

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: OCT. 8, 1946

MR. SALYER

SECTION OF HABITAT IMPROVEMENT:

~~MR. BROWN~~

~~Mr. Griffith~~

~~MR. KRUMHOLTZ~~

MR. DUMONT

~~Dr. Brown~~

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SECTION OF OPERATIONS:

SECTION OF LAND MANAGEMENT:

Mr. Regan

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~~Mr. KENT~~

MR. BAIL

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~~Mr. KENT~~

SECTION OF STRUCTURES:

STENOGRAPHERS:

~~Mr. Taylor~~

REMARKS:

MISSISQUOI NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY - AUGUST 1946

Return to:

MISS COOK



MISSISQUOI NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY, JUNE, JULY AND AUGUST, 1946

I. GENERAL

A. Weather Conditions

The data in the following table was supplied through the courtesy of the United States Weather Bureau station at Burlington, Vermont. This station is located about 40 miles south of the refuge. Since the weather reports are seldom received prior to the tenth of the month, the period covered is from April through July.

	Precipitation		Snowfall		Mean Temperature			
	Total	Normal	Total	Normal	Maximum	Minimum	Mean	Normal
April	2.31	2.15	3.9	4.1	52.0	32.0	42.0	43.3
May	4.03	2.85	0	0.1	64.0	43.4	53.7	56.5
June	1.57	3.38	0	0	77.3	52.4	64.8	65.7
July	3.89	3.50	0	0	80.5	56.6	68.6	70.3
Totals	11.80	11.88	3.9	4.2	Mean 68.5	46.1	57.3	59.0

The mean temperature for this period was nearly two degrees below normal. However, there was a wider variation in temperature than normally occurs; in every month except May the mean maximum temperature was somewhat above normal while in every month the mean minimum temperature was from three to five degrees below normal. Total precipitation and snowfall were nearly normal for the period. However, precipitation during May and June departed considerably from normal; in the former the rainfall was 41 per cent greater while in the latter it was 54 per cent less than usually occurs.

B. Water Conditions

Water levels were close to normal throughout this period. Heavy rains during the month of May kept the water level relatively high over a longer period than usual. However, by late June the scarcity of rainfall during that month made itself evident in the steady drop in the water level. From a high of four feet above mean low water the first of May there was a steady decline to just under one foot above mean low water in late August. There were no sudden or extreme fluctuations in water levels during the period.

C. Fires

Since so much of the refuge is low and marshy there is very little danger from fires. Although parts of the area were dry enough to burn during August, no fires occurred during this period.

II. WILDLIFE

A. Migratory Birds

1. Populations and Behaviors.

a. Waterfowl - The spring migration of waterfowl extended well into May this year. The species which are observed on the refuge during migration only were present throughout the greater part of the month. Approximately 800 birds were using the refuge at times early in May. Of this number about 70 per cent were Black Ducks, 10 per cent Golden-eyes, 5 per cent Blue-winged Teal, 5 per cent American Mergansers, and the remainder Wood Ducks, Green-winged Teal, Ring-necked Ducks and Mallards in that order. One Hooded Merganser and one flock of about 100 Scaup were observed.

By early June only the resident species remained. An estimated 150 waterfowl were using the refuge at this time. Of these about 60 per cent were Black Ducks, 20 per cent Wood Ducks, 10 per cent Golden-eyes and 10 per cent Blue-winged Teal. This number was increased throughout July and August by the production of young and a gradual influx of migrant birds. Green-winged Teal and a very small number of Mallards appeared late in August as well as more Black Ducks, Wood Ducks and Blue-winged Teal. The number of birds using the refuge at present is probably near that at the beginning of the period.

