 8/14 - 9/30/84

Biological Aid, GS-3, 11/4 - 12/07/84. (Goose Hunter Check)

Andrew Drummer

Jay Wolowitz

Eric Marsh

Robert Wootke

Volunteer,

Steven Mitchell, Recreation, 14 days

Douglas Hayward, Recreation, 14 days

Kenny Bird, Wildlife, 36 days

Jim Lavender, Wildlife, 4 days

Youth Conservation Corps - Staff, Social Services Aid, GS-3, 6/4 - 8/3/84

W. Frank Aly

Kenneth Cook

Dennis Burks

Timothy Flynn

Youth Conservation Corps - Enrollee,

Anthony Bittle

Julie Bullock

Steve Hilliard

Julie Hunsaker

Mark Mann

Kelly Koehler

Randall Rossi

Lorna McGee

James Ward

Sarah Miller

Ron Wilson

Beverly Rush

Jonica Beers

Nona Vaughn

Youth Conservation Corps - Enrollee (Cont.)

- Alternates that worked part of the program:

Terry Dunbar	Deborah Rasmussen
James McHargue	Lora Anderson
Dewayne Fowler	Ginger Hatton
Ronald Blankenship	

- Resigned during program:

Jeff Young	Tracy Hancock
Roger Smith	

- Terminated by FWS:

Darryl Greenrod

Staff Changes during 1984 included:

- 01/21/84 - N. Ross Adams, Wildlife Biologist, transferred to Refuge Manager, Clarence Cannon NWR, MO.
- 01/22/84 - Gregory A. Wolf, Wildlife Biologist, transferred from Clarence Cannon NWR, MO.
- 03/04/84 - Jimmie C. Hudson, Fishery Biologist, transferred to Fish Hatchery Manager, Senecaville NFH, OH.
- 03/19/84 - George Beckwith, Maintenance Worker - WG-7, to Utility Systems Operator - WG-7.
- 03/30/84 - Russell Massie, Automotive Worker, retired.
- 04/01/84 - David L. Kirkby, Refuge Manager-Enforcement, transferred from Lee Metcalf NWR, MT.
- 04/15/84 - John W. Mahan, Firefighter-Structural, transferred from Bureau of Prisons, Marion, IL.
- 05/13/84 - John T. Emerson, Firefighter-Structural to Maintenance Worker, WG-5.
- 05/27/84 - Daniel R. Eastman, Electrician - WG-10, to Maintenance Foreman, WS-8.
- 07/06/84 - Karon L. Keeler, Accounting Technician, resigned.
- 08/05/84 - Bradley W. McKinney, Refuge Manager-Enforcement - GS-5 to GS-7.
- 09/16/84 - George A. Stapleton, Biological Technician - GS-7 to GS-9.
- 09/16/84 - Robert T. Oliveri, Refuge Manager-Enforcement - GS-5 to GS-7.
- 09/30/84 - Richard D. Logan, Firefighter-Structural - GS-4 - E.O.D.
- 11/16/84 - Robert V. Swidergal, Supply Technician, resigned.
- 11/25/84 - Kay F. Parks, Accounting Technician, E.O.D.
- 12/22/84 - Robert H. Webb, Firefighter-Structural, retired.

2. Youth Programs

The Youth Conservation Corps program was a 20-enrollee, non-resident camp. Outdoor Recreation Planner Ed Wagner served as camp director with four temporary employees as crew leaders. Enrollee selection was conducted by the Illinois State Employment Service at Herrin, and 224 applications were received.

The following work was accomplished by YCC:

- Moved 700 feet of wooden rail fence.
- Buried ignition wire and repaired sneak fence at three goose banding sites.
- Removed and stored 1,200 railroad ties.
- Seeded and mulched several potential erosion sites.
- Removed .75 mile of old fence.
- Constructed .5 mile of new barbed wire fence.
- Removed vines from .5 mile of chain link fence.
- Built 12 target stands for the firing range.
- Installed and anchored 10 picnic tables.
- Painted refuge facilities.
- Updated 12 miles of boundary signage.
- Extensive litter cleanup.
- Repaired goose holding pens.
- Refurbished facilities at the water and sewage treatment plants.



YCC enrollees removed and stored 1,200 railroad ties from an old railroad line.

6/15, 84-4, EFW



Outdoor Recreation Planner Cameron assists YCC Enrollees in setting an information sign. 7/18, 84-5, EFW



YCC Program accomplishments included seeding and mulching of old building demolition sites. 6/15, 85-6, EFW

4. Volunteer Program

The volunteer program showed progress which demonstrates that volunteers can work with minimal supervision and complement refuge programs. Four volunteers donated 188 hours. In addition to hours worked, \$150 was donated by the family of the late Herbert W. Hase.

Volunteer projects included: showing wildlife films at campgrounds, assisting with hunter education and duck identification classes, conducting a trapping clinic, issuance of firewood permits, wildlife survey work, and waterfowl banding.

5. Funding

	<u>FY-81</u>	<u>FY-82</u>	<u>FY-83</u>	<u>FY-84</u>	<u>FY-85*</u>
Migratory Birds	721,000	656,000	637,000	1,041,000	1,154,600
Mammals/ Birds	103,000	191,700	192,000		
Recreation	200,000	117,000	222,000		
Total O & M	1,024,000	964,700	1,051,000	1,041,000	1,154,600
Expense for Sales	160,000	214,000	218,000	273,000	328,900

*Subject to reduction as final appropriations adjustments are made by Regional Office.

Refuge receipts for the past five calendar years were:

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Building Rent	275,013	374,870	359,230	363,104	357,948
Water	35,512	42,696	39,902	39,325	38,211
Sewer	15,458	21,927	17,169	22,190	20,274
Total Industrial	325,983	439,493	416,301	424,619	416,433
Wildlife	8,741	7,410	6,823	10,415	9,590
Recreation	24,424	33,687	36,818	18,734	26,310
Total Refuge Receipts	359,148	480,590	459,942	453,768	452,333

Payment to counties, 74% of the full amount due, under the Refuge Revenue Sharing Act for FY-84 were: Williamson - \$167,584, Jackson - \$2,102, and Union - \$2,947.

6. Safety

Only two fatalities occurred from 1979 through 1983. However, there were three water related fatalities in 1984, and three other individuals who were rescued from the water.

June 9, 1984. Randy J. Ridenour, 18, Cambria, drowned in Crab Orchard Lake near Carterville Beach and his body was recovered the next evening by the Carterville Volunteer Rescue Unit. Winds were 25 mph and Ridenour was boating with two others in a 12-foot aluminum boat when he and one companion decided to jump out and swim. The boat drifted away and the third individual was unable to start the motor. Another boat rescued one individual, but was unable to locate Ridenour in the rough water. All had been drinking beer.

June 14, 1984. George A. Smith, 28, Midlothian, drowned in Devils Kitchen Lake in the afternoon near the picnic area. His body was recovered the next day in 80 feet of water by refuge and Carterville Volunteer Rescue Unit personnel. Smith and his nine-year old son were fishing, weather was hot, and Smith went in swimming. Smith started calling for help and his son jumped in to help. Two ladies on a paddle boat responded to the calls, pulled the boy out of the water unconscious, but could not locate Smith. They gave mouth-to-mouth resuscitation and revived the boy. Smith had a history of cramps.

September 8, 1984. Robert J. Orr, 28, Granite City, drowned in Little Grassy Lake at night while checking trotlines set earlier. Orr was camping with his family, had been drinking beer, and decided to go out on the lake alone even though winds were over 25 mph. The refuge was notified at 10 pm that Orr had not returned. His boat was found that night and the body was recovered September 11 near shore.

Accidents involving the refuge staff included:

Riprap fell from a refuge dump truck on August 14 as it turned from A-3 road onto state highway 148. A car driven by David Wolfe of Dahlgren hit the riprap causing \$1,000 damage to his car.

On August 21, an employee pulled out from the maintenance shop road onto state highway 148 in a pickup truck listed as excess property. The employee did not see a tractor-trailer gravel truck traveling at 50 mph. The gravel truck side-swiped the refuge truck, causing both to run off the road. There were no injuries, the refuge truck suffered \$250 damage and the gravel truck \$1,500 damage.

Yellowjackets stung the face and head of Maintenance Worker John Emerson on August 21 while he was rotary mowing roadsides. Emerson was treated and released from the Herrin Hospital emergency room.

A YCC enrollee required a tetanus shot after stepping on a nail and suffering a puncture wound.

All heavy equipment was tested and certified as having safe roll-over protection.

YCC staff and enrollees were given the basic first aid and C.P.R. courses by Illinois State Police Instructor Mel Kirsten.

The refuge safety committee held regular meetings and assisted with quarterly safety inspections. Monthly staff/safety meetings were held.

8. Other

A-76 The A-76 process, whereby work now performed by government employees is reviewed and could be contracted out to private business, was terminated by legislation for the Fish and Wildlife Service in October. A-76 at Crab Orchard NWR began in 1983 when fire protection was bid and one contractor bid \$100,000 above present costs. Industrial leasing was bid with one contractor bidding \$40,000 above present costs. Bids were not awarded. The water/sewer plants were also bid with two bids just above the government cost of \$210,000 per year, and one bid at \$120,000 per year. The low bid contractor claimed an error in his bid and with current legislation, awarding of this contract is in doubt. Other programs which were under review but had not gone to bid included: building-grounds maintenance, biological studies, and public contracts. The future of this procedure is uncertain.

F. HABITAT MANAGEMENT1. General

The Sangamo dump site and Crab Orchard Lake received additional testing for environmental contamination. Soil, fish and sediment samples were analyzed by the City of Marion, Illinois Department of Conservation (IDOC), U. S. Environmental Protection Agency (USEPA), and the U. S. Fish and Wildlife Service (FWS). Olin Corporation, who occupies the old Sangamo industrial facilities analyzed soil and air samples at their facilities. Southern Illinois University (SIU) took fat samples from deer and geese.

The primary target of analysis was for polychlorinated biphenyls (PCB's), dioxins, and furans. Among the various findings were: 132,000 ppm PCB's in soil samples at a selected location outside a Sangamo building, and minute amounts of PCB contaminated particles in air samples from an empty building; 3.64 ppm PCB's in a whole catfish sample and 1.1 ppm in a large mouth bass fillet; 12,000 ppb and 1,400 ppb of "octa-" and "hepta-" isomers of dioxins in sediments; 23 ppt of "penta-" isomer dioxin in a fish sample; up to 50 ppt of 2,3,7,8-tetrachlorodibenzofuran in sediments and fish

Many of the fish sampled had no detectable levels of any of the dioxins. A Remedial Investigation and Feasibility Study (RIFS) is planned to determine the degree of contamination at Sangamo and other sites, and the proper method of cleanup. The political aspects of this and a related issue are discussed in Section J.



Areas devoid of vegetation on the Sangamo dump site.

5/25, 84-7, GAW



U.S.E.P.A assisted in taking soil samples at Sangamo dump. Protective "space suits" in 90 degree temperatures made working difficult. 8/15, 84-8, GAW

2. Wetlands

Most water level management objectives on moist soil impoundments were achieved. Heavy rainfall amounts early in the fall season precluded the development of mudflat and shallow water habitat, resulting in a low number of shorebird use-days.

The A-41 Moist Soil Units were drained in late April to facilitate maintenance work and management activities. The five sub-impoundments were disced in June and shallowly reflooded in July to control cocklebur and willow growth. All sub-impoundments were reflooded in October and November to average depths of 8-12 inches. Wildlife response to reflooding was also diversified and included the following species: LeConte's sparrows, bald and golden eagles, and white-tailed deer, and peak duck and goose populations of 4,500 and 5,000 respectively.

Water levels on the U.S. Powder Pond and Firehouse Pond were drawn down 2 to 2.5 feet in 1984. Moist soil plants such as millet, various species of sedges, and smartweed grew along the edges of the impoundment on the exposed areas. These ponds were used primarily by geese during the fall and winter.

A complete drawdown of the Observation Pond in June allowed refuge personnel to disc the outer edges of the impoundment where cocklebur and willow encroachment had become a problem. The impoundment was flooded with rainfall by the end of October, and ducks, geese, shorebirds and raptors were all seen using the area throughout the fall and winter.

A complete drawdown of the Pigeon Creek Moist Soil Unit in early June was followed by a satisfactory response of millet, nutsedge and smartweed in the south unit and an unsatisfactory response in the north unit where ash, willow and cocklebur encroachment has become a problem. Waterlevels in deciduous forested wetlands were sufficient to meet wood duck brood habitat requirements.

3. Forests

Fifty-two \$5 permits were issued with one pick-up truck load allowed for each permit. Approximately 26 cords of dead hardwood were removed along roads and trails. The firewood program was temporarily discontinued in the fall due to shortage of staff.

4. Croplands

The cropland program was seriously affected by the wet spring and fall, and mild early winter (See Section B.). Some planting was delayed until June, resulting in more milo being planted than in previous years. Harvesting was delayed in September, when the first of 28 inches of rain in the last quarter began to fall. Many cooperative farmers were forced to use tracks on their combine drive wheels, in order to continue harvesting. Despite this, some fields had not been harvested by the end of the year. Soil damage due to compaction was extensive in many grain fields harvested before freeze-up.



Severe rutting and soil compaction in crop field resulted from harvesting during the wet fall.

11/1, 84-9, GHU

Cropland acreage and yield by crop are summarized below:

<u>CROP</u>	<u>ACRES</u>	<u>YIELD</u>	<u>REFUGE SHARE</u>
Corn	1,419	88 bu./ac.	24,571 bu.
Milo	1,773	75 bu./ac.	39,622 bu.
1st year Clover	1,131	Clipped	Green Browse
2nd year Clover	750	3 tn./ac.	Green Browse

The following fertilizer and lime applications were made by cooperative farmers:

<u>COMPOUND</u>	<u>AMOUNT-TONS</u>
Di-Ammonium Nitrate	73
Anhydrous Ammonia	142
Potash	74
Phosphorus	54
Starter Fertilizer	218
Agricultural Lime	1,502

7. Grazing

Eighteen permittees paid \$7,095 in fees for 20 grazing units, totaling 2,147 acres. The fee is \$4.95 per adult and 25 percent and 75 percent of the adult rate for calf and yearling, respectively.

