

Narrative Report Routing Slip

Mr. Salyer _____

~~Mr. Ackerman~~ EOA _____

Mr. Crawford C _____

Administrative Services

Miss Baum _____

Operations

Mr. Fermanich _____

Mr. Regan _____

Public Use

Mr. DuMont DA _____

Mr. Kubichek _____

~~Mr. Stollberg~~ BS _____

Resource Management

Dr. Morley _____

Mr. Hickok _____

Wildlife Management

Mr. Banko _____

Mr. Stiles _____

Mr. Goldman _____

Refuge MISSISQUOI _____

Period May - August 1960 _____

NARRATIVE REPORT

MISSISQUOI NATIONAL WILDLIFE REFUGE

SWANTON-VERMONT

MAY - AUGUST 1969

REFUGE PERSONNEL

Edwin H. Chandler Refuge Manager
Ralph H. Minns Refuge Manager
Aldolph A. Vanslette Maintenance man

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF SPORT FISHERIES & WILDLIFE

FISH AND WILDLIFE SERVICE

SWANTON, VERMONT

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NARRATIVE REPORT
MISSISQUOI NATIONAL WILDLIFE REFUGE
SWANTON, VERMONT
MAY - AUGUST 1960

I GENERAL

A. Weather Conditions

The following summary of weather conditions is taken from records maintained at Refuge Headquarters:

	<u>Snowfall</u>	<u>Precipitation</u>		<u>Temperatures</u>	
		<u>This Month</u>	<u>Normal*</u>	<u>Maximum</u>	<u>Minimum</u>
May	--	1.71	--	85	43
June	--	2.34	--	88	36
July	--	1.96	--	89	43
August	***	<u>1.43</u>	<u>--</u>	<u>93</u>	<u>41</u>
Totals	--	7.44	--	93	36

* No "Normal" has been established for precipitation here at Refuge Headquarters as our weather station has been in operation only a few months. Prior to the previous period, weather data were obtained from the U.S. Weather Bureau Station in Burlington, 40 miles south. However, there has always been a great variance between conditions here and at Burlington. It is estimated that our precipitation was about 60% of normal for this period.

All months of the period were drier than normal and temperatures were lower than normal for most of the summer. Most daytime temperatures averaged in the 70's, although daily maximum's often reached the low 80's. This summer provided a pleasant contrast to the summer of 1959 when temperatures were generally over 85. There were no abnormal or unusual weather features during the period, other than those noted above.

B. Habitat Conditions

1. Water

For the most part, water levels in the Missisquoi River and Lake Champlain were 4 to 6 inches higher than a year ago, although precipitation was slightly less here at the refuge. This fact is attributed to normal or above rainfalls in other watersheds draining into Lake Champlain. Toward the end of August, however, levels dropped to those of a year ago.

On May 11, 1960 our water gauges were checked against the Alburg Bridge bench mark, just west of the refuge at the entrance to Missisquoi Bay. It was determined that all of our previous readings were 0.79 feet low. When the gauges were re-set in June, they were placed at the corrected level. The gauge readings for May 11, 1960 were determined to be as follows:

Lake Champlain: 99.79

Big Marsh Slough: 99.79

Goose Bay Pool: 99.87

By the end of August, levels had dropped to:

Lake Champlain: 94.45

Big Marsh Slough: 95.45

Goose Bay Pool: 95.86

It is of interest to note that with the dike at Goose Bay having been completed in October, 1959, water levels in this pool were consistently higher than in Big Marsh Slough Pool. The opposite had been true a year ago when the Goose Bay Dike was only partially completed.

The lack of rainfall hampered the growth of cultivated crops but not sufficiently to retard grain production to any harmful degree. We were able to continue many of our operations due to dry weather and the subsequent lack of mud in most of our work areas. Pool levels held fairly well, with generally 8 to 12 inches more water than in the lake.

2. Food and Cover

Conditions were apparently close to ideal for the production of natural aquatic food plants. Wild Rice is now prevalent in about 80% of both pools and a good crop is coming off. Rice started dropping off by mid-August, almost 5 weeks ahead of last fall when it was 3 weeks late. This and other aquatic plants provided ample food for summer waterfowl populations and will be available for early fall migrants. Cover conditions were likewise good for waterfowl, as evidenced by good production and flight-stage young.

