BRANCH OF WILDLIFE REFUGES NARRATIVE REPORTS

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MR. GRIFFITH _____

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MR. REGAN MR _____ MR. DuMONT _____

Land Management

~~MR. ACKERMAN~~ CHT _____ ~~MR. HORLEY~~ Low

Habitat Improvement

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MR. KUBICHEK _____

Stenographers

_____ _____

REFUGE CRAB ORCHARD PERIOD SEPT-DEC. 1956

RAY SEE PGS 3 ←→ A/10 4

CRAB ORCHARD NATIONAL WILDLIFE REFUGE

REFUGE STAFF

E. E. CRAWFORD . . . . . PROJECT MANAGER

H. E. STILES . . . . . .REFUGE MANAGER

(VACANT) . . . . . .PROJECT ENGINEER

G. H. HUNTER . . . . . .ADMINISTRATIVE ASSISTANT

A. O. MANKE . . . . . .SOIL CONSERVATIONIST

L. B. SHEFFIELD . . . . . PARK RANGER

(VACANT) . . . . . JR. REFUGE MANAGER

7 EMPLOYEES . . . ADMINISTRATIVE AND TECHNICAL STAFF

J. J. PICKAR . . . . . FOREMAN, MIXED GANG

15 EMPLOYEES. . . . . CRAFTS, TRADES AND LABOR

W. E. ELLIOTT . . . . . FOREMAN, REFUGE SHOP

7 EMPLOYEES . . . . . .OPERATORS AND MECHANICS

A. BOLES . . . . . FOREMAN, WATER AND SEWER

4 EMPLOYEES . . . . . .WATER AND SEWER

E. HUNTER . . . . . .FOREMAN, HEAT AND STEAM

4 EMPLOYEES . . . . . HEAT AND STEAM

G. MELTON . . . . . FOREMAN, PROTECTION AND SECURITY

9 EMPLOYEES . . . . . .PROTECTION AND SECURITY

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I. GENERAL

Weather Conditions

Temperatures and rainfall throughout the period rounded out what could be called weatherwise a most ideal year. The Month of December had an average temperature 5 degrees above normal. The lowest December reading was 21° which was 9° warmer than the low for November. The only snow of the period, occurring on November 26, accumulated less than an inch and remained less than 24 hours.

Table No. I, below summarizes weather statistics for the period. These data are furnished by the official weather station of the Marion Veterans Hospital, Marion, Illinois.

Table No. I - Weather Statistics for Report Period

Month	Precipitation 1955	Precipitation 1956	Temperatures - Minimum	Temperatures - Maximum
September	1.52	3.28	43	94
October	3.17	1.37	34	86
November	2.73	2.43	12	78
December	0.35	2.97	21	69
Totals for Period	7.77	10.05	Extremes 12	94

Total precipitation - 1956 38.24 inches
50-Year average 41.90 "
Departure from norm -3.66 "
Accumulated deficit - past 5 years -- 41.82 inches

Water Conditions

Evaporational loss on Crab Orchard and Little Grassy Lakes was unseasonably high during late September and most of October. Less than one inch of rain fell during this 35 day portion of the period and lake levels dropped rapidly. The lowest levels were reached on November 14, when Crab Orchard stood at 11 inches below spillway and Little Grassy held at 38 inches below. Little Grassy Lake has not filled to spillway level since the late summer drawdown of 1955. At the close of the period both lakes were rising again with Little Grassy within 30 inches of spillway crest and Crab Orchard 6 inches shy of overflow.

Refuge farm ponds and sloughs also reflected the warm, dry, breezy days of early autumn with most ponds losing up to a foot of

water. Most ponds were full again by the end of the period with their inundated margins providing choice "goobering" for the puddle ducks.

Industrial and Municipal Water Use

Industrial water demands from the refuge operated water treatment plant have been relatively normal during this report period. Despite the fact that we have operated this period with a peak load of industrial employees Table No. II reflects less water use. A partial explanation of this seeming discrepancy is the isolation and repair of broken lines that were wasting water. There remains much to do in repair of lines and facilities. It is only through diligence of our water and sewer department employees that the operations are functioning so well. Water and sewage handlings for the period are shown in Table No. II.

Table No. II - Water and Sewage Handlings of Treated Water and Sewage at Refuge Operated Plants.

Month	Sept.- Dec. 1955 Gal. Treated Water	Sept.- Dec. 1955 Sewage	Sept.- Dec. 1956 Gal. Treated Water	Sept.- Dec. 1956 Sewage
September	19,444,000	4,547,000	15,706,000	5,550,000
October	19,835,000	5,739,000	14,774,000	5,275,000
November	18,766,000	6,427,000	14,385,000	5,100,000
December	18,718,000	5,782,000	13,694,000	5,575,000
Total	76,763,000	22,495,000	58,559,000	21,500,000

The four municipalities with emergency pumping facilities from Crab Orchard Lake have made only slight use of their emergency tap. Municipal pumpings are shown in Table No. III.

Table No. III - Raw Water Pumped from Crab Orchard Lake by Municipalities.

City	Sept.- Dec. 1955 Gallons Pumped	Sept.- Dec. 1956 Gallons Pumped
Herrin	73,858,200	6,400,900
Marion	9,500	---
Carterville	14,946,900	15,261,020
Carbondale	120,000,000	93,212,000*
Total	208,814,600	114,873,920

* Based on a 1955-56 annual pump of 279,637,000 gallons.

Fires

Three field fires occurred on the refuge this period. Prompt action by refuge personnel on all three fires confined total burn to five and one-half acres of grass and brush. One fire resulted from careless smokers, one from debris burning by a government contractor and one from sparks originating from a foundry cupola of a very undesirable industrial tenant. A bill for collection in the amount of $37.27 to this industrial tenant still remains unpaid.

The above three fires are reported more fully in the refuge annual fire report previously submitted.

Fire and Security Activities

Fire training drills were replaced with fire action of the 'real McCoy' in September and October. Drill periods have definitely paid off in action operations. In addition to the reported fire actions one run was necessary in December to the dormitory area at Southern Acres, but cook-stove fire in apartment was out upon arrival.

This office has failed to take administrative action necessary to officially empower our security force the power of enforcement of refuge regulations. It is important to the overall security and to broaden the usefullness of our Security force that such administrative action be taken.

II. WILDLIFE

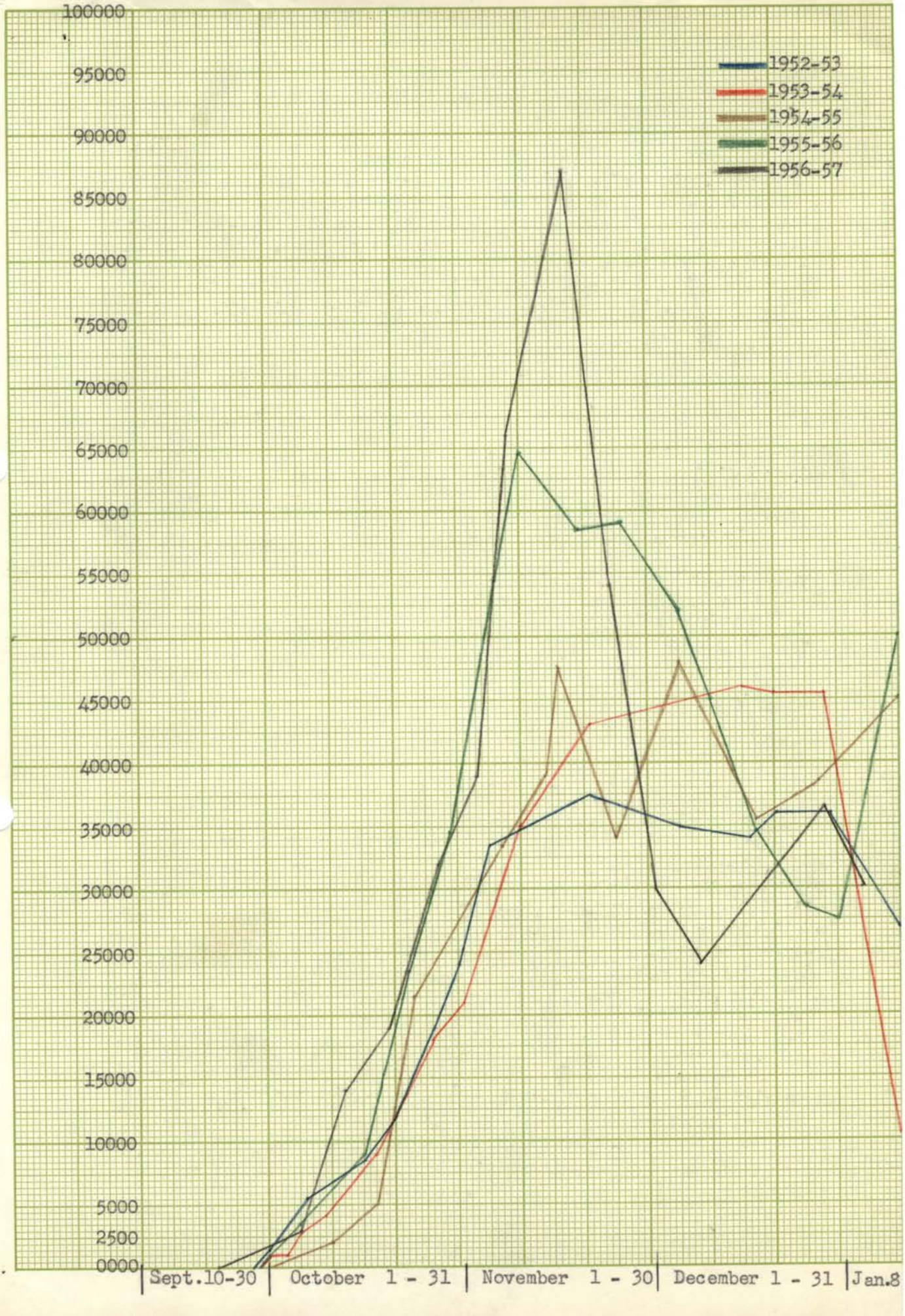
Migratory Birds -(See Forms NR-1 and NR-1A)

Populations and Behavior

First arrivals of Canada Geese were noted on September 20, when on that date Heavy Equipment Operator Meneese watched a flock of 120 birds make the long glide into Wolf Creek Bay-"flaps down and landing gear locked". Through the years, September 20 has become established as the approximate arrival date for Canada Geese at this refuge regardless of the buildup pattern that follows. Unlike the 1955 fall migration, the buildup was slow through October this year, and fully a week behind schedule on through to the peak population date which occurred on November 16. On that date an aerial count showed 87,000 Canada Geese, 350 blue geese and 150 snow geese on the refuge. This was more Canada Geese, by 22,500, than ever before recorded at Crab Orchard. This population fell off rapidly during the balance of November to about 30,000 birds. The flock then fluctuated between 24,000 and 36,000 during the rest of the period.

RAY— NOTE

CRAB ORCHARD - CANADA GOOSE POPULATION - BY CENSUS



There was very little off-the-refuge movement of geese this period until the last 10 days of the goose season (Southern Illinois closed on December 15). Several comments as to this year's geese being the laziest ever were heard from hunters and farm permittees. We suspect a goose will fly only so far and so high as he must to get to his feeding, drinking and loafing grounds. An abundance of all three were unusually well supplied this fall--some within walking distance of the lake. Only after all available corn and green forage in the peripheral zone of the lake had been consumed were any significant flights within and outside the refuge noted. For about 6 weeks, those honkers "never had it so good".

