

BRANCH OF WILDLIFE REFUGES

NARRATIVE REPORT

ROUTING SLIP

DATE February 18, 1952

Mr. Salyer _____

Mr. DuMont PAJ

Mr. Krummel _____

Miss Baum [initials]

SECTION OF OPERATIONS:

~~Mr. Bell~~ _____

~~Mr. Morris~~ Lam

~~Mr. [unclear]~~ MR

SECTION OF HABITAT IMPROVEMENT:

~~Mr. Griffith~~ REG

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Dr. Bourd _____

Mr. Stiles _____

SECTION OF LAND MANAGEMENT:

~~Mr. Ackerman~~ Wae

Mr. Davis [initials]

STENOGRAPHERS:

REFUGE Crab Orchard

PERIOD September-December, 1951

CRAB ORCHARD NATIONAL WILDLIFE REFUGE

REFUGE STAFF

E. E. CRAWFORD	- - - - -	REFUGE MANAGER
H. E. STILES	- - - - -	CONSERVATIONIST (Soil)
(VACANT)	* * - - -	SUPERVISORY PARK PLANNER
R. L. HORSWELL	- - - - -	JR. REFUGE MANAGER
H. T. GUALDONI	- - - - -	REFUGE CLERK
LEE BUSH	- - - - -	REFUGE AIDE
J. J. PICKAR	- - - - -	MAINTENANCE FOREMAN
J. W. NELSON	- - - - -	MECHANIC
W. F. MENESE	- - - - -	MAINTENANCE MAN (GEN'L.)
(VACANT)	* * - - -	MAINTENANCE MAN (GEN'L.)
G. W. TRIPP	- - - - -	FIRE CONTROL AIDE

TABLE OF CONTENTS

		<u>Page</u>
I.	GENERAL	
	Weather Conditions - - - - -	1
	Water Conditions - - - - -	1
	Fires - - - - -	2
II.	WILDLIFE	
	Migratory Birds - - - - -	2
	Populations & Behavior - - - - -	2
	Other Waterbirds - - - - -	4
	Food and Cover - - - - -	5
	Upland Game Birds - - - - -	5
	Populations & Behavior - - - - -	5
	Food and Cover - - - - -	6
	Big Game Animals - - - - -	6
	Populations & Behavior - - - - -	6
	Food and Cover - - - - -	6
	Fur Animals, Predators, Rodents & Other Mammals - - - - -	6
	Predacious Birds - - - - -	7
	Fish - - - - -	7
III.	REFUGE DEVELOPMENT MAINTENANCE	
	Physical Development - - - - -	7
	Collections - - - - -	9
	Plantings - - - - -	9
IV.	ECONOMIC USE OF REFUGE	
	Grazing - - - - -	12
	Haying - - - - -	12
	Timber - - - - -	12
	Other Uses - - - - -	13
V.	FIELD INVESTIGATION OR APPLIED RESEARCH	
	Ecological Relations Study - - - - -	13
	Banding - - - - -	13
	Ornithology - - - - -	14
	Goose Forage Study - - - - -	14
	Silt Survey - - - - -	14
	Southern Illinois University - - - - -	14
VI.	PUBLIC RELATIONS	
	Recreational Use - - - - -	14
	Refuge Visitors - - - - -	16
	Refuge Participation - - - - -	17
	Hunting - - - - -	18
	Fishing - - - - -	20
	Violations - - - - -	20
VII.	OTHER ITEMS	
	Photographs - - - - -	20
	Bird Lists - - - - -	Appended

I. GENERAL

Weather Conditions

The proverbial appearance of the red man, to give us Indian Summer, didn't happen. Guess he was busy making big medicine or ricing on the northern refuges. Our weather made*in a short hop and a jump from summer into winter even giving us an unseasonable snow-storm November 6, 7 and 8th.

Other than the one good bout with the snow, most of our troubles have come from excessive rainfall. Rains stopped all mechanical harvesting of crops and precluded accomplishing some of the construction developmental plans we had programmed out. There being good in most evil, the weather did have one compensating factor @ it made for one of the best duck hunting seasons on record, with 30 duck-days and 15 blue-bird days during the 45-day season.

Statistical summarization of the weather follows:

Month	Precipitation			Temperatures	
	1950	1951		Minimum	Maximum
September	4.22	5.52	:	34	95
October	1.10	3.00	:	31	89
November	3.11	6.27	:	12	71
December	1.36	3.62	:	3	74
TOTALS - -	9.79	18.41	: Extr. 3		95

Total yearly precipitation - 49.62 inches which was 7.72 inches above normal but 13.33 inches below 1950 all-time high.

Water Conditions

Crab Orchard Lake - The draw-down for fisheries management purposes was started on September 7, 1951 with the lake reading 404.2 which was 0.8 below spillway. Monthly high and low readings during the quarter were:-

Month		Gauge Readings	
		High	Low
September	:	404.2	403.6
October	:	403.6	402.8
November	:	405.5	403.0
December	:	405.3	404.9

The gate valves were closed on December 11th, in order to stabilize water levels below the lake and not cause undue hardship from additional flood waters to the peoples along the Big Muddy River. Excessive rains, snow run-off and saturated ground conditions created near disaster conditions on the Big Muddy River. The Service was editorially complimented on having had the lake down and catching sufficient waters to prevent a major disaster to the city of Murphysboro.

Little Grassy Lake - With gates closed, the reservoir has been filling and at the close of the year stands at 492.0 or 8 feet below spillway elevation.

Fires

With weather such as we had, we should have escaped the quarter unscratched as far as field fires were concerned. But no, some thoughtless rabbit hunters gave us a pleasant New Year's Eve gift of a dandy fire that kept three of the staff sober from 7:30 p.m. December 31 to 2:00 a.m. January 1. Tabulated, this fire is as follows:-

Date	: Acreage:	: Probable :	Man	
	: Burned :	Cover-Type :	Cause :	Hours
12-31-51	: 120	: 40 A - 4 - 12 H'Wood:	:	
	:	: 80 A - Aband.fields :	Smokers :	18
	:	:	:	

A summarization of our fire picture for the year follows:-

Total No.:	: Cause	: Suppression	: Habitat in	: Total
Fires :		Man Hrs. : Cost :	Acres	Acres
	: 3 - smokers :	:	: 190 - Aban.field	
	: 3 - burning :	:	: 100 - Pine :	
11	: 2 - camp-fire :	115 : \$243.70:	80 - Brush :	430
	: 1 - motorist :	:	: 57 - H'dwood :	
	: 1 - R.R. train :	:	: 3 - Marsh :	
	: 1 - Undeterm. :	:	:	
	:	:	:	

II. WILDLIFE

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

Populations and Behavior - Considering the ups and downs in numbers between species, the over-all waterfowl picture was much on a par with last year. Individually, our waterfowl species showed the following

noted behavior and trends other than what is statistically indicated in the report form:- Canada geese - our Crab Orchard flock continues the annual build-up in defiance of those who said we couldn't create a wintering Canada goose refuge. With the arrival of 32 Canadas on September 28, the flock gradually increased to 3500 on October 12. During this period Bush handled the tab on our geese by sight observation and estimation. On October 19, our counting station method of counting the Canadas on their morning feeding flight was initiated and has continued each week. Three to ten stations have been manned - depending upon feeding flight characteristics. Census counts from weekly counts are as follows:-

Date :	G E E S E			Ducks (all species - no coots or mergansers)
	Canada	Blue	Snow	
Oct. 19	3,593	97	46	13,000
Oct. 26	8,950	530	283	15,000
Nov. 2	17,465	867	323	50,700
Nov. 9	17,588	570	480	66,000
Nov. 16	24,365	2,600	752	23,200
Nov. 26	31,120	1,730	420	38,100
Nov. 30	35,037	1,000	625	25,000
Dec. 7	30,780	800	400	14,000
Dec. 14*	30,000	--	--	21,000
Dec. 21	24,200	140	27	7,000
Dec. 27**	25,000	3	2	8,000

* Estimated by L. Bush

** Estimated by L. Bush and E.E. Crawford.

During the count period tabulated, U.S.G.M. Agent, Conover, flew the refuge on two occasions for a plane check of our goose populations. His counts were as follows:-

October 25 - - - - 5,700 Canada geese
300 Blue & Snow geese
December 4 - - - - 32,000 Canada geese
1,200 Blue & Snow geese

We certainly welcome these check flights by the Agents and are only sorry funds will not permit them a weekly census of birds on these critical wintering areas.

No unusual behavior has been noted in our Canadas. The refuge seemingly had all to be desired to offer and there has been little to no movement of the birds off the refuge. Personnel were alerted to watch for the Canadas that had been neck banded at the Horicon Refuge during November.

The following neck-bands observations have been made on Crab Orchard:

Nov. 24 - 2 - in flock of 6000, Wolf Creek Bay, by Hawkins, Jahn and Stiles.

Dec. 26 - 1 - in flock of 28, in cornfield, by Crawford.

Dec. 30 - 3 - in flock of 400, in beanfield, by Crawford.

Blue, Snow and Hutchin's Geese - While making their appearance and accepting our offerings, never were as common in numbers as they were the past two years. Where-as blues and snows have always withstood some of our goose gun-pressure, this year we know of less than 50 that fell before the guns. The staff failed to get any age ratio sampling on the blues and snows this fall.

Common mallard - Our peak concentration of 40,000 mallards on November 9th was 5,000 birds greater than the peak for last year but total mallards using the refuge this season was smaller. A cold front moving in from the north following our unseasonable snow-storm of November 6th seemingly moved the mallards to and through us in a single wave. Thus the total usage indicated is probably more near a correct figure than that of a year ago when smaller flights came through and being subject to re-counting, no doubt, carried an untrue picture of total usage. Black duck - were at times, during the fall, equal in numbers to the mallard. As with the mallard, our total usage figures and probably our peak figures were not as high as they would have been had not all the surrounding river bottoms (Big Muddy, Cache and Saline) not been flooded and a great number of mallards and blacks took refuge and to feeding in the slashings. Gadwall, baldpate and pintail - were fewer in numbers than for any previous fall period. The teal, green-winged and blue-winged were up in numbers over the past year and the green-winged teal bore a great deal of the local gun pressure this year. Where-as the shoveller is a common fall observation on our stock water impoundments, they were almost an ornithological novelty this season. Wood duck - numbers using the refuge were considerably down this year but our records being down can not be used as an indice to the total population being down. From our own excursions off the refuge and known hunter kill, the wood duck was scattered throughout the flooded slashes of Southern Illinois in greater numbers than for any year in the past 15 years. Other than for the ring-necked duck, our visiting divers were more limited than usual. The coot, that provides our local colored gentry with their favorite duck hunting, was so few in numbers that we saw only one colored gentleman afield during the entire hunting season.

Other Waterbirds - The factual listing of waterbirds in Form NR-1A covers the situation.