Although migrant birds were not as plentiful as in previous years (probably because of the extended period of migration due to weather conditions) the nesting population appeared to be equal to or greater than that of last year. At any rate more broods were observed. Water levels remained moderately high and quite static during the height of the nesting season. During the first half of the period most of the waterfowl remained in the seclusion of the flooded perimeter of the refuge. In mid-June two full days were spent by the Refuge Manager and Refuge Aid searching for waterfowl nests around Big Marsh Slough and along the south side of the marsh itself. Although numerous birds, mainly Black Ducks, were flushed, no nests were located. Also a careful watch for nests was kept during the accomplishment of other tasks on the refuge. The only nests found were those of Wood Ducks and Golden-eyes in trees. A notable exception to this was a Black Duck nest located in a hollow in a tree on May 22. This nest site, about seven feet above the ground, had been used earlier in the season by a Wood Duck; both nests were destroyed by raccoons before the clutches of eggs were complete.

The improved tree nesting sites for Wood Ducks and Golden-eyes were checked several times during May and the first half of June. Of the fourteen nests found in these sites ten, approximately 70 per cent, were destroyed by predators. In most cases all indications point to raccoons as being responsible for the losses. From the number of broods observed later in the season, however, it is evident that some of these birds re-nested.

It was not until July that the water level receded to a point where the adults and broods were forced out into the open. Then the results of a fairly successful hatching season were more in evidence. The following brood observations were made:

Black Ducks

Date	Number	App. Age	Location
May 29	7	✓ 1 week	Flooded section of Shad Island
June 16	9	✓ 4 weeks	West shore Gander Bay
June 19	9	✓ 4-5 weeks	Shad Island
June 25	6 plus	✓ 5 weeks	Shad Island (Probably same as May 29 brood)
	2 plus	✓ 5 weeks	Shad Island (Probably same as June 19 brood)
July 8	9	✓ 4-5 weeks	Mouth of East Branch
July 9	5	✓ 6 weeks	Goose Bay
July 10	8	✓ 6 weeks	River above Metcalf Island
July 16	5	✓ 4 weeks	Mack's Bend
	7	✓ 6 weeks	Goose Bay
July 21	12	✓ 7 weeks	Middle Branch at upper end Shad Island
July 22	6	✓ 7 weeks	East Branch
July 27	13	✓ 5 weeks	Big Marsh Slough
	3	✓ 5 weeks	Big Marsh Slough
	2 plus	✓ 2 weeks	River at Rood's Island
	8	✓ 6 weeks	River near south boundary of Refuge
Aug. 23	4	✓ 6-7 weeks	Gander Bay

Wood Ducks

June 13	9	4 weeks	Marsh at head of Goose Bay
	7	4 weeks	Between Big Marsh Slough and camp trail
June 16	2 plus	1 week	West shore Gander Bay
July 6	10	7 weeks	Saxes' Creek
July 8	2	4 weeks	Big Marsh Slough
July 10	8	5 weeks	Big Marsh Slough
July 15	8	2 weeks	River near Shad Island
July 22	12	7-8 weeks	River near Shad Island
	7	6 weeks	River near Shad Island
July 27	2 plus	4 weeks	Mouth of Dead Creek

Golden-eyes

June 20	5 week	1 week	Gander Bay off Martindale Point
June 22	2	4 weeks	Goose Bay
June 25	6	3 weeks	Goose Bay
	6	6 weeks	Goose Bay
June 28	6	4 weeks	Goose Bay (Probably same as June 25 brood)
July 3	3	6 weeks	Goose Bay

Blue-winged Teal

Date	Number	App. Age	Location
July 27	12	2 weeks	Middle Branch at upper end Shad Island
	4	3 weeks	Mouth of Big Marsh Slough
	7	1 week	River below Rood's Island

b. Other Waterbirds - Probably the most abundant species in this group is the Great Blue Heron. The heron rookery on Shad Island appeared to be slightly larger than last year with several new nests in evidence. The rookery was visited several times and on July 9 the young were making short flights to trees adjoining their nests. Apparently the nests averaged about three young birds each. The greatest number of adult birds observed in one day was eighteen.

American Bittern were quite numerous on the refuge but not as much in evidence as the Blue Herons. One nest located on May 20 contained five eggs. Four of these hatched early in June and on June 16 appeared ready to leave the nest. The greatest number of adult bitterns recorded in one day was ten.

