

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
FISH AND WILDLIFE SERVICE
P. O. BOX J,
CARTERVILLE, ILLINOIS.

CRAB ORCHARD NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

1971

WATERFOWL

REFUGE Crab Orchard

MONTHS OF September TO December, 19 71

(1) Species	(2) Weeks of reporting period									
	19/7 :	2/14 :	3/21 :	4/28 :	5/5 :	6/12 :	7/19 :	8/26 :	9/2 :	10/9 :
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	100	100	475	750	14,000	18,100	18,100	20,000	44,000	43,000
Cackling										
Brant										
White-fronted										
Snow					10	15	15	25	60	65
Blue					25	135	135	125	140	185
Less Richardson's							100	100	150	150
Ducks:										
Mallard	355	420	525	540	900	1,550	1,750	2,000	5,750	6,500
Black	5	5	25	20	120	260	310	500	2,260	1,700
Gadwall	5	5	15	5	60	100	175	200	65	125
Baldpate	10	65	60	145	835	645	675	800	400	300
Pintail		15	20	30	110	215	290	300	270	175
Green-winged teal	25	55	50	25	70	115	155	250	80	180
Blue-winged teal	135	115	85	85	105	85	70	50	35	15
Cinnamon teal										
Shoveler		10	20	15	40	105	70	60	15	55
Wood	90	90	125	125	125	150	150	100	100	100
Redhead					5	10	15	10	15	25
Ring-necked					20	325	300	400	150	600
Canvasback										
Scaup					5	25	50	200	850	200
Goldeneye										5
Bufflehead										10
Ruddy						5	15	100	65	15
Other Hooded Merg.										20
Coot:										

WATERFOWL
 (Continuation Sheet)

REFUGE Crab Orchard MONTHS OF September TO December, 1971

(1) Species	(2) Weeks of reporting period										(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	11/16	11/23	12/30	13/7	13/14	13/21	13/28	14/4	14/11	14/18		
Swans:												
Whistling												
Trumpeter												
Geese:												
Canada	48,000	30,500	45,000	75,000	70,000	70,000	72,000	72,000	72,000	72,000	3 2000	4,000 675
Cackling												
Brant												
White-fronted												
Snow	15	15	15	15	15	15	15	15	15	15	3 2000	5,000
Blue	100	100	100	100	100	100	100	100	100	100	3 2000	10,000
Other	100	100	100	100	100	100	100	100	100	100	3 2000	10,000
Richardson's	100	100	100	100	100	100	100	100	100	100	3 2000	10,000
Ducks:												
Mallard	6,500	3,700	3,200	7,000	5,400	5,400	5,400	5,400	5,400	5,400	3 2000	11,000
Black	1,700	875	1,400	2,000	2,000	2,000	2,000	2,000	2,000	2,000	3 2000	10,000
Gadwall	125	100	100	100	100	100	100	100	100	100	3 2000	10,000
Baldpate	300	25	25	25	25	25	25	25	25	25	3 2000	10,000
Pintail	125	25	100	100	100	100	100	100	100	100	3 2000	10,000
Green-winged teal	100	60	100	100	100	100	100	100	100	100	3 2000	10,000
Blue-winged teal	15										3 2000	10,000
Cinnamon teal											3 2000	10,000
Shoveler	15	25	100	15	20	20	20	20	20	20	3 2000	10,000
Wood	100	100									3 2000	10,000
Redhead	5	15									3 2000	10,000
Ring-necked	15	15	100	100	100	100	100	100	100	100	3 2000	10,000
Canvasback											3 2000	10,000
Scaup	200	60									3 2000	10,000
Goldeneye	5	15	5	5	10	10	10	10	10	10	3 2000	10,000
Bufflehead	10	40	40	100	100	100	100	100	100	100	3 2000	10,000
Ruddy	15	60	100								3 2000	10,000
Other Hooded Merg.	100	245	100	100	100	100	100	100	100	100	3 2000	10,000
Garter Merg.		30	75	25	100	100	100	100	100	100	3 2000	10,000

(over)

Best possible image.

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	:	:	:	Principal feeding areas
Geese	4,504,545	75,000	:	
Ducks	664,525	10,000	:	Principal nesting areas
Coots	:	:	:	
				Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Crab OrchardMonths of September to December 1957

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Great Blue Heron	Present	at begin-	20	10-19	Still Present					
	ing of	period.								
Green Heron	"	"	10	09-07	2	09-28				
Little Blue Heron	"	"	5	09-14	2	09-21				
Yellow Crown Night Heron	"	"	1	09-07	1	09-07				
American Coot	"	"	1	09-07	1	09-07				
Cattle Egret	"	"	1	09-07	1	09-07				
II. <u>Shorebirds, Gulls and</u>										
<u>Terns:</u>										
Greater Yellow Legs	"	"	5	09-14	5	10-05				
Lesser Yellow Legs	"	"	2	09-14	2	09-28				
Spotted Sandpiper	"	"	1	09-21	1	09-28				
Solitary Sandpiper	"	"	3	09-07	5	09-21				
Common Tern	"	"	3	09-21	3	09-28				
Ring-billed Gull	5	10-05	500	12-28	Still Present					
Bonapartes Gull	5	11-02	50	11-23	25	12-07				
Caspian Tern	1	09-28	The only sighting							
Common Tern -										

(over)

Best possible image.

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Resident									
IV. <u>Predaceous Birds:</u> Golden eagle - Duck hawk Horned owl- Magpie Raven Crow	1	10-19	2	11-30	Still Present					
	Resident									
	Resident									
Bald eagle -	2	11-09	9	12-31	Still Present					
Black Vulture -	1	09-28	Only fighting							
Osprey -	1	10-18	Only fighting							
						Reported by James R. Rice				

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750c
Form NR-1C

WATERFOWL HUNTER KILL SURVEY

Year 1971

Refuge: Crab Orchard

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Weeks of Hunting	No. Hunters Checked	Hunter Hours	Waterfowl Species and Nos. of Each Bagged	Total Bagged	Crippling Loss	Total Kill	Est. No. Hunters	Est. Total Kill
11/15-21	1281	5124	Canada Geese	57	12	69	1306	* *
11/22-28	1409	5676	Canada Geese	59	12	71	1437	
11/29-12/5	1285	5140	Canada Geese	146	29	175	1311	
12/6-12	1071	4284	Canada Geese	80	16	96	1091	
12/13-19	1283	5132	Canada Geese	178	36	214	1309	
12/20-22	633	2532	Canada Geese	117	23	140	645	
TOTALS	6962	27,888		637	128	765	7099	

* * A mandatory registration system is used in public hunting areas. As most hunters bagging geese register their kill, a heavy bias would make a projected kill figure in this column inaccurate.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Crab Orchard

Months of September to December, 19 71

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	Upland brush, meadow and forest edges - Area I - 15,345 Ac.	16			55:45	202			960	Figures based on roadside observations and the natural population renewal index.
	Area II - 18,609 Ac.	13				202			1440	
Turkey	Area II, IV, V				Unknown				150	Figures based on casual observations by Refuge staff.

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	Upland and Bottomland Hardwoods - 14,600 acres. Brushland - 6,900 acres Agricultural land - 5,086 acres. Grasslands - 3,684 acres. Misc. (roads, recreational and industrial sites) - 1,900 acres. TOTAL ACREAGE - 32,170.	900	257				(73	road killed)				3,100	2,770*	0.38: 0.30 0.95
								None						
									321 killed during regular shotgun six-day season (80% taken from Refuge).					
														* Does not include the loss due to dispersion which is still under investigation.

Remarks:

Reported by Darrell D. Uptegraft

3-1751

Form NR-7

Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

(1)

Refuge Crab OrchardYear 19 71

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Small Food Plots in Various Locations.		500	Autumn Olive	April	Good	
							Selected Recreation Areas		250	Various Species	Spring	Good	

(1) Report agronomic farm crops on Form NR-8

(2) C = Collections and R = Receipts

(3) Use "S" to denote surplus

Total acreage planted:

Marsh and aquatic

Hedgerows, cover patches

Food strips, food patches About 2

Forest plantings

Remarks:

CULTIVATED CROPS - HAYING - GRAZING

Refuge Crab Orchard County Williamson State Illinois

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn	1418.3	65,000	68.2	4,100	381.5	22,900	1868.0	Clover	1367.5
Milo	618.6	61,860	16.4	1,640	188.0	18,800	823.0	Wheat	426.0
Clover	1046.0	- -					1046.0		
Oats and Clover	321.5	6,440					321.5		
Lespedeza	48.0	- -					48.0		
Soybeans	13.0	- -					13.0		
Buckwheat					62.0	620	62.0		
Rice					37.0	2200	37.0		
								Fallow Ag. Land.	420

No. of Permittees: Agricultural Operations 20 Haying Operations 1 Grazing Operations 13

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	543	2260	5085	1,775
				2. Other				
				1. Total Refuge Acreage Under Cultivation				4,644
Hay - Wild				2. Acreage Cultivated as Service Operation				

CULTIVATED CROPS - HAYING - GRAZING

Refuge Crab Orchard County Jackson State Illinois

Cultivated Crops Grown	Permittee's		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Share Harvested		Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons.			
Corn	24.0	960 bu.	6	240 bu.					
Wheat & Clover	30.0								
Clover	18.5								
								Fallow Ag. Land.	

No. of Permittees:	Agricultural Operations	1	Haying Operations	Grazing Operations	1
--------------------	-------------------------	---	-------------------	--------------------	---

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	25	150	337.50	122
				2. Other				
				1. Total Refuge Acreage Under Cultivation				
Hay - Wild			2. Acreage Cultivated as Service Operation					

REFUGE GRAIN REPORT

71

Refuge Crab OrchardMonths of January through December, 1955

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Big Blue Stem		30 lbs	30 lbs		30 lbs						
Indian Grass		25 lbs	25 lbs		25 lbs						
Side Oats Granma		10 lbs	10 lbs		10 lbs						
Switch Grass		10 lbs	10 lbs		10 lbs						
Little Blue Stem		2 lbs	2 lbs		2 lbs						
Winter Wheat		2,000 bu.	2,000 bu.		2,000 bu.						
Wheat		150 bu.	150 bu.		150 bu.						
Buckwheat		5,000 lbs	5000 lbs		5,000 lbs						
Rice		50 bu.	50 bu.		50 bu.						
Milo		300 lbs	300 lbs		300 lbs						
Corn, Seed		1 bu.	1 bu.		1 bu.						
Corn, Shelled		2535.8	2,535.8			1335.8	1335.8	1200		1200	
Milo		120 bu.	120 bu.		120 bu.	120 bu.	120 bu.				

(8) Indicate shipping or collection points _____

(9) Grain is stored at Crab Orchard Refuge

(10) Remarks _____

*See instructions on back.

TIMBER REMOVAL

Refuge...Crab Orchard..... Year 1957

Permittee	Permit No.	Forest Mgmt. Compartment -Unit-or- -Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Rametta, Andy	SUP-40-71	20	15	Posts 150 ea. Cords 8 Cords 24 Cords 8 Cords 5	.09 ea 5.00 .50 1.50 .50	13.50 40.00 12.00 12.00 2.50	3"x6" dia X 7' 1gth Mine Props Pulpwood Pulpwood Fuelwood	Black Locust White Oak Mix. Hardwood Pine Mix. Hardwood
Wyatt, Wm. H.	SUP-20-72	5	5	Cords 20	1.00	20.00	Fuelwood	White Oak
Rametta, Andy	SUP-24-72	17	5	MBM 17.518	Variable	143.80	Sawlogs	Mix. Hardwood
" "	SUP-26-72	20	10	MBM 19.451	"	310.84	"	" "
" "	SUP-19-72	14	5	MBM 15.518	"	197.80	"	" "
" "	SUP-23-72	20	10	MBM 18.098	"	238.18	"	" "
Wyatt, Wm. H.	SUP-16-71	12	1	Posts 80	.09 ea	7.20	3"-6" dia X 7' 1gth	Black Locust
" "	SUP-9-71	5	1	Posts 300	.09 ea	27.00	"	" "
" "	SUP-11-72	11	1	Posts 300	.09 ea	27.00	"	" "
Kelly, Vernon	SUP-12-71	21	2	Posts 350	"	31.50	"	" "
Kelly, Herschel	SUP-106-70	25	1	Posts 200	"	18.00	"	" "
Cummins, Steve	SUP-11-71	2	1	Posts 200	"	18.00	"	" "
Pitts, Rodney	SUP-8-71	25	2	Posts 700	"	63.00	"	" "
Joyner, Charles	SUP-17-71	2	1	Posts 300	"	27.00	"	" "
Reed, David	SUP-3-71	25	1	Posts 200	"	18.00	"	" "

Total acreage cut over 61..... Total income 1227.32.....

No. of units removed B. F. 70,585..... Method of slash disposal Lop and scatter.....
Cords 65.0.....
Posts - Ties 2,780.....

N A R R A T I V E R E P O R T

1971

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

CRAB ORCHARD NATIONAL WILDLIFE REFUGE
Post Office Box J
Carterville, Illinois - 62918

CRAB ORCHARD NATIONAL WILDLIFE REFUGE

R E F U G E S T A F F

Administrative, Managerial and Technical

L. A. MEHRHOFF.PROJECT MANAGER
DARRELL D. UPTGRAFT. REFUGE MANAGER
G. HILEY HUNTER. ADMINISTRATIVE OFFICER
WESLEY F. JAMES. ADMINISTRATIVE OFFICER
EDWARD H. NICHOLS.PUBLIC USE SPECIALIST
LEROY E. HOVELL. SOIL CONSERVATIONIST
RICHARD J. JOHNSON.FORESTER
JAMES R. RICE. BIOLOGICAL TECHNICIAN (WILDLIFE)
GORDON W. TRIPP.FORESTRY TECHNICIAN
ROBERT E. WILSON.WILDLIFE BIOLOGIST (GENERAL)
H. T. GUALDONI.REFUGE CLERK
ESTHER M. DUNGEY.CLERK-STENOGRAPHER
MARSOLIE MCCARTY.CLERK-STENOGRAPHER
STELLA M. GRIMES. FISCAL ACCOUNTING CLERK
WILLIAM J. MCCOY. PUBLIC USE SPECIALIST
GERALD GAFFNEY.OUTDOOR LABORATORY COORDINATOR (PART TIME)

Construction, Operations and Maintenance

J. J. PICKAR.MAINTENANCE & OPERATIONS FOREMAN
R. E. GOLDSMITH. AUTO & ENGINEERING EQUIP. REPAIRER FOREMAN
R. L. BASLER.FIRE CHIEF
A. G. BOLES. WATER TREATMENT PLANT OPERATOR FOREMAN

W. T. CAMPBELL.MAINTENANCEMAN FOREMAN
 J. T. GIBBENS . . . (Deceased 5/15/71).FIREFIGHTER
 W. E. WEBB.FIREFIGHTER
 K. W. SUMMERS FIREFIGHTER
 L. J. GASS FIREFIGHTER
 C. B. ORANGE FIREFIGHTER
 H. L. SUMMERSGUARD
 J. E. STEPHENS GUARD
 J. A. DEJULIOGUARD
 J. E. BRUSHGUARD
 M. L. MILAMGUARD
 J. C. COX. FILTER & DISPOSAL PLANT OPERATOR
 H. L. DAVIS. FILTER & DISPOSAL PLANT OPERATOR
 J. C. LILLICH.FILTER & DISPOSAL PLANT OPERATOR
 L. R. PARKS.(Deceased 4/24/71). FILTER & DISPOSAL PLANT OPERATOR
 H. L. CARNER. FILTER & DISPOSAL PLANT OPERATOR
 J. C. CALCATERRA. BUILDING REPAIRMAN
 C. L. DAVIS.BUILDING REPAIRMAN
 W. C. HERRING. . . (Retired 2/28/71). OPERATOR GENERAL
 L. MORSE.ENGINEERING EQUIPMENT OPERATOR
 E. E. DARNELL. ENGINEERING EQUIPMENT OPERATOR
 L. R. TIPPY. ENGINEERING EQUIPMENT OPERATOR
 R. H. HOWELL.BUILDING REPAIRMAN WORKER (PLUMBING)
 C. ADAMS AUTOMOTIVE WORKER
 R. MASSIEAUTOMOTIVE WORKER

G. L. HANKS.MECHANIC'S HELPER, AUTOMOTIVE
 J. H. MOORE. MAINTENANCEMAN
 T. GALINES. MAINTENANCEMAN
 W. J. STACEYMAINTENANCEMAN
 J. L. SMITH MAINTENANCEMAN
 R. L. VENEGONIMAINTENANCEMAN
 J. A. NEWBURY MAINTENANCEMAN
 G. STAPLETON. MAINTENANCEMAN
 C. L. FLORA LABORER
 J. TAYLOR. LABORER
 E. W. SHEW LABORER
 R. L. WOODSUMLABORER

Temporary Help

28 Employees - WAE

- 9 - Laborers
- 3 - Patrolmen
- 7 - Lifeguards
- 5 - Fee Collectors
- 2 - Maintenance Workers
- 2 - Recreational Aids

C O N T E N T S

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I. GENERAL

A. Weather Conditions

	<u>Month</u>	<u>Precipitation</u> <u>Normal</u>	<u>Snowfall</u>	<u>Max.</u> <u>Temp.</u>	<u>Min.</u> <u>Temp.</u>
January	2.23	3.68	-	59	6
February	4.98	3.75	4.58	69	5
March	1.00	4.63	.14	74	19
April	2.66	4.40	9.50	86	27
May	6.33	4.58	.00	85	33
June	2.79	3.64	.00	99	50
July	3.04	3.16	.00	98	52
August	4.56	4.01	.00	92	52
September	0.96	3.56	.00	100	44
October	1.05	3.46	.00	99	38
November	0.94	3.30	.15	86	20
December	<u>3.87</u>	<u>3.27</u>	<u>.00</u>	<u>74</u>	<u>14</u>
Annual Totals:	34.41	45.44	14.37 Ext. 100		5

Climatic conditions for 1971 were unusual in all aspects.