Food and Cover - Having a fall migrant and wintering population of waterfowl species that are seemingly growing more dependent upon cultivated feed crops for their existence, we were a bit concerned relative to our ability to support a large population of waterfowl this period. Weather the past spring and summer caused such losses in our cultivated crops that though our total crop acreage was up, crop yield was down to the point of complete loss on some fields. As mentioned in our last narrative though all cultivated fields did have bountiful volunteer crops of smartweed, millet and pigeon grass. It is to these volunteer crops and the ability of the fowl to go back to such native feeds that we will be able to successfully winter our population. With the weather stopping all mechanical harvesting, our birds have taken some toll of farmers share of crops. Adverse weather also precluded permittees getting out the winter grain acreage planned and consequently the limited acreage of green feed-out appears to have suffered a 100% feed-out and perhaps kill-out by geese.

Emergent aquatics, while not in abundance, did produce good seed crops this season and provided some supplementary diet for the birds. Again during the draw-down, we had a green carpeting of mud flats by Eleocharis acicularis and Cyperus ferruginescens that was heavily utilized by all species of geese, black ducks and green-winged teal.

Disease - No loss noted this period. We had no reoccurrence of loss of Canada's from feeding on soy-beans this year. This can probably be attributed to the fact that at soy-bean harvest time, there was enough moisture to cause dropped beans to swell before geese started ingesting them.

Upland Game Birds - (See Form NR-2)

Population and Behavior - 1951 can probably be recorded as one of the poorest bob-white quail years on record. Adverse weather during nesting season cut production to an all-time low. Such is the quail picture on the public use area, but, the State Quail Research findings on Area II of the refuge rather belie the assumption. Their findings are as follows:-

1951		Experimental Area	1950
80	- - - -	Observed Covies	68
2.9	- - - -	Acres / Bird	3.77
13.0	- - - -	Brood Size	12.9
41.	- - - -	Acres / Brood	48.
1150.	- - - -	Total Census Population	882.
		Check Area	
60	- - - -	Observed Covies	63
3	- - - -	Acres / Bird	3.3
12	- - - -	Brood Size	10.4
32	- - - -	Acres / Brood	34.
720	- - - -	Total Censured Population	659.

The China Pheasant population is so low as to not warrant mention.

Food and Cover - With the abundance of rainfall, weed and introduced species of food and cover plants have made rank growth and in most cases abundant seed. One exception is the native Korean lespedeza which is light on seed due to an early frost during blossom time, cutting seed production as much as 70%.

Big Game Animals - (See Form NR-3)

Population and Behavior - Field observations lead us to believe that we had a poor fawn crop this year. The herd continues to grow and spread throughout the public use area as well as the closed area. Many of the youth campers at Little Grassy are going to be thrilled by their first sight of a deer as they are becoming quite adapted to that area. We have heard of several instances of dog packs and running fox hounds working the deer and assume that they will be a definitely limited factor in fawn survival.

Food and Cover - Ample for a growing herd. No reported complaints from permittees of deer utilization in cultivated crops, but we have seen high use being made of corn and soy-beans.

Fur Animals, Predators, Rodents and Other Mammals

Squirrels - With an excellent mast crop this season, the squirrels seemingly gauged their production accordingly and populations of both gray and fox squirrels are high. Summarized data from our controlled squirrel hunt will be found in Section VI.

Cotton-tail Rabbit - Production of early litters indicated a possible high in rabbit population for the year, but after producing the first litter, production seemingly stopped and we entered the fall with a low population.

Muskrat - The apparent two seasons' draw-down of Crab Orchard Lake for fisheries management has had an effect of reducing our rat population. This could be a false impression caused from the rats moving from house dens to bank dens and not being so readily observable.

Mink - The few signs seen of the species indicates that the population is low.

Raccoons - Ever present and no feasible means of removal yet.

Opossums - Normal in population levels.

Coyote and Wolf - Local crying bench gossip now is that we are harboring a high population of coyotes and wolves in the wilds of Devil's Kitchen. From the talk, these killer coyotes and wolves have killed

more poultry and sheep than we know was raised in Williamson County. Fox hunters are buying coyote and wolf dogs. Are they catching any? Sure - they have caught numerous coyotes and wolves and have even collected \$15.00 bounties on them. The only hitch in the whole story - no one capable of identifying a coyote or a wolf has been shown one of the varmints.

Predacious Birds

With cultivated crops below normal in production yields, refuge personnel stood by incensed as thousands of 'blackbirds' and crows harvested valuable and needed waterfowl food. It was not uncommon to see a mixed flock of red-winged blackbirds, rusty blackbirds and grackles numbering 10 to 15,000 buzz and dive bomb a 1000 bird flock of mallards until they drove them from their feeding field and then they drop in and relish the harvest. Controls are needed, but what is the answer? We don't have it.

Fish

There has been no change in the fisheries picture here on the refuge. The draw-down of '50 was apparently effective to a degree and was thus tried again in '51 as previously reported. The fall bass fishing in both Crab Orchard and Little Grassy Lakes was again excellent this year. Fishermen didn't find the good fall crappie fishing they found in '50 though.

III. REFUGE DEVELOPMENT AND MAINTENANCE

Physical Development

The physical development and maintenance program has seen the following work accomplished:-

Project 622 E

Refuge Maintenance

- Operation of dove and waterfowl traps.
- Knocking down of standing corn for waterfowl.
- Servicing, painting and manipulation of all lake valves.
- Scraped and painted 14' shell-lake boat.
- Inventory and transportation of reinforcing steel to Rice Lake and Lower Souris and Upper Souris Refuges.
- Leveling, graveling and grading around shop.
- Installation of gas and diesel pumps and oil-house at shop.
- Installation of blower-type furnace at shop.
- Masonite-ing of kitchen in Qtrs. # 4.
- Salvage and sale of 10.6 tons of scrap iron - \$349.80.
- Minor over-haul to Jeep I-19011 and Dodge pickup.

Project 622 R
Pile Boundary Line

- Remaining piling driven in place; pile capped where needed; all pile painted aluminum and boundary signs placed.
- Job Completed.

Project 622 C-1
Boat-Dock - Boat-House

- Pile driven, capped, trussed, decked and building moved in place for boat-house. Some finish trim and painting remains to be done.

Project 131 E-1
Fire Protection

- Service of all suppression and detection equipment.
- Blading of primary fire truck trails.
- Stock piling of gravel for trail surfacing.

Project 131 E-2
Recreational Management

- Winterizing of beach pumping equipment.
- Winter pick-up and storage of iron fire-places, portable tables, trash baskets, play-ground equipment and directional signs.
- Weld repairs to all pipe guard-rail in Area I.
- Hauled 180 yards of gravel surface material on roads and parking areas.

Project 170 E
Soil and Moisture Conservation

- Renovation with winter-grain, grass-legume seeding of 90 acres.
- Contouring of above 90 acres.

Project 712 R
Little Grassy Guard Rail

- Set in place 263 cement guard-rail posts on Little Grassy Dam.

Recreational Development

- Salvage of lumber and pipe materials for recreational construction of tables, guard rails, etc.
- Running topog. lines for boat dock at Little Grassy and drawing plans for same.

Collections

Refuge personnel made no collections of seeds, tubers or propagules this report period.

Again our Herrin High School Conservation Club group, whom we work with, collected 150 pounds of multiflora rose hips. These hips will be dried, the seed separated and packets of seed sent to other high school biology classes.

The Illinois Natural History Survey is collecting multiflora rose hips for a live quail subsistence feeding experiment.

The Illinois State Department of Conservation did not collect any multiflora rose hips from the refuge this year, hence we won't have a source of rose seedling stock for next spring.

Plantings

Aquatic, Marsh and Upland plantings - None made this period.

Cultivated Crops - Going into the harvest last September, the cultivated crop outlook, on the refuge, was anything but good. Unusually heavy rainfall in June and early July delayed planting and hampered cultivation to the point where it was doubtful how well-fed our waterfowl would be this winter. Practically all corn and soybeans planted on bottom-lands were near, if not complete failure, due to repeated flooding and weed and grass competition. Upland crops were favored by the above normal precipitation and in the final analysis the over-all yield for all refuge crops was near or even above those of preceeding years.

From September 15 to December 15, the refuge farmers realized barely a month of good harvest weather. Mechanical corn pickers bowed out in favor of hand picking behind horse and wagon. Because of this, much waste corn normally destined for goose gizzards wound up in the farmer's cribs. A hard freeze the first week in December permitted combining of late soybeans, so despite rain, snow, waterlogged fields and impatient geese, the refuge farmers were able, for the most part, to wind up the year in the black.

As usual the better farmers continue to show larger yields as their units respond to rather intensive soil treatment. The list of 'better farmers' is growing and more and more of the here-to-fore less successful permittees are following through with our liming, contouring, rotation and fertilization recommendations and benefiting both themselves and the refuge.

In a very few cases permits will not be re-issued for the coming year because of lack of interest or ability on the part of the permittee

to carry out the minimum soil improvement practices. For the most part, however, the present permittee list has been pretty well screened and it is felt our farming program will show rapid progress.

The fertilization program was near maximum effort again this year, being financed jointly by the farmers and the refuge. A total of 3432 tons of limestone and 73 tons of rock phosphate were applied to refuge lands. In addition, a total of 100 tons of commercial fertilizer was applied to crops at planting. Approximately, this represents a cash outlay of \$10,713.00 for limestone, \$1,606.00 for rock phosphate and \$4,981.00 for commercial fertilizer.

Permittee cooperation is progressing in such improvement practices as contour farming, establishment of grass waterways, seeding of green manure crops such as sweet clover and rye, and pasture renovation. Approximately 400 acres of pasture land is in the process of renovation - most of this to be completed during the calendar year 1952.

Additional agricultural acreage has been gained through clearing of sprouted lands. This activity was accomplished largely by refuge personnel, with some assistance by permittees. This practice of land clearing will probably diminish in the future as the value of the land, for agricultural purposes, is hardly commensurate with the cost of reclamation.

One factor in the agricultural program is becoming very evident; that being the necessity of reduction in corn acreage as the five-year rotation, (corn-soybeans-winter-grain-hay-hay) comes into the third and fourth years. Here-to-fore, through constant enlargement of the agricultural acreage by having access to reverted farm land, it has been possible to maintain a large corn acreage (corn being the first year crop on reclaimed ground). This source of new acreage is about exhausted, therefore, it will be necessary to reduce the size of the present fields and intensify management of present acreage to increase fertility. To maintain corn production, land that is now producing 30 bushels of corn per acre will have to produce from 45 to 60 bushels per acre. Crop records of certain agricultural units show this to be economically possible, if not desirable. There was a total of 1762 acres of corn grown on the refuge this year, producing an average yield of 31.5 bushels per acre, about $1\frac{1}{2}$ bushel per acre less than last year. A total of 542 acres of corn were left standing in the field. This acreage plus an 8% to 10% residue left by mechanical pickers on $\frac{2}{3}$ of the total corn acreage should have made about 18,000 bushels available for waterfowl food.

Soybeans on 945 acres produced 11,950 bushels with an average yield of 13 bushels per acre. Last year's yield was 12 bushels per acre.

Wheat grown on 436 acres produced 3930 bushels, averaging 9 bushels per acre. This latter figure is $1\frac{1}{2}$ bushels per acre greater than last

year, but still barely enough to be profitable to the farmer. Many complaints of goose damage were registered by the farmers and there was considerable reluctance on their part to plant wheat again this year. Approximately 650 acres of winter wheat, rye and barley have been sown this past fall. Despite all our efforts to disperse the geese and spread utilization of winter grain, some severe damage has occurred.

