

OKEFENOCHEE

NARRATIVE REPORTS

JANUARY-DECEMBER 1948

ROUTING SLIP

BRANCH OF WILDLIFE REFUGES

DATE: 2-7 1949

MR. SALYER \_\_\_\_\_

MR. KRUMMES \_\_\_\_\_

MR. DUMONT PAD 5-31

MISS BAHM \_\_\_\_\_

SECTION OF HABITAT IMPROVEMENT:

~~MR. GRIFFITH~~ PEG 4-7

~~DR. BOURN~~ WSB 2-8-49

~~MISS COOK~~ JWC 3-10

SECTION OF OPERATIONS:

~~MR. BALL~~ \_\_\_\_\_

~~MR. REGAN~~ \_\_\_\_\_

DR. MORLEY

SECTION OF LAND MANAGEMENT:

MR. KENT \_\_\_\_\_

~~MR. ACKERKNECHT~~ COE

SECTION OF STRUCTURES:

MR. TAYLOR \_\_\_\_\_

MR. JOHNSTON \_\_\_\_\_

STENOGRAPHERS:

\_\_\_\_\_

\_\_\_\_\_

NARRATIVE REPORT

REFUGE: OKEFENOKEE

PERIOD: SEPTEMBER - DECEMBER 1948

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OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

SEPTEMBER - DECEMBER 1948.

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OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

SEPTEMBER - DECEMBER 1948

I. GENERAL.

A. Weather Conditions.

	<u>Precipitation</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>
September	8.13	95	50
October	4.48	85	35
November	1.91	87	35
December	3.65	82	29
	<u>18.17</u>	Extremes <u>95</u>	<u>29</u>

Temperature extremes were 2° less during this period in 1948 than during the same period in 1947. Temperatures ranged about the same during the first two months of each period but the weather was decidedly warmer in November and December of '48 than in the same months in '47.

Almost twice as much precipitation occurred during this period in '48 than during the corresponding period in '47. More precipitation occurred during October of '47 than during the last three months of '48.

B. Water Conditions.

Despite the small amount of precipitation which occurred in this period the Cornelia gauge continued to show readings in the neighborhood of 122 during the months of September and October. However, the water began to fall during the first part of November and continued a slow but steady decline during the remainder of the year. The water level was approximately one foot higher during this same period in 1947 when a record high was reached of 123.06 on September 24.

C. Fires.

No fires occurred during this period.

## II. WILDLIFE.

### A. Migratory Birds.

#### 1. Populations and Behavior.

As during this corresponding period in '47 waterfowl migrations were rather slow but not quite as late. Migrations began about the first of November and continued for about a month. Blue-winged teal arrived September 8 and were followed by coot on September 18.

Mallard and Black duck populations showed a decided decrease compared to the same period in '47. The wood duck population remains static.

An estimated total of 6450 waterfowl used the refuge during '48 compared to a total of 9222 during '47.

It is believed the heron, egret and crane populations increased slightly during the past year. Populations of other species of large wading birds remained static.

Wilson's snipe and woodcock showed a slight increase in numbers while the black tern showed a decided decrease.

#### 2. Food and Cover.

The ducks concentrated in Chesser and Grand Prairies continued to feed on red-root, Gyrotheca tinctoria, and some evidence of feeding on the small patch of dollar pad, Brasenia schreberi, was discovered in Sapling Prairie.

### B. Upland Game Birds.

#### 1. Populations and Behavior.

a. The quail population on Okefenokee appears to remain static, Although some large coveys were observed in new areas, some old well-known habitats were barren of birds.

b. Eastern turkey.

Due to excellent protection by patrolmen on areas adjacent to the Cornelia headquarters these birds appear to have increased approximately 40% in population over the same period in '47.

#### 2. Food and Cover.

Time did not permit a study of foods available but it is believed control-burning in the rough pine woods would afford better feeding grounds.

### C. Big Game Animals.

#### 1. Populations and Behavior.

##### a. White-tailed Deer.

Refuge personnel and visitors reported seeing more and more deer. Deer sign on the islands and on the pinelands adjacent to the swamp proper is in abundance. Extensive night patrol carried on by refuge patrolmen and other cooperating enforcement officers is undoubtedly paying dividends as evidenced by the increase in population.

##### b. Black Bear.

Many bears have moved off the refuge proper to the very rough pinelands and bays which border the swamp. Most of these adjacent lands are now owned by large paper companies. As these companies begin to control-burn the roughs the bears will probably move back into the deeper areas of the swamp.

#### 2. Food and Cover.

Deer and bear continued to feed on foods mentioned in previous reports. Strange Island and Fiddler's Island on the west side of the refuge appear to be very heavily inhabited with deer. It is possible it may be necessary later on to remove some of the animals from these two areas to other parts of the refuge or to some other area for restocking purposes. These islands are being observed frequently by refuge personnel for indications of over-grazing.

#### 3. Disease.

None known.

### D. Fur Animals, Predators, etc.

All indications point to an increase again in the Raccoon population. As pointed out before, the writer is of the opinion that a live-trapping program for restocking purposes should be inaugurated when game management is to be permitted in Okefenokee.

Otters and bob-cats show a slight increase in population but still have plenty of room for expansion.

The grey squirrel population has shown a definite increase according to reports received from the patrolmen. These animals are now being found in the small houses (islands) in most of the prairies. With the exception of raccoons, the writer believes there is ample food for all the other types of fur bearers covered herein.

#### E. Predaceous Birds.

Biologist Fleetwood did not mention the Bald eagle in the preceding report. However, more and more of these birds are being seen in the bays along the large prairies and it is believed the trend is upward in their population. New nests were found during this period.

The writer is of the opinion that former Biologist Fleetwood gave high estimates on the population of the owls and hawks at Okefenokee and a low estimate on ospreys. New estimates for these species have been entered on the NR 1-A form included with this report.

#### F. Fish.

The water level remained high enough during this period to permit fish to scatter out in the shallow lakes and ponds in the prairies. Despite increased fishing pressure daily limits continued to be taken which points out that populations are holding up well.

#### G. Alligators.

Indications are that the alligator population is steadily increasing. Many small runs and ponds which were closed in by growing vegetation have been opened up by the 'gators. Sign has been discovered in areas where the 'gators were killed out several years ago.

### III. REFUGE DEVELOPMENT AND MAINTENANCE.

#### A. Physical Maintenance.

A considerable amount of progress was made during the period in training personnel in the preventive maintenance program in connection with the use of automotive equipment and boats. One vehicle was repainted, rust spots were sanded and painted on other vehicles. The maintenance man and assisting personnel went over the entire fleet tightening body and chassis bolts. Overload springs were installed on two International fire trucks. Two surplus Berkeley pumping units were overhauled and painted. One was transferred to Reelfoot Refuge and the other is awaiting pickup. In connection with the automotive preventive maintenance program a check system was developed by Mrs. Barrett, the Refuge Clerk, to make certain that all vehicles receive the 3,000 mile Safety Inspection and 5,000 mile Preventive Maintenance checkups whenever either were due. The maintenance man and field personnel adopted a system of greasing the shackles and universals on all automotive equipment at the end of each day's use when same was used in woods patrol over sandy and/or muddy roads.

Charlton County extended cooperation in furnishing heavy equipment and dump trucks for maintenance and repair of the Cornelia entrance road and the Chesser Island road. Clinch County continued to maintain the refuge road from Griffis Camp to Jones Island by grading periodically with a motor patrol. Refuge patrolmen accomplished some repair work on bridges over entrance roads into the south end of the refuge.

All boats were painted and repaired during this period. Outboard motors were given periodic checkups.

The guest cottage at Cornelia, residence No. 4, was thoroughly scrubbed inside and plans were made for modernization of the residence. The old rail fence around this cottage was rebuilt and a new gate installed.

In spare time personnel continued to recaulk the log buildings at Cornelia. More timbers were replaced in the boat dock at Cornelia. Work began on repair of the old stable located across the road from the Cornelia headquarters.

Some boundary lines were repainted and cut out on the south and north ends of the refuge. More new poles were installed in the telephone line from Cornelia to Folkston.

#### B. Physical Developments.

A good deal of the Acting Manager's time was consumed in supervision of the respective contracts entered into with the organizations at Homerville, Waycross and Folkston for operation of guide concessions at the west, north and east entrances to the refuge. Numerous conferences were held, meetings attended and plans discussed. Plans were submitted to the Regional Office from Okefenokee Recreation, Inc. for building cabins, etc. on Jones Island.

A patrol cabin was built deep in the south end of Grand Prairie on a small island near Monkey Lake from which overnight patrol can be carried on in the remote southern areas of the refuge. All lumber was hauled in by boat and the task required a great deal of hard poling on personnel's part.

The R.E.A. power line was extended from the Cornelia headquarters to residence No. 3 at the boat landing and the boat house by the Okefenokee Sportsman's Club of Folkston, Georgia. This organization hired an electrician for wiring No. 3 residence. The boat house was wired by refuge personnel. The Sportsman's Club practically completed dismantling the four old barges and house boats at the boat landing.

A small electric sump pump was installed in the cellar of Cornelia residence No. 1 to automatically keep the cellar free of water seepage. Many attempts were made to waterproof the cellar but the pump appears to be the only solution.

Sewage facilities were corrected at residences Nos. 1 and 2 by construction of an additional large septic tank out of concrete blocks at each house. These additional tanks now take care of the drains from the first tanks which the tile fields could not handle. When time permits corrections will be made at residence No. 4.

The maintenance man constructed two square stern boats out of cypress lumber for use in the prairie runs with small motors. The boats will be used by patrolmen in some areas for overnight patrol and cross-swamp travel. Capacity is limited to two men and camping equipment.

A narrative report was submitted during the period and a property inventory made. The Manual of Information was completed. Mrs. Barrett, the Refuge Clerk, set up a revised and more efficient filing system in the Waycross office.

B. Plantings.

None.

C. Collections.

None.

D. Receipt of Seed and Nursery Stock.

None.

IV. ECONOMIC USE OF REFUGE.

D. Timber Removal.

During the latter part of the period rains made the woods too wet for continued operation and the permittee was instructed to clean up slash and butts. However, good progress was made during the early part of the period and the operation should be completed by June of 1949.

## VI. PUBLIC RELATIONS.

### A. Recreational Uses.

Okefenokee continued to bask in the limelight as a haven for sport fishermen, nature lovers and scientists. It is estimated about 4,000 people visited the refuge during the period of which number about 80% were fishermen. The total attendance indicates a 25% increase over the corresponding period for 1947.

Many long distance phone calls were received in the Waycross office requesting information on fishing and numerous pieces of correspondence were answered. It is anticipated an attendance record will be established during 1949 as a result of the increased advertising being sponsored by the three organizations operating the guide concessions at the three entrances to the refuge. Public relation work at Okefenokee is definitely increasing and is already consuming more and more of refuge personnel's time.

### B. Visitors.

Mr. R. O. Gustafson, Equipment Engineer from the Washington Office inspected equipment on the refuge on October 8.

Regional Director Silver and Mr. W. R. Dillon of the Washington Office arrived on the afternoon of October 20. They inspected the northern entrance to the refuge at Okefenokee Swamp Park early on the morning of the 21st and were escorted to Floyd's Island by the acting refuge manager and patrolmen during the remainder of the day. Refuge problems and policies were discussed with the acting refuge manager during the evening of the 21st.

Regional Refuge Supervisor Miller, Refuge Biologist Baldwin, Mr. Richard E. Griffith of the Washington Office and Pilot Ball arrived November 17 and inspected the northern entrance to the refuge. On the following day this party was escorted to Fargo and up the Suwannee River for observation of dead pine timber in the vicinity of Middle Island.

Mr. Fred Hebard, son of the former owner of Okefenokee, had as his guests at Okefenokee on November 26 Dr. and Mrs. D. C. Scott, Ornithologists from Athens, Georgia.

On November 30th, refuge patrolmen escorted Philip H. Livingston, Director of Pennsylvania Forestry Association, P. M. Robinson, President American Entomological Society and P. B. Street, Ornithologist, on a tour of the refuge. All of the group were from Philadelphia, Pennsylvania.

### C. Refuge Participation.

The Acting Refuge Manager attended numerous meetings and dinners of civic organizations in Waycross, Homerville and Folkston during the period. Short talks were given on wildlife and timber management on the refuge.

### D. Hunting.

Quail and turkey hunting was considered excellent on areas adjacent to the east side of the refuge. Deer Hunting was also excellent on areas near the west and south sides of the refuge but very poor on areas adjacent to the east side. It is reasoned that pulpwood operations on lands next to the east side drove the deer to other areas. An abundance of squirrels furnished good sport all around the refuge. Duck hunting was very poor on all adjacent areas.

### E. Fishing.

Although fishing pressure increased during the first half of the period good strings continued to be taken. A lull was experienced during the month of November but warm weather in December started the large-mouth bass and war-mouth perch moving again, providing recreation for disappointed hunters.

### F. Violations.

#### Refuge Cases.

John L. McAllister, Samuel A. McAllister, Chester N. Bennett, Leon G. Meeks, Carl Malphus, Leroy Malphus, Chas. H. Wiggins, Joe L. Maronville, Jesse Salamor, Waylan F. Carter apprehended November 18, 1948 entering permit area without permit, by Patrolmen McCray L. Coleman and Jewett V. Hall. Received fines of \$10.00 each on December 11, 1948, in Charlton County Superior Court.

#### Federal Cases. Adjacent to Refuge Lands.

C. Kenneth Douglas apprehended November 8, 1949 hunting ducks out of season, by Patrolmen McCray L. Coleman and John D. Eadie. Received fine of \$25.00 in County Court on November 12, 1948.

Harold Pearsons apprehended November 12, 1948 hunting ducks out of season and gun not plugged, by Patrolman McCray L. Coleman and John D. Eadie. Received fine of \$50.00 on November 13, 1948, in Clinch County Court.

George Houston Combs apprehended November 12, 1948 hunting ducks out of season, by Patrolmen McCray L. Coleman and John D. Eadie. Received fine of \$25.00 on November 13, 1948 in Clinch County Court.

C. G. Leverits, Robert G. Jackson, C. G. Childers, J. H. Frazier and E. E. Rainey apprehended November 13, 1948 hunting from motor boat, by Patrolmen McCray L. Coleman and John D. Eadie. Received fine of \$25.00 each on November 13, 1948 in Clinch County Court.

Cooperative State Cases.

Jess Jordan apprehended September 8, 1948 taking fish with gun and light, by Patrolmen McCray L. Coleman and Jewett V. Hall. Received fine of \$25.00 in Clinch County Court on September 9, 1948.

Robert Jordan apprehended September 8, 1948 shooting fish with pistol and light, by Patrolmen McCray L. Coleman and Jewett V. Hall. Received fine of \$25.00 in Clinch County Court on September 9, 1948.

M. B. Scarbrough apprehended November 23, 1948 fishing without license, by McCray L. Coleman and Jewett V. Hall. Received fine of \$25.00 on November 23, 1948 in Clinch County Court.

VII. OTHER ITEMS.

A.. Items of Interest.

Patrolmen Hall and Jernigan and the writer assisted the Game Management Branch in enforcement of mourning dove regulations from September 13th to September 22nd in North Georgia.

Fred Hebard and party reported observation of two ivory-billed woodpeckers in Grand Prairie Gap on November 30th. The party was escorted by Patrolman Eadie.

B. Photographs.

Negatives of photographs to have been submitted with this report were misplaced. If the negatives are located the photos will be forwarded for inclusion in the report.

Respectfully submitted,

*Wm. R. Edwards*  
Wm. R. Edwards  
Acting Refuge Manager

February 2, 1949.