II WILDLIFE

A. Migratory Birds

1. Waterfowl

Summer waterfowl populations averaged between 500 and 600 birds, mainly Wood Duck, which is above our normal figures. Excellent nesting and brooding conditions were present and undoubtedly accounted for most of this increase. Production was very good this year, judging from brood counts and sizes and from Wood Duck nesting box surveys. Brood counts- admittedly a poor index here for production- were well above last year. Observations between brood count dates showed more and larger broods, in total, than a year ago. A total of 308 Wood Duck, 78 Goldeneye, and 29 Hooded Merganser were produced in our nesting boxes- well above 1959 production. Black Duck and Blue-winged Teal brought off a good number of broods, but the total is unknown except for a few nests of each species which were kept under periodic observation. In retrospect, it appears that waterfowl had a good year here on the refuge and in adjacent marshes; State Fish and Game personnel report much the same results on the Webb Marsh, across the river from the refuge, where they maintain nesting boxes and production surveys. Prospects for fall flights through this area from eastern Canada appear brighter than a year ago, especially if we can use our own populations and production as criteria. The fall flights will not approach those of 1955, but the picture is in some measure encouraging.

No Canada Geese have been present on or near the refuge this period to our knowledge. We have not yet been successful in establishing goose breeding here. (See Section V).

2. Other Waterbirds

For the 2nd year, a brood of Pied-billed Grebes has been observed; our first recorded brood was observed in 1959. Both broods were noted in Big Marsh Slough. Little Green Herons were more abundant than they have been for a number of years, especially along Dead Creek. Great Blue Herons were common throughout the period, as were American Bitterns. Florida Gallinules and Virginia Rails were present in their normally small numbers, with a few broods known to have been produced.

3. Shorebirds, Gulls, and Terns

Large numbers of Black Tern were present during most of the period, with quite a bit of nesting occurring in the peripheral marshes of Goose and Gander Bays where they made use of old duck blinds. No accurate number is known, but probably over 100 adults and immatures were present by the end of July. Gulls confined themselves mainly to the lake and rivers except when they fed on freshly plowed fields during our farming operations. A few Greater Yellowlegs and Killdeer were also present. No change in the small numbers of Woodcock was noted. The annual census made in early ~~JULY~~ May, and which covers only a small portion of the refuge, showed no change over the past few years.

B. Upland Game Birds

No observations of Ruffed Grouse were made on the refuge- except for a bird or two on the newly-acquired Donaldson Farm. However,, it probable that we still have about a dozen on the island portion of the refuge.

C. Big Game Animals

White-tailed Deer numbers were up over a year ago (see previous period). A few fawns were observed and, although we have no actual figures, we suspect that a good fawn crop was again produced. Our herd, bolstered by fawns, probably does not exceed 100 animals.

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

1. Muskrats - Although our 1959-60 winter house count was down from the previous year, it appears that many 'rats have moved back into our marshes. An accurate picture of the muskrat population will have to await ice in December.

2. Beaver - These animals appear to be on the increase and it may be that we will have to resort to share-trapping next spring in order to remove a few of these troublesome critters. When they chew off boundary posts- complete with sign and the same one twice- it's time to ponder. One colony has begun establishing a territory on a small brook behind Refuge Headquarters and is probably made up of 2-year olds from a colony further down Maquam Creek. Other houses exist on the refuge along the river near the goose pen, in Wood Duck Creek, on Dead Creek, and in Shad Island Bay. In addition, there are several houses or bank burrows along the river opposite the refuge and one colony on Noaks Island at the mouth of Dead Creek. It is planned to try a repellent (TNB-A, 10%) on trees bordering Route 78 which are being taken by refuge beaver who have a lodge in a grove of "popple" across the river. Suffice to say, they don't bother with "their own" trees. A working supply of TNB-A has been ordered from the Morton Chemical Co., Woodstock, Illinois.

3. Predators - In an attempt to reduce our pesky Red Fox population, Region 5 P & RC personnel spent five days on the refuge in early May carrying on trapping operations. They were largely unsuccessful, with only 2 fox and a few raccoon being taken. Trap odors are suspected as being the chief cause of failure. At any rate, we can look forward to another winter of comparatively high fox populations.

4. Others - Otter sign is still much in evidence in the pool areas and the refuge and local population is higher than for a number of years; probably at least 15 are on the refuge at times of peak use.

E. Hawks, Eagles, Owls, Crows, etc.

Very few of any of these birds are ever on the refuge. Marsh Hawks were the most numerous of the Hawk family; daily observations in late August would indicate about 20 of them present at that time. No eagles have been observed this period. A few Barred Owls can be heard occasionally. Probably no more than 50 Crows were present on or near the refuge this period.

F. Other Birds

Nothing to report this period.