There were only 86 days of measurable rain for a total rainfall of 34.41 inches. This is 11.03 inches below the normal. May, with 12 days of rain measuring 6.33 inches, was our wettest month. Only three heavy rains occurred during the year. February 21 showered us with a 1.69 inch rain; 2.13 inches fell on April 28, and the heaviest of the year -- a 2.20 inch rainfall occurred on August 22.

Our heaviest snow of the year was on April 6, when we had a 9.5 inch snowfall. Temperatures during the year were considered mild. Only three days of 100 degree temperature for the entire

year, and they came on September 9, 10, and 14. Our coldest day was February 13, when the temperature fell to 5 degrees above zero.

Weather data was obtained from the U. S. Forest Service Wood Pilot Plant located at Southern Illinois University's Vocational Training Institute in Area II of the Refuge.

B. Habitat Conditions

1. Water

Crab Orchard Lake

The biggest problem on Crab Orchard Lake is bank erosion. This has long been a problem, but what really points it out is that the east point on Wolf Creek Bay has eroded 790 feet since the lake filled.

A study of the lake's history shows that most of the erosion occurred in the spring when the lake was above spillway. We attempted to keep the lake at spillway elevation in the spring and summer, but February rains caught us off guard, and we got off to a bad start. The following table compares results to years 1970 and 1969:

	<u>1971</u>		<u>1970</u>		<u>1969</u>	
<u>Month</u>	<u>Silt</u> <u>ppm</u>	<u>Lake</u> <u>Level</u>	<u>Silt</u> <u>ppm</u>	<u>Lake</u> <u>Level</u>	<u>Silt</u> <u>ppm</u>	<u>Lake</u> <u>Level</u>
January	45	405.0	32	405.2	85	405.5
February	71	405.6	36	405.3	148	405.6
March	77	404.9	56	405.6	83	405.2
April	37	405.0	103	405.9	78	405.6
May	93	405.2	88	405.6	85	405.9
June	97	405.1	111	405.4	140	405.5
July	95	404.7	100	404.9	125	405.3
August	94	405.1	109	404.6	95	405.1
September	69	404.9	94	404.5	84	404.8
October	64	404.7	70	404.1	80	404.0
November	49	403.1	61	403.7	62	403.5
December	53	403.4	32	403.4	45	403.9
Ave.	70		74		93	

This shows the silt content dropped 28% from the 1969 average. We believe we can improve this, however before improvement can be made we must set up an inspection and maintenance schedule on the control valves. This should have been done years ago. At the present time one valve is inoperable, and the other is operated at only 40% efficiency. We are in the process of getting both valves checked, oiled and repaired so that 100% efficiency can be achieved. This should lower the silt average to 60-65 ppm. No runoff change is reflected in this; it is all due to slowing shoreline erosion.



One way to stop shoreline erosion. Bald cypress occur on Crab Orchard Lake, but as far as is known all were planted. (McCoy)

Little Grassy Lake

A thorough check of Little Grassy Lake controls is in the making. Here again, there has been no inspection or maintenance for several years. Engineers are now requesting an appropriation to rebuild the valve house, hydraulic controls, the ventilation system, and water outlet. We will not operate the valve until it is completed.

Devils Kitchen Lake

No manipulation of this lake was done this year. This dam has a regular maintenance and inspection schedule.

2. Food and Cover

Generally, the food on the area this year was good. This can be summarized by saying the following foods were left in the fields:

23,000 bushels of standing corn

19,000 bushels of milo

6,000 bushels of waste grain

2,200 bushels of rice.

We were concerned about the way geese might accept the milo. Four rows were left standing out of each 16 rows.

A lack of wheat due to an army worm invasion caused the geese to resort to buckwheat and clover first. Then came the corn and, last of all, geese and ducks cleaned the milo and then went back to corn and clover. Complete utilization was achieved by January 15. However, the geese continued to pick on the pastures and the neighboring farmers.

Ducks and geese fought the few blackbirds and ate the rice early in the season.

Food was plentiful for quail and doves. The milo provided an ideal place for the seed eaters such as cardinals, sparrows etc. Eighteen male cardinals were observed in an area approximately 25 feet square in a milo field on Wolf Creek Road.

Mast crops were light, but the corn carried a bumper crop of squirrels. Rabbits are doing fair in the clover.

Deer food is not plentiful. The honeysuckle is over-browsed, and in a few areas trees are showing a browse line. Deer, being crepuscular animals, continue to move into the clover fields in the twilight hours where herds numbering as high as 100 or more have been observed.

II. WILDLIFE

A. Migratory Birds1. Geese

Our expectations as to the arrival of the first migrant geese were correct. Forty honkers were sighted September 23, resting in the pasture field north of Crab Orchard Bay. The flock buildup was fast this year -- by October 3, 4,000 birds had arrived, and the first aerial survey on November 8 showed 43,000 on the area. During this same period the aerial survey showed 1200 at Ballard County, Kentucky; 28,000 at Horseshoe Lake; and 10,000 at the Union County area here in Southern Illinois. Our flock peaked at 75,000 the week of December 15. A small flock of 300 Hutchins (Branta canadensis Hutchinsi) used the area for a short time. Some of these fell to the gun during hunting season.

Some 500 blue and snow geese utilized Crab Orchard Bay and the A-27 area for a short time before moving on south.

It may be interesting to note the results of the coordinated December Goose Inventory for all Southern Illinois and Ballard County, Kentucky:

Crab Orchard Lake -	70,000
Union County -	50,000
Horseshoe Lake -	70,000
Rend Lake -	6,000
Mermet -	2,000
Ballard County, Kentucky -	27,000

Banding

We were disappointed at the termination of the goose banding program at this station. As previously reported, we have phased out the cannon net and have two large swim-in traps. With these traps we can band our quota in a very short time, and the cost is at the minimum.

No ducks or mourning doves were banded during this period.

Since we received several inquiries concerning the swim-in trap, a series of explanatory photographs is included here.



Both refuge traps are constructed in diked depressions for water level control. (McCoy)



The trap is baited by carrying in corn. (McCoy)



In the right of the picture note how the wall forms a V-shaped funnel to guide the unsuspecting geese through the small water level opening. There are three such entrances.

(McCoy)



The trap runs onto dry land for a resting area and herding corral.

(McCoy)



Once the birds are enclosed in the herding corral, they will move through the door shute into the banding boxes. (McCoy)

2. Ducks

The duck population remains static. Records indicate this for the past five years. The mallard remains the dominant species, counting for 50 percent of the population, with 17 species making up the other 50 percent. The duck population peaked at 10,000 birds the first week of November.

Duck production was down compared to last year. This was due in part to the eroding and loss of some of the islands in Crab Orchard Lake. These islands are the principal nesting sites for the mallards.

3. Coot

Approximately 1,000 coot were observed during the summer months. The greater percentage of these utilized the picnic and beach areas, feeding on the grass and in the mowed sections of these areas.

4. Swan

Nothing to report.

5. Mourning Dove

Large concentrations of dove were observed in the closed area of the refuge prior to the opening of hunting season. We estimate a ten percent increase over last year. The dove hunter should have much better luck this year.

No banding of mourning doves was done this period. Job priorities were the main reason for this.

6. Water and Marsh Birds

The common egret and the little blue heron are still on the decline. Only 20 egret showed up this past summer. Only 5 little blues were sighted this time compared to 15 a year ago. The yellow-crowned night heron is holding its own. Six nests were found in the Crab Orchard Creek area. The success of production is uncertain.

A lone cattle egret moved into the A-27 pond area and stayed through the month of July.

Black-crowned night herons were sighted again this year for the third straight year. Their stay is approximately seven weeks.

The great blue heron remains the most stabilized of all species using the area.

7. Shorebirds, Gulls and Terns

A noticeable decline in shorebirds occurred for the second consecutive year. Only nine species were sighted, and none of these in large numbers. The common snipe was the most prevalent of the species.

One Caspian tern sighting was made during September. The killdeer is a resident and a common nester of the area.



Active killdeer nest was abandoned after late April snow. Month of May proved more favorable as shown by camouflaged young. (Rice)



(McCoy)

B. Upland Game Birds

1. Quail

Winter carryover quail counts indicate a population about the same as in 1970. The state-wide breeding population was approximately 20 percent lower than in 1970 and about 25 percent lower than the 1968-69 high.

Our production indicates a few more young birds than last year. Overall, we probably will have much the same quail population as last year.

Quail hunters probably will find about the same number of birds as last year, and as usual, the best hunting will be in the south and southwest part of the state.



Prescribed burning is considered one of our most valuable quail management tools because it has proven very favorable to partridge pea production. (Johnson)

C. Big Game Animals

Deer

Research on the whitetail deer continues and is currently in the 10th year of the project.

NR-3 reflects the current population dynamics of this research. Population estimates are believed to be quite accurate at this time, with the exception of one unknown factor which is dispersion. Research is now being concentrated in this area. Although the population is quite high at nearly 3,000 animals, the habitat has not shown any serious decrease in quality as yet. The physical condition of the deer remains excellent.

Current population estimates as of December 31, in Area II (closed) is 2,100, and 670 deer in Areas I and III (open to public), for a total of 2,770. There was a total of 73 deer road-killed during 1971. A total of 321 deer was killed during the regular 6-day shotgun season in Williamson County (refer to section on hunting).



For the dispersion study the deer are marked with numbered collars, with ear tags, colored ribbons or radio transmitters. (Mehrhoff)

Turkey

Studies are being carried out for the first time this year. These studies are conducted by the Cooperative Wildlife Research Laboratory at Southern Illinois University. No work prior to this time has been done. All estimates as to numbers using the refuge have been made from casual sightings by staff personnel. Only one brood sighting occurred this season. A hen and nine young were sighted several times on the West Gate road near Big Grassy Creek.

D. Fur Animals, Predators, Rodents, and Other Mammals

The beaver population continues to climb. Lodges are scattered throughout the entire refuge waterways. One very active family has taken up housekeeping on one of the small islands in Crab Orchard Lake.

The muskrat population continues to be somewhat of a problem in the farm ponds.

Other populations such as fox, woodchuck etc. appear to be normal for this area. No work has been done to determine the density of these species.

E. Hawks, Owls and Eagles

A Bald eagle was sighted on September 17 of this year. This is the earliest sighting recorded at Crab Orchard. This is one month earlier than last year.

Red-tailed and Sparrow hawks continue to be the dominant hawk species.

Great horned and Barred owls continue to nest on the Refuge.

F. Other Birds

Nothing unusual to report.

G. Fish

The Fourth Annual Southern Illinois Bass Fishing Team Championship tournament was held on Crab Orchard Lake April 17 and 18. This contest is sponsored by a local bass fishing club and is limited to Illinois residents. It is one of the largest team championships in the midwest.

The critics who condemn bass tournaments because they say it has a detrimental effect on the game fish population of a lake had no argument when this tournament ended. Of the 310 largemouth bass caught, 250 were lip banded and returned unharmed to Crab Orchard Lake.



Note the band on the upper lip.

(mehrhoff)



Jim Harrison, biologist for the Central States Fishery Station, returns a bass to the lake after measuring and banding the fish.

(mehrhoff)

H. Reptiles

Occasional sightings of copperheads were reported throughout the summer. One student was bitten by a copperhead while camping at the Southern Illinois University camp at Little Grassy Lake.

Three persons reported being bitten by water snakes while waterskiing on Crab Orchard Lake.

I. Disease

Nothing to report.

J. Rare and Endangered Species

The Bald and Golden eagles are appearing in small numbers again this year. A Bald and two Golden were sighted on our last survey. No nesting occurs by these species.

One Osprey was sighted in October. This was the only sighting for the year.

No other sightings for the endangered species have been recorded.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

The wildlife habitat improvement program progressed at a steady rate. Brush removal and plantings of wildlife food-producing trees and shrubs are the primary improvements being made.

Field and pond work included gully erosion control, brush removal on pond dikes, pond and lake riprapping, reshaping of fields through fence row removal, building removal and junk collection on newly acquired land, fertilizing, seeding, mowing, and Johnson grass control. The soil and moisture program had some diversion this year. The shoreline erosion problem was studied and attacked. Ponds were repaired and field checks were made. Several erosion problems were worked on, and 355 acres acquired from Logan College was worked into the plan.

Recreational maintenance followed the normal routine necessary for the upkeep of 312 campground sites, four public beaches, ten picnic areas, and 28 boat docks. This routine includes sign placement, road repair, trash collection, mowing, staining of restrooms and picnic tables, placement of barrier posts, dock repairs, spreading of sand on the various beaches, and installation of goose hunter registration stations.

The Buildings and Grounds maintenance crew was kept busy as usual. With over 500 buildings of World War II vintage, of which 19 are government living quarters, there is always something requiring repair or replacement.

Equipment maintenance involved the upkeep of over 40 units of rolling stock, 30 units of heavy equipment, 2 locomotives, and many smaller pieces of equipment such as gas pumps, water pumps, power saws and mowers. The preventive maintenance and safety check program requires all equipment to be checked every 3,000 miles or every three months, whichever applies. A continuous welding program through the year keeps the men busy on rainy days fabricating grills, tanks, pipe sign hangers, gates, metal truck beds, and other automotive parts that are less expensive to repair than to purchase.

B. Plantings

1. Aquatic and Marsh Plants

On October 30 and 31, 1971, the following aquatic food plants purchased from Game Food Nurseries in Oshkosh, Wisconsin were

planted in a 1/4 acre pond along the Charnesstown School Trail:

<u>Description</u>	<u>Quantity</u>
Wild Celery (<u>Vallisneria Spiralis</u>)	100 tubers
Sago Pondweed (<u>Potamogeton Pectinatus</u>)	100 tubers
Burreed Roots (<u>Sparganium</u>)	100 roots
Three-Square Rush (<u>Scirpus Americanus</u>)	100 roots
Hard Stem Bulrush (<u>Scirpus acutus</u>)	100 rootstocks
Wapato Duck Potato (<u>Sagittaria Latifolia</u>)	100 tubers
Giant Wild Rice (<u>Zizania Aquatica</u>)	2 lbs.

2. Trees and Shrubs

About 500 Autumn olive trees were planted on selected sites throughout the refuge for habitat improvement. Over 250 trees and shrubs of various species were planted as ornamentals and wildlife food-producers on the Charnesstown School Trail.

No forest plantings were done this year.

3. Cultivated Crops

The Southern corn blight caused some major changes in the farming at Crab Orchard this year. A large variety of seed was used. Every permittee was hunting "N" varieties of corn for seed and trying blends and open-pollinated seed. We ended up with yields ranging from 10 to 90 bushels per acre. By far the poorest yield was some Trojan seed rated as "N" planted in A-6 unit. This was susceptible to the blight, and some was not harvested. This was the only failure on the area. The rest of the crops paid their way.

We planted 823 acres of milo on the area. Yields ran from 60 to 140 bushels per acre with very few fields less than 90 bushels.



There were two types of milo seed heads produced.
The tight head is susceptible to feeding birds.
The loose milo seed head discourages feeding birds.
(McCoy)

These two grain crops varied in moisture conditions at maturity. Two farmers got driers this year. Driers were in great demand, and some farmers lost money when they could not get their grain dried.

One of the surprising things about the earlier milo was that it headed again from "suckers" after combining. One farmer wanted to combine a second time.

We planted buckwheat about July 25 in Crab Orchard Bay. Rains drowned out the stand the first week in August. We then planted wheat in the bay and more buckwheat and wheat on the upland. The wheat in Crab Orchard Bay got 2.2 inches of rain on August 22, and drowned. Army worms hit all the upland wheat and devoured better than 90 percent of the stand during the latter part of August.