Date: 2/4/49

Approved: *Edward G. Miller*

*Was checking this  
HAM*

WATERFOWL

Refuge Chickadee Months of September to December 1948

(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 Cackling goose Brant White-fronted goose Snow goose Blue goose	17	11/4	50	11/5	4	11/20	None	None	50
III. <u>Ducks:</u> Mallard Black duck Gadwall Baldpate Pintail Green-winged teal Blue-winged teal Cinnamon teal Shoveller Wood duck Redhead Ring-necked duck Canvas-back Scaup Golden-eye Buffle-head Ruddy duck	4 2 5 2 4 11 Present	10/20 10/2 11/28 10/11 11/2 9/8	145 23 11 21 7 14 148	12/9 11/29 11/29 12/16 12/14 11/6 12/17	Still present		None " " " " " " " " " " " " " " " " " "	None " " " " " " " " " " " " " " " " " " "	1000 500 50 150 50 150 2500 1000 800
IV. <u>Coots:</u>	2	9/15	94	12/24					500

## SUMMARIES

Total Production:Geese 10Ducks 5000Coots 500Total waterfowl usage during period 6150Peak waterfowl numbers 619Areas used by concentrations Open prairiesPrincipal nesting areas this season Bogs and prairiesReported by Refuge Personnel

## 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.

MIGRATORY BIRDS  
(other than waterfowl)

Refuge Okefenokee Months of September to December 1948

(1) Species  Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	
<b>I. Water and Marsh Birds:</b>										
Pied-billed grebe	Present		100	12/15	Present		None	None	None	100
Cormorant	6	9/27	50	12/1	"		"	"	"	75
Anhinga-Anhinga	Present		50	12/1	"		"	"	"	100
Ward's Heron	"		400	12/15	"		"	"	"	600
Little Blue Heron	"		100	12/15	"		"	"	"	200
Green Heron	"		75	10/1	"		"	"	"	100
Yellow Night Heron	"		75	10/30	"		"	"	"	100
American Egret	Present		1000	12/20	"		"	"	"	1500
Snowy Egret	2	9/27	15	12/15	"		"	"	"	25
Wood Ibis	"		25	10/1	3	11/4	"	"	"	50
White Ibis	"		15	10/1	5	11/8	"	"	"	25
Florida Crane	"		300	12/15	Present		"	"	"	400
Florida Gallinule	"		50	11/1	"		"	"	"	75
<b>II. Shorebirds, Gulls and Terns:</b>										
Wilson's Snipe	2	9/18	150	12/15	Present		"	"	"	250
Woodcock	4	9/7	50	12/15	"		"	"	"	100
Solitary Sandpiper	2	10/8	25	12/15	2	12/28	"	"	"	25
Greater Yellow-legs	1	9/18	10	12/15	3	12/28	"	"	"	10
Killdeer	4	9/18	50	12/15	Present		"	"	"	75
Black tern	Present		100	12/15	Present		"	"	"	150

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Present	200	12/30	Still present	None
White-winged dove					None
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl	Present	50	12/30	"	"
Magpie					
Raven					
Crow	Present	100	12/30	"	"
Osprey	"	50	12/15	"	"
Bald Eagle	"	20	12/15	"	"
Barred Owl	"	350	12/15	"	"
Red-Shouldered Hawk	"	500	12/15	"	"
Red-tailed Hawk	"	50	12/15	"	"
Marsh Hawk	2	25	12/15	"	"
Reported by <u>Refuge Personnel</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

Refuge Okefenokee Months of September to December, 1948.

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
	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.
Bobwhite quail	50,000 acres, pine woods, fields and islands	20	None	None	Unknown	NONE	NONE	NONE	2500	
Eastern Turkey	"	100	None	None	"	NONE	NONE	NONE	500	

INSTRUCTIONS

3-1782  
Form NR-2  
(April 1946)

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.

BIG GAME

Refuge Okefenokee Calendar Year 1948

(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
White-tailed deer	150,000 acres. Pine woods, cypress swamps and islands.	100	N	0	N	E	U	k	n	n	None	500	500	Unknown
Black Bear	"	125		6			U	n	k	n	None	400	400	Unknown

Remarks:

Reported by Refuge Personnel.

INSTRUCTIONS

3-1758  
Form NR-3  
(June 1945)

Form NR-3 - BIG GAME

- |     |  |
|-----|--|
| (1) | <p><b>SPECIES:</b> 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.</p>  |
| (2) | <p><b>DENSITY:</b> 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.</p> |
| (3) | <p><b>YOUNG PRODUCED:</b> Estimated total number of young produced on refuge.</p>  |
| (4) | <p><b>REMOVALS:</b> Indicate total number in each category removed during the year.</p>  |
| (5) | <p><b>LOSSES:</b> On the basis of known records or reliable estimates indicate total losses in each category during the year.</p>  |
| (6) | <p><b>INTRODUCTIONS:</b> Indicate the number and refuge or agency from which stock was secured.</p>  |
| (7) | <p><b>TOTAL REFUGE POPULATION:</b> Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.</p>  |
| (8) | <p><b>SEX RATIO:</b> Indicate the percentage of males and females of each species as determined from field observations or through removals.</p>   |

115000

Remarks:

Reported by

Refuge Okafonokoo Year 1948

Botulism

Lead Poisoning or other Disease

Period of outbreak None

Period of heaviest losses None

Losses:

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

  

Number Hospitalized	No. Recovered	% Recovered
(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 None

Species affected None

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

Number Recovered \_\_\_\_\_

Number lost \_\_\_\_\_

Source of infection \_\_\_\_\_

Water conditions \_\_\_\_\_

Food conditions \_\_\_\_\_

Remarks \_\_\_\_\_

FISH

Refuge Crofenokes Year 1948

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	
Bass, black	Plentiful		5000	None	None	None	None	None
Eastern Pickerel	"		3500	"	"	"	"	"
Perch	"		20,000	"	"	"	"	"
Catfish	"		10,000	"	"	"	"	"
Grimel	"		4,000	"	"	"	"	"
	<b>Total</b>	<b>10,000</b>	<b>42,500</b>					

REMARKS:

Above figures are estimated.

3-1757  
Form NR-7  
(April 1946)

PLANTINGS  
(Marsh - Aquatic - Upland)

Refuge Okefenokee Year 1948

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
None								

TOTAL ACREAGE PLANTED: **None.**

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



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.

REFUGE GRAIN REPORT

Refuge Okefenokee

Months of Sept. thru Dec. 1948

(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.
Shelled corn and mixed grain	5	None	5			3	3	2		2	

(8) Indicate shipping or collection points Folkston, Georgia

(9) Grain is stored at Camp Cornelia Headquarters

(10) Remarks

NR-8a (8) 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.



HAYING AND GRAZING

Refuge Wrenokee Year 1948.

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
			N	O	N	E			

Totals:

Acreage grazed..... Animal use months..... Total income Grazing.....  
 Acreage cut for hay..... Tons of hay cut..... Total income Haying.....

TIMBER REMOVAL

Refuge.....Okefenokee..... Year 194...8

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
J. V. Gowen, Jr.	46,466	East side	15,000	735,276 B.F. 4,043.32 (c)	\$15.00 1.80	11,029.15 7,277.97	Only turpentine trees being cut. 5 to 8 per acre being left for seed where no round trees are standing	Slash and long-leaf pine.

Total acreage cut over...14,000.....

Total income...\$18,307.12.....

No. of units removed B. F. 735,276.....

Method of slash disposal...Tops lopped down.....

Cords...4,043.32.....

Ties...None.....

ROUTING SLIP

BRANCH OF WILDLIFE REFUGES

DATE: \_\_\_\_\_ 194

MR. SALYER \_\_\_\_\_

SECTION OF HABITAT IMPROVEMENT:

~~MR. KRUMMES~~ \_\_\_\_\_

~~MR. GRIFFITH~~ REB 11-12

MR. DUMONT DAD 12-30

~~DR. BOURN~~ WSB 11-9

MISS BAUM \_\_\_\_\_

~~MISS COOK~~ dec 11-16

SECTION OF OPERATIONS:

SECTION OF LAND MANAGEMENT:

~~MR. BALL~~ \_\_\_\_\_

~~MR. KENT~~ JK

MR. REGAN WPR 12/22

~~MR. ACKERKNECHT~~ AK

SECTION OF STRUCTURES:

STENOGRAPHERS:

~~MR. TAYLOR~~ WV 2/11

AK 11-1-48 \_\_\_\_\_

MR. JOHNSTON \_\_\_\_\_

NARRATIVE REPORT

REFUGE: \_\_\_\_\_ OKEFENOKEE \_\_\_\_\_

PERIOD: \_\_\_\_\_ MAY - AUGUST 1948 \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*File*

OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY - AUGUST  
1948.

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OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY - AUGUST  
1948.

I. GENERAL.

A. Weather Conditions.

	<u>Precipitation</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>
May	2.46	99	50
June	3.10	97	56
July	10.66	96	53
August	6.07	97	63
	<u>22.29</u> Extremes	<u>99</u>	<u>50</u>

Average precipitation occurred during this period compared to corresponding periods in previous years. Compared to the same period in 1947, there was 38 inches less rainfall. Little rainfall occurred in May and June. However, hardly a day passed during July and August without some precipitation occurring. Heavy downpours were experienced in July.

Extremes in temperatures were about the same compared to the period in 1947 but many more days of high temperatures occurred during the 1948 period. Humidity ran extremely high in July and August.

B. Water Conditions.

Water levels for the period followed very closely those for the same period in 1947. A high reading of 121.98 was recorded from the Camp Cornelia gauge on August 27th and much higher readings were expected during the early part of September.

C. Fires.

Although fire danger readings were very high during May and June, refuge personnel carried on efficient fire patrol and no fires occurred. However, refuge fire 49-1 occurred on August 17th as a result of careless smoking on the part of laborers employed by the timber operation permittee.

## II. WILDLIFE.

### A. Migratory Birds.

#### 1. Populations and Behavior.

##### a. Pied-billed grebe. Podilymbus podiceps podiceps

In the narrative report for the corresponding quarter last year it was stated that the summer occurrence of this species in Okefenokee was unusual. Perhaps it is not unusual to observe a few individuals during the summer months as we have three records for this quarter. The first one is June 22 when 3 individuals were seen feeding on Buzzard's Roost Lake. July 1, Patrolman Eadie observed 2 on the Canal east of Coffee Bay. July 23, 1 individual was observed by Patrolman Hall feeding on a bar pit near Fargo, Georgia. These birds may represent early fall migrants as the species nests locally in Florida and Georgia.

##### b. Water turkey. Anhinga anhinga.

Water turkeys were present throughout the quarter and they appeared more numerous than in the corresponding quarter last year. May 11, 46 individuals were seen from Dinner Pond to the Swamp Park. June 17, 18 individuals were observed at the Dinner Pond rookery. Two days later the writer counted 16 over a rookery at the south end of Chesser's Island. July 1, 12 individuals were seen flying high in the air at Buck Lake Inlet. July 13, Patrolman Coleman and Hall counted 150 individuals at Dinner Pond and Sapling Prairie. Young birds probably made up a good percentage of this number. August 13, the writer observed 9 birds flying over Seagrove Lake. The flock probably included birds raised at the south end of Chesser's Island. The largest number of nests were found at Dinner Pond and Sapling Prairie numbering 20 nests. The Chesser Island rookery contained 10 nests of this species and 8 of the American egret. The average number of young was four per nest.

##### c. Ward's heron. Ardea herodias wardi.

This species had a successful nesting season judging from the success of approximately 50 nests that were under observation. Dinner Pond and Chesser Prairie had the greatest concentration of nests. A majority of the young had left the nests by the middle of May but there were some late nesters as evinced by three fully feathered young in a nest in a cypress tree 1/4 mile northwest of Seagrove Lake July 28. On August 13 the writer observed two fully feathered young on a nest of this year east of Cooter Lake. One of the birds flew off the nest but the other remained on the nest. The writer on four occasions has watched the egrets, ibis and little blue herons going into the roost at the south end of Chesser's Island and not once has any Ward's herons been observed using the rookery.

American egret. Casmerodius albus egretta.

In spite of rather high water levels during the greater part of the quarter egrets have been fairly common in the swamp. The largest number seen on any one day in May was 18 individuals at Dinner Pond and Sapling Prairie. On June 19, the writer went to the south end of Chesser Island to investigate a rookery that was reported by Joseph T. Chesser. This rookery of about 1/4 acre was centered around an alligator pond surrounded by small cypress and bay trees. The rookery was used by egrets, little blue herons, water turkeys and white ibis. Scattered around this water hole and located in cypress trees approximately 25 feet above the water were 8 nests of this species. A number of the nests contained fully feathered young which clambered out of the nests when the writer approached. The writer succeeded in catching two birds which were carried to Mr. Chesser who accompanied the writer to the rookery who held them while the writer went to the truck for bands. However, the writer got confused in the directions and had to call Mr. Chesser who released the birds. The writer estimated that 300 egrets were using the roost. The following day Patrolman Eadie and the writer went to the rookery and succeeded in catching and banding 11 young birds. After the banding was completed the writer climbed a tree and counted the birds as they came in. 308 egrets were counted. The birds that came in from the north seemed to follow the edges of Chesser's Island and did not fly directly over the island. Mr. Chesser said that these were the first and only egret nests that he had seen in the swamp and he has lived in the swamp 35 years. July 26, the writer estimated that 900 egrets were using the roost. They came in so fast that it was impossible to get an accurate count. July 1, the writer estimated 150 egrets on Buck Lake Prairie and 100 feeding in a shallow prairie at Big Bend. July 13, Patrolman Hall and Coleman counted 350 individuals on Sapling Prairie. August 16, the writer went to Grand Prairie and spent the night there for the purpose of ascertaining whether the egrets and blue herons that feed in the prairie leave the prairie for the Chesser Island rookery. The writer did not see any birds flying out of the prairie toward Chesser Island but many did fly towards Buzzard's Roost Lake where they roosted in the small trees and the old inlet. It was strange that few birds from the direction of Goose House Gap flew towards the Grand Prairie rookery.. Evidently there has been an influx of immature birds from southern nesting sites as only a small percentage were raised in the swamp. The population this quarter exceeds that for the corresponding quarter last year by many hundreds.

Louisiana heron. Hydranassa tricolor ruficollis

This heron which is rather common along the sea coast approximately 60 miles away is a rare bird in the swamp. The writer obtained his first record July 30 when one was seen perched on a fallen tree near Grand Prairie Gap. Later on in the day 4 individuals were seen perched on bushes in a small house at Buzzard's Roost Lake.

Writer reported as common in  
summers 1940 and 1941.

f. Little blue heron. Florida caerulea caerulea.

In contrast with the corresponding quarter last year this species in our commonest water bird this quarter. This probably results from the past breeding season migration inland and northward as 3/4 or more of the birds observed have been in the blue plumage of immature birds. The first birds appeared May 27 and from then on they gradually increased. June 17, the writer counted 50 from Billy's Lake to Big Water. June 19, the writer estimated 800 individuals using the rookery at the south end of Chesser's Island. The following night 780 were counted going into the rookery. June 26, the writer counted 1615 individuals going into the rookery. July 1, 300 individuals were seen feeding in Buck Lake Prairie. July 13, Patrolmen Coleman and Hall counted 450 in Sapling Prairie. July 14, the writer counted 700 individuals as they entered the rookery at the southern end of Chesser's Island. August 16, 150 individuals were estimated in the rookery at Buzzard's Roost Lake.

g. Eastern green heron. Butorides virescens virescens.

This species appears to have had a successful breeding season. The writer noticed little green herons flying back and forth along the canal south of Camp Cornelia so on July 2 a boat was used to explore the deeper portions of the canal east of the fill. Twelve nests were found in shrubs overhanging the water. They ranged from 2 feet to 6 feet above the water and all were in titi bushes with the exception of two which were in black gum and upland willow oak, the latter having blown across the canal. On July 7, the writer found four nests at Bluff Lake, three of which were in the same clump of cypress that was used last year. July 10, the writer found 3 nests in the deep portion of the canal southwest of the guest house. All told 22 nests were found that contained eggs or young. July 22 twelve more nests were found along the canal west of the Suwannee dam. One of the nests was in a honeysuckle Rhododendron viscosum and contained one bird which was caught and banded. None of the 36 nests found contained more than four eggs but five young were found in a nest July 10. Whether this nest contained 5 eggs or a young bird wandered over from an adjacent nest is not known. Three pairs of green herons nested in the big cypress clump at Seagrove Lake. The two or three pairs that nested at Buzzard's Roost Lake last year failed to do so this year. Highlights of day's listings were May 8 when 19 individuals were seen on Durden Prairie; July 11 when Patrolman Davis observed 14 individuals along the canal and July 23 when 20 individuals were seen along the run between the Suwannee Dam and Billy's Island. It seems that many of the birds left the swamp by August as none of our August lists contain more than 3 individuals.

h. American bittern. Botaurus lentiginosus.

Birds of Georgia, 1945, state that it is of casual occurrence in summer. Wright and Harper found a bird on June 17, 1912 along the Suwannee River in the Okefenokee Swamp. The writer is happy to report one observed at Monkey Lake, June 22. It arose from some pickerel weed and maiden cane as the boat approached. It also was seen by Warren Houck, Route 1, Elverson, Pennsylvania, a student at Cornell University.

i. Wood ibis. Mycteria americana.

The first wood ibis were observed March 14. There there is an elapse of two months before our next record of June 15 when one was seen flying over Jones Island. There are two other records of small flocks for June but on July 1, with the lowest water level for at least a year, there was an influx. 250 were seen feeding on shallow water in Buck Lake Prairie. When they arose the noise made by their wings sounded like the onrush of a tornado. On the same day 18 wood ibis were seen at Big Bend. July 9 the writer counted 100 individuals perched in cypress trees in the small prairie on the southwest side of the Canal between the first and second branch canals. July 13, Patrolmen Coleman and Hall observed 15 individuals on Sapling Prairie. July and August had excessive rainfall with rising water levels and this seems to have affected the ibis population adversely as there was only one record for the month. A single bird observed at Double Lakes August 6.

j. White ibis. Guara alba.