Approximately 130 acres of rye and winter wheat was sown by refuge personnel this past fall. Most of this acreage was planted as a nurse crop for grass and legume seedings. Since the planting is located near one of the main goose concentration points, it was hoped this would serve to relieve the grazing pressure on permittee winter grains. To some extent it has, but 25 to 30,000 geese can chew a lot of greens.

Weather condition put the damper on harvesting of Korean lespedeza seed almost entirely. A five-inch snow cover in early November lodged the lespedeza to where harvesting would not be profitable.

Following is a tabulation of the cash value of crops grown on refuge lands during the past year. The increase of \$25,633.00 over the preceeding year is due in part to increased crop production and in part to higher prices for commodities produced.

52,561 bushels of Corn	@	\$1.65/bushel	- -	\$ 86,725.65
11,949 bushels of Soybeans	@	2.63/bushel	- -	31,425.87
3,930 bushels of Wheat	@	1.89/bushel	- -	7,427.70
1,235 bushels of Oats	@	0.90/bushel	- -	1,111.50
621 Tons of Hay	@	20.00/Ton	- -	12,420.00
1,000 pounds of Lesp.seed	@	0.15/pound	- -	150.00
Total - - - - -				\$ 139,258.72
Cash value of 1950 refuge crops	- - - - -			113,625.30
Cash value of 1949 refuge crops	- - - - -			67,183.99
Cash value of 1948 refuge crops	- - - - -			76,104.38

From the above grain and hay prices, it is understandable why such a strong local demand exists for refuge agricultural lands.

IV. ECONOMIC USE OF REFUGE

Grazing - This phase of economic use will continue to expand as more land becomes renovated for pasture. Present limiting factor on lands suitable for grazing are fencing, water supply and carrying capacity. Removal of all three of these factors is progressing as rapidly as funds and man-power on both the part of the refuge and the farmer will permit.

Weather conditions were favorable for pasture growth throughout the grazing season. Korean lespedeza provided good pasture from July until the end of the grazing season. A total of 4697 Animal Use Months were realized during the grazing season, amounting to a total revenue of four thousand two hundred ninety-five dollars and sixteen cents (\$ 4,295.16). The grazing rate is \$1.00 per AUM for cattle and horses and \$0.20 per AUM for sheep. The experimental sheep grazing in the cyclone-fenced area (Area 13) continues to be satisfactory. Grazing was made available to horses on Agricultural Unit A - 16 to accommodate the Crab Orchard Field Trial Club.

Haying - Haying operations on the refuge will become more important as the crop rotation matures. Demand for hay locally is strong. Continuing the policy of charging one-fourth (1/4) the local current market price for hay; alfalfa was sold to the permittee for \$6.75 per ton. Lespedeza and Mixed hay sold for \$5.00 per ton. A total of 215 tons of hay were harvested under permit and 459 tons were given to permittees ~~for~~ to compensate for cost of stand establishment and limestone. Revenue from hay harvested under permit amounted to \$1,113.50.

Timber - In the future timber management harvest will become an important activity on the refuge. Some thinning of pine plantation will be desired along with harvest of mature and over-mature hardwoods. Three timber permits were issued this past year for the harvest of three-hundred black locust fence posts. The receipts for these cuttings totaled \$19.40. Further harvest of black locust will be in order as these plantings are approaching stagnation and in need of thinning.

Other Uses - Tabulated below is the government's return from the concession contract, at the rate of 3% of the gross:-

Facility	: Sept.	: Oct.	: Nov.	: Dec.	: Total	: Total for 1951
Refreshments - -	9.56	1.15	---	---	10.71	200.54
Gas. & Oil - -	5.58	1.49	.20	---	7.27	47.66
Boat, Dock, Motors	26.68	14.58	4.76	---	46.02	232.65
Bait - - - - -	---	---	---	---	---	0.77
Equip. & Repairs	1.19	3.78	1.56	---	6.53	118.28
Swim (Colored) -	---	---	---	---	---	---
Swim (White) - -	1.63	---	---	---	1.63	143.23
Gun Club - - - -	9.10	---	19.50	---	28.60	68.52
Miscellaneous - -	---	---	---	---	---	261.07
TOTALS --- \$	53.74	21.00	26.02	---	100.76	\$1072.72

Total Receipts for Year 1950 - - - - - \$1114.11

V. FIELD INVESTIGATION OR APPLIED RESEARCH

Ecological Relations Study

Such is the new official title of the former Quail Research Study of the Illinois Natural History Survey. In addition to the quail findings reported under Section II of this narrative, their progress report dated October 1, 1951, summarized their work for the summer as:- Experimental nursery work, field plantings, field reconnaissance and plans for intensive habitat improvements on 900 acres, and plans were developed for nutritional and cultural requirements for habitat plants and timber management studies.

Banding

During the report period the following migratory birds were banded:

Species	No. Banded
Canada Goose - -	28
Common Mallard - -	144
Black Duck - -	147
Canvasback - -	1
Ring-necked Duck - -	11
Ruddy Duck - -	3
Am. Pintail - -	8
Wood Duck - -	6
Mourning Dove - -	17

Fifteen (15) of the banded mallards were pinioned and shipped to the Sanibel Refuge in Florida for use as decoy callers.

Ornithology

Appended to this report is a copy of the Audubon Xmas Bird Count as made on the refuge and a listing of bird species observed on the refuge during 1951, with a showing of first arrival dates. It will be noted that 194 species were recorded on the refuge this year - 4 being first sight records on the refuge.

Goose Forage Study

On the following sheet is goose forage plot study area. As the seeding was late in the season, only the winter cover crops were sown and fertilization made. Grass seeding mixtures as indicated will be made this year.

Silt Survey

The inter-agency silt survey of the waters of the refuge was completed and we have been informed that calculation of data is progressing nicely. In connection with this silt survey, the entire county was re-photographed aerially and air photos are available.

Southern Illinois University

In addition to previous projects listed, one new project was initiated by the wildlife unit of the school.

"A management study of the gray and fox squirrel in Southern Illinois".

The botany department has approached our office relative to initiation of a plant ecological study. To date project plans have not been submitted for approval.

VI. PUBLIC RELATIONS




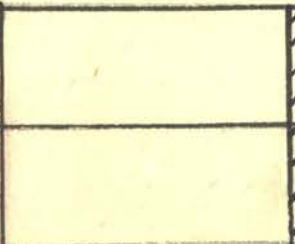




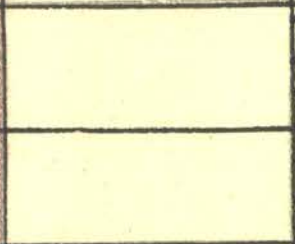




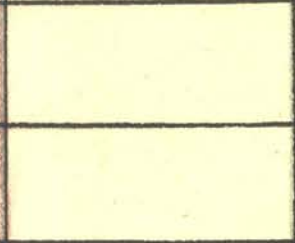




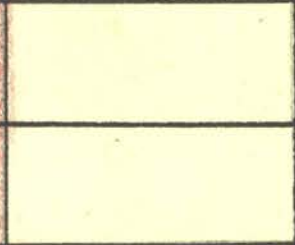




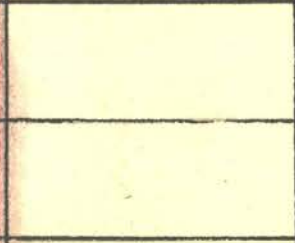




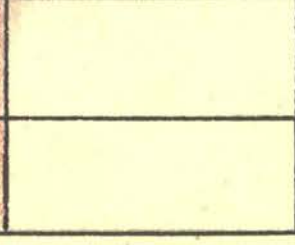




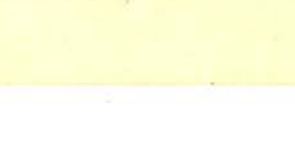

Recreational Use

Hunting, as elsewhere, took the lime-light this period. Our controlled squirrel hunt in the first part of September could be described as our opening kick-off. Doves were in the picture about this time also but they and the hunters saw little of one another.

A lull and then came waterfowl with all hunters in preparedness for a great season. And most of them made several stabs at it throughout the longer 45 day season.

FIELD PLAN. GOOSE FORAGE EXPERIMENT.

	Lime, Rock, Phosphate and Com. Fertilizer.		Lime and Rock Phosphate.		No treatment.
	Lime and Com. Fertilizer.		Com. Fertilizer only		Lime only.

1. LADINO CLOVER					
2. TIMOTHY. (wheat)					
3. LADINO CLOVER BROME. (wheat)					
4. RED TOP ORCHARD GRASS. (wheat)					
5. KENTUCKY 31 FESCUE. (wheat)					
6. REED CANARY GRASS. (wheat).					
7. LADINO CLOVER ALTA FESCUE. (rye)					
8. RYE GRASS RED TOP. (rye)					
9. LESPEDEZA. (rye)					
10. BROME. (rye)					
11. TIMOTHY. (rye)					
12. LESPEDEZA. (native stand)					

Quail were not up to par this fall and consequently hunting fell off some.

Rabbits commanded their usual steady following and are apparently in strength of numbers to meet the challenge.

In general, fall fishing was better than good, especially for bass, and the fishermen were out so long as the weather was comfortable.

Picnickers ventured in accordance with the weather also and were noted in numbers well up into October. The after-dark bonfire type outing is becoming ever more popular here and it takes advantage of the cool, clear evenings that extend well into November.

The following table was made in compliance with a directive to summarize estimated public use of the refuge for the year. This is submitted in a break-down of activities since it is felt that the diversity would make it of greater interest and value.

The degree of actuality achieved in these figures is governed by the validity of the individual observations and records of the refuge staff, past records and present office records. These plus a large measure of retrospect when tossed into the conference room produce, what we consider, highly acceptable figures.

RECREATIONAL USE FIGURES - Visitor Day

<u>Type of Recreation</u>	:	<u>1951</u>
<u>Hunting</u>		
Squirrel	- - - - -	1037 *
Dove	- - - - -	120
Waterfowl	- - - - -	18900 ?
Quail	- - - - -	600
Rabbit	- - - - -	1625
Total Hunting	- -	23382
<u>Fishing</u>		
Boat	- - - - -	150000
Bank	- - - - -	45000
Dip-netters	- - - - -	500
Total Fishing	- -	195500
<u>Recreational General</u>		
Picnicking	- - - - -	128500
Swimming	- - - - -	30000
Camping	- - - - -	1080
Power-Boating	- - - - -	8400
Sail-Boating	- - - - -	1200
Field Trialing	- - - - -	8020
Dog Training	- - - - -	1150
Total Recreational	-	178350
GRAND TOTAL VISITOR DAY	- - - - -	395,132

* Includes 277 hunters on Area II during controlled squirrel hunt.