RAY-NOTE

Peak populations of other waterfowl species this period show mallards with 125,000, black ducks 8,000, gadwall 500, pintail 4,500, baldpate 2,000, lesser scaup 5,000, ringneck duck 1,500 and canvasback 400. All peaks occurred between November 15 and December 1. Blue-winged teal, green-winged teal, shovelers, wood ducks, redheads, goldeneyes, buffleheads and ruddy ducks were also represented at some time during the period. Two old squaw ducks were seen on Crab Orchard Lake during the annual Audubon Christmas bird count.

Marked fluctuations in mallard numbers from day to day during the migration season indicates a rapid turnover of this species.

Hutchins geese were present during most of the period, with a maximum flock of about 100. One of these deminutive honkers was recorded in the hunter bag-check.

American mergansers apparently yet finding open water and good fishing to the north were slow in building up here this year, with only 1,500 present at the close of the period. Over 9,000 were present during December of 1955. Hooded mergansers were also down slightly from last year, but coots were up over 300% in average use days over 1955.

Other Waterbirds

Great blue herons were common throughout the period with 24 being counted in the Audubon Christmas Census on December 27. Herring gulls and ring-billed gulls are abundant, forming "white islands" on ice floes about the lake. Double-crested cormorants, green herons and common egrets were the water birds most prevalent during September and early October.

Mourning Doves--though a substantial mourning dove population was present during the 40 day September -October dove season, the November migration was more noticeable. Flocks of up to 140 birds were seen frequently in picked corn fields outside the inviolate refuge. Since the ducks and geese had gleaned all the waste corn inside the refuge, there was little attraction left for doves. Only 17 mourning doves were tallied on the Christmas bird count.

Woodcock--An open season on this species in Illinois contributed nothing to the hunters bag in this area. Even a fisherman has difficulty locating angle worms in the locality, so its not surprising few woodcock are seen here in autumn.

Wilson Snipe made up about the same percentage of the shorebird migration as in previous years.

Food and Cover

Blessed by an ideal growing season, the refuge waterfowl food supply was in greater abundance this year than ever before. Yields on all crops--corn, soybeans, milo, buckwheat and small grains were record breaking. Winter rye seeded by refuge personnel for goose forage, and as a nurse crop for new pasture seedings, was well stooled out before the migration got far advanced. Twenty acres produced more green forage this fall than 50 acres had produced in former years. Refuge pastures also made good late summer and early fall growth adding substantially to the larder of greens. Perhaps 50% of the refuge share of permittee-grown corn remained unavailable to the geese because of ears being above their reach. Ear-height was noticeably greater than usual--presumably favored by the excellent growing conditions. Crop manipulation restrictions prevents making these high ears available by knockdown until after the close of the Mississippi Flyway waterfowl season on January 15. In view of the present daily movement of the refuge flock to private lands for feeding, a corn knockdown program will begin at 8:00 A.M. on January 16.

Upland waterfowl foods in the form of volunteer smartweed and wild millet, waste soybeans, buckwheat and proso millet were much appreciated by the ducks--especially following pothole creating rains when feeding conditions were more to their liking.

Diseases

No loss nor incidence of diseases noted in waterfowl this period.

Upland Game Birds -(See NR-2)

Population and Behavior

Since the field research station of the Illinois Natural History Survey formerly located on the refuge has been abolished, no bob-white quail census was conducted this year. General observations indicate a quail population near or at carrying capacity of the lands within the closed refuge. Hunting success on bob-white quail in the public hunting area of the refuge reflected an above average quail population there.

Ring-necked pheasants were infrequently observed on the refuge after the National Springer Spaniel Field Trial, December 6, 7 and 8. Following this trial, those pen-reared birds that escaped both gun and dogs were often seen in the vicinity of the trial grounds. If these birds follow the pattern established by previous "trial refugees", their future is anything but bright.

Food and Cover--Under existing and planned refuge land use, lack of food and cover for upland birds should never be a problem. The complaint most often heard by field trial people of the closed area, and by hunters on the public use area, is that there is too much cover.

Big Game Animals -(See Form NR-3)

The nearest thing to a harvest of white-tailed deer this period was accomplished by a highway kill of five bucks, one doe and one fawn. The doe and fawn were killed on Sneed road which bisects the closed area, and the five bucks were killed on State Highway 13 which parallels the north boundary of the refuge. A collision with one buck resulted in the automobile ending up in Crab Orchard Lake. Minor to major damage to automobiles resulted from the other car-deer collisions. Where salvageable, these deer were turned over to the State for disposal to charity.

A refuge deer census is currently underway. For this report, we would estimate the present herd at 800 animals. It is hoped that in this session of the State legislature, an Illinois deer season will be granted thus enabling us to possibly hold a controlled deer hunt. At the present rate of increase, certainly some harvest measures should be undertaken in the near future.

Food and Cover

Aside from increasing damage to permittee-grown refuge crops, little evidence of a deer food problem exists. For the first time, however, evidence of deer browsing retarding growth of greenbriar and honeysuckle was found in the pine plantations. One interesting sidelight noted in deer use was their apparent preference of black walnut saplings for antler rubbing or polishing. This tree seems to suffer far more damage from this activity than any other species.

Fur Animals, Predators, Rodents and Other Mammals

Fox and Gray Squirrels

Frequent observations of both species indicates a substantial population left after the controlled squirrel hunt held on the closed refuge in September. Only five days were required to harvest 534 squirrels. This represented a total of 234 hunts.

Cottontail Rabbit--Much talk is heard from local nimrods of how thick the rabbits are 30 miles north or 30 miles west, but a similar irruption by the bunny population was not noted on the refuge. At best this years numbers would be only slightly higher than last.

Muskrat--Rather stable water levels favored this species during the period. More houses than usual in some of the cattail bays indicate a probable increase in populations. Trapping of muskrats and other fur-bearers only on the public use area was permitted.

Red and Gray Fox--Neither species showing much change in population. Dead and wounded geese falling inside the refuge adjacent to public and "clubbed" hunting areas provided pretty easy living for foxes during the latter half of this period.

Racoon--Evidently on the increase again. Somewhat more interest seems to be present locally in hunting this nocturnal wonderer.

Skunk--Still on the increase but creating no apparent problems. It was not unusual to see them foraging in broad daylight on the refuge this period.

Predaceous Birds--(See Form NR-1A)

Bald eagles were present during the latter half of the period with nine being tallied on the Christmas bird count. One golden eagle was also observed, the third such observation in the history of the refuge. Crows were far too numerous throughout the period. An unusually heavy migration flight was noted during November. Red-tailed hawks, red-shouldered hawks and sparrow hawks were other raptores commonly seen throughout the period.

Fish--(See Form NR-6)

No data are available on which to base fish population trends during the period. With stable water levels and comparitive freedom from pollution, it is assumed no unusual influences were exerted on fish life this period.

III. REFUGE DEVELOPMENT AND MAINTENANCE

General Wildlife and Biological Development:

- Conducted five-day controlled squirrel hunt on refuge.
- Inspected refuge boundary signs, cleared away brush and replaced signs where needed.
- Installed and operated duck banding trap.
- Posted open water boundary of refuge with temporary wood piling and buoys.

- Performed weekly waterfowl census, air and land.
- Performed 448 hours of law enforcement patrol.
- Made Annual Audubon Christmas bird census.
- Hauled 2000 b.f. of logs to sawmill from highway R-O-W.
- Cut brush from and along 1½ miles of primary fire trails.
- Surfaced 3/4 mile of primary fire trail with salvaged rock.
- Surfaced 1 5/8 miles of primary fire trail and field access road with cinders.
- Installed 20 feet of 30" concrete culvert on primary fire trail.
- Combine harvest 420 pounds of dwarf milo maize.

Recreational Development and Maintenance:

- 2 new septic toilet units constructed
- 618 tons #8 rock dump spread on needy roads
- 49 man days mowing in picnic areas
- 26 man days cleanup in picnic areas
- 6 man days hauling firewood
- 20 man days road repairs and improvement
- 7 picnic tables rebuilt
- 5 man days installing and adapting 2 new 16 h.p. motors on rescue boat
- constructed boat hoist for rescue boat
- removed hand pump at Little Grassy Public Use Area and Concessioner installed power pump
- constructed new gate at Little Grassy
- gassed 3 chuck dens in Crab Orchard Dam
- put gravel under picnic tables
- salvaged and cut pipe for new picnic tables
- 20 man days on Devils Kitchen planning

Soil and Moisture Conservation:

- Cleared brush and trees from 33 acres with tractor dozers.
- Prepared seed bed and seeded grass and rye on 80 acres in pasture renovation.
- Seeded grass and rye on contour with grassland drill on 37 acres in pastures.
- Built 2 stock ponds, including seeding and mulching of the dikes; and rip-rapping around outlet structures. The ponds are 1 acre and 2½ acres in size.
- Shaped, disced and seeded 2200 feet of grass waterways.
- Constructed 1 mile of fence and peeled 960 pine fence posts for treatment.
- Lilliston mowed 80 acres of unharvested grass-legume fields for weed control and the mulching of organic residues.
- Cleaned 1180 pounds lespedeza seed.
- Applied 123.225 tons limestone, 33.33 tons rock phosphate, 5.7825 tons muriate of potash, and 3.1 tons 12-12-12 on 60 acres in pasture renovation.

- Attended Public Hearing and prepared Report on Cache River Flood Control Program.
- Attended grass "band-seeding" demonstration at West Frankfort, Illinois.
- Acted as "Conservation Instructor" at West Frankfort, Illinois, 4-H Camp.
- Five "Conservation Farming Guides", comprised of 1650 acres, planned and approved by S.C.S. Board.
- Prepared Quarterly S&M and appended "Short Corn Experiment" reports.

Facility Construction and Maintenance

A great percentage of our labor during this seasonal period of the year is necessarily used in getting our facilities in preparation for the winter months. The winter months are trying ones for our utilities. We are pushing heating systems to capacity. Water and sewage utilities delight in showing us their weaknesses. Rolling equipment needs the attention it didn't quite get during the more busy months.

Boiler House

The time, effort and expense that was put into the renovation of the boiler house the last report period has given us a relatively worry free operation during this heavy use period. Maintenance at the boiler house has been confined to:

- Minor adjustments and repairs to the heating equipment with the heaviest load coming in maintenance of the coal conveyor system from bin to stoker. This system needs complete replacement.
- Fire in the coal bin stock pile necessitated moving and handling of the entire supply in order to get complete extinguishment.

Buildings and Grounds

We had hoped to concentrate the efforts of this department in making rather large strides on getting our Central Shop in useable and operating condition. Delays in engineering and attention to the emergency, and normal routine has seen slow progress on said shop.

- Progress made on Central Shop this report period.
  - Central heating system of coal fired, stoker operated, steam heating system installed and housing for said heating system.
  - Partitioning of personnel use facility part of building framed in.
  - Sliding doors on locomotive and of shop replaced with 12' x 16' overhead doors.
- Staff house #6 completely redecorated, on the interior, for occupancy of U. S. Game Management Agent Newcomb.

- Loading, hauling and spreading 150 cu. yds. per month of cinders from Boiler House #1 for use on fire trails and farm unit access roads.
- Entire industrial building area and use roadsides received a complete annual fall mowing.
- Reshingled roof of Quarters No. 7.
- Placed attic insulation in Quarters No. 1, 2, 3 and 4.
- Checked, adjusted and made repairs as needed to all quarters heat systems prior to heating season.
- The Fire and Security Department, with little supervision, have, during and in addition to their normal work, made alterations in the south end (former bunk room) of the Fire Station. Partitions were torn out to make for an open room for storage of field fire pack and rescue units. An overhead door will be added for outside access. Partition material salvaged was re-used in fabricating additional and more useable hose rack facilities.

