

BRANCH OF WILDLIFE REFUGES

NAIIGATIVE REPORT

ROUTING SLIP

DATE May 28, 1954

~~Mr. Salyer~~ _____

Mr. DuMont PAO

~~Mr. Krumm~~ _____

Miss Baum _____

Section of Operations:

~~Mr. Ball~~ _____

Dr. Morley _____

~~Mr. Hagan~~ KR

Section of Habitat Improvement:

Mr. Griffith _____

Mr. Kubichek _____

~~Dr. Bourn~~ WSB

Mr. Stiles WBS

Section of Land Management:

~~Mr. Hackett~~ wa

~~Mr. Davis~~ _____

Stenographers:

REFUGE MUD LAKE

PERIOD January-April, 1954

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

MUD LAKE NATIONAL WILDLIFE REFUGE
Holt, Minnesota

NARRATIVE REPORT

January - April, 1954

PERSONNEL

Robley W. Hunt- - - - - - - - - -Refuge Manager
John C. Carlsen - - - - - - - Junior Refuge Manager
Oliver T. Davidson- - - - - - Maintenance Foreman
Irven O. Rostad - - - - - - - Maintenance Man
Melvin R. Johnson - - - - - - - - - - Clerk
Stanley W. Harris - - - - - - - -Student Assistant-

8 T. A. Laborers

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NARRATIVE REPORT

January - April, 1954

I. GENERAL

A. Weather Conditions

January, February and March of this period were more or less on the mild side as to temperatures, excepting a period of several days in January when the temperature slid to 43 and 35 below for two days, and precipitation was certainly not excessive. During April, however, the picture changed - we have experienced unusually low temperatures, we received some precipitation - not at all excessive but sufficient for filling pools.

Following is a comparison for the periods comparing 1953, and 1954:

Month	Snowfall		Precipitation		Max. Temp.		Min. Temp.	
	1953	1954	1953	1954	'53	'54	'53	'54
January	12.06	10.00			33	-28	-26	-43
February	4.50	.11			35	43	-23	-18
March	1.00	Traces			50	43	-20	-18
April	None	.92	1.21	2.54	65	69	8	- 8
Total	17.56	11.03	1.21	2.54	65	69	-26	-43

B. Water Conditions

For a while it appeared that we would be short of run-off, and that all pools would not be brought up to desired levels. The summer and early fall of 1953 were likewise dry, and the ground did absorb much of the potential run-off due to periodic thaws and freezes in early spring. At this writing, (May 5) all pools are very close to desired levels for commencing the summer.

Briefly, the pool levels are as follows: Mud Lake - slightly above approved level of 1141.0; Green Stump - 2.0' lower than the 1140.0 and approximately where desired for the summer draw-down; Madsen - about nine inches low, but filling now and will be to approved

level of 1140.0 within several days; South - a bit low yet but we expect it will be close to the old approved level; Headquarters - filling fast and will be held at about same level as Mud Lake through the summer; East - down about 12-18 inches at this time, and we hope to dry it completely for the approved summer draw-down; CCC - Lower and Middle being drawn down as approved - upper CCC close to approved levels; Mud River - has received considerable run-off, and we have had to spill to attain the draw-down level of about 7 inches below the old approved 1143.00; Webster - at approved level for this season (18" below old level of 1144.0); Northwest - about 1 foot low, but we may obtain additional water before the spring rains have stopped.

C. Fires

None at all this period. We burned off one field to be broken for farming operations, and also burned off a marshy area which had little value for nesting, but from which we can cut considerable quantities of wild hay.

II. WILDLIFE

A. Migratory Birds

1. Populations and Behavior

a. Whistling Swans

The Swan flight through Mud Lake Refuge was smaller than usual, at no time were there more than 75 present. The majority seemed to prefer the area in Mud Lake Pool near the Ditch 11 Control although some were seen in the Northwest part of Mud Lake Pool and some in CCC Pool.

b. Geese

Canada Goose numbers showed an encouraging increase over last springs' total numbers. The spring flight was very nearly equal to the flight last fall, while usually the spring flight is considerably less. Concentrations used the newly flooded flats in the vicinity of Northwest Dike and another group fed daily in the rye and wheat fields in the goose pen and loafed

on the flats and bars in the east end of Mud Lk Pool.