Black Tern appeared on the refuge earlier than usual this year; the first group of eighteen was observed on May 14. Approximately that number remained on the refuge throughout June but in July their numbers declined; none of the tern were observed after the first week of August. In June some of these birds gave all the appearances of nesting in Goose Bay; however, no nests could be located.

A Florida Gallinule nest containing ten eggs was located near the upper end of Big Marsh Slough on June 5. This nest was kept under observation for two days before the extremely shy owners could be seen and identified. The young hatched and left the nest between June 15 and June 20. It is believed that these birds are more common on the refuge than the infrequent glimpses of them would indicate.

Herring Gulls were present daily in small numbers and on two occasions Common Tern were observed in Missisquoi Bay near the refuge. Pied-billed Grebes were present throughout the period but these extremely shy birds were observed only twice. Green Heron were not as plentiful as last year but two were observed several times throughout the period. The same is true for Black-crowned Night Heron. Two American Egrets were observed on several occasions during August.

c. Shorebirds - During the early part of the period there was not enough shoreline exposed to attract any numbers of these birds. However, several Spotted Sandpipers were present throughout the period. Other shorebirds occasionally observed in small numbers include Wilson's Snipe, Killdeer, Greater Yellow Legs and American Woodcock (one observation). A brood of young Wilson's Snipe was observed near the mouth of Big Marsh Slough in July.

d. Song Birds - Following is a list of the small birds observed on or near the refuge with their relative abundance. This is not a complete list of the birds present since no attempt was made to catalog all the small birds on the area.

<u>Species</u>	<u>Relative Abundance</u>
✓ Whip-poor-will	Common
✓ Nighthawk	Scattered
✓ Chimney Swift	Scattered
✓ Belted Kingfisher	Abundant
✓ Northern Flicker	Scattered
✓ Hairy Woodpecker	Common
✓ Downy Woodpecker	Abundant
✓ Eastern Kingbird	Abundant
✓ Crested Flycatcher	Abundant
✓ Eastern Phoebe	Scattered
✓ Least Flycatcher	Scattered
✓ Wood Pewee	Scattered
✓ Tree Swallow	Abundant
✓ Bank Swallow	Common
✓ Barn Swallow	Scattered
✓ Black-capped Chickadee	Scattered
✓ White-breasted Nuthatch	Scattered
✓ Long-billed Marsh Wren	Common
✓ Catbird	Scattered
✓ Brown Thrasher	Scattered
✓ Eastern Robin	Common
✓ Hermit Thrush	Scattered
✓ Veery	Scattered
✓ Eastern Bluebird	Scattered
✓ Starling	Common
✓ Philadelphia Vireo	Scattered
✓ Warbling Vireo	Scattered
✓ Black and White Warbler	Scattered
✓ Yellow Warbler	Common
✓ Magnolia Warbler	Scattered
✓ Northern Water Thrush	Scattered
✓ Northern Yellow-throat	Common
✓ Canada Warbler	Scattered
✓ American Redstart	Common
✓ House Sparrow	Common
✓ Bobolink	Common
✓ Red-wing	Abundant
✓ Baltimore Oriole	Common
✓ Bronzed Grackle	Abundant
✓ Cowbird	Scattered
✓ Eastern Goldfinch	Scattered
✓ Chipping Sparrow	Scattered
✓ Field Sparrow	Common
✓ White-throated Sparrow	Scattered
✓ Swamp Sparrow	Scattered
✓ Song Sparrow	Common

2. Food and Cover.

There was no scarcity of food or cover for migratory birds on the refuge throughout this period. In fact a somewhat larger population of all birds except the shorebirds could have been supported with ease. Along with the other duck foods wild rice was abundant especially along Dead Creek, the river and the slough. Wild Celery was abundant reaching its best growth in Goose Bay. No supplementary feeding was done.

3. Diseases.

No evidence of disease was found among the migratory birds on the refuge during this period.