Equipment

Shop men and operators have been assigned varied duties this report period. All contributed materially to the fabrication, erection and installation of the Central Shop heating system. In addition, the wheels and tracks of the equipment needed, to do a rather large job, were kept turning by their men.

Railroad

- Railroad switch yard completely brushed and mowed.
- Removed 1000 feet of dead railroad trackage from the west side of the Sangamo Electric Company lease.
- Brushed 1½ miles of track into and through igloo Area 6, to service Universal Match Company.
- Handled a total of 369 car switches during report period, as compared to 396 for the same period one year ago.

Water and Sewer

- All fire hydrants inspected, serviced and winterized by fire-security force.
- All sewage lift stations washed down.
- Interior of chemical storage building at water plant given a 2-coat enamel paint (resistant to chemical acids) treatment.
- Minor repairs and adjustments to heating plant at water plant including furnace, stack and fuel systems.
- Repaired 2 year old break in 8 inch water main at COSA.
- Repaired water break on 12 inch water main at Olin area.
- Winterized all water meter installations.

Plantings--No plantings of aquatics, shrubs or tree stock this period.

Food Report Recorded WPB

Pest Plant Control

The following herbicidal controls of undesirable plant species were undertaken this period.

Trumpet vine, cottonwood, elm, willow control:

Approximately 3.8 acres of the above species, located on the Wolf Creek Road Causeway and the Crab Orchard Dam, were sprayed during the first two weeks of August with 2, 4, 5-T. Application was at the rate of 3.5 pounds per acre of acid-equivalent. Water was used as the dilutant. The solution was applied through a variable spray nozzle from a pressure pump system and tank mounted on a jeep pickup. An estimated 95% kill was achieved. Total cost of this treatment was $57.03 or $15 per acre.

Staghorn sumac, Honeysuckle, elm, poison ivy, Sassafras, Blackberry, trumpet vine control:

Approximately 20 miles of primary fire trails, including the above species, in Areas II and III were sprayed with a water solution of 3.3 pounds of acid equivalent 2,4,5-T per acre. (Total area involved approximated 28.2 acres.) Spraying was continuous from August 7 until August 15, but not including one weekend. About half the mileage involved has been cut-over in the early spring and all woody growth consisted of sprouts and briers. The 2,4,5-T solution was applied with the same equipment as used in the dam and causeway treatments previously mentioned. Examinations of the treated areas subsequent to spraying indicated an apparent kill of about 95%. Total cost of the fire trail treatment was $417.87 or $14.86 per acre. On a mileage basis this would amount to $20.88 per mile of trail.

American Lotus control:

Between July 26 and August 3, 40.8 acres of American Lotus (Nelumbo pentopetala) located in the first and second bays east of the Cambria Road, and in the two bays that surround the Group Picnic Area, were sprayed with a solution of 2,4-D and diesel oil. Application was at the rate of 3/4 pounds per acre of acid equivalent. Hand back pumps were used to effect the spray, and all spraying was done via boat. Percentage of kill ran from 100% in some areas to no more than 50% in others. Weather, spraying technique and time of year probably were factors influencing the success of this treatment. An average 70% kill was estimated for the entire 40.8 acres under treatment. Cost of the entire lotus control was $263.70 or $6.43 per acre.

Herbicide inventory at the end of the report period: 90 gallons 2,4-D and 45 gallons 2,4,5-T.

Cultivated Crops

Crop year 1956 was one of the busiest and best years in the history of the refuge. Crop yields "per acre" reached an all time high. This years average yield of 20.1 bushels per acre more than doubled the 5-year average for soybeans. This years average of 50.4 bushels of corn per acre almost doubled the 5-year average. Although winter grain yields remained about as low as ever, more acres were sown. Several fields of alfalfa became well established, and more than the usual amount of red clover fields were established and productive. Lespedeza-timothy-red top fields produced more than average. This all adds up to more food for the geese. Not only was there more food but a greater variety was offered. Buckwheat, dwarf milo, Atlas sorgo, and millet were seeded by refuge personnel. This was in addition to some 70 acres of rye and rye-vetch seeded for green manure and goose forage, and some 125 acres of rye and grass seeded in pasture renovations. All of this "extra" planting lends validity to the statement that this was a busy year.

Table No. IV - Crop Program Summary

Crop	Acres	Total Yield	Yield/ Acre	Yield/5 yr. Average 1952-1956	Departure fr. 5 yr. Average
Corn	1324	66718 bu.	50.4 bu.	28.8	+ 21.6
Corn silage	25	100 tons	4.0 tons		
Soybeans	983	18486 bu.	20.1 bu. 1/	9.9	+ 10.2
Oats	771	12834 bu.	21.2 bu. 1/	24.4	- 3.2
Wheat	323	3975 bu.	14.5 bu. 1/	12.3	+ 2.2
Rye	219	884 bu.	14.5 bu. 1/		
Barley	7	116 bu.	16.6 bu		
Hay (tame)	1616	1028 tons	1.1 tons 1/	.83	+ .27
Grass-legume seed	226	24395 lbs.	113.5 lbs. 1/		
Other	668				
Total -	6151				

1/ Computed from harvested acreages only.

This was a good year, but! Even with the good crops, the goose flock outstripped the increased production. All available corn had been gleaned and all winter grains had been grazed to the ground by about December 1. The geese then became dependant upon hay fields, pastures, and off-the-refuge feeding. Our physical and economical limitations have kept us from keeping pace with the increases in the numbers of waterfowl and other wildlife using Crab Orchard. We have not been able to reclaim, develop, and fertilize land fast enough. Another "dark" figure is the economic return from the refuge. Although "crop yields" reached an all time high, the total crop value was some $23,750 less than the peak year of 1954. This reflects the lower prices received.

Table No. V - Economic Return, Farm Crops

Crop	Yield		Unit Price	Amount
Corn	66 718	bu.	@ $ 1.10/bu.	$ 73 589.80
Corn silage	100	tons	@ 8.00/ton	800.00
Soybeans	18 486	bu.	@ 2.00/bu.	36 972.00
Oats	12 834	bu.	@ .50/bu.	6 417.00
Wheat	3 975	bu.	@ 1.65/bu.	6 545.75
Rye	884	bu.	@ .85/bu.	751.40
Barley	116	bu.	@ .70/bu.	71.20
Hay	1 028	tons	@ 16.00/ton	16 448.00
Kentucky fescue seed	6 300	lbs.	@ .15/lb.	945.00
Common red clover seed	5 000	lbs.	@ .37/lb.	1 850.00
Kenland red clover seed	1 325	lbs.	@ .42/lb.	556.50
Korean lespedeza seed	13 800	lbs.	@ .10/lb.	1 380.00
			1956 Total -	$ 146 326.65
Cash value of 1955 Refuge crops			-	103 941.46
" " " 1954 " "			-	170 085.58
" " " 1953 " "			-	142 880.60
" " " 1952 " "			-	146 497.00
" " " 1951 " "			-	139 258.00
" " " 1950 " "			-	113 625.30
" " " 1949 " "			-	67 183.99
" " " 1948 " "			-	76 104.38

Conducive weather conditions reestablished our faith in our crop rotation and fertilization programs. Land brought to basic fertility far out produced unfertilized land. Some 265 acres of fertilized land produced over 65 bushels of corn per acre, with 200 acres averaging over 75 bushels and 50 acres over 90 bushels. This demonstrates a solution to the problem of keeping pace with the goose flock. An expanded economy that would permit a greater expenditure of funds for basic fertilizers would do much to raise the production necessary. A total of 828 tons limestone, 126 tons rock phosphate, 10.7 tons calmeta phosphate, and 24 tons of potash were applied to refuge lands. In addition a 100 tons of commercial fertilizers and 627 tons of barn manure were used. The total value of the fertilizers applied is about $13,385.00, of which $1749.62 was expended from appropriated funds. In addition to the fertilizers $3777.00 were expended for grass-legume seeds of which $457.00 were expended from appropriated funds. The $14,956.00 represents the majority of the Government's return from the Government's share of the harvested crops not delivered to the granary.

IV ECONOMIC USE OF REFUGE

Grazing

Refuge pastures continued to make good growth and remained green until about October 1. A drouthy period from about mid-September to about the end of October stopped this rare, but desirable, condition. The pastures did, however, carry the cattle through the grazing season and were in good condition to receive the onslought of the geese. Almost all of the permittees stated that their cattle made better than average gains. A total of 3684 acres pastured 4554 A.U.M.s.

Renovation of approximately 240 acres of pasture was completed in the spring of 1956. Light grazing was permitted on about 140 of the 240 acres toward the end of the grazing season. Seeding in another 250 acres will be completed in spring of 1957.

All ponds held more than a sufficient amount of water for the stock; and, of course, this added to available shore bird and waterfowl habitat. Two stock watering ponds were completed this fall, one of about 1½ acres. An outlet structure that eliminated the "upright" was used in the 3/4 acre pond. It consisted of a straight tube through the dike with the upper, or pond ward side, cut at a 45° angle. The "long" side of the tube is turned to the top, thus giving a "hooded" appearance. This supposedly insures full flow through the tube.

Haying

Hay yields were comparatively high, and of somewhat better quality than in previous years. Several hundred bales were ruined by rain. Southern Illinois experienced a period of fast forming showers during the peak of the hay-making season. As last year, almost all haying operations were done on the share basis with only 98 acres harvested under 6 special use permits. The cash revenue from these permits amounted to $428.71 for 3053 bales.

Timber

Two timber permits are now in effect for the harvest of 1000 black locust posts. Demand for this product during the balance of the winter will probably harvest all available post-size black locust post on the refuge.

During the past year, four permittees harvested 641 black locust posts and 164,100 board feet of mixed hardwood sawtimber. These timber products returned a revenue of $1720.09 to the Service.

Harvest of merchantable timber in the Devils Kitchen Lake basin will get underway in the coming spring. This operation should boost timber revenues to a new high.

Industrial

Rental and occupancy of available building space showed some fluctuation downward primarily due to decreased warehousing activity by Norge. Generally summarized from Table No. VI, though somewhat down from last period, gains over the same period one year ago are 854,524 sq.ft. space rented as against 808,879, and employment by industrial lessee's totaled 2191 as compared to 1970 a year ago.

No new industries were established this report period.

Activities of Established Industries:

Activities by established industries has been rather stable this report period.

Castellano Construction Co.--Prefab house forming has been steady but some seasonal slump noted.

Diagraph-Bradley Industries, Inc.--Business volume remains steady with indications of an upward trend. Lease negotiations still not complete on renewal of lease. Recent discussions indicate lease problems about resolved and expect completion of a lease within 30 days.

Dura-Crates, Inc.--A few ups and downs this report period but showing forward progress. Are faced with a problem of raw products inventory storage, and are contemplating construction additions to their facilities.

Grinnell Sash and Door--This industry was considerably hampered this report period by a 37 day strike of employees on wage negotiation. The strike hit at a very bad time in this building trade, and they suffered a business loss that has been difficult to recover from. They seem on the mend now, business wise, but talk of facility expansion has been shelved.

Marion Metal and Roofing--Have shown interest in relocation within the refuge area and combining of their Marion operations with their facilities here for a central warehousing. Unfortunately, we don't have quite the right set of circumstances to give them much encouragement.

Olin-Mathieson Chemical Corporation--We are well on the way to having constructed, within our ownership, the most modern dynamite plant in the world. Construction contractors and sub-contractors for Olin are employing 220 men in changing the physogomy of the land and constructing buildings.