Of special significance is the large number of observations of paired geese that have been recorded throughout the refuge. The recent sessions of cold weather somewhat chilled their mating instincts but late observations indicate that they are once again "in the modd". With water levels restored and the habitat greatly improved, it is entirely possible that this could be the year to put the goose production project over the hump.

No Snow or Blue Geese were observed during the reporting period but a heavy flight has been in progress since May 5th. To the best of our knowledge none of these birds used the refuge but simply passed over high going in a northeasterly direction.

c. Ducks

Cold weather and the late spring breakup caused the start of spring migration to be considerably delayed. While the first migrants are usually seen during the last week of March, it wasn't until the end of the first week in April that the first Mallards showed up. There was very little open water at the time and these early arrivals fed in the fringe of water in the millet plantings in Mud Lake Pool.

The warm weather and strong south winds occurring around the 12th of April served to melt much of the ice on the pools and brought in a considerable number of ducks. Steady gains were made in total numbers until the 20th when the duck population numbered about 18,000. By April 26th the migrant population had nearly doubled and peaked for the period. The last week of the period was one of miserable weather and the duck population fluctuated greatly. The cold and stormy weather brought back some of those that had pulled out earlier and a second peak of approximately 34,000 ducks occurred on the last day of the period.

Each year generalizations are made about the early or late arrival of certain birds and a comparison made of the peak numbers against other years. The best of our knowledge available data has not been analyzed to determine whether given arrival date and peak population was actually early, late, up, down or right on schedule. The following table is an average

To

Never

SPRING MIGRATION -- MUD LAKE NATIONAL WILDLIFE REFUGE

1946 - 1954

Average of arrival dates and peak population figures.
Populations rounded off.

SPECIES	FIRST ARRIVAL		PEAK CONCENTRATION	
	(1946-1954)	1954	(1946-1954)	(1954)
Whistling Swan	4/15	4/10	75	50
Canada Goose	4/1	4/10	600	1,000
Mallard	3/29	4/5	10,250	12,000
Black Duck	4/13	4/17	50	50
Gadwall	4/14	4/18	1,500	2,000
Baldpate	4/13	4/18	3,250	8,000
Pintail	4/5	4/10	2,000	4,000
Green-winged Teal	4/15	4/9	1,250	4,000
Blue-winged Teal	4/16	4/10	4,500	1,500
Shoveler	4/13	4/10	500	500
Wood Duck	4/15	4/17	25	25
Redhead	4/18	4/18	500	750
Ring-necked Duck	4/12	4/12	2,500	1,500
Canvasback	4/14	4/20	250	500
Lesser Scaup	4/11	4/13	9,250	6,000
Goldeneye	4/6	4/10	2,000	750
Bufflehead	4/11	4/20	500	250
Ruddy	4/27	4/30	100	25
Total Ducks			38,425	41,850
Coots	4/16	4/13	1,750	6,000

of the arrival dates and peak population figures for the period 1946 through spring 1954.

The table demonstrates the pattern of migration through this refuge quite clearly. The first arrival is the Mallard during late March and followed by the Pintail and Goldeneye during the first week in April. There follows almost a week before any of the other migrants begin to show up. The rest of the divers arrive just before the middle of April and the rest of the dabblers just after the middle of April. All species are generally present by the 18th of April except the Ruddy which comes dragging in just before the end of the period.

This spring's migration followed the pattern pretty well except that it got off to a late start and was rather compressed in the middle. That is to say, the arrival dates were slightly closer together than in an average year. Probably the most outstanding exception this year was the early arrival of the Blue-winged Teal. The Green-winged Teal and the Shoveler were also slightly ahead of schedule but all other species were considerably late in arriving.

In at least two instances the average peak population figure is deceiving. The peaks for the Blue-winged Teal and Ruddy often occur after the end of the period and hence never get included on the Narrative Report form. Otherwise the peak population figures seem quite reasonable. Since all the peaks do not occur at the same time it is not possible to add up all the peak figures to get a total peak duck population. However, we may examine each species by itself. In general the dabbler usage of the refuge was up this spring and the diver usage down from the average but still better than last year. This latter fact is undoubtedly due to the restoration of water levels on some of the pools that had been dry.

The Baldpate, Pintail and Green-winged Teal were present in record breaking numbers this spring. The Baldpate flight was quite outstanding being more than double the average number. The numbers of Green-winged Teal and Pintail were also doubled but the peak was considerably smaller than the Bladpate.