B. Upland Game Birds

Although approximately 700 acres of suitable cover as well as abundant food material are available, no upland game birds were observed on the area throughout the spring and summer. The single Ruffed Grouse which was occasionally observed during the fall and winter evidently deserted the refuge about the time of the early spring flooding or fell victim to some predator.

C. Big Game Animals

1. Populations and Behavior.

The only big game animals present on the refuge are White-tailed deer. Tracks of these animals were found on nearly all parts of the refuge throughout the period. One or two deer were observed at times. When the water level was high during the spring, these animals spent most of their time on the Clark and Cheney properties south of the refuge. Later, however, they were more in evidence on the refuge.

2. Food and Cover.

Food and cover were plentiful for the number of animals on the refuge. As the water level receded more deer utilized the area. The river ridge and intersecting ridges as well as the south boundary meadow provided adequate range for these animals. No artificial feeding was needed.

3. Disease.

No evidence of disease among the deer was found this period. Neither were they harassed by dogs as they were during the early part of the winter.

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

1. Fur Animals.

By far the most important furbearer present is the Muskrat. Signs of these animals were much in evidence over most of the refuge. Notwithstanding the 479 'rats trapped during the fall and spring trapping seasons, their number is probably about the same as last year. Food and cover are plentiful; however, if the present low water level continues, forcing the animals to concentrate on the perimeter of the refuge, they will be subjected to heavy trapping just outside the boundary line this fall. Also low water levels during the winter would cause the 'rats to travel on top of the ice more, thus subjecting them to heavy predation, mainly from the Red Fox. The fact that no dead 'rats were found on the refuge during this period indicates that they were not seriously troubled by parasites or disease.

A litter of young skunks was observed near the south boundary meadow in the spring. On one or two night patrols of the refuge one of these animals was observed scratching for food in the ground litter. Mink and weasel are probably present on the area in small numbers but were not in evidence during this period.

2. Predators.

Although a furbearer, the raccoon has given so much trouble by destroying Wood Duck and Golden-eye nests as well as interfering with duck trapping activities, that it must be classed here as a predator. The 'coons appear to be increasing in numbers and the refuge is ideal habitat for them. The old-growth swamp hardwood with its innumerable hollow trees and a bountiful supply of frogs assure the "ring-tails" of unfailing food and cover. Approximately 75 per cent of the Wood Duck and Golden-eye nests which were located during the spring were destroyed; marks on the trees in most cases indicate that 'coons were largely responsible for the losses. The first night the duck traps were in operation a 'coon entered one of them and killed two Wood Ducks. Duck trapping was then halted for ten days until some of the 'coons could be removed from the area. Authority has been previously granted to live-trap and remove some of these animals. Earlier in the summer a box trap was designed and built from scrap lumber and chicken wire from illegal fish traps seized by the state wardens. This trap proved successful so two more were built. Until the present time five raccoons have been caught in these traps and turned over to the state wardens to be liberated in some area where they will not be so troublesome.

The only other four-footed predator of consequence, the Red Fox, was not so much in evidence during the spring and summer months. However, signs of them were observed from time to time and it is believed that they will be plentiful as usual this winter. A dead fox was located on May 22 near the south boundary meadow. This animal had been dead for

no out of line
fellow giving

one caught while
was down - in

some time; it is probable that it was wounded by fox hunters across the river from the refuge in late winter and it was able to travel as far as the refuge before it died.

3. Other Mammals.

Aside from those mentioned above the Gray Squirrel is the only other small mammal observed on the refuge. These are not abundant even though food and cover are plentiful.

E. Predaceous Birds Including Crows.

Several species of predaceous birds were observed on the refuge. Most abundant of these were crows. Five crow nests were located and the presence of at least four more was evident from the calls of the young. No direct evidence of nest robbing by crows could be found. However, from past observations it is probable that they accounted for some losses to nesting waterfowl.