R. K. Manufacturing Co.--Operations this period have been pretty much status quo with a tendency downward.

Table No. VI - Industrial Leasing, Revenue & Employment

INDUSTRY	Lease Footage Sept.	Oct.	Nov.	Dec.	Monetary Return Rent	Wat.&Sew.	Steam	Switching	Total	Total No. Employed 4-30-56	Total No. Employed 12-31-56
Allen Industries, Inc.	20,500	20,500	20,500	20,500	$ 1 161.68				$ 1 161.68	4	5
Aronson, Knute	1,550	1,550	1,550	1,550	77.52				77.52	1	1
Castellano Const. Co.	20,500	20,500	20,500	20,500	1 161.68	$ 16.00		$ 207.68	1 385.36	14	16
Diagraph-Bradley Inds.	71,186	71,186	71,906	71,906	4 562.12	138.34		56.64	4 757.10	95	105
Dura-Crates, Inc.	20,721	20,721	20,721	20,721	1 381.40	44.18		236.00	1 661.58	37	47
E.Side Lumberyard Co.	15,695	15,695	15,695	15,695	1 046.32	16.00		47.20	1 109.52	3	3
Egyptian Ind. Supply Co.	----	----	4,556	4,556	113.90				113.90	--	1
General Services Admin.	63,103	63,103	63,103	63,103	3 538.44	16.00		236.00	3 790.44	8	9
General Telephone Co.	4,715	4,715	4,715	4,715	267.20				267.20	--	1
Great Lakes Solvents	25,846	25,846	25,846	25,846	1 463.12	16.00		764.64	2 243.76	3	4
Grinnell Sash & Door Co.	33,517	33,517	33,517	33,517	1 832.56	25.10		322.05	2 179.71	50	48
Kroger Co.	21,500	21,500	21,500	21,500	1 211.68	16.00		556.96	1 784.64	5	6
Marion Metal & Roofing Co.	10,250	10,250	10,250	10,250	580.84			18.88	599.72	8	8
Norge	56,350	46,100	35,850	35,850	2 794.70			292.64	3 087.34	50	45
Olin-Mathieson Corp.	4,598	4,598	31,236	31,236	1 237.44	110.60		94.40	1 442.44	34	66
Pride of Egypt	4,224	4,224	4,224	4,224	281.60	233.40			515.00	17	15
R.K. Mfg. Co.	7,771	7,771	7,271	7,271	501.38	40.63			542.01	28	25
Sangamo Elec. Co.	219,490	219,490	219,490	219,490	11 008.28	4 670.05	$20 589.44		36 267.77	1018	1070
Samuel, Ceasar	----	1,079	1,079	1,079	34.51				34.51	--	--
Skelcher, Marshall	----	----	----	----		25.00*			25.00	--	--
Southern Homes, Inc.	82,520	82,520	82,520	82,520	4 240.12	26.30		302.08	4 568.50	32	25
Sou. Ill. University	----	----	----	----		750.21			750.21	99	69
Storey, Jack M.	----	----	----	576	21.60**				21.60	--	1
Supreme Transformer Co.	25,464	25,464	25,464	25,464	1 467.60	496.80			1 964.40	175	140
Triangle Const. Co.	20,500	20,500	20,500	20,500	1 025.00				1 025.00	--	--
Universal Match Corp.	101,273	90,659	90,659	93,873	4 132.06	327.09		28.32	4 487.47	84	187
Charles Wood Corp.	18,082	18,082	18,082	18,082	1 024.64	49.51			1 074.15	15	18
Carterville Water	----	----	----	----		305.23			305.23	--	--
Herrin Water	----	----	----	----		128.02			128.02	--	--
Marion Water	----	----	----	----		100.00*			100.00	--	--
Chemical & Ind. Corp.	----	----	----	----				28.32	28.32	10	40
Fowler Plumbing & Heating	----	----	----	----				28.32	28.32	--	--
Frazier-Davis Const. Co.	----	----	----	----				75.52	75.52	6	180
C.O.F.T. Club	----	----	----	----	25.00*	34.55			59.55	--	--
C.O.S.A. Club	----	----	----	----	25.00*	20.00			45.00	--	--
L&R Const. Co.	----	----	----	----						9	--
Totals-Sept.-Dec. 1956	849,355	829,570	850,734	854,524	$46 217.39	$ 7 605.01	$20 589.44	$ 3 295.65	$77 707.49		2135
Totals-Aug. 31 1956				878,411	$48 104.41	$14 064.76	$ 9 653.14	$ 3 813.76	$75 636.07	1805	

* Annual Charge ** Dec. 1956 Jan. 1957 and Feb. 1957 Charge

Sangamo Electric Co.--Employment gains are noticed and business trends normal. Company officials have granted the local plant monies for a plant improvement program that indicates permanency. Many production line improvements and building improvements have been made on the interior of the plant. The exterior of the main entrance is receiving a modernization treatment that will make for a more attractive appearance.

Southern Homes, Inc.--A seasonal slump in production of their prefab homes is marked.

Universal Match Co.--There has been a major reorganizational shakeup within this Company that reached to the local refuge plant facility. Business gains in pyrotechnics production and demand has seen increased employment at the local plant. Research by this Company has been greatly expanded, and major alterations are being made to refuge facilities to accommodate this expansion.

Industrial Prospects and Contacts:

Local Chambers of Commerce and Southern Illinois Incorporated report little industrial lease interest this report period. Lease footage interest in our facilities, this report period, were expressed by:--

General Services Administration--Several telephone and one personal contact was made by this Federal Agency relative to possible lease of space. Their interest is in the stock pile storage of Kryolite ore--nothing firm has developed to date. Their interest was confined to 71,750 square feet of railroad siding space in Area 3.

Olin-Mathieson Chemical Corporation--Renewal of a rather old interest in the Artillery Primer Line was initiated this period and is being followed up by amendment to their present contract for space and services. Use of the area will be for development of a research center to work on propellants for the guided missel program. No testing will be allowed on the refuge, and the Company has already purchased a test site off the refuge.

Heat and Steam Production

Steam demands of Sangamo Electric Company from the one Government operated boiler house have lessened. Our employees on the steam equipment have performed a satisfactory operation. In the interest of economy of operation, with increased fuel oil prices, they have endeavored to meet all steam requirements on the coal burning boiler.

Reflected in the following table is our steam production.

Table No. VII -Comparative Heat and Steam Production, Boiler House #1

Boiler No. & Type	Sept.-Dec. 1955. Steam Prod.	Sept.-Dec. 1955. Fuel Used	Sept.-Dec. 1956. Steam Prod.	Sept.-Dec. 1956. Fuel Used
#1 Coal Fired	35,880,000	4,527,900#	31,699,500	4,299,360#
#2 Oil Fired	10,817,500	91,624gal.	5,474,000	46,315gal.
Total Steam Produced	46,697,500 pounds		37,173,500 pounds	

Other Uses

The payment from Swartz & Davis is calculated at 3% of their gross receipts and is tabulated in the following Table No. VIII:

Table No. VIII

Facility	Sept.	Oct.	Nov.	Dec.	Total	Total for 1956
Refreshments	16.93	3.19	.43		20.55	196.40
Gas & Oil	24.03	7.74	2.91	7.84	42.52	184.34
Dock, Boat, Mtr.	6.94	4.87	1.01		12.82	92.65
Storage	9.38	10.85	6.15	12.87	39.25	222.71
Merchandise	18.40	10.48	1.91	21.17	51.96	475.07
Labor	.14	3.05	1.28	1.51	5.98	20.47
Swim (Beach)	.79				.79	82.70
Rides	2.76				2.76	18.20
Totals -	79.37	40.18	13.69	43.39	176.63	1,292.54
					Fixed annual fee -	250.00
					Total revenue: 1956	1,542.54
					Total revenue: 1955	1,588.65
					" " 1954	1,667.50
					" " 1953	1,232.37

Revenues realized from all phases of the recreational operation are listed in Table No. IX on the following page.

Table No. IX

Item	September thru Dec.	Previous Months	Total for 1956
Camp lease, Educational Council of 100		300.--*	300.00
Camp lease, Independent Order of Odd Fellows	50.--		50.00
Camp lease, Seventh Day Adventist Church	47.--		47.00
Camp lease, Veterans of Foreign Wars		50.--	50.00
Camp permit, Boy Scouts of America		1.--	1.00
Camp permit, Future Farmers of America		1.--	1.00
Camp permit, Girl Scouts of America		1.--	1.00
Camp permit, Methodist Church		1.--	1.00
Camp permit, Presbyterian Church	1.--		1.00
Camp permit, Crab Orchard Boat & Yacht Club		25.--	25.00
Concession, Julius Swayne, Little Grassy		711.--	711.00
Concession, Schwartz & Davis, Crab Orchard	176.63	1365.91	1542.54
Impoundment fees for 3 boats		30.--	30.00
Total revenues	- 274.63	2485.91	2760.54

* The $300.00 paid in 1955 apparently was held until the lease was validated in May 1956 and was credited as of that date.

V FIELD INVESTIGATIONS AND APPLIED RESEARCH

Ornithology

No new birds were observed during the period to add to our refuge check list. Some unusual observations were made, however, that are of interest.

A golden eagle, an eared grebe and two old squaw ducks were observed on December 27, during the Annual Audubon Christmas Census.

Troupials which include the red-wing and grackles, along with starlings established a night roost on the refuge that numbered in the millions. The morning and evening flights were a source of wonder to all who saw them. Since their principal flight was over a major highway that skirts the refuge, their presence was noticed and commented on by many.

In all, 78 different species of birds totalling 2,327,062 individuals were recorded on the Audubon Christmas Census. This is a new record in both number of species and number of individuals.

Banding

A total of 201 ducks were caught for banding during the period. Of this total, 124 were banded, 69 were repeats and 8 were retraps.

Breaking these figures down into species:

	Banded	Repeats	Retraps	Total
Mallard -	76	23	1	100
Black Duck -	46	45	7	98
Pintail -	2	1	--	3
	124	69	8	201

The usually accepted theory that the black duck is more wary than the mallard is certainly belied in the above figures, as 53% of the total black ducks trapped were caught again, while only 24% of the total mallard catch were caught again. Of the birds retrapped from previous bandings, 7 were blacks and 1 was a mallard. One of the black duck retraps has an unusual record. Here is the log taken from our banding records:

Wearing band number 547-82259 and was an adult male when banded.

Banded November 25, 1953.	Repeated December 5
Retrapped November 17, 1954.	Repeated November 22, 23, 24, 25, 27 and 29; and December 1, 2, 7, 10, 14, 16 and 23.
Retrapped December 15, 1955.	No repeats
Retrapped November 26, 1956.	Repeated November 30, December 3, 5, and 7.

On December 12 the bird was exhibited on a television program of refuge activities. After being brought back to the refuge and released, the bird repeated on December 19.

Canada Goose Flock Counts

As suggested by Art Hawkins and Don Smith, a series of flock counts were made of Canada geese this period in an effort to establish gunning pressure on individual family groups or flocks. Duration of each of the following counts were based on 100 single birds as a control. In other words, each flock count was continued until 100 lone flyers had been tallied. Tabulations appear on Page 20.

Number of birds in flock	Flock Count No. 1 (No. of Flocks)	Flock Count No. 2 (No. of Flocks)	Flock Count No. 3 (No. of Flocks)
1	100	100	100
2	116	93	51
3	83	101	40
4	89	106	34
5	93	108	17
6	55	97	12
7	42	63	11
8	19	31	11
9	10	24	7
10	6	14	4
11	4	14	5
12	4	11	3
13	1	8	2
14	0	7	1
15	0	4	2
Location of count	North side of refuge	East side of refuge	South side of refuge
Date	November 20, 1956	November 28, 1956	December 6, 1956
Time	1:05PM to 2:15PM	1:55PM to 3:30PM	1:20PM to 3:20PM
Weather	Cloudy & cool	Cloudy & cool	Clear & cool
Direction of flight	N & NW	East	South
	These bird subject to moderate to heavy gunning when passing over public hunting area, but maintain high flight path due to "sky busting" and highway.	These birds subject to moderate gunning, but maintain high flight path due to highway, railroad and "sky busting".	These birds subject to heavy and lethal gunning from goose clubs--flight path comparitively low. Counts compare favorably with those made at Horseshoe Lake.