G. Fish

The usual amount of boat fishing for bass, bullhead, pickerel, northern pike, and yellow perch took place on the river and Dead Creek during the summer. Some use of the Public Fishing Area along Route 78 was done throughout the period. However, no fishing is available on the refuge, except along the fringes- the river, its branches, and Missisquoi Bay.

H. Reptiles

A few Snapping Turtles were seen during the period. Painted and Soft-shelled Turtles were fairly common along the river and creeks. An occasional water snake or garter snake was also seen. No poisonous snakes inhabit this part of the country, which greatly eased the mind of Mr. Luther Goldman, formerly of Laguna Atascosa, who paid us a visit from the Washington office this summer.

I. Disease

None evident this period.

III PHYSICAL DEVELOPMENT AND MAINTENANCE

A. Physical Development

Dikes - Work commenced in August to repair washed sections of Goose Bay Dike and to build up the access road from near the river to the north end of the dike. This section of approximately 1/8 mile was only slightly above the level of the marsh and travel was hindered by soft sections. This section, now built up, is completed and will act as a dike along the north side of Goose Bay Pool. By the end of the period, the patches on the main dike were ready for seeding.

From Goose Bay Dike, we moved to the Big Marsh Slough Dike with our Bucyrus-Erie 22-B dragline and TD-14 dozer to commence installation of a metal culvert in order to effect a drawdown of the Slough. We plan to put our rotary cutters and tiller to work getting rid of brush in the pool. Not enough water can be held in the pool

with the present diking system to control brush by water level manipulation, so we must resort to mechanical means. Upon completion of the culvert installation, it is planned to start the dike connection between Goose Bay Dike and Big Marsh Slough Dike, using our own men and O & M funds.

Maintenance - The following work was done this period:

1. Installed water gauges in Lake Champlain, Big Marsh Slough, and Goose Bay Pool.
2. Spring planting program accomplished.
3. New sidewalks installed at Headquarters.
4. Posted all refuge water boundaries, Donaldson farm, and along Route 78.
5. Changed piping on gasoline storage tank to permit easier access by delivery trucks.
6. Painted Oil House 2 coats white cement paint.
7. Dug up suction pipe from underground cistern and replaced below frost line.
8. Measured and plotted several "islands" in the western portion of Maquam Swamp; these will form part of a diking system for a sub-impoundment in this area.
9. Surveyed and staked out area for new goose pens and started bulldozing stream banks and bed; will complete with dragline.
10. Removed fencing and posts from south goose pen on island.
11. Conducted summer waterfowl banding; continued into September.
12. Received and installed new 60-watt General Electric central radio set in office and had surplus FBI set in 1952 Jeep pickup put into operation.
13. Periodic cutting of clover as required.
14. Performed routine vehicle and building maintenance as required.
15. Made one trip to Montezuma Refuge to deliver 5/8 clamshell bucket and pick up rotary tiller and 35 hp outboard motor.

Other

The following equipment was obtained this period:

New: Central radio, GE, 60-watts
 Plow, 3-bottom, Oliver
 Disc harrow, double-gang, Oliver


Surplus: Dragline, Bay City, 3/4 yd
 Boom for above, 35 feet
 Rotary tiller, Seamans, 1942
 Outboard motor, 35 hp, Evinrude, 1957

B. Plantings

1. Aquatics and Marsh Plants

None.

2. Trees and Shrubs

Planted 425 Red Pine in triple row around Headquarters Area for future windbreak. Planted 75 Red Pine, 500 White Spruce, and 2000 White Pine in the north end of Field 3. All trees 3-year old seedlings. 

3. Upland Herbaceous Plants

None.

4. Cultivated Crops

During the course of spring planting operations, the following crops were planted for spring (1961) waterfowl foods:

Japanese millet w/clover	- 24 acres
Japanese millet alone	- 20 acres
Buckwheat	- 46 acres

Two 1-2 acre strips of buckwheat were planted along the lower edges of fields on the Tabor and Donaldson farms. These areas, next to spring flooded timber, should help increase waterfowl use along the west side of Maquam Swamp. The only year (spring of 1959) we had crops here, our waterfowl use was greater than at any previous time.

C. Collections

None.

D. Control of Vegetation

None.

E. Planned Burning

Not applicable this period.

F. Fires

Two separate fires occurred in Maquam Swamp this summer. Because this marsh is inaccessible except during high water, we could not determine the acreage burned over. Most of the swamp is "blueberry marsh" and we would derive more benefit than harm from such a burn inasmuch as this area is scheduled for impoundment and it saves us from clearing brush. The fires were of undetermined origin, but were probably set by blueberry pickers using the marsh south of our boundary through the marsh.