2. Food and Cover

Ducks and Geese made extensive use of the newly flooded areas that had volunteered to emergent vegetation during the draw-down program. The areas on both sides of the Northwest dike proved especially attractive. The Canada Geese used the grain and rye fields in the goose pen vicinity to a considerable extent and there also were some dabblers attracted to the fields. The wild and Japanese millet plantings of last year were used by the ducks for feeding and escape cover when the weather was cold and stormy.

3. Botulism

None in evidence this period.

4. Lead Poisoning and Other Diseases

None in evidence this period.

B. Upland Game Birds

1. Population and Behavior.

Sharptails continue to prosper in the newly developed farmlands scattered throughout the refuge. Other areas where increased numbers of sharptails have been seen are along the refuge boundaries where there are grain or flax fields on the outside. The refuge provides cover and relief from hunting pressure for these birds.

No observations of Pinnated Grouse have been made this period but we feel sure there are a few in the farmland in the goose pen vicinity.

Ruffed Grouse drummings and visual observations indicate the number of birds is about the same as last year. The population took a dip about a year ago and has not rebuilt to its previous level yet.

Hungarian Partridges and Ring-necked Pheasants are seen only occasionally on the refuge. There are approximately 50 Partridge and not more than 15 Pheasants present.

2. Food and Cover

A great abundance of food and cover is available for all birds in this category. The Sharptails and the few Pinnated Grouse that have been seen favor the grain and flax fields in the goose pen vicinity. A single Hungarian Partridge was recently seen utilizing this area so perhaps this species will make gains in that locality.

3. Disease

None in evidence.

C. BIG GAME ANIMALS

Considering the winter as a whole, it can be said that it was generally a good one from the wintering deer standpoint. January was quite cold and the snow was quite deep but both February and March were exceptionally mild and hence the deer had an easy time of it. In fact, it was so mild that deer trapping activities were canceled during the latter part of February. The total of 16 deer tagged was the smallest for any complete winters trapping yet. All deer were in the best of condition, except an old buck which had just lost his antlers and the stumps were bleeding.

It is unusual for a deer to carry it's antlers beyond the first week in January in this locality but an exception was noted this year. Many observations were made of a large 10 point buck in the vicinity of Dahl grove that carried it's antlers much later than usual. The last observation was on February 20th when we managed to get close enough to get a picture of the animal. It looked to be in the best of condition. Many theories have been advanced as to why this animal did not shed its antlers and probably the most likely is that its physiology had been upset.

The annual big game census on February 8 and 9 revealed there were 645 deer wintering on the refuge. This is the smallest number that have been observed since the annual plane counts were established in 1947. The reason for this decline in numbers is the four hunting seasons on the refuge since 1949.

Despite the loss of five moose last deer season, the refuge moose herd reached an all time high of 72 last February. The moose are pretty well scattered over the north and east parts of the refuge with the exception of the spruce-tamarack bog areas. There are no areas which could be called over-utilized and it is hoped that the moose herd will continue to prosper.

2. Food and Cover

All main browse species are in abundant supply. In fact, some of the willow is growing oversize and out of reach simply because it has not been browsed down by the deer and moose. Extensive studies by refuge personnel indicate that the refuge is capable of supporting many more deer and moose than are now present on the refuge with no damage to the browse vegetation. Browse surveys have also indicated that deer also take annual weeds and grasses and sweet clover. Many deer have been noted this spring using the stubble fields in the goose pen vicinity. Practically all of these fields are seeded down with a legume and the deer are making extensive usage of the tender young shoots.

3. Disease

None is in evidence this period.

D. FUR ANIMALS, PREDATORS, RODENTS AND OTHERS

Evidently enough bank muskrats made it through the winter to provide breeding stock for future fur harvests. There were very few houses built last fall and these were trapped out since they would have frozen out anyway. With water levels restored this year, prospects look improved although a large harvest is not expected.

The beaver seem to have wintered in good fashion too. Since there were no trouble spots as far as clogging the water controls or flooding farmer's fields, we did not harvest any beaver this spring. With pelt prices as poor as they are, one would have trouble finding a trapper willing to go after them.

Mink are seen in about the usual numbers and we have no evidence to believe that weasel aren't as

numerous as usual.

The skunk and raccoon reduction program this spring has been fairly successful. Seventy-four skunk and 8 raccoon have been killed since January 1. The fall and spring kill on these predators totaled 127 skunks and 19 raccoons. This should serve to reduce the number of nest predators considerably.