Permittees are responsible for maintaining fences and mowing units. The fescue dominated pastures grew well in the fall, and excellent green browse was available through December.

8. Haying

Cooperative farmers harvested approximately 2,300 tons of second-year red clover hay from 750 acres. Clover response to the wet fall resulted in excellent green browse.

9. Fire Management

Pre-burn surveys of 455 acres had begun when the spring rains started. No burning was conducted.

10. Pest Control

The Johnson grass control program was successful, but expensive. Cooperative farmers are required to treat the grass, and the refuge

provides the round-up glyophosphate. It is expected to take one more year to bring problem areas (about 150 acres) under control.

Other agricultural plant pest control was carried out by cooperators using seven approved herbicides. The most commonly used were atrazine on 2,941 acres, and metolachlor on 1,491 acres.

Purple loosestrife was controlled by removing whole plant and root systems. This year only one plant was found. A refuge neighbor who cultivates a "hedge-row" said he had the plants shipped from a supplier in the north.



In agricultural field B-9, after treatment with round-up only a few Johnson grass plants were seen. The degree of success in all problem areas will be known after the coming year.

9/25, 84-10, GAW



One Purple loosestrife plant was removed
from the Cambria public use area.

8/15, 84-11, GAW

G. WILDLIFE

1. Wildlife Diversity

In previous years, as many as 45 small plots in 20 wildlife openings were planted to various species of sorghum grain, grass, and foxtail millet. Planting of foods in these openings ceased in 1984 due to questionable benefits to wildlife and the associated cost. An evaluation of the value of these openings to wildlife and outdoor recreation was begun to develop a set of management alternatives.

2. Endangered and/or Threatened Species

A peregrine falcon was observed flying over the east side of the refuge in mid-May and an adult male was observed perched in a snag on October 15. These observations represent the first documented sightings of this species on the refuge since 1972.

The bald eagle population peaked at 16 birds in late November and early December. Migration of eagles was notably delayed this year, with the first migrants not arriving until October 16. Use-days totaled 1,946; 226 less than the objective of 2,172 use-days.

The bald eagle nest located along the shoreline of Little Creek Impoundment produced one eaglet which fledged on June 29. Although this marked the fifth straight year in which the parents have successfully raised young at this site, nesting in the coming season is questionable as the nest was blown down by strong winds in late December. A second eagle nest, located six miles southeast of the Little Creek nest site along a deciduous forested wetland, was unoccupied for the third consecutive year. However, two adult eagles attended this nest from November 11 through December 31, and a considerable amount of material was added onto the nest.



Additional nest material added by a different pair of bald eagles leaves refuge personnel hopeful of a second active nest.
12-31, 84-12, EFW

3. Waterfowl

The Canada goose population peaked at only 49,000 on December 12, with a total of 3,646,580 use-days in 1984. This was the lowest number of use-days in the past nine years (objective level is 9,750,000). Migration of geese to the southern Illinois area was notably delayed; goose numbers reached 90,000 on October 22, and the next major migration did not take place until December 10, when 133,000 birds were counted. A large number of birds with Crab Orchard NWR neck collars were observed throughout October in Wisconsin. As a result, the direct relationship usually seen between goose

use-days and food availability was not observed in 1984 (Graph 1). Graph 2 illustrates fall population trends of Canada geese in the southern Illinois area.

The downward trend in total duck use continued with the refuge providing only 595,476 use-days, far short of the 3,500,000 objective level. Numbers of fall migrant ducks were substantially down throughout southern Illinois this year and biologists in Springfield (central Illinois) also noted lower than normal numbers during the fall season. Mallard and lesser scaup were the most common species; both had peak populations of 5,500 on November 21, and October 31, respectively. Rare migrants which were observed include five tundra swans (November 13-15), two black scoters (December 2), and three surf scoters (December 2).

Wood duck production was estimated to be 112, down 16 percent from 1983. The number of breeding wood ducks has steadily declined since 1980 when production was estimated to be 400 young.

The American coot population peaked at 2,000 in early November, the largest count in the last three years. The number of coot use-days in 1984 was 102,179.

4. March and Water Birds

Fall numbers of great blue herons peaked at 175 on August 29 which is consistent with peak levels established in recent years. No black-crowned night herons were observed this year at a rookery thought to be active in 1983. A maximum of 75 double-breasted cormorants were seen on November 7 and a pair of late cormorants were observed on December 26.

A number of rare birds were sighted in 1984, including common moorhen, red-throated loon and red-necked grebe. This was the first time a red-throated loon has ever been seen on the refuge and only the second time a red-necked grebe has ever been identified at Crab Orchard NWR.

5. Shorebirds, Gulls, Terns and Allied Species

Killdeer, pectoral sandpipers and lesser yellowlegs accounted for the majority of shorebird use. The spring migration was highlighted by three Wilson's phalaropes in late April.

Large amounts of rainfall earlier than usual in the fall precluded the development of ideal shorebird habitat and shorebird use-days (36,855) were considerably lower than the 88,718 use-days recorded in 1983.

Total gull use-days were 87,542. Gull numbers peaked at 1,200 in late February. The fall migration of gulls was unremarkable due to the mild weather conditions during November and December.

6. Raptors

As many as eight golden eagles, which are uncommon but regular visitors to the refuge, were seen during the spring and fall migration periods. Rare falcons which were sighted during the year include one merlin and two peregrine falcons. This year also marked the fourth time in the past seven years that rough-legged hawks were not seen during the fall migration period. Seventeen turkey vultures, observed on the December 15 Christmas Bird Count, represent one of the latest records for this species on the refuge.

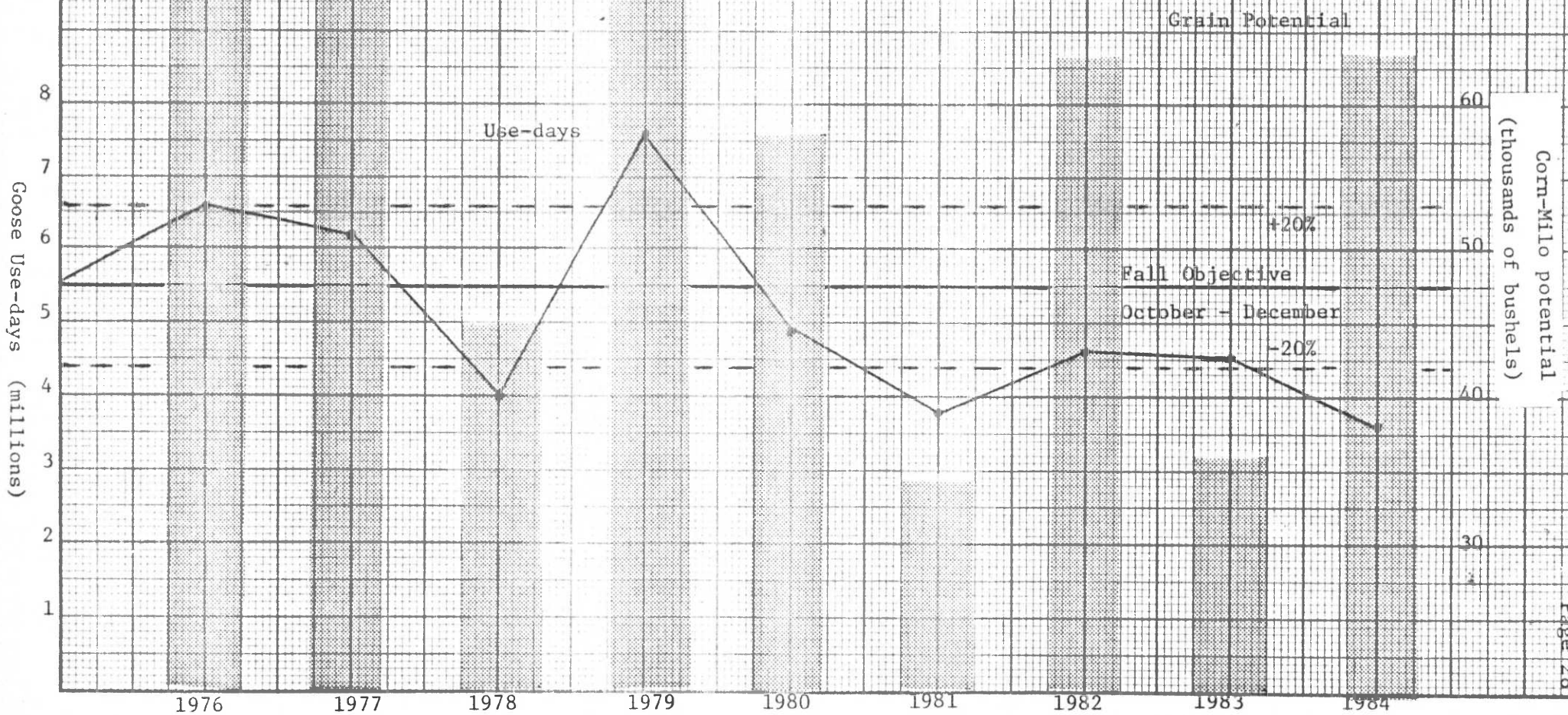
7. Other Migratory Birds

The Crab Orchard Christmas Bird Count, which was held on December 15, set a new state record by recording 98 species. Rare birds found on the count include golden eagle, Bewick's wren, gray catbird, five LeConte's sparrows, 48 lapland longspurs, four snow buntings (first record for refuge) and 16 red crossbills. The old state record, 95 species, was also set at Crab Orchard NWR in 1975 and 1983. Five fish crows were identified by John Robinson on May 15. These birds represent the first sighting of this species on the refuge. Fish crows are commonly seen on the Mississippi River south of St. Louis during the spring and summer.

The Mourning Dove Call Count and the North American Woodcock Singing Ground Surveys were conducted by refuge staff. Robinson and Stapleton conducted the dove survey. Approximately 30 doves were heard along the Franklin-Saline County route, down 10 from 1983. Two woodcock were heard along the Jackson County route as compared to six which were recorded in 1983.

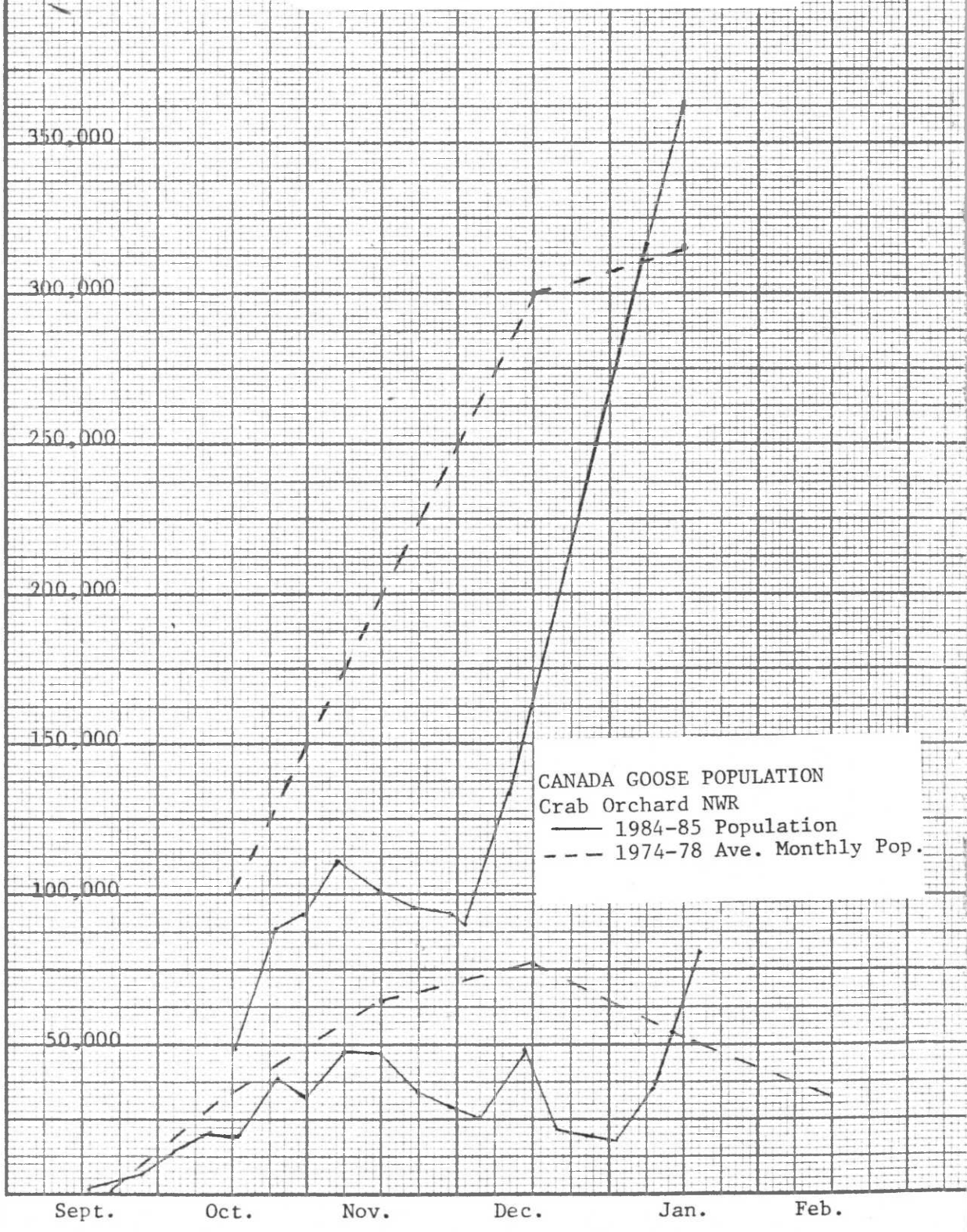
GRAPH 1.

Relationship between bushels of standing grain and goose use-days.