IV RESOURCE MANAGEMENT

A. Grazing

One Special Use Permit (Missisq-31) was issued to Mr. Robert Carman for pasturing 10 head of young dairy cattle on 19 acres of Field 10a for the period 5/26 - 11/25/60: 60 AUM @ \$.50:- \$30.00.

B. Haying

Special Use Permits were issued to Mr. Harry Martin (Missisq-33) and Mr. Bernard Cheney (Missisq-32) for a total of 154 acres, with a total revenue of \$656.00.

C. Fur Harvest

Not applicable this period.

D. Timber Removal

None this period.

E. Commercial Fishing

Not applicable.

F. Other Uses

One Special Use Permit (Missisq-34) was issued to Mr. Charles Barozzi for the keeping of 40 beehives on the refuge. This use was appended to our Economic Use Plan. Total revenue: \$10.00.

Total revenue, all uses: \$696.00

V FIELD INVESTIGATION OR APPLIED RESEARCH

A. Canada Goose Flock

Our flock of 49 young geese released into our pen on the island in March 1960 dwindled to 39 birds by the end of the period due to unknown causes. Several dead birds were found (remains only) and foxes are suspected for early season reductions in the flock. Wing-clipping

operations may have accounted for others, but we cannot be sure. It is planned to construct one new pen near Headquarters before winter and we feel that losses will be thus reduced by having the pen predator-proof. During the winter, many of our geese in the old pens could be caught by foxes as the wire openings were large enough to permit their entry when snow cover was sufficient to allow them to reach them 4 feet and more above ground level. The old pens were never adequate nor were they located in a readily accessible site.

The flock we now have is scheduled for release during the spring of 1962 with the hope that they will be induced by their stay with us to nest on or near the refuge. We have not yet been able to maintain a flock of young geese through to their 3rd spring due to predation.

B. Waterfowl Banding

In an attempt to secure more information on waterfowl in this part of the flyway, banding operations were begun a month earlier than usual. The Washington office asked that we band as many Black Duck as possible prior to the opening of the waterfowl season. Right away, we are up against it: 1) few Blacks arrive prior to the time when we must close our traps, i.e., 2 weeks prior to the opening of the shooting season in early October, and 2) their reluctance to be lured to traps because of the abundance of natural foods, especially Wild Rice. Most of our native Blacks also do not respond to bait until the rice is gone. Therefore, with 3 traps in operation since August 10, only 8 Blacks were banded; the remainder consisted mainly of Wood Duck. About 80% of the Wood Duck were immatures; their numbers reflect not only good local production, but good survival (see below, C). Banding results are as follows:

Wood Duck	-	256
Black Duck	-	8
GW Teal	-	3
Pintail	-	2
Mallard	-	1
Total		<u>270</u>

C. Wood Duck Nesting Box Survey

Our program of maintaining nesting boxes for Wood Duck was continued this year with the maintenance of boxes already erected and the adding of boxes in suitable habitat. At the end of the 1959 season, we had 80 boxes erected throughout the marshes on the island portion of the refuge. Ice took out 3 of these boxes, leaving 77 available for the early nesters. By the end of April we had added 20 more boxes, but use of these new boxes was negligible this spring. Therefore, we have based our usage figures on the 77 available at the beginning of the nesting season- early April, just after the ice cleared the marshes and flooded timber.

Three checks were again run on all boxes and a 4th on 6 boxes that still had eggs being incubated. The following tables present an interesting picture and indicate that our nesting box program is succeeding fairly well:

TABLE I

Percent of Boxes Used, by Species, Based on the Number of Boxes Available at the Start of the Nesting Season *

Boxes	1957 37	1958 56	1959 56	1960 77
Wood Duck	24.3%	23.2%	42.8%	33.7%
Goldeneye	--	12.5	5.3	14.2
Hooded Merganser	--	3.5	1.7	5.2

* Boxes present from late April on:
1957 (37), 1958 (56), 1959 (80),
1960 (97).

TABLE II

Total Production - By Species

	1957	1958	1959	1960
Wood Duck	91	137	266	308
Goldeneye	--	17	9	78
Hooded Merganser	--	3	3	29

All clutches hatched by 7/18

Very little predation occurred; one avian predator killed an incubating Hooded Merganser, but her clutch was hatched by a Goldeneye who subsequently took over her nest box and brought off her own clutch as well. Although Raccoons are numerous here, we have had no trouble with them in this program. Most of our boxes are metal with a wooden base; to this base is attached a 6" square steel plate to which is welded a short length of 2½" pipe. This pipe is then slipped over the top of a cedar pole driven into the mud. Whether or not this accounts for our lack of 'coon predation, we cannot say, but it certainly acts as a deterrent.