Date	Name	Title	Purpose of Visit
Nov. 1	M. Leake	FWS Malheur Refuge	Pick up surplus
1	Drs. Welch & Voight	S.I.U.	Discuss Ecology Study Project
1	Dr. T. Scott & H. Hanson	INHS - Biologists	Forage Demonstration inspection
5	T. Shraeder & J. Kimball	R. Basin Studies	Courtesy Call
25	A. Hawkins, H. Duncan, L. Jahn	FWS - Biologist FWS - Game Agent Wis. Cons. Dept.	Canada Goose Concentration ditto ditto
Dec. 4	Conover, Duncan	FWS - Game Agents	Plant Census of Geese
27	W. Wandell	INHS - Forester	Habitat Plans

Refuge Participation

Refuge personnel, as indicated, participated in the following public contacts and/or meetings as representatives of the Service:-

- Sep. 5 - All personnel attended regular monthly meeting of C.O.S.A.
- 11 - Crawford, guest speaker at Benton Rotary Club.
- 11 - Bush attended monthly meeting of Carbondale Sportsmen's Club.
- 17 - Pickar, Stiles and Crawford, guests of Illinois Central Railroad and International-Harvester Co. at a pasture renovation demonstration at Dixon Springs Experimental Station.
- 27 - Crawford attended a special called board meeting of C.O.S.A.
- Oct. 3 - All personnel attended regular monthly meeting of C.O.S.A.
- 5 - 6 - Pickar, Stiles and Crawford placed our refuge display panel on exhibit at Carterville Free Fair and gave with information.
- 9 - Bush attended monthly meeting of Carbondale Sportsmen's Club.
- 10 - Crawford attended monthly board of directors meeting of COSA.

- 17 - Bush assisted Herrin Hi. Conservation Club in wildlife float.
- 30 - Crawford, guest speaker at District 21 Eagles meeting re camping on Little Grassy Lake.
- Nov. 4 - Mr. & Mrs. Crawford, guests of National Quail Futurity at drawing.
- 5 - Mr. & Mrs. Crawford, and Stiles, dinner guests at National Quail Futurity banquet. Crawford guest speaker.
- 7 - All personnel attended monthly meeting of C.O.S.A.
- 8 - Crawford guest speaker at the Marion Rotary Club.
- 13 - Bush guest speaker at monthly meeting of Carbondale Sportsmen's Club and showed film "Conservation in Action".
- 14 - Crawford and Stiles each conducted separate Agriculture classes over refuge.
- 15 - Gualdoni conducted a party over refuge on goose concentration observations.
- 16 - Crawford, guest speaker at New Hope Parent Teachers Association meeting.
- 26 - Mr. & Mrs. Crawford guests of Nat'l. Brittany Spaniel Club at their National Bench Show.
- 27 - Stiles, Horswell, Crawford and their wives, guests of Nat'l. Brittany Club at their Nat'l. Banquet.
- 30 - Mr. & Mrs. Crawford guests of the Girl Scouts of America at their dinner for the formal unveiling of their Little Grassy Camp plans.
- Dec. 8-15 Stiles, Horswell and Crawford in attendance at the Region 3 Refuge Managers' Conference.
- 20 - Stiles, guest speaker at the annual dinner meeting of the Herrin Hi-School Conservation Club.

Hunting

Those whom find recreation from gunning had varying degrees of success, in 1951, depending upon the game species pursued.

Squirrels - Following our seven (7) day controlled squirrel hunt on the closed portion of the refuge, it was possible to tabulate some factual data relative to squirrel hunting in Southern Illinois. Summarized, the data is as follows:-

- 277 hunters killed 340 squirrels.
- Bag consisted of 200 gray squirrels and 140 fox squirrels.
- 97% of hunters used shot-guns (12 ga. - 53%), 3% used rifles.
- 52% hunters still-hunted, 31% stalked and 17% combination of methods.
- 277 hunters fired 523 times or an average of 1.54 shots per squirrel in the bag.
- 22 squirrels were unretrieved.
- 340 squirrels seen in addition to those bagged.
- Successful hunters required 2.6 hours of hunting per squirrel.

Doves - With the peak of the dove flight coming in late August and the season being in September, the dove kill was probably the lowest of any the past three years.

Waterfowl - As indicated under weather conditions, the weather treated the duck hunter more kindly than in many a year. We had the birds and the weather and hunter success, we know, was better than average.

A check of local post office sales of duck stamps indicated that 1951 sales compare with those of the last two years, our five (5) towns surrounding the lake selling 2700 stamps. With bag check data as recorded by personnel, while on patrol, we find the following:-

No. Duck Hunters	Total No. Hunts	Average No. Days Hunted	Av. Daily Goose Kill	Total Kill	Av. Daily Duck Kill	Total Kill
Bag Check :	242	1	.058	14	.069	167
242 :						
Sales 2700:	18900	7	.058	1096	.069	13041

As an example of the kind of hunting that brought our kill figures up over last year. Three (3) hunters hunting one of our Crab Orchard Lake islands, hunted a total of 29 days, killed 199 ducks and 16 geese, getting skunked on only 2 days.

Quail - As pointed out under Section II, the production figures found by the quail biologist on the experimental area are at far variance from conditions found on the shooting grounds, and lands adjacent to the refuge. Whereas, we know quail hunters that call 170 to 250 quail in-the-bag an average season, few of the same hunters topped 35 quail for the season this year. We doubt, if more than 500 quail were killed on our public shooting grounds this season.

Rabbits - Kill below average this season.

Fishing

As indicated, fishing success remains good. The Crab Orchard Lake draw-down gave the fishermen some good fall bass fishing. Bass fishing has been off in Little Grassy this period probably due to rising water levels.

Violations

Without a doubt, we had the best cooperation of the Illinois State Department of Conservation wardens since our taking over here. During our controlled squirrel hunt, at least two State wardens were in attendance and on patrol at all times. Prior to waterfowl season, several joint meetings were held with the District Warden and three of his county wardens. Our office was also used as a base of patrol operations for them. At least two State wardens worked the refuge area during waterfowl season. Several cases of no license, no duck stamp and late shooting were made by the wardens, but we have no record of the arrests for incorporation here. We were disappointed in the \$14.00 fines imposed.

Refuge personnel made one arrest of hunting on the closed area of the refuge. Upon our recommendation and plea, the case was taken thru State Court, by State Warden Vargo, and the violator fined \$75.00 plus \$4.00 court costs.

VII. OTHER ITEMS

A few personally owned photos taken during the period are attached.

This narrative was co-authored by the following personnel:- Stiles, Horswell, Gualdoni, Bush, and Crawford.

Respectfully submitted,

Eugene E. Crawford
Eugene E. Crawford
Refuge Manager

Date Submitted:- Jan. 11, 1952

Approved by Regional Office:

[Signature]
Acting Regional Director
January 15, 1952

1951 XMAS AUDUBON BIRD COUNT
CRAB ORCHARD NATIONAL WILDLIFE REFUGE

BY

E. E. Crawford and Lee Bush

Dec. 27, 1951

Tufted Titmouse
Barred Owl
B.C. Chickadee
Robin
Red-wing
Mockingbird
Crow
Towhee
Redheaded Woodpecker
Pileated Woodpecker
S.C. Junco
Blue Jay
Goldfinch
Tree Sparrow
Red-bellied Woodpecker
Cardinal
Brown Creeper
Flicker
Downy Woodpecker
Meadow Lark
Mallard
Canada Goose
Red-tailed Hawk
Snow Goose
Black Duck
Bald Eagle
Song Sparrow
Carolina Wren
Blue Goose
Starling
Rock Dove
Sparrowhawk

English sparrow
Prairie Horned Lark
White Crowned Sparrow
Mourning Dove
Bronzed Grackle
Hooded Merganser
American Merganser
Canvasback
Ring-neck Duck
Marsh Hawk
Golden Crowned Kinglet
Hairy Woodpecker
Purple Finch
Red-shouldered Hawk
Bluebird
Herring Gull
Ring-billed Gull
Great Blue Heron
Lesser Scaup
American Goldeneye
Bufflehead
Cooper's Hawk
Coot
Pintail
Bob-white

BIRD OBSERVATION AND FIRST ARRIVAL LISTING - 1951

CRAB ORCHARD NATIONAL WILDLIFE REFUGE

First 62 species present or observed the first 15 days of January.

- | | |
|----------------------------|--------------------------------|
| 1. Pied-billed Grebe | 45. Starling |
| 2. Canada Goose | 46. English Sparrow |
| 3. Snow Goose | 47. Meadowlark |
| 4. Blue Goose | 48. Red-wing |
| 5. Mallard | 49. Cardinal |
| 6. Black Duck | 50. Goldfinch |
| 7. Gadwall | 51. Towhee |
| 8. Pintail | 52. Slate-colored Junco |
| 9. Canvas-back | 53. Tree Sparrow |
| 10. American Golden-eye | 54. White-crowned Sparrow |
| 11. Bufflehead. | 55. Song Sparrow |
| 12. Hooded Merganser | 56. Sharp-shinned Hawk |
| 13. American Merganser | 57. Golden-crowned Kinglet |
| 14. Cooper's Hawk | 58. Ring-necked Duck |
| 15. Red-tailed Hawk | 59. Bronzed Grackle |
| 16. Red-shouldered Hawk | 60. Swamp Sparrow |
| 17. Bald Eagle | 61. Baldpate |
| 18. Marsh Hawk | 62. Pigeon Hawk |
| 19. Sparrowhawk | 63. Cedar Waxwing - - 1/15 |
| 20. Bob-white | 64. Hutchin's Goose - - 1/17 |
| 21. Ring-necked Pheasant | 65. Horned Grebe - - 2/17 |
| 22. Coot | 66. Killdeer - - - 2/21 |
| 23. Herring Gull | 67. Shoveller - - - 2/22 |
| 24. Ring-billed Gull | 68. Cowbird - - - 2/23 |
| 25. Rock Dove | 69. Turkey Vulture - - 2/23 |
| 26. Mourning Dove | 70. Red-headed Woodpecker 2/23 |
| 27. Great Horned Owl | 71. Bewick's Wren - - -2/25 |
| 28. Barred Owl | 72. Screech Owl - - - 3/1 |
| 29. Flicker | 73. Belted Kingfisher - 3/1 |
| 30. Pileated Woodpecker | 74. Field Sparrow - - - 3/3 |
| 31. Red-bellied Woodpecker | 75. Woodcock - - - - 3/4 |
| 32. Hairy Woodpecker | 76. Broad-winged Hawk -- 3/8 |
| 33. Downy Woodpecker | 77. Brown Thrasher - - 3/13 |
| 34. Prairie Horned Lark | 78. Great Blue Heron - 3/16 |
| 35. Blue Jay | 79. Lesser Scaup Duck - 3/16 |
| 36. Crow | 80. Fox Sparrow - - - 3/16 |
| 37. Black-capped Chickadee | 81. Carolina Chickadee 3/16 |
| 38. Tufted Titmouse | 82. Green-winged Teal 3/16 |
| 39. Brown Creeper | 83. Red Head - - - - 3/16 |
| 40. Carolina Wren | 84. Phoebe - - - - - 3/16 |
| 41. Mockingbird | 85. Red-breast Merganser 3/16 |
| 42. Robin | 86. Barn Swallow - - - 3/22 |
| 43. Bluebird | 87. Purple Martin - - 3/22 |
| 44. Migrant Shrike | 88. Blue-winged Teal - 3/23 |