Wheat planted off the refuge was not affected by the Army worm. This was the first time this pest has occurred in noticeable numbers on Crab Orchard.

The rice did well. A lower yield was caused by millet competition and fertilization problems (budget).

One more thing should be said about the corn. In this area it is generally true that "N" varieties survived the blight. However, blight was present in all stands. We cannot say definitely that blight encouraged other troubles, but:

1. Corn did not seem to respond adequately to nitrogen application.
2. Stalk rot was so severe as to cause a complete lodging of corn left in the field (geese liked this).
3. Yellow leaf blight, Southwestern corn borer, European corn borer, aphids, root rot, smut, etc. had a general field day.

It appears that it will be some time before 100-bushel yields are common here.



Flowering buckwheat in the latter part of
August -- the honey bee's delight. (McCoy)



Same buckwheat field as above, only in November.
The geese really went for it. (McCoy)

C. Collections and Receipts

At the present time there is one stand of native prairie grass on the area. This is an Indian grass stand near the old Sangamo area. We plan to clear the scattered brush out by hand and burn to increase the stand.

Near the Channesstown School Trail there was a field of little value. This year we sowed 45 lbs. of Big Blue Stem, 25 lbs. of Indian grass, 10 lbs. Side Oats Grama, 10 lbs. Switch grass, and some Little Blue Stem received from the Wilson Seed Farms, Polk, Nebraska. The idea is to establish a demonstration plot of native grasses.

Planting took place on July 12 because that was the earliest date a Nesbit Seed Drill was available from the Illinois Highway Department. On July 13 a beautiful rain came -- the first in a month. All species caught but the Little Blue Stem and Indian grass. The other species are doing well. This fall we gathered seed from compass plants and sowed on the area.

Wheat seed was received from DeSoto Refuge.



The Big Blue Stem reached 18 inches in height by the end of the grow-season. (McCoy)

D. Control of Vegetation

Vegetation control is done mostly by farmers. Atrazine has become a "standby", and farmers here insist on treating corn with this product.

As a result there is good broadleaf control but very little grass control. It takes constant checks and consultation with permittees to encourage grass control.

The big problem is foxtail. This seriously hurts yields of corn. However, wildlife does utilize the seed and cover. Even geese feed on the seed.

We do not force the issue but let the quail, doves, and rabbits have their day. The advice and encouragement given the farmer is more to show him a profit and improve his methods.

The Paraquat-Atrazine combination or Paraquat-Atrazine-Ramrod combinations used for zero-till farming are very good for soil conservation. No adverse effects have been observed. Good weed control is achieved, and crops are comparable to conventional tillage. Mulching is complete with the dead vegetation on first-year corn, and practically no erosion occurs (less than 0.5 ton per acre).

There are two weeds that continue to give the farmers trouble with the best use of herbicides. These are Johnson grass and cocklebur. At present, Johnson grass occurs in small spots and Dalapon controls it. If the grass spreads to large areas, we have no effective control.



A typical stand of Johnson grass on Crab Orchard Refuge. The short dark green grass is July planted Big Blue Stem. (McCoy)

E. Planned Burning

Controlled fire is prescribed for use on selected areas to improve upland game habitat, to reduce hardwood brush density, and to reduce the hazardous wildfire fuel buildup.

About 145 acres of shortleaf pine plantation were burned this year prior to pulpwood marking, and 466 acres of brushland were burned, for a total of 611 acres.



Note the recently worked fire break. After the prescribed burning season is over, these breaks are seeded and used as fire lanes. Which side would you rather mark for a timber sale?

(Johnson)



This prescribed burn is to improve upland game habitat by setting back succession and making more food available in the form of new sprouts. (Johnson)



Here is the same scene as above, only one month later. (Johnson)

F. Forest and Range Fires

During 1971 there were four field fires on the refuge. About two acres of grass and brush was burned. There was no reportable resource damage from the fires. Two of the fires were started by smokers, one by a powerline failure, and one was a deliberate incendiary attempt. Fortunately, an alert youngster saw what was going on and promptly reported the incident. As a result, just a small spot was burned by the time we were able to put out the fire.

IV. RESOURCE MANAGEMENT

A. Grazing

Grazing usage of the refuge was low again this year. The reason was the high price of calves and our pasture fee. We do not wish to change the pasture fee, but if the price of cattle drops, the pasture fee may be lowered since farmers' profit is cut.

Gains on cattle were fair to good, with the lespedeza pastures doing the best.

A dry spell in August caused some concern, but 2.2 inches of rain on the 22nd revived the pasture.

B. Haying

All haying is in rotations and was discussed under "Cultivated Crops".

C. Fur Harvest

No trapping was done by refuge personnel.

D. Timber Removal

Timber sale activity was slower this year compared to 1970. Markets remain relatively strong for mature hardwood sawlogs, but our acreage of this material is limited.

We have an abundance of intermediate size hardwoods and pine plantations, but the markets for this material is limited. However, there are indications that the local paper mills and post treating plants may become more active, so we are hoping next year will be better.

The main problem with the refuge forest is an imbalanced age class distribution. A secondary problem is species composition. A vigorous commercial thinning program would help both of these situations. We are in the process of marking about 160 acres of shortleaf pine plantation for sale as either pulpwood or post and pole material. The trees are selectively marked to insure that the residual stand is of the best value possible for future use. The yield will be over ten cords per acre.

In summary, the 1970 timber sales program produced 70,585 board feet of hardwood sawlogs, 65 cords hardwood mine props and fuelwood, and 2780 black locust fence posts, for a total revenue of \$1,227.32. The side benefits of this cutting included: an improved species and quality composition in the hardwood sawlog stands, and an additional improvement in the growth potential in the intermediate hardwood stands.

E. Commercial Fishing

One special use permit was issued for commercial fishing of carp, buffalo, drum, bullhead, shad, and turtle in Crab Orchard Lake. All fishing was done between February 20 and May 21. Use of trammel nets was authorized by the Illinois Department of Conservation. The following table summarizes the catch in pounds for the year:

<u>Buffalo</u>	<u>Carp</u>	<u>Drum</u>	<u>Bullhead</u>	<u>Turtle</u>
3333	1555	85	14	126

F. Other Uses

Annual Revenue received from all phases of public use operations are listed in the following table:

Concessions:

Devils Kitchen -	\$2,032.16
Little Grassy -	3,631.33
Pirates Cove -	5,366.83
Southern Sports Inc.	3,097.05
Camp Leases -	103.00
Use Permits -	740.00
Refuge Campground Operation -	38,065.36
Land & Water Conservation Fund -	28,472.00
	<hr/>
	\$81,507.73

Public use revenue in 1971 increased 17% over revenue collected in 1970. The following table shows public use revenues collected during the 1967-70 period:

<u>Year</u>	<u>Revenue</u>
1970	\$67,865.71
1969	62,763.77
1968	52,324.52
1967	42,962.85

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Progress Reports

1. Wildlife Studies

- a. The Crab Orchard National Wildlife Refuge White-Tailed Deer: WMS - Project No. 3a; Progress Report No. 10 (Cooperative Project)

This research was started many years ago and is presently in the tenth year as a formal management study. The project was established to provide long-term objectives, goals, and direction for all deer research on the area. The project is sponsored by BSWF and the Department of Zoology, Southern Illinois University. All research is under the supervision of Dr. W. D. Klimstra, Director of the Cooperative Wildlife Research Laboratory. Various phases of this research will be conducted by graduate students in fulfilling their requirements for advanced degrees.



Deer for the dispersion study are captured with a cannon net trap or nicotine dart gun. After tagging the deer, blood samples are taken and the deer released.
(Odum, Researcher)

ABSTRACT

Seventy-six deer were captured in 1971 with but one mortality. Approximately 7,950 visual observations of marked deer were recorded. The number of deer observed per mile along the 20-mile census route varied from a low of 2.53 in June to a high of 19.11 in March. The buck:doe:fawn ratio for January-March was 0.16:1.00:1.03, 0.33:1.00:1.01 for April-June, 0.75:1.00:0.32 for July-September, and 0.38:1.00:0.95 for October-December. Seven marked deer were road-killed or harvested off the inviolate area, an average of 3.5 miles from original capture sites. Seventy-three deer were road-killed on the refuge and adjacent highways. The population in Area 13 increased from 75 to 107 deer from March-April 1970 to April-May 1971. Approximately 2,200 radio locations were recorded from radio-marked deer.

Only one paper was published this year as a result of the research: "Dispersal of Deer from Crab Orchard National Wildlife Refuge" by R. E. Hawkins, W. D. Klimstra, and D. C. Autry (J. Wildl. Mgmt. 35(2): 216-220).

There were no advanced degrees confirmed during 1971 as a result of this research. Two students are currently working on (1) population dynamics of fawns, and (2) social behavior of deer, in an effort to earn their Master of Science degrees. There are no doctoral candidates currently engaged in this project.

b. Ecology of Feral Dogs (*Canis familiaris*) on Crab Orchard National Wildlife Refuge. WMS - Project No. 15 (Southern Illinois University)

This study is under the supervision of Dr. H. J. Stains, Department of Zoology, Southern Illinois University. The principal investigator is W. H. Nesbitt, who is conducting this research in partial fulfillment for his doctor's degree.



The bitch that produced three feral puppies on the refuge. When Nesbitt finished his field investigations these dogs had disappeared.
(Nesbitt)

ABSTRACT

The study began in January 1969, with three basic objectives: (1) investigate daily and seasonal activities of individual and pack members, (2) evaluate home range in relationship with ecological characteristics of the area, and (3) describe the social relationships between individuals of the pack.

Emphasis was placed on the trapping of the dogs and collections of data. Observations were aided through the use of radio-telemetry collared dogs. A pack of dogs in Area 10 has become the keynote study unit.

Most field work has been completed with data analysis and submission of thesis being planned for 1972.

- c. Effect on Canada Goose Crop Impaction Mortality by Elimination of Soybeans from Crab Orchard National Wildlife Refuge. WMS - Project No. 6; Progress Report No. 4 - Final Report (Bureau Project)

This report was initiated in 1967, with James R. Rice, Wildlife Technician, as the principal investigator.



An example of crop impaction by soybeans
on Crab Orchard Refuge. (Rice)

ABSTRACT

Prior to 1966 there were several years of high goose mortality due to crop impaction by soybeans. Therefore, soybeans were removed from the refuge farming lands. A survey was initiated in 1967 to collect data on goose mortality and to compare this data to years when soybeans were allowed on the area.

<u>Year</u>	<u>Acres Soybeans</u>	<u>Number Dead Birds</u>	<u>Population at Time of Surveys</u>
1963	1284.0	640	28,000
1964	1062.0	700	29,000
1965	1195.5	100	48,000
1966	1435.0	2500	30,000
1967	0	0	45,000
1968	0	0	36,000
1969	0	2	22,000
1970	0	0	47,000
1971	0	0	42,000

With the continued decrease in goose mortality, after five years of data we can assume that the restriction of soybeans from the area was a sound management decision.

d. Life History and Ecology of Wood Duck.

WMS - Project No. 10, Progress Report No. 3 (Cooperative Project)

This project was established in June 1967 to provide long-term objectives, goals, and direction for all Wood duck research on the area. Dr. John N. Krull was the principal investigator for all work undertaken. Research will be conducted by various graduate students in fulfilling their requirements for advanced degrees.

The objectives for this study include: (1) delineate potential and actual habitat, and actual production from the various refuge habitats, (2) delineate potential and actual brood rearing habitat and ecologically describe and evaluate these areas, (3) ecologically describe and evaluate potential and actual limiting factors on overall wood duck production, (4) study the summer-fall wood duck population on the refuge, (5) thoroughly evaluate an artificial nesting structure program on the refuge, and (6) thoroughly evaluate a wood duck introduction program with emphasis being placed on building up an imprinted population of birds that return annually to breed.

There were two projects being worked on and/or not completed during 1971.

Characteristics of Wood Duck (*Aix sponsa*) Brood Rearing Habitat on the C.O.N.W.R. WMS - Project No. 10a (Robert L. Delaney - Master's Degree - Final Report.

ABSTRACT

Objectives of this study were to: (1) delineate potential brood rearing habitat, (2) locate actual brood rearing habitat, (3) ecologically describe this habitat, and (4) make recommendations for the improvement of both actual and potential brood rearing habitat.

Much of the field work for this study had been completed, but no further advancement made. It is understood that Mr. Delaney has dropped this research in favor of his recently acquired employment.

A Survey of Wood Duck (*Aix sponsa*) Nest Sites on the C.O.N.W.R. WMS Project No. 10b (Michael Joyce)

ABSTRACT

The objectives of this study were to: (1) determine on the basis of cavities in trees the potential of nesting on selected stream segments, (2) relate stream characteristics with suitability for wood duck utilization, and (3) provide a preliminary evaluation of wood duck utilization on the basis of limited field observations.

A total of 346 potential nesting trees were examined on five selected stream segments. The data analysis and final report is expected to be submitted in 1972.

- e. The Density and Territory Size of Breeding Prothonotary Warblers (*Prothonotaria citrea*) with Respect to Various Habitats in Southern Illinois. WMS - Project No. 17 - Progress Report No. 2 (Southern Illinois University).

ABSTRACT

This study is under the general supervision of Dr. H. I. Fisher, Chairman, Department of Zoology, Southern Illinois University. The principal investigator is Vernon M. Kleen, who is conducting the research in partial fulfillment for his Master's degree.

The study began in the spring of 1970 and will attempt to determine six basic objectives: (1) breeding densities, (2) territory sizes, (3) breeding success, (4) effects of nesting boxes in less favorable habitats, (5) changes in territories for re-nesting attempts, and (6) factors that influenced the breeding of the birds.

From 24 April to 14 July 1971, Prothonotary Warblers (Prothonotaria citrea) were again studied in a remote area of the Crab Orchard National Wildlife Refuge, Williamson County, Illinois. All birds were individually color-coded for recognition and their movements were plotted on reference maps according to a grid pattern set up in the 50-acre study area in 1970. Twelve males defended territories within the study area; nine of these males were birds originally marked in the area in 1970. By the use of tape-recorded playbacks of a singing male Prothonotary Warbler, the territory size for each bird was determined; some males increased their territory size after other males departed from the study area. Territory sizes ranged from about 3/4 acre to nearly 3 acres. Eleven females were color-coded in 1971, and none were found to change mates during the season. Ten nests were located (each for a different pair -- 1/2 of which were not accessible); no second nests were found even though two pairs definitely and three pairs possibly, nested a second time. Only 8 young were banded. The nest boxes placed uniformly throughout the study area in February and March were not used by the warblers.

- f. The Crab Orchard National Wildlife Refuge Wild Turkey:
WMS - Project No. 20 - Progress Report No. 1 (Southern Illinois University)

This research was started in September 1971, under the direction of Dr. W. D. Klimstra of the Cooperative Wildlife Research Laboratory, Southern Illinois University. Charles J. Newling is the principal investigator who is doing the research in partial fulfillment for his Master's degree. The project is sponsored by both the Cooperative Wildlife Laboratory and the Outdoor Laboratories at Little Grassy Lake.

ABSTRACT

This research will place emphasis on the ecology and population dynamics of the turkey. Field work to date consisted of attempting to locate flocks and personnel interviews. All data is incomplete at this time with no conclusions being made about turkey numbers or flocks present.

- g. The Effect of Prescribed Burning on Quail Habitat.
WMS - Project No. 16, Progress Report No. 2 (Southern Illinois University - Final Report.

ABSTRACT

This study is under the general supervision of Dr. Roger C. Anderson, Botany Department, Southern Illinois University. The principal investigator is Frank Novak, who is conducting the research in partial fulfillment for his Master's degree.

This study began in the spring of 1970 and is concerned with three basic objectives: (1) determine the response of desirable quail cover and food species to burning, (2) record the response of tree and shrub species to burning, and (3) provide information to help formulate a program for quail habitat management.

The study will be cancelled, as the data collected was not usable. It is hoped that another student may be available to undertake this research.

- h. Aquatic Plant Ecology on Crab Orchard National Wildlife Refuge.
WMS - Project No. 12, Progress Report No. 4 (Southern Illinois University).

This project is under the supervision of Dr. R. H. Mohlenbrock, Chairman, Department of Botany at Southern Illinois University. Research is being conducted by Donald C. Autry to fulfill requirements for a Doctor's degree.

ABSTRACT

Objectives of this study include: (1) describe aquatic flora, particularly vascular plants, (2) determine patterns of seasonal and annual succession, and (3) derive a mathematical expression of certain environmental factors for the purpose of predicting plant abundance.