Corn-Milo potential
(thousands of bushels)

Graph 2.
CANADA GOOSE POPULATION
S.I. and Ballard Co., Ky. Refuges
— 1984-85 Population
--- 1974-78 Ave. Monthly Pop.



CANADA GOOSE POPULATION
Crab Orchard NWR
— 1984-85 Population
--- 1974-78 Ave. Monthly Pop.

8. Game Animals

The number of deer seen per mile on a standard census route in Area II conducted by SIU during September - November was 2.71. As this is slightly above the objective level of 2.52 deer per mile, hunting pressure will continue at or above the current year. (see Section H.8)

10. Other Resident Wildlife

The number of wild turkeys seen by refuge staff continues to increase. As many as 23 were seen at one time and the species was recorded on the Christmas Bird Count for the first time in 12 years. Two toms and seven hens were released by the IDOC in 1978. A total of 119 hunting permits were issued for Williamson County in 1984. The majority of the 11 birds killed were shot on the refuge's public hunting areas.

11. Fisheries Resources

Regulations prohibiting scuba diving and snagging as a means of taking spawning channel catfish were implemented. Abuses of these methods are thought to have decreased the success of catfish spawning.

Fish stocking included the following:

Crab Orchard Lake

- 18,000 flathead catfish (4-7 inches)
- *2 - 50,000 white bass x striped bass hybrid fingerlings
- 500,000 white bass x striped bass hybrid fry
- *2 - 6,000 threadfin shad (adults)

Devils Kitchen Lake

- 5,000 rainbow trout (non-vulnerable)

Little Grassy Lake

- *2 - 10,000 channel catfish (5-7 inches)

*2 - Provided by Illinois Fish Hatchery system.

The white bass x striped bass hybrids stocked as fry in 1982 are responding well. Hybrids up to six pounds are being found in fishermans creels.

A problem with the hybrid striped bass has been identified. After summer oxygen depletion a fish kill occurs in a large pool below the Crab Orchard Dam spillway. Hybrid striped bass are among the dead fish, indicating they are emigrating from the lake. Concurrently, an investigation is being conducted by the Bureau of Reclamation into improving the safety of the dam and its ability to pass major rain-fall runoff. One alternative proposed is to widen the spillway, which would increase the rate of escapement of the hybrid striped bass. The fisheries assistance officer proposed that a fish barrier be constructed as part of any spillway modification. The proposal was forwarded to the Bureau of Reclamation.

Routine population monitoring of Little Grassy Lake revealed a yellow bass population larger than most found in the Midwest. Some yellow bass were 10-11 inches, nearly twice as long as what they normally are.



Yellow bass in the Midwest often stunt between 5-7 inches. These represent a larger size population in Little Grassy Lake.

7/20, 84-13, EFW

14. Scientific Collections

Ten Canada goose carcasses were shipped to the National Wildlife Health Lab in January and February, thus completing the refuge's participation in the FY-84 Lead Poisoning Monitoring Program. Of the 22 carcasses which were sent to the lab in 1983-84, four (18%) were found to have died from lead poisoning. Results from an additional sample of 68 livers, gizzards and hearts from hunter-killed geese indicated elevated (2 ppm, wet weight) liver lead concentrations in seven percent of the birds.

15. Animal Control

Beaver activity has been increasingly apparent over the last several years. Two families of beaver were removed from A-16 and Job Corp ponds to prevent further damage by water over-flowing dikes and emergency spillways.

The supply of propane cannons was returned to Horicon NWR in October. Requests for cannons were not met until a new supply was received in mid-December. Thirteen cannons were loaned during the year. Depredation by geese and especially blackbirds was heavy on corn and milo crops.

16. Marking and Banding

A total of 331 MVP Canada geese were captured pre-season using rocket nets. Leg bands and blue neck collars with white number/letter codes were placed on 272 geese. Leg bands only were placed on 59 geese. Due to the substantially low peak population of 48,000 geese on November 5, less than 400 birds were ultimately banded. An additional 37 adult female Canada geese were marked by SIU personnel with neck collars, leg bands and radio transmitters. The movements of these geese were monitored throughout the fall migration period. SIU biologists hope to gather information relating to family behavior and movement during 1985.

17. Disease Prevention and Control

A die-off of Canada geese occurred on the Job Corp pond. Between November 29 and the end of the year, 32 geese were found. The mortality was limited to this pond only and health lab tests did

not identify any disease. During the course of the field investigation it was discovered that the pond was constructed adjacent to an old dump site. Further analysis of geese conducted by a private lab to isolate pesticides or other toxins was in progress at the end of the year.

H. PUBLIC USE1. General

The number of refuge visitors during 1984 was 1,093,468 which is 150,000 less than average. This reduction was, apparently, caused by adverse publicity regarding a dump site containing hazardous wastes near Crab Orchard Lake. News coverage of the Sangamo dump site continued throughout the summer and created an extraordinary amount of public relations activity for refuge personnel.

Additional public relation efforts were expended while proceeding to phase-out vested interest in recreation concession and sailing club operations. (See concessions #19).

A new refuge map with general regulations was produced.

2. Outdoor Classrooms - Students

Youthcampers, 2,000 total, each received a minimum of one hour of environmental education at the Little Grassy Lake youth camps.

SIU utilized the refuge area adjacent to their outdoor learning center, Touch of Nature, while conducting environmental education activities for several hundred students.

3. Outdoor Classroom - Teachers

Many teachers also attend environmental education sessions at Touch of Nature. This center, once a refuge facility, still serves to a degree as a refuge learning area. While participating in a two day workshop there, ORP Ed Wagner qualified as an instructor for Project WILD--a national conservation education program.

4. Interpretive Foot Trails

Chamnesstown School Trail, the only refuge interpretive trail, was walked by approximately 19,000 visitors; 150 were given conducted walks. The trail underwent repairs after vandals removed trail markers and destroyed an observation blind. A new leaflet was designed and produced for this trail.

5. Interpretive Tour Routes

There is no formal auto tour route; the "closed" area is used on a limited basis, as a conducted motorized route. This route was also opened again for the annual, one day, self-guided auto tour. In spite of the fact that it rained all that day, 690 people drove the route.

6. Interpretive Exhibits/Demonstrations

Twenty-five thousand visitors received information and viewed exhibits at the fire station and the main office which continue to serve as visitor contact stations.

"System 70" and "The Duck Stamp Story" exhibits were displayed at National Hunting and Fishing Day, hunter safety class, trappers clinic and waterfowl identification programs.

Fishing and recreation reports were given over three radio stations on a weekly basis during the summer.

Several thousand visitors used the two observation platforms to view geese which congregate in adjacent fields.

Total visitation for the above category was 38,955.



Despite the very poor weather, the refuge held a successful National Hunting and Fishing Day.

9/22, 84-14, EFW



ORP Wagner addressing students at the "Annual Outdoor Consortium" at the TVA Golden Pond Center.

5/22, 84-15, UNK

7. Other Interpretive Programs

Several refuge management-type sessions were conducted on the refuge for college and high school students by Cameron, Wagner, Wolf, and Robinson.

Off-refuge programs presented by Wagner included sessions for 600 fifth graders at Mount Vernon, and 80 students from several universities who attended the Annual Outdoor Recreation Consortium at the Tennessee Valley Authority (TVA) Golden Pond Center.

8. Hunting - Big Game

One-thousand permits were issued for the two three-day shotgun deer seasons in Area II. In the November 16-18 season, 465 hunters registered and 301 deer were taken for a success rate of 65 percent, while 251 deer were taken by 454 hunters for a success rate of 55 percent in the December 7-9 season. An additional 475 deer were killed in the remainder of Williamson County. Williamson County ranked third in the state with a total of 1,027 deer harvested.

Archers accounted for an estimated 2,925 refuge visits during the 56-day bow season, but harvest figures are not available.

Migratory Birds

Goose hunting season in the four county quota zone was shortened from 40 to 25 days with the quota of 17,500 remaining the same. Fourteen thousand six hundred and seven geese were calculated to have been harvested in the zone. This was 3,525 fewer than the 18,132 taken in 1983. On the refuge controlled hunting areas, 1,056 hunters took 142 geese, and paid \$2,872 in user fees, and blind and decoy rental. An estimated 3,829 additional waterfowlers hunted outside the controlled areas.

Approximately 400 hunters pursued doves, woodcock, snipe and rails with minimal success.

Upland and Small Game

An estimated 1,620 hunters participated in squirrel, rabbit and quail hunting. Squirrel hunting was good, quail fair, and rabbit poor.

9. Fishing

Fishing pressure dropped during 1984, due to reduced trips to Crab Orchard Lake. Publicity about Sangamo dump contamination of the lake stemmed fishing pressure which had been increasing due to the popularity of the white bass/striped bass hybrid population. Many anglers stayed away even though the fish were not condemned by public health officials.

Three sanctioned large-mouth bass tournaments were held. All fish were returned to the water. One tournament at Crab Orchard Lake produced 1,200 pounds of bass with 18 weighing five pounds or more.

10. Trapping

Eighteen trapping permits were issued for the 1984-85 season. Muskrats continue to be the most popular species taken.

11. Wildlife Observation

One-half million visits were recorded in this category. The principal interest was seeing deer and Canada geese. Visitors during December were also treated to bald eagle sightings.

12. Other Wildlife Oriented Recreation

Camping and picnicking at the Little Grassy Lake youth camps accounted for most of the 29,000 visits assigned here. This is 10 percent more than during 1983.

13. Camping

Improved camp sites at the Crab Orchard Campground were expected to increase usage considerably during 1984, but the anticipated increase was curtailed by the Sangamo dump publicity. The total visitation for all three concession-operated campgrounds increased approximately 15 percent over 1983. There were 57,210 non-wildlife oriented camping visits.

14. Picnicking

An estimated 52,670 picnickers used eight refuge picnic areas. Maintenance of these areas continues to be difficult due to high use, vandalism and deteriorating facilities. Several tables were replaced and two temporary employees were hired to assist with maintenance. New comfort stations for these areas are being constructed by the Mingo Job Corps Center.

15. Off-Road Vehicles

Vehicle trespass continues to be a minor problem, especially in the winter. Off-road vehicles (ORV's) move back and forth between Forest Service land and the refuge. There are a multitude of access points that only fencing will deter.

16. Other Non-Wildlife Oriented Recreation

Swimming, boating and water skiing visits were estimated at 100,640 which is 15,000 below 1983. This reduction is also probably related to the Sangamo dump publicity.

17. Law Enforcement and Fires

Refuge officers investigated three drownings on the refuge: Crab Orchard Lake on 6-9-84, Devils Kitchen Lake on 6-16-84, and Little Grassy Lake on 9-18-84. No law suits are anticipated (See Section E.6).

Also investigated were several boating/skiing accidents involving property damage and injuries, and several automobile accidents involving property damage and minor and serious injuries.

Training for refuge officers this past year included:

- S-130 and 190 fire fighting, U. S. Forest Service, February.
- Forty-hour first aid and CPR, Crab Orchard NWR, March.
- Forty-hour refresher, Springfield, IL, early April.
- Firearm requalification, Crab Orchard NWR, October 1.
- Assisted IDOC with hunter safety (8 hours) and trapping clinic (8 hours), November.

Refuge officers worked assignments with Special Agents and IDOC game wardens throughout the year, focusing primarily on deer poaching and waterfowl violations.

On February 9, a refuge officer gave a presentation to a forestry class, discussing career potential with the FWS.

In April, officers provided law enforcement coverage for three popular bass tournaments involving participants from throughout the region.

Between August 6 and August 20, refuge officers were involved in a cannabis cultivation investigation. The interagency team effort involved agents from: Illinois Division of Criminal Investigation, Williamson County Sheriff's Department, Southern Illinois Enforcement Group, Illinois State Police, and Crab Orchard NWR. Over a two week period, four "plots" were located throughout the refuge, using helicopter, fixed-wing aircraft, boats, and walk-in searches. Surveillance was conducted over each plot, resulting in one arrest and the seizure of 204 plants, street-valued at \$167,000. Crab Orchard NWR contributed 44 man-hours and the use of refuge motor boats.



Crab Orchard Refuge officers, coordinating with four other agencies, seized \$167,000 of marijuana plants on the refuge and made one arrest.

8/15, 84-16, BWK

Later in August, officers were requested to provide security for Vice President Bush as he passed through the refuge.

For a week in October, a refuge officer was sent to Montana to assist special agents with "Operation Falcon." The officer provided surveillance over and protection for evidence and a key witness.

This winter, for two three-day weekends, refuge officers provided law enforcement coverage of the special refuge deer hunt involving 1,000 permit holders.

Four refuge officers wrote 135 tickets in 1984, for the following violations:

Illegal camping	17	Felony class X sex offense	1
Unauthorized use	47	Felony class 1 sex offense	1
No fishing license	20	Leaving scene of an accident	1
Unauthorized swimming	11	Vehicle trespass	1
Reckless boating	2	Spotlighting wildlife	5
Disorderly conduct	2	Illegal possession of wildlife	1
Illegal fire	2	Illegal possession of firearm	2
No valid license plate	2	Attempt to take wildlife with	
Driving while intoxicated	2	motor vehicle	1
Trespassing	2	Disturbing wildlife	1
Illegal possession of		Taking waterfowl over bait	4
toxic shot	4	Hunting from a tree stand	1
Off road vehicle use	1	Allowing dog to run loose	1
Unplugged shotgun	1	No federal duck stamp	1
Using falsified deer permit	1		

Other Incidents

Numerous thefts from campsites, boats, and autos, and several acts of vandalism were investigated. One noteworthy incident involved two culprits breaking through refuge gates and entering a bunker area at 2:00 am, on October 2. The two intoxicated thieves proceeded to gain access into a bunker, using a log chain tied to their back bumper and the bunker door. After vandalizing the building, the two left the refuge leaving behind only tire tracks....and their rear license plate. The two were arrested later that day.

Fire Station/Subheadquarters

The fire station/subheadquarters serves as the principal visitor contact station for the refuge. During the year, station personnel provided information to over 14,000 walk-in visitors. Station personnel processed 484 goose hunters and 928 deer hunters, during controlled hunt seasons. CPR, advanced first aid, and in-service equipment training was given to all fire station personnel.