Black Bear, Bobcat, Badger, Red Fox and Coyote are present in small numbers and do not constitute a threat to the waterfowl or deer.

E. PREDACEOUS BIRDS, INCLUDING CROWS, RAVENS AND MAGPIES.

The winter population of ravens and magpies seem to have become rather stable for the past three years. There have been about 200 ravens and 50 magpies each year. Although the last part of the winter was rather mild they did not pull out until the first week in April which is a little later than usual. The Crows were not nearly as numerous as last spring and the flight was more of a gradual movement into this area rather than a mass flight as occurred last year. Seven crows were trapped or shot in the goose pen vicinity to lessen the possibility of a goose nest being destroyed by crows.

Evidently our control measures on Horned Owls has reduced their numbers considerably since there are very few present. Compared to last year there are very few owls around since we didn't have any Barred and very few Short-eared Owls.

There were no wintering hawks this year although a few Rough-legged Hawks did show up early in March. There has been no concentrated flight and the present population constitutes the usual summer nesting population. Those species observed this period are: Rough-legged, Red-tailed, Marsh, Cooper's, Sparrow and Duck Hawk. An interesting chase of a male Blue-winged Teal by a Duck Hawk was noted this spring. The duck had flown north out of the goose pen with the hawk in pursuit. The duck turned and headed back toward the goose pen, flying low with the hawk in hot pursuit. In his excitement the duck forgot about the fence and crashed into it going full tilt. The hawk wheeled and started to drop to pick up the duck when we ran up and chased it off. The duck was crippled but managed to get into the water and swim off into the weeds where we couldn't get it. It was noted that the bird carried an aluminum band on it's

leg so it would have been interesting to have obtained it.

Several Golden Eagles frequented the Mud River pool area and the goose pen for a while after we put the geese out in the summer pen. One goose was killed by an eagle and the rest badly frightened. The eagle did not come back after it had killed the one goose.

F. FISH

There was no fish run during the period because there was no water in the river. The controls were opened around the 1st of May and since that time there have been considerable numbers of suckers trying to get past the controls. There are very few fish that can survive the winter inside the refuge pool system since it freezes to the bottom in most places.

III. REFUGE MAINTENANCE - DEVELOPMENT

A. Physical Development

Major physical accomplishments are necessarily limited during this period of snow and cold. It was possible, however, to accomplish considerable in the way of maintenance, and did get a fair start on some of the larger seasonal jobs:

712-C-2: Garage: Completed in preceding period.

712-C-3: Storage Building Construction. To date footings and wall have been poured; the three walls are completed; footings have been poured for the supporting posts; rafters have been cut, and all materials but the roofing have been purchased and hauled to the site. The building should be completed, with possible exception of painting, within the next several weeks.

622-E: Laundry-Bath Building Construction. All construction completed - including plumbing, inside partitions, chimney, heating stoves in place, seats, benches, etc. All that remains is to lay the water main.

712-R: Gravel Northwest Dike. Job completed previous period.

712-R:

Gravel Secondary Trail

Job completed in previous period, but we may have to spot patch a few spots that have deteriorated during "break-up".

Gravel Green Stump Dike

Nothing accomplished during this period. Remaining work consists of additional gravel to be dumped and spread on dike slopes, and, if possible, some repairs on the spillway proper.

Fencing

Nothing accomplished this period; four miles of new fencing completed in previous period. Work has just commenced on constructing new fencing along Mad-sen boundary dike.

Ditch Cleaning

All approved jobs have been completed during the preceding two periods.

Aquatic Plantings

See "B", Plantings.

Seed Harvest

See "C", Collections.

S & M Operations

Detailed reports on regular S & M forms have been reported for the period of January through March. Accomplishments of course during this period were limited to purchases - fertilizer, seed, and grain augur.

During the month of April it was possible to get a start on some of the field operations. Actual accomplishments were as follows:

Mowing willow brush over volunteer sweet clover stands -
15-20 acres.

Bulldozing dead aspen & heavy willow brush in sweet
clover areas:

East Pool - 15-20 acres
South of E - 6-10 acres

Land clearing (bulldozing large trees in potential farming area - South of "E" - 6-10 acres.

Using Rome bog disc on burned peat area (this operation to break in preparation for regular discing) - about 3- 35 acres.

Also used dozer to level off unevenly burned peat areas.

Moved farm equipment to farming sites.