Short Corn and Wide-Row-Corn Experiments

These are reported fully in Mr. Manke's report appended to this narrative.

VI PUBLIC RELATIONS

Recreational Use

This year seemed to be a rather normal one with visitor days passing one million. Our estimates are based on a key point, State Highway Department traffic counter, in conjunction with our own observations and estimates through the year, and the results are as follow:

	1955	1956
Count based on key point counter	958,700	1,010,200
Count based on our guesstimations	925,900	1,010,000

A breakdown of the visitor day useage for the year is given in the following Table No. X:

Table No. X - Visitor Day Useage

	1955	1956
Hunting:		
Waterfowl	31,750	32,000
Dove	400	400
Quail	500	800
Squirrel	1,500	1,800
Rabbit	1,500	1,800
Fox Hounding	800	700
Racoon	200	100
Total Hunting -	36,650	37,600
Fishing:		
Boat	85,000	75,000
Bank	40,000	40,000
Spearing	--	300
Dip netting	250	100
Total Fishing -	125,250	115,400
General:		
Picnicking	150,000	160,000
Swimming (C.O. Beach)	20,000	16,000
Swimming (promiscuous)	140,000	260,000
Camping (individual)	8,000	9,000
Camping (organized-Little Grassy)	30,000	46,700
Power boating	30,000	40,000
Sail boating	1,500	3,000
Field trialing	3,000	1,500
Dog training	1,500	800
Spectators (general)	320,000	250,000
Spectators (waterfowl)	60,000	50,000
* Other useage	--	20,000
Total General -	764,000	857,000
Total Visitor Days	925,900	1,010,000

* Other useage--mostly nocturnal! Not recognized in previous reports.

The Little Grassy Lake camps are progressing satisfactorily with six of the ten showing major improvements such as dining halls, water systems, toilets, improved waterfronts, and other camping facilities. We have started distribution of a new public information sign for these camps stating that the land is under lease which entitles the lessee to exclusive use thereof. These signs should give relief to the camps which have been troubled by the public using their facilities.

Business at the Little Grassy Concession is increasing, but apparently the $711 yearly fee is a rather high percentage of the gross income.

Business at the Crab Orchard Concession has been good, but slightly decreased for the past two years. The major decreases have been in boat and motor rentals, merchandise sales, and swimming beach returns. The increases have been in refreshments, gas and oil, and boat storage. Mr. Cecil Davis would like to increase the charges for boat storage on the basis that similar services in other places are much higher, and only a few places offer the covered storage which is in such great demand here. The Beach netted about $300 profit for last summer's season. Its still a profit, but business has decreased more than 50% in the past four years. The concessionaire plans improvements for the coming season in an effort to offer better service to the public. It is going to be necessary to return to the use of lake water for showers and toilets, because the well flow is decreasing and does not meet the need.

Veterans Haven, during 1956, accommodated approximately 50 patients from the Veterans Hospital, and some 400 patients from the Anna State Hospital. Other visitors numbered about 4000. The Haven continues to be a well kept show place with relatively light useage. There were 48 patients from the Anna Hospital for the annual Christmas dinner; and it was made unusually special this year--thanks to Wes Newcomb, who donated 14 dressed, confiscated, Canada geese for their use.

The Crab Orchard Boat and Yacht Club now has 375 members and has all dockage space taken. This year they built 16 small boat docks and 8 large dock spaces. They also constructed a concrete launching ramp and a combination change house and workshop.

Devils Kitchen planning is progressing satisfactorily with the Corps of Engineers doing a top notch job of specification preparation. Our plan for the distribution and management of the cabin sites is almost completed.

Our public use areas are showing improvement, and receiving compliments, but most of the areas are still below the standard of what the United States Government should have. Our maintenance budget now should be five times its present amount.

Several million blackbirds, grackles, and starlings are using the public campground as a winter roost which is supplying the area with a heavy application of guano. Unless the birds head north early enough for the April showers to give a good washing, there is going to be a decrease in camping activities at that location. It smells like an uncleaned chicken house. However, the vegetation should not suffer from lack of nutrients.next summer.

There was a major boating accident in September in which a 16' boat with 25 h.p. motor towing a water skiier ran through the bow of and sank a cabin cruiser. Reckless boating charges are pending against the operator of the smaller boat and also a suit for $2,500.00.

Another suit is also pending for reckless boating against a hydroplane operator who ran full speed through the public boat dock area.

Twenty other reckless boaters were apprehended but no action was taken.

Two parties were apprehended and repremanded for picking Christmas "greenery".

Vandalism was relatively light this period with the septic toilet contractor receiving the greatest damage from someone who shot about 50--.22 cal slugs inside one unit. The following weekend, the inside of the same unit was well smeared with mud. Two picnic tables were badly damaged.

There is a definite need for more patrol work to control the improper activities of our visiting public.

Field trialing continues to be a popular fall activity on the refuge. Following is a schedule of trials conducted during the period.

September--6 to 9	Crab Orchard Beagle Trial
" -19 to 23	Sangamon Beagle Trial
October --13 to 16	Egyptian Beagle Trial
" --20, 21	Amateur Shooting Dog Stake
" --21,22	Mississippi Valley Shorthair Trial
November-- 5 to 9	National Quail Futurity
" -- 9 to 14	COFTC Open all Age Stake
" --18	Egyptian Beagle Club Pack Race
" --23	Crab Orchard Pack Race
" --25 to Dec.1	National Brittany Spaniel Bench and Field Trial Championship
December-- 6 - 9	National Springer Spaniel Trial

Refuge Visitors

A log of visitors, with business of importance, for the period, follows on Page 24:

Date	Name	Title	Purpose of visit
Sept. 2	Grace Schaller Dr. Joan Boydston	Ed. Council of 100	Lease problems
3	Reid Troutman	Ill. Cons. Dept.	Hunting Regulations
4	Richard Lane	US Forest Service	Courtesy
	Robert Merz	US Forest Service	Courtesy
	Larry Teague	Frazier Davis Cons. Co.	Olin construction
	Edward Kersting	Frazier Davis Cons. Co.	Olin construction
6	Paul Meyers	Southern Acres	Surplus steel
	Winton Walkup	IC Railroad	Courtesy
	Col. George White	Corps Engineers	Devil's Kitchen
7	A. A. Swanson	Olin Mathieson	Construction prints
	J. H. Rheuby	Olin Mathieson	Construction prints.
	Larry Teague	Frazier Davis	Olin construction
	Charles Winters	Bank of Egypt	Prospective leasing
	Harold Pangborn	Bank of Egypt	Prospective leasing
10	J. D. Rheuby	Olin Mathieson	Prints
	Reid Troutman	C.O.F.T.C.	Keys for trial
	Lawrence Finazzo	Finazzo Sales	Lumber bids
	Lester Webb	Butler Associates	Water Plant
	Sam Caruthers	C.I.P.S.	Right-of-way
	James Kimrey	C.I.P.S.	Right-of-way
	Stephen Creech	F.W.S. - USGMA	Courtesy
11	Lloyd Teas	Ill. Highway Dept	Right- of-way
	George Johnson	Frazier Davis	Olin Construction
	A. A. Swanson	Olin Mathieson	Olin construction.
13	Conference on Canada Goose Transplant as follows:		
	Forrest Carpenter	Region III	
	Carl Fermanich	Region IV	
	Don Smith	Region III	
	Arthur Hawkins	Region III	
	George Arthur Reddinger	Ill. Dept. Conservation	
		Ill. Dept. Conservation	
	Ted Shanks	Mo. Dept. Conservation	
	David Donaldson	Arkansas Dept. Conservation	
	Carl Hunter	Arkansas Dept. Conservation	
	Marshall Stinnett	Region III - USGMA	
	Ross Hanson	Region III	
	Preston Lane	Reelfoot Refuge, Region IV	
	Robley Hunt	Swan Lake	
	Lew Helm	Missouri Dept. Conservation	
	Paul Lamendola	U.S. Forest Service	Forestry problems
	Clark Poole	Olin Mathieson	Olin construction
	Floyd Bracy	Bracy Insurance	Allen Industries Ins.

14	Winton Walkup	I. C. Railroad	Prints & tracings
	R. J. Brunner	Brunner Co.	Rubber stamps
17	Orville Bevele	Triangle Cons. Co.	Right-of-way.
	Sam Carruthers	C.I.P.S.	Right-of-way
	Musgrave	Resident	Trapping
18	A. J. Johnson	Walton Viking Co.	Grinnell Sprinklers
	James Sands	I. C. Railroad	Returned prints.
	Cecil Barth	Barth Construction	Contract
19	Vic Blazevic	USGMA	Courtesy
20	Virgil Bowman		Hunting rules
	Ike Brandon	C. O. F. T. C.	Field Trials
	Carl Parsons	C. O. F. T. C.	Field Trials
	Harry Howell	Soil Cons. Service	Personnel assignment
	Sam Hancock	United Press	Feature Article
	S. E. Thorne	Hoe Supply	Smoke stack
	James Sands	I. C. Railroad	Directories
	Glen Ogden	Triangle Cons. Co.	Bridges on Rt. 148
25	Wayne Smith		Pasture rental
	W. G. Little	Ill. Insp. Bureau	Ins. & fire protection
	Larry Neff	U. S. Forest Svs.	Hunting on forest lands
	Paul Kilmeyer	U.S. Forest Svs.	Hunting on forest lands
	James Jay	U.S. Forest Svs.	Hunting on forest lands
26	Ray Richardson		Security
27	Ray Karinen	General Mills	Olin construction
	Clare Tregoning		Right-of-way.
28	Lloyd Teas	Ill. Highway Dept.	Load limit & Olin.
Oct. 1	Al Peithman	Sptg. goods store	Prospective lease
	G.H. Hughes	S. I. I.	Lease information
2	Rev. Roy Simpkins	United Pentecostal Church	Lease group camp
	Grace Schaller	Council of 100	Lease boundary
	Dr. Joan Boydston	Council of 100	Lease boundary
	R.W.McElwee	General Electric	Locomotive parts
	Carl Parsons	C.O.F.T.C.	Hunting regulations
3	Carl R. Sandin	R. T. Booker Assoc.	Olin construction
	Reid Troutman	Ill. Dept. Cons.	Hunting regulations
4	Carl Wall	C.I.P.S.	Olin power lines
	C. R. Gibbens	C.I.PS.	Olin power lines
	William Stalman	Ill. Highway Dept.	Lake drawdown
	George Westall	Sears-Westall Co.	Lease information
	George Johnson	Frazier Davis	Olin boundaries

5	William Farley Ray Schmidt	I. P. A. C. Sangamo Electric Co.	Girl Scout Tour Lease
8	W. A. Leucke	C.I.P.S.	Olin power
9	Herb Settle	State Highway Dept.	Removal of gas line
11	Julius Swayne Lew Behnken	Concessionaire Frazier Davis	Concession rights Water line for Olin
16	Jack Storey Marshall Morgan	Herrin, Ill.	Leased S-4-1 Hunting regulations
17	Graner	Corbin Lock Co.	Defective locks.
18	A. A. Swanson Winton Walkup Cy. Brown	Olin Mathieson I. C. Railroad U. S. D. A.	Layout plans Freight traffic Co-op farming
19	A. A. Swanson	Olin Mathieson	Location layout plans
23	W. DeJonge & wife	Chicago, Ill	Tour of Refuge
24	Lou Cox! F. C. Gillett	Ill. Dept. Conservation R. O.	Law Enforcement Inspection
25	F. C. Gillett	R. O.	Inspection
	Conference regarding law enforcement		
	Reid Troutman	Ill. Dept. Conservation	
	Lou Cox	"	
	Robert Cooksey	"	
	Leonard Deevers	District 17 "	
26	F. C. Gillett J. C. Williams	R. O. Contractor	Inspection
29	Ray Richardson		Plant Security
30	W. A. Leucke	C.I.P.S.	Right-of-way
	C. R. Gibbons	C.I.P.S.	Right-of-way
	Roy Dodd	A. D. T.	Fire Protection Ins.
	Richard Sharp	A. D. T.	Fire protection Ins.
	Robert Burwell	R. O.	Courtesy
	Floyd Davis	R. O.	Courtesy
	Ike Brandon	C.O.F.T.C.!	Quail Futurity Trial
31	Robert Burwell	R. O.	Courtesy
	Floyd Davis	R. O.	Courtesy
	J. C. Rheuby	Olin Mathieson	Construction
	Silas Brown	U.S.D.A.	Farm Program
	Bill Taake Ray Richardson	U.S.D.A.	Farm Program Security.