Refuge firefighters responded to the following fire calls:

Grass	1
Dumpster	1
Boiler House	1
Boat	1
False Alarm	6



Fire equipment training was conducted for firefighters and personnel involved in prescribed burning.

6/1, 84-17, GAW

On March 8, Rend Lake Water District had a major break in their supply lines. Ten towns were without water for more than 48 hours. Carterville Township called upon the refuge to supply them with water in case of fire. More than 1,500 feet of 2½-inch fire hose was laid to connect the Carterville and refuge hydrant systems. Adequate hydrant pressure was maintained until the system was repaired.

19. Concessions

Contracts eliminating vested interest were awarded to the Little Grassy Lake camping and marina concession and the Crab Orchard Boat and Yacht Club. Management of the Sail Boat Club was converted to a concession operation.

The Methodist youth camp at Little Grassy Lake began construction of a new \$292,000 meeting center, complete with sleeping quarters for 30 campers. This center is built with an understanding that it will be government property.

Gateway Marina, the last concession with vested interest, is slated for a new contract in December of 1985.

Fish and Wildlife Service
Division of Wildlife Refuges

PUBLIC USE REPORT

1984

Page 1 of 3

OUTPUT TYPE	NO. VISITS	ACTIVITY HOURS	NON-STD TOT. RBUS
	27-35	36-45	46-55
INTERPRETATION			
Wildlife Trails - Nonmotorized			
Self Guided	19,450	17,970	
Conducted	159	159	
Wildlife Tour Routes - Motorized			
Self Guided			
Conducted	711	1,512	
Interpretive Center			
Visitor Contact Station	25,046	7,083	
Interpretive Exhibits - Demonstra			
Self Guided.	38,955	6,906	
Conducted			
Other On-Refuge Programs	1,569	1,361	
ENVIRONMENTAL EDUCATION			
Students	1,020	2,850	
Teachers			
RECREATION-WILDLIFE CONSUMPTIVE			
Hunting Mig. Birds - Waterfowl			
Ducks	1,585	6,340	
Geese	3,300	11,700	
Swans			
General Waterfowl			
Hunting Mig. Birds - Other	370	1,260	
CONTROL TOTALS			

Region 3 Station Crab Orchard NWR, IL

Name _____

Fish and Wildlife Service
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PUBLIC USE REPORT

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OUTPUT TYPE	NO. VISITS	ACTIVITY HOURS	NON-STD TOT. REUS
	27-35	36-45	46-55
RECREATION-WILDLIFE CONSUMPTIVE (c't)			
Hunting Resident Game			
Upland Game Birds	250	1,500	
Big Game			
Deer - Gun	1,800	1,450	
Deer - Bow	2,925	10,750	
Small Game	1,620	5,870	
Other Game			
Trapping	1,167	2,788	
Fishing			
Warmwater	222,000	684,000	
Coldwater			
Saltwater			
Clams, Crabs, Oysters, Frogs			
Other Consumptive Wildl. Rec.	310	595	
RECREATION-WILDLIFE NON-CONSUMPTIVE			
Camping	13,226	156,052	
Picnicking	15,875	22,065	
CONTROL TOTALS	9		

Region 3 Station Crab Orchard NWR, IL

Name _____

Fish and Wildlife Service
Division of Wildlife Refuges

PUBLIC USE REPORT

1984

Page 3 of 3

OUTPUT TYPE	NO. VISITS	OUTPUT UNITS	NON-STD TOT. REUS
	27-35	36-45	46-55
RECREATION-WILDLIFE NON-CONSUMPTIVE		Act.Hr.	
Wildlife/Wildlands Observation			
Foot	12,230	12,230	
Land Vehicle	501,000	501,000	
Boat	6,360	7,960	
Other			
Photography	1,120	2,450	
Field Trials			
RECREATION - NON-WILDLIFE			
Camping	57,210	352,920	
Picnicking	52,670	85,870	
Swimming	52,090	54,545	
Boating	35,450	70,650	
Waterskiing	13,100	26,200	
Off Road Vehicling			
Other			
TOTAL VISITS TO REFUGE	1,093,468		
FISH & WILDLIFE INFORMATION		Per. Sata	
Public Inquiries		12,597	
News Releases		18	
Personal Appearances		61	
Professional Services		1	
Exhibits			
CONTROL TOTALS			

Region 3 Station Crab Orchard NWR, IL

Name _____

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

A 1982 building demolition contract with Ed's Construction, East St. Louis, was terminated. The contract was to bury the 3-story melt pour building at Fiberlite. Plans are to re-bid the project during 1985.

Building Demolition 83-096. Excavating Services, Carbondale, \$64,000. Work was completed, and sites were seeded by YCC, on removal of seven buildings (30,000 square feet) in Manpower Training and Trojan Corporation areas.



This building was no longer suitable for industrial use. It was demolished and the area reseeded.

5/30, 84-18, GHU

Equipment Roll-over Protection. Purchase Order. In February Ed Pennington, Waukomis, Oklahoma, constructed roll-over protection and certified as safe the D-7 and D-4 dozers, and two farm tractors. Cost of the fabrication and certification was \$5,515.

3. Major Maintenance

Watertower/Plant Painting 84-052. Nick's Painting Company, Warren, Ohio, \$52,150. The three 250,000-gallon elevated water towers were painted inside and outside with epoxy paint. Exteriors of the water treatment plant, furnace building, and chemical storage building were painted light brown with dark brown trim.



The three water towers supplying refuge and industrial tenant buildings were painted.

8-1, 84-21, EFW

Water/Sewer Line Replacement 83-129. F.E.Holmes Construction, Marion, \$530,647. Work was completed and areas were seeded where cast iron water and sewer lines were replaced with PVC plastic line. Five miles of waterline and two miles of sewerline were replaced. Both lines crossing Crab Orchard Lake were placed on the lake bottom, and the causeway lines were abandoned. Lines between the Manpower - Trojan - Diagraph areas were eliminated.



New water and sewer lines crossing Crab Orchard Lake were placed on the lake bottom.

7/1, 84-19, GHU

Road Blacktop 84-061. Interface Construction, Wood River, \$223,950. Hot mix asphalt, 5,950 tons, was placed on 4.7 miles of roads at a depth of three inches as a Jobs Bill project. Work was performed by E.T.Simonds Company of Carbondale, and roads paved were A-3, A-6, Wolf Creek, and from A-3 to A-5 roads.



Hot mix asphalt road rehabilitation
on 4.7 miles of the refuge's 28
miles of paved roads.

7/15, 84-20, GHU

Brush along the major access roads to Devils Kitchen Lake was cut back with the Mo-Trim rotary mower.

4. Equipment Replacement and Utilization

Equipment purchases included two ½-ton pickup trucks costing a total of \$18,000.

Equipment transferred out included: 1965 International farm tractor, 511 farm plow, and soil-mover to Clarence Cannon NWR, 1977 pickup truck to Missouri Wildlife Co-op Research Unit, and the Insley Shovel Crane to the Illinois Surplus Property program.

Equipment sold by GSA for trade-in credit included: 1977 Plymouth station-wagon, two 1966 International farm tractors, 1974 Dodge pickup truck, and a 1971 Dodge pickup truck.

7. Energy Conservation

Gas-Diesel fuel use was 16,286 gallons with an allotment of 23,000 gallons. Use was 30 percent less than the allotment.

J. OTHER ITEMS1. Cooperative Programs - Industry

Implementation of the 1981 Industrial Policy continued with obsolete buildings and concrete pads being removed, other buildings being upgraded and painted brown, and water/sewer lines being replaced. The Trojan Area, representing 25% of the industrial complex, was abandoned. The water, sewer and electric lines were cut, and some buildings were torn down. With an upswing in the economy, rental demand increased for the second year.

3. Items of Interest

City of Marion Water Request - The City of Marion, population 15,000, has a raw water supply reservoir of marginal capacity and an outdated water treatment plant in need of renovation or replacement. In November 1979, Marion requested raw water increases from Crab Orchard Lake (they pump from the lake during dry periods) and possibly placement of a water plant on the refuge. Increased raw water from the lake was not a problem, but a treatment plant on the refuge was. In April 1983, another request was made for four million gallons per day of raw water from the lake. In July 1983, before action was taken, Marion asked for a meeting and said Crab Orchard Lake water was not acceptable because of PCBs in the lake sediment. At this time, Marion asked to use Devils Kitchen Lake as a sole supply of raw water. Marion Mayor Robert Butler and city officials met with FWS officials, including the Regional Director, in September 1983 in Minneapolis. The FWS said data were incomplete, but because of potential lake drawdowns of over five feet, the request to use Devils Kitchen Lake would probably be denied. More data were provided by Marion and the FWS Regional Engineer, and in February 1984 the request was denied.

In June 1984 Senator Charles Percy became involved, held a meeting at the refuge, and met with Marion officials in an attempt to solve their water problem. As a result, in September 1984 Refuges Chief Walter Stieglitz, Regional Office and refuge staff met with Marion officials again. More data were provided to FWS for evaluation. In December 1984, FWS completed a Compatibility Study, and the Regional Director sent a letter of denial to Marion on their request to use Devils Kitchen Lake as a municipal water supply. The denial was based on the fact that such use was not compatible with objectives for which the area was acquired, and that drawdowns would alter the character of the lake habitat and adversely affect adjacent aesthetic values. Marion has indicated that further attempts to secure Devils Kitchen Lake as a water supply will continue.

Other issues associated with this request were: the federal prison attempting to drill wells as they felt Crab Orchard Lake water may not be safe, various law suits by inmates at the prison, Rend Lake water district offering to provide treated water to Marion - the offer was refused, the news media's interest in public debate and disagreement, and a national election year - U.S. Representative Paul Simon challenging Senator Charles Percy for the Senate and retired U. S. Representative Kenneth Gray running against Randy Patchett for the House of Representatives. Messrs. Simon and Gray, both Democrats, won the election.



One of several meetings with State and Federal agencies and legislators concerning the monitoring and cleanup at Sangamo dump. Senator Charles Percy(center) was present.

6/18, 84-23, EFW

Hazardous Waste Dump Site The military occupied the refuge Area II from 1942 - 47 and various and many industrial tenants have occupied the area since 1947. Up into the 1960's, sites were utilized to deposit waste. These areas were covered with soil and left to revegetate. There is no way of knowing just how many such sites exist with military construction, military operations, and industrial operations. Following is an account of what will occupy much staff time and cost for several years; location, study, and cleanup of hazardous waste dump sites:

1975 - First indications of contaminants in the Crab Orchard Lake system were noted through Illinois Environmental Protection Agency (IEPA) fish samples which showed mercury and PCB's.

1980 - High levels of lead were found in deer livers by SIU from hunter check stations. Similar data in 1983 did not confirm 1980 results.

1982 - Soil testing by FWS showed high lead levels at an old industrial dump site near industrial Area 9.

1982-83 - Random sampling by FWS, IEPA, IDOC, and Illinois Department of Public Health (IDPH) revealed lead, PCB's, furans, and dioxins at the Area 9 dump site. The furans and dioxins were of a type and low enough as not to be of major concern. Low levels of PCB's, were found in fish and lake sediment near the site.

July 21, 1983 - FWS called a meeting to discuss and work on the problem. USEPA, IEPA, IDOC and IDPH were all represented. USEPA said they could conduct preliminary studies through a contractor, as the lake is a public water supply. They could not do any cleanup as federal sites were not covered by the Superfund program.

September 1983 - USEPA sent a contractor to Area 9 to determine the area and depth of the dump.

January 10, 1984 - Department of Defense, through the Corps of Engineers, Huntsville, Alabama, came to the refuge to investigate old military facilities under the Environmental Restoration Fund Act. The military may study and take necessary cleanup action on sites used only by the military.

April 29, 1984 - The Southern Illinoisan Newspaper, Carbondale, came out with a front page exclusive in red headlines, "PCB, Lead Hot Spot", and blasted the government for having such a site and not informing the public. This and subsequent articles carried the logo of a water drop with skull and crossbones over it. Articles and editorials continue to chastise the FWS, apparently trying to justify the original articles. Other news outlets have been more restrained and objective.

May 4, 1984 - Senator Alan Dixon called for quick action on the hazardous waste problems.

May 17, 1984 - The IEPA held a press conference in Marion demanding that Interior Secretary Clark have the area closed off to any access, contaminant action be taken, and a Remedial Investigative Field Study (RIFS) be completed within six months. IEPA said they were not concerned about the site until dioxins and furans were discovered.

May 1984 - The Food and Drug Administration proposed lowering allowable PCB'S in fish from 5.0 ppm down to 2.0 ppm. This caused a panic among the public as the news media announced that when this took effect, Crab Orchard Lake would be closed.

May 1984 - Several prisoners at the Marion Federal Prison filed suit for millions of dollars damage against the prison, EPA, and FWS.

May 30, 1984 - IDPH announced that fish samples from the lake were safe for human consumption and no warnings or advisories would be issued. Testing was done by a certified state public health lab.

June 1984 - FWS installed a cyclone fence around the 2.5 acre Area 9 dump site for \$18,000.

June 1984 - Senator Charles Percy held a meeting of state and federal agencies, the City of Marion, and the press at refuge headquarters. The Senator conducted the meeting and asked that all work toward a quick solution. He said he would be in contact with USEPA officials in Washington about the cleanup.

June 29, 1984 - A technical meeting was held in Springfield at IEPA headquarters to formulate a team approach to completion of the RIFS scope of work.

June 1984 - Williamson County States Attorney Randy Patchett called a grand jury to look into the dump site issue. Project Manager Adams was called to testify and appeared as a voluntary witness. No action was ever taken nor a decision announced by the grand jury.

July 9, 1984 - Congressman Paul Simon announced the formation of a citizens advisory committee to study the dump site issue and see if appropriate action was being taken. Three meetings were held by the group and news releases were issued saying there was no wrongdoing but somewhat criticizing FWS for slow action.

July 16, 1984 - Olin Corporation, through testing of building dirt and dust, found PCB'S in building I-1-123 and restricted access to that building.