D. Vegetational Analysis - Big Marsh Slough

This year, for the first time, we had the services of a Student Assistant. It was felt that since our impoundments are partially completed and fairly new a study of the vegetation in them was in order. Mr. Charles R. Gillette, a 1960 graduate of the University of Massachusetts in Wildlife Management, was hired to start the initial studies of the vegetation in Big Marsh Slough- our largest (650 acres) impoundment and most important waterfowl use area. Because of the limited amount of time in which he had to work, Mr. Gillette confined himself to the type mapping of that portion of the Slough which is now the best waterfowl marsh habitat that we have. Eight study plots in representative types were set up, marked, and photographed. This will aid in checking and determining the effects of the impoundment on vegetation caused by manipulating and/or controlling water levels. It is hoped that this project will be continued for at least 2 more years in order to complete type mapping of this impoundment and of Goose Bay Pool (100 acres).

Charlie did an excellent job in the time he had and was a capable, willing, and pleasant addition to our staff this summer. Unfortunately, for the Service, he took a job as Assistant Waterfowl Coordinator for the State of Maryland. We feel that he will do at least as good a job for them as he did while he was at Missisquoi.

VI PUBLIC RELATIONS

A. Recreational Use

As is usual for this period, the majority of our public recreational use was confined to fishing along the Route 78 Public Fishing Area, use of the 2 picnic areas in this same locality provided by the State Highway Department, and use of the Public Boat Landing at the gate to our roadway which leads to the old shop. The latter use was heaviest during the wall-eye run in May, but almost daily use was made of it by one or more parties throughout the period.

B. Refuge Visitors

The following visitors stopped in during the period:

<u>Date</u>	<u>Name and Affiliation</u>	<u>Purpose</u>
5/1-2	Gilbert Bohannon, State Warden	Investigate illegal deer kill
"	Leroy Aldrich, State Warden	" " "
5/4	David S. Dupee, Game Mgt. Agent	Vt. Proj. Leaders Meeting
"	Ben Schley, Mgr., Pittsford NFH	" " " "
"	Maurice Hubbard, Mgr, St. Johnsbury NFH	" " " "
"	John Buckalew, Game Mgt. Agent	Courtesy call
5/9-13	C.E. Faulkner, Reg. Supervisor, P&RC	Predator trapping
"	John Peterson, Asst. Dist. Agent, P&RC	" "
"	Fred Courtsal, " " " "	" "
"	James Caslick, " " " "	" "

<u>Date</u>	<u>Name and Affiliation</u>	<u>Purpose</u>
5/9-13	C.R. Studholme, Asst. Dist. Agent, P&RC	Predator trapping
"	Ernest Mills, " " " "	" "
"	Edward Ladd, Animal Control Biol., "	" "
"	Norman Holgersen, " " " "	" "
5/12-13	Robert Boone, R.O., Chief, Wildlife Div.	" "
5/18	Arthur Godfrey, Town Fire Warden	Fire plan
"	Mr. Burbank, State Fire Warden	" "
5/24-27	Harvey Warner, R.O., Br. of Realty	Land acquisition
6/6	Gilbert Bohamon, State Warden	Help w/tame deer
6/9	David S. Dupee, Game Mgt. Agent	Courtesy call
6/15	Erlin Perkins, Brigantine Refuge	Deliver dragline
"	Merle Gerhardt, Brigantine Refuge	" "
6/22	Kenneth Marsh, Surplus Property Officer, Vt. Dept. of Education	Surplus property
6/23	Robert Boone, R.O., Chief, Wildlife Div.	Meeting w/Vt. F&G & tour refuge
"	Merton Radway, Asst. Refuge Super, R.O.	" " "
7/14	George W. Davis, Director, Vt. F & G	Discuss waterfowl
"	C.F. Addy, Flyway Representative, C.O.	" "
"	Charles Bank Belt, Atlantic Waterfowl Council	" "
7/18-19	Luther Goldman, Refuges, C.O.	Inspection & tour
"	Thomas C. Horn, Refuge Supervisor, R.O.	" "
"	Merton Radway, Asst. " " "	" "
8/14	David S. Dupee, Game Mgt. Agent	Leave vehicle
8/19	W.A. Morris, Ontario Dept. of Lands and Forests	Courtesy call
8/25	Erlin Perkins, Brigantine Refuge	Deliver dragline boom
8/30-31	Harvey Warner, R.O., Br. of Realty	Land acquisition

Bill Morris, of the Ontario Dept. of Lands and Forests, an old school buddy of the writer, visited the Chandler's for an evening and spent a short time at the office. This was a pleasant reunion for the two of us who had not seen each other since the good old days at the University of Massachusetts graduate school.