Second in numbers and perhaps in predation was the Marsh Hawk. From one to five were observed daily; toward the latter part of the period they became more numerous. On one occasion a Marsh Hawk was flushed from a Wood Duck upon which it was feeding; since it was very unlikely that this duck was wounded by hunters it is probable that it was killed outright by the hawk.

An occasional broadwing hawk was observed on the refuge and three different Bald Eagles were identified from time to time. However, no evidence of predation by these birds was found. Rough-legged Hawks, Great Horned Owls and Short-eared Owls are known to be present on the area but none were observed during this period.

F. Fish

Yellow Perch were by far the most abundant fish in refuge waters. Other species included Rock Bass, Calico Bass, Blue Gill, Black Bass, Pickerel and Horned Pout. In spring and early summer numerous carp and schools of one hundred or more Gar-pike were to be seen in the shallow waters along the boundary as well as in Big Marsh Slough. These two latter species reached sizes of from three to four and one-half feet in length; it is believed that they do considerable damage. The Carp root up many of the plants utilized as food by waterfowl and muskrats, while the Gar-pike are believed to prey upon smaller fishes.

During Late June and July unusually large numbers of dead fish were observed especially in Goose and Gander Bays. These were mainly Yellow Perch but all species known to be present were represented except Gar-pike. One 3½-pound Black Bass found in a dying condition had lesions on its back and tail which appeared to be fungus or parasitic growths.

III. REFUGE DEVELOPMENT MAINTENANCE

A. Physical Development

No physical development work is in progress on the refuge; however, some Maintenance work was necessary. The most time-consuming task was cutting, peeling and setting water boundary stakes. During the winter and early spring ice movements bend over or break off the majority of these stakes every year. Small maple poles ten feet long are cut and peeled and driven at intervals of one to two hundred yards along the lake shore and at somewhat greater intervals along the river and Dead Creek at mean low water mark which is the refuge boundary. Since the water is from two to three feet deep at this point when the stakes are driven, the work must be done from the canoe. This is rather "ticklish" work from such an unstable craft and can be done only on relatively calm days. The tops of these stakes are painted red for greater visibility. In Goose, Gander and Shad Island Bays,--points at which hunters and fishermen come in closest contact with the boundary,--a penalty or blue goose marker is placed on every other stake. From forty to seventy-five of the stakes have to be replaced every year. This year an additional sixty stakes were cut for use next spring. The object of this was to have them ready for use early in the spring when the water is deeper and the long stakes can be more easily driven from a boat. Formerly they could not be cut until late May or June when the sap runs so they can be peeled. Not only were they hard to drive then because of the lower water level but the refuge boundary was not well marked during April and May.

Each spring when the greater part of the refuge is flooded considerable debris floats in on the trails. After the water recedes, usually in June and July, the trails must be raked clear of small brush and bits of old lumber and the larger trees and logs cut out. This work accounts for one to two weeks of the patrolmans time during this period. This year the river trail was extended the last 300 yards to the northern tip of the refuge. This will facilitate patrol work during the fall hunting and trapping seasons, especially if the water is low since more foot patrolling will be done in that event.

Another task which consumed about seven man days of labor during June was cutting the tall grass around the young spruce trees planted at the south boundary meadow. The majority of these trees are growing fast and in the future should more than hold their own in competition with the grass. However, some of the smaller ones will need assistance for several years.

IV. ECONOMIC USE OF REFUGE

A. Haying

A permit was issued to Mr. Fred P. Cheney to cut the hay on the south boundary meadow. The price of the standing hay was \$3.00 per ton; this was considered to be a fair price in view of the inaccessible nature of the refuge to heavy equipment. Approximately five tons of hay have been cut to date. The hay was tall and dense but weed species

impaired the quality in places. Part of the meadow is due to be plowed and reseeded this fall; this should improve the quality of the hay in future years.