July 27, 1984 - Olin Corporation found high PCB levels in soils adjacent to various buildings, roadways, and ditches in Area 9.

July 30, 1984 - Tests of FWS fish samples by a USEPA lab showed no dioxins or furons or very low levels in the samples. Cost was \$20,000.

July 1984 - A new USEPA Superfund priority listing included the Crab Orchard site as number one for Illinois.

September 1984 - The RIFS was completed in draft form.

October 1984 - Congress authorized funding for the RIFS. Cost was for up to \$1 million from the refuges threats and conflicts fund of \$30 million.

November 1984 - Dead Canada geese, approximately 25, were found over a few days period at the Job Corps Pond along Wolf Creek Road. Investigation found a dump site in the area with electrical components on the ground. The geese were sent to a Wisconsin lab for analysis.

January 1985 - Sangamo agreed to conduct the RIFS for the Area 9 site and adjacent buildings. O'Brien and Gere, a New York environmental testing company, will conduct the study for Sangamo. FWS will arrange for contract compliance personnel.

There is no way of knowing where, when, or at what cost the contaminants trail will lead. It will take several years to clean up dumping of the past.

Dams Safety Study FWS, under contract with the Bureau of Reclamation in Denver, is studying the three major dams for recommendations to improve safety and institute a monitoring/maintenance program. Contractors drilled test wells at Crab Orchard and Little Grassy dams in 1984 to check ground water levels and soil types below the dams.



Drilling Contractors at Little Grassy Lake
taking core samples of the dam to determine
necessary safety modifications.

11/5, 84-24, GHU

4. Credits

The following were contributors: Sections A, B, C, D-
Wolf; Sections E, I, J, K- Updike; Sections F & G- Stapleton,
Robinson, Wolf; Section H- Wagner, Priest, DeJulio. Wolf
edited and McCarty and Parks typed the report.

K. FEED BACK

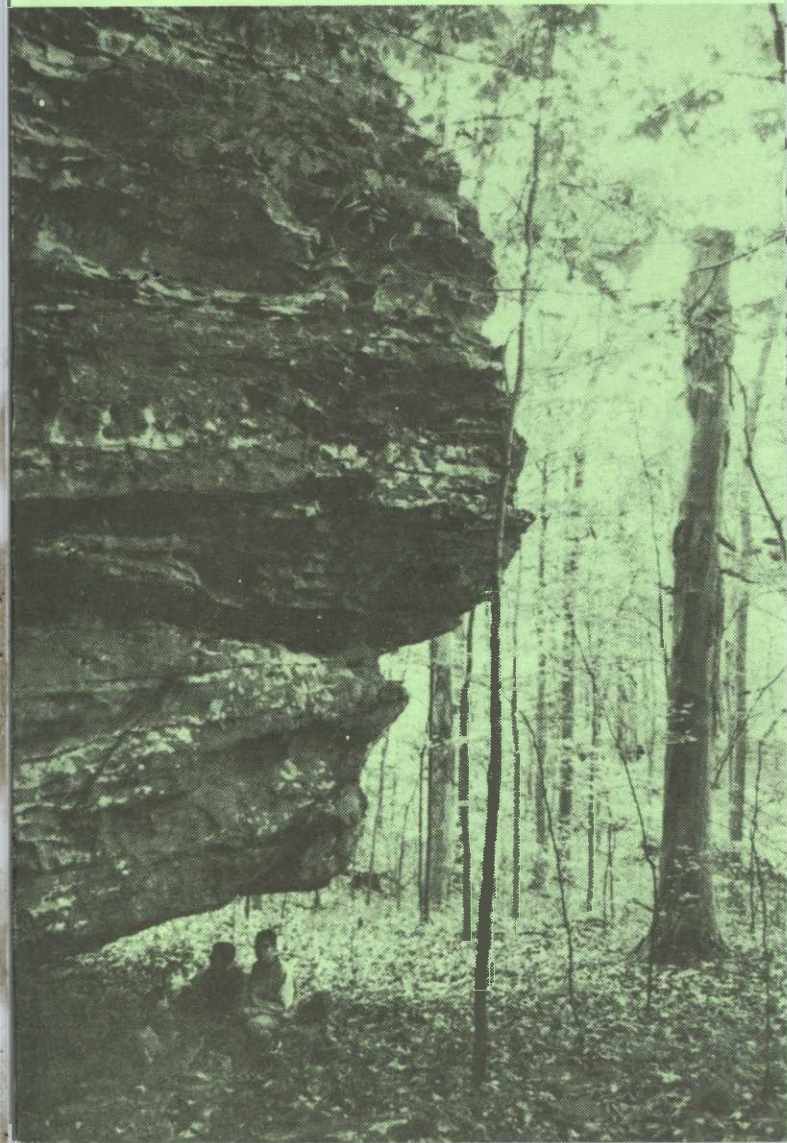
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Uniforms The new system has greatly reduced administrative work at the field station, and the uniform component changes are an improvement.

**Crab Orchard
Wilderness Area**
Illinois



Congress designated 4,050 acres of the Crab Orchard National Wildlife Refuge as "Wilderness Area" in 1976. This designation insures that the area will be protected against destructive acts of man for future generations to enjoy and study.

The Land

The glaciers that covered northern and central Illinois did not reach beyond the northern boundary of the Crab Orchard Wilderness Area. The landscape remains steep with many sandstone outcroppings. Numerous creeks interlace the area and two man-made lakes (Devils Kitchen and Little Grassy) border the wilderness area.

Flora and Fauna

The Wilderness Area is home to a wide variety of plants and animals. Plant species ranging from orchids to prickly-pear cactus are found there along with other unusual wildflowers and 115 different types of trees. Wildlife species include beaver, raccoon, coyote, fox, deer, and possibly bobcat. A small number of poisonous copperhead snakes are present and visitors should be alert in rocky areas.

History

Southern Illinois was an unoccupied Indian hunting ground when the Shawnee tribe settled there in 1740. In the half-century that followed, the Shawnee were invaded by a steady trickle of white homesteaders from Kentucky, Tennessee, and the



Carolinas. The white settlers soon pushed the Shawnee out of southern Illinois and by 1840 had established villages and primitive roads through most of the area. A road to Jonesboro ran through the present-day Wilderness Area following part of the path that Rocky Comfort Road now takes.

Recreation

The Crab Orchard Wilderness Area has been preserved for people as well as wildlife, and some types of wildlife-oriented recreation are permitted. The Shawnee National Forest and Giant City State Park border the Wilderness Area on the south and west, providing excellent opportunities for a back-country experience.

Birdwatchers, hunters, fishermen, and hikers are welcome in the Wilderness Area; but for the protection of the area no camping, fires, or motor vehicles are permitted. Backpackers planning to visit the area may camp at Giant City State Park, the Shawnee National Forest, or one of the Refuge campgrounds.

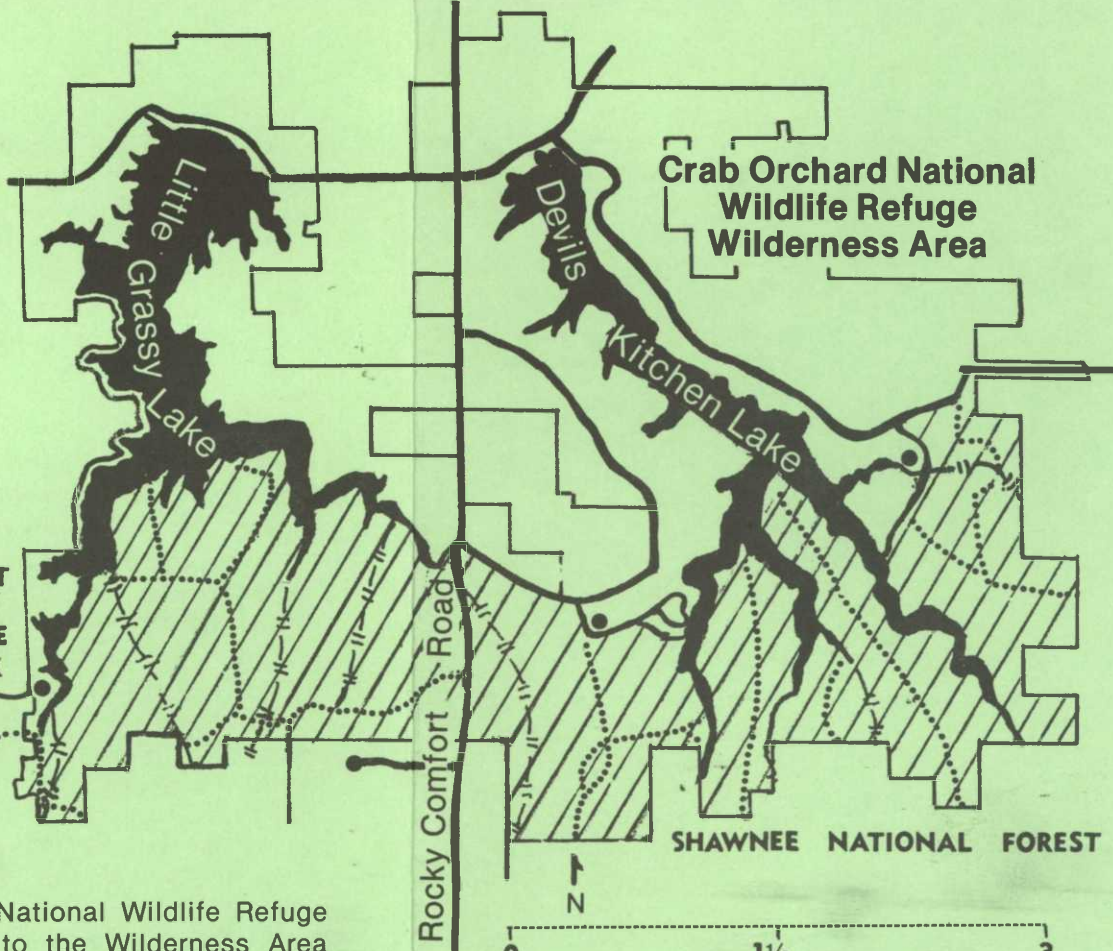


LEGEND

- //// Wilderness Area
- Vehicle Road
- Foot Trail
- Access Point (Parking)
- X Campground*
- //— Streams



GIANT CITY STATE PARK



Information

All Crab Orchard National Wildlife Refuge regulations apply to the Wilderness Area along with the special regulations previously noted. For more information contact Refuge Headquarters at 618-997-3344, or write the Project Manager, Crab Orchard National Wildlife Refuge, Box J, Carterville, Ill. 62918.

For Shawnee Forest information write: U.S. Forest Service, 317 E. Popular St., Harrisburg, Ill. 62946.

For State Park information write: Illinois Dept. of Conservation, Land and Historic Sites Division, Springfield, Ill. 62706.

*Camping is not permitted in the wilderness area. For area camping information, contact the State and U.S. Forest Service.



**DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE**

Crab Orchard

National Wildlife Refuge
Illinois

Hunting Map and Regulations

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



HUNTING REGULATIONS

Map on back

Hunting in General:

■ Season dates are in accordance with state and federal regulations.

*

▨ Hunting and trapping are permitted only in areas of the refuge designated by signs as being open to hunting. Hunting, trapping and/or trespassing is prohibited in the closed area unless otherwise specified.

Hunters under 65 years of age are required to have a valid state hunting license in possession. Waterfowl hunters 16 years of age or older are required to have a Federal and State Migratory Bird Hunting Stamp in their possession. Resident hunters 65 years old or older, or physically handicapped hunters, are exempt from having a State hunting license and a State Migratory Bird Hunting Stamp.

Disturbing, injuring, destroying or attempting to do the same to any plant or animal on the refuge is prohibited except for game animals during the specified hunting season.

Directing rays of spotlights, automotive headlights or other artificial light on an animal is prohibited for the purpose of locating, spotting or taking the animal within the boundaries of the refuge or from road right-of-ways within the refuge.

**QUALITY HUNTING DEPENDS ON YOU
PLEASE RESPECT ALL REGULATIONS**

Deer Hunting in Closed Area

▨ A special state permit is required to hunt deer in closed areas of the refuge. Application should be made in spring to the Illinois Department of Conservation in Springfield, and permits are awarded on a random basis. People receiving permits will be provided a map of the refuge and list of special regulations.

Deer Hunting in Open Area

■ People with a state shotgun permit for Williamson County or a state bow and arrow permit may hunt the open portion of the refuge in areas designated open to hunting.

*

Waterfowl Hunting:

■ Persons hunting waterfowl with shotguns on the refuge are allowed to use or have in their possession only steel shot shells.

*

Special Rules for Geese:

■ Special regulations apply in the controlled goose hunting areas, Carterville Beach and at certain areas along Crab Orchard Lake shoreline as posted. Check with refuge sub-headquarters just prior to goose season for details.

*

No goose hunting is permitted within 200 yards of the closed area of the refuge.

All goose hunting must be done from a blind that is portable or constructed of dead vegetation. Blinds must be removed at the end of the hunt. Blinds must not be established or occupied beyond the shoreline on refuge waters and no more than 3 persons may hunt from a blind in the public hunting area. Pits may not be dug or used for blinds.

All goose hunters must sign in at a provided registration box prior to hunting geese each day and report their kill prior to leaving the hunting area.

Information:

For more information, contact Crab Orchard National Wildlife Refuge Sub-headquarters, Post Office Box J, Carterville, IL 62918, or call 618/997-3344.