Data concerning the vegetation and water chemistry was collected on 44 ponds during April-September 1969. All field work has been completed. Data will be transferred to cards for computer analysis. Preliminary data suggests correlations between certain environmental parameters and plant abundance. Considerable vegetational varieties existed between ponds which, at first glance, appeared similar.

Due to unavoidable circumstances, there was no progress made with this study during 1971. Barring any further delays, it is hoped that the study will be completed and submission of thesis during 1972.

2. Forestry Studies

a. Walnut Study

(Cooperative Project with the U. S. Forest Service, Carbondale Research Station).

This is a relatively long-term study, 10 to 15 years, designed to measure the growth response of black walnut trees to various methods and intensities of cultural treatments. Measurements taken during the past six growing seasons show that black walnut does respond favorably to these practices. This is to be expected. The real problem remains: how much of what practice is needed to produce merchantable black walnut from plantations. The answer to this and other walnut questions will come from this study.

One phase of the study concerns the heritability of walnut anthracnose resistance. In two 32-year old plantations, 165 black walnut trees have been rated for relative susceptibility to walnut anthracnose. All trees were scored in 1970 and 1971, a few of them for 4 or 5 consecutive years. Seedlings from 31 of these parent trees are outplanted in progeny-test plantations on Southern Illinois University Farms.

For 56 trees, correlation analyses were made of seed production in 1969, 1970, and 1971, diameter increment in the same three years, and anthracnose susceptibility. The following correlations with anthracnose rating (0 = minimum anthracnose; 10 = severely infected) were obtained:

Seed production - 1969	.34**
1970	.06
1971	.04
Diameter growth - 1969	-.35**
1970	-.26*
1971	-.42**

Because of limited variation among the young trees in the progeny-test plantations, no parent-progeny correlation or heritability estimates have yet been calculated. Repeatability of anthracnose ratings among 65 parent trees was calculated to be .136. Subsequent data collection will allow determination of a more precise estimate of repeatability which can be compared with heritability estimated from parent:progeny correlations.

B. Hybrid Chestnut Study

(In Cooperation with the U. S. Forest Service)

This study, started in 1949, continues to record and interpret the progress of a 100-tree hybrid chestnut plantation. The plantation

is one of many that were established throughout the original range of the native American chestnut in an attempt to develop a blight resistant strain.

Of the thousands of seedlings planted over 20 years ago, one tree, Number B-26, continues to stand out because of its desirable characteristics. B-26 is known throughout the world of forestry as the "Clapper Chestnut" in honor of its developer, Russell B. Clapper. In 1967, this tree became infected with the chestnut blight. In spite of this, the tree continues to thrive, each year exhibiting the vigorous growth and fine form that makes it a champion.

The Clapper was measured on August 23, 1971 and showed a gain of 1/2 inch in D.B.H. and 2 feet in height. It now measures 13.0 inches D.B.H. and 68 feet tall. We ran the usual race between ourselves and the squirrels to harvest the nuts, which are still considered of high value. Each year that the tree survives the active infestation of the blight (Endothia parasitica) increases the potential value of the seeds.

3. Recreational Studies

- a. Effects of Camping on the Soil and Vegetation at the Crab Orchard Lake Campground in Southern Illinois: A Case Study.
WMS - Project No. 18 - Final Report.

This study was completed by Dennis Foss in partial fulfillment of a Master of Science degree at Southern Illinois University. Requirements for this study were completed with receipt of the thesis. This thesis will be made available to those interested upon request.

ABSTRACT

Three units of similar size, soil type, topography, and vegetative overstory were selected from Loops B and C in the campground. Two of the units have had established camping use since 1964. The third had never had any established camping use. It was used as a control. All three units were sampled at the end of the camping use season to compare relationships between bulk density and the following characteristics: (1) soil depth, (2) degree of use on the unit, (3) percent of herbaceous vegetative coverage, and (4) litter weight.

The results of these comparisons showed that: (1) bulk density values were higher on the camping units than on the control unit, (2) as bulk densities increased, percent of vegetation and litter weight decreased, (3) bulk density values were highest on the heaviest used portion of the unit, and (4) greatest bulk density values or greatest degree of soil compaction occurred primarily in the surface soil (one inch depth).

- b. Habitat Improvement and Management for Recreational Uses
WMS - Project No. 14 - Progress Report No. 5 (Bureau Project)

ABSTRACT

This project was initiated in 1966 to plan, execute, and evaluate habitat development work within the public hunting area. All work has been conducted by refuge personnel and equipment.

Of the six basic objectives set up for this study, the following progress has been made: (1) review of wildlife species habitat requirements was completed, (2) review of past land practices and habitat management history in the study areas (Areas I and III) was completed, (3) cover-type maps were completed, (4) development of a unit management system was completed (McBee card systems), (5) development of specific units have been done on funds and manpower allowed. Habitat improvement completed this year includes:

<u>Location</u>	<u>Acres</u>	<u>Treatment</u>
Comp. No. 1 (R. 1E; T-9S, NW - Sect. 15)	14	Renovated
Comp. No. 1 (R. 1E; T-9S, SE - Sect. 16)	17	Renovated
Comp. No. 9 (R. 1E; T-10S, SE - Sect. 5)	20	New development.
Comp. No. 21 (R. 1E; T-10S, SE - Sect. 15)	21	New development.

4. Fisheries Studies

- a. Spawning Behavior of the White Bass (*Morone chrysops*) in Crab Orchard Lake. WMS - Project No. 19 - Final Report Southern Illinois University.

This project was initiated and completed during 1971 by Robert J. Standish in partial fulfillment of his Master of Science degree at Southern Illinois University. Final requirements for this study were completed upon receipt at this station of a copy of his thesis. This thesis will be on permanent file at the station and made available to those interested.

ABSTRACT

Objectives of this study were to: (1) determine areas used for spawning, (2) ecologically describe these areas, (3) determine interspecific competition, and (4) determine if possible various spawning limiting factors.

MANAGEMENT RECORD

Body of Water

Name of Lake, Pond, or Stream	Size acres/miles	Species Managed
Crab Orchard Lake	6,590 acres	LMB, BLG, NOP, BLB, CCF
Devils Kitchen Lake	810 acres	LMB, BLG, WHC
Little Grassy Lake	1,000 acres	LMB, BLG, WHC
Restricted Impoundments and Ponds (61 sites)	535 acres	LMB, BLG, NOP, CCF, FHM, GOS, WAE

Stocking Record

Date	No.	Species	Location	Avg. Length	Remarks
12-29-71	29	NOP	Firehouse Reservoir	14"	
11-11-71	3,000	NOP	Crab Orchard Reservoir (Pigeon Creek)	14"	
5-19-71	10,275	NOP	Pigeon Creek Marsh	2-3"	
5-19-71	13,000	NOP	Firehouse Reservoir	2-3"	
6-16-71	10,000	LMB	Pond 27	1-2"	
6-16-71	1,000	LMB	Pond 19	1-2"	
6-16-71	66	SMB	Pond 25	1-2"	
10-23-70	126	NOP	Reservoir 38	17"	
10-23-70	494	NOP	Crab Orchard Reservoir (Pigeon Creek)	17"	
5-5-70	1,000	NOP	Pigeon Creek Marsh	2-3"	Transferred from Little Grassy Hatchery
4-7-70	75,000	NOP	Job Corps Pond	Fry	
4-7-70	350,000	NOP	Crab Orchard Bay	Fry	
11-20-69	962	CCF	Pond 29A	4-6"	
6-11-69	24,000	WAE	Greentree Reservoir	1-3"	
6-11-69	6,000	WAE	Firehouse Reservoir	1-3"	
7-2-68	1,000	NOP	Firehouse Reservoir	2-3"	
5-20-68	9,000	Chautauqua MUE	Reservoir #38	1"	Area A-41
5-20-68	1,000	Ohio MUE	Goose Pond #31	1"	5 acre pond
10-23-68	500	STB	Goose Pond #31	4.2"	
10-23-68	1,500	STB	Reservoir #38	4.2"	Area A-41

No chemicals used in biological control

1972 Annual Project Report.

Results indicate that the White Bass in Crab Orchard Lake spawn mainly in Crab Orchard and Little Creek. The only migration route for White Bass leaving the lake is Crab Orchard Creek. There are few spawning sites in Crab Orchard Lake. Developing suitable spawning sites with sand and gravel on small tributaries may help to increase White Bass numbers in the lake.

b. Fishery Management Program
(Cooperative Project)

This project will cover all work done on the refuge by Fishery Services and presently under the direction of James S. Harrison.



This three-year old Northern pike, netted in a restricted area pond, proves that the waters of Crab Orchard are favorable for the growth of this fish.
(Mehrhoff)

ABSTRACT

Fishery personnel spent a total of 35 days on the area between February 16 and October 29, 1971. Total man-days of fishing during 1971 was estimated at 175,000.

A 162-day creel census on Devils Kitchen Lake (810 acres) indicated 808 anglers recorded on 42 census days, which resulted in a total of 43,078 man-hours, or 11,626 man-days of angling during the interval. From the projected catch of 27,337 fish, 74% were bluegills, 14.4% largemouth bass, 5.2% warmouth, and 1.9% crappie. Six other species accounted for 4.5%. The overall catch rate was .64 fish per hour, slightly below the state average.

A 189-day creel census on Little Grassy Lake (1,000 acres) indicated 1,146 anglers recorded on 24 census days resulted in 17,944 man-days of fishing. The average fishing day was 3.5 hours and totaled 18 man-days per acre pressure. The overall catch rate was .90 fish per hour. Both northern pike and walleye pike are reported to be in the lake, but has not been documented. Four White Bass were creeled in 1970 and warrants close observation.

Emphasis on Crab Orchard Lake (6,590 acres) was placed on population sampling. Gizzard shad account for 50% of both number and weight of fish present. Carp account for a small percentage of number, but 17% by weight. Bluegill and largemouth bass are well represented, but crappie, yellow bass, and bullhead are below expected numbers. White bass are increasing gradually. Efforts to salvage bass from the fishing contest reached 50% survival in 1971. The evaluation of northern pike introduction continues.

Testing for survival and growth continues on the restricted area "rearing" ponds for northern pike, walleye pike, smallmouth bass, striped bass, and muskellunge.

c. Food Intake and Periodicity of Feeding of Largemouth Bass in the Wild. WMS - Project No. 8 (Southern Illinois University.)

This study is under the general supervision of Dr. W. M. Lewis, Director of the Cooperative Fisheries Research Laboratory at Southern Illinois University.

ABSTRACT

This study seeks to (1) determine forage available to bass in different lakes by stomach content analysis, (2) calculate as a percentage of body weight the food intake of bass populations, (3) determine the feeding periodicity of bass, and (4) compare the percentage of full stomachs in a planktophagic fish population (gizzard shad) to a population of a pissivorous form (large mouth bass).

The following tentative conclusions can be made concerning the bass in Crab Orchard Lake: (1) primary forage for the bass is the gizzard shad, (2) average size shad eaten by bass 12 inches or larger was 6 inches, (3) 50 percent of all fish sampled had food in their stomachs, and (4) the bass fed randomly throughout a 24-hour period.

The data collecting phase of this project is completed. A change in the computer system at the university has caused a delay in the data analysis. It is expected that the final report will be completed during the spring of 1972.

VI. PUBLIC RELATIONS

A. Recreational Uses

The refuge recorded 1,499,767 visits during 1971. This is 132,000 visits less than 1970. While use fluctuates from year to year because of weather, economic conditions, etc., we believe refuge public use has stabilized at around 1½ million visits a year. We expect any future increases to be mainly in the wildlife oriented uses. Refer to the following Form 3-123 for a complete breakdown on 1971 public use.

1. Wildlife-oriented Use

In 1968, only 11% of the total refuge use was wildlife-oriented. During 1971, 540,473 visits were recorded for this purpose, and this represented 36% of the refuge public use. Wildlife-oriented use in 1970 was 25% of the total use. Significant increases were recorded for wildlife observation, environmental education and wildlife trail use. A gradual re-orientation of our public use program, as well as an increasing capability to provide interpretive programs and services is primarily responsible for this use trend.

The program of presenting weekend campfire programs at the Crab Orchard and Little Grassy campgrounds was continued in 1971. Conservation and environmental oriented films were shown weekly, along with short talks on the Bureau, Refuge and conservation.

A guided auto tour of the closed portion of the refuge was offered on a twice-a-week basis during the summer months. The tour originated in Crab Orchard Campground and was popular with campers. Present plans are to open this tour to the public in 1972 if funds permit.

A 12 X 24 foot trailer was moved into the Crab Orchard Campground and converted into a small interpretive and information center. It proved to be a very popular attraction, especially among young people. A great deal more of this type of work could be done if funds for such development were available.

During 1971, 29,928 visits were recorded for environmental education. This program is primarily conducted through the Southern Illinois University's Outdoor Laboratory at Little Grassy Lake. This program is just beginning to get underway and has tremendous long range potential.



Dale Miller, SIU student and part-time refuge employee, helped lead refuge tours. A total of 3,225 first grade through college students and 420 campers were provided such tours in 1971.
(McCoy)

The annual refuge "Open House" was held on November 13 and 14. It attracted 7,236 people in 2,043 vehicles during the two days that the "closed" portion of the refuge was open to the public.

A Refuge and Bureau exhibit was manned at the DuQuoin State Fair from August 28 to September 6, and also at the Illinois Wildlife Federation meeting in Springfield on September 18 and 19. Another exhibit was placed at the Saline County Courthouse Museum on October 3, during their open house. We believe this type of participation is an effective way of communicating with many people concerning the Bureau and Refuge programs.

2. Non-Wildlife Oriented Use

A total of 959,294 visits were recorded in this category during 1971. This compares to 1,223,860 in 1970. Decreases were recorded for all types of uses except camping with the largest decreases being swimming, boating and picnicking. Adverse weather during late spring and early summer, as well as the local economic conditions, were factors affecting public use.

Most public use areas were operated under the Land and Water Conservation Fund Act in 1971. A total of \$28,422 was collected in 1971 as compared to \$24,790 in 1970. The increased cost of the annual permit accounted for the increased collections in spite of lower public use.

The three campgrounds on the refuge were heavily used during the summer months. The 310-site refuge operated campground was near or at capacity on most weekends and holidays. The addition of three comfort stations with flush toilets and showers at this campground were well received and, surprisingly, well cared for by the public. Construction of three additional units is planned for 1972.

The Playport, Pirates Cove, and Little Grassy concessions received generally good use during the year. The Devils Kitchen concession continues to be a marginal operation. An audit of all concessions was made in April by C. O. Lund from the Regional Office. The audit indicated that concession operations are satisfactory.

Two fatalities occurred during the 1971 public use season. On June 5, a 46-year old Murphysboro woman apparently drowned in Crab Orchard Lake while swimming in a restricted area. An autopsy showed death was due to cardiac arrest. On September 25, a 36-year old Benton fisherman drowned in Crab Orchard Lake. Apparently he lost his balance while attempting to start his outboard motor and fell out of his small fishing boat.

A total of 454 man-days was spent on visitor protection and services, enforcement, and public safety during 1971. This includes operation of refuge public hunting and fishing areas, supervision of the LWCF and lifeguard programs, as well as the general public use areas. We believe the relative low incidence of accidents and serious problems can be attributed to this program.

B. Refuge VisitorsJANUARY

<u>Date</u>	<u>Name</u>	<u>Title or Organization</u>	<u>Purpose of Visit</u>
8	Capt. McBride - George Dennison	SIU Security, Carbondale, Illinois.	Law Enforcement
11	H. A. Lucas	U.S. Forest Service, Philadelphia, Pa.	Courtesy Call
13	Art Secrest	Bloomington, Illinois	Refuge picture story
19	Burton H. Atwood	Field Representative, USDI, DesPlaines, Ill.	Refuge tour
19	Charles E. Hendricks	Forest Supervisor, Shawnee National Forest.	Refuge tour
19	Wayne Nicolls	Public Use Specialist, Shawnee National Forest.	Refuge tour
21	Murl Teske	EPA	Water Pollution
29	Fred Graper	FBI, Carbondale, Ill.	Law enforcement

FEBRUARY

5	Wayne Gueswell	Refuges, Washington, D.C.	Refuge tour
10	Jack Newton	Fish Cons. Agent, Illinois Dept. of Conservation.	New pond construction
10	Claude Grace	FBI, Carbondale, Illinois.	Law enforcement
10	Don Ragsdale	SIU Security	Law enforcement trng.
11	Warden Harris	U.S. Penitentiary, Marion	Courtesy call
11	William Matthews	Supt. of Industries, U.S. Penitentiary, Marion, Ill.	Courtesy call
23- 24	John R. Langenbach	Asst. Regional Director	Refuge tour.