Nov.

1	Ray Hubbs	Herrin Chamber of Commerce	Courtesy
	Mrs. Giy Bonney	Audobon Society	Tour of Refuge
	Mrs. D. W. Undley	Audobon Society	Tour of Refuge
	Rev. M. J. Wolfe	Pentecostal Church	Youth Camp
	Rev. D. Simpkins	Pentecostal Church	Youth Camp
	Kurby Sniderwin	Marion Metal & Roofing	Additional leasing
2	Harvey Pitt	Univ. Match Corp	
	John Sauer	Egyptian Ind. Supply	Leased 1-1-26
5	Julius Swayne	Concessionaire	Little Grassy Concessio
	Jack Sharp	A. D. T.	Diagraph Sprinklers
6	F. E. Graper	F. B. I.	
7	Norl Hamilton	Olin Mathieson	Courtesy
	A. Swanson	Olin Mathieson	Courtesy
	H. Lindsey	Olin Mathieson	Courtesy
8	F. W. Thorstenson	R. O. Engineer	Inspection
	R. Steffenhagen	C. O. Engineer	Inspection
13	J. W. Kimrey	C.I.P.S.	Right of way
	Sam Carruthers	C.I.P.S.	Right of way
	Larry Yahn	Wis. Dept. Conservation	Courtesy
	Cy Kabot	Wis. Dept. Conservation	Courtesy
14	Tom Mofield	Gander Cty Htg. Club	Report banded duck.
19	L. Patterson	H. L. Chastain & Co.	Key to area
	Karl Bednarik	Ohio Dept. of Conservation	Tour
	William Travelstead	Gen. Telephone Co.	Courtesy
20	Harry Sewell	Gen. Telephone Co.	Relocating poles
	F. S. Crook	American Well Works	Water Dept.
21	Julius Swayne	Concessionaire	Concession
	Carl Wall	C.I.P.S.	Right of way
	Cecil Ollar	Chas. Todd Uniform Svs.	Prospective lease
27	Sam Childers	Right of way permittee	
28	Bruce Moore	C.I.P.S.	Power lines
	Lloyd Teas	Ill. Highway Dept.	Right of way
	Jack Storey		Lease S-4-1
	Robert Merz	U.S. Forest Svs.	Policies
	Ray Hubbs	Chamber of Commerce	Courtesy
	Jo. V. Walker	Chamber of Commerce	Courtesy
	M. L. Boulden	Ill. Division Highways	Right of way

29	Norl Hamilton Arthur Swanson Jack O'Neil Ward Becker Gene Andrews	Olin Mathieson	Leasing Primer Line
	Harry E. Sewell	General Telephone Co.	Right of way.
	Oldham Paisley	Marion Daily Rep.	Courtesy
	William Howe	S. I. U.	Camp boundaries
30	Dr. Delyte Morris	S. I. U.	Coop with Forest Svs.
	Robert Merz	Forest Service	Arboretum
Dec.			
4	B. W. Palas	R. O. GMA	Courtesy
	Monsignor DeGaspari	Catholic Diocese	Youth Camp
	G. H. Hughes	S.I.I.	Available space
	Paul Dorris	F.C.D.A.	Additional space
	A. A. Swanson	Olin Mathieson	Construction
	Marshall Morgan		Hunting Regulations
	Harold Steck		Hunting Regulations
	Ed. Renn		Hunting Regulations
5	Lou Craig	Nat'l Springer Trial	Springer Trials
	Julius Swayne	Concessionaire	Concession
	Carl Wiemken	Chasteen Associates	Area use
	Vernon Kelley and six from Southern Ill. Horsemans Association.		
6	D. Manseegar	G.S.A.	Leasing Area III
	R. P. Gholson	Fowler Htg. & Plmg.	Switching Permit
	Jack Sharp	A.D.T.	Diagraph Sprinklers
	Leonard Mitchess	Marion	Re Federal Prison
7	Wendell Kilpatrich	Universal Match	Lease Area 6
	Ed. Lampa	Universal Match	Lease Area 6
	Tom Mofield	Hunting Club	Regulations
	Jack Storey		Power in building
	R. W. McElwee	General Electric	Courtesy
	Kurby Sniderwin	Marion Metal & Roofing	Lease addition
	W. A. Leucke	C.I.P.S.	Right of way
	Lester Wohlwend	Havana Refuge	Courtesy
	Ed. Nichols	Havana Refuge	Courtesy
11	Link Perrine	I.S.E.S.	Civil Defense
	Joe DellEra	Civil Defense	Space for Tent City.
12	Paul Dorris	F. C.D.A	Additional buildings
	Winton Walkup	I. C. Railroad	Traffic schedules

17	Frank Hemmings	R. O. Engineer	Inspection
18	Dr. D. W. Morris	S.I.U.	Land acquisition
	Steve Broyce	U.S. Forest Service	Land acquisition
	Robert Merz	U.S. Forest Service	Land acquisition
	John Hosner	S. I. U.	Land acquisition
	Karl Malzahn	V. T. I.	Trees to transplant
	Sam Carruthers	C.I.P.S.	Power interruptions
	Sam Ehrlich	Universal Match	Fuze line prints
19	Elmer Huizenga	Corps Engineers	Devil's Kitchen
	James Mallory	Corps Engineers	Devil's Kitchen
20	Winton Walkup	I. C. Railroad	Switching services
	William Scruggs	I. C. Railroad	Switching Services
27	William D. Carter	Refuge Manager	Courtesy
31	Kurby Sniderwin	Marion Metal & Roofing	Lease building
	Carl Wall	C. I. P. S.	Olin power lines
	C. R. Gibbens	C. I. P. S.	Olin power lines

Refuge Participation

Members of the Crab Orchard Refuge staff attended the following meetings as representatives of the Service:

September

6--Crawford, Stiles and Sheffield met with Col. Geo. White of Corps Engineers--re: Devils Kitchen project. Sheffield, with Col. White as guest, appeared on WSIL-TV--re: Devils Kitchen.
6--Stiles, Crawford, Manke and Jones attended monthly meeting of COSA.
13--Refuge staff played host to Service and State representatives at a meeting held in our conference room on the Canada goose transplant program.
13--Stiles attended monthly Board of Directors Meeting COSA.
18--Stiles served as instructor in soil, water and wildlife conservation-West Frankfort City School Outdoor Education Program and Camp.
18--Stiles transcribed 15-minute radio program over Station WJPF-Herrin.
19--Manke served as instructor in soil, water and wildlife conservation-West Frankfort City School Outdoor Education Program and Camp.
20--Crawford attended Southern Illinois Personnel-Management Club meeting at S.I.U.
20--Stiles served as instructor-West Frankfort City School Outdoor Education Program and Camp.
21--Manke served as instructor-West Frankfort City School Outdoor Education Program and Camp.
24--Crawford and Jones attended monthly meeting of Southern Illinois, Incorporated.
25--Refuge staff played host to a meeting with Shawnee National Forest Service personnel on mutual problems, held in our conference room
26--Crawford and Jones attended a Herrin Chamber of Commerce luncheon honoring Olin and their contractors personnel.

October

4--Stiles attended monthly meeting of COSA
4--Crawford guest of Marion Rotary Club at luncheon honoring Olin personnel.
6--Stiles presented talk on refuge to 250 St. Louis Area Girl Scouts at Giant City State Park.
8--Crawford presented talk on "Conservation and Our Youth" to Carterville Parent Teachers Association.
10--USGMA Newcomb, and Stiles, presented 15 minute telecast on waterfowl regulations over Station WSIL-TV, Harrisburg, Illinois.
11--Crawford attended a joint board of directors meeting of COSA and Egyptian Beagle Club.
14--Bush conducted a day tour of the refuge for the Decatur Audubon Nature Club.

22--Crawford and Jones attended monthly meeting of Southern Illinois, Incorporated at Engel's Cafe in Carbondale.

23--Sheffield gave a refuge slide talk on conservation and the refuge to the biology classes of Hurst-Bush High School.
23--Mrs. Murray,(Clerk-typist), presented a talk on the refuge to the Herrin Business and Professional Womens Club.
25--Sheffield and USGMA Newcomb attended Little Egypt Auxiliary Crime Protection Association, Herrin.
25--Refuge staff played host to Illinois State Game Wardens at a meeting on law enforcement problems.
25-- Hunter and Crawford attended a Southern Illinois Labor Council meeting at Southern Acres.
31--Sheffield met with personnel of Southern Illinois University, and a Dr. Patty of T.V.A.--re: recreational development programs.

November

1--Sheffield and Crawford attended Little Grassy Camp Association meeting at S.I.U.
1--Staff attended monthly meeting of COSA.
4--Crawford attended drawing for American Field Futurity at Crab Orchard Field Trial Club.
5--Stiles, Manke and Crawford guest of American Field Futurity at their annual trial banquet.
5--Sheffield presented refuge slide program to Winkler School (Carbondale) P.T.A.
7--Stiles, Manke Crawford and wives guest of American Field Editor, Bill Brown, at a dinner.
8--Stiles attended monthly Board of Directors meeting of COSA.
14--Sheffield conducted tour of refuge by 100 biology students of Carbondale High School.
14--Stiles guest speaker at Marion Lions Club luncheon.
14--Crawford-with dog trainer, Tom Cox, and wife presented a program on Field Trialing and dogs over Station WSIL-TV.
19--Manke attended public hearing of Corps Engineers on Cache River Project at Vienna, Illinois.
26--Sheffield attended monthly meeting of Southern Illinois, Inc..
26--Manke, Crawford, Stiles and wives guests at National Brittany Spanial annual banquet, Carbondale.
28--Stiles attended monthly meeting of Jackson County Sportsmans Club, Carbondale.
29--Stiles conducted tour of refuge for 110 Herrin High School biology students.

December

3--Sheffield and Crawford attended a public hearing by House Merchant Marine Committee, in St. Louis, on public boating regulations.