89.	Hermit Thrush	--	3/23	141.	Olive-backed Thrush	-	4/26
90.	Ruby-Cr. Kinglet	-	3/23	142.	Summer Tanager	--	4/26
91.	Db1-Cr. Cormorant	-	3/25	143.	Yellow-throated Vireo		4/26
92.	Old Squaw *	--	3/25	144.	Yellow Warbler	--	4/26
93.	Wilson's Snipe	--	3/27	145.	Scarlet Tanager	--	4/26
94.	House Wren	--	3/27	146.	Yellow-breasted Chat		4/26
95.	Chimney Swift	--	3/29	147.	Blk. & White Warbler		4/26
96.	Ruddy Duck	--	3/30	148.	Kentucky Warbler	--	4/26
97.	Osprey	--	3/30	149.	Baltimore Oriole	--	4/27
98.	Pectoral Sandpiper	-	3/30	150.	Short-billed Marsh Wren		4/27
99.	Tree Sparrow	--	4/2	150.	Dickcissel	--	4/27
100.	Gr. Yellow-legs	--	4/3	152.	Indigo Bunting	--	4/29
101.	Loon	--	4/5	153.	Catbird	--	4/29
102.	Savannah Sparrow	--	4/9	154.	Acadian Flycatcher	-	4/29
103.	Rusty Blackbird	--	4/10	155.	Wood Pewee	--	4/29
104.	Vesper Sparrow	--	4/10	156.	Sora	--	4/30
105.	Blue-gray Gnatcatcher		4/10	158.	Rose-breasted Grosbeak		4/30
106.	Upland Plover	--	4/11	157.	Wood Duck	--	5/1
107.	Kingbird	--	4/11	158.	Veery	--	5/1
108.	Myrtle Warbler	--	4/19	160.	King Rail	--	5/1
109.	Spotted Sandpiper	-	4/19	161.	Nighthawk	--	5/1
110.	Prothonotary Warbler		4/19	162.	Chuck-will's-widow	-	5/1
111.	Green Heron	--	4/21	163.	Tennessee Warbler	--	5/1
112.	Lesser Yellow-legs	-	4/22	164.	Yellow-billed Cuckoo		5/2
113.	Warbling Vireo	--	4/22	165.	Bell's Vireo	--	5/2
114.	Rough-winged Swallow		4/23	166.	Chestnut-sided Warbler		5/2
115.	Whip-poor-will	--	4/24	167.	Chipping Sparrow	--	5/3
116.	Palm Warbler	--	4/24	168.	Bobolink	--	5/5
117.	Prairie Warbler	--	4/24	169.	Common Tern	--	5/6
118.	Clay-colored Sparrow*		4/24	170.	American Bittern	--	5/7
119.	White-throat. Sparrow		4/25	171.	Northern Water-Thrush		5/8
120.	Wood Thrush	--	4/25	172.	Black-poll Warbler	-	5/11
121.	American Egret	--	4/25	173.	Black Tern	--	5/14
122.	Sycamore Warbler	-	4/25	174.	Caspian Tern	--	5/14
123.	White-eyed Vireo	--	4/25	175.	Pine Warbler	--	5/16
124.	Red-eyed Vireo	--	4/25	176.	Grasshopper Sparrow	-	5/19
125.	Parula Warbler	--	4/25	177.	Least Bittern	--	6/1
126.	Northern Yellow-throat		4/25	178.	Least Tern	--	6/5
127.	Orchard Oriole	--	4/25	179.	Little Blue Heron	--	8/6
128.	Crested Flycatcher	-	4/25	180.	Marbled Godwit *	--	8/22
129.	Ruby-thr. Hummingbird		4/25	181.	Canada Warbler	--	9/12
130.	Blue-headed Vireo	-	4/25	182.	Snowy Egret	--	9/12
131.	Blue Grosbeak	--	4/25	183.	Least Sandpiper	--	9/17
132.	Least Flycatcher	--	4/25	184.	Semi-palmated Sandpiper		9/17
133.	Blk-thr. Green Warbler		4/25	185.	Wilson's Warbler	--	9/17
134.	Ovenbird	--	4/25	186.	Nashville Warbler	--	9/22
135.	Redstart	--	4/25	187.	Long-billed Marsh Wren		9/25
136.	Purple Finch	--	4/26	188.	Bay-breasted Warbler	-	9/25
137.	Solitary Sandpiper	-	4/26	189.	Orange-crowned Warbler		10/1
138.	Gray-cheeked Thrush		4/26	190.	Blackburnian Warbler	-	10/5
139.	Blk-Cr. Night Heron		4/26	191.	Magnolia Warbler	--	10/6
140.	Louisiana Water-thrush		4/26	192.	Dowitcher	--	10/23
				193.	Brewer's Blackbird *	-	11/9
				194.	Winter Wren	--	12/26

* Denotes first record for refuge.



1. - Pile driven in place for combination boat-dock boat-house.
10/1951 E.E.C.



2. - Pile topped for capping and decking. 10/1951 - E.E.C.



3. - Moving of first of two 14' x 24' buildings onto boat-dock deck.
10/1951 - EEC.



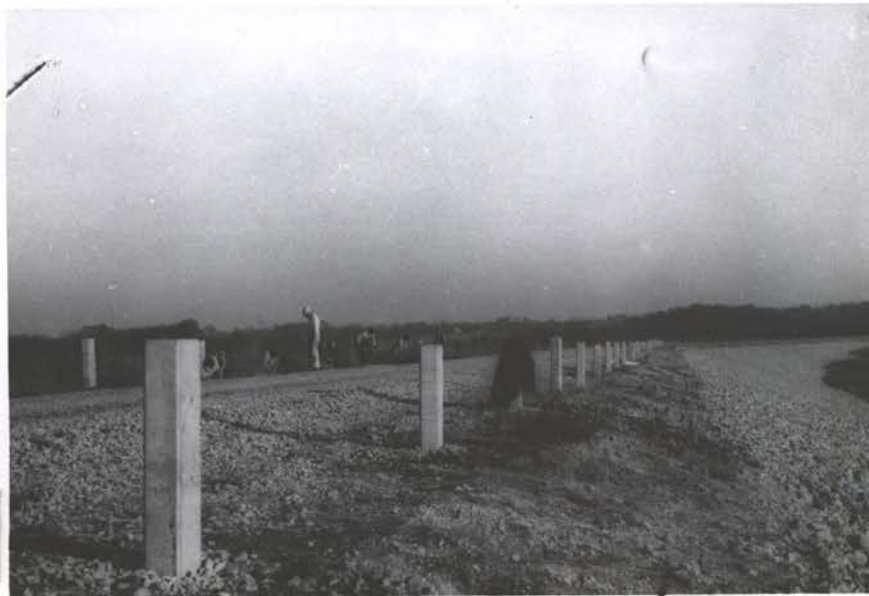
4. - Controlled squirrel hunt. Personnel shown left to right:
(head in lower left removing sex organs of squirrel) Dick Moran,
"Pint" Gualdoni, our clerk, a four for four squirrel hunter, H. Stiles,
our Conservationist, and Tom Collins, our Student Ass't.
9/1951 - EEC.



5.

11/1951 EEC

Placing 350# cement guard-rail posts on Little Grassy Dam road-way. The hoist unit was shop fabricated by our able maintenance man, Bill Meneese, shown driving the pickup.



6.

11/1951 EEC.



7.

9/1951 EEC.

- Fencing of three-fourths of each stock water pond has aided in creating more ideal waterfowl habitat and species of bulrushes needed for transplanting to our eroding lake shore-lines are appearing as may be seen in photo.



8.

9/1951 EEC.

- Quail habitat improvement of fence lines. This well developing quail habitat fence row was planted in April of 1950, Area I of the refuge. Plant species in row wide coveret are:- 3 lespedezas, (bicolor, korean and sericea) and multiflora rose.



9

9/1951 EEC.

Some successful transplants of valuable emergents on Crab Orchard Lake are, above 3-square and below, round-stem bulrushes.



10

9/1951 EEC.



11. -

9/1951 EEC.

Lespedeza bicolor planted in April of 1948 now stands 6 to 8 ft. tall, above, and for the first time blossomed (below) and produced seed.



12.

9/1951 EEC.

WATERFOWL

Refuge Crab OrchardMonths of September, 1951 to January19452

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I. <u>Swans:</u>									
Whistling swan									
II. <u>Geese:</u>									
Canada goose - - -	32	9/28	35,000	11/30	25,000	12/31	- - - -	- - - -	45,000
Cackling goose									
Brant									
White-fronted goose									
Snow goose - - - -	4	10/10	750	11/16	2	12/27	- - - -	- - - -	750
Blue goose - - -	11	10/18	2,600	11/16	3	12/27	- - - -	- - - -	2,600
Hutchin's goose - -	4	10/25	50	11/26	1	11/30	- - - -	- - - -	50
III. <u>Ducks:</u>									
Mallard - - - - -	(Permanent)		40,000	11/9	(to end of period)		- - - -	- - - -	50,000
Black duck - - - -	7	9/6	25,000	11/9	(to end of period)		- - - -	- - - -	30,000
Gadwall - - - - -	2	11/3	500	11/20	2	12/17	- - - -	- - - -	700
Baldpate - - - - -	15	10/15	200	11/2	7	12/20	- - - -	- - - -	300
Pintail - - - - -	23	10/1	1,000	11/2	(few at end of period)		- - - -	- - - -	1,500
Green-winged teal -	117	10/26	3,000	10/27	1	12/5	- - - -	- - - -	3,000
Blue-winged teal -	78	9/2	3,000	10/15	31	11/9	- - - -	- - - -	5,000
Cinnamon teal									
Shoveller - - - -	3	10/8	150	11/1	7	11/12	- - - -	- - - -	250
Wood duck - - - -	(summer resident)		700	9/28	12	11/17	- - - -	- - - -	700
Redhead - - - - -	33	10/29	400	11/15	1	12/1	- - - -	- - - -	400
Ring-necked duck -	21	10/25	3,500	11/27	4	12/27	- - - -	- - - -	5,000
Canvas-back - - -	11	10/29	1,000	11/27	(few at end of period)		- - - -	- - - -	2,000
Scaup, Lesser - - -	16	10/23	700	11/27	9	12/27	- - - -	- - - -	1,200
Golden-eye - - - -	8	11/12	50	11/27	1	12/27	- - - -	- - - -	75
Buffle-head - - - -	2	11/8	400	11/27	(few at end of period)		- - - -	- - - -	700
Ruddy duck - - - -	31	10/25	300	11/27	3	12/2	- - - -	- - - -	500
Hooded Merganser -	8	11/1	300	11/24	7	12/27	- - - -	- - - -	500
Amer. Merganser - -	7	10/26	2,000	12/15	1,204	12/31	- - - -	- - - -	3,000
IV. GOOSE Red Br. Merganser	1	11/1	1	12/1	1	12/1	- - - -	- - - -	1
<u>COOT</u> - - - - -	(permanent)		800	10/26	38	12/31	- - - -	- - - -	1,500