B. Other Uses

A permit was issued to Mr. Ralph Holbrook of Swanton for the purpose of gathering Skull Cap (*Scutellaria*) on the refuge during August and early September. This plant is picked quite extensively in this locality and sold as a medicinal herb. However, after one reconnaissance trip over the refuge Mr. Holbrook reported that the species was not present in sufficient quantity to warrant gathering it.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

Preparations were made in mid-August for the fall duck trapping and banding work. The two duck traps were set up in their usual locations,-- one in the lower part of Big Marsh Slough and the other behind the small island on the river. After a few days to allow the birds to become accustomed to the traps they were baited and began taking ducks the following day. However, the raccoon depredations began almost immediately so trapping operations were suspended for the remainder of the period. It is believed that the predators have now been controlled to the point where banding operations can again be started.

VI. PUBLIC RELATIONS

A. Refuge Visitors

The following visitors were on the refuge during this period:

May 20, 21 and 22. Mr. Robert Montgomery of the Maine Cooperative Wildlife Research Unit was on the area obtaining data on Wood Duck and Golden-eye nest sites.

May 20, 21 and 22. Mr. Jay S. Gashwiler of the Maine Cooperative Wildlife Research Unit was at the refuge. The first two days were spent collecting data from the muskrat pelts obtained from the refuge during the spring trapping season. The third day was spent on the refuge locating Wood Duck and Golden-eye nest sites.

July 9. Mr. Gilbert Bohannon, state game warden, and Mr. Max Derrick of the Vermont Fish and Game Service spent the day on the refuge for the purpose of obtaining moving pictures of bird life in general and particularly waterfowl broods.

July 10. Mr. Roger Seamans, State Biologist, accompanied by two assistants spent a half day on the refuge for the purpose of learning the construction and operation of duck traps.

August 9. Mr. William Frey of Port Chester, New York accompanied Mr. Truax on a tour of the refuge.

August 18. Mr. George Sheets, caretaker of the Webb property adjoining the refuge visited the area.

August 31. Mr. Robert Dunbar, a local farmer, visited the refuge.

B. Refuge Participation

The usual monthly reports of birds observed on or near the refuge were sent to the Massachusetts Audubon Society. The number of species of birds reported were; May, 65; June, 56; July, 47; August, 1. During nearly all of the latter month the Refuge Manager was on temporary assignment to Moosehorn Refuge; since the Refuge Aid is not trained in small bird identification no records were kept except of the more common species. Two American Egrets were reported to the Audubon Society in August because these birds are quite uncommon in this locality and it was thought the observation might be of special interest to them.

C. Fishing

Although fishermen are discouraged from entering refuge waters because of the disturbance to nesting waterfowl, considerable fishing is done along the boundaries. As was to be expected, more fishermen were present than in former years. Often as many as fifteen boats could be seen at one time in Goose and Gander Bays. Perch fishermen apparently were quite successful during the early part of the season. However, when the bass season opened conditions were not as favorable and not many bass were caught.

Respectfully submitted,

Eldon R. Clark
Eldon R. Clark,
Refuge Manager

September 21, 1946

Approved:

Arthur Imre

Regional Refuge Supervisor

9-26-46

Date

E. B. Bailey

Acting Regional Director

10/3/46

Date

MIGRATORY BIRDS

Refuge Mississippi Refuge Months of May to August, 1946

1612

(1) Species	(2) First Observed		(3) Became Common	(4) Peak Concentration		(5) Last Observed		(6) Young Produced			(7) Total
Common Name	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Common Loon	One observation	only		1	6/7/46						1
Pied-billed Grebe	1	6/12/46		Two observations	only	1	7/27/46				4
Great Blue Heron	*			18	6/12/46	**		3	3	20	40
American Egret	2	6/10/46		4	6/20/46	**					4
Eastern Green Heron	1	6/21/46		2	7/21/46	2	7/27/46				2
American Bittern	*			6	6/6/46	**		1	4	16	24
Common Mallard	*			5	6/1/46	**					25
Common Black Duck	*			600	5/6/46	**		15	7	105	2000
Green-winged Teal	*			20	5/10/46	3	5/29/46				50
Blue-winged Teal	*			100	6/14/46	**		3	8	23	600
Wood Duck	*			100	6/25/46	**		10	8	80	300
Ring-necked Duck	*			13	5/10/46	1	5/27/46				50
Greater Scaup	One observation	only		100	5/12/46						100
American Golden-eye	*			75	5/15/46	12	6/15/46	5	5	25	200
Hooded Merganser	One observation	only		1	5/21/46						1
American Merganser	*			35	5/12/46	10	5/21/46				100
Florida Gallinule	2	6/6/46		5	7/1/46	**		1	10	20	50
Killdeer	2	5/29/46		2	5/29/46	1	6/6/46				5
American Woodcock	One observation	only		1	5/22/46						1
Wilson's Snipe	*			4	5/15/46	**		1	2	6	10
Spotted Sandpiper	1	5/7/46		5	6/5/46	**					25
Greater Yellow Legs	One observation	only		1	7/26/46						1