MARCH

<u>Date</u>	<u>Name</u>	<u>Title or Organization</u>	<u>Purpose of Visit</u>
2	Sgt. Rockwell	Illinois State Police	Law enforcement trng.
2	Earl Fairly	State Cons. Agent	Courtesy call.
5	Dr. Robert Cooper Mrs. Studebaker	Ball State University, Muncie, Indiana.	Refuge tour.
10- 11	David Smith	Realty Div., R.C.	Land acquisition.
11	Bart Foster	Upper Mississippi Refuge.	Law enforcement trng.
18	Philip Morgan Jim Gillett Gerald Cummings Charles Scheffe	Asst.Reg. Supvr., Refuges. Manager, Mark Twain NWR. Area Biologist, Havana, Ill. Manager, Muscatatuck NWR.	Law enforcement training school.
19	Chuck Agrella	FBI, Carbondale, Ill.	Law enforcement.
31	Don Driscoll	Fish Hatchery, Marion, Ala.	Courtesy call.

APRIL

23	Jim Harrison William Harth Alvin Lopinot O. M. Price James S. Allen Donald M. Garver Maurice Whitacre	CSFS, Princeton, Indiana. Chief, Div. of Fisheries, Management of Crab Illinois Dept. Cons. Chief Fishery Biologist, Ill. Dept. Cons. Area Fishery Biologist, Ill. Dept. Cons., Oblong, Ill. District Fishery Biologist, Ill. Dept. Cons., Harrisburg. District Fishery Biologist, Ill. Dept. Cons., Sparta, Ill. State Fish Culturist, Ill. Dept. Cons., Carbondale, Ill.	Conference on Fisheries Orchard Lake.
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MAY

11	Donald Boyd	YCC, Washington, D. C.	YCC program.
26	Jim Gritman	Assoc. Refuges Supvr., Minneapolis.	Systems Analysis.

<u>Date</u>	<u>Name</u>	<u>Title or Organization</u>	<u>Purpose of Visit</u>
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JUNE

4	Helen Carlson Elsie Welter	Bozeman, Montana. Morehead, Minnesota.	Refuge tour
8	John Novaria Alfred R. Vigil	Management Analysis Team, Audit. Denver, Colorado.	
28	Lyle Miller Jack Morrison	Safety Officer, R.O. YCC Office, Washington	YCC Meeting. YCC Meeting.

JULY

9	Larry Watts	Radio Station WGGH, Marion.	Refuge tour
12- 16	John Ramsour David Eubank	Engineering Div., R.O.	Lagoon Disposal Plant.
16	Jack Downs	Illinois Highway Dept.	Use of Refuge materials in rest areas.
19	M/M John Jones	Chief, Safety Office, Washington, D. C.	Courtesy call.
22	Jerry Leinecke	Trempealeau NWR, Wisc.	Courtesy call.
22	John W. Kincheloe	Div. Fish Hatcheries, Washington, D. C.	YCC program.
22	Larry Smith	R.O.	YCC program.

AUGUST

2	James Gritman	Assoc. Reg. Supvr., Refuges, Minn.	Review Refuge Objectives.
11- 12	M/M Ed Theroff	Area Manager, Glendale Fish & Wildlife Area, Indiana Dept. of Natural Resources.	Refuge tour.
13	Harry Stiles	C.O., Washington, D. C.	YCC program.
13	Samuel Benjamin	Asst. Dir., Admin. & Eng. Washington, D. C.	YCC program.
16 - 19	George Kubik	Classification Officer, R.C., Minn.	Classification Complaint.

<u>Date</u>	<u>Name</u>	<u>Title or Organization</u>	<u>Purpose of Visit</u>
<u>SEPTEMBER</u>			
20- 22	Marvin Duncan Samuel Moore	Div. Refuges, Wash., D.C. Recreation Use Branch Planning & Review, Office of the Secretary.	
29	Don Driscoll	Asst. Mgr. Marion National Fish Hatchery, Alabama.	Courtesy Call.
<u>OCTOBER</u>			
1	Steve Frick	DeSoto NWR.	Courtesy call.
13- 15	Ed Yaw Ed Murczek Jay Hamernick Steve Smith Ronald Bisbee Gilbert Key Bill Sontag	R.O., Boston, Mass.) Seney NWR) Upper Mississippi NWR) Wichita Mountains NWR) Okefenokee NWR) R.O., Minn.) R.C., Minn.)	
	Dr. Dwight McCurdy	BSFW and Southern Illinois University.	Conducted Public Use Workshop.
18	Ray White	Illinois Information Service, Springfield.	Shot film on refuge.
13- 14	Caldwell C. Robinson Elwood Harry	Advisory Committee, Office of the Secretary, Washington, D. C.	Review Public Use program.
<u>NOVEMBER</u>			
8- 12	Harold O'Connor and Dale Coggeshall	Washington, D. C.	Instructors for Workshop.
18	Sen. Gene Johns Paul Gayer	Illinois State Senate. Asst. to Cong. Gray.	Courtesy call
<u>DECEMBER</u>			
15	Ralph VonDane	USGMA, Peoria, Ill.	Goose Census.
27	Roland C. Zuelsdorf	Licensed Guide, Horicon, Wisconsin.	Refuge information.
30	John Venegoni	Fish Springs, Utah.	Courtesy call.

FREQUENT VISITORS

David Kennedy	Union County Refuge.
Dr. Paul Yambert	Little Grassy Outdoor Lab., SIU.
Dr. Gerald Gaffney	Little Grassy Outdoor Lab., SIU.
David Purinton	USGMA, Anna, Illinois.
Maurice A. Whitacre	Little Grassy Fish Hatchery.
John Yates	State Conservation Agent.
Earl Fairly	State Conservation Agent.
Art Reid	Southern Illinoisan newspaper.
Marshall Skelcher	Concessioner, Devils Kitchen Lake.
James S. Harrison	Project Leader, Central States Fishery Station, Princeton, Indiana.
Dr. Dwight McCurdy	Southern Illinois University.
Karl E. Malzahn	Refuge resident.

C. Refuge Participation

PROGRAMS PRESENTED	Hovell	Johnson	Lively	McCoy	Mehrhoff	Miller	Nichols	Pickar	Rice	Uptegraft	Waterbury	Wilson
Sportsmen's Clubs												
Bird, Garden, Nature Clubs												
Schools	14	6	4	59	2	14	2		8	3	8	4
Church Groups				1								
Service Clubs				1	1			1		2		1
Youth Groups	3			5			2					
Professional/Scientific				1	2							
State/Federal Government							2	1				1
TV/Radio/Newspaper					3		3					1
Campground			16	27								4
Other	17	6	20	94	8	14	9	2	8	5	8	11
TOTALS												
ACTIVITIES ATTENDED												
Sportsmen's Clubs												
Bird, Garden, Nature Clubs												
Service Clubs							1					
Youth Groups												
State/Federal Government					1	1			1			2
Professional/Scientific					3		14					5
Other				2	1	1	1					1
TOTALS				2	5	1	17		1			8

D. Hunting

Squirrel hunting was only fair this year. The hunting pressure was light and well-dispersed over the available squirrel hunting areas. The majority of squirrel hunting occurs around Devils Kitchen Lake.

As in the past few years, mourning dove hunting was poor on the refuge public hunting area. Very few hunters were able to bag their 12-bird limits.

Illinois again had an early teal season lasting nine days in September. Hunting pressure was very light and few teal were taken.

The duck season lasted from October 23 to December 11. The point system based on 100 points was used for the second year in a row. A point value was assigned to each species and sex of duck. A hunter reached his daily limit when the point value of the last duck shot, added to the sum of point values of other birds already taken during that day, equaled or exceeded 100 points. The possession limit was the maximum number of birds, by species and sex, which could legally be bagged in two days of hunting. The point values are listed below:

<u>100 Points</u>	<u>90 Points</u>	<u>20 Points</u>
Canvasback	Hen mallard	Drake mallard
Redhead	Black duck	Pintail hen
	Wood duck	Ring-necked duck
	Hooded merganser	

All other species and sexes of ducks counted 10 points.

Considering a maximum duck population of 10,000 present on the refuge during the season, hunter success was fairly good. Hunting pressure was steady throughout the season. A variety of species was taken including teal, scaup, ringnecks, wood ducks, mallards, and a few redheads and canvasbacks.

Goose season opened November 15 and closed December 22, when the four-county quota of 24,000 birds was reached.

Goose hunting in the Crab Orchard Refuge area was very good. A total of 5,789 geese was bagged in or near the refuge area. This compares to last year's all-time high kill of 7,139.

A total of 25,363 geese were bagged in the four-county zone. On the refuge public hunting area 6,962 hunters bagged 637 geese. This figure might have been higher, however one of our best hunting areas was closed for the majority of the season due to baiting.

Goose kill figures were compiled on a daily basis by the refuge staff and reported weekly to the Union County Wildlife Refuge Supervisor. These figures were based on club kill records, registers kept in 11 of the major refuge public hunting areas, field checks, and records kept by private individuals.

The Illinois Department of Conservation required goose hunters to obtain a Goose Hunting Permit this year. This was a two-part permit; one part to be filled out and mailed to the Department within 24 hours after the close of the season, and the other part to be carried in the field. Hunters were to state how many geese they killed during the season and in what county they hunted. The primary objective of this permit is to check on the goose harvest. No figures are available yet to compare with the regular methods used to measure goose kill.

A comparison of the 1971 season with the previous ten seasons follows:

<u>Year</u>	<u>Number Clubs</u>	<u>Club Kill</u>	<u>Public Hunting Area Kill</u>	<u>Private Non- Club Kill</u>	<u>Season Totals</u>
1971	68	4628	637	524	5789
1970	50	4731	1164	1244	7139
1969	31	2506	748	1855	5109
1968	29	2521	636	593	3750
1967		711	567	141	1419
1966	33	1575	432	267	2294
1965	37	264	279	107	650
1964	43	1533	305	276	2114
1963	43	1547	395	228	2170
1962	42	1944	532	249	2725
1961		1289	872	424	2585

Bow and arrow hunting for deer is a very popular sport in this area, and there is plenty of good deer country available in which to hunt. Heaviest hunting pressure was on opening day; however, there was steady pressure throughout the season. More deer were reported bagged than in the past few years.

Shotgun deer hunters killed 267 deer in Williamson County during the first 3-day season, November 19-21. With fewer hunters in the field, only 54 deer were taken the second 3-day season, December 10-12. The 6-day total of 321 was the highest kill ever recorded for Williamson County.

Quail and rabbit hunting on the refuge public hunting area was poor. Hunting pressure was very light.

E. Violations

The violations listed below were handled by refuge personnel this year:

<u>Violation</u>	<u>Number</u>	<u>Fine and Cost</u>
Trespass	33	\$1,132.70
Criminal trespass to a vehicle	2	90.60+ 12 mo. probation.
Kidnapping	1	2-5 years State Penn.
Battery	1	30.30
Disorderly conduct	2	40.00
Public nudity (disorderly conduct)	18 (2 pending)	628.30
Littering	1	100.00
Illegal possession liquor	11	305.30
Public indecency	1	70.30+ 6 mo. probation.
Cans on spillway area	4	85.00
Illegal parking	24	290.00
Disobey stop sign	5	75.00
Speeding	4	106.00

<u>Violation</u>	<u>Number</u>	<u>Fine and Cost</u>
Illegal transportation liquor	9	\$335.00
Drive too fast for conditions	3	50.00
Drive on revocation	1	30.00+ 9 days in county jail
No valid vehicle registration	1	15.00
Littering roadway	1	20.00
Fleeing police officer	1	80.00
Drive vehicle off designated road	2	30.00
Operate boat w/out life preservers	10	150.00
Operate boat w/out registration numbers	1	15.00
Operate boat w/o proper lights	7	105.00
Deposit debris in lake	2	50.00
Fish w/out State license	(1 pending)	30.00
Hunt w/out State license	1	35.00
Possess live migratory birds w/o permit	1	35.00
Take migratory game birds out of season.	2	60.00
Hunt with unplugged gun	2	65.00
Hunt migratory waterfowl w/out stamp	2	65.00
Shoot before hours	4	140.00
Shoot after hours	(5 pending)	--
Take geese within 100 yards of property line	14 (2 pending)	470.00
Take geese from a blind within 50 yards of another blind	3	105.00
Take geese within 200 yards of refuge closed area boundary	(2 pending)	--

<u>Violation</u>	<u>Number</u>	<u>Fine and Cost</u>
Take geese over baited area	2	\$420.00
Hunt in closed area	2	200.00+ shotgun confiscated
Shining deer	2	110.00
Illegal possession of road killed deer	1	35.00
Illegal transportation of firearms	3	450.00+ two pistols confiscated
TOTAL -		186
	12 pending	\$6,058.80
		18 months probation
		2-5 years State penn.
		9 days county jail.

An additional 222 cases were handled in which no charges were filed. These do not include the many contacts during the year in which only verbal warnings were given.

Federal cases were handled before the U. S. Magistrate in Carbondale. State cases were filed in Circuit Court in Marion.

The following incidents were investigated by refuge personnel. In the more serious cases, assistance in the investigations was given by state or local authorities.

<u>Incident</u>	<u>Number</u>
Motor vehicle accident (majority involving deer)	43
Abandoned vehicle	2
Trespass	12
Moving auto violations	2
Theft	28

<u>Incident</u>	<u>Number</u>
Vandalism	4
Injury to using public	27
Indecent exposure	3
Attempted rape	1
Indecent liberties with a child	1
Battery	2
Disorderly conduct	4
Intoxication	2
Death (natural)	1
Drowning	1
Littering	3
Boating accidents	9
Boating violations	4
Hunting violations	6
Lost persons	4
Narcotics	1
Miscellaneous	25
<hr/>	
TOTAL -	185

Excellent cooperation and assistance were received throughout the year from the Illinois State Police, the Williamson County Sheriff, and the Southern Illinois University Police. The Illinois Department of Conservation assigned a patrol boat and personnel to Crab Orchard Lake for assistance in enforcing boating regulations and boater safety on several of the high-use weekends during the summer.

Assistance was also provided throughout the year by Williamson County States Attorney Kenneth Powless and his staff.

F. Safety

The Refuge Safety Officer is Darrell D. Uptegraft. The Safety Committee members for 1971 were: from Management - Richard Johnson, Chairman, and Wesley James; from the Union - Bill Stacey, Secretary, and Harry Davis.

SAFETY MEETING SCHEDULE - 1971

<u>Date</u>	<u>Department</u>	<u>Suggested Topic</u>
January	Safety Officer & Committee	New Schedule & Officers
February	Buildings & Grounds	General
March	Shop	Equipment
April	Soil & Moisture	Farm Equipment
May	Recreation	Water Safety
June	Office (James)	Defensive Driving
July	Fire Station	First Aid
August	Water & Sewage	Prevention & Gases
September	Recreation	Hunting Safety
October	Fire Station	Fire Prevention
November	Shop	Winter Driving
December	Buildings & Grounds	Home Safety

Safety meetings are scheduled for the first Wednesday of each month.

The Refuge Safety program was carried out with great success this year with very few incidents involving refuge personnel. Minor damage and/or repairs were made to equipment and/or facilities throughout the year. The procedures of all personnel submitting their safety ideas and suggestions through the Committee to the Safety Officer appears to be very functional.

We are pleased that there were no major injuries or even lost time work related injuries this past year. Five personnel had six minor injuries throughout the year.

Response to our request for individual safety awards under the Bureau's Safety Award Program is still pending from last year.

At the end of this period the record now stands at:

Total accident-free driving miles -	1,036,810
Prior accident-free driving miles -	627,164
Number of days without lost-time accident -	1,228
Total Man-days without lost time -	54,519
Man-hours without lost time -	436,152
Date of last lost-time accident -	August 29, 1968
Date of last vehicle accident -	May 30, 1969

VII. INDUSTRIAL ACTIVITIES

A. Water Use1. Industrial Consumption

Production of treated water decreased for the second consecutive year. In 1970 we had a decrease of 66,925,000 gallons and during 1971 our decrease was 63,624,000 gallons. This was due to the decreased production and employment caused by Commercial Solvents Corp. consolidating and moving their Crab Orchard Refuge operation to Terre Haute, Indiana, and apparently reflects the national trend of decreased production and employment. Below is a comparison of the gallons treated:

	<u>1969</u>	<u>1970</u>	<u>1971</u>
Water	311,478,000	244,553,000	180,929,000
Sewage	79,164,000	77,131,000	115,500,000

2. Municipal Consumption

The water requirements of the four cities connected to Crab Orchard Lake remained about the same as in 1970. It is anticipated that their demands for 1972 will be zero gallons. Marion's new water plant is in full operation, and Carbondale's new system should be in full operation in early 1972. Herrin and Carterville are connected to the Rend Lake Conservancy Water District. The requirements for the four cities during the coming year will be for emergency purposes only.