4--Crawford presented a talk to Herrin Lions Club on "Progress on Crab Orchard in 10 Years".
5--Stiles and Crawford guests of Marion Chamber at a dinner for National Springer Spaniel Trial folks.
5--Stiles and Crawford met with So. Illinois Horsemen's Association, re: needs.
6--Staff attended monthly meeting of COSA.
7--Stiles and Crawford attended a joint meeting of Marion Chamber of Commerce and board of National Springer group--re: grounds development.
10--Crawford attended a meeting of Saline County educators--re: a school conservation program in Harrisburg.
11--Stiles and Crawford met with Marion Chamber of Commerce on development of a National Springer Spaniel Trial grounds.
11--Stiles presented refuge slide show to Creal Springs Lions Club.
12--Bush and Stiles presented 15 minute telecast on Waterfowl Banding over Station WSIL-TV, Harrisburg.
13--Stiles attended monthly Board of Directors meeting COSA.
13--Manke and Crawford attended meeting of So. Illinois Personnel Management Club.
18--Crawford and Stiles met with S.I.U. and U.S. Forest Service personnel on a timber management-arboretum study plot area.
18--Stiles and Crawford cut 4 tapes for Radio Station WFRX.
19--Stiles and Crawford attended a joint meeting of the Board of Directors of the Crab Orchard Field Trial Club and the So. Illinois Horsemen's Association.

Fishing

Since hunting held the spotlight throughout most of the period, fishing received comparatively little attention. Good catches of large-mouth bass and black crappie were made from October 15 until the end of the period. Some fishing was done from duck blinds during the dull hunting hours of midday, with some excellent catches reported.

Hunting

Bob-white quail hunting gave waterfowl hunting some competition this season. Quail populations in the area were well above average, and those nimrods fortunate enough to have good dogs had "quail on toast" as a pretty regular bill of fare.

Mourning dove hunting was perhaps a bit below average, but good shooting was provided by locally reared birds early in the season.

Cottontail rabbit hunting became the excuse for goose poaching following the close of waterfowl season. The "beagle boys" appeared to be "genuine" in their pursuits, but rabbit hunting popularity among the non-beaglers in areas frequented by geese indicated ulterior motives. As previously mentioned in this narrative, the good rabbit hunting was to be found a few counties to the north and west of the refuge.

Waterfowl hunting this period retained its number 1 rating in this area. Hunting the Canada goose reached a new high in both popularity and numbers of birds bagged. In sampling for a total season kill, 175 waterfowl hunters were contacted on the public hunting area of the refuge during the last two days of the goose season. These 175 hunters reported a total season kill of 397 geese and 554 ducks. This gave an average season kill of 2.27 geese and 3.16 ducks per hunter. These figures multiplied by the duck stamp sales in the immediate area (3244), gives a kill of 7364 geese and 10,251 ducks. The 32 private and commercial goose clubs in the area reported a total kill of 1524 geese and 90 ducks. Using a 10% crippling loss on ducks and a 15% crippling loss on geese, the 1956 waterfowl take from Crab Orchard is computed as follows.

Formula: Average season kill x No. stamps sold + club kill + crippling loss

Geese-- 2.27 x 3244 + 1524 + 15% = 10,220

Ducks-- 3.16 x 3244 + 90 + 10% = 11,682

From general observations and from comparison with previous years, we believe these figures to be reasonable.

Violations

Increased emphasis on the law enforcement phase of refuge management this period, combined with record number of geese in the area, pushed violations to a new high. Valuable assistance by U.S. Game Management Agent Wesley Newcomb, in enforcement patrol, regulation interpretation and prosecution of cases, was greatly appreciated and highly commendable. Members of the refuge staff are also to be commended for their long hours of diligent patrol and all around alertness in apprehending violators. Park Ranger, Larry Sheffield, did an especially fine job in keeping wayward nimrods in line.

Game violation cases apprehended by refuge agents during the period were as follows:

Date	Violator	Type of Violation	Disposal
10-25-56	L.W. Tripp	Possession of firearms on refuge	J.P.Court Fine & Cost - $ 29.00
10-25-56	H. Beauchamp	" " " " "	" $ 29.00 "
10-25-56	E.E. Sanders	" " " " "	" $ 29.00 "
11-13-56	H.C. Schwarm	Refuge trespass with firearms	" $ 39.00 "
11-13-56	L.W. Kitts	" " " "	" $ 39.00 "
11-10-56	H. Hiller	Improperly plugged gun	" $ 29.00 "

Date	Violator	Type of Violation	Disposal
11-13-56	R.W. Dimick	Shooting migratory waterfowl from boat under power; shooting waterfowl in refuge	J.P. Court Fine & Cost-$104.00
11-13-56	R.W. Yates	Shooting migratory waterfowl from boat under power; shooting waterfowl in refuge	" $104.00 "
11-15-56	C.V. Kirkpatrick	Hunting in refuge	" $ 54.00 "
11-15-56	B.D. Hanks	Hunting in refuge	" $ 54.00 "
11-23-56	N.L. Hill	Hunting after closing hours	" $ 29.00 "
11-23-56	E.T. Lewis	Taking waterfowl over baited field	" $ 29.00 "
11-23-56	W. Barrett	" " " " "	" $ 29.00 "
11-23-56	B. Barrett	" " " " "	" $29.00 "
11-24-56	J.M. Hoover	Trespassing in refuge (retrieving goose)	" $ 29.00 "
12- 2-56	W. Branson	Exceeding bag limit (St.violation)	" $ 29.00 "
12- 2-56	E. Branson	" " " " "	" $ 29.00 "
12- 2-56	P. Stilley	" " " " "	" $ 29.00 "
12-10-56	V. Freeman	" " "	" $ 29.00 "
12- 8-56	A. Basinger	" " "	" $204.00 "
12- 5-56	J. Heern	Trespassing in refuge (retrieving goose)	" $ 29.00 "
12-11-56	T. Bingman	Hunting after closing hour	" $ 29.00 "
12-11-56	R.B. Tomanzewski	Hunting after closing hour on borrowed duck stamp & license	" $ 29.00 "
12-11-56	A.W. Allen	Hunting after closing hour	" $ 29.00 "
12-11-56	G.W. Duty	Loaning hunting license & duck stamp	" $ 29.00 "
12-12-56	C. Shirley	Hunting geese over baited & posted area	" $ 29.00 "
12-15-56	C. Gibbons	Improperly plugged sun	" $ 29.00 "

In addition to apprehending the above violators, refuge personnel assisted U.S. Game Management Agents, Newcomb, Brevig, Bonde and Hopkins in a law enforcement crackdown at Horseshoe Lake and the "Cambell Pond Area" which resulted in the apprehension and prosecution of 7 violators.

The result of this year's law enforcement effort indicates the number of violators apprehended is proportionate to the number of man hours spent in enforcement work. The "turnover" of waterfowl hunters in

this area was rather high, and a new crop appeared every weekend to be "educated".

VII OTHER ITEMS

Photographs

Several pages of refuge history this period could much better be told in pictures than in words. Being in the right place at the right time with camera in hand has proved to be a time consuming task, however, and though pictures represent a first quality media of communication, they cost expensively in time. And time was an especially elusive commodity to all staff members during this, the period of waterfowl season, industrial expansion, crop harvest, increased public relations and preparation for winter. For these reasons, no photographs appear in this narrative except in the appended "Short Corn Study".

Odds and Ends

With the completion of this narrative, we close the book on the Calendar Year 1956--a seemingly appropriate time for reflection--a time for evaluating our management policies and practices--a time for balancing the gains and/or losses 1956 has seen come to this refuge.

On the gain side, we would mention the over one million use days of public recreation furnished; the more than 2000 jobs furnished through refuge industrial management; and, as a refuge, perhaps most important, the sanctuary furnished peak flocks of 87,000 Canada geese and 143,000 ducks, and the more efficient overall refuge management wrought through a full year's application of the refuge administrative reorganization.

On the loss column, we would consider the bisecting of the closed portion of the refuge by a through state highway, the denial forever of more than 300 acres of land for effective waterfowl management. Industrial expansion, though a gain in the human employment sense, removed from Service control for practical wildlife management, an additional 1000 acres of partially developed goose habitat in the heart of the refuge. Surveys for an interstate super highway indicate still another 600 acres of potential goose and duck area will be severed from the east portion of the refuge. Present local, State and National interests in still more refuge lands, in amounts from 10 to 1500 acres, for all manner of uses from horse show rings to Federal prisons indicates the end to these demands on refuge lands is not yet in sight. Though more than 300 acres were reclaimed through clearance and drainage for waterfowl use in 1956, several times that amount was lost through highway, construction, industrial expansion and other non-wildlife developments. The balance between gain and loss in the long range wildlife consideration seems far too heavy to the loss side.

At this level, control of refuge lands as regards industrial expansion, highway construction and other major encroachments on wildlife management objectives is limited. We look to the forthcoming "Operation Fish and Wildlife" to strengthen our defense of the wildlife position at this refuge. We feel certain that the long range management development plan now in preparation for Crab Orchard will better define long range objectives with firm limits placed on such questionably compatable uses as industry, recreation and metropolitan type developments.

If we are to meet the challenge that "Operation Fish and Wildlife" offers--then certainly it would seem we must begin with zealously guarding our present areas--and developing them to their maximum wildlife ability.

Personnel

The Year 1956 ended without the filling of the Jr. Manager position. With a new register now available, it is hoped this position will be filled early in 1957.

Project Engineer, Richard Y. Jones, was separated on December 1.

U.S. Game Management Agent, Wesley Newcomb, in a sense, joined the Crab Orchard family in September by filling the position vacated by the transfer of Rex Tice. The refuge staff was most happy to welcome Wes, as both a very capable colleague and a fine neighbor. His contributions in waterfowl censussing and law enforcement were of great help.

Roland Oakley, entered on duty October 25, as Building Repairman (Electrical). Roland tied into the electrical maintenance in the manner of a man with plenty of know-how in his specialty.

Credit for the composition of this report goes to the administrative and technical staff. But to those who equally share in carrying the burden of this project--to those who keep the boilers humming, the vehicles and railroad running, the water pure and flowing; to those who repair the buildings, cut the brush, dig the ditches, sweep the floors, plow, seed, mow--and to those, who keep vigilence day and night we owe a large share of credit and applause for a job well done.