Accomplished repairs on equipment to be used on S & M operations: all farm equipment, complete overhaul on Cletrac.

Marsh Development

Dahl Pool

Nothing this period - checking flow into pool area from east at regular intervals. We did determine that flow line of the ditch, and culvert installation are correct for taking minimum flows; also that the earth plugs installed in the east boundary ditch are working satisfactorily; there has been insufficient run-off to fill the west sections of the marsh area, and the small "bay".

Goose Pen Development

Willow brush, parts of trees, roots, etc., were placed on a number of the nesting islands, constructed within the goose pen, during the winter. The D-6 was also utilized in dozing a number of trails or channels through the dense cattail marsh area. The cover on the islands should eventually improve nesting habitat; the channels or trails, have already been utilized by the geese in moving about through the marsh area; additional supplies of natural "greens" will also result from the opening of the dense cattail stand.

In the dense cattail marshes to the immediate north of the goose pen fence additional work was accomplished to improve the marsh area for waterfowl use - 10 mounds of cattail were bulldozed to provide potential nesting sites. These mounds measured about 12 x 15 X 7 feet in height - they, of course, will be somewhat smaller in all dimensions when completely thawed out, but they will still provide nesting possibilities similar to muskrat houses.

Over 6,000 lineal feet of channel or trail was bulldozed clean of old cattail growth in this same area. The channels varied from 12 to 20 feet in width. As in the goose pen these channels will provide access channels through the formerly dense stands of solid cattail, and should improve general utilization by waterfowl.

Miscellaneous Repairs. Maintenance. Job Accomplishments

1. Checked and operated 9 deer traps daily from January 6th through February 27th.
2. Bulldozed trails through deer utilization areas, and into and out of trap sites.
3. Bulldozed trails into beaver dams located on boundary ditches - a co-op project with State wardens for blowing dams which were allegedly causing flooding damage to farmers.
4. Two two-day over-nite trips to Norris Camp to capture and transplant spruce hens.
5. Ran predator trap line through February, March and April.
6. Bulldozed trail into Whiskey Lake area - for laying out proposed truck-trail to be constructed this season.
7. Bulldozed plug into connecting channel between Upper and Middle CCC Pools.
8. Took shipment of fertilizer from Holt siding.
9. Two trips to Bagley for hauling storage building lumber.
10. Trip to T.R. Falls and hauled culverts.
11. Trip to Middle River for cement.
12. Hauled two loads of gravel and used maintainer to raise open spillway on Kelley Pool.
13. Cleaned (fanned) 1500 lbs. Early Fortune Millet, 30 bushels of wheat, 1000 pounds of smartweed for spring planting.
14. Ran germination tests on wheat to be seeded.
15. Mr. Carlsen constructed two wooden observation towers for installation in marsh areas.
16. Blew beaver dams where interfering with flow into refuge ditch system.
17. Constructed 3 brooder, and three nesting boxes for Canada goose rearing experiment.
18. General clean-up in goose pen.
19. Spring clean-up at Headquarters site.
20. Constructed 24 goose decoys for use in goose pen.
21. Daily care of 86 captive geese through the period January 1 - March 24th.

22. Transferred captive geese from winter to summer pen.
23. Cleaned out metal granary and dumped remainder of mixed grain for captive goose flock - total of 7,600 lbs. hauled.
24. Constructed shelter for weather instruments.
25. Constructed new feed and grit hopper for captive geese.

Maintenance of Buildings and Facilities

Service Building

Constructed stand for air compressor; installed pipe line to exterior of Service building, and underground to equipment shed shop. Repair on deep-well pump; repairs on sump pump. Replaced one window in garage portion.

Fur Shed

Repaired wall board on ceiling. Repaired roofing.

Bunkhouse

Removed old hot water tank.

Primary Residence

Painted bedroom, dining room and living room.

Equipment Maintenance and Repairs

Vehicles

Ford

New spindle bolts and steering arm.

Int. Pickup

New window glass and channel.

Jeep (1952)

Steering sector, oil seals.

Jeep (1948)

Repaired gas tank.

Reo

Paint job on rack. Two new windows. Adjustments.

Heavy Equipment

Cletrac

Complete overhaul of motor. Made new extension for hitch.