The first spring record was March 10 and the largest flock seen in March consisted of 50 individuals. The largest flock observed in April contained 20 individuals. May saw the size of the flock increase to 150 individuals. June and July was the period of greatest concentration. June 14 a flock of 85 birds was observed flying southward across Grand Prairie. On the same date 20 individuals were counted while they perched in cypress trees along the west side of Chesser's Prairie. June 17, the writer and Jim Jenkins saw a flock of 15 flying southwestward along Billy's Lake. The same day 40 were counted at Big Water. June 19, the writer estimated 150 using the roost at the south end of Chesser's Island. The following night 158 individuals were counted as they came into the roost. June 26, the writer tried to get an accurate count at the Chesser Island rookery but the birds came in so fast that it was almost impossible to do this. Usually the white ibis come in in V formations from single birds to flocks consisting of 100 or more birds. From the count the writer estimated that 600 white ibis were using the rookery. A few individuals, usually 1 to 4 individuals, were observed on trips made into the swamp in August. Evidently the high water level was decreased their numbers in the swamp.

k. Wood duck. Aix sponsa.

Day's listings for wood duck run from 5 to 50 for the quarter but there are two days when the listings exceeded the above numbers. On July 12, Patrolman Coleman and Hall observed 528 wood ducks on Sapling Prairie. August 16, the writer went to Grand Prairie and spent the night. At dusk, 330 wood ducks were counted as they flew towards a roost in the Tar Lake area. All of these ducks came from the direction of Goose House Gap and the south end of Grand Prairie. If the ducks came in from the other directions in the same ratio, it is possible that 1000 ducks are using this roost. The writer only observed one pair of adults with a brood June 17 but has seen many more ducklings unable to fly this quarter trying to escape by pattering across the water than in the corresponding quarter last year. From our current observations it is believed that the wood duck population will be up this winter.

l. Purple gallinule. Tronornis martinica,

The narrative report for the corresponding quarter last year gave a paragraph on the finding of gallinules' nests in Grand Prairie and the surmise that they might be those of the purple gallinule. On June 14, the writer discovered three gallinules' nests in Grand Prairie. One nest was in a small patch of aquatic vegetation and was supported by pickerel weed 16 inches above the water. A few pickerel leaves had been interwoven to form a canopy over the nest that contained 6 eggs and there was still 6 eggs June 22. Another nest was on the edge of a gator hole approximately 400 yards northeast of Monkey Lake and like the first nest the supporting vegetation was pickerel weed and it was 15 inches above the water. This nest contained 4 eggs and 2 black downy young one of which had probably been hatched the middle of the morning. The other one had not been out of the shell much over an hour or two as the down was still wet. The young were jet black. The tip of bills were black with a small white spot on the upper mandible. There were a few zig-zag wavy black lines around the middle of the bill. Base of bill reddish. The oldest bird climbed out of the nest while I was getting the boat in position to look into the nest. After I caught the oldest one the other started climbing toward the rim of the nest but didn't get out before I returned the other one to the nest. The nest was visited June 22 and it had been partially destroyed. There were pieces of egg shells in the nest so the other eggs may have hatched before it was partially destroyed. The third nest was in pickerel weed 18 feet from the water of Monkey Lake. It was one foot above the water and locked the canopy. The nest contained 5 eggs June 14 but one was pierced by a pencil while being marked. It was brought to the laboratory and the contents were blown out by Ralph Davis. The egg was then sent to Mr. John W. Aldrich of the Fish and Wildlife Service, Washington, who stated that it was a purple gallinule's egg, so one of the three nests was this species. The other two nests probably belonged to this species. Although the

owners of the nest were not seen. The writer observed a purple gallinule and heard two others May 10. One June 14, 7 individuals were seen or heard in Grand Prairie. The three seen had yellowish legs but no other field marks were discernible. Two birds were heard at Buzzard's Roost Lake July 30. Thus far Grand Prairie is the only place in the swamp where gallinules are found in summer. There are undoubtedly other places but the writer has not found them.

m. Coot. Fulica americana americana.

Patrolman Davis observed 5 individuals in Grand Prairie May 5 and these probably represent late stragglers.

n. Spotted sandpiper. Actitis macularia.

These little sandpipers which are not seen in large numbers during the spring and fall migrations are among the earliest fall migrants. Our last spring record for the quarter was May 11. Our first fall record was between July 25-31 and was obtained by Joseph T. Chesser. He also obtained another record August 8.

o. Yellowlegs. Totanus melanoleucus. Totanus flavipes.

Other early fall migrants through the Okefenokee are the yellow-legs. Our first record is July 31 when the notes of one were heard as the bird flew over headquarters August 18. Another bird was heard to utter three notes as it flew over headquarters. None of the birds have actually been seen but it is believed that both the larger and lesser yellow-legs were represented.

p. Black tern. Chlidonias nigra surinamensis.

July 30, the writer got a glimpse of a tern as it flew by little Cooter Lake in Grand Prairie. It changed the course of flight when it saw the writer. August 16 just before dusk a tern was seen flying southward between Monkey Lake and Goose House Gap. The time these birds were under observation did not permit actual identification but from past observations it is believed that the two birds were black terns. It is possible that a single bird has taken up residence in Grand Prairie and it is this bird that the writer observed.

2. Food and Cover.

Aquatic and marsh plants have made the usual growth during the quarter. Watershield, Brasenia, the largest patch which occurs around Seagrove Lake, has increased in size until it almost covered an acre. The patches at Monkey and Buzzard's Roost Lake have spread but not as much as the Seagrove Lake patch. Duck grass, Rynchospora corniculata was beginning to bloom by July 30. This plant is usually found on batteries and appears to be most abundant on batteries that have arisen

from submergence this spring. The stomach of a black duck killed in Chesser's Prairie by a bobcat December 5, 1947 contained 85 seeds or 3% of this beakrush. The stomach of a mallard killed by a bob-cat at the same time contained 8 seeds or 1% of this beakrush. This beakrush is generally found along the edges of the prairies but a species that grows in water has been seen in Grand Prairie. Traces of Rynchospora gracilentata and Rynchospora fascicularis were found in two of the three duck stomachs that were examined. Red root, Gyrotheca tinctoria started blooming June 20 and most of the plants had completed this stage by August 1. The high water levels that prevailed during the greater part of the quarter have not affected the distribution and abundance of the plant. Spikerush, Eleocharis sp. is found throughout the prairies. Dense stands are found in the run at Dinner Pond platform. Water lily, Castalia odorata was blooming fairly well at the beginning of the quarter. The stomach of a black duck killed in a trap by a bob-cat contained 27 seeds or 1% of this species. The stomach of a mallard killed at the same time contained a trace. Waterlilies were blooming in greater abundance at the end of the quarter than at the beginning. The waterlily is practically replaced by spatterdock, Nymphaea macrophylla on the west side of the swamp. Spatterdock is found along the runs through Sapling Prairie almost to Cowhouse Island. There is a fair crop of saw palmetto, Serenoa repens berries and these no doubt will be eaten by bears and turkeys. There is a good crop of berries for black gum, Nyssa biflora. Cassine holly, Ilex cassine, gallberries, Ilex glabra and Ilex coracea, Elderberry, Sambucus canadensis, blackberry, Rubus, possum haw, Viburnum nudum, black bamboo, Smilax laurifolia, red bamboo, Smilax volteri. There is a heavy production of acorns by most of the oaks that occur in the Okefenokee. During the last three weeks of August, two coveys of bobwhites have been feeding on ripe berries of the elderberry at headquarters. One day in August 23 birds (coveys of 11 and 12) were seen around the elderberry. The birds flew up into the bush to eat the berries. The stomach of a black duck killed in a trap December 5, 1947 by a bob-cat contained 15 seeds or 3% of Smilax, probably laurifloria. The stomach of a mallard killed at the same time contained 40 seeds or 14% of Smilax, probably laurifolia.

## B. Upland Game Birds.

### Populations and Behavior.

#### a. Bob-white. Colinus virginianus virginianus.

At the beginning of the quarter bobwhites were heard and seen almost daily at Camp Cornelia, but they had paired off by this time. On June 16 a pair was observed crossing the road in The Pocket. It was not until June 28 that a brood of 15 young still in the downy stage was observed crossing the yard at headquarters. Ten of the little fellows were caught and placed in a bucket for a short time then released. The last of July two adults and five half-grown young were seen under and in the elderberry bush at headquarters. August 4 a covey of 14 birds including the parent birds was flushed from the palmettoes at the southeast corner of the breeding bird plot. The young could fly and they were probably

hatched on the south side of the canal. August 19 the writer saw a large covey of bob-whites of two sizes feeding around the elderberry bush at headquarters. After feeding for a short time the parents of one covey walked westward across the lot. This covey contained 11 birds. The parents and young of the other covey walked eastward into the briar patch. This covey contained 12 individuals. So there are three different coveys that ranged in the lot at headquarters during August. Joseph T. Chesser reports two coveys of from 8 to 10 young on Chesser's Island and two coveys of 8 and 12 birds along the road between Chesser's Island and headquarters. Patrolman Eadie observed a covey of 14 at the boat landing August 22. The young were in the downy stage and unable to fly. August 25, Joseph T. Chesser saw five fully grown bob-white along the fence on the north side of the compound. There were probably other young that he did not see. Thus there are seven known coveys with a total of 79 individuals within a mile radius of Camp Cornelia. From these observations it is apparent that the bob-white has had a successful breeding season and are as numerous as they were the corresponding quarter last year.

b. Eastern turkey. Meleagris gallapavo silvestris.

From the observations made during the quarter it is evident that the turkey population around Camp Cornelia is far below last year's population. This spring the writer heard a male gobbling on two mornings, probably the same bird. We do not have any reports of young turkeys. However, Union Bag and Paper Company employees have seen a few adult birds. August 24, Joseph T. Chesser saw tracks in the Chesser Island road approximately 1/2 mile southwest of Camp Cornelia, which were made by two individuals.

c. Eastern mourning dove. Zenaidura macroura carolinensis.

A few pairs have been observed around Camp Cornelia and one pair had a nest in a lob-lolly pine tree in the lot. The nest was out on a horizontal limb approximately 22 feet above the ground and the height prevented the writer from banding the young. A small flock is present on Chesser's Island. At the close of the quarter no definite migration had begun.

2. Food and Cover.

There has not been no noticeable change in the cover with the exception of the removed "boxed pine trees for logs and pulpwood. This timber operation has opened up the woodlands. The logging operations have had a beneficial effect on the partridge pea, Chamaecrista growing along the canal banks. It appears that dragging logs over the ground helps to scarify the seed which results in better germination. There is a good pine mast crop and the grey squirrels started eating the pine seed early in July. There is a good crop of bullace grapes, Muscadinia munsoniana, which were beginning to ripen July 20. The writer observed mocking birds,

brown thrasher and white-eyed towhees eating the grapes. Elderberries were eaten by the red-bellied and red-headed woodpeckers. As usual there is a good crop of wax myrtle, Myrica cerifera. There was a good huckleberry and blueberry crop. There were some tall blueberry bushes near the boat landing and Jones Island that were simply loaded with ripe luscious berries June 16. Turkey oak, live oak, upland willow oak, laurel oak, scrub oak, and dwarf oak are very productive of acorns this year.

### C. Big Game Animals.

#### 1. Populations and Behavior.

##### a. White-tailed deer.

During the quarter the writer has not seen a single deer. However, Patrolmen Coleman and Hall have reported several on the west side. Harry Chesser reported seeing the last of July a doe with a fawn on the Trail Ridge road approximately 3 miles north of Camp Cornelia a few tracks have been observed in the compound around headquarters.

##### b. Black bear.

With the emergence of the bears from the interior of the swamp and their appearance in the surrounding uplands come reports of bear depredations on hogs and cattle, but as is usually the case destruction of livestock was exaggerated. The irate stock owners organized hunting parties and went after the marauders. Traps were also used to combat bruin and Willie and Ralph Davis did succeed in trapping one in July. Mr. Renshaw and party killed a 380 pound bear that had been getting a pig each night for a week or more. This animal was killed approximately 2 miles from the swamp.

June 22, Patrolman Eadie, Warren Houck, John Wanamaker and the writer saw a bear standing up and looking at us as we approached a house in Grand Prairie. She finally retreated into the house and made a series of grunts. We soon found out why she acted this way for right in the top of bay trees covered by bamboo, Smilax laurifolia, were three cubs that would weigh 20-25 pounds apiece. Soon after we discovered the cubs, the mother rushed out of the house and went to a nearby house. Mr. Houck and the writer climbed up the bay trees and took three pictures of a cub. One little fellow did not like our presence so he scrambled down a tree and went to another house. The writer was close enough to pet one, but when we got down two of the cubs were still in the tree tops. The mother bear came out of the nearby house once while we were getting the pictures. July 22, Morris Ryder and the writer went to Billy's Island and spent the night. Less than 1/4 mile west of the old switch on Billy's and Floyd's Island tramroad, we startled a bear close to the boat run. Last December in the same vicinity, the writer heard a mother bear grunting to her cubs. Joseph T. Chesser, on several occasions, has observed bear tracks in the roads on Chesser Island and in the road to headquarters. August 6,

Joseph T. Chesser and the writer made a trip to Gannett Lake and bear sign was practically non-existent. July 7, Patrolman Eadie and the writer went to Durden Prairie. We saw regular bear trails along the boat run through the bay. No such trails were seen along the run last year.

## 2. Food and Cover.

As previously mentioned in this report there is a good acorn crop and the saw palmetto has a fair crop of berries which will later provide food for bears. On July 22, the writer saw several places along the west end of the canal where bears had been after bullace grapes, Muscadinia munsonina. There is a good crop of gum berries which will be eaten by bears this fall. With so many species having good seed crops bears in the swamp should find ample food.

## D. Fur Animals.

1. Raccoon and opossum are everywhere plentiful in the swamp. August 24, Patrolman Eadie observed two raccoons crossing the road between headquarters and the CCC camp site. June 19, Patrolman Eadie and the writer saw two otters cross the road at the first "dreen" on the Chesser Island road. They had been feeding in pools along the road. No bob-oats have been seen during the quarter but this does not mean that they are not present, on the refuge. The grey squirrels started making nests the last of June and young were heard in the nests by the last of July. The Cornelia squirrels started feeding on long-leaf pine cones July 1. The ground under a tree that had several cones is covered by pieces of the cones. A few rabbits have been seen at Camp Cornelia and they have eaten the leaves of watermelon, mushmelon, small mushmelons and ripening tomatoes,

## E. Predaceous Birds.

### Swallow-tailed kite. Elanoides forficatus forficatus.

We do not have as many observations of this species this quarter as we did for the corresponding quarter last year but our observations this quarter probably represent as many individuals as for the corresponding quarter last year. May 8, Patrolman Hall observed four individuals at the old CCC barracks on Jones Island. He stated that they appeared to be feeding on insects that were on wax myrtle bushes. July 24, Patrolman Hall observed a single bird flying over Billy's Lake.

### 2. Eastern red-tailed hawk. Buteo borealis borealis.

When only two records of a species is obtained in four months in an area the size of Okfenokee that species certainly cannot be called common. This is the case of the red-tailed hawk. One bird was seen in the pine woods at Camp Cornelia May 9. Another bird was seen June 17 perched in a cypress tree at Big Water. Thus far the writer does not have any evidence of breeding in the swamp unless the presence of birds in May and June indicates breeding.

3. Florida red-shouldered hawk. Buteo lineatus alleni.

There is nothing to report about this common hawk in the swamp except the discovery on May 10 of a nest containing four nearly grown young in a tall pine tree in a house on Chesser Prairie. Another thing of interest about this hawk is the tameness of some individuals which may be young birds. July 23 in response to a "squeak" one perched upon a limb within 20 feet of my jungle hammock on Billy's Island. The hammock was zipped and the writer got out of the hammock and dressed while the hawk looked on. It was not until the hammock was taken down that the hawk flew.

4. Osprey. Pandion haliaetus carolinensis.

The young in all the known nests in the swamp were out of the nests by the middle of June and throughout July from 1 to 5 individuals were on a day's list. Patrolman Coleman and Hall counted 5 birds in Sapling Prairie July 13. The writer did not observe the species during August. Evidently the birds or a majority of them are early migrants. A foreman of a group employed on Jones Island by the concession company is reported to have killed one with a fishing pole in July.

5. Southern screech owl. Otus asio asio.

From January 12 until July 26 this species was not recorded. This does not mean that the birds are absent. They are silent. Since July 26 there are three records, all based on the "screeching" of birds at Camp Cornelia.

6. Great horned owl. Bubo virginianus virginianus.

We have two records of this species for the quarter. Joseph T. Chesser observed a single bird along the Chesser Island road June 22 and July 15. The writer spent the night on Billy's Island but did not hear a single bird hooting.

7. Florida barred owl. Strix varia alleni.

Days' lists throughout the quarter contained from 1 to 4 birds and seldom is a trip into the swamp made without one or more birds being listed.

8. Fish crow. Corvus ossifragus.

The number of fish crows that occur in the swamp in summer varies very little from summer to summer. The largest number seen in a single day was a flock of 14 at Camp Cornelia July 16. July 9, two individuals were seen at the cornbox on Chase Prairie. July 30 two birds were seen in the piney house at Buzzard's Roost Lake. August 7 a flock of 11 flew over Camp Cornelia. None have been seen since August 19.