Following is the tabulation of the gallons of water pumped, and the revenues received per city:

<u>City</u>	<u>Gallons Pumped</u>	<u>Revenue</u>
Marion -	-0-	-0-
Herrin -	59,040,000	\$1,180.80
Cartersville -	40,030,000	800.00
Carbondale -	<u>1,449,100,000</u>	<u>28,982.00</u>
	1,549,170,000	\$30,963.40
Annual Fees -		<u>400.00</u>
		\$31,363.40

B. Facility Activities

1. Railroad

The switching schedule of three days per week is working very satisfactorily, although it is proving to be a very costly operation. During the period July 1, 1970 through June 30, 1971, the railroad switching operation showed an operating loss of \$20,561.00.

No major breakdowns or repairs occurred this year. One hundred thirty-seven (137) man days were spent maintaining the track right-of-way and repairing switches. Daily maintenance checks were performed on both diesel-electric locomotives.

We switched three hundred twelve (312) railroad cars to refuge tenants, for an annual revenue of four thousand six hundred eighty dollars (\$4,680.00). The 1971 cost per car switched was \$81.20.

The number of cars switched dropped from three hundred ninety-two (392) last year to three hundred twelve (312) this year.

2. Water and Sewage Plants

The daily operations of the water and sewage facilities were routine. No major breakdowns occurred nor renovations required.

The water monitoring program was instituted this year. Some of our pollution problems have been solved, but we are still studying many fields that are possibly giving us a little pollution. Hopefully, this will all be solved during 1972.

The construction on our sewage lagoon was started during 1971. The dirt work and pipe has all been completed. Minor valve and electric work has to be completed.

3. Fire and Security

The fire department was busy during the year picking up and disposing of 73 road-killed deer on adjacent and refuge roads. During November and December approximately 30 man days were spent issuing state goose permits.

Eight fire calls were answered during 1971, two of these fires were major industrial building fires.

Station personnel issued 92 violation tickets, 82 parking tickets, and filed 78 incident reports.

C. Industrial Lease Management

During 1971, the industries on Crab Orchard Refuge suffered another year with many problems and frustrations that industries suffered throughout the country during the past two years. The industrial employment dropped from 1600 to 1500 with two of the industries closing their doors in bankruptcy procedures. Most of the space available on Crab Orchard Refuge is under lease, except the buildings retained by Commercial Solvents Corp. These buildings cannot be leased until all of the decontamination shooting is completed. Extensive shooting is planned during January through March 1972.

At the close of the period there were 50 industrial tenants actively engaged in operations on the refuge. Growth is limited to the smaller industrial operations, except Olin-Mathieson, which is our largest single employer, and during the last three months has expanded into several buildings released by smaller operations. They have taken over the complete Job Corps building complex for their ordnance division operation. Diagraph-Bradley, our second largest employer, is expanding its operation through new construction on their present complex.

National Tape Corporation and Southern Illinois Paper Company, a wholly-owned subsidiary of National Tape Corporation, filed for bankruptcy in late 1971. Companies were engaged in the manufacturing of pressure sensitive tapes. We believe the companies were operating on a very tight budget, and due to a very competitive market were forced into bankruptcy. We were very fortunate in that we had the buildings vacated and leased to another company with only a small Priority Landlords Claim of \$346.61 for rent.

On December 16, 1971, two Brooks Paper Company employees were dying Easter basket grass, putting it into a tube which sucks it up through a dryer and into a bin. They saw a spark come down the inside of the tube, and at once there was a sheet of solid flame. The building filled with fire so fast there was no time to use fire extinguishers. Two pumpers and 12 Refuge employees fought the fire, with assistance from the Cartersville Fire Department and Olin employees. The building, with several thousands of dollars worth of stock, was a total loss.

Brooks Paper Company, which leases approximately 30,000 square feet of space, has been purchased by Pan American Packaging Corp. They are presently re-organizing, and we hope they will be able to continue their operation on the refuge. Their employment is rather low, but orders have been improving, and with good financial backing, their outlook seems much brighter.

Because of three major fires during the past two years, it was our belief that increased responsibility of the lessee was needed for the protection of the leased premises against damage or destruction by fire or other causes. The proposed change was approved by the Regional Director and all new leases, lease renewals, and special use permits reflect the recommended changes by addition of the fire insurance requirement. We have placed a replacement value on all buildings and the lessee will furnish proof of insurance for 80 percent of the insurable value. We feel that with the insurance, industries will be more inclined to rebuild at the same site, protecting the government's interest in Crab Orchard Refuge.

D. Lease Prospects

Forecasts for 1972 appear to be good, with the majority of the existing industries holding their own. With most of the buildings in the Commercial Solvents Corp. complex unoccupied, we hope to make arrangements for the Olin Corp. or another company to lease the facilities when the decontamination shooting is completed.

Two small companies are suffering from the lack of good financial backing, and are being watched closely. With the waiting list we have for industrial buildings, we will be quick to suggest they look elsewhere for a place to operate.

Table No. 1 - INDUSTRIAL LEASING, REVENUE, & EMPLOYMENT

	Lease Footage		Monetary Return				Total No. Employed	
	1/1/71	12/31/71	Rent	Wat. & Sew.	Switching	Total	1/1/71	12/31/71
Allen Industries, Inc	83,000	83,000	\$ 13,543.45	\$ 194.40	\$ 480.00	\$ 14,217.85	20	3
Austin Powder Company	9,261	12,828	1,122.66	---	---	1,122.66	---	---
Central Fixtures Mfg. Co.	33,181	53,902	4,886.52	156.25	135.00	5,177.77	22	50
C. O. Field Trial Club	---	---	1,000.00	82.80	---	1,082.80	---	---
Sam DeNeal	1,069	2,138	89.10	---	---	89.10	---	---
Department of Justice	---	---	---	16,904.02	60.00	16,964.02	278	278
Diagraph Bradley Ind., Inc.	104,052	104,052	17,103.12	764.02	195.00	18,062.14	162	147
East Side Lumberyard Supply	35,850	35,850	7,170.00	82.80	1,275.00	8,527.80	12	12
Electric & Machine Company	14,394	14,394	2,070.72	165.60	---	2,236.32	11	11
Great Lakes Terminal	30,971	---	1,753.56	18.40	540.00	2,311.96	5	---
Humitube Packaging, Inc.	42,191	42,191	8,094.96	768.26	270.00	9,133.22	98	41
Marion Civil Defense Agency	8,460	8,460	837.00	82.80	---	919.80	2	2
Mark Twain Marine Industries	71,406	67,531	11,147.37	630.96	180.00	11,958.33	12	20
Midwest Brush Mfg. & Sales	8,524	8,524	1,272.48	82.80	---	1,355.28	20	23
National Reproductions, Inc.	3,891	3,891	778.20	82.80	---	861.00	2	2
National Tape Corp.	---	12,568	2,361.60	55.20	---	2,416.80	---	---
Olin Corporation	218,428	309,136	46,441.50	22,753.88	1,005.00	70,200.38	533	651
Olin Corp. - Ordnance Prods.	---	12,388	290.42	---	---	290.42	---	---
Olin Corp. - Pyrotechnic Div.	144,685	158,692	27,014.05	---	---	27,014.05	---	---
Pennzoil United	---	20,500	2,412.32	---	---	2,412.32	---	2
Phelps Dodge Cable & Wire	20,500	20,500	3,075.12	---	45.00	3,120.12	---	---
Rend Lake Beverages	10,250	10,250	1,879.13	46.00	45.00	1,970.13	---	5
Seyer Buckner Tool & Machine	21,932	21,932	4,502.40	165.60	---	4,668.00	4	4
Shamrock Boats	---	3,324	332.40	---	---	332.40	---	---
Southern Illinois Paper Co.	10,250	10,250	1,742.52	---	90.00	1,832.52	4	---
SIU Housing Business Services	---	---	598.50	45.00	---	643.50	---	---
SIU Vocational Tech. Institute	---	---	---	1,211.96	---	1,211.96	181	135
							(1,300 Students)	(1,276 Students)
SIU Purchasing Department	24,642	24,642	1,983.36	41.40	---	2,024.76	---	---
SIU Tech. & Adult Education	46,292	46,292	9,304.00	546.56	---	9,850.56	31	28
							(178 Students)	(172 Students)
SIU Training	32,593	32,593	5,761.08	509.13	---	6,270.21	44	29
							(114 Students)	(86 Students)
Supreme Plating	5,945	5,945	1,189.08	1,979.31	---	3,168.39	6	6

Table No. 1 - INDUSTRIAL LEASING, REVENUE, & EMPLOYMENT

	Lease Footage		Monetary Return				Total No. Employed	
	1/1/71	12/31/71	Rent	Wat. & Sew.	Switching	Total	1/1/71	12/31/71
Surrey Homes	---	19,567	\$ 2,086.72	\$ ---	\$ ===	\$ 2,086.72	---	---
Trojan US Powder, Marion	286,885	286,885	32,027.02	6,562.57	45.00	38,634.59	52	7
Trojan US Powder, Wolf Lake	1,069	1,069	106.92	---	---	106.92	---	---
Turco Mfg. Company	10,250	10,250	1,742.52	---	---	1,742.52	5	---
Civil Air Patrol	1,069	1,069	106.92	---	---	106.92	---	---
Dooley Brothers	---	3,206	320.60	---	---	320.60	---	---
E.I. DeNemours Dupont & Co	---	14,427	1,442.70	---	---	1,442.70	---	---
Warren G. Heidbreder	1,069	1,069	106.90	---	---	106.90	---	---
Kilbourn Specialties	---	1,069	106.90	---	---	106.90	---	---
Missouri Research Laboratories	2,138	---	---	---	---	---	---	---
Monsanto Chemical Company	1,069	1,069	106.90	---	---	106.90	---	---
Norge Division	7,552	7,552	1,132.80	---	---	1,132.80	---	---
Petroff Trading Company	1,603	---	---	---	---	---	---	---
Propellex Chemical Corp.	1,069	1,069	106.90	---	---	106.90	---	---
E. T. Simonds Construction	---	---	300.00	---	---	300.00	---	---
SIU Geology Department	2,021	2,021	824.47	---	---	824.47	---	---
Wildlife Materials, Inc.	---	100	10.00	---	---	10.00	---	---
Winco	---	1,069	106.90	---	---	106.90	---	---
<hr/>								
TOTALS, 1971		1,477,264	\$220,391.79	\$53,932.52	\$4,365.00	\$278,689.31		1,456 (1,534 Students)
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TOTALS, 1970	1,297,561		\$218,640.06	\$63,032.35	\$5,880.00	\$287,552.41	1,504 (1,592 Students)	

VIII. OTHER ITEMS

A. Items of Interest

Crab Orchard Refuge was selected as one of nine Youth Conservation Corps Centers hosted by the Bureau this summer. Our center was one of the largest (40 enrollees), co-educational, with 23 males and 17 females. The camp was run as a full 7-day residential program for eight weeks. The residential portion of the program was performed under contract with Southern Illinois University Outdoor Laboratories at Little Grassy Lake. Darrell D. Uptegraft, Refuge Manager, served as the Agency Coordinator and Contract Representative, and Dr. Gerald E. Gaffney of the Outdoor Laboratories and BSFW served as the Corps Director. A total of 14 various projects were worked on during the 8-week period, resulting in 14,286 youth hours and 1,730 YCC staff hours. Crab Orchard personnel contributed 1,345 hours to the program.



The YCC's worked in five teams of eight. Every week the groups would rotate to a new job. Eight miles of boundary line fencing was cleared in eight weeks.

(Uptegraft)



Other YCC activities included registration and information services at the Crab Orchard Campground,

and

riprapping a half-mile of Crab Orchard Lake shoreline.
(Uptegraft)



Could be, Charles Darwin had a point....huh?

Photographer, Kent Kirkton, SIU.



A lone Barnacle goose (Branta leucopsis) was sighted below the public observation towers near the swim-in trap on February 1st. When first sighted, it was standing outside the trap honking in a high pitched voice at the geese inside. It stayed for two days and fed voraciously the whole time it was observed. Five different people confirmed its presence -- the first ever recorded on the refuge. With nesting grounds in eastern Greenland, and being only a casually seen bird on the Atlantic coast, it was quite a treat to see this bird on Crab Orchard Refuge.

On February 10, 1971, an accident happened that could have spelled disaster for Crab Orchard Lake. A tanker truck leaving Interstate 57 near the east end of the refuge overturned as it left the exit ramp. The tank split open and poured 6,000 gallons of an inflammable form of sulfuric acid, diethylamine sulfate, onto the ground. The drainage system lead right to Crab Orchard Creek, the main water supply for Crab Orchard Lake. The first reaction was to mobilize the refuge bulldozers to dam the drainage area. As luck would have it, the liquid was heavier than water and remained localized in a pool. That same day a nearby natural gas distributor salvaged most of the liquid with his tank truck. Until the gas man showed up, Crab Orchard Refuge personnel and the Environmental Protection Agency people did some fast and frantic thinking. There is now a refuge emergency plan for accidents such as this.

B. Personnel

William C. Herring, Operator General, retired February 28, 1971, after more than 24 years of Government service, of which 22 years was with the Bureau of Sport Fisheries and Wildlife. Mr. Herring began his federal service with the Ordnance Department in 1945. After service with the Corps of Engineers and War Assets Administration, he joined the Bureau in 1948 as a Mobile Crane Operator. In 1955 Mr. Herring was promoted to Operator General with principal duties of railroad switching within the Crab Orchard Refuge. Mr. Herring was awarded the Distinguished Service Award upon retirement.

We were shocked and saddened by the sudden death of Leon Parks at his home of a massive coronary on April 24, 1971. Leon was our Sewage Plant Operator and had over 28 years of Federal Service.

On May 15, 1971, Jewell T. Gibbens died of cancer after a prolonged illness. Jude was one of our Firefighters. He was 65 years old and had over 25 years of Federal Service.

Congratulations to the following personnel who received promotions this year: Carl Orange, Guard, GS-4, to Firefighter (Structural) GS-5; and William J. McCoy Jr., Public Use Specialist, GS-5, to Public Use Specialist, GS-7.

On December 8 and 9, a new Basic Agreement between Crab Orchard Refuge and Local 2086, American Federation of Government Employees was negotiated at Crab Orchard Refuge. The Management negotiating team consisted of L. A. Mehrhoff Jr., Project Manager; James Gritman and George Kubik, Regional Office; Wesley F. James, Crab Orchard Refuge Administrative Officer. Union representatives were William E. Webb, Lodge President; Martin Amore, National Representative; Herbert L. Summers and James Moore of the local lodge. The new agreement was negotiated to conform with the President's New Executive Order 11491.

Crab Orchard Refuge acted as host to a 40-hour, in-service, law enforcement seminar held March 8 through 12. The training was presented by Southern Illinois University Department of Law Enforcement and Corrections. Attending were personnel from Crab Orchard Refuge, Upper Mississippi, DeSoto, Wheeler, and Wichita Mountains refuges. Also in attendance was a representative of the Shawnee National Forest, and USGMA Hopkins as an observer.

A Public Use Workshop was held at Crab Orchard Refuge October 13 through 15. Dr. Dwight McCurdy conducted the workshop. Public Use Specialists and related personnel from several states attended.

November 9 through 12, Crab Orchard Refuge acted as host to a PPBE Workshop. Harold O'Connor and Dale Coggeshall from the Central Office instructed the workshop. In addition to Crab Orchard personnel, about 40 employees from Indiana, Michigan, Nebraska, Ohio, Missouri and Illinois attended, as well as Regional and Central Office personnel.

Training Received This Reporting Period

L. A. Mehrhoff Jr. -	"Management Decisions in Natural Resources Administration" - Bureau of Land Management, Davis, California - March 1971.
Edward H. Nichols -	Police Training Seminar, SIU - 40 hours. Problems in Crime Control, SIU - Credit Course - 9/71 to 12/71.
Wesley F. James -	"Supervision and Group Performance" - USCSC, Chicago - 3/29 - 4/2/71. "Camp Administration" (Rec. & Parks) - 3-credit correspondence course, University of Minnesota.

Richard J. Johnson - Police Training Seminar, SIU - 40 hours.
"Management and Group Performance" - USCSC,
Chicago - 11/15 - 19/71.

Robert E. Wilson - "Introduction to Supervision" - USCSC,
St. Paul, Minnesota - 9/20-24/71.
Law Enforcement Training School - Crab
Orchard Refuge - 3/8-12/71.

Esther M. Dungey - "Executive Secretarial Seminar" - USCSC,
Chicago - June 1971.

Stella M. Grimes - "Accounting III" - John A. Logan College -
credit course.
"Control Accounting" - John A. Logan College -
credit course.
"Cost Accounting" - John A. Logan College -
credit course.