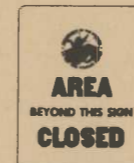
KNOW YOUR SIGNS



REFUGE BOUNDARY SIGN — ENTRY BY PERMISSION ONLY



AREA OPEN TO HUNTING AT SPECIFIC TIMES

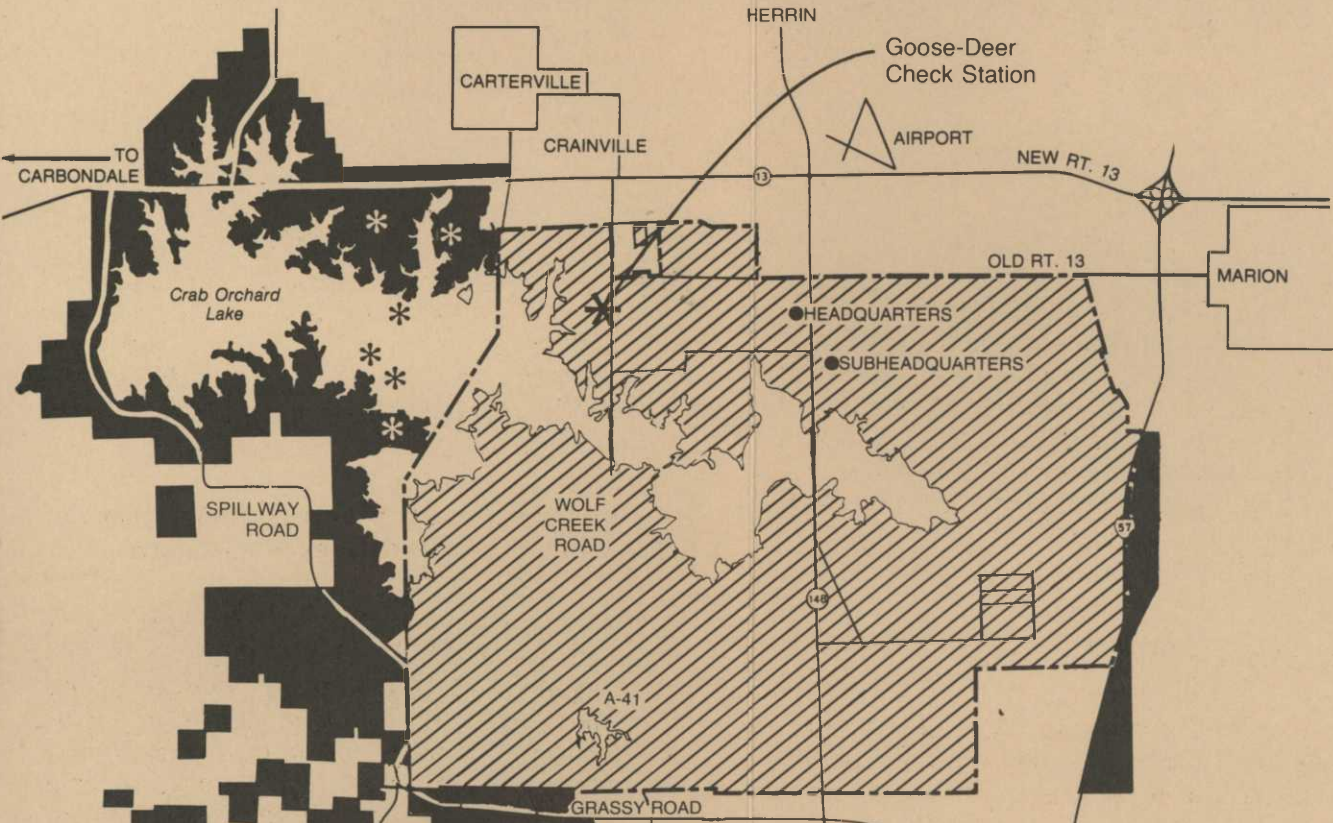


SANCTUARY AREA — OFF LIMITS TO THE PUBLIC UNLESS OTHERWISE SPECIFIED

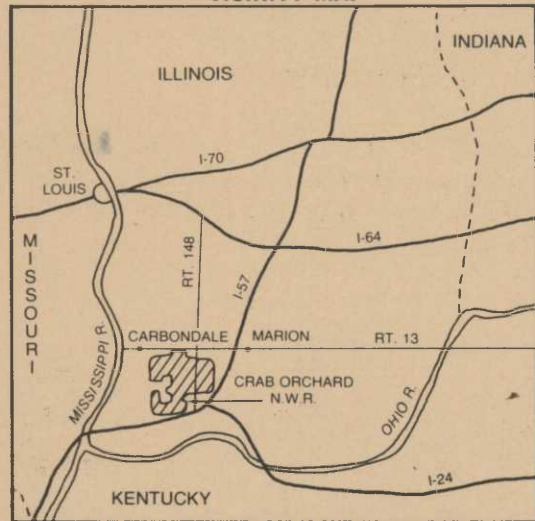
RF-32610-6

June 1979

CRAB ORCHARD NATIONAL WILDLIFE REFUGE



VICINITY MAP



SCALE



OPEN AREA
Open to hunting

CLOSED AREA
No hunting or trespassing
except for special deer hunt.

*** CONTROLLED GOOSE HUNTING AREA**
Special regulations apply.

**Crab Orchard
National Wildlife
Refuge**

illinois



History

History is as close to the Crab Orchard visitor as an Indian mound along a creekbank, or an overgrown cemetery stumbled upon in a thicket. Straight-rowed pine plantations remind visitors of the 1930's when tree planting and the development of Crab Orchard Lake provided work for the Works Project Administration and the Civilian Conservation Corps. World War II may be brought to mind by metal-sided refuge buildings dating back to the time when the Illinois Ordnance Plant was one of the largest producers of ammunition and explosives in the nation. In 1947, the entire project was transferred to the Department of the Interior, U.S. Fish and Wildlife Service, and the Crab Orchard National Wildlife Refuge was established. The Congressional act that created the refuge specified that management would be for wildlife, recreation, agriculture, and industry.

Today the Crab Orchard Refuge covers 43,000 acres that includes 3 lakes, 12 natural areas, and a 4,000 acre wilderness area.

Wildlife

Forest, prairie, and wetland species of plants and animals coexist at Crab Orchard. Wildlife management is centered around providing a winter feeding and resting area for Canada geese, and the refuge goose flock may build up to 120,000 birds by December. Many species of ducks visit the refuge in fall and winter and bald eagles may often be seen sitting in trees overlooking the goose flock.

Spring brings the departure of most migratory waterfowl and eagles, while other species become more active. White-tailed



deer, common year-round, can be seen in many areas. Other species of animals sometimes seen by visitors are coyotes, beaver, muskrat, opossum, and raccoon. A bird list is available at refuge headquarters.

Industry

Industry is important for the economy of southern Illinois and on Crab Orchard, it coexists with wildlife. Industries located on the refuge manufacture a wide variety of products with minimal impact to the environment.

Wildlife can often be seen near industrial buildings. Many buildings now housing industries were used in the manufacture of explosives in World War II and most of the concrete "igloos" once used for munition storage are now leased to private industry.

Agriculture

Farming is an important wildlife management tool at the refuge, and 5,000 acres are planted annually to provide food for the wintering goose flock. Local farmers sharecrop refuge land and take a certain percentage of the crop, leaving the rest in the field for wildlife.

Livestock grazing is permitted on 2,700 acres of land on a fee basis. Cattle graze the pastures all summer and are removed in October to give arriving geese undisturbed use of the area.

Other management activities on the refuge include the planting of wildlife food plots, limited controlled burning and pine thinning. These practices make different types of food and cover available to wildlife and allow the refuge to support a greater variety of animals.

Recreation

Wildlife-oriented recreation is encouraged at Crab Orchard, and opportunities for wildlife observation are excellent. Hikers can walk the self-guided Chamnesstown School Trail, explore the reconstructed Chamnesstown Schoolhouse, or venture out along old fire trails in "open" areas of the refuge. Some may wish to climb observation towers to watch geese, drive public roads to look for deer, or lunch at established picnic areas by Crab Orchard Lake.

Hunting and fishing are popular activities at Crab Orchard. Concession-operated campgrounds and marinas are located on Crab Orchard, Little Grassy, and Devil's Kitchen lakes for the convenience of visitors, and swimming beaches are provided on Crab Orchard and Little Grassy lakes. Fees are charged for the use of campground and beach facilities.

Information

The Crab Orchard National Wildlife Refuge is located between Carbondale and Marion, Illinois, and is easily accessible from I-57.

For the protection of the public and refuge resources, visitors are permitted only in designated areas of the refuge. Camping is allowed only in designated campgrounds, no off-road vehicle traffic is permitted, and fires are to be confined to established fireplaces/grates.

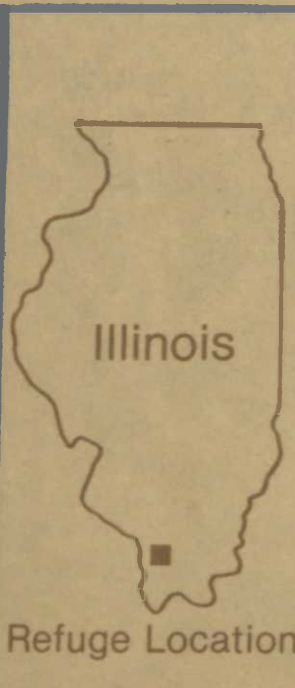
General information, including leaflets, regulations, and maps may be obtained by visiting refuge headquarters (open 8:00-4:30, Monday-Friday), subheadquarters (open 24 hours), or by contacting the Project Manager, Crab Orchard National Wildlife Refuge, Post Office Box J, Carterville, Illinois 62918.