### G. Alligators.

June 14 the writer went to Monkey Lake in Grand Prairie. While there 19 alligators were counted in that small lake. Falling water levels may have caused the saurians to seek deeper water such as afforded by this lake. July 23, the writer caught a small alligator measuring 17 inches in length in the run 1 mile west of the Suwannee Dam. This little fellow was about a year old. It was released in the swamp after it had been photographed. August 7 an alligator measuring 10 feet and 4 inches was caught at the boat landing in a wooden bear trap that had been baited with dog fish. Mr. David Da Lie, Manager of the Okefenokee Swamp Park was notified and he brought assistants and came down to get the animal. Da Lie finally succeeded in tying the animal which was loaded in the station wagon and taken to the Swamp Park as an attraction to their wildlife exhibit. The 'gator was removed from the canal at the boat landing because it had been stalking some pigs and was deemed dangerous to fishermen and visitors at the boat landing. August 6, Joseph T. Chesser found a small alligator's nest about 1/4 mile northwest of Goose House Gap. Unfortunately, it did not contain any alligator eggs but it did contain at least 50 cooter eggs.

## III. REFUGE DEVELOPMENT AND MAINTENANCE.

### A. Physical Maintenance.

As in past periods it was necessary for refuge personnel to spend a great deal of time in maintaining the Cornelia entrance road and Chesser Island roads. At the close of the period no road repair equipment had been furnished this station and it was very difficult for personnel to keep the roads open to travel, using small hand tools. Fence repair and maintenance consumed a good part of all personnel's time. High winds blew down numerous old turpentine pine trees across the refuge fences and created extra fence repair.

The boat dock at the Cornelia landing was repaired by replacing rotted timbers and beams with dead pine trees cut near the Cornelia headquarters. Some planking was also replaced.

Preventive maintenance and safety inspections were incorporated in the automotive repair and maintenance program at this station. Personnel were installed to follow closely the established policy on preventive maintenance.

Some rotted poles were replaced in the telephone line from Camp Cornelia to Folkston. New insulators and some ground wires were added. This line of communication has been somewhat improved.

Boats and outboard motors received periodic cleanings and adjustments. Greater operating success is being enjoyed with the larger motors than with those of lesser horsepower formerly used.

Patrolmen continued cleaning out the boat run from the end of Suwannee Canal to Billy's Lake. When this run is cleared it will be possible for patrolmen to cross the swamp in very little time by using a light boat and small motor. This run is not to be opened to travel by other than refuge personnel.

Some boundary lines on the north end were cut out and remarked. It is planned during the coming period to begin a complete remarking and posting of all existing lines.

#### B. Physical Developments.

Contract I-6-fw-11066, for operation of the guide concession at the western entrance to the refuge was granted by the Service on May 20th to Okefenokee Recreation, Inc. of Homerville, Georgia.

Contract I-6-fw-11081, for operation of the guide concession at the northern entrance to the refuge was granted the Okefenokee Association, Inc. of Waycross, Georgia on June 1st by the Service.

After considerable planning, Contract I-6-fw-11134 was awarded by the Service on July 28th to the Okefenokee Sportsman's Club, Inc. of Folkston, Georgia for operation of the guide concession at the Camp Cornelia entrance.

Execution of the foregoing contracts consumed a great deal of the Acting Manager's time as well as time of other refuge personnel. Supervision of contract conditions is now requiring and will continue to require a considerable amount of refuge personnel's time until construction is completed and boat runs are cleaned and opened.

#### IV. ECONOMIC USE OF REFUGE.

##### D. Timber Removal.

Considering the abnormal rains during the latter part of the period, the timber operation under Special Use Permit 46-466 progressed about as well as could be expected. When the woods became too wet and soggy to permit hauling the permittee was required to clean up slash and butts. One attempt was made to move the operation to Loyd's Island but the entrance road became impassable to even tractors and 4-wheel drive trucks.

V. FIELD INVESTIGATION OR APPLIED RESEARCH.

A. Progress Report on Bird Banding.

1. Tabulation of bird banding during quarter and to date:

Species	Prev. Banded	May	June	July	Aug.	Qtr.	F.Y.	To date
Water turkey	6	19	6	0	0	25	31	31
Ward's heron	23	1	0	0	0	1	24	24
American egret	0	0	11	0	0	11	11	11
Green heron	9	0	0	50	0	60	50	59
Chuck-will's-widow	0	2	2	0	0	4	4	4
Florida nighthawk	3	0	2	0	0	2	4	5
Red-headed wood- pecker	2	0	3	0	0	3	5	5
Hairy woodpecker	0	0	0	1	0	1	1	1
Kingfish	0	0	0	3	0	3	3	3
Crested flycatcher	1	6	0	0	0	6	7	7
Carolina wren	10	6	6	0	0	12	19	22
Mockingbird	18	15	8	0	0	23	23	41
Bluebird	38	15	0	9	0	24	42	62
Red-wing	14	12	0	0	0	12	12	26
Florida grackle	6	4	0	0	0	4	4	10
Others	1010						869	1010
<b>Totals</b>	<b>1140</b>	<b>80</b>	<b>38</b>	<b>63</b>	<b>0</b>	<b>181</b>	<b>1053</b>	<b>1321</b>

B. Breeding Bird Census Report.

Due to timber cutting operations on the logleaf pine and palmetto flatwoods census area lying north of the road between headquarters and the boat landing, a new one was selected this year for the breeding bird census. The new census area lies south of the canal and is about as uniform a habitat of this type as can be selected on this region. Temporary details to Cape Romain Refuge prevented the biologist from spending more hours on the project. The census revealed 43 pairs of birds per 100 acres of this habitat type.

LONGLEAF PINE AND PLAMETTO FLATWOODS. A typical flatwoods, the dominant species being longleaf pine (*Pinus palustris*); secondary dominants, slash pine (*Pinus caribaea*), upland willow oak (*Quercus cinerea*), turkey oak (*Quercus catesbaei*). A distinctive understory is present throughout the area and includes in the order of abundance the following species: saw palmetto (*Serenoa serrulata*), gallberry (*Ilex glabra*), dwarf live oak (*Quercus minima*), dwarf wax-myrtle (*Certhamnus pumilus*), huckleberry, (*Cyanococcus myrainites*), staggerbush, (*Xoliana fruticosa* and *X. ferruginea*), scrub oak (*Quercus myrtifolia*), large gallberry (*Ilex coriacea*), fetterbush (*Desmothamnus lucidus*), sweet pepperbush (*Clethra alnifolia*), gopher apple (*Chrysobalanus oblongifolia*), Rubus blackberry (*Rubus sp.*), calico bush (*Kalmia hirsuta*), chinquapin (*Castanea pumila*).

Certain portions of the area have dense stands of wiregrass (*Aristida*) and other native grasses. The forest is a mixed age stand, the older trees averaging 16 inches in diameter (DBH) and 90 feet in height. All the older trees have been worked "gum" and are in a decadent stage. The second-growth trees average about 7 inches in diameter (DBH). The area was burned by an uncontrolled fire during February 1946 and many of the "boxed" trees were cut for pulpwood during the summer of 1947. Botanical nomenclature above follows "Guide to Georgia Trees", by Wilbur E. Duncan, and "Manual of the Southeastern Flora", by J. K. Small, 1933 ed.) Size: 47 acres (surveyed, 14x34 chains). Location: South side of Suwannee Canal and between Trail Ridge road and the swamp, Okefenokee National Wildlife Refuge, Charlton County, Georgia. Tract bounded on all sides by similar forest. Topography: Level, north boundary approximately  $4\frac{1}{2}$  chains from the abandoned Suwannee Canal. Dreen or branch on the south side of area drains into the swamp. Elevation: 120-140 feet. Surveys: Selection and mapping completed December, 1947. Coverage: April 28, 30; May 8, 9, 25, 26, 27, 28. Hours varied from 5:00 A.M. to 7:30 P.M., totaled  $12\frac{1}{2}$ . Weather: Temperatures moderately above normal. Precipitation averaged above one-half inch above normal. Winter open. The birds were censused by the Williams spot-mapping method, and observations were made by traversing the area along staked lines 2 chains apart. Sensus: Pine-woods sparrow, 4 (2Y), pine warbler, 2 (1Y); brown-headed nuthatch, (2)(1Y), white-eyed towhee (2-1P), red-cockaded woodpecker, 1 ( $\frac{1}{2}$ P); yellow-throat, 1 ( $\frac{1}{2}$ P); brown thrasher, 1 ( $\frac{1}{2}$ P); Carolina wren, 1 ( $\frac{1}{2}$ P); red-headed woodpecker, 1 ( $\frac{1}{2}$ P). Birds with territories on or partially on area, 9 species; density, 15 pairs per 100 acres. The following species nested off the area but visited it for food: Carolina wren, 6 (3P); white-eyed towhee, 4 (2P); yellow-throat, 4 (2P); red-headed woodpecker, 4 (2P); crested flycatcher, 4 (2P); red-bellied woodpecker, 2 (1P); flicker, 2 (1P); hairy woodpecker, 2 (1P). Total, 8 species: density, 28 pairs per 100 acres. Grand total of all birds nesting on or regularly feeding on area 13 species, density 43 pairs per 100 acres. Visitors (average number of individuals per 100 acres); Florida grackle, 2; Florida nighthawk, 1; bob-white, 1; fish crow, 1; Florida blue jay, 1; bluebird, 1; chimney swift, -; mourning dove;-; mockingbird -; chuck-wills-widow;-; kingbird-6

### C. Utilization of nesting boxes by song birds.

The writer had 14 nesting boxes scattered from the old CCC camp site to the boat landing at the beginning of the nesting season. One box at the old CCC camp site was stolen after a pair of bluebirds had nearly completed a nest. This is the second box stolen from this site since January 1947. Twelve of the remaining thirteen boxes were occupied and seven of the twelve boxes had two nests during the nesting season. Bluebirds used 10 of the nesting boxes for a total of 16 nests from which went 61 young bluebirds. A pair of crested flycatchers used one box, laying six eggs of which five hatched and the young left the box. A pair of red-headed woodpeckers used one of the boxes, the same one that was used by this species last year. Three eggs were laid, two of which hatched and the young left the nest.

A brown-headed nuthatch is believed to have used one of the boxes as it contained a nest of pine seeds, the characteristic nesting material used by this species. The appearance of the nest indicated that it had contained young. By banding the owners of a nest it was easy to determine whether the pair stayed mated for the nesting season and whether they raised two or more broods during the season. The writer does not have evidence that bluebirds raise three broods at Okefenokee but some pairs raise two broods, usually in the same nesting box. Bluebirds are definitely more common at Camp Cornelia than they were when the writer was transferred to Okefenokee.

## VI. PUBLIC RELATIONS.

### A. Recreational Uses.

It is evident that the national advertising being sponsored by the Okefenokee Association, Inc. of Waycross and the Okefenokee Sportsman's Club, Inc. of Folkston, regarding the Okefenokee Swamp, is responsible

for the ever increasing numbers of fishermen, sportsmen, sightseers and scientists visiting the refuge during the period compared to 5,000 for the corresponding period in 1947 and it is believed 10,000 persons would have visited if the high water levels had not affected the good fishing during July and August.

#### B. Visitors.

Mrs. E. G. Kilpatrick, Miss Elizabeth Griffis and Miss Allie Gafford of Atlanta Regional Office arrived on the evening of May 28th. On May 29th, refuge personnel accompanied them on a visit to the west side of the refuge. On May 30th they visited the north end of the refuge.

Mr. Howard A. Miller arrived on the afternoon of June 6, 1948 and conferred with Manager Edwards on refuge policies. On June 7th, he was accompanied by refuge personnel from Cowhouse Island to Dinner Pond, Big Water and on out through Jones Island. On June 8th he was accompanied by refuge personnel from Camp Cornelia boat landing to Floyd's Island for inspection of cabin and boardwalk. In the evening he conferred with the Okefenokee Sportsman's Club, of Folkston, Georgia relative operation of concession on east side of refuge. Mr. Miller left for the Regional Office on the morning of June 9th.

Mr. Walker T. Harrod, U. S. Game Management Agent, attended Federal Court in the Post Office Building in Waycross on June 14th and 15th. He also conferred with Manager Edwards in the refuge office in Waycross re refuge violations.

Mr. Wm. S. Towns, of the Regional Office visited the refuge office and attended Federal court in Waycross relative land cases on June 14th.

Assistant U. S. Attorney Russell visited refuge office on June 14th and inspected east side of refuge on June 15th, escorted by refuge personnel.

U. S. Attorney J. Saxton Daniels visited refuge office on June 16th for conference on refuge violations and settling of fishing cases in State court.

Manager Childs of Sabine Refuge and Manager Parker of Lacassine Refuge on visit in Waycross office on July 8th.

Mrs. G. Osborne of Regional Office and party arrived July 10, 1948 for visit to refuge. Spent July 11th inspecting east side of refuge in company with Manager Edwards.

Mr. Richard Dittman of Regional Office in refuge office on July 15th for discussion with members of Okefenokee Recreation, Inc. of plot plans.

Mr. Eugene Cypert, Biologist, from Paris Tennessee, in Waycross office for conference on July 21st.

Mr. Verne E. Roweley, radio technician, National Park Service, arrived for conference on FM radio equipment August 13, 1948.

Mr. W. P. Baldwin, Biologist, in Waycross Office for visit on August 23, 1948.

Mr. S. V. Landers, Firestone Representative, was in Waycross office on August 26th for conference on use of Firestone spark plugs in outboard motors and automotive equipment.

Mr. R. F. Thorne of Cornell University and Dr. W. C. Meuncher of Emory University, in Waycross office for permit to collect botanical specimens on refuge for scientific studies on August 31, 1948.

#### C. Refuge Participation.

The Acting Refuge Manager continued to meet with numerous civic organizations in Waycross, Homerville and Folkston in an effort to educate people living adjacent to the refuge in the aims and purposes of the Fish and Wildlife Service. Some success was enjoyed in pointing out that the bears, which have been preying on the livestock of farmers each summer, do not come out of the refuge interior but come from privately owned rough woods bordering the refuge boundaries. Presentation of this thought to landowners and farmers resulted in some highly successful control burns in the woods surrounding the swamp. As was expected by the writer, in those areas where the roughs were burned, the bear moved deeper into the swamp and its islands and depredations on stock greatly declined.

#### D. Hunting.

No open season for hunting during the period. Observations of patrolmen and others indicate a bumper crop of quail and squirrels and an increase in deer and turkey on areas adjacent to the refuge.

#### E. Fishing.

All types of fishing were excellent during May and June. Perch fishing was only fair in the early part of July and then unsettled weather and high water levels made good catches difficult. Trolling for bass and jack produced some good catches toward the close of the period. In all fishing was much better on the east side than on the west side of the refuge. This is attributed to the high water levels on the west side in Billy's Lake caused by the drainage from east to west.

F. Violations. - Case Disposition - Refuge Cases.

Willie Darling Crews, Herbert M. Crews and Charlie L. Crews apprehended June 4, 1947 fishing in the waters of the refuge without State license, by Patrolman Wm. W. Davis, Jr. and Manager Wm. R. Edwards. Received fines of \$10.00 each and 6 months probation, on June 26, 1948, in in Charlton County Court.

C. H. Waters, J. W. Reid, L. F. Royal, Mrs. R. F. McKenney and Mrs. Helen Wolfe apprehended June 8, 1947 fishing in the waters of the refuge without State license, by Patrolmen Hall and Coleman. Each received fine of \$10.00 and six months probation, on June 29, 1948 in Charlton County Court.

Leon Crawford apprehended April 20, 1948 fishing in the waters of the refuge without State license by Manager Wm. R. Edwards. Received fine of \$10.00 and 6 months probation on June 26, 1948, in Charlton County Court.

Robert S. Young apprehended June 21, 1948 fishing in the waters of the refuge without State license by Patrolman Grady N. Jernigan. Received fine of \$10.00 on June 25, 1948, in Charlton County Court.

Euel C. Smith apprehended June 21, 1948 fishing in the waters of the refuge without State license by Manager Edwards. Received fine of \$10.00 on June 25, 1948, in Ware County Court.

Cleo Anderson, H. D. Fuss and W. H. McCarthy apprehended June 18, 1948 possessing and taking over the limit of game fish from the waters of the refuge by Patrolman John D. Eadie. Received fines of \$25.00 each on August 28, 1948, in Charlton County Court.

Earl G. Sims, Mrs. E. G. Sims and Jerry A. Sims apprehended July 4, 1948 fishing in the waters of the refuge without valid non-resident fishing license, having purchased resident licenses and given fictitious addresses, by Patrolman Grady N. Jernigan and Manager Wm. R. Edwards. Received fines of \$25.00 each on July 17, 1948, in Charlton County Court.

Mrs. Ouida Laforrest Lucas apprehended July 7, 1948 fishing in the waters of the refuge without license by Patrolmen Eadie and Jernigan. Fined \$10.00 on August 14, 1948, in Charlton County Court.

Golden Manley Thacker apprehended July 10, 1948 fishing in the waters of the refuge without State license by Patrolmen Eadie and Jernigan. Received fine of \$25.00 on August 28, 1948, in Charlton County Court.