William J. McCoy Jr. - "Police Training Seminar" - SIU, 3/8-3/12/71.
"Museum Methods - Anthropology" - SIU -
credit course.
"Outdoor Education Workshop", Rec. & Outdoor
Education, SIU - credit course.
"Forest Ecology, Botany" - SIU - credit course.
"Introduction to Supervision" - USCSC -
St. Paul, Minnesota - 9/20-24/71.

L. E. Hovell - Police Training Seminar, SIU - 40 hours.

C. Photographs (Appended)

The colored photos were mostly slides taken with Honeywell
Pentax cameras. Persons taking the photos are identified
under each caption.

D. Credits for This Report

- Section I - (A) Gualdoni, (B-1 and 2) Hovell.
- Section II - Rice.
- Section III - (A) Staff: Hovell, Nichols, Goldsmith, McCoy; (B-1 McCoy; (B-2, E, F) Johnson; (B-3 C, D) Hovell.
- Section IV - (A, B, C) Hovell, (D) Johnson, (E) Wilson, (F) Grimes.
- Section V - Uptegraft.
- Section VI - (A) Nichols; (B) McCarty; (C) McCoy; (D and E) Wilson, (F) Uptegraft and Grimes.
- Section VII - (A and B) James, Grimes; (C, D) James.
- Section VIII - (A) Uptegraft, (B) James, (C) McCoy, (D) McCoy.

Report typed by Bonnie Dungey.

Editor - William McCoy.

SIGNATURE PAGE

Submitted by:



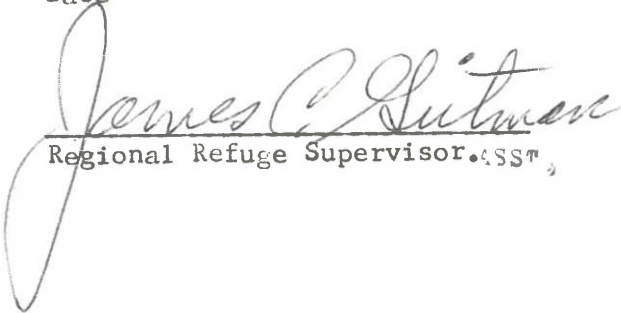
L. A. Mehrhoff Jr.,
Project Manager.

May 22, 1972

Approved, Regional Office:

MAY 25 1972

Date



Regional Refuge Supervisor. ASSⁿ

PHOTOGRAPHIC SECTION

Meet Mumpy and Grumpy, the Horned owls of Crab Orchard Refuge. After some friendly persuasion they reluctantly posed for a picture for the 1971 Narrative Report.

An interesting item concerning the owls was their diet. It consisted largely of grackles, starlings, redwings and bluejays.

(McCoy)



The Ruby-throated Hummingbird is a common nester on Crab Orchard Refuge. For most people, however, it is a rare occasion to find a hummingbird nest. There are two good reasons for this. The nest is the size of a 50¢ piece and is constructed of bits and pieces of mosses, lichens and ferns, all tied together with spider webs.

Biologist Rice, who found three active nests in 1971, states that the nests are usually found on overhanging branches along stream banks and trails. Apparently the bird likes to have an open travel lane.

(Rice)



The regal monarch, graced with the crown
jewels that have given him his position
in deerdome and often his death in the domain
of man. (Mehrhoff)



01' Chiseltooth is becoming more and more common on the refuge. Almost any night a person can walk a short distance along the lake shore and spot at least one beaver paddling about.

(McCoy)



A turkey vulture nest with one egg was located on a cliff ledge below Devils Kitchen Dam. This is the first vulture nest found on Crab Orchard Refuge. The egg successfully hatched, and a blue-eyed snow-white young 'un later matured and glided off with the parents.

(Rice and McCoy)



Disturb this nest and you're in for a lot of trouble. This masterpiece of art is a creation of one of the paper wasps, the Bald-faced Hornet (Dolichovespula maculata). These nests are becoming uncommon because people seem to have an inborn instinct to destroy them on sight. If they do so after several hard frosts it would not matter since the carrier of future progeny, the fertilized female, would have left the nest and gone into hibernation. People will not recognize one of their own friends -- a friend that does much good by feeding almost entirely on insects.

(McCoy)





Probably the most interesting item of interest is this giant morel mushroom collected the first week of May by biological technician, Bob Rice.

We believe its phenomenal growth was due to the desirable side effects of an earlier prescribed burn. Rice stated the mushroom seemed as tuff as wood.
(Rice)

WATERFOWL

REFUGE Crest Orchard WMA

MONTHS OF January TO April 30, 19 71

(1) Species	(2) Weeks of reporting period									
	1/1 1	1/14 2	1/21 3	1/28 4	2/4 5	2/11 6	2/18 7	2/25 8	3/4 9	3/11 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	58,000	58,000	58,000	56,000	56,000	62,000	62,000	61,000	40,000	25,000
Cackling										
Brant										
White-fronted										
Snow						10	10	10	10	10
Blue						25	25	25	25	25
Other										
Ducks:										
Mallard	1575	1175	1000	750	735	690	690	700	760	665
Black	865	965	650	765	770	695	695	690	625	615
Gadwall						10	10	10	10	5
Baldpate									5	5
Pintail			10	30	10	25	25	50	55	20
Green-winged teal								5	10	10
Blue-winged teal										
Cinnamon teal										
Shoveler				15	15	5	5	5	10	50
Wood									50	50
Redhead								35	125	125
Ring-necked	150	155	150	150	150	65	65	90	300	195
Canvasback		10	10	10	5	5	5	25	25	25
Scaup				10	10	10	10	10	25	75
Goldeneye	120	100	105	90	90	140	140	140	140	50
Bufflehead	15	15	10	15	10	10	10	10	5	10
Ruddy									35	60
Other	25	20	5	15	5	15	15	10	15	10
Hooded Merganser										
American Merganser	3700	4000	4400	3800	3900	4400	4400	3800	3800	2470
Red Br. Merganser										5
Coot:										10

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Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Crab Orchard

MONTHS OF January TO April 30, 19 71

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6		
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	20,000	12,000	750	2,000	2,000	800	200	175	4,037,425	x
Cackling										
Brant										
White-fronted										
Snow	10	10	5	10					595	
Blue	25	15	30	25	10	10	10		1750	
Other										
Ducks:										
Mallard	440	435	415	405	340	315	315	315	78,750	
Black	65	40	15	15					49,945	
Gadwall	25	20	30	30	20	5	30	10	1,445	x
Baldpate	45	40	35	35	20	10	10	5	1,440	x
Pintail	90	35	10	5	10				2,625	
Green-winged teal	30	30	35	45	45	15	5		1,610	x
Blue-winged teal		25	65	120	80	65	110	135	3,530	x
Cinnamon teal										
Shoveler	30	50	80	110	90	80	90	90	4,535	x
Wood	30	50	50	50	50	65	80	80	3,125	x
Redhead	145	150	180	35					5,565	
Ring-necked	180	175	265	195	300	45			18,130	
Canvasback									840	
Scaup	235	125	185	1825	775	85			23,960	
Goldeneye	40								7,945	
Bufflehead	25	40	35	55	40	15			2,240	
Ruddy	70	55	80	100	40	25	20		3,535	
Other									875	
	1275	275	425	100	50	75			277,690	
	5	45	190	180					2,975	
Coot:	410	500	500	1100	850	865	300	150	32,035	

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	:	:	:	Principal feeding areas <u>Crab Orchard Lake,</u>
Geese	<u>4,039,770</u>	<u>434,245</u>	:	<u>Areas II & III,</u>
Ducks	<u>491,440</u>	<u>45,710</u>	:	Principal nesting areas <u>Revs. islands, and local streams.</u>
Coots	<u>32,035</u>	<u>2,700</u>	:	
				Reported by <u>George Stapleton</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

WATERFOWL

REFUGE Crab Orchard

MONTHS OF May 1, 1971 TO Aug. 31, 1971

(1) Species	Weeks of reporting period ⁽²⁾									
	5/7 1	5/14 2	5/21 3	5/28 4	6/4 5	6/11 6	6/18 7	6/25 8	7/2 9	7/9 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	110	110	110	110	110	110	110	110	110	110
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	300	300	300	300	300	300	300	300	350	380
Black										
Gadwall	10	10	10	10	10	10	10	10	10	10
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal	130	45	20	10	5	5	5	5	5	20
Cinnamon teal										
Shoveler	80	20								
Wood	80	80	80	80	80	90	120	120	155	155
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										

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Cont. NR-1
(Rev. March 1953)WATERFOWL
(Continuation Sheet)REFUGE Cash OrchardMONTHS OF May 1, TO Aug. 31, 19 71

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods:Estimate seen : total	
	7/16 11	7/23 12	7/30 13	8/6 14	8/13 15	8/20 16	8/27 17	+ 4 18			
<u>Swans:</u>											
Whistling											
Trumpeter											
<u>Geese:</u>											
Canada	110	110	110	110	110	110	110	110	13,530	2	10
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
<u>Ducks:</u>											
Mallard	380	380	380	380	380	380	380	380	42,050	9	80
Black											
Gadwall	10	10							840		
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal	45	60	85						3,080		
Cinnamon teal											
Shoveler									560		
Wood	210	210	210	210	210	210	210	210	18,410	8	100
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
<u>Coot:</u>											

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	:	:	:	Principal feeding areas
Geese	:	:	:	
Ducks	:	:	:	Principal nesting areas
Coots	:	:	:	
				Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

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- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
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- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

WATERFOWL

REFUGE Crab Orchard

MONTHS OF September TO December, 19 71

(1) Species	(2) Weeks of reporting period									
	1 9/7	2 9/14	3 9/21	4 9/28	5 10/5	6 10/12	7 10/19	8 10/26	9 11/2	10 11/9
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	100	100	475	750	14,000	18,100	18,100	30,000	44,000	43,000
Cackling										
Brant										
White-fronted										
Snow					10	15	15	25	60	65
Blue					25	135	135	125	140	185
Other Richardson's							100	100	150	150
Ducks:										
Mallard	355	480	525	540	800	1,550	1,750	2,000	5,750	6,500
Black	5	5	25	20	120	240	310	500	2,260	1,700
Gadwall	5	5	18	5	60	100	175	200	65	125
Baldpate	10	65	60	145	835	645	675	800	460	300
Pintail		15	20	20	110	215	290	300	270	175
Green-winged teal	25	55	90	25	70	115	185	250	80	180
Blue-winged teal	135	115	85	85	105	85	70	30	35	15
Cinnamon teal										
Shoveler		10	20	15	40	105	70	60	15	55
Wood	90	90	125	125	125	150	150	100	100	100
Redhead					5	10	15	10	15	25
Ring-necked					20	125	300	400	150	600
Canvasback										
Scaup					5	25	50	200	850	200
Goldeneye										5
Bufflehead						5	45	100	45	10
Ruddy						5	15	100	65	15
Other Hooded Merg.										20
Coot:										

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Cont. NR-1
(Rev. March 1953)

WATER FOWL.
(Continuation Sheet)

REFUGE

MONTHS OF September TO December, 1971

		(2)		(3)		(4)	
		Weeks of reporting period		Estimated		Production	
(1)				waterfowl		Broods: Estimated	
Species	11/16 11/17 11/18 11/19 11/20 11/21 11/22 11/23 11/24 11/25 11/26 11/27 11/28 11/29 11/30 12/1 12/2 12/3 12/4 12/5 12/6 12/7 12/8 12/9 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23 12/24 12/25 12/26 12/27 12/28 12/29 12/30 1/1 1/2 1/3 1/4 1/5 1/6 1/7 1/8 1/9 1/10 1/11 1/12 1/13 1/14 1/15 1/16 1/17 1/18 1/19 1/20 1/21 1/22 1/23 1/24 1/25 1/26 1/27 1/28 1/29 1/30 1/31 2/1 2/2 2/3 2/4 2/5 2/6 2/7 2/8 2/9 2/10 2/11 2/12 2/13 2/14 2/15 2/16 2/17 2/18 2/19 2/20 2/21 2/22 2/23 2/24 2/25 2/26 2/27 2/28 2/29 2/30 3/1 3/2 3/3 3/4 3/5 3/6 3/7 3/8 3/9 3/10 3/11 3/12 3/13 3/14 3/15 3/16 3/17 3/18 3/19 3/20 3/21 3/22 3/23 3/24 3/25 3/26 3/27 3/28 3/29 3/30 3/31 4/1 4/2 4/3 4/4 4/5 4/6 4/7 4/8 4/9 4/10 4/11 4/12 4/13 4/14 4/15 4/16 4/17 4/18 4/19 4/20 4/21 4/22 4/23 4/24 4/25 4/26 4/27 4/28 4/29 4/30 5/1 5/2 5/3 5/4 5/5 5/6 5/7 5/8 5/9 5/10 5/11 5/12 5/13 5/14 5/15 5/16 5/17 5/18 5/19 5/20 5/21 5/22 5/23 5/24 5/25 5/26 5/27 5/28 5/29 5/30 5/31 6/1 6/2 6/3 6/4 6/5 6/6 6/7 6/8 6/9 6/10 6/11 6/12 6/13 6/14 6/15 6/16 6/17 6/18 6/19 6/20 6/21 6/22 6/23 6/24 6/25 6/26 6/27 6/28 6/29 6/30 7/1 7/2 7/3 7/4 7/5 7/6 7/7 7/8 7/9 7/10 7/11 7/12 7/13 7/14 7/15 7/16 7/17 7/18 7/19 7/20 7/21 7/22 7/23 7/24 7/25 7/26 7/27 7/28 7/29 7/30 7/31 8/1 8/2 8/3 8/4 8/5 8/6 8/7 8/8 8/9 8/10 8/11 8/12 8/13 8/14 8/15 8/16 8/17 8/18 8/19 8/20 8/21 8/22 8/23 8/24 8/25 8/26 8/27 8/28 8/29 8/30 8/31 9/1 9/2 9/3 9/4 9/5 9/6 9/7 9/8 9/9 9/10 9/11 9/12 9/13 9/14 9/15 9/16 9/17 9/18 9/19 9/20 9/21 9/22 9/23 9/24 9/25 9/26 9/27 9/28 9/29 9/30 10/1 10/2 10/3 10/4 10/5 10/6 10/7 10/8 10/9 10/10 10/11 10/12 10/13 10/14 10/15 10/16 10/17 10/18 10/19 10/20 10/21 10/22 10/23 10/24 10/25 10/26 10/27 10/28 10/29 10/30 10/31 11/1 11/2 11/3 11/4 11/5 11/6 11/7 11/8 11/9 11/10 11/11 11/12 11/13 11/14 11/15 11/16 11/17 11/18 11/19 11/20 11/21 11/22 11/23 11/24 11/25 11/26 11/27 11/28 11/29 11/30 12/1 12/2 12/3 12/4 12/5 12/6 12/7 12/8 12/9 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23 12/24 12/25 12/26 12/27 12/28 12/29 12/30 1/1 1/2 1/3 1/4 1/5 1/6 1/7 1/8 1/9 1/10 1/11 1/12 1/13 1/14 1/15 1/16 1/17 1/18 1/19 1/20 1/21 1/22 1/23 1/24 1/25 1/26 1/27 1/28 1/29 1/30 1/31 2/1 2/2 2/3 2/4 2/5 2/6 2/7 2/8 2/9 2/10 2/11 2/12 2/13 2/14 2/15 2/16 2/17 2/18 2/19 2/20 2/21 2/22 2/23 2/24 2/25 2/26 2/27 2/28 2/29 2/30 3/1 3/2 3/3 3/4 3/5 3/6 3/7 3/8 3/9 3/10 3/11 3/12 3/13 3/14 3/15 3/16 3/17 3/18 3/19 3/20 3/21 3/22 3/23 3/24 3/25 3/26 3/27 3/28 3/29 3/30 3/31 4/1 4/2 4/3 4/4 4/5 4/6 4/7 4/8 4/9 4/10 4/11 4/12 4/13 4/14 4/15 4/16 4/17 4/18 4/19 4/20 4/21 4/22 4/23 4/24 4/25 4/26 4/27 4/28 4/29 4/30 5/1 5/2 5/3 5/4 5/5 5/6 5/7 5/8 5/9 5/10 5/11 5/12 5/13 5/14 5/15 5/16 5/17 5/18 5/19 5/20 5/21 5/22 5/23 5/24 5/25 5/26 5/27 5/28 5/29 5/30 5/31 6/1 6/2 6/3 6/4 6/5 6/6 6/7 6/8 6/9 6/10 6/11 6/12 6/13 6/14 6/15 6/16 6/17 6/18 6/19 6/20 6/21 6/22 6/23 6/24 6/25 6/26 6/27 6/28 6/29 6/30 7/1 7/2 7/3 7/4 7/5 7/6 7/7 7/8 7/9 7/10 7/11 7/12 7/13 7/14 7/15 7/16 7/17 7/18 7/19 7/20 7/21 7/22 7/23 7/24 7/25 7/26 7/27 7/28 7/29 7/30 7/31 8/1 8/2 8/3 8/4 8/5 8/6 8/7 8/8 8/9 8/10 8/11 8/12 8/13 8/14 8/15 8/16 8/17 8/18 8/19 8/20 8/21 8/22 8/23 8/24 8/25 8/26 8/27 8/28 8/29 8/30 8/31 9/1 9/2 9/3 9/4 9/5 9/6 9/7 9/8 9/9 9/10 9/11 9/12 9/13 9/14 9/15 9/16 9/17 9/18 9/19 9/20 9/21 9/22 9/23 9/24 9/25 9/26 9/27 9/28 9/29 9/30 10/1 10/2 10/3 10/4 10/5 10/6 10/7 10/8 10/9 10/10 10/11 10/12 10/13 10/14 10/15 10/16 10/17 10/18 10/19 10/20 10/21 10/22 10/23 10/24 10/25 10/26 10/27 10/28 10/29 10/30 10/31 11/1 11/2 11/3 11/4 11/5 11/6 11/7 11/8 11/9 11/10 11/11 11/12 11/13 11/14 11/15 11/16 11/17 11/18 11/19 11/20 11/21 11/22 11/23 11/24 11/25 11/26 11/27 11/28 11/29 11/30 12/1 12/2 12/3 12/4 12/5 12/6 12/7 12/8 12/9 12/10 12/11 12/12 12/13 12/14 12/15 12/16 12/17 12/18 12/19 12/20 12/21 12/22 12/23 12/24 12/25 12/26 12/27 12/28 12/29 12/30 1/1 1/2 1/3 1/4 1/5 1/6 1/7 1/8 1/9						