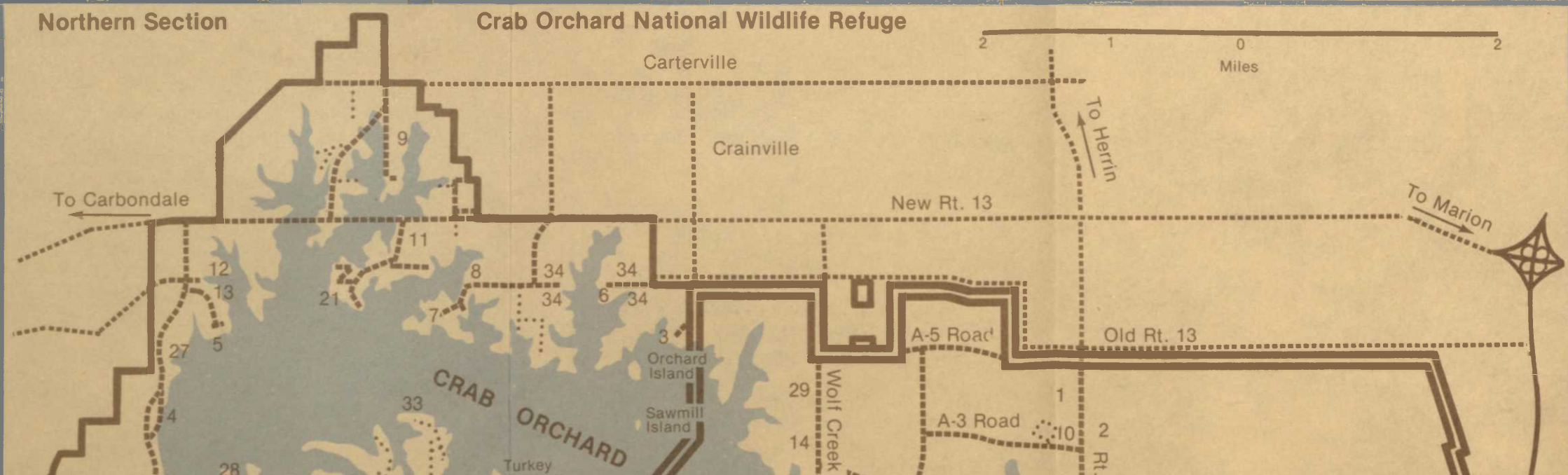
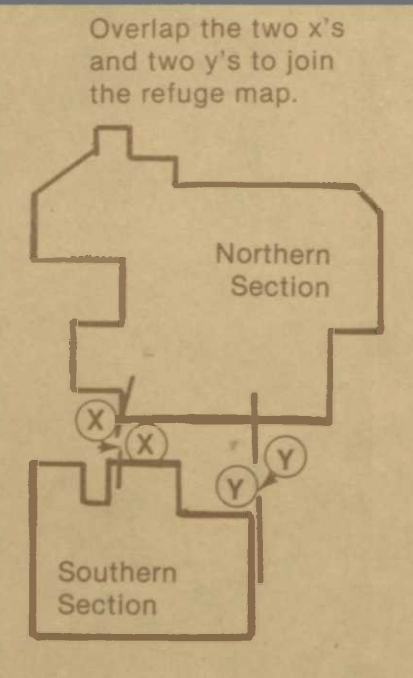
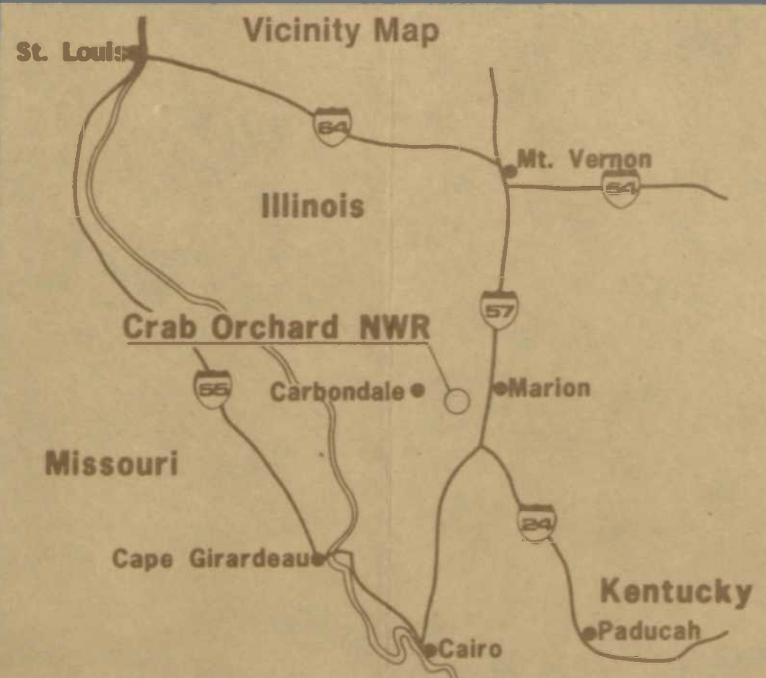
DEPARTMENT OF THE INTERIOR
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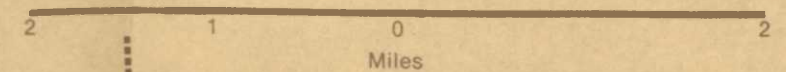
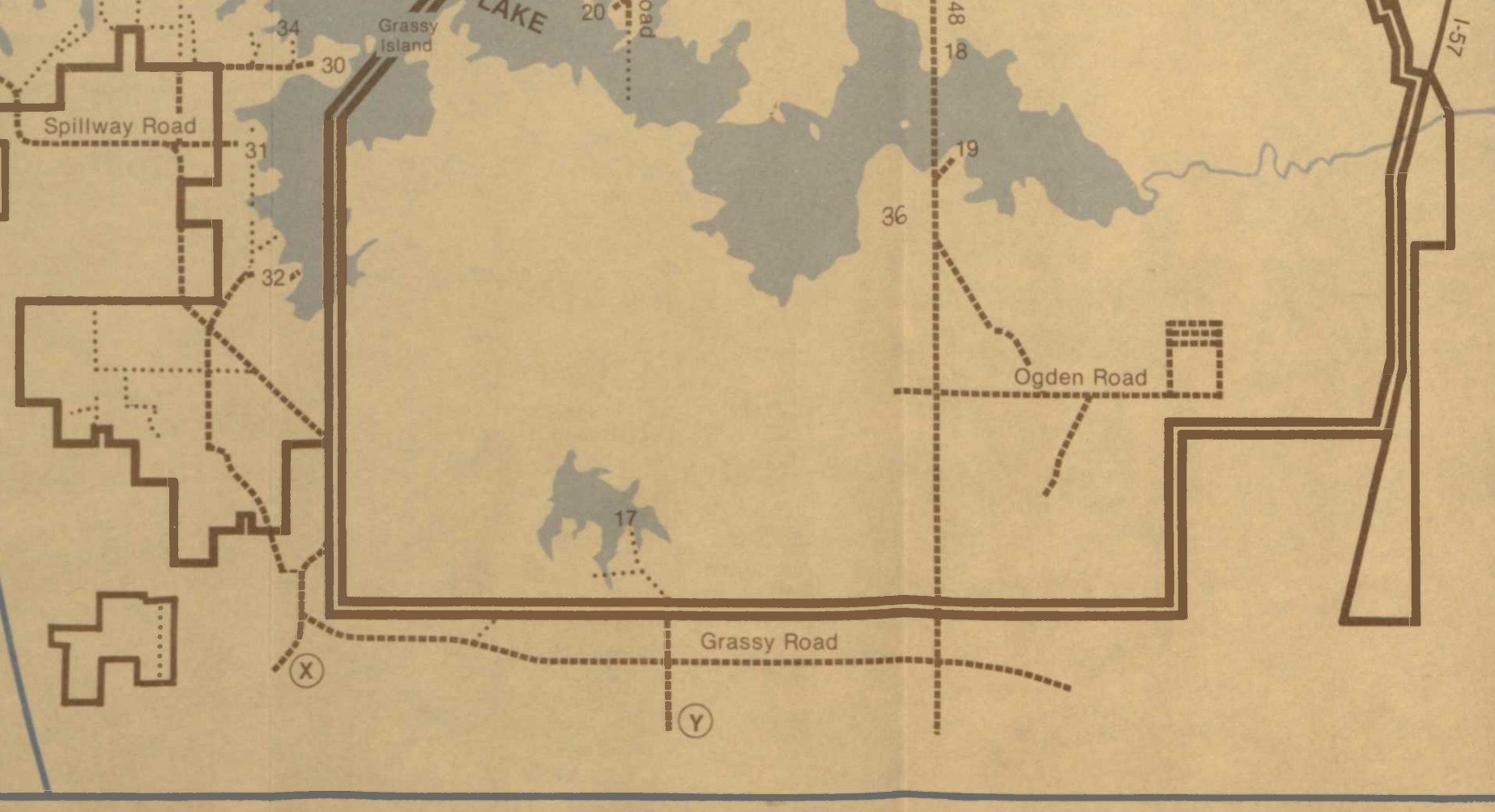
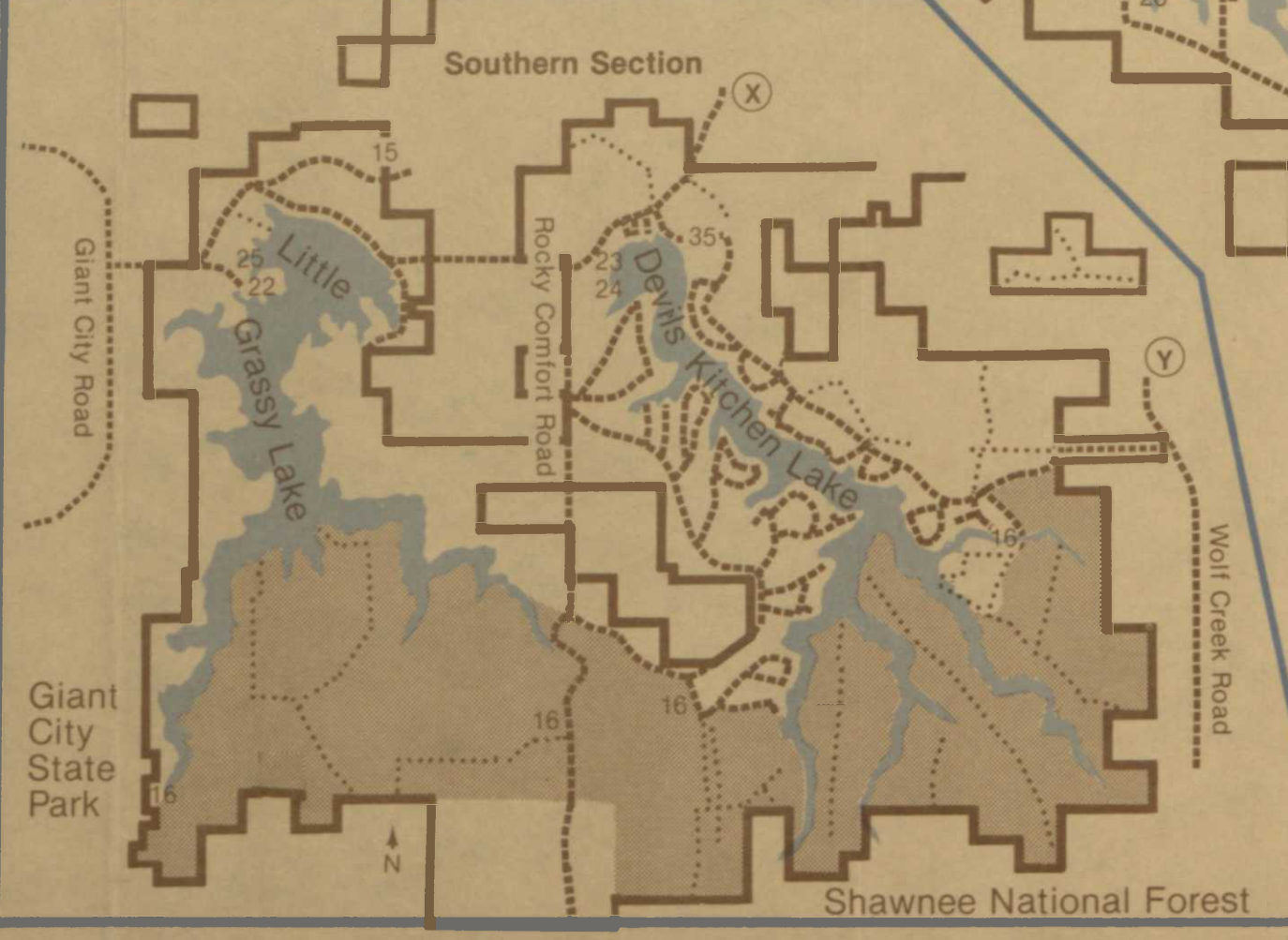
As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



Refuge Location



LEGEND	
	CLOSED AREA No Trespassing
	FOOT TRAFFIC ONLY
	VEHICLE ROAD
	WILDERNESS AREA
1	REFUGE HEADQUARTERS
2	REFUGE SUBHEADQUARTERS
3	CARTERVILLE RECREATION AREA
4	CRAB ORCHARD RECREATION AREA
5	LOOKOUT POINT
6	OLD RT. 13 RECREATION AREA
7	GROUP PICNIC AREA
8	BULLINER POINT
9	CAMBRIA NECK RECREATION AREA
10	CHAMNESSTOWN SCHOOL AREA
11	GATEWAY MARINA
12	PLAYPORT MARINA
13	SAIL BOAT BASIN
14	WATERFOWL DISPLAY POND
15	STATE FISH HATCHERY
16	WILDERNESS AREA ACCESS
17	A-41 FISHING AREA OPEN 4/1 - 10/31
18	RT. 148 NORTH FISHING AREA
19	RT. 148 SOUTH FISHING AREA
20	WOLF CREEK FISHING AREA
21	CRAB ORCHARD CAMPGROUND
22	LITTLE GRASSY CAMPGROUND
23	DEVILS KITCHEN CAMPGROUND
24	DEVILS KITCHEN BOAT RENTAL
25	LITTLE GRASSY BOAT RENTAL
26	CRAB ORCHARD SPILLWAY AREA
27	WEST END BOAT RAMP
28	DOGWOOD LANE
29	DEER GOOSE CHECK STATION
30	GRASSY POINT
31	GRASSY BAY - NORTH ROAD
32	GRASSY BAY - SOUTH ROAD
33	PINEY POINT
34	CONTROLLED GOOSE HUNTING AREA
35	DEVILS KITCHEN DAM
36	OBSERVATION TOWERS



1-57

CRAB ORCHARD NATIONAL WILDLIFE REFUGE - 1984

K. FEED BACK

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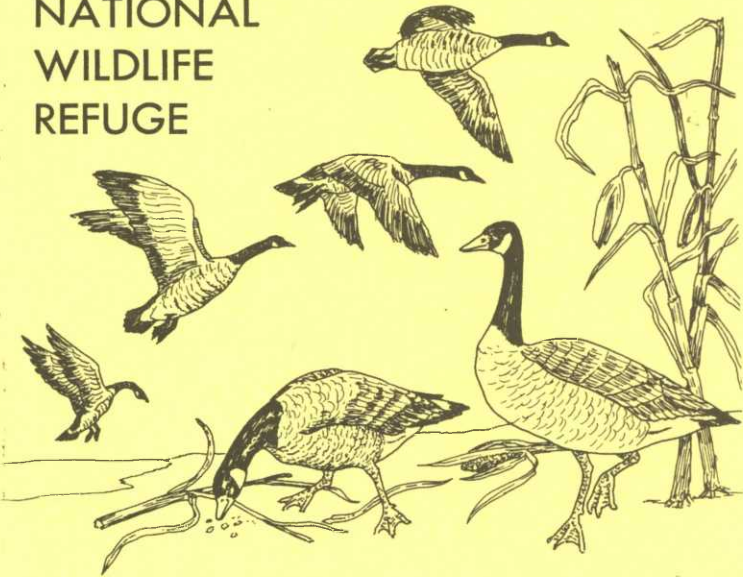
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BIRDS

OF

CRAB ORCHARD NATIONAL WILDLIFE REFUGE



GENERAL INFORMATION

LOONS—GREBES—PELICANS—CORMORANTS—HERONS AND
BITTERNS—GEESE AND DUCKS—VULTURES

HAWKS—EAGLES—OSPREY—FALCONS—QUAIL—TURKEY—RAILS—
COOT—PLOVERS—SNIPES—SANDPIPERS

AVOCET—PHALAROPES—GULLS & TERNS—DOVES—CUCKOOS—
OWLS—GOATSUCKERS—SWIFTS—HUMMINGBIRDS—KING-
FISHERS—WOODPECKERS—FLYCATCHERS—LARKS

SWALLOWS—JAYS—CROWS—CHICKADEES—TITMOUSE—NUTHATCHES—
CREEPERS—WRENS—THRASHERS—THRUSHES & BLUEBIRDS—
GNATCATCHERS—KINGLETS—PIPITS—WAXWINGS—
SHRIKES—STARLINGS

HOUSE SPARROW—MEADOWLARKS—BLACKBIRDS AND ORIOLES

TANAGERS—GROSBEAKS—FINCHES—SPARROWS AND
BUNTINGS—RARE BIRDS

Crab Orchard National Wildlife Refuge covers 43,000 acres in southern Illinois. The primary purpose of the refuge is to provide a winter home with food for thousands of Canada geese and ducks in the Mississippi Flyway.

The refuge area also draws hundreds of other bird species. A rich ecological diversity exists in the area because of its close proximity to the southern transition zone in Illinois. This zone is a meeting point for many north and south plant and animal species. It is marked by a shift in patterns of both climate and soil conditions.

The Art of "Birding"

To be sure of correct identification, use binoculars and a "field guide" to birds. The field guide books note distinguishing characteristics and have colored illustrations with life history facts about every bird in North America. Above all, be **quiet** and **patient**. Stop frequently and look and listen. The birds are there if you give them a chance to appear.

Many people like to keep a "life-list." As you spot birds today, check them off in the spaces in this leaflet. This can be the start of your "life-list."