George Thomas Hutchinson and James E. Mosley apprehended July 17, 1948 fishing without State License on the waters of the Okefenokee Refuge, by Patrolman Grady N. Jernigan. Fined \$10.00 each on August 14, 1948, in Charlton County Court.

James Marshall Gibbs apprehended July 24, 1948 killing an osprey with a pole on the refuge by Patrolman Jewett V. Hall. Received fine of \$25.00 on August 28, 1948, in Charlton County Court.

Joseph P. Crawford apprehended August 14, 1948 fishing in the waters of the refuge without State license, by Patrolman Grady N. Jernigan. Received fine of \$10.00 on August 14, 1948, in Ware County Court.

Violations. - Cases Pending - Refuge Cases.

Chester B. Davis of Jackson, Mississippi, was arrested by Patrolman Jernigan, July 7, 1948 fishing in the waters of the refuge without a State license. Davis was arraigned before the U. S. Commissioner in Waycross on July 7 and placed under bond of \$100.00. The case is being prepared for prosecution in Federal court.

James E. Plunkett, Ivey B. Barnes, John Emmett Holland, Emmett Rudolph Royal and Fitz. L. Royal, all residents of Georgia, were apprehended by Patrolmen Hall and Coleman on July 8, 1948 trespassing on a restricted area of the refuge without permit. The cases are being prepared for prosecution in Federal Court.

The following cases are to be settled in Ware County Court during the month of October, 1948:

Mr. and Mrs. Clifford Crosby were apprehended by Patrolman Eadie on June 10, 1948 for having over the limit of fish in their possession.

M. M. Lang was apprehended June 10, 1948 by Patrolman Eadie for taking over the limit of game fish from the waters of the refuge.

James M. Allman and James F. Roddenberry were apprehended by Patrolman Eadie on June 10, 1948 for fishing in the waters of the refuge without State license.

Samuel M. Altman was apprehended by Patrolman Eadie on June 12, 1948 for fishing in the waters of the refuge without State license.

James Daniel Allen was apprehended by Patrolmen Jernigan and Eadie on July 3, 1948 for fishing in the waters of the refuge without State license.

Upshaw F. Gibson was apprehended July 17, 1948 by Patrolman Jernigan for fishing in the waters of the refuge without license.

Violations: - Cooperative Cases.

The following cases were made by refuge personnel in cooperation with State of Georgia Conservation Officials in Clinch County on areas

adjacent to the refuge.

H. C. Pittman and Bud Pittman were apprehended deer hunting at night with gun and light by Patrolman Hall and Coleman on August 3, 1947. Received fines of \$50.00 each and 6 months probation in Clinch County Court, on August 4, 1947.

Buddy Griffis was apprehended deer hunting at night with gun and light by Patrolman Hall and Coleman on August 3, 1947. Received fine of \$100.00 and 12 months probation in Clinch County Court, on August 4, 1947.

Clyde Barton was apprehended August 3, 1947 by Patrolmen Hall and Coleman for possession of venison meat out of season. Received fine of \$100.00 and 6 months probation in Clinch County Court, on August 4, 1947.

Garnet Hare was apprehended August 13, 1947 by Patrolmen Hall and Coleman hunting deer at night with gun and light. Received fine of \$300.00 in Clinch County Court, on August 16, 1947.

Ernest Higginbottom, James L. Markham and Bryant Skimmer were apprehended August 13, 1947 by Patrolmen Hall and Coleman deer hunting at night with gun and light. Received fines of \$250.00 each in Clinch County Court, on August 16, 1947.

Tommie Alford was apprehended August 16, 1947 by Patrolmen Hall and Coleman deer hunting at night with gun and light. Received fine of \$250.00 in Clinch County Court, on August 16, 1947.

H. C. Parks was arrested by Patrolmen Hall and Coleman on June 12, 1948 for fishing in the Suwannee River without a State license. An appearance bond of \$25.00 was forfeited.

C. H. Pendley, Cecil Pendley, T. V. Jenkins, W. E. Bishop, Davis Carter and Emory Carter were apprehended on June 12, 1948 for taking over the limit of fish from the Suwannee River by Patrolmen Hall and Coleman. Appearance bonds of \$25.00 each were forfeited.

#### Enforcement

Patrolmen continued to receive training during the period by the Acting Refuge Manager in handling of firearms, making apprehensions and arrests and presenting cases in County Courts for disposition.

Strict patrol was emphasized for alligator hunters during the period but no violations were found.

#### VII. OTHER ITEMS OF INTEREST.

Patrolman Eadie from Reelfoot National Wildlife Refuge reported for duty May 31st at Cornelia headquarters.

Appointment of Wm. W. Davis, Jr. was terminated on June 2, 1948 by the Regional Office upon recommendation by Refuge Manager Wm. R. Edwards.

Patrolman McCray L. Coleman was placed on assignment with Patrolman Dean of Savannah Refuge transferring Boat 176 to Everglades National Wildlife Refuge and other property from Everglades Refuge to St. Marks Refuge, and to Savannah Refuge, the early part of May.

Grady N. Jernigan was appointed as a Laborer-Patrolman July 1, 1948 at Camp Cornelia Headquarters.

A large bull alligator, ten feet, six inches in length and weighing approximately 375 pounds was trapped in Suwannee Canal in box-type bear trap on August 7, 1948 by Patrolmen Eadie and Jernigan. It was turned over to Okefenokee Swamp Park for display pond. The 'gator had become belligerent and began to attack persons at Cornelia boat landing. Several attempts had been made to scare him away from the boat landing but to no avail.

Bears began coming out of the swamp and surrounding rough uplands about the first of August to prey on cattle and other livestock. Trapping began. Patrolmen are assisting stockowners in killing marauding bears.

Respectfully submitted,

*Wm R. Edwards*

Wm. R. Edwards  
Acting Refuge Manager

By: *Margaret B. Barrett*  
Margaret B. Barrett  
Refuge Clerk (Clk.-Typist)

September 15, 1948.

Date: 9/16/48

Approved: *Mark Shurber*

*Acting Reg. Refuge Supv.*

WATERFOWL

Refuge Okefenokee Months of May to August 1948

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total	
	Common Name	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 Cackling goose Brant <u>White-fronted goose</u> Snow goose Blue goose										
III. <u>Ducks:</u> Mallard Black duck Gadwall Baldpate Pintail Green-winged teal Blue-winged teal Cinnamon teal Shoveller Wood duck Redhead Ring-necked duck Canvas-back Scaup Golden-eye Buffle-head Ruddy duck										
	present	6,000*	8/30		Present				5,000*	5,000*
IV. <u>Coot:</u>										

\*Estimated.

(over)

## SUMMARIES

### Total Production:

Geese 0

Ducks 6,000

Coots 0

Total waterfowl usage during period 6,000

Peak waterfowl numbers 6,000

Areas used by concentrations No concentration areas

Principal nesting areas this season \_\_\_\_\_

Throughout season.

Reported by R. J. Fleetwood

## 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.

MIGRATORY BIRDS  
(other than waterfowl)

Refuge Crawfish Months of May to August 1948

(1) Species  Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Colonies	Total # Nests	Total Young	
<b>I. Water and Marsh Birds:</b>										
Pied-billed grebe	3	6/22	---	---	still present		0	0	0	10*
Water turkey	present		150	7/13	still present		2	30	30	220*
Ward's heron	present		35	5/10	still present		1	20	150	800*
American egret	present		900	6/30	still present		1	8	32	3000*
Louisiana heron	5	7/30	---	---	still present		0	0	0	25*
Little blue heron	present		1615	6/26	still present		0	0	0	3500*
green heron	present		20	7/23	still present		3	36	660	850*
yellow-crowned nightheron	present		17	5/5	still present		0	10	35*	65*
American bittern	1	6/22	---	---	1	6/22	0	0	0	1
Least bittern	3	5/10	700*	7/30	still present		0	100*	500*	700*
Wood ibis	present		250	7/7	still present		0	0	0	400*
White ibis	present		800	6/26	still present		0	0	0	900*
Florida crane	present		20	5/10	still present		0	30*	80*	120*
Callimule	present		7	6/14	still present		1	3-12	80*	110*
<b>II. Shorebirds, Gulls and Terns:</b>										
Spotted sandpiper	1	7/25/26	7/31	None	still present		0	0	0	5*
Yellow-legs	1	7/31	None		still present		0	0	0	5*
Black tern	1	7/30	None				0	0	0	1
<b>III. Doves and pigeons:</b>										
Mourning dove	present		325*	8/30	still present		0	0	0	325*
<b>IV. Predaceous birds</b>										
Horned owl	present		30*	8/30	still present		0	0	0	30*
Barred owl	present		450*	8/30	still present		0	0	0	450*
Fish crow	present		60*	7/10	still present		0	0	0	60*
Osprey	present		28*	7/13	still present		0	0	0	28*
Red-shouldered hawk	present		600*	8/23	still present		0	0	0	600*

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

Reported by Raymond J. Fleetwood

**Biologist**

#### 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.

Refuge \_\_\_\_\_ Months of \_\_\_\_\_ to \_\_\_\_\_, 194\_\_\_\_\_

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks	
						Hunting	For Re- stocking	For Research			
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'vd.	Estimated Total	Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.	
Bob-white	50,000 acres pine woods, fields, Islands	20	12	1500	53% males 47% females	N	O	N	E	2500*	Within an area 1 mile square around Camp Cornelia there are 9 coveys with 79 indi- viduals or 1 bird for every 7-3/11 acres.
Turkey	pine woods, fields, Islands	143	0	200		N	O	N	E	350*	

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

## INSTRUCTIONS

3-1752  
Form NR-2  
(April 1946)

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.

REFUGE GRAIN REPORT

Refuge Okefenokee

Months of May thru August 194 8.

(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.	
Shelled corn and mixed grain.	5	None	5		N	O	N	E	5		5	

(8) Indicate shipping or collection points Folkston, Georgia

(9) Grain is stored at Camp Cornelia headquarters, Folkston, Georgia.

(10) Remarks used for baiting duck banding traps by Biologist.

(10) RECEIVED FROM THE REFUGEE GRAIN REPORT

(11) GRAIN TO BE REPORTED BY THE REFUGEE GRAIN REPORT

NR-8a (3) REFUGEE 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.

PERIOD	SEED	FEED	SALES
EMB OF			
(e)		(1)	

NUMBER OF REFUGEE GRAIN REPORTS

REFUGEE GRAIN REPORT

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: May 24, 1948

MR. SALYER \_\_\_\_\_

MR. KRUEGERS \_\_\_\_\_

~~MR. DUDONT~~ PAD 10-18-48

MISS BAUM \_\_\_\_\_

SECTION OF HABITAT IMPROVEMENT:

~~Mr. Griffith~~ REG 6-3

~~Dr. Bourn~~ USP 9-30

~~Miss Cook~~ ZWC 6-22

SECTION OF OPERATIONS:

~~Mr. Hall~~ \_\_\_\_\_

~~Mr. Rogan~~ 9/12/48

SECTION OF LAND MANAGEMENT:

Mr. Kent JK

~~Mr. Ackerknecht~~ WA

SECTION OF STRUCTURES:

~~Mr. Taylor~~ 2/27 10/22

Mr. Johnston \_\_\_\_\_

STENOGRAPHERS:

4/16-14-48 \_\_\_\_\_

\_\_\_\_\_

REMARKS:

OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY—APRIL 1948

Return to: \_\_\_\_\_

OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY - APRIL 1948.

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FOREWORD.

Sections II. Wildlife and V. Field Investigation or Applied Research of this report are compiled and written by Raymond J. Fleetwood, Biologist, at Okefenokee.

OKEFENOKEE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY - APRIL  
1948.

I. GENERAL.

A. Weather Conditions.

	<u>Precipitation</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>
January	3.74	77	17
February	1.94	84	28
March	6.37	88	38
April	<u>7.35</u>	<u>90</u>	<u>47</u>
	19.40	Extremes	<u>90</u> <u>17</u>

Precipitation for the period was again approximately 6 inches above normal but one-half inch less than for the corresponding period in '47. On April 1 a downpour of 5.20 inches fell in 24 hours. Extremes in temperatures were about the same as in '47 but much below those for corresponding periods preceding '47.

B. Water Conditions.

According to readings recorded from the Cornelia gauge the water level remained higher during the period than the corresponding period in previous years or any other 4 months period preceding. On April 3 an all time high of 123.10 was recorded. This can probably be attributed to the precipitation of 5.2 inches on April 1 and 1.5 inches on April 2. At the close of the period the water still remained above 122.

C. Fires.

No fires occurred on the refuge during the period which fact can probably be attributed to the same reasons covering the no fire count during the corresponding period in 47. Above normal rainfall hampered the intentions of fire bugs considerably but the writer is of the opinion that efficient patrol has kept down fires on the refuge since areas adjacent thereto were burned to some extent. Cooperative fire patrol with several large pulpwood companies and Clinch County TPO has increased our protection.

## II. WILDLIFE.

### A. Migratory Birds.

#### 1. Populations and Behavior.

##### a. Canada goose, Branta canadensis canadensis.

The geese that pass over Okefenokee in the fall on the way to their wintering grounds must return to their nesting grounds by a different route as spring records for the Okefenokee are few. There was one spring record of 4 individuals for the corresponding quarter last year. For the quarter this year there is one record of seven individuals observed on Chase Prairie January 21. The morning was rather foggy and the flock was heard before it was seen and the birds appear to have risen from the water near Hammer Lakes. They circled a time or two honking all the while then disappeared in the fog.

##### b. Ducks.

The duck population of the refuge during the quarter shows a slight increase over that of the corresponding quarter last year, and this increase may be due to more thorough coverage of the swamp on the waterfowl inventory taken January 9. Last year two days were devoted to the inventory taken January 16 and 17 and there were three pole boat parties (two individuals to the boat) in the field each day and the parties covered Chesser, Grand, Hog Island, Buck Lake, Chase, Mizell, Sapling and Floyd's Island Prairies. At the end of the two days' inventory 1,495 ducks had been counted. This year there were four pole boat parties in the field on inventory day and they covered the same prairies that were covered last year. At the end of the one day inventory we had counted 1,592 ducks or 97 more than on the 1947 inventory. From these observations you can draw your own conclusions about the trend of the duck population in the Okefenokee.

Realizing that it is impossible to cover thoroughly the swamp in pole boats, refuge manager Edwards employed a pilot to carry him over the swamp visiting all the places that were covered by the pole boat parties and other places inaccessible by pole boats. Mr. Edwards was able to cover Durdin, Territory, Honey Island and Sap Prairies, Cedar Thick and Coward Lake areas. Mr. Edwards at the close of the day had counted 9,025 ducks or 6 times as many as the four pole boat parties observed. However, if we exclude the five areas that Mr. Edwards covered but were not visited by pole boat parties and deduct the 3,888 individuals counted here, we find that Mr. Edwards counted from the air 5,137 ducks on the same areas where the pole boat parties counted 1,592 individuals. In other words, Refuge Manager Edwards observed 3-1/4 times as many ducks as the pole boat parties on those areas covered by the boats and plane. //

Out of a total of 9,025 ducks, 4,192 were mallards, 1808 were black ducks, 1153 were ring-necked ducks, 862 were wood ducks, 593 were pintails. The balance, 417 individuals, consisted of buffleheads, hooded mergansers, baldpates, gadwalls, blue-winged and green-winged teal. Using the data obtained on the waterfowl inventory and other observations, we estimated the greatest number of ducks using the refuge at one time was 11,787 individuals. The four leading species being mallard, black duck, ring-necked duck and wood duck. Last year we had more wood ducks than ring-necked ducks.

Chase, Durdin and Territory Prairies had poor concentration of ducks considering the size of the prairies. Grand, Chesser, Honey Island and Sap, Floyd's Island Prairies and Cedar Thick had the best duck concentrations as revealed by the inventory. The largest flocks of ducks flushed from the prairies were mallards, blacks and ring-necked ducks, and the greatest number that the writer observed at any one place was on the high prairie northwest of Monkey Lake in Grand Prairie. This spot, the main feeding place in Grand Prairie, was probably not submerged last summer as plume grass *Erianthus* and *Andropogon* grew here in abundance. There is some red root, *Gyrotheca tinctoria* and scattered clumps of green arum, *peltranda virginia* growing among the grasses. The ground cover appears to be a mass of sphagnum moss. Other plants characteristic of this feeding place are water willow, *Decodon verticillatus*, buttonbush, *Cephalanthus occidentalis*, pickerel weed, *Pontederia cordata*. Another locality where several hundred ducks chiefly mallards, black and ring-necked ducks fed was along the edges of houses and the bay. Red root, *Gyrotheca tinctoria* appeared to be one of the chief items eaten. The spring departure dates this year are in line with those of last year. No wood ducks with young have been observed during the quarter.

### c. Herons.

Due to the constant high water level in the swamp since September last to the close of the quarter, the ward heron wintering population appears to have decreased. Last year on the two day waterfowl inventory 42 herons were recorded. This year the four pole boat parties recorded 18 individuals. However, by air plane coverage of areas not visited by the pole boat parties the total arose to 94 individuals. It is difficult to estimate the number of herons missed on the inventory count but it is believed that the number is sufficient to make for the quarter a total of 500 herons using the refuge.