C. Refuge Participation

No talks given nor films or slides shown this period when the community is in a state of confusion with the many tourists coming and going. We were asked to enter a float in the Swanton Festival parade, but were not given sufficient time in which to prepare one. We requested that, if the Festival is held next year, we be given a little more time as we would like to participate.

D. Hunting

None this period. Proposals for opening the same portion of the refuge as was opened last year to public waterfowl hunting were drawn up and submitted. These were approved and the area north of a line from the Missisquoi River to Martindale Point, including Shad Island, will again be available to the public.

F. Violations

None known to have occurred this period. The illegal deer jack-ing mentioned in the previous period's report remained unsolved.

VII OTHER ITEMS

A. Items of Interest

Mr. Harvey Warner of the Regional Office, Branch of Realty, made two trips to the refuge this period in an effort to pin down and expedite land acquisition. One 12-months option was obtained to approximately 70 acres of the Royal Bushey farm lying between the Tabor and Donaldson farms in West Swanton. An exchange agreement was entered into with John Carman for the exchange of his marsh property lying between Charcoal Creek and the Donaldson farm for a piece of the Donaldson farm lying outside our Approved Acquisition Boundary. This matter remains in an unstable position due to the presence of a church lot, the uncertain boundaries of his property, and the difficult task of obtaining comparable marshland values.

No concrete progress was made in obtaining the Julian Clark (Cranberry Creek) Tract for which we have an option. It is expected that this may be partially cleared up after this fall's hunting season, although there is a 20-acre hunting right leased to 88-year old Archie Tetrault for the remainder of his life- and reports have it that Archie looks healthier than ever.

This station's safety record remains good, with no disabling or time-lost injuries since April 1957; we have a total of 1228 injury-free days.

One June 24, the Chandler's became the parents of a baby girl, Nancy Elizabeth. We now have a boy (3½ year old Paul) and the new addition.

B. NR Forms

Appended.

C. Photographs

Appended.

Respectfully submitted,

Edwin H. Chandler

Edwin H. Chandler
Refuge Manager

Date: September 19, 1960

Approved

Thomas LeHon
Refuge Supervisor

9/23/60

Approved

Regional Director

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

WATERFOWL

REFUGE MISSISQUOI

MONTHS OF MAY TO AUGUST, 1960

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter										
Geese:										
Canada	150	100	50	25	25					
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	75	25	25	20	20	10	10	10	10	10
Black	300	200	150	150	150	100	100	100	100	120
Gadwall										
Baldpate										
Pintail	100	25								
Green-winged teal	25	15	15	15	15					
Blue-winged teal	30	30	30	30	30	30	30	30	30	30
Cinnamon teal										
Shoveler										
Wood	200	200	200	200	200	200	200	300	300	300
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye	25	25	25	25	35	20	20	100	100	100
Bufflehead										
Ruddy										
Other										
Hooded Merganser	12	12	12	12	12	10	10	20	20	20
Coot:										

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

[illegible]

Swans:											
Whistling											
Trumpeter											
Geese:											
Canada									2,450	---	---
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	10	10	10	10	10	25	50	50	2,580	---	---
Black	120	120	120	120	120	150	150	200	17,390	4	28
Gadwall					1		5		42	---	---
Baldpate											
Pintail								10	915	---	---
Green-winged teal		4	4	4		10	15	15	914	1	4
Blue-winged teal	30	30	30	30	30	50	50	50	4,050	3	18
Cinnamon teal											
Shoveler											
Wood	300	300	300	300	300	350	350	350	32,900	12	109 1/2
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye	100	100	100	100	100	100	100	100	8,625	2	19 1/2
Bufflehead											
Ruddy											
Other											
Hooded Merganser	20	20	20	20	20	20	10	10	1,930	---	--- 3/4
Coot:	1/ Nest box production: 308.	2/ Nest box production: 78.	3/ Nest box production: 29	(over)							

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	:	:	:
Geese	2,450	150	----
Ducks	69,346	795 785	178 *
Coots	:	:	:

* Known nest box production: 415

SUMMARY	
Principal feeding areas	Flooded timber, cropfields, marshes, impoundments
Principal nesting areas	Field borders, nesting boxes, hollow trees, stumps.