D-6

New track roller installed. Transported to Crookston Ziegler shop for following work: Checked final drives, installed 3 new bearings bellow assem. and holder assembly. Removed broken and installed new cap screws on both Roller frames for carrier bracket. Changed carrier roller shaft half turned on 3 brackets, and new shaft on one. Installed 4 new seals and 2 new sleeves for carrier rollers; new heat indicator. Checked governor. Installed new shaft and bearings. Checked starter bendix.

Farm Machinery

Disc (Oliver)

Completely disassembled. 1 new cross-shaft; 12 new spools & wooden boxings; 1 new disc. New mud scrapers. And, general fixing, welding, etc. New hitch.

Lilliston Brush Cutter

New gears and bearing installed, new blades, 1 new spindle, oil seal. Welding work.

Drag/Harrow

Rebuilt 3 sections from 4.

Brush Breaker Plow

New hitch, and hitch behind for hooking on second plow. Two new depth control cranks installed. Rolling coulter removed and sharpened.

Fanning Mill

Repaired several screens. Removed flat drive pulley and replaces w/v-pulley & mounted 1/6 hp motor.

B. Plantings

1. Aquatic and Marsh Plants

Aquatic plantings were barely commenced during the last week in April. A total of 96 lbs. of wild millet.

2. Trees and Shrubs

None planted.

3. Upland Herbaceous Plants

None planted.

4. Cultivated Crops

None planted. During the period we had sign-up day for the farmers and a total of 19 farm permits were initiated. In addition there are 4 long-term permits in force, which is in addition to the above 19. There is an increase in farming activity within the refuge. One permittee made exceptionally well on flax and barley last year. Now it appears as if others are interested.

A combination of permittee and refuge farming should give the refuge a total of 1200-1500 acres in cultivation by fall.

C. Collections

1. Seed and other Propagules

None this period.

2. Specimens

None this period.

3. Receipts of Seed and Nursery Stock

<u>Type</u>	<u>Quantity</u>	<u>Source</u>
Alfalfa	75	Waubay
Dwarf Milo	100	Swan Lake
Bluegrass	400	Valentine
Jap Millet	1500	Local purchase

IV. ECONOMIC USE OF REFUGE

A. Grazing

Two permits will be issued for the season. In addition, there is the one combination haying-grazing permit which has been in effect for many years.

B. Haying

Fifteen permittees signed up for haying this year. The demand is up from last year. We have farmers who want hay but all of our haying units have been utilized. There seems to be a shortage of hay in this area at this time, but this has been brought about by the cold weather. The new grass was late in coming and as a consequence the farmers had to feed hay.

C. Fur Harvest

No trapping permits were in effect this period. A summary of last fall's trapping harvest follows:

Species	No. Removed	Trapper's Share Total \$ Received	Trapper's Share Average Price
Muskrat	80	\$ 20.00	\$.50
Mink	83	775.32	19.88
Weasel	40	9.86	.58
Beaver	27	109.49	8.11
Raccoon	11	13.75	1.25
Skunk	53	27.50*	.60
Fox	6	4.00 Bounty paid by County	

* Some not sold

D. Timber Harvest

A total of 14 cords of dead and down timber was cut during the period under two permits.

E. Other Uses

The permit for beekeeping on the refuge has been issued again and indications are that the bees will have plenty of clover to pollinate, and thus the honey crop should be very good.

There seems to be no ready market for cattail fluff at the present but the local manufacturer has hopes for greater use in the future. He hasn't the capital necessary for promoting the product and therefore it will take time to create a market for it's many uses.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report

Mr. Stanley Harris, Student Assistant, has again reported for work and a continuation of his PH D study on drawdown effects on Mud Lake marshes.

The study is being commenced at the beginning of the growing season this year, and it is hoped that some useful information may be obtained at completion of the study during the early fall. Mr. Harris will again provide a brief progress report as of the end of August, 1954.

Soil Tests

A number of soil samples have been sent to the University soils division for analyses. We as yet have not heard back on the results of the tests.

Deer Tagging

A total of 165 deer have been tagged since this project was initiated in 1947. The total of 18 for the past winter was the poorest record for any complete winter's trapping. This was largely due to the balmy weather during February and March when it was not possible to entice the deer into the traps. The tag return data has been summarized for publica-

tion in cooperation with Mr. R. E. Farries, Are Game Manager for the Minnesota Conservation Department. Twenty-seven tag recoveries have been recorded during the past four hunting seasons. Fourteen of these recoveries have been made by hunters on the refuge and thirteen recoveries have been from outside the refuge. The farthest tag recovery was from a distance of 56 miles.