Respectfully submitted,

Harry E. Stiles
Refuge Manager

Eugene E. Crawford
Project Manager

Date submitted January 18, 1957

Approved by Regional Office

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE CRAB ORCHARD MONTHS OF September Thru December, 1956

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada				1,554	1,960	22,890	98,000	179,200	224,000	273,000
~~Cackling~~ Hutchin's								7	175	
Brant										
White-fronted										
Snow							119	350	1,225	1,400
Blue							259	1,750	2,800	2,800
Other										
Ducks:										
Mallard	70	70	70	119	140	154	3,500	24,500	38,500	24,500
Black				14	14	56	350	2,100	4,900	6,300
Gadwall										175
Baldpate						70		525	2,100	7,000
Pintail							175	2,800	2,100	10,500
Green-winged teal						98	70	175	91	1,050
Blue-winged teal	350	350	700	791	1,050	1,729	1,400	1,400		
Cinnamon teal										
Shoveler								70	140	175
Wood	1,750	1,750	1,750	1,540	1,540	2,100	700	700		
Redhead										
Ring-necked									259	770
Canvasback										
Scaup, Lesser						63	245	21	1,750	1,190
Goldeneye										
Bufflehead										
Ruddy								119		
~~Other~~ Old Squaw										
Hooded Merganser										
American Merganser										
Coot:	14	14	14	14	14	21	700	2,100	3,500	5,250

These are erroneous: Waterfowl days rather than census figures. Each should be divided by 7 for true readings

Int. Dup. Sec.,

3-7150a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE CRAB ORCHARD MONTHS OF September Thru 30 December, 1956

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	462,000	609,000	378,000	210,000	168,000	193,200	210,000	255,500	3,286,304		
~~Cackling~~ Hutchin's	700	700	700	350	140	126	56		2,954		
Brant											
White-fronted											
Snow	1,400	1,050	700	175	70	77	28		6,584		
Blue	4,200	2,450	1,400	525	350	217	14		16,765		
Other											
Ducks:											
Mallard	315,000	665,000	875,000	245,000	245,000	245,000	210,000	199,500	3,019,123		
Black	38,500	52,500	56,000	35,000	35,000	28,000	24,500	24,500	307,734		
Gadwall	2,100	3,500	3,500	700	700	700	350	28	11,753		
Baldpate	10,500	14,000	7,000	1,400	3,500	1,400	700	210	48,405		
Pintail	31,500	17,500	3,500	1,400	5,600	5,600	3,500	1,050	85,225		
Green-winged teal	875	700	350	350	175	175	70	70	4,249		
Blue-winged teal									7,770		
Cinnamon teal											
Shoveler	700	1,400	700	700	350	350	210	105	4,900		
Wood									11,830		
Redhead	350				210				560		
Ring-necked	3,500	8,400	10,500	1,400	2,100	1,400	700		29,029		
Canvasback	700	700	1,400	2,100	2,800	1,400	700	70	9,870		
Scaup Lesser	7,000	21,000	35,000	10,500	10,500	7,000	3,500	700	98,469		
Goldeneye								350	350		
Bufflehead		175		70	70	70	70	70	525		
Ruddy	350	525		350					1,344		
~~Other~~ Old Squaw								14	14		
Hooded Merganser	700	3,500	3,500	3,500	3,500	3,500	3,500	2,800	24,500		
American Merganser		700	2,100	2,100	4,200	14,000	14,000	10,500	47,600		
Coot:	35,000	525,000	42,000	35,000	21,000	14,000	3,500	350	687,491		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	3,312,607		
Ducks	3,785,250		
Coots	687,491		

SUMMARY

Principal feeding areas Area #2

Principal nesting areas

Reported by Lee Bush

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).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Crab Orchard Months of Sept. to Dec. 1956

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Common Loon	1	10-21	5	11-26	1	12-27				10
Eared Grebe	1	12-27	1	12-27						1
Pied-billed Grebe	Breeds									100
Double-crested Cormorant	Breeds?		500	10-1						500
Great Blue Heron	Breeds		200	10-15	Still present at end of period.					300
Common Egret	Post-breeding mig.		500	10-15	1	11-22				500
Little Blue Heron	" "	"	100	10-1	1	10-20				200
Green Heron	Breeds		500	9-20	1	11-8				500
Black-crown Night Heron	Breeds?		50	9-1	1	10-8				50
King Rail	Breeds		50	9-1	1	10-25				100
Sora	1	9-4	30	10-12	1	10-25				30
II. Shorebirds, Gulls and Terns:										
Killdeer	Breeds		2,000	9-15	Present at end of period in limited numbers					3,000
Woodcock	Breeds in limited numbers.									10
Wilson's Snipe	1	10-3	100	10-20	1	12-2				200
Spotted Sandpiper	Breeds		100	9-1	1	9-30				100
Greater Yellow-legs	1	9-30	5	10-18	1	11-9				10
Lesser Yellow-legs	4	10-1	11	10-10	1	10-25				25
Pectoral Sandpiper	40	9-25	200	10-1	4	11-5				300
White-rumped Sandpiper	7	10-19	7	10-19						7
Baird's Sandpiper	4	9-17	4	9-17						4
Least Sandpiper	17	10-18	35	10-19	3	10-26				50
Herring Gull	1	9-5	20,000	12-31	Still present					25,000
Ring-billed Gull	10	10-10	10,000	12-31	Still present					15,000
Caspian Tern	2	9-27	25	10-5	1	10-15				50
Black Tern	1	10-5	17	10-7	5	10-12				25

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	Permanent Res.		5,000	9-15				10,000
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	12-27	1	12-27				1
~~Duck hawk~~ Bald Eagle	1	10-26	12	12-31	Still present			12
Horned owl	Permanent Resident							20
~~Magpie~~ Barred Owl	Permanent Resident							25
~~Raven~~ Screech Owl	Permanent Resident							50
Crow	Permanent Resident							5,000
Turkey Vulture	Breeds		50	9-1	2	12-17		100
Cooper's Hawk	Breeds		In limited numbers					10
Sharp-shinned Hawk	Breeds		Uncommon					4
Red-tailed Hawk	Permanent Resident							200
Red-shouldered Hawk	Permanent Resident							50
Broad-winged Hawk	Breeds				1	12-27		20
Rough-leg	1	10-4			1	12-27		2
Osprey	Breeds		4	9-1	1	10-15		6

Reported by Lee Bush

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

(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 Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first migration record for the species for the reporting period.

(3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.

(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 species days use (average population X no. days present) of refuge during the reporting period.

Interior--Duplicating Section, Washington, D. C.

26014

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge **Crab Orchard** Months of **September, 1956** to **January**, 19**57**

(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 obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob-white Quail	**Cultivated fields, Upland brushland, woodlands and pastures, Area I and III 15,000 acres**	**20**	**----**	**----**	**50♂:50♀**	**500**			**750**	
	Area II--19,000 acres	**3.9**	**----**	**5000**	**60♂:40♀**	**0**			**5,000**	
Ring-necked Pheasants	**Same cover types as above 15,000 Area II**								**30**	**)Birds escaping from)National Springer Trials and)found mainly in locality of)trial grounds.**
	8,200 Area I & III								**20**	

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.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Crab Orchard Calendar Year 1956

(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-tail Deer	All except water areas of Refuge--bottomland & upland brush & woodland, cultivated fields and pastures 35,000 Acres	200					10*		20**	----------		800	800	1♂:1.5♀

Remarks:

* estimated loss due to poaching

** accidental kill--highways, dogs, fences, etc.

Reported by Harry E. Stiles

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 <u>each</u> <u>species</u> 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.

116008

Form NR-6 FISH 1617

Refuge Crab Orchard Year 1956

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
			% of total catch					
L.M. Bass	common	-------	12 %					
White crappie	abundant	-------	25 %					
Black crappie	common	-------	15 %					
Bluegill	common	-------	5 %					
Other sunfishes	common	-------	5 %					
Bullheads	common	-------	18 %					
Carp	abundant	-------	16 %	1*	6,000			
Buffalo	uncommon	-------	1 %		1,000			
Drum	common	-------	2 %					
Warmouth Bass	common	-------	1 %					
		115,400	100 %					

REMARKS: * Special Use Permit No. 24410

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Crab Orchard Year 1956

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
Sericea Lespedeza	B-4	40#/Acre	2 Acres	80# unhulled Seed	2/29	Fair	Unfertilized pipeline spoil, tramped by public.	Will survive and make better growth 2nd year.

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches..... 2 acres.
Food strips, food patches.....
Forest plantings.....

Interior—Duplicating Section, Washington, D. C.

24315

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

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
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Corn	942	47,265	43	1,491	339	17,962	1324	Wheat green manure	50
Soybean	685	13,827	233	4,659	65	0	983	Soybean Green Manure	65
Oats	454	9,600	151	3,234	166	3,519	771	R-top,-Timo-Lespedeza Soil Holding & building	554
						Browse 75-Ton			
Wheat	205	2,981	68	994	50	" 20-Ton	323	R-Clover Soil Building	150
Rye	36	516	25	368	158	" 110-Ton	219	Rye Green Manure	158
Barley	6	95	1	21		" 3-Ton	7	S-Clover Green Manure	223
Corn Silage	25	100-Ton	-	-	-	-	25		
(Kentucky Fescue	23	175	12	87	500	Browse 100-Ton	--		
(Korean Lespedeza	107	410	37	143	11	44			
(Red Clover - common -	9	32	3	10	150	Browse 150-Ton	--		
(Red Clover - Kenland -	3	3	17	19	-	--	--		
(Timothy	3	6	1	2	-	--	--		
(Dwarf Milo	-	-	1	8	10	200	11		
(Millet	-	-	-	-	14	14	14	Fallow Ag. Land	383
Atlas Sorgo	-	-	-	-	8	100	10		
Buckwheat	-	-	-	-	28	400	28		
R-Top,Timothy-Lespedeza	-	-	-	-	554	Browse 277Ton	554		

No. of Permittees: Agricultural Operations 50 Haying Operations 6 Grazing Operations 25

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue
Soybean Hay	9.6	11	
Oat Hay	16.0	25	
Alfalfa	53.2	43	
Red Clover	285.6	215	$ 259.35
R-Top,-Timo-Lespedeza	678.6	618	169.36
Hay - Wild			

GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
1. Cattle	863	4554	$4554.00	3684
2. Other	6	36	0.00	67
1. Total Refuge Acreage Under Cultivation				6151
2. Acreage Cultivated as Service Operation				~~215~~ 214

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.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Crab Orchard — Months of September through December, 1956

(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
Corn - - - -	80	1490	1570	-	-	-	~~1570~~	1570	--	1570	-0-
Dwarf Milo - - -	0	8	8	-	--	--	---	8	8	--	-0-
Wheat - - - -	50	-0-	50	-	--	--	---	50	-	50	-0-
Rye - - - - -	270	-0-	270	-	270	--	270	-0-	-	--	-0-
Oats - - - - -	100	-0-	100	-	100	--	100	-0-	-	--	-0-
Hay - Soybean	0	50	50	-	--	--	--	50	50	--	-0-

(8) Indicate shipping or collection points Marion, Illinois LC1; C1 Ordill, Illinois

(9) Grain is stored at Refuge Granary

(10) Remarks

*See instructions on back.

16—61482-1

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

16—61482-1 U. S. GOVERNMENT PRINTING OFFICE

3-1759
Form NR-9

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)

Refuge Crab Orchard Year 1956

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
Buckwheat				----	605 lbs.	Necedah Refuge	----	----
Proso millet				----	500 "	Lower Souris Refuge	----	----
Kentucky bluegrass				----	500 "	Valentine Refuge	----	----
Sericea lespedeza				----	300 "	Carolina Sandhills	600 lbs.	----
Red clover	1,765 lbs.	May - Sept.	Combine harvest	Refuge share			1,790 "	----
Korean lespedeza	3,570 "	Sept.- Dec.	Permittee harvest	" "			3,570 "	----
Timothy	100	May - Sept.	" "	" "			250 "	----
Kentucky fescue	2,100	May - Sept.	" "	" "			700 "	----
Milo maize	420	Sept.- Dec.	Refuge harvest	6¢/#			420 "	----

3-1761
Form NR-11

TIMBER REMOVAL

Refuge Crab Orchard Year 1956

Permittee	Permit No.	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
H. G. Reinbold	24406	SW¼, Sec.6 T10S, R2E	2.0	508 posts	.09	45.72	3"-6" x 7'	Black locust
Pleas Vinson	24407	NE¼ SW¼ Sec. 33, T9S, R1E	1.0	133	.09	11.97	3"-6" x 7'	Black locust
Will O. Adams	24409	NW¼ NE¼ Sec. 15, T10S, R1E	.5	1,210 B.F.	8.00/M	9.68	As marked	Sycamore
Claude Cox	24482	Sec. 1 &12 T10S, R1E Sec. 6 & 7 T10S, R2E	78.0	162,890 B.F.	10.14/M	1652.72	As marked	Mixed hardwoods

Total acreage cut over 81.5 Total income $1,720.09

No. of units removed B. F. 164,100 Method of slash disposal lopped & scattered

Cords

Ties

Posts 641

Interior--Duplicating Section, Washington, D. C.