Reported by Edwin H. Chandler
Edwin H. Chandler, Refuge Manager

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

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

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge MISSISQUOIMonths of MAY to AUGUST 1950

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Great Blue Heron	15	5/1	35-40	6/20 thru period				1 found		
American Bittern	3	5/1	15	6/20 thru period						
Least Bittern	1	7/20	Only observation							
Little Green Heron	3	6/14	25	6/30 thru period						
Bl Cr. Night Heron	1-2	sighted occasionally in July and August								
Florida Gallinule	2	6/15	30	7/1	4	8/30			4 seen	
Virginia Rail	3	6/20	12	7/1	1	8/30				
Pied-billed Grebe	1	6/14	8	7/15	1	8/30			5 seen *	
								* 2nd nesting record		
II. <u>Shorebirds, Gulls and Terns:</u>										
Woodcock	None seen, but probably 20 present early May re census report & estimate.									
Greater Yellowlegs	5	5/1	5	5/1, 8/30	5	8/30				
Killdeer	3-5	5/1	8	throughout July and August						
Herring Gull	Present, but mainly on river and Lake Champlain									
Black Tern	1	5/3	150	7/19	5	8/30		est. 25	est. 75	

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>	None observed, but probably a few present as is normal for this period.				
Mourning dove					
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow	3	5/1	50	ranged refuge and vicinity most of period	
Marsh Hawk	1	5/1	20	Late Aug. 6	8/30
Reported by <u>Edwin H. Chandler</u>					

Edwin H. Chandler, Refuge Manager

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.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge MISSISQUOI

For 12-month period ending August 31, 19 60

Reported by E.H. Chandler

Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat			(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage				
1	Crops	132	Ducks	287,913	95 pr.	475
	Upland	709	Geese	8,660		
	Marsh	920	Swans			
	Water	180	Coots			
	Total	1941	Total	296,573	95 pr.	475

2	Crops	268	Ducks	50,808	9 pr.	45
	Upland	647	Geese	7,004		
	Marsh	660	Swans			
	Water	40	Coots			
	Total	1615	Total	57,812	9 pr.	45

Total	Crops	400	Ducks	338,721	104 pr.	520
	Upland	1356	Geese	15,664		
	Marsh	1580	Swans			
	Water	220	Coots			
	Total	3556	Total	354,385	104 pr.	520

	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.
- (5) **Production:** Estimated total number of young raised to flight age.

Amendment to Unit Description - NR 1-B

It has been felt that a thin line of distinction has been separating Units 1 and 2, as originally described in the NR for the period ending August 31, 1957, and that the differences in acreage, ecology, proximity, and waterfowl use was too indistinct to warrant a separation into two units. Therefore, beginning with this reporting period, Units 1 and 2 have been combined and designated as Unit 1. Unit 3 is now designated as Unit 2.

Waterfowl use- feeding, resting, breeding- is not clearly enough separated between former Units 1 and 2 to justify this separation. Actually, Unit 1- the marshes and waters between the timber line and Lake Champlain- is an integral part of the remainder of Unit 2, known as the island. This is shown in the pattern of waterfowl use and movements between the two. It appears to be best to include the lakeshore marshes with the remainder of the island and allow the line of distinction between two widely separated waterfowl-use types to be between this lakeshore marsh and the open waters of Lake Champlain (Missisquoi Bay), i.e., our low water boundary.

See map attached.