This bird list contains 238 species which have been recorded on the refuge. Season and abundance are coded as follows:

S—Spring March-May
S—Summer June-August
F—Fall September-November
W—Winter December-February

a-abundant—common species that is very 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 2-5 years

●—nests on refuge

GENERAL INFORMATION

LOONS—GREBES—PELICANS—CORMORANTS—HERONS AND
BITTERNS—GEESE AND DUCKS—VULTURES

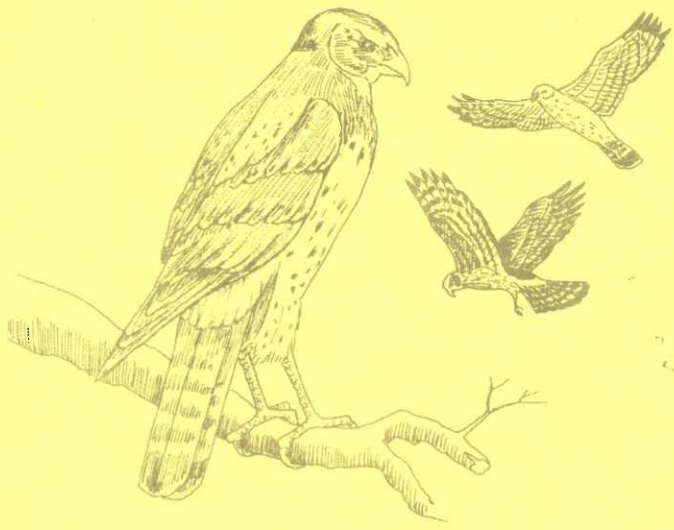
HAWKS—EAGLES—OSPREY—FALCONS—QUAIL—TURKEY—RAILS—
COOT—PLOVERS—SNIPES—SANDPIPERS

AVOCET—PHALAROPES—GULLS & TERNS—DOVES—CUCKOOS—
OWLS—GOATSUCKERS—SWIFTS—HUMMINGBIRDS—KING-
FISHERS—WOODPECKERS—FLYCATCHERS—LARKS

SWALLOWS—JAYS—CROWS—CHICKADEES—TITMOUSE—NUTHATCHES—
CREEPERS—WRENS—THRASHERS—THRUSHES & BLUEBIRDS—
GNATCATCHERS—KINGLETS—PIPITS—WAXWINGS—
SHRIKES—STARLINGS

HOUSE SPARROW—MEADOWLARKS—BLACKBIRDS AND ORIOLES

TANAGERS—GROSBEAKS—FINCHES—SPARROWS AND
BUNTINGS—RARE BIRDS



S S F W

___ Goshawk	r	r	r
___ Sharp-shinned Hawk	o	o	c
___ Cooper's Hawk •	u	u	u
___ Red-tailed Hawk •	c	c	c
___ Red-shouldered Hawk •	c	c	c
___ Broad-winged Hawk •	c	c	u
___ Rough-legged Hawk	u		o
___ Golden Eagle	r		o
___ Bald Eagle	u		u
___ Marsh Hawk •	c	u	c
___ Osprey	o	u	u
___ Pigeon Hawk	r		r
___ Sparrow Hawk •	c	c	c
___ Bobwhite •	c	c	c
___ Turkey •	u	u	u
___ Virginia Rail	u	o	c
___ Sora	o	o	
___ Common Gallinule	r		
___ American Coot	c	u	c
___ Semipalmated Plover	o	o	
___ Killdeer •	c	c	c
___ American Golden Plover	u	o	
___ Black-bellied Plover	u	c	
___ American Woodcock •	c	c	o
___ Common Snipe	c	c	o
___ Upland Plover •	c	c	
___ Spotted Sandpiper •	c	o	c
___ Solitary Sandpiper	u	o	c
___ Greater Yellowlegs	u	o	c
___ Lesser Yellowlegs	o	o	c
___ Pectoral Sandpiper	c	o	c
___ White-rumped Sandpiper			u
___ Baird's Sandpiper	r	o	
___ Least Sandpiper	u	o	c
___ Dunlin	r	o	
___ Dowitcher			o
___ Stilt Sandpiper	r	u	
___ Semipalmated Sandpiper	u	o	
___ Sanderling			u

HAWKS—EAGLES—OSPREY—FALCONS—QUAIL—TURKEY—RAILS—
COOT—PLOVERS—SNIPES—SANDPIPERS

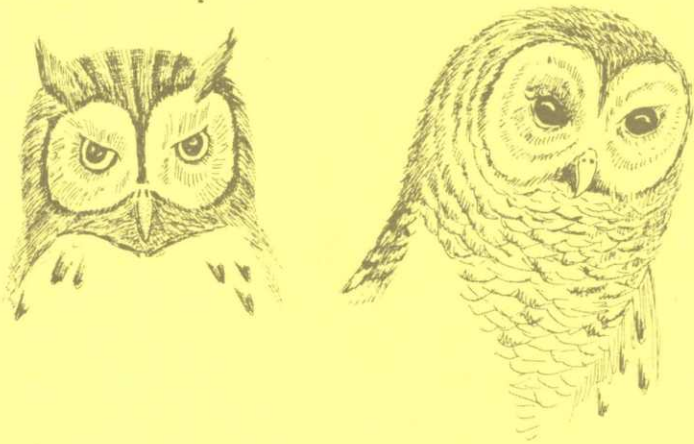
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	S	S	F	W
American Avocet			U	
Wilson's Phalarope	O		U	
Northern Phalarope	O		O	
Herring Gull	C	O	C	C
Ring-billed Gull	C		C	C
Franklin's Gull	U		U	
Bonaparte's Gull	r		C	
Common Tern	C	O	C	
Least Tern		O		
Caspian Tern	O		O	
Black Tern	O	C	O	
Mourning Dove	C	C	C	C
Yellow-billed Cuckoo	O	C	U	
Black-billed Cuckoo	O	U	O	
Screech Owl	O	O	O	O
Great Horned Owl	C	C	C	C
Barred Owl	C	C	C	C
Short-eared Owl	U		r	
Chuck-will's-widow	U	C		
Whip-poor-will	C	C	O	
Common Nighthawk	O	C	O	
Chimney Swift	U	C	O	
Ruby-throated Hummingbird	O	C	O	
Belted Kingfisher	C	C	C	C
Yellow-shafted Flicker	C	C	C	C
Pileated Woodpecker	U	U	U	U
Red-bellied Woodpecker	C	C	C	C
Red-headed Woodpecker	C	C	C	C
Yellow-bellied Sapsucker	O		O	
Hairy Woodpecker	C	C	C	C
Downy Woodpecker	C	C	C	C
Eastern Kingbird	U	C	O	
Great Crested Flycatcher	U	C	O	
Eastern Phoebe	C	C	C	O
Yellow-bellied Flycatcher	U			
Acadian Flycatcher	U	C	O	
Traill's Flycatcher		O		
Least Flycatcher	U		U	
Eastern Wood Pewee	U	C	O	
Olive-sided Flycatcher			r	
Horned Lark	C	C	C	C

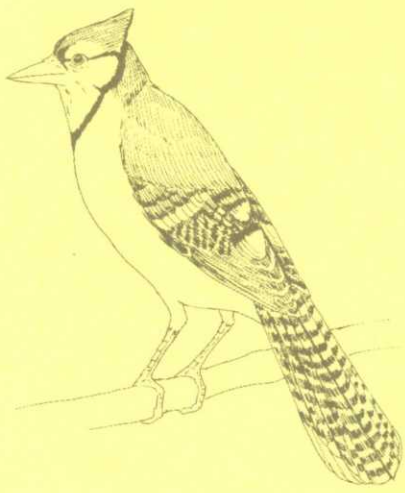


AVOCET—PHALAROPES—GULLS & TERNS—DOVES—CUCKOOS—
OWLS—GOATSUCKERS—SWIFTS—HUMMINGBIRDS—KING-
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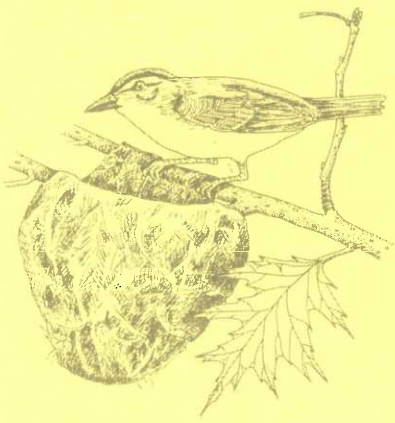
	S	S	F	W
Tree Swallow •	u	c	u	
Bank Swallow	u			
Rough-winged Swallow	o	c	u	
Barn Swallow •	u	c	o	
Cliff Swallow •	u	c	o	
Purple Martin •	c	c	o	
Blue Jay •	c	c	c	c
Common Crow •	c	c	c	c
Black-capped Chickadee	c	u	u	c
Carolina Chickadee •	u	c	c	o
Tufted Titmouse •	c	c	c	c
White-breasted Nuthatch	c	o	u	c
Red-breasted Nuthatch	c		u	r
Brown Creeper	c		o	c
House Wren •	c	c	c	
Winter Wren	c		o	o
Bewick's Wren •	c	c	c	u
Carolina Wren •	c	c	c	c
Long-billed Marsh Wren	o		u	
Short-billed Marsh Wren	o		u	
Mockingbird •	c	c	c	c
Catbird •	u	c	u	
Brown Thrasher •	c	c	c	c
Robin •	c	c	c	o
Wood Thrush •	u	c	o	
Hermit Thrush	u		o	o
Swainson's Thrush	u		u	
Gray-cheeked Thrush	u		u	
Veery	u		r	
Eastern Bluebird •	c	c	c	c
Blue-gray Gnatcatcher •	c	c	o	
Golden-crowned Kinglet	c		c	c
Ruby-crowned Kinglet	o		c	
Water Pipit	r		o	
Cedar Waxwing •	c	c	c	c
Loggerhead Shrike •	c	c	c	u
Starling •	a	a	a	a



SWALLOWS—JAYS—CROWS—CHICKADEES—TITMOUSE—NUTHATCHES—
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HOUSE SPARROW—MEADOWLARKS—BLACKBIRDS AND ORIOLES

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S S F W

___ White-eyed Vireo • -----	c	c	o	
___ Bell's Vireo • -----	u	u	r	
___ Yellow-throated Vireo -----	u	c	o	
___ Solitary Vireo -----	o		u	
___ Red-eyed Vireo • -----	c	c	o	
___ Warbling Vireo • -----	c	c	o	

___ Black-and-white Warbler -----	u	u	o	
___ Prothonotary Warbler • -----	o	c		
___ Swainson's Warbler -----	o			
___ Worm-eating Warbler -----	u		o	
___ Golden-winged Warbler -----	o		r	
___ Blue-winged Warbler -----	u			
___ Tennessee Warbler -----	o		o	
___ Orange-crowned Warbler -----	u		r	
___ Nashville Warbler -----	u		u	
___ Parula Warbler • -----	c	c	u	
___ Yellow Warbler • -----	c	c		
___ Magnolia Warbler -----	u		o	
___ Cape May Warbler -----	u		r	
___ Black-throated Blue Warbler -----	r		r	
___ Myrtle Warbler -----	c		c	
___ Black-throated Green Warbler -----	u		o	
___ Cerulean Warbler • -----	u	o		
___ Blackburnian Warbler -----	u		o	
___ Yellow-throated Warbler • -----	c	u	o	
___ Chestnut-sided Warbler -----	u		u	
___ Bay-breasted Warbler -----	u		o	

___ Blackpoll Warbler -----	u		c	
___ Pine Warbler • -----	u	u	o	
___ Prairie Warbler • -----	c	c	u	
___ Palm Warbler -----	u		u	
___ Ovenbird -----	u		o	
___ Northern Waterthrush -----	u		u	
___ Louisiana Waterthrush • -----	c	c	c	
___ Kentucky Warbler • -----	c	u	u	
___ Mourning Warbler -----	r			
___ Yellowthroat • -----	c	c	c	
___ Yellow-breasted Chat • -----	c	c	u	
___ Hooded Warbler -----	u		o	
___ Wilson's Warbler -----	u		u	
___ Canada Warbler -----	u		o	
___ American Redstart -----	c	u	c	

___ House Sparrow • -----	c	c	c	c
___ Bobolink -----	u			
___ Eastern Meadowlark • -----	c	c	c	c
___ Red-winged Blackbird • -----	c	c	a	c
___ Orchard Oriole • -----	c	c	u	
___ Baltimore Oriole • -----	c	c	o	
___ Rusty Blackbird -----	c		o	o
___ Common Grackle • -----	a	a	a	a
___ Brown-headed Cowbird • -----	c	c	c	c



HOUSE SPARROW—MEADOWLARKS—BLACKBIRDS AND ORIOLES

TANAGERS—GROSBEAKS—FINCHES—SPARROWS AND
BUNTINGS—RARE BIRDS



S S F W

___ Scarlet Tanager	u	o	u	
___ Summer Tanager •	c	c	o	
___ Cardinal •	c	c	c	c
___ Evening Grosbeak				r
___ Rose-breasted Grosbeak	u		u	
___ Blue Grosbeak •	u	u	u	
___ Indigo Bunting •	c	c	u	
___ Dickcissel •	c	c		
___ Purple Finch	c		o	c
___ American Goldfinch •	c	c	c	c
___ Rufous-sided Towhee •	c	c	c	u
___ Savannah Sparrow	c		o	
___ Grasshopper Sparrow •	c	u	u	
___ Henslow's Sparrow	u			
___ Vesper Sparrow	u	r	u	
___ Lark Sparrow	r	r		
___ Bachman's Sparrow •	u	u		
___ Slate-colored Junco	c		c	c
___ Tree Sparrow	c		o	c
___ Chipping Sparrow •	c	c	o	
___ Field Sparrow •	c	c	c	c
___ Harris' Sparrow	o		u	c
___ White-crowned Sparrow	c		c	c
___ White-throated Sparrow	c		c	c
___ Fox Sparrow	u		o	c
___ Lincoln's Sparrow	r		r	
___ Swamp Sparrow	c		c	c
___ Song Sparrow •	c	c	c	c

The following birds are classed as accidentals—seen only once or twice on the refuge and out of normal range.

- ___ Eared Grebe
- ___ Western Grebe
- ___ Snowy Egret
- ___ Whistling Swan
- ___ Brant
- ___ Barrow's Goldeneye
- ___ Surf Scoter
- ___ Mississippi Kite
- ___ Sandhill Crane
- ___ Willet
- ___ Western Sandpiper
- ___ Marbled Godwit
- ___ Ground Dove
- ___ Bachman's Warbler
- ___ Connecticut Warbler
- ___ Brewer's Blackbird
- ___ Western Tanager
- ___ Pine Siskin
- ___ Red Crossbill
- ___ LeConte's Sparrow
- ___ Clay-colored Sparrow
- ___ Lapland Longspur