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese _____

Ducks _____

Coots _____

Total waterfowl usage during period 154,726

Peak waterfowl numbers 121,401

Areas used by concentrations Area II

Principal nesting areas this season _____

Reported by E.E. Crawford and Lee Bush

INSTRUCTIONS

- (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) **First Seen:** The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.
- (3) **Peak Concentration:** The greatest number of the species present in a limited interval of time.
- (4) **Last Seen:** The last refuge ~~record~~ for the species during the season concerned in the reporting period.
- (5) **Young Produced:** 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.
- (6) **Total:** Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

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

MIGRATORY BIRDS

(other than waterfowl)

Refuge Grab Orchard

Months of September thru December 31 1945

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon	1	11/18	2	11/20	2	11/20	-	-	-	2
Horned Grebe	1	10/14	12	11/9	1	11/30	-	-	-	20
Pied-billed Grebe	(Breeds)		75	11/30	(Present at end of period)		-	-	-	90
Blk.-crested Cormorant	(Breeds ?)		800	10/30	(Present at end of period)		-	-	-	1000
Great Blue Heron	(Breeds)		500	9/20	1	12/27	-	-	-	750
American Egret	(Summer visitor)		500	9/10	3	11/17	-	-	-	700
Snowy Egret	(Rare summer visitor)		2	9/12	2	9/22	-	-	-	5
Little Blue Heron	(Summer visitor)		100	9/10	5	10/7	-	-	-	150
Green Heron	(Breeds)		500	9/1	1	11/2	-	-	-	800
Blk.-crowned Heron(night)	(Breeds)		200	9/25	17	11/14	-	-	-	300
Least Bittern	(Breeds)		10	9/1	1	9/4	-	-	-	25
American Bittern	(Breeds)		20	9/1	1	10/10	-	-	-	50
King Rail	(Breeds)		40	9/1	1	9/28	-	-	-	75
Sora Rail	1	9/15	20	9/20	1	9/29	-	-	-	40
II. Shorebirds, Gulls and										
Terns:										
Killdeer	(Breeds)		2000	9/10	2	12/14	-	-	-	3000
Woodcock	(Breeds)		20	9/1	1	11/19	-	-	-	40
Wilson's Snipe	1	9/27	40	10/1	1	12/4	-	-	-	100
Upland Plover	(Breeds)		100	8/10	-	9/11	-	-	-	200
Spotted Sandpiper	(Breeds)		50	9/1	2	10/28	-	-	-	100
Solitary Sandpiper	2	9/24	6	10/15	1	10/22	-	-	-	15
Greater Yellow-legs	6	9/25	25	10/26	2	11/8	-	-	-	150
Lesser Yellow-legs	4	9/25	300	9/10	21	10/29	-	-	-	500
Dowitcher	2	10/23	7	10/29	7	10/29	-	-	-	7
Pectoral Sandpiper	3	10/10	20	10/20	5	10/30	-	-	-	100
Semi-palmated Sandpiper	(late summer vis.)		10	9/5	1	9/9	-	-	-	50
Herring Gull	5	10/14	4200	12/27	(Pres. at end of period)		-	-	-	5000
Ring-billed Gull	1	10/11	2100	12/27	(ditto)		-	-	-	3000
Common Tern	(late summer visitor)		100	9/10	11	9/22	-	-	-	200
Caspian Tern	15	9/5	100-25	9/20	2	9/30	-	-	-	300
Black Tern	(late summer visitor)		25	9/15	17	9/21	-	-	-	100

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove - - - -	(Permanent Resident)	2000	8/30	(Still Present)	3000
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Calden eagle (Bald) - -	1	11/1	4	12/27 (Still present at end of period)	10
Duck hawk					
Horned owl - - - -	(Permanent resident)				
Magpie (Barred Owl) - -	ditto				
Raven					
Crow - - - - -	ditto				
Red-tailed Hawk - - - -	ditto				
Red-shouldered Hawk - -	ditto				
Cooper's Hawk - - - - -	ditto				
Sharp-shinned Hawk - -	ditto				
Reported by <u>E.E. Crawford & Lee Bush</u>					

INSTRUCTIONS

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

UPLAND GAME BIRDS

1613

Refuge Crab Orchard

Months of Sept 1

to Dec. 31, 1945

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Bob White Quail Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'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	Area I and III 15,000 Acres	18	-	-	5M - 3F	500			835	
	Area II 19,000 Acres	2.9	-	-	4M - 3 F.	---	---	---	6340	
China Pheasant	As Above	??	-	-	-----	--	00	--	70	

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 OrchardCalendar Year 1951

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer														
White-tailed Deer	35,000 available acres	10 ♀					*2						80 ♀	1M - 2F

Remarks:

* Killed by autos.

Reported by

Eugene H. Crawford

INSTRUCTIONS

Form NR-3 - BIG GAME

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

Refuge Crab Orchard RefugeYear 1945

Botulism

Lead Poisoning or other Disease

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

"NONE"

3-1756
Form NR-6
(April 1946)

FISH

Refuge.....Crab Orchard Refuge.....Year 1945

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken % of Total catch	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
L. M. Bass	common							
L. M. Bass - - -	common	- - - - -	11 %					
White Crappie - -	common	- - - - -	15 %					
Black Crappie - -	common	- - - - -	15 %					
Blue gill - - -	common	- - - - -	27 %					
Other Sunfish - -	common	- - - - -	12 %					
Bullheads - - -	common	- - - - -	11 %					
Carp - - - - -	common	- - - - -	5 %		(1353			
)	- - 1 - -	- (
Buffalo - - - -	rare	- - - - -	2 %		(50			
Warmouth bass -	rare	- - - - -	2 %					
		195,500 250,000	100 %					
Turtles - - - -	common	- - - - -	- - - - -	0 - 1 - -	177			

REMARKS:

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge.....Grab Orchard.....Year 1945..51

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
Multiflora Rose	Area II	3660/mile	5 miles	18,000 seedlings	4/1951	Good		
Potamogeton pectinatus	Little Grassy Lake & stock ponds Area II	10# /acre	50 acres	500 #	Spring	Poor	?????	

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....50 acres
Hedgerows, cover patches.....5 miles
Food strips, food patches.....
Forest plantings.....

CULTIVATED CROPS

Refuge Crab Orchard Year 195 1

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Har- vested	Harvested		Unharvested		
							Acres	Bu.	Acres	Bu.	
D.C. Samuel	C.O. 130	A - 1 A - 8 A - 9	Corn Wheat Leasp. hay Soybeans	43 13 1.3 T. 15.5	98 42 12. 52.5	4214 534 15.75T. 823.5	8 14 4 17.5	344 178 5.25T. 274.5	37 1591	App. on Limestone App. on Limestone ditto ditto	
Vernon Howell	C.O. 170	A-2	Soybeans	14.	15	210.	5	70		App. on Limestone	
Walter Fleming	C.O. 153	A-3 A-10 A-11	Corn Soybeans Leasp. S. Clover	30 15.75	52 52.5	1560 827	17.5 21. 83.	225.	26 780	App. on Limestone Goose Graz.-Soil Imp Soil Improvement	
Ben A. Walker	C.O. 159	A-4	Corn	35	26	910	14x	--	14 490		
John Copher	C.O. 169	A-5 A-7	Corn Soybeans Wheat	9.8 11.5 12.	20 6 9	197 69 108	- 2 3	- 23 39	10 - -	98 - -	App. on Limestone ditto
G.B. Morris	C.O. 136	A-6	Soybeans Corn Leasp. Hay	12.0 45	32 39	389 1780	11 --	130 --	- 19.5	- 890	App. on Limestone App. on Limestone
D.C. Samuel	(As Above)		Oats	19.5	15	294	5	98		App. on Limestone	

Summary of Crops Grown:	Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
			Acres	Bushels	Harvested		Unharvested		
					Acres	Bu.	Acres	Bu.	
									\$ _____
Interior Duplicating Section, Wash.D.C.									

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number of acres harvested or 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. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

CULTIVATED CROPS

Refuge Crab Orchard Year 1951

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Har- vested	Harvested		Unharvested		
							Acres	Bu.	Acres	Bu.	
L.J. Wohlwend	C.O. 162	A - 12 A - 14	Wheat	11.5	31.5	392	10.5	130	3	-	Goose graz & Lime.
			Corn	36	110	4000	-	-	55	2000	
			Alfalfa	.5 T	17	8 T.	6	2.5T	-	-	App. on Limestone
			Oats	8.	27	215	8	70.	-	-	ditto
H. Broeking	C.O. 119	A-13	Wheat	13.7	36	493	12	165	-	-	App. on Limestone
			Soybeans	20.3	25.5	517	8.5	173	-	-	App. on Limestone
			Corn	61	26.8	1601	-	-	8.2	534	
			Alfalfa	1.6T	7.5	12 T.	2.5	4 T.	-	-	App. on Limestone
			Ladino Clover		(No Harvest)				3.	(Goose	Graze - Soil Impr.
			S. Clover		(No Harvest)				25		ditto Ditto
E. A. Fosse	C.O. 141	A-15	Soybeans	11	10.5	116	3.5	41	-	-	App. on Limestone
			Corn	40	21	840	4	163	3	120	ditto
Ernest Fisher	C.O. 124	A-16	Soybeans	8	15	122	5	40	-	-	App. on Lime & Fert.
			Corn	35	27	945	-	-	22	455	9 Acr. made no crop
			Lesp. Hay	.3T	11	3.3T	4	1.2T	-	-	App. on Limestone
			Red Gl. Hay	1. T	5	5 #.	2	2. T	3	-	Lime - Soil Improv.
			Lesp. seed	330#	1.5	500 #	1.5	500#	-	-	
			Oats	17	9.	153	3	51	-	-	App. on Limestone
			Wheat	16	4.5	74	1.5	24	16	-	Goose Forage
			RedTop Gr.					15		ditto	

Interior Duplicating
Section, Wash.D.C.

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number of acres harvested or 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. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

CULTIVATED CROPS

Sheet # 3

Refuge Crab Orchard Year 195 1

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Har- vested	Harvested		Unharvested		
							Acres	Bu.	Acres	Bu.	
Kimmel Baker	C.O. 125	A-20	Soybeans	10	28.5	285	9.5	95	-	-	App. on Limestone
			Wheat	7.6	30	228	10.	76	-	-	App. on Fertilizer
			Corn	33	27	891	-	-	17	462	
			Leasp. Hay	1.4 T	7.5	10.2 T	2.5	3.4 T	--	-	App. on Limestone
Hobart Tanner	C.O. 166	A-21	Soybeans	9	18	166	7	56	-	-	App. on Fert.-Lime.
			Corn	25	40	1000	-	-	20	500	
			Wheat	6.6	30	198	10	66	-	-	App. on Fert.-Lime.
Louie Turnage	C.O. 126	A-18	Corn	32	49	1600	-	-	25	800	
		A-22	Soybeans	15	36	538	11	164	-	-	App. on Fertilizer
Marion Ramsey	C.O. 144	A-23	Corn	27	30	810	-	-	15	405	
			Soybeans	12.5	24	339	8	113	-	-	App. on Limestone
			Wheat	6	3	18	1	6	-	-	ditto
Charlie A. Moore	C.O. 163	A-23a	Corn	35	48.5	1698	2.5	80	20.5	718	80 bu. app. on Lime
Alfred Layman	C.O. 156	A-24	Corn	37	27	1000	-	-	21	521	8 ar. drowned out
		A-39	Wheat	9	21	184	6	61	-	-	App. on Limestone
		Leasp. Hay	1 T.	7.5	7.5	2.5	2.5	-	-	ditto	
Ray McGee	C.O. 155	A-24a	Corn	19.5	6	117	2	39	-	-	App. on Limestone

Summary of Crops Grown:	Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
			Acres	Bushels	Harvested		Unharvested		
					Acres	Bu.	Acres	Bu.	
									\$ _____
Interior Duplicating Section, Wash.D.C.									