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	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	:	:	:	Principal feeding areas
Geese	4,504,545	75,000	:	Principal nesting areas
Ducks	664,525	10,000	:	
Coots	:	:	:	
				Reported by

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon	2	4/23	2	4/30	2	4/30				
Horned Grebe	1	4/2	2	4/9	1	4/23				
Pied-billed Grebe	2	1/8	15	4/9	Still	Present				
Cormorant	12	4/23	12	4/23	12	4/23				
Great Blue Heron	5	1/8	5	4/23	5	4/30				
Green Heron	1	4/9	10	4/23	10	4/30				
Little Blue Heron	1	4/2	3	4/23	3	4/30				
Common Egret	1	4/2	1	4/9	Still	Present				
Yellow Crown Night Heron	1	4/2	5	4/3	Still	Present				
II. Shorebirds, Gulls and Terns:										
American Golden Plover	75	4/9	75	4/9	75	4/9				
Common Snipe	1	3/19	5	4/9	5	4/23				
Greater Yellowlegs	2	4/23	2	4/23	1	4/30				
Lesser Yellowlegs	4	4/9	10	4/23	10	4/30				
Spotted Sandpiper	1	4/23	1	4/23	1	4/30				
Solitary Sandpiper	2	4/30	2	4/30	2	4/30				
Pectoral Sandpiper	3	4/2	5	4/23	5	4/23				
Semi-palmated Plover	1	4/30	1	4/30	1	4/30				
Herring Gull	Present at be-		500	1/29	5	4/23				
Ring-Billed Gull	ginning of period.		2500	1/29	Still	Present				
Bonaparte's Gull	20	4/16	20	4/16	10	4/23				
Common Tern	10	3/19	10	3/19	8	4/30				

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove	Resident				
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle	Present at begin-	1	1/22	1	2/19
Duck hawk	ning of period.				
Horned owl					
Magpie					
Raven					
Crow					
Bald Eagle	" "	16	1/8	3	3/19
Reported by <u>George Stapleton</u>					

INSTRUCTIONS

(1) Species:

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Columbiformes to Ciconiiformes and Gruiformes)

II. Shorebirds, Gulls and Terns (Charadriiformes)

III. Doves and Pigeons (Columbiformes)

IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen:

The first refuge record for the species for the season concerned.

(3) Peak Numbers:

The greatest number of the species present in a limited interval of time.

(4) Last Seen:

The last refuge record for the species during the season concerned.

(5) Production:

Estimated number of young produced based on observations and actual counts.

(6) Total:

Estimated total number of the species using the refuge during the period concerned.

3-175
Form NK-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge... Crab Orchard Months of May 1 to August 31, 19571.

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Horned grebe	5	5-8	5	5-8	Only sighting					
Great Blue heron	Present at begin- ning of period		32	3-26	Still Present					
Green heron	"	"	40	7-24	"	"				
Little Blue heron	"	"	25	7-24	"	"				
Yellow crown night heron	"	"	15	7 - 1	"	"	1	5	7	10
American bittern	2	6-19	2	6-19	"	"				
Cattle egret	1	6-26	1	7-17	"	"				
II. <u>Shorebirds, Gulls and Terns:</u>										
Greater yellowlegs	Present at begin- ning of period		3	5-8-71	"	"				
Lesser yellowlegs	"	"	5	"	"	"				
Semi-palmated sandpiper	5	5-15-71	5	5-15-71	Only sighting					
Solitary sandpiper	Present at begin- ning of period				Still Present					
Least sandpiper	25	5-15-71	25	5-15-71	Only sighting					
Ring-billed gull	Present at begin- ning of period		125	5-8-71	10	5-15-71				
Common tern	"	"	10	5-15-71	Still present					

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons</u> :	Resident				
Mourning dove					
White-winged dove					
IV. <u>Predaceous Birds</u> :					
Golden eagle					
Duck hawk					
Horned owl	Resident				
Magpie					
Raven					
Crow	Resident				
Reported by				J. L. Rice	

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Crab Orchard

Months of September to December 1957

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Great Blue Heron	Present	at begin- ning of period.	88	10-19	Still Present					
Green Heron	"	"	10	09-07	2	09-28				
Little Blue Heron	"	"	3	09-14	2	09-21				
Yellow Crown Night Heron	"	"	1	09-07	1	09-07				
American Bittern	"	"	1	09-07	1	09-07				
Cattle Egret	"	"	1	09-07	1	09-07				
II. <u>Shorebirds, Gulls and Terns:</u>										
Greater Yellow Legs	"	"	3	09-14	3	10-05				
Lesser Yellow Legs	"	"	2	09-14	2	09-28				
Spotted Sandpiper	"	"	1	09-21	1	09-28				
Solitary Sandpiper	"	"	3	09-07	3	09-21				
Common Tern	"	"	3	09-21	3	09-28				
Ring-billed Gull	3	10-05	300	12-28	Still Present					
Bonapartes Gull	3	11-02	30	11-23	25	12-07				
Common Tern	1	09-28	The only sighting							
Common Tern -										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Resident				
IV. <u>Predaceous Birds:</u> Golden eagle - Duck hawk Horned owl - Magpie Raven Crow - Bald eagle - Black Vulture - Osprey -	1 Resident Resident 2 11-09 1 09-28 1 10-18	2 11-30 9 12-21 Only Sighting Only Sighting	Still Present Still Present		
Reported by <u>James E. Lane</u>					

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750c
Form NR-1C

WATERFOWL HUNTER KILL SURVEY

Year 1971

Refuge: Crab Orchard

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. Hunters	(9) Est. Total Kill
11/15-21	1281	5124	Canada Geese	57	12	69	1306	* *
11/22-28	1409	5676	Canada Geese	59	12	71	1437	
11/29-12/5	1285	5140	Canada Geese	146	29	175	1311	
12/6-12	1071	4284	Canada Geese	80	16	96	1091	
12/13-19	1283	5132	Canada Geese	178	36	214	1309	
12/20-22	633	2532	Canada Geese	117	23	140	645	
TOTALS	6962	27,888		637	128	765	7099	

* * A mandatory registration system is used in public hunting areas. As most hunters bagging geese register their kill, a heavy bias would make a projected kill figure in this column inaccurate.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Cash Orchard Months of January to April 30, 19 71

(1) Species	(2) Density	(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
		Acres Per Bird	Number broods observed		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat		Estimated Total	Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	Upland brush, meadow and forest edge - Area 11 - 15,345.	12.8		55:45				1,200	Figures based on roadside observations and the natural population renewal index.
	Area 11 - 18,609	10.3		55:45				1,800	
Turkey	11, 14, 15			Unknown				150	Figures based on casual observations by Refuge staff.

*Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Crab Orchard

Months of May 1, to August 31, 19 71

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	Upland brush, Meadow and forest edges Area II 15,345 acres.	9.9			55:45				1,550	Figures based on roadside observations and natural population renewal index.
	Area II 18,607	8.7			59:43				2,140	
Turkey	II, IV, V								160	Figures based on casual observations by Refuge staff.

*Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Crab Orchard

Months of September to December, 19 71

(1) Species	(2) Density	(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
		Acres Per Bird	Number broods observed		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat		Estimated Total	Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite Quail	Upland brush, meadow and forest edges - Area I - 15,345 Ac.	16		55:45	202			940	Figures based on roadside observations and the natural population survival index.
	Area II - 18,609 Ac.	13			102			1440	
Turkey	Area II, IV, V			Unknown				130	Figures based on casual observations by Refuge staff.

*Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

5-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Crab Orchard

Calendar Year 1971

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses	(6) Introductions	(7) Estimated Total Refuge Population		(8) Sex Ratio			
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	Upland and Bottomland Hardwoods - 14,600 acres. Brushland - 6,900 acres Agricultural land - 5,086 acres. Grasslands - 3,684 acres. Misc. (roads, recreational and industrial sites) - 1,900 acres. TOTAL ACREAGE - 32,170.	900	257					(73 road killed)				3,100	2,770*	0.30: 1.0 0.95
								None						
					</									

* Does not include the loss due to dispersion
which is still under investigation.

Remarks:

Reported by Darrell D. Uptegraft

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116000

5-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Crab Orchard

Calendar Year 1971

(1) Species	(2) Density	(3) Young Produced	(4) Removals					(5) Losses	(6) Introductions	(7) Estimated Total Refuge Population		(8) Sex Ratio		
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	Upland and Bottomland Hardwoods - 14,600 acres. Brushland - 6,900 acres Agricultural land - 5,086 acres. Grasslands - 3,684 acres. Misc. (roads, recreational and industrial sites) - 1,900 acres. TOTAL ACREAGE - 32,170.	900	257					(73	road killed)		None	3,100	2,770*	0.39: 0.31 0.95

Remarks:

* Does not include the loss due to dispersion
which is still under investigation.

Reported by Darrell D. Uptegraft

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) **SPECIES:** Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) **DENSITY:** Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) **YOUNG PRODUCED:** Estimated total number of young produced on refuge.
- (4) **REMOVALS:** Indicate total number in each category removed during the year.
- (5) **LOSSES:** On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) **INTRODUCTIONS:** Indicate the number and refuge or agency from which stock was secured.
- (7) **TOTAL REFUGE POPULATION:** Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) **SEX RATIO:** Indicate the percentage of males and females of each species as determined from field observations or through removals.

116000

3-1751
Form NR-7
Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

(1)

Refuge Crab Orchard

Year 19 71

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Small Food Plots in Various Locations.		500	Autumn Olive	April	Good	
							Selected Recreation Areas		250	Various Species	Spring	Good	

- (1) Report agronomic farm crops on Form NR-8
- (2) C = Collections and R = Receipts
- (3) Use "S" to denote surplus

Total acreage planted:

Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches About 2
Forest plantings _____

Remarks: _____

CULTIVATED CROPS - HAYING - GRAZING

Refuge Crab Orchard County Williamson State Illinois

Cultivated Crops Grown	Permittee's		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Share	Harvested	Harvested		Unharvested				
			Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn	1418.3	65,000	68.2	4,100	381.5	22,900	1868.0	Clover	1367.5
Milo	618.6	61,860	16.4	1,640	188.0	18,800	823.0	Wheat	426.0
Clover	1046.0	- -					1046.0		
Oats and Clover	321.5	6,440					321.5		
Lespedeza	48.0	- -					48.0		
Soybeans	13.0	- -					13.0		
Buckwheat					62.0	620	62.0		
Rice					37.0	2200	37.0		
Fallow Ag. Land.									420

No. of Permittees: Agricultural Operations 20 Haying Operations 1 Grazing Operations 13

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	543	2260	5085	1,775
				2. Other				
				1. Total Refuge Acreage Under Cultivation				4,644
Hay - Wild				2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

CULTIVATED CROPS - HAYING - GRAZING

Refuge Crab Orchard County Jackson State Illinois

Cultivated Crops Grown	Permittee's		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Share	Harvested	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Corn	24.0	960 bu.	6	240 bu.					
Wheat & Clover	30.0								
Clover	18.5								
								Fallow Ag. Land.	

No. of Permittees: Agricultural Operations 1 Haying Operations _____ Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	25	150	337.50	122
				2. Other				
				1. Total Refuge Acreage Under Cultivation				72.5
Hay - Wild				2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

71

Refuge Crab OrchardMonths of January through December, 195*

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Big Blue Stem		30 lbs	30 lbs		30 lbs						
Indian Grass		25 lbs	25 lbs		25 lbs						
Side Oats Gramma		10 lbs	10 lbs		10 lbs						
Switch Grass		10 lbs	10 lbs		10 lbs						
Little Blue Stem		2 lbs	2 lbs		2 lbs						
Winter Wheat		2,000 bu.	2,000 bu.		2,000 bu.						
Wheat		150 bu.	150 bu.		150 bu.						
Buckwheat		5,000 lbs	5,000 lbs		5,000 lbs						
Rice		50 bu.	50 bu.		50 bu.						
Milo		300 lbs	300 lbs		300 lbs						
Corn, Seed		1 bu.	1 bu.		1 bu.						
Corn, Shelled		2535.8	2,535.8			1335.8	1335.8	1200		1200	
Milo		120 bu.	120 bu.		120 bu.	120 bu.	120 bu.				

(8) Indicate shipping or collection points

(9) Grain is stored at Crab Orchard Refuge

(10) Remarks

*See instructions on back.

TIMBER REMOVAL

Refuge Crab Orchard

Year 1967

Permittee	Permit No.	Forest Mgmt. Compartment Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Rametta, Andy	SUP-40-71	20	15	Posts 150 ea. Cords 8 Cords 24 Cords 8 Cords 5	.09 ea 5.00 .50 1.50 .50	13.50 40.00 12.00 12.00 2.50	3"x6" dia X 7' 1gth Mine Props Pulpwood Pulpwood Fuelwood	Black Locust White Oak Mix. Hardwood Pine Mix. Hardwood
Wyatt, Wm. H.	SUP-20-72	5	5	Cords 20	1.00	20.00	Fuelwood	White Oak
Rametta, Andy	SUP-24-72	17	5	MBM 17.518	Variable	143.80	Sawlogs	Mix. Hardwood
" "	SUP-26-72	20	10	MBM 19.451	"	310.84	"	" "
" "	SUP-19-72	14	5	MBM 15.518	"	197.80	"	" "
" "	SUP-23-72	20	10	MBM 18.098	"	238.18	"	" "
Wyatt, Wm. H.	SUP-16-71	12	1	Posts 80	.09 ea	7.20	3"-6" dia X 7' 1gth	Black Locust
" "	SUP-9-71	5	1	Posts 300	.09 ea	27.00	"	" "
" "	SUP-11-72	11	1	Posts 300	.09 ea	27.00	"	" "
Kelly, Vernon	SUP-12-71	21	2	Posts 350	"	31.50	"	" "
Kelly, Herschel	SUP-106-70	25	1	Posts 200	"	18.00	"	" "
Cummins, Steve	SUP-11-71	2	1	Posts 200	"	18.00	"	" "
Pitts, Rodney	SUP-8-71	25	2	Posts 700	"	63.00	"	" "
Joyner, Charles	SUP-17-71	2	1	Posts 300	"	27.00	"	" "
Reed, David	SUP-3-71	25	1	Posts 200	"	18.00	"	" "

Total acreage cut over 61

Total income 1227.32

No. of units removed B. F. 70,585

Method of slash disposal Lop and scatter

Cords 65.0

Posts - ~~Ties~~ 2,780

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number
CO-1-71 through
CO-6-71Reporting Year
1971

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
April-June	Broadleaves	Farming Unit	878	Atrazine	2170 lbs.	2½ lbs./ac.	H ₂ O/3 gal.	Farm Sprayer
May	Weeds & Grasses	A-11	19	(Atrazine (Paraquat	50 lbs. 5 gal.	2½ lbs./ac. 1 qt./ac.	H ₂ O/ 18 gal.	Farm Sprayer
April-June	Grasses	Farm Units	210	Ramrod	1450 lbs.	7 lbs./ac.	H ₂ O/ 5 gal.	Farm Sprayer

10. Summary of results (continue on reverse side, if necessary)

Results were good in all cases.