Spruce Grouse Transplant

Since it is the policy of the Fish and Wildlife Service to protect rare species of wildlife and because Mud Lake Refuge has an "ecological niche" suitable for one such rare species that was not then present on the refuge, it was decided to attempt a transplant of Spruce Grouse to this refuge. Permission was obtained from the Minnesota Conservation Department to obtain 20 Spruce Grouse from the Red Lake Game refuge. An expedition was made into the jack pine wilds north of Red Lake and 13 "Spruce Hens" were caught by means of a wire crook on the end of a 12 foot pole. Three of the grouse were injured in capture and subsequently died. A total of six male and four female grouse were released in the spruce-tamarack area east of Whiskey lake. To date several checks have been made in the release area but no observations have been made.

Captive Canada Goose Flock

The captive geese wintered at Headquarters in excellent shape. Only one bird succumbed of unknown causes leaving 86 which were put out on March 24th. Their diet consisted of alfalfa hay, greens from the wholesale house in Thief River Falls, corn, wheat and other grains. The geese were herded into the chicken coop on nights which were especially cold. Litter was provided in the resting yard in the form of old hay and straw. No water supply was provided so the geese used snow for drinking purposes.

Canada Goose Notes

Daily observations of Canada Geese are entered on a map and record sheet in the refuge office for the purpose of better estimating the amount of goose utilization of various parts of the refuge and also to help in locating mated pairs of geese. After keeping

the records for a period of a month it is possible to go back over the record and pick out the mated pair observations to see how many show indications of nesting.

VI. PUBLIC RELATIONS

A. Recreational Uses

Boy Scout Troop 112 of Holt had an overnight hike to the spruce-tamarack area near Whiskey lake on the weekend of March 20 and 21st. The purpose of the trip was to learn winter camping methods and also to search for sign of the Spruce Grouse released in the area. Twelve boys participated.

B. Refuge Visitors

See following page.

C. Refuge Participation

Public interest in the refuge film and slide collection is still high. Our total attendance figures for both, run in the neighborhood of 12,000. The following public relations contacts were made during the period:

<u>Movies or Slides</u>			
Feb. 8	Mavie Luth. Church	14	Johnson
Feb. 10	Goodridge Sport. Club	40	Hunt
Feb. 24	4-H at Crookston Winter Shows	250	Johnson
Mar. 3	Crookston Sport. Club	75	--
Mar. 8	Scout Rummage Sale, Holt	75	Carlsen
Apr. 26	Malung PTA, Roseau	180	Davidson
Apr. 26	SCS, Grygla	60	Hunt
Apr. 27	4-H, Holt	30	Hunt
<u>Talk</u>			
Apr. 8	Rock Creek, PTA, Sacred Heart, Minn. (while on leave)	40	Carlsen

D. Hunting

None this period.

Date	Name	Station, etc.	Purpose	Length Stay
1-19	Ed Weiland,	State Warden, Crook- ston	Beaver Removal	2 hrs.
1-19	L. Lindvold	State Warden, Red Lake Falls, Minn.	"	2 hrs.
1-19	C. Sundstrom	State Warden, Thief River Falls, Minn.	"	2 hrs.
1-19	B. Miller	State Warden, Crook- ston, Minn.	"	2 hrs.
1-20	R. Farnes, P-R Biol	TRFalls, Minn.	Deer Report	3 hrs.
1-22	L. Lindvold	Crookston	Beaver Removal	2 hrs.
1-22	C. Sundstrom	TRF, Minn.	"	2 hrs.
2-8-9	D. Smith, Biol.	R.O.	Big Game Count	8 hrs.
2-9	R. Farnes, P-R	TRFalls, Minn.	Deer Paper	3 hrs.
2-9	M. Smith, Patrolman	TL Refuge	Check deer traps	2 hrs.
2-9	J. Haroldson, Supt.	TL Refuge	"	2 hrs.
2-10	C. Sundstrom	TRF, Minn.	Re deer violation	2 hrs.
2-17	Brandt (Patrolman)	Lower Souris	Compressor transfer	2 hrs.
2-25	R. Farnes, P-R	TRF, Minn.	Deer paper	3 hrs.
3-9/10	H. Gunderson	U. of Minn.	Wildlife data pictures	8 hrs.
4-9	M. Smith (Pat.)	TL Refuge	Violations	2 hrs.
4-10	N. Roeske, SCS	Grygla	SCS Surveys	8 hrs.
4-27	R. Farnes, P-R	TRFalls, Minn.	Wildlife Data, deer paper	3 hrs.
4-30	F. Gillett, Supvr.	R.O, Mpls.	Inspection	8 hrs.
4-30	J. Bezansky, Admin	C.O.	Inspection	8 hrs.
4-30	D. Barrett, Bureau of the Budget,	Wash.	Inspection	3 hrs.