Nest building must have started about February 1 and several new nests were found in living pine trees in Chesser Prairie February 18. One tree contained six nests and there were a few nests in nearby trees. It is not unusual to find a single nest in a tree out in a prairie far from other trees used as nesting sites. In general the nests of ward's herons on the east side of the swamp are located at greater heights than the nests found along the run from Sapling Prairie to Big Water. Along the latter nests have been found in small

After February the egrets abandoned this roosting place. The only record of the snowy egret for the quarter is an observation made by Refuge Manager Edwards January 9 when he was covering the swamp in a plane. He observed two birds on Floyd's Island Prairie.

e. Florida crane.

We estimated 300 cranes used the refuge during the corresponding quarter last year and this estimate was based on the number (66) observed on the 2 day waterfowl inventory taken January 19. This year the four pole boat parties observed 92 individuals on the waterfowl inventory. Refuge Manager Edwards covered the swamp by plane on the day of the waterfowl inventory and he reported a total of 278 cranes. So the estimate of 300 individuals is not far off the actual number using the refuge during the quarter. The greatest concentrations during the quarter were in Chesser, Grand and Buck Lake Prairies. January 9 the writer observed 34 and 37 on Chesser and Grand Prairies respectively.

February 18, 21 and 24 individuals were counted on Chesser and Grand Prairies respectively. The 24 birds in Grand Prairie were all in the air at once and was a pretty sight. February 27, 22 and 26 cranes were observed in Grand Prairie and Buck Lake and Hog Island Prairies respectively. Cranes prefer to roost on batteries that are surrounded by water. No nests were found during the quarter, but it is believed that the high water level reached in April may have destroyed several of the nests.

f. Ibis.

Both the white and wood ibis were absent from the refuge during January and February but both appeared in March. The white ibis appears to return before the larger wood ibis, the former was observed this year on March 10, the latter on March 14. Both records are earlier than last spring's arrival dates. The largest flock of white ibis observed this quarter numbered 50 individuals. The same quarter last year a flock of 150 birds was observed at Camp Cornelia. Observations of the wood ibis this spring are few compared to those of last spring.

g. Coot.

This species was rather common in the swamp this quarter as compared to the three records (3 birds) for the corresponding quarter last year. The greatest concentration was in Grand Prairie followed by Honey Island and Sap Prairie. Observation made during the waterfowl inventory January 9 revealed that there were 402 coots in the swamp and increase of nearly 400 present. As this was being written patrolman Davis reported 5 individuals observed in Grand Prairie May 5.

h. Snipe and woodcock.

During the quarter 37 Wilson's snipes were observed on the refuge and of the number 19 were seen by Patrolman Coleman on the waterfowl inventory. The species was usually observed feeding on batteries. The

living cypress trees as low as 12 feet above the water.

Ward's herons usually lay from 3-4 eggs but the writer on February 26 found a nest in a 7 inch living cypress approximately 22 feet above the water that contained five eggs. The nest was visited April 13 and four of the eggs had hatched and the nestlings were fairly well feathered. A number of pictures were taken of the nestlings. The writer made another visit to the nest April 29 and banded the four nestlings. They were not as vicious this time as on my second visit but the nestlings did get out of the white-washed nest (the excreta of the nestlings) and clambered out on the branches as far as possible. Some of the birds regurgitated fish that had been swallowed as food and this partially digested food plus the excreta made a foul smelling nest. The parent birds did not appear to be the least interested in their young as they flew off at our approach.

The little blue heron was not observed in the swamp during January and it was the last week of February when the first one was observed in the swamp. Since then the species both mature and immature birds have been seen in increasing numbers and April 29 on a trip from Dinner Pond Cypress to the Swamp Park the writer counted 23 individuals.

The eastern green heron was observed 12 days earlier this spring than last having shown up March 12. A few birds have been heard along the canal at Camp Cornelia and out the canal to north prong at the close of the quarter. Nesting activities had not begun.

Yellow-crowned night herons were not plentiful during the quarter. The writer observed one at Grand Prairie run March 26. The largest flock seen during the quarter was one consisting of 12 birds on the Grand prairie run less than 1.4 mile from the canal May 1.

#### d. Egrets.

The high water level that prevailed in the swamp throughout the quarter had an adverse effect on the egret population as many left the swamp for places where food was more readily obtained.

Last year on the 2 day waterfowl inventory the three pole boat parties observed 132 American egrets. This year on the 1 day inventory four pole boat parties observed only 63 birds. Although the number was increased to 206 birds by Refuge Manager Edwards who covered the swamp in a plane and visited areas not visited by the pole boat parties. Another factor supporting my opinion that the egret population is smaller than for the corresponding quarter last year is the number of birds that were counted as they came into the roost along the Suwannee canal at Grand Prairie inlet. On January 28, 1947, 206 individuals were counted as they came in to the roost from Chesser and Mixell Prairies. The writer used the same observation tree that was used last year on January 2 and 3, 1948 and counted 38 and 32 individuals respectively.

largest number seen in a flock was 7 individuals. The writer has not observed a woodcock during the quarter nor has he had any reports of any.

i. Water turkey and cormorant.

It appears from our records that several pairs wintered in the swamp as 12 individuals were observed January 9. April 13 the writer and patrolman Davis found a small rookery composed of water turkeys and ward's herons near Dinner Pond. There were 8 nests of the former, 5 of the latter. Most of the water turkey nests contained 2-5 eggs or nestlings on this date. The water turkey nests at lower elevations than ward's heron and is seldom that a nest is found in the swamp that is 20 feet above the water. The nests are solidly built of twigs, often with some Spanish moss and lined with green leaves or smaller twigs and are placed in the upright fork of a bush or tree. All of the 8 nests found near Dinner Pond were in living cypress bushes and trees. The lowest one was 7 feet above the water. None were found in a tree that contained a heron's nest but three nests were in trees approximately 10 feet from trees that contained heron's nests. The two species apparently get along amicably as the writer never witnessed any antagonism, not even when water turkeys perched on ward's heron's nests. The young just after hatching are naked and blind and are ugly creatures but within two weeks they become covered with down and look like a bird. The rookery was visited on April 29 and 6 of the nestling water turkeys were banded only after chasing three of them with a boat. The three largest nestlings clambered out of the nest and fell into the water. One bird was easily caught as it could not dive on account of the submerged bladderwort. Every time it would stick its head into the water it would encounter the bladderwort. The other two nestlings found openings in the bladderwort and dived out of sight. We were able to follow their course by the air bubbles. When they reappeared only the slender snakelike necks showed above the water. After several attempts to grab them we finally succeeded in catching them. After they were banded, they were returned to the nests by pitching them up to the nests which they clung to with their heads and sharp toe nails.

We have 6 records representing 10 cormorants that were observed during the quarter. Two of these observations were of 3 individuals each on Buzzard's Roost Lake January 9 and Billy's Lake January 26. The species was not as common as the water turkey this quarter so it is believed that 75 is a good quarter estimate for the swamp.

2. Food and Cover.

As previously mentioned, red-root, Gyrotheca tinctoria is believed to be utilized as food by both game and non-game ducks in the Okefenokee Swamp. The game ducks being mallards, black and ring-necked ducks, and the non-game being the wood duck. The Service has records of three wood ducks taken in the Okefenokee Swamp that had eaten the roots of this plant. This past winter some of the largest flocks of ducks observed in the swamp arose from places where this plant grew abundantly. The chief species usually found at red-root stations were black, mallard and ring-necked ducks and from the appearance of the battery and bay edges,

bits of roots and tuber-like growths floating on the water where the ducks had been, indicated that they had fed upon this plant. If it is true that Okefenokee ducks are utilizing portions of this plant as food it would seem proper that a description of the widely distributed swamp plant be given: red-root is a perennial stoloniferous herb with fibrous roots. Its flat cluster of narrow leaves at the base of the fruiting stalk somewhat resemble those of an iris but are shorter than the stalk, the cauline gradually reduced. The fruiting stalk runs up to a height of about two feet and is terminated by a dense compound cyme of dingy yellow flowers in July and August. The reddish seeds enclosed in a capsule are very flat, rounded and fixed by the middle. The fleshy fibrous roots are of a brilliant red color and hence the origin of the common name for the plant. Many small underground and tuber-like growths averaging about 1-1/4 inches in length and 3/8 of an inch in diameter, are produced. These are a brilliant red and like the roots, are brittle, crisp and have a rather pleasant taste. Very little is known about the life history of the plant but it is known that it spreads very rapidly by underground runners. It is not known whether it can be reproduced from seed or from the tubers, It is a favorite plant of Okefenokee bees.

The occurrence of this species in the swamp is not unusual as it requires a highly acid organic soil which is typical of the prairie soils. This plant is found growing on batteries, the edges of bays and on islands that have pot holes and mucky places. Strange Island is the one island in the swamp where it is rather common. Chesser, Mizell, Grand and Chase Prairies are the main places in the swamp where the species grows abundantly. Many of the batteries where the plant grows during the summer months sink during the fall and winter months and the muck containing the roots and tubers is covered by a foot or two of water and the writer believes that the roots are not utilized when submerged in this manner.

Soil Conservation Service personnel in South Carolina conducted some duck gullet analyses during the winter of 1946-47 with a special effort being made to obtain ducks that had been fed in areas where red root grew and they found that nearly half the mallards and pintails that had any feed material in their gullets had eaten the roots and tubers of this plant even though it represented only a small percent of their food. This is noteworthy since it was the first record of the use of red-root by game ducks.

The tipping ducks such as mallards, pintails and blacks evidently run their bill down in the soft peat in the shallow water areas and snip off pieces of the roots. The tubers may be eaten whole.

It should be pointed out that sufficient observations and studies have not yet been made to draw any conclusions as to the relative importance of the red root in the Okefenokee area.

In order to determine the degree of utilization of red root by Okefenokee ducks the writer would like to have permission to collect at least four individuals of species found feeding in red root areas next winter. The gullets would be sent to the Service Laboratory for examination.

collection not essential to plants to use ducks for collecting the seedling.

The Brasenia patch at Seagrove lake continues to increase in size and ducks, chiefly wood and ring-necked ducks, were flushed from the area on a few occasions. There is a small colony of this species in the run to Floyd's Island. Another very small station is in the northern part of Durdin prairie. The last two stations are too small to be of importance to Okefenokee ducks.

Spadderdock, Nymphaea macrophylla.

This species is confined chiefly to the Suwannee River and the runs that enter it from the northeastern part of the swamp. It is a common and obstructive plant from Billy's Lake to Mud Lake which is some distance north of Sapling Prairie. This species has completely covered Half Moon Lake in Durdin Prairie. There is a small station of this species along the boardwalk through Floyd's Island bay a few hundred yards from the island end of the walk. This last station is rather a surprise as it appears isolated. No plants have been found between this station and Billy's Lake. The seeds of this plant may be eaten by Okefenokee ducks and if so the ducks along the Suwannee River and its swamp tributaries should have a source of food but of slight value.

White water lily. Castalia odorata.

This species is more widely distributed in the swamp being found in all the prairies that the writer has visited. It occurs in open water in the bays and along all the water courses in the swamp. This species is undoubtedly the most widely distributed species and source of duck food in the swamp. The seeds may be eaten by certain species of Okefenokee ducks.

Arrowhead, Sagittaria.

Two species Sagittaria graminea and Sagittaria lancifolia the latter more abundant in Grand Prairie than elsewhere in the swamp may be a source of food for ducks. The tubers are the portion of the plants eaten. These species are not abundant enough in the swamp to be of much importance as a duck food.

Arrow-arum, Peltandra.

Two species Peltandra virginica and Peltranda glauda occur in the swamp. The former is widely distributed over the prairies while the latter is more restricted having been collected by the writer in Durdin Prairie. These species produce an abundance of large rather fleshy berries but there is little evidence that they are eaten except by wood ducks. These berries are a favorite food of the Florida water rat, Neofiber alleni that occurs in the swamp.

Duckweed, Lemna sp.?

The writer has observed duckweed at two stations in the swamp. One station being the old run into Buzzard's Roost Lake and the other in Floyd's Island Prairie. It is difficult to understand why this genus is not more widely distributed in the swamp. Its limited distribution in the swamp makes this plant of little importance as a duck food.

Horned-rush, Rychospora corniculata.

This species is rather abundant in the swamp and the large flat-tish seeds are eaten by ducks. The plant is usually found growing on batteries.

The good crop of Cassena berries, Ilex cassine were devoured by the hordes of robins that wintered in the swamp area. Myrtle warblers had practically stripped the berries from the wax myrtle, Cerothamnus ceriferus bushes by the middle of February. On February 8 the writer observed a yellow-bellied sapsucker feeding on a dwarf sumac, Rhus copallina bush outside the service building. It was apparently eating the ripe berries. On two other occasions it was observed performing the act.

3. Diseases.

None.

B. Upland Game Birds.

1. Populations and Behavior.

a. Bob-white.

During the quarter 7 coveys (86 birds) have been observed and with the exception of a covey at the CCC Camp site all the other coveys have been observed within a mile of Camp Cornelia. One covey ranging around Camp Cornelia gave me considerable trouble by repeatedly entering my bird traps. On one occasion there were 3 birds in a step-trip trap at the same time. A Fabian trap was constructed of wood framing and R-V Lite. The R-V Lite was used in the hope that it would prevent bruised heads. The material did not entirely prevent bruised heads but they were not as badly bruised as they would have been had the birds been caught in a wire trap of the same type. Nine quails were taken in the traps one or more times. Eight of these were banded. The other one had been banded at my station October 25, 1947. On account of the almost daily tripping of the traps, even though a few of the traps were on platforms three feet above the ground, the traps were taken up to prevent injuries to the bob-whites. At the close of the quarter the males of mated pairs could be heard at Camp Cornelia whistling in every direction.

b. Eastern turkey.

Our observations and records on this species for the quarter are meager as we have only three records representing 7 individuals. All records were of birds seen crossing the headquarters and Chesser Island road. The writer has only heard one male gobbling. That was the morning of April 8 and it was near the swamp at the northwest corner of lot 83. Patrolman Davis reported hearing three gobblers at his home one morning in April.

c. Ground dove.

The pair of birds that were observed on Chesser Island last quarter have not been observed this quarter. Patrolman Davis reported seeing six individuals along the railroad tracks in Folkston, January 12. The writer observed one along the highway through Homeland April 14.

2. Food and Cover.

The acorn, pine mast, and berry crops were good so turkey and bobwhites should have had ample food. Lespedeza meibonia and the grasses produced abundantly so the upland game birds should have found it easy to obtain these foods. One shrub that did not produce a good berry crop was the saw palmetto, Serenoa repens, the abundant palmetto of the flatwoods around the swamp. In previous reports the writer has incorrectly called this plant Sabal minor.

C. Big Game Animals.

1. Populations and Behavior.

a. white-tailed deer.

There are only two sight records of this species on the refuge for the quarter. One was seen crossing the road one-half mile east of Camp Cornelia, the last week of April. The other animal, a doe, was observed March 28 on Jones Island by Patrolman Hall. On a trip to Floyd's Island March 30 the writer observed a deer crossing at the Indian mound.

b. Black bear.

Bear activity appeared to have decreased during the quarter compared to that of last quarter. The only sight record is that of refuge manager Edwards who observed an individual running down the old tram road when he flew over Floyd's Island January 9. The trampled and torn saw palmettos, Serenoa repens on the swamp islands is evidence that there are several bears on the islands. During the last week of April a bear killed three or four pigs for Ben Chesser who lives on Chesser Island. April 29 several men took stands off the refuge while dogs were placed on the bear's trail but the bear eluded the dogs and men.

## 2. Food and Cover.

Cover for both deer and bear is ample and with the abundance of saw palmetto, Serenoa repens, live oak Quercus virginiana, scrub oak, Quercus myrtifolia; running oak, Quercus pumila; black gum, Nyssa biflora either on the mainland or interior islands, bears should have been able to obtain ample food.

### D. Fur Animals, etc.

#### 1. Populations and Behavior.

##### a. Raccoon.

The raccoon population this quarter is as great or greater than for last quarter on account of the young ones that have been raised. The writer does not have any evidence that these animals destroy the eggs of the wood duck but it seems plausible that they do since raccoons eat the eggs of turtles and other birds. The writer is of the opinion that a removal program should be initiated for next winter.

##### b. Otter.

We have a few sight records of the otter for the quarter. January 9 while taking the waterfowl inventory in Grand Prairie, the writer and Tom Chesser observed one north of Monkey Lake. Plenty of otter signs have been seen on the Floyd's Island and Coffee Bay board walks.

##### c. Opossum.

This species is abundant in the pine flatwoods surrounding the swamp. Tracks can be observed in the roads at Camp Cornelia any day. Twice during the quarter the writer found individuals curled snugly in chicken nests in the chicken house. The animals were caught and carried some distance away where they were released.

##### d. Bob-cat.

Nothing to report on this species.