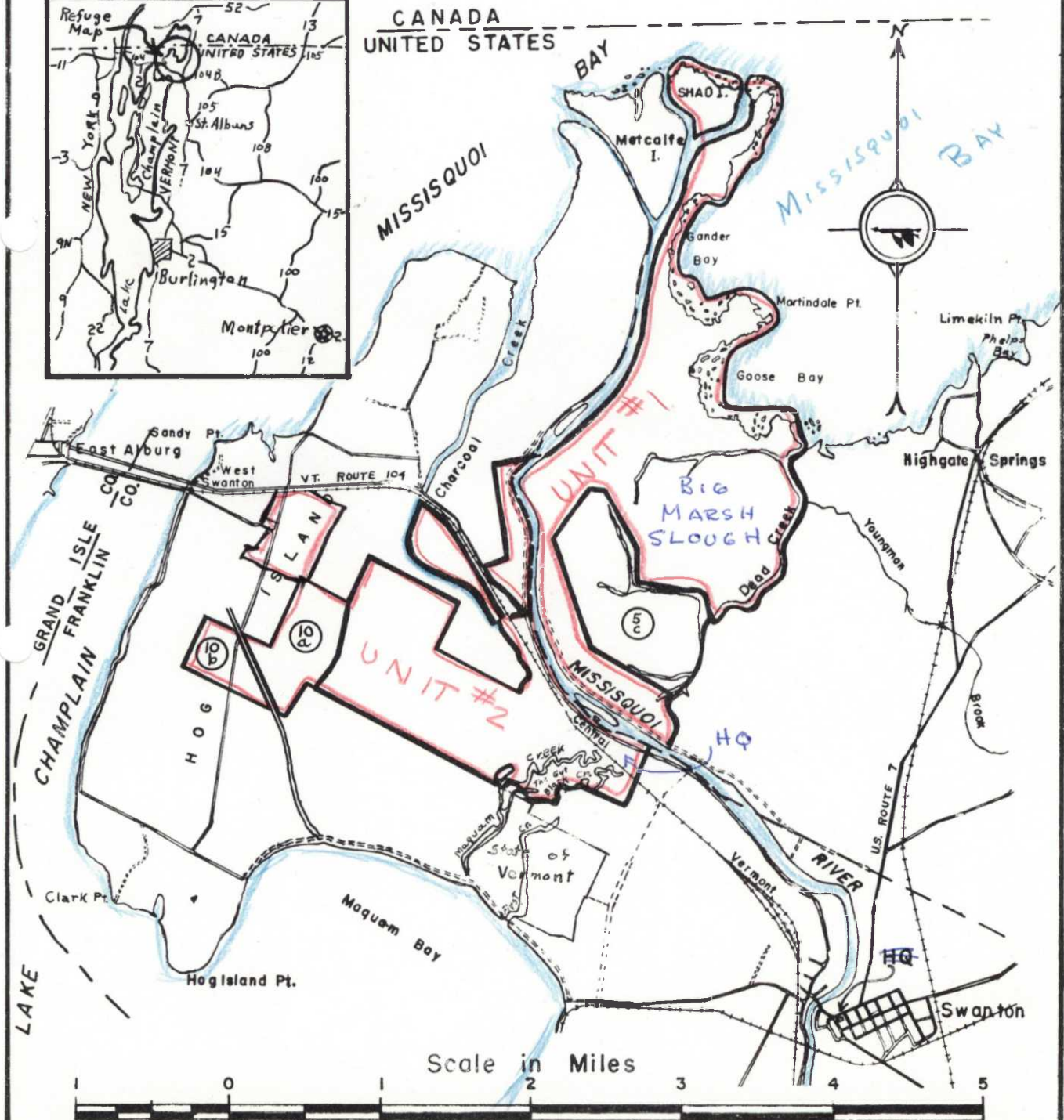
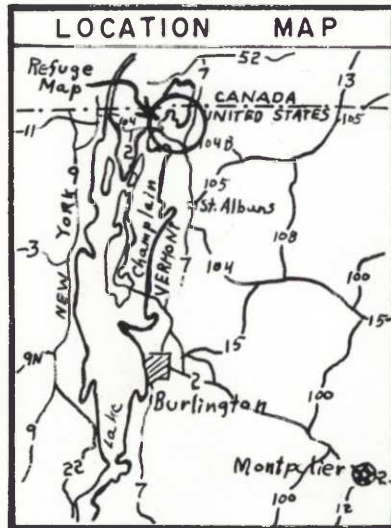
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

MISSISQUOI

NATIONAL WILDLIFE REFUGE
FRANKLIN COUNTY
VERMONT

NR-1B

(Revised 8/30/60)



3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge MISSISQUOI Months of MAY to AUGUST, 19 60

(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.
Ruffed Grouse	Upland Hardwood Swamp Bog Brush Cropland	88 940 300 50 <u>1368</u>	137 acres per bird					10	No essential change from previous period. Donaldson Farm acreage not censused yet, but not many birds suspected as being present.

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.



R-34-1

6/15/60

Surplus Bay City Model 34 dragline
transferred from Brigantine Refuge.



R-35-2

8/2/60

View of trailer repair unit hitched up
and ready to go. This is a converted
Jeep trailer w/welder, generator, power
tools, etc. for on-the-job repairs.



R-33-2

5/2/60

Refuge Manager Ralph Minns planting
Red Pine seedlings at Headquarters
for future windbreak



R-33-6

5/11/60

View of Blue-winged Teal nest in Field
No. 6. Nine eggs present. 12 eggs by
5/17/60. All eggs hatched on 6/7/60.



R-36-1

8/25/60

Banding trap located in Big Marsh Slough. Note Wild Rice which is prevalent throughout this 650-acre impoundment.



R-36-2

8/25/60

Student Assistant Charles R. Gillette with Wood Duck during banding operations.