E. Fishing

None permitted on refuge.

F. Violations

To our knowledge none within the refuge boundaries during this period.

VII. OTHER ITEMS

A. Items of Interest

None this period.

Section II; IV C; parts of V; and VI, were written by J. C. Carlsen.

Date Submitted: May 20, 1954

Respectfully submitted,

R. W. Hunt

R. W. Hunt
Refuge Manager

Approved: *[Signature]*

Title: Regional Director

Date: 5/24/54

WATERFOWL

Refuge Mud LakeMonths of January 1 to April 30 19454

(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>									W.U.D.
Whistling swan	5	4-10	50	4-23	Still present				735
II. <u>Geese:</u>									
Canada goose	14	4-10	1000	4-30	Still present				14,350
Cackling goose									
Brant									
White-fronted goose									
Snow goose	Not present during period.								
Blue goose	Not present during period.								
III. <u>Ducks:</u>									
Mallard	16	4-5	12,000	4-26	Still present				190,400
Black duck	2	4-17	50	4-20	" "				840
Gadwall	50	4-18	2,000	4-24	" "				26,600
Baldpate	50	4-18	8,000	4-27	" "				85,400
Pintail	20	4-10	4,000	4-26	" "				52,500
Green-winged teal	2	4-9	4,000	4-24	" "				36,260
Blue-winged teal	6	4-10	1,500	4-30	" "				14,000
Cinnamon teal									
Shoveller	10	4-10	500	4-30	" "				7,420
Wood duck	10	4-17	25	4-30	" "				490
Redhead	6	4-18	750	4-27	" "				8,750
Ring-necked duck	10	4-12	1,500	4-30	" "				19,250
Canvas-back	1	4-20	500	4-30	" "				7,000
Scaup	40	4-13	6,000	4-22	" "				61,600
Golden-eye	6	4-10	750	4-20	" "				11,970
Buffle-head	100	4-20	250	4-30	" "				3,150
Ruddy duck	1	4-30	-	-	" "				50
IV. <u>Coots:</u>	100	4-13	6,000	4-30	" "				79,100

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese _____

Ducks _____

Coots _____

Total waterfowl usage during period 619,965

Peak waterfowl numbers 34,000

Areas used by concentrations NW, Mud Lake Pool, Mud River

Principal nesting areas this season _____

Reported by J. C. Carlsen

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 Mud LakeMonths of Jan 1 to April 30 19454

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Sandhill Crane	20	4-20	No peak		5	4-21				25
Great Blue Heron	1	4-5	100	4-30	Summer resident					100
Black Crowned Night H	Not observed	during period								
Eared Grebe	Not observed	during period								
Red-necked Grebe	2	4-22	300	4-30	Summer Resident					300
Horned Grebe	1	4-22	50	4-30	Summer Resident					50
Pied-billed Grebe	1	4-10	250	4-30	Summer Resident					250
American Merganser	2	4-8	25	4-15	2	4-22				25
Hooded Merganser	2	4-10	30	4-30	Summer Resident					30
Red-breasted Merganser	1	4-18	No peak		-	-				5
D.C. Cormorant	100	4-23	200	4-30	Summer resident					200
White Pelican	Not observed	during period.								
Belted Kingfisher	1	4-26	No peak		Summer Resident					10
American Bittern	Not observed	during period.								
YH Black bird	Not observed	during period.								
RW Blackbird	100	4-16	Unknown		Summer resident					very abund.
II. <u>Shorebirds, Gulls and Terns:</u>										
Herring Gull	1	4-14	No peak							25
Ring-billed Gull	1	4-14	No peak							50
Franklin Gull	7	4-20	1500	4-30	Summer resident					1500
Common Tern	Not observed	during period								
Wilson's Snipe	Not observed	during period								
Greater Yellow-legs)										
Lesser Yellow-legs)	2	4-14	100	4-30	Summer resident					100

(over)

[illegible]

UPLAND GAME BIRDS

1613

Refuge Mud Lake Refuge

Months of January