REMARKS: (Pertinent information not specifically requested)

* Present during preceding period

** Still present at end of period

(Cont.)

INSTRUCTIONS

Form NR-1 - MIGRATORY BIRDS (Include species in families Gaviidae through Strigidae; also doves and woodcocks)*

In case a resident form occurs, such as mottled duck on the Gulf Coast, use only the columns that apply.

- (1) SPECIES: Use correct common names as found in the A.O.U. Check List, 1931 Edition, and list in A.O.U. order. General terms are to be avoided, such as "scaup", "teal", etc.; use "green-winged teal" or "lesser scaup".
- (2) FIRST OBSERVED: The first refuge record for the species during spring migration, fall migration, wintering, or summering, and the number observed. In the case of resident species this column may be disregarded.
- (3) BECAME COMMON: The date the species became common on the refuge.
- (4) PEAK CONCENTRATION: The greatest number of the species present on any one date or limited interval of time.
- (5) LAST OBSERVED: The last refuge record for the species during the spring or fall migration, wintering, or summering, and the numbers observed exclusive of obvious cripples or non-migrants.
- (6) YOUNG PRODUCED: Estimated number of young produced based upon 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 are to be omitted.
- (7) 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 manner in which birds come through; i.e., in waves or all at once. On refuges representing the terminus of the flight lane, the figures would probably be the same in many cases.

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

MIGRATORY BIRDS (Cont.)

Refuge Mississippi Refuge Months of May to August, 1948

1612

(1) Species	(2) First Observed		(3) Became Common	(4) Peak Concentration		(5) Last Observed		(6) Young Produced			(7) Total
Common Name	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Herring Gull	*			5	6/10/46	**					25
Common Tern	1	7/29/46		5	8/2/46	5	8/2/46				10
Black Tern	18	5/14/46		18	5/14/46	5	8/6/46				18
<u>PREDACEOUS BIRDS</u>											
American Rough-legged Hawk	One observation only			1	5/7/46						1
Bald Eagle	*			3	6/12/46	**					3
Marsh Hawk	*			5	8/25/46	**					20
Osprey	*			4	5/25/46	**					10
* Present during preceding period ** Still present at end of period											

REMARKS: (Pertinent information not specifically requested)

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- (2) FIRST OBSERVED: The first refuge record for the species during spring migration, fall migration, wintering, or summering, and the number observed. In the case of resident species this column may be disregarded.
- (3) BECAME COMMON: The date the species became common on the refuge.
- (4) PEAK CONCENTRATION: The greatest number of the species present on any one date or limited interval of time.
- (5) LAST OBSERVED: The last refuge record for the species during the spring or fall migration, wintering, or summering, and the numbers observed exclusive of obvious cripples or non-migrants.
- (6) YOUNG PRODUCED: Estimated number of young produced based upon 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 are to be omitted.
- (7) 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 manner in which birds come through; i.e., in waves or all at once. On refuges representing the terminus of the flight lane, the figures would probably be the same in many cases.

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

Refuge Mississippi RefugeMonths of May to August, 1948

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
No upland game birds have been observed on the refuge during this period										
	Swamp hardwood 730 Bog brush 560									

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

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

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