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

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CULTIVATED CROPS

Sheet # 4

Refuge Crab Orchard Year 1951

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Har- vested	Harvested		Unharvested		
							Acres	Bu.	Acres	Bu.	
Vernon Kelley	C.O. 139	A-25	Corn Wheat Oats Soybeans	44 4 7.5 10.	20 12 5.5 33	880 48 47 322	- 4 1.5 10	- 16 13 107	9 - - 12	440 - - --	App. on Limestone ditte ditte
Dale Baker	C.O. 105	A-26	Corn	(No	Harvest; poor	crop)			7	70	
Floyd Chamness	C.O. 113	A-27	Corn Leop. Hay Mixed Hay	35 1.5 T 1	21 21 50	740 31 T 50	- 7 -	- 11 T (poor quality)	11 - -	370 - -	app. on Limestone gave crop for cutting
Orval Morris	C.O. 150	A-28 A-28a	Corn Soybeans Leop. Hay	25 9.6 1 T	21.66 57.5 32	1650 553 32 T	- 19 16	- 185 16 T	17 - -	425 - -	** app. on Limestone ditte
SAME AS ABOVE			Oats	18	11.5	207	3.5	63	-	-	ditte
C. James & W. Talley	C.O. 164	A-32	Corn	28	16	430	-	-	8	215	
Leon Moore	C.O. 137	A-34	Corn Soybeans	15 8	40 24	600 192	- 8	- 64	20 -	300 -	app. on Limestone
Fred Watson	C.O. 147	A-36	Corn Soybeans Wheat	(No Harvest) 11. 10.7	26.75 26	298 278	9.25 8	104 94	21 -	150 -	app. on Limestone App. on Fertilizer

** Gave crop for clearing land.

Summary of Crops Grown:	Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
			Acres	Bushels	Harvested		Unharvested		
					Acres	Bu.	Acres	Bu.	\$

Interior Duplicating
Section, Wash.D.C.

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

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Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

CULTIVATED CROPS

Sheet # 5

Refuge Crab Orchard Year 1951

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Har- vested	Harvested		Unharvested		
							Acres	Bu.	Acres	Bu.	
C. McGee, R. McGee & P. McGee	C.O. 152	A-38 C-6	Corn Wheat Soybeans	29 5 11.3	115 13.5 48	3314 68 534	1 4.5 16	21 32 178	52 13 -	1657 -- --	Goose Forage - Lime App. on Limestone
Waldo Craig	C.O. 135	A-40	Corn Soybeans Wheat	24 15 11.5	7.5 7.5 7.5	180 112 86	- 2.5 2.5	-- 38 29	3.5 - -	84 -- --	App. on Limestone ditto
Clifton Morgan	C.O. 107	A-41a	Corn	31	9	306	4	103	-	--	App. on Limestone
P. & V. Reed	C.O. 133	A-41 C-18	Corn Soybeans Wheat	- - - 14.9 3.5	- - - 39 30	(CROP FAILURE) 582 105	- 13 10	- 192 34	- - -	- - -	Flooded App. on Limestone ditto
Earl Walker	C.O. 157	B-1	Wheat Soybeans	4 14.5	33 13.5	132 196	10 4.5	34 65	- -	- -	App. on Limestone ditto
Earl Venable	C.O. 121	B-2 B-4	Alfalfa Hay Leop. Hay	.5 T 1.5 T	20 46	10 T 69 T	7. 15	3.5 T 23 T	- -	- -	App. on Limestone ditto
Wayne Howell	C.O. 149	B-6 B-7	Corn Soybeans Oat Hay	25 13 .75 T	15 34 13.5	375 446 10.1 T	5 11 4.5	125 149 3.4	- - -	- - -	App. on Limestone ditto
R.O. Stearns	C.O. 151	B-8	Corn	30	22	660	8	240	-	-	

Summary of Crops Grown:	Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
			Acres	Bushels	Harvested		Unharvested		
					Acres	Bu.	Acres	Bu.	
									\$ _____
Interior Duplicating Section, Wash.D.C.									

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

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CULTIVATED CROPS

Sheet # 6

Refuge Crab Orchard Year 1951

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return					
					Acres	Bu. Har- vested	Harvested		Unharvested		Compensatory Services, or Cash Revenue	
							Acres	Bu.	Acres	Bu.		
John Wagley	C.O. 171	B-9	Soybeans	8.4	22	189	8	163	-	-	app. on Limestone	
J. T. Clayton	C.O. 167	B-10	Corn	10	15	150	5	50	-	-	App. on Fertilizer	
Raymond Bigler	C.O. 110	B-11	Corn Mixed Hay	20 1 T.	14 9	420 9 T	- 3	- 3 T.	18	220	App. on Limestone	
Raymond Hayton	C.O. 118	B-12	Lesp. Hay	1 T.	18	18 T	6	6 T.	-	-	App. on Limestone	
Otto Stocks	C.O. 132	B-14 B-16	soybeans Corn	14.5 26	33 10	476 260	11 -	159 -	- 5	- 130	app. on Limestone	
Walter Hayton	C.O. 131	B-15	Soybeans	18	16.5	296	5.5	98	-	-	app. on Limestone	
L. Henderson	C.O. 146	B-17 C- 3	Soybeans Corn Red-top Hay	11 - - - 1.5 T	3 - - - 3	33 - - - 4.5 T	1 - - - 1	10 - - - 1.5T	- - - - -	- - - - -	app. on Limestone drowned out app. on Limestone	
Mart Collins	C.O. 158	B-18	-----	No Crops	-----	-----	-----	-----	-----	-----	-----	
Ogle Burklow	C.O. 117	C-2 & 5	Corn	33	15	520	6	173	-	-		
W. B. Smith	C.O. 150	C-4	Corn	13	6	78	2	26	7	Crop failure		
H. Batson	C.O. 103	C-7	Corn Soybean Hay	12 -	5 10	60 10 T	- -	- -	2 -	24 -	gave for Limestone	

Summary of Crops Grown:	Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
			Acres	Bushels	Harvested		Unharvested		
					Acres	Bu.	Acres	Bu.	
									\$ _____
Interior Duplicating Section, Wash.D.C.									

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

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CULTIVATED CROPS

Sheet # 7

Refuge Crab Orchard Year 1951

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
					Acres	Bu. Har- vested	Harvested		Unharvested		
							Acres	Bu.	Acres	Bu.	
Ervin Yancy	C.O. 104	C-8	Corn Lesp. Hay	24 .5 T	3 1.5	72 1.5 T	1 .5	24 .25T	- -	- -	app. on Limestone
Oleo Escue	C.O. 112	C-9 C-13	Corn Soybean	25 20	18 19	450 374	6 7	150 128	17 *	60 -	* failure app. on Limestone
Tony Kristeff	C.O. 143	C-11	Corn Lesp. Hay Rye	- 1 T -	- 19 -	- 19 T -	- - -	- - -	11 (failure)	- - 5	Govt share f/seed goose forage
Jay K. Odum	C.O. 165	C-11	corn	9	10.5	90	3.5	30	--	--	
Ed. & Rob't. Cox	C.O. 142	C-12 & 14	Corn	24	37.5	900	12.5	300	--	--	app. on Limestone
John Duncan **	C.O. 148	C-17 & 19	Corn	22	6	135	2	45	-	-	app. on Fertilizer
T. J. Throgmorton	C.O. 115	C-21	Corn		9	162	3	54	-	-	app. on Fertilizer
Russell Stout	C.O. 114	C-22	Corn	26	12	330	5	110	12	(failure)	
Logan Colp	C.O. 145	A-29 & 37	Alfal. Hay	1.9T	13	24.7T	--	--	--	--	app. on Soil Improv.
Raleigh Kelly	C.O. 172	C-3	S-bean Hay	1 T.	1	1 T.	--	--	--	--	app. on Limestone
** No crops on C-19.											

** No crops on C-19.

Summary of Crops Grown:		Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
				Acres	Bushels	Harvested		Unharvested		
						Acres	Bu.	Acres	Bu.	\$ _____
Interior Duplicating Section, Wash.D.C.		<u>Corn</u>	<u>1762</u>	<u>1140</u>	<u>35.925</u>	<u>80.5</u>	<u>2077</u>	<u>542</u>	<u>14.559</u>	
		<u>Soybeans</u>	<u>945.5</u>	<u>692</u>	<u>9.005</u>	<u>231</u>	<u>2945</u>	<u>22</u>	<u>-</u>	
		<u>Wheat</u>	<u>436</u>	<u>329</u>	<u>2.946</u>	<u>107</u>	<u>984</u>	<u>-</u>	<u>-</u>	
		<u>Oats</u>	<u>89</u>	<u>68</u>	<u>911</u>	<u>21</u>	<u>324</u>	<u>--</u>	<u>--</u>	
		<u>Hay</u>	<u>420</u>	<u>336</u>	<u>367 Ton</u>	<u>84</u>	<u>89 Ton</u>	<u>21</u>	<u>Goose Forage</u>	

Interior Duplicating
Section, Wash.D.C.

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

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REFUGE GRAIN REPORT

Refuge Crab Orchard Refuge

Months of September thru December 1945

(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 USE		
				TRANS- FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Corn (Shelled) '48	25	--	25	--	--	20	20	5	--	-5-	0
Corn (Ear) '49	40	--	40	--	--	--	40	40	--	40	0
Corn (Ear) '50	970	---	970	---	---	10	10	960	--	960	0
Corn (Ear) '51	---	521	521	---	---	36	36	485	--	485	0
Total corn on hand - end of period.								1490			1490
Rye - - - -	115	--	115	---	113	---	113	2	2	---	0
Wheat - - -	17	38	55	---	49	1	50	5	--	5	0
Soybeans - -	0	2	2	---	--	--	---	2	--	2	0

- (8) Indicate shipping or collection points.....
- (9) Grain is stored at Refuge grain storage buildings
- (10) Remarks Soybeans to be used in baiting goose trap-net.