### E. Predaceous Birds.

#### a. Hawks.

The red-shouldered hawk was present in normal numbers during the quarter, but the red-tailed hawk was almost absent as there is only one record. Cooper's hawk was more common than the sharp-skinned hawk and as usual the pair of sparrow hawks roosted at Camp Cornelia usually on the ridge pole over the office door.

#### b. Swallow-tailed kite.

We have four records of this species for the quarter, two more than

for the corresponding quarter last year. Refuge Manager Edwards observed one January 3 as it flew across the highway between Argyle and Homerville, Georgia. The second record is that of a bird seen flying over Billy's Lake by Patrolman Hall, March 28. The writer observed the third one gliding over the tree tops at the Suwannee dam April 5. The last record is that of a pair observed flying over Mud Lake by Patrolman Davis April 12. From these records it can be stated that the species is either ranging more widely in search of food or there were more individuals present in the swamp this quarter.

c. Bald eagle.

There is only one record of this species for the quarter which is difficult to understand as we had four records for last spring. Patrolman Davis observed one on Chase Prairie February 27.

d. Osprey.

The first osprey observed this quarter was February 2 when a pair was seen flying around a nest on Chase Prairie by Patrolman Davis. Two days later Davis saw a pair flying over Buck Lake Prairie. There are five nests that are known to be used this year. The nest that was used last year on the Grand Prairie run approximately 1/2 mile from the canal, the nest in Mizell Prairie at Big Bend, the nest in a dead tree approximately one mile southwest of Mall Hammock Lake used last year, the nest that was used last year approximately 1/4 mile west of the Dinner Pond platform, and the nest that was used last year within sight of the Jones Island boat landing. There may be others in the swamp that have not been found. The pair occupying the nest at Big Bend was seen copulating on the nest April 20.

e. Crows.

The fish crow was observed February 2 when a flock of five individuals were flying along the canal at the "cutoff". The small flock that ranges along the canal does not appear to go beyond Coffee Bay. A few individuals were seen flying over Sapling Prairie April 12. The Florida crow seems to keep east of Trail Ridge so they are uncommon at Camp Cornelia.

f. Owls.

There is only one record of the great horned owl for the quarter whereas there are a dozen or more records for the Florida barred owl, the most common owl in the swamp. The screech owls have been rather silent during the quarter

G. Alligators.

Alligators continued to be seen in numbers throughout the quarter but in greater numbers in March and April. Patrolman Hall observed 35 alligators between Billy's Lake and Big Water March 28, 1948. At 10:00 A.M.,

April 18, the writer heard four bulls bellowing in Chase Prairie between the canal and Cooter Lake. April 5, the writer surprised a big gator basking in the sun near the 7 mile post. It must have been 20-24 inches across the back and 14 feet long. Patrolmen Coleman and Hall reported seeing a bunch of 30-35 gators, averaging 8 inches in length, on April 15, in the run a few hundred yards west of the Suwannee dam. Other small gators have been seen in a hole along the west side of Chase Prairie. Animals averaging less than 3 feet in length are seldom seen. On April 5 the writer came upon a small gator approximately 3-1/2 feet in length basking on floating maiden cane in the run beyond the Suwannee canal. The writer pushed the boat within paddle's length of it and his sides was rubbed with the paddle. The gator did not move. When the writer returned up the canal he again rubbed the side of the gator but he did not move. Would have been an excellent opportunity for a picture.

### III. REFUGE DEVELOPMENT AND MAINTENANCE.

#### A. Physical Maintenance.

A great deal of time was consumed in road maintenance during the period. Water diversion ditches were pulled with the Mathis plow along the Chesser Island road to prevent wash-outs. Abnormal rainfall in early April took out bridges and culverts on the Cornelia entrance road and also the Chesser Island road. The Charlton County road department extended great cooperation with the use of their heavy equipment in filling wash-outs and keeping the Cornelia road open to travel. The County furnished some large 30 inch metal culverts which could not be procured locally.

Over 200 fence posts were used to replace rotted posts in the fence line around the Cornelia headquarters. Rotted timbers were replaced on all cattle guards on the east side of the refuge.

While on upland patrol personnel continued to remark and cut out brush along boundary lines. Several lines were rerun by the Timber Scaler on the east side of the refuge.

Considerable time was spent repairing bridges on access roads into the south end of the refuge. It is necessary to keep these roads open to permit travel of fire fighting equipment. Many of the bridges span long strands of swamp and require periodic maintenance.

Adjustment and tuning of the FM 2-way radio equipment was continued in the first half of the period in an effort to secure required coverage. Antennas were mounted higher in the trucks containing the mobile units and larger batteries were installed to increase transmitter output. Finally the Acting Manager held a conference with several different technicians who had worked on the equipment and it was determined that the antenna height was lacking at the main station at Cornelia and the fixed station wattage was too low. Use of the radio equipment was discontinued during the period to await technicians from the National Park Service.

Numerous poles were cut to replace rotted ones in the telephone line from Camp Cornelia to Folkston. In several stretches the line was relocated to cut out angles and crooks. Improved telephone communication is being obtained since the line has been reworked. A telephone was installed in the Cornelia boat house to permit contact between the personnel working at the boat landing and the headquarters in event of fire or emergency calls.

Six outboard motors were given a spring tune-up during the period. Satisfactory performance is being experienced with the motors since personnel have been instructed in the motor maintenance system.

The boat "Anhinga" FWS-176 was pulled from the water and overhauled prior to being transferred to the Everglades Refuge. The hull was scraped and tested for rotted places and then repainted. The inside was scrubbed and flushed, then painted with red lead. Copper paint was applied to the bottom for use in salt water. Motor controls and lights were checked for operation. No work was accomplished on the motor since it was not large enough for the hull and intentions are to install a larger motor.

Six outboard hulls and four pole boats were overhauled and painted. Fire Extinguishers were installed in the motor boats.

Maintenance work was continued on all trucks, cars and tractors. The Maintenance Man was instructed to periodically tighten chassis and motor bolts on equipment. A first class mechanic is needed at Okfenokee to maintain the large fleet of equipment necessary for the administration of a refuge this size.

Personnel continued to recaulk the buildings at the Cornelia headquarters and to apply the wood preservative "Woodlife" to the logs. This preservative should have been applied to the logs years ago when they began to dry out. The buildings now require numerous applications of "Woodlife" before the logs begin to take on a darker color. The preservative is being applied with back pack fire pumps using a spray type nozzle.

It was necessary to again repair the roof of the cabin on Floyd's Island. High winds blew down limbs off of the large oaks surrounding the cabin. These limbs tore several holes in the roof. The only preventative for this would be to cut down the large trees surrounding the cabin. In the opinion of the writer this would be foolhardy and the only alternative is to repair the cabin roof when necessary. Temporary repairs have been made to the boardwalk through the Bay onto the Island from Chase Prairie. This walk will require complete rebuilding at quite some expense if it is used any longer. As an alternative it is suggested that the old pole boat trails alongside the walk be dynamited out to its original depth permitting access to the cabin.

Cleaning up and brushing out the lower end of the Cornelia headquarters site was continued. This site is taking on more and more the appearance of a National Wildlife Refuge headquarters. Purchase of the new tractor-type mower has enabled personnel to keep the lawns out low and in respectable condition.

Personnel continued cleaning out the old boat run from the end of the Suwannee Canal to the upper end of Billy's Lake. This waterway is to be used solely by refuge personnel in crossing from the east side to the west side of the refuge and vice versa for patrol purposes.

#### B. Physical Developments.

The annual waterfowl inventory was made on January 9th by the Acting Refuge Manager flown in a Piper Cub over the refuge area by a competent pilot at an average altitude of 50 feet. In addition a crew of 8 made a comparative inventory by boats. The results were startling in that approximately 10 times as many ducks were observed from the plane as were seen by the personnel in boats. Those in the boats claimed that they would not have seen many of the ducks they observed if the plane had not scared them up.

Outboard motors of greater horsepower were put into operation for patrol and travel in lieu of the smaller motors. Formerly small motors were operated at full throttle in an attempt to cut down travel time. Results were that the small motors were burned out in short periods. The larger motors can be operated at half throttle and still permit speedy and efficient transportation.

The larger motors operated at half throttle should provide economical transportation for a considerable length of time in comparison to the smaller motors.

The Dodge power wagon recently purchased for this station has been completely equipped as a fire fighting unit, with two each 120 gallon water tanks, a Panama pressure pump, hose, back pack pumps, flame throwers, flaps, etc. This unit will revolutionize fire fighting in the pine woods of the south.

Attempts were made again to pull fire lines along the "Pocket" road on the west side of the refuge for security burns. However, the small 22 H.P. tractor is not large enough to pull the Mathis plow. Funds in amount of \$3000.00, were allotted for the purchase of a D-4 type tractor for fire pre-suppression and suppression work at Okefenokee but were withdrawn by the Central Office.

Negotiations continued with the Okefenokee Association, Inc. and the Okefenokee Recreation, Inc. of Waycross and Homerville for operation of the guides concessions at the northern and western entrances to the refuge respectively. At the close of the period considerable progress had been made and it was expected that final drafts of contracts would soon be accepted by the organizations and the Service.

## IV. ECONOMIC USE OF REFUGE.

D. Timber Removal.

Under Special Use Permit No. 46-466 the removal of turpented pine trees on the east side of the refuge progressed as well as could be expected. Abnormal rainfall flooded the woods and roads for extended periods and temporarily made it necessary for the permittee to cease operations.

## V. FIELD INVESTIGATION OR APPLIED RESEARCH.

## A. Progress Report on Bird Banding.

## 1. Tabulation of Birds Banded during Quarter and to date.

Species	Prev. Banded	Number of Birds Banded						
		Jan.	Feb.	March	April	Qtr.	F.Y.	To Date
Water turkey	0	0	0	0	6	6	6	6
Ward's heron	0	0	0	0	23	23	23	23
Common mallard	0	1	0	0	0	1	1	1
Common black duck	0	0	1	0	0	1	1	1
Bob-white	5	5	3	0	0	8	9	13
Yellow-bellied sapsucker	0	1	0	0	0	1	1	1
Crested fly- catcher	0	0	0	0	1	1	1	1
Florida wren	5	0	0	0	5	5	5	10
Catbird	3	0	1	0	0	1	2	4
Hermit thrush	1	0	1	0	0	1	1	2
Bluebird	20	0	0	0	18	18	27	38
Myrtle warbler	1	2	0	0	0	2	3	3
Yellow-throat	0	1	0	0	0	1	0	1
Red-eyed towhee	48	3	0	0	0	3	5	51
White-eyed towhee	10	0	1	0	0	1	2	11
White-throated sparrow	28	1	3	0	0	4	9	32
fox sparrow	0	1	0	0	0	1	1	1
Others	941						858	941
	1062	15	10	0	53	78	935	1140

## 2. Banding.

Three duck traps were constructed in Chesser Prairie less than 1/4 mile from the canal but the batteries on which two of these traps were located sunk a short time after the traps were constructed. However, one female black duck was taken in the trap and banded. Another trap of the same type took a drake mallard which was banded before it was released. The portable trap did not catch a single bird but raccoons walked in and out of it. Next winter an effort will be made to trap some ducks for banding and the writer will make a special effort to locate traps on more stable ground.

The trapping of song birds at Camp Cornelia was not much better than my duck trapping operations. This may have been due to the scarcity of birds and the abundance of natural foods. Chipping, field, white-throated sparrows, towhees did not appear to be as numerous as last winter, whereas the fox sparrow was more common than last winter and one was trapped and banded. Last year two of the nesting boxes were occupied by bluebirds and each box having two broods. This year six of the boxes are occupied by bluebirds and four of the boxes had complements of 5 eggs. The other two boxes had complements of 4 eggs. Out of a total of 28 eggs, 27 of them hatched and at the close of the quarter 18 of the nestlings had been banded, and the others will be when they are large enough.

#### B. Mid-Winter Bird Population Studies.

The biologist participated in the first Mid-Winter Bird Population Census to be held under the auspices of the National Association of Audubon Societies. Two areas were selected for the studies. One was a pine and palmetto flatwoods of 48 acres lying south of Camp Cornelia. The other was Shallow Marsh (Prairie) consisting of 88 acres in Chesser Prairie, lying along the Suwannee Canal. The writer was rather surprised that the shallow marsh area had a total average of 277 birds per 100 acres, as compared to the total average of 137 birds per 100 acres for the pine and palmetto flatwoods area.

#### WINTER BIRD POPULATION CENSUS.

**Pine and Palmetto Flatwoods.** Size: 48 acres. Location: Okefenokee National Wildlife Refuge, Folkston, Georgia. Description of area: An immature second growth forest area, rectangular in shape lying on the south side of the old Suwannee canal between Camp Cornelia and the boat landing. The area was burned by an uncontrolled fire in the spring of 1946. All the decadent "boxed" trees with the exception of an average of four per acre were cut the spring of 1947. The canopy is about 80 feet in height, and the average diameter of the second growth tree trunks breast high is 7 inches; of the "boxed" trees 14 inches. It is characterized by a great variety of plants. Dominant trees in the order of their abundance are: longleaf pine (*Pinus palustris*), slash pine (*Pinus caribaea*), turkey oak (*Quercus Catesbaei*), upland willow oak (*Quercus cinerea*). A distinctive understory is present throughout the area and includes in the order of abundance the following species: saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), dwarf live oak (*Quercus minima*), dwarf wax myrtle (*Certhamnus pumilus*), huckleberry (*Cyanococcus myrainites*), staggerbush (*Xolisma fruticosa*), scrub oak (*Quercus myrtifolia*), large gallberry (*Ilex coriacea*) fetter-bush (*Desmothamnus lucidus*), sweet pepperbush (*Clethra alnifolia*), blackberry (*Rubus sp?*), gopher apple (*Chrysobalanus oblongifolia*). Certain portions of the area have dense stands of wiregrass (*Aristida*) and it is estimated that 75% of the area is covered with grass and pine straw. **Water:** Temporary pools occasionally formed after heavy rains in the middle of the east and on the south side near the southeast corner. No pools in January. **Climate:** Daily mean temperature during census period, 49 degrees (extremes 17 to 77 degrees); total precipitation, 4 inches. Ground slightly frozen two mornings of the census period.

Food: Pine mast and winter crop normal. Census dates: January 8, 11, 15, 16, 22, 23, 26, 30; February 1, 2, 1948. Total 10 trips. Total hours spent on area 18-3/4. Hours per trip averaged slightly over 1-3/4.

CENSUS - AVERAGE NUMBER OF BIRDS SEEN PER 100 ACRES OF HABITAT (WITH AVERAGE NUMBER OF INDIVIDUALS IN AREA PER TRIP IN PARENTHESES): turkey vulture, 3 (1.2); Florida red-shouldered hawk, - (.1); bob-white, 29 (1.4); yellow-bellied sapsucker, - (.1); hairy woodpecker, 1 (.6); downy woodpecker - (.2); red-cockaded woodpecker, 2 (1.2); red-bellied woodpecker, 1 (.6); phoebe, 1 (.3); tree swallow, 1 (.3); Florida nuthatch, - (.1); brown-headed nuthatch, 4 (2.0); house wren, 5 (2.5); Carolina wren, 3 (1.5); mockingbird, - (.2); catbird, 3 (1.4); brown thrasher, 1 (.3); robin, 33 (15.9); hermit thrush, 2 (.9); bluebird, 4 (2.0); golden-crowned kinglet, - (.2); ruby-crowned kinglet, 2 (1.2); mountain vireo, - (.2); orange-crowned warbler, - (.1); myrtle warbler, 17 (8.3); pine warbler, 6 (3.1); western palm warbler, 1 (.3); yellow-throat, 4 (1.9) red-wing, 2, (1.0); goldfinch, - (.2); red-eyed towhee, 2 (1.1); white-eyed towhee, 1 (.5); white-throated sparrow, 1 (.4); swamp sparrow, 1 (.4). Total: average of 137 birds per 100 acres. Remarks: On several occasions I observed species listed above feeding along the canal approximately 5 chains from the area but did not record them on the area. The pine warbler were always observed feeding with bluebirds. The turkey vulture, red-wings, goldfinches were observed flying over the area and were never observed feeding on the area.