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 lbs., Corn (ear)—70 lbs., Wheat—60 lbs., Barley—50 lbs., Rye—55 lbs., Oats—30 lbs., Soy Beans—60 lbs., Millet—50 lbs., Cowpeas—60 lbs., and Mixed—50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately: Corn, wheat, proso millet, etc. 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 breakdown by varieties of grain listed in Column 6.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters grainary", etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

3-1759
Form NR-9

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

Refuge Crab Orchard Refuge Year 1945

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
Sweet Clover	-----	-----	-----	-----	2000 lbs	Mud Lake Ref.	2100	
Korean Lespedeza	250 lbs	10-15-51	combine-harvester	-----	-----	-----	-----	

HAYING ~~ANNUAL REPORT~~

Refuge Grab Orchard Refuge

Year 1945

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Kimmel Baker	C.O. 185	A-20	10		13.7	9/1 - 10/1/51	\$5.00	\$ 68.40	
Audy Burklow	C.O. 181	C-2	4		4.	8/15 - 9/15/51	5.00	20.00	
Ogle Burklow	C.O. 179	C-2	6		6.2	8/1 - 8/31/51	5.00	31.20	
Logan Colp	C.O. 175	A-29	13		13.6	6/15 - 8/31/51	5.00	67.95	
Raleigh Kelley	C.O. 180	C-3	4		4.25	8/1 - 8/31/51	5.00	21.25	
Vernon Kelley	C.O. 178	A-25	17		15.75	8/1 - 8/31/51	5.00	78.75	
Chas. A. Moore	C.O. 177	A-26	25		18.4	8/1 - 8/31/51	5.00	91.80	
Earl Venable	C.O. 176	(B-2	(31		31.5 15.3	8/15 - 8/31/51	6.75	102.00	2nd cut alfalfa
		(B-4	(70		70.5 78.6		5.00	392.40	
L.J. Wohlwend	C.O. 174	A-12	30 23		37.4	7/2/51 - 8/31/51	5.00	186.75	
L.J. Wohlwend	C.O. 173	A-12	23		82 8.0	7/16/51 8/30/51	6.75	53.00	

Totals:

Acreage grazed..... Animal use months..... Total income Grazing.....

Acreage cut for hay 233..... Tons of hay cut 215.1..... Total income Haying \$ 1113.50.....

~~HAYING AND~~ GRAZING

Refuge Grab Orchard

Year 1945

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
O.R. Albright	C.O. 116	A-19	1200	44		4/15 - 9/30	1.00	44.00	
Herman Batson	C.O. 102	C-16	140	58.5		4/15 - 10/31	1.00	58.50	
Raymond Bigler	C.O. 109	B-11	80	100		5/1 - 9/30	1.00	100.00	
H. Broeking	C.O. 120	A-13	240	292.5		4/15 - 10/31	1.00	292.50	
T.D. Clark	C.O. 98	C-16	140	135		4/15 - 11/30	1.00	135.00	
Logan Colp	C.O. 106	A-37	400	(115.5		4/15 - 11/30	1.00	115.50	
				(502.5		4/15 - 11/30	0.20	100.50	---Sheep grazing
Glee Escue	C.O. 111	C-10	30	67.5		4/15 - 11/30	1.00	67.50	
J.D. Ferrell	C.O. 87	C-15	75	98		5/1 - 11/30	1.00	98.00	
W.G. Fleming	C.O. 95	A-3	80	60		4/15 - 11/30	1.00	60.00	
Edgar Flenner	C.O. 96	C-9	220	123.3		4/15 - 10/20	1.00	123.33	
Ernest Fisher	C.O. 123	A-17	680	128		4/15 - 10/31	1.00	128.00	
E. A. Fosse	C.O. 94	A-15	150	133.5		4/15 - 10/31	1.00	133.50	
Loyd Futrell	C.O. 134	A-17	680	66.5		4/15 - 10/31	1.00	66.50	---Horses - Field Trials
E.Green, E.James	C.O. 85	A-29a	80	78		4/15 - 10/31	1.00	78.00	
W.C. Hawthorne	C.O. 86	B-5	64	72		4/15 - 7/31	1.00	72.00	
Wayne Howell	C.O. 101	B-13	160	150		4/15 - 10/15	1.00	150.00	
Chester Johnson	C.O. 99	C-9	220	72		4/15 - 10/15	1.00	72.00	
W.L. Kane	C.O. 93	A-30, 31, 32	560	338.3		4/15 - 9/10	1.00	338.33	
V. Kelley	C.O. 138	A-35	72	60.		5/1 - 8/31 & 10/1 - 31	1.00	60.00	
F.E. Morrison	C.O. 129	A-13	280	162.5		4/15 - 10/31	1.00	162.50	
E. Phenister	C.O. 91	B-13	160	130		4/15 - 10/31	1.00	130.00	
D.C. Samuel	C.O. 92	A-1	200	200		4/15 - 11/30	1.00	200.00	
R.O. Sterns	C.O. 89	B-8	300	39		4/15 - 10/31	1.00	39.00	
L.B. Turnage	C.O. 127	A-18, 19	1200	582		4/15 - 11/30	1.00	582.00	

Totals:

Acreage grazed See next page

Animal use months

Total income Grazing

Acreage cut for hay

Tons of hay cut

Total income Haying

Refuge Grab Orchard Refuge Year 194 51

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Hal Vaughn	C.O. 88	B - 8	300	150		4/15 - 10/31	1.00	150.00	
Earl Venable	C.O. 122	B- 8	300	225		4/15 - 10/31	1.00	225.00	
R. A. Waldron	C.O. 154	C-9	220	71.5		5/15 - 10/31	1.00	71.50	
Earl Walker	C.O. 90	B-1	80	136.5		4/15 - 10/31	1.00	136.50	
H. Walker	C.O. 108	C-16	140	81.		4/15 - 10 8/31	1.00	81.00	
L.J. Wahlwend	C.O. 97	A-6	140	224.5		4/15 - 8/1 & 9/14 - 11/30	1.00	224.50	

Totals:

Acreage grazed <u>5331 Acres</u>	Animal use months <u>4697.16</u>	Total income Grazing <u>4295.16</u>
Acreage cut for hay <u>233</u>	Tons of hay cut <u>215.1</u>	Total income Haying <u>1113.50</u>

TIMBER REMOVAL

Refuge Grab Orchard Refuge Year 1945

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
Walter Hayton	C.O. 183	SW 1/4 NE 1/4 Sec. 15, T. 10S., R. 1 E.	1/3 Acre	100 posts	.06/ea.	\$ 6.00	3 - 6" x 7'	Blk. Locust
Russell North	C.O. 182	Same as above	1/3 Acre	100 posts	.06/ea. & .20/ea.	\$ 7.40	3 - 6" x 7' 7 - 9" x 7'	Blk. Locust Blk. Locust
Otto Stocks	C.O. 184	Same as above	1/3 acre	100 posts	.06/ea.	\$ 6.00	3 - 6" x 7'	Blk. Locust

Total acreage cut over 1

Total income 19.40

No. of units removed B. F. _____

Method of slash disposal lopped & scattered

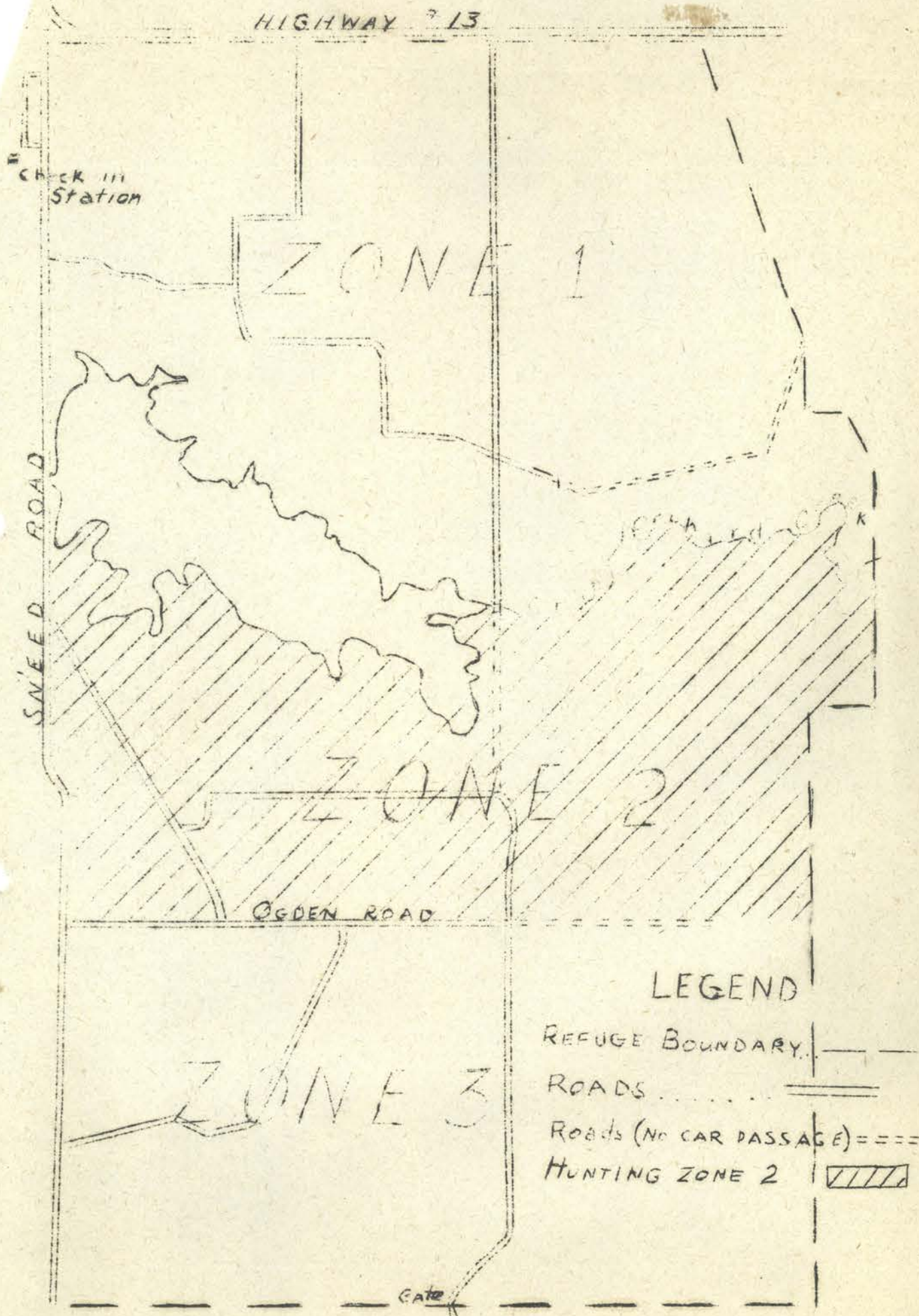
Cords _____

Ties _____

Posts 300

WELCOME TO CRAB ORCHARD REFUGE

MAP OF CONTROLLED HUNT AREA



1. Squirrels are the ONLY legal target.
2. Observe zone boundaries. For directional aid, contact the roving patrol.
3. Close any gate you open -- cattle are being pastured.
4. Questions will be asked of you concerning the following:-
 - a. Number of shots fired
 - b. Number of squirrels seen
 - c. Number of squirrels lost or crippled.
5. For scientific purposes, we ask that you do not clean or skin your squirrels before checking out.
6. REMEMBER! The fire hazard is high.