SHALLOW MARSH (PRAIRIE). Size: 88 acres. Location - Okefenokee National Wildlife Refuge, Folkston, Georgia. Description of area: A rectangular shallow marsh being a portion of Chesser Prairie lying along the old Suwannee canal between the cut-off canal and Grand Prairie inlet. Dotting the area are little islands or houses (varying in size from a room to  $\frac{1}{2}$  acre) which either were originally higher points of land or have become so by accumulation of vegetable debris. However it is difficult to find enough dry land in these houses for a camp site. Some of the houses are composed of shrubs alone such as buttonbush (*Cephalanthus occidentalis*), black titi (*Cyrilla racemiflora*) yaupon (*Ilex cassine*), fetterbush (*Desmodium lucidus*), (*Eubotrys racemosa*), chokeberry (*Aronia arbutifolia*), bamboo-vine (*Smilax laurifolia*). The larger houses usually have a central core of trees such as swamp red bay (*Gordonia losianthus*), pond pine (*Pinus serotina*), pond cypress (*Toxodium ascendens*), white bay (*Magnolia virginiana*). Many trees are draped with Spanish moss (*Dendropogon usneoides*) and tower far above the fringe of shrubs. There are several aquatic plants well distributed over the area, the chief ones being duck grass (*Rynchospora alba*), never-wet (*Orontium aquaticum*), maiden cane (*Panicum hemitomum*), white water lily (*Castalia odorata*), floating heart (*Nymphoides aquaticum*), pickerel weed (*Pontederia cordata*), green arum (*Peltandra virginica*), button grass (*Ericoaulon compressum*), yellow-eyed grass (*Xyria Smalliana*), plume grass (*Erianthus saccharoides*), bladderwort (*Utricularia* sp?). Water: Varies from 1-2 or 3 feet in depth over the entire area including the islands or houses. The shallow waters are filled with (*Utricularia*) and slimes and it is difficult to pole a boat through them. Climate: Daily mean temperature during census period, 49 degrees (extremes 17 to 77 degrees); total precipitation, 4 inches.

Ground slightly frozen two mornings of the census period. Food: Aquatic plants and winter fruit crop normal. Census dates: January 8, 11, 15, 16, 22, 23, 26; February 2, 3. Total 9 trips. Total hours spent on area,  $22\frac{1}{2}$ . Hours per trip averaged  $2\frac{1}{2}$ .

CENSUS-AVERAGE NUMBER OF BIRDS SEEN PER 100 ACRES OF HABITAT (WITH AVERAGE NUMBER OF INDIVIDUALS IN AREA PER TRIP IN PARENTHESES); pied-billed grebe, 1 (.9); Ward's heron, (.2); American egret, 3 (2.6); mallard, 4 (3.5); black duck 1 (.7); baldpate, 1 (.6); wood duck, 4 (4.0); turkey vulture, 1 (1.4); black vulture - (.3); Cooper's hawk - (.3); Florida red-shouldered hawk - (.3); Florida crane, - (.2); Florida gallinule, - (.2); coot, 4 (4.0); barred owl, 1 (.7); belted kingfisher, 1 (.8); flicker, - (.4); pileated woodpecker, 1 (.8); red-bellied woodpecker, 1 (.8); downy woodpecker, - (.1); phoebe, 2 (2.2); tree swallow, 8 (7.0); Carolina wren, 1 (.5); mockingbird, 4 (3.4); catbird, 5 (4.7); brown thrasher, - (.1); robin, 172 (151.4); hermit thrush, - (.3); golden-crowned kinglet, 1 (1.2); ruby-crowned kinglet, 10, (8.6); cedar waxwing, 22 (19.8); orange-crowned warbler, 1 (1.2); myrtle warbler, 8 (7.0); yellow-throated warbler, - (.2); yellow-throat, 3 (2.7); red-wing, 2 (1.5); grackle, 1 (1.1); cardinal, 1 (.6); goldfinch, - (.1). Total: average of 277 birds per 100 acres. Remarks: The large number of robins and cedar waxwings is probably due to the abundance of yaupon berries on the area. No egrets were observed feeding on the area but there was a roost at the northwest end of the area. The vultures, Florida cranes and the goldfinch were observed flying over the area.

## VI. PUBLIC RELATIONS.

### A. Recreational Uses.

Sightseers, fishermen and scientists continued to visit the refuge in increasing numbers. It is estimated 5000 persons visited the refuge during the period as compared to 3000 for the same period in 1947 and 1000 for the period in 1946.

The increase in the number of visitors to the refuge is attributed to the national advertising being sponsored by the Okefenokee Association, Inc. of Waycross, Georgia and the excellent fishing being enjoyed by visiting fishermen.

### B. Visitors.

Dr. Watson of the Atlanta Regional Office and Mr. Charles N. Belt of the American Museum of National History arrived at the refuge on January 19th and spent two nights at the cabin on Floyd's Island in company with Patrolman Nazworth and Biologist Fleetwood. They departed the evening of the 21st.

Dr. Gross, Biologist from Region 5 arrived February 12th for bird study in Okefenokee.

On the evening of February 18th, Refuge Supervisor Miller arrived for inspection. Mr. Miller departed on the morning of the 20th.

Mr. George Cenup of Predator and Rodent Control and Mr. Stanley P. Young of the Research Branch visited the refuge from March 2nd through the morning of the 3rd for a discussion on bob-cats.

Mr. Fred Brewer of the Georgia Game and Fish Commission visited the Waycross Office on March 24th for a conference with the Acting Refuge Manager on cooperative patrol. Mr. Brewer was accompanied by Mr. Harrell, District Supervisor from Jesup, Georgia.

Mr. Ed Friend of the Georgia Game and Fish Commission and party were escorted through the refuge on March 26th by Patrolmen Hall and Coleman.

Mr. Edwin Moss Williams, Vice-President of the United Press Association and his son, arrived at the Waycross office on March 27th. They visited the east side of the refuge on the 28th and were escorted from the north end of the refuge through to Jones Island on the west side by Edwards and Dave Da Lie of the Okefenokee Swamp Park on the 29th. Mr. Williams desired to get an inside picture of the swamp in order to clarify printing of the United Press news items pertaining thereto.

Mr. Frank DuFresne of the Washington office and party arrived on April 17th and spent the afternoon inspecting the Okefenokee Swamp Park in connection with the northern entrance to the refuge. On the 18th Mr. DuFresne and party were escorted in motorboats by Patrolman Hall and Manager Edwards from the Swamp Park onto the refuge and then to Dinner Pond and return.

#### C. Refuge Participation .

Acting Manager Edwards attended numerous meetings of civic organizations in Waycross, Homerville and Folkston during the period upon special invitations and gave short talks on the refuge and aims and purposes of the Fish and Wildlife Service.

#### D. Hunting.

Deer hunting on areas adjacent to the refuge was excellent at the close of the season January 5th. Likewise an abundance of quail could be found on these same areas and observations after February 15th, when the season closed, indicated a good number remained for propagation purposes.

Wild turkeys appear to be staging a comeback on these areas and luckily were not hunted to any extent.

#### E. Fishing.

Due to abnormally high water on the refuge during the period fishing could only be considered fair. Bass fishing was good in the deep prairie holes but only fair elsewhere. Perch began biting good toward the close of the period. Fishing pressure greatly increased over previous corresponding periods.

F. Violations.

Leon Crawford of St. George, Georgia was apprehended by Manager Edwards fishing on the refuge April 20th without a license. The case will be settled in State court.

Several persons were apprehended fishing on the refuge after daylight hours and were released after being warned of the violations. No other reports of violations were received.

Enforcement

Continued attempts were made in an effort to procure some sort of forest green color uniform at a reasonable cost for use by patrolmen at Okefenokee. Some progress was made on trousers but no company seems interested in supplying shirts. Adoption of a uniform at Okefenokee will greatly increase respect for the refuge patrolmen by natives and visitors.

VII. OTHER ITEMS OF INTEREST.

The temporary appointment covering the position of Laborer-Patrolman was terminated during the period and a regular position established. At the close of the period it was planned to transfer a patrolman from the Reelfoot Refuge to Okefenokee to fill the position.

Respectfully submitted,

*Wm. R. Edwards*

Wm. R. Edwards  
Acting Refuge Manager

May 14, 1948.

Date *May 19/1948* .....

Approved *Edward Mill* .....

## ANNUAL REPORT.

Several weather records were recorded during the yearly period. A record total of 78.21 inches of precipitation was established. According to records in the Waycross office this total is greater than any for corresponding 12 months periods. On April 1, a total of 5.2 inches of rain fell in twenty-four hours. As regards water level an all time high of 123.10 was recorded on the Cornelia gauge on April 3rd. This record is attributed to the heavy dampness on April 1 and 2.

Only one fire occurred during the entire annual period. This occurred on June 9th when the uplands woods were very dry. This fire was attributed to carelessness of laborers cutting pulpwood in connection with the timber operation. The abnormal rainfall greatly reduced the fire danger. However the drastic reduction in fires is also attributed to efficient patrol and cooperative patrol entered into with the Clinch County and Charlton County TPO and the large timber companies surrounding the refuge.

Use of a plane in making the annual waterfowl inventory provided coverage of areas not accessible by boat or on foot. An increase in ducks and herons was recorded over the previous inventory. However, this may have been attributed to the coverage of new areas.

The refuge continued to rise in popularity as an attraction for tourists, scientists and sightseers. Fishing pressure greatly increased over preceeding corresponding periods. More and more out of state fishermen purchased non-resident licenses from the Chief Guides at the eastern and western entrances. On an average fishing was considered good during this period. The high water scattered the fish in the prairies and lakes which made the boys work for their catches. Nevertheless, many excellent catches were made of bass in the prairie areas which inaugurated a new type of bass fishing at Okefenokee.

Hunting of deer, bear, wild turkey, quail and squirrels on areas immediately adjacent to the refuge continued to improve. Hunters were delighted with their take and were high in their praise of the refuge which afforded protection and permitted the overflow on adjacent areas.

Refuge personnel continued to trap bears, which came off the refuge and preyed on hogs and cows. Excellent cooperation was received in this trapping program from cattle raisers and stock owners. This action pacified the natives and no requests were received to permit bear hunting on the refuge. //

Personnel received advanced enforcement training which paid good dividends since no raids were made by would-be hunters on the alligators and deer and fishing violations greatly decreased. Patrolmen checked bag limits of fish constantly which put a stop to fish being hauled away from the refuge in wash tub loads.

Under an equipment maintenance training program personnel showed considerable improvement in the upkeep of cars, trucks, motors and boats. This maintenance plan will provide more economic operation of equipment in the long run.

The log buildings at Camp Cornelia were recaulked and sprayed with a wood preservative on the exterior. This work began during the period preceding this one and was continued throughout this whole period when time permitted. The exteriors of the buildings had not been given any preservative treatments since their construction until this program was inaugurated and the logs had dried out and cracked to some extent. It is believed that continued application of the preservative will retard deterioration.

The Acting Refuge Manager continued to negotiate with the several civic organizations surrounding the refuge regarding the operation of guide concessions at the eastern, western and northern entrances. At the close of the period considerable progress had been made and final drafts of contracts were submitted by the Central Office to the respective organizations for acceptance. Negotiating these contracts required a great amount of the Acting Manager's time and it is expected a good deal more of refuge personnel's time will be consumed before the concessions are operating according to schedule and construction of facilities have been completed. However, it is believed that this will be one of the most important assets to Okefenokee in that visitors to the refuge will be afforded decent accommodations.

WATERFOWL

Refuge Okefenokee Months of January to April 1948.

(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 Cackling goose Brant White-fronted goose Snow goose Blue goose	7	1/21	7	1/21	7	1/21	None	None	7
III. <u>Ducks:</u> Mallard	present		4,192	1/9	2	3/19	None	None	4,192
Black duck	present		1,808	1/9	5	3/14	None	None	1,808
Gadwall	present		75	1/9	75	1/9	None	None	75
Baldpate	present		68	1/9	19	2/20	None	None	68
Pintail	present		593	1/9	3	3/24	None	None	593
Green-winged teal	present		78	1/9	2	4/24	None	None	78
Blue-winged teal	present		40	1/9	2	3/28	None	None	40
Cinnamon teal									
Shoveller	present		862	1/9	still present		None	None	862
Wood duck									
Redhead	present		1153	1/9	4	3/24	None	None	1153
Ring-necked duck	1	2/11	1	2/11	1	2/11	None	None	5
Canvas-back									
Scaup									
Golden-eye									
Buffle-head	present		19	1/9	19	1/19	None	None	19
Ruddy duck	present		5	2/18	2	2/29	None	None	50
Hooded merganser	present		137	1/9	6	3/18	None	None	137
IV. <u>Coot:</u>	present		402	1/9	9	3/21	None	None	402

## SUMMARIES

### Total Production:

Geese 7

Ducks 9,080

Coots 402

Total waterfowl usage during period 9,489

Peak waterfowl numbers 9,440

Areas used by concentrations Grand, Chesser, Sapling, Mizell,

Floyd's Island, Buck Lake Prairies and Cedar Thicket.

Principal nesting areas this season \_\_\_\_\_

Reported by Wm. R. Edwards

R. J. Fleetwood

## 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 Okefenokee Months of January to April 1948

(1) Species  Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Colonies	Total # Nests	Total Young	
I. Water and Marsh Birds:										
Common loon	1	1/9	5	4/13	3	4/13	None	None	None	4
Horned grebe	present		10*	1/30	2	2/18	None	None	None	10
Pied-billed grebe	present		100*	3/15	1	4/24	None	None	None	100
Cormorant	present		9	1/9	still present		None	None	None	78
Water turkey	present		20	4/13	still present		1	8	6	160
Ward's heron	present		94	1/9	still present		2	32	36	500
American egret	present		206	1/9	still present		None	None	None	1500
Snowy egret	present		2	1/9	still present		None	None	None	50
Little blue heron	1	2/27	23	4/29	still present		None	None	None	150
Green heron	1	3/12	100*	4/20	still present		None	None	None	100
Yellow-crowned night heron	present		12	4/30	still present		None	None	None	125
Wood ibis	2	3/14	50*	4/30	still present		None	None	None	50
White ibis	4	3/10	45	3/30	still present		None	None	None	300
Florida crane	present		92	1/9	still present		None	None	None	278
Gallinule	present		50*	4/30	still present		None	None	None	50
II. Shorebirds, Gulls and Bittern Terns:										
Wilson's snipe	present		19	19	3	4/5	None	None	None	200
Woodcock	present		50*	4/20	still present		None	None	None	50
Solitary sandpiper	2	4/29	2	4/29	still present		None	None	None	15
Spotted sandpiper	1	4/29	20*	4/30	still present		None	None	None	20
killdeer	present		11	1/1	2	1/30	None	None	None	50
Herrin gull	9	1/27	9	1/27	1	4/7	None	None	None	10

\* Estimated.

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	present	300*	1/27	still present	None None None 300
White-winged dove					
Ground dove	present	2*	4/30	still present	None None None 2
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl	present	40*	4/30	still present	None None None 40
Magpie					
Raven					
Crow	present	50*	3/30	still present	None None None 50
Fish crow	2 2/2	60*	4/30	still present	None None None 60
Osprey	2 2/2	18	3/19	still present	None None None 24
Bald Eagle	present	5*	1/30	still present	None None None 5
Red-shouldered hawk	present	15	2/18	still present	None None None 600
Red-tailed hawk	present	30*	1/30	still present	None None None 30
Marsh Hawk	present	25*	1/30	1 2/18	None None None 25
Barred owl	present	100*	4/30	still present	None None 50* 300

Reported by

\*Estimated.

#### INSTRUCTIONS

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

3-1752  
Form NR-2  
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Okefenokee Months of January to April, 1948

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
	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	
Bob-white	50,000 pine woods, fields, islands	50	0	0	53% male 47% females	N	0	N	1000	Pertinent information not specifically requested. List introductions here.
Turkey	pine woods, fields, islands	333 $\frac{1}{2}$	0	0		N	0	N	160	

## INSTRUCTIONS

3-1782  
Form NR-2  
(April 1948)

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.

SMALL MAMMALS

Refuge Okefenokee Year ending April 30, 8

(1) Species  Common Name	(2) Density  Cover Types & Total Acreage of Habitat Acres Per Animal		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
			Hunting	Fur Harvest	Predator Control *	Fur Re- stocking	Fur Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated		Furs Destroyed
								Permit Number	Trappers Share	Refuge share				
Raccoon	3,000 acres		0	0	0	0	0	0	0	0	0	0	0	1500
Striped skunk	timbered uplands, swamp marshes		0	0	0	0	0	0	0	0	0	0	0	600
Opossum	"		0	0	0	0	0	0	0	0	0	0	0	300
Grey squirrel	"		0	0	0	0	0	0	0	0	0	0	0	1500
Fox squirrel	50,000 acres upland hardwoods		0	0	0	0	0	0	0	0	0	0	0	1000
Weasel	" "		0	0	0	0	0	0	0	0	0	0	0	91
Rabbit	"		0	0	0	0	0	0	0	0	0	0	0	2000
Fox	"		0	0	0	0	0	0	0	0	0	0	0	50
Otter	250,000 acres marsh and swamp		0	0	0	0	0	0	0	0	0	0	0	1250
Mink	"		0	0	0	0	0	0	0	0	0	0	0	625

\* List removals by Predator Animal Hunter

REMARKS:

Reported by \_\_\_\_\_

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. 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, bottom land 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) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprime-ness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

REFUGE GRAIN REPORT

Okefenokee

Refuge.....

Months of January thru April 1948.

(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.
Shelled corn and mixed grains	8	3	11			6	6	5	5		

(8) Indicate shipping or collection points..... Folkston, Georgia.....

(9) Grain is stored at..... Camp Cornelia headquarters, Folkston, Georgia.....

(10) Remarks..... Used for baiting duck banding traps by Biologist......

REFUGEE GRAIN REPORT

NR-8a

REFUGEE 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.

(8) Indicate shipping or collection points

(9) Grain is stored at

(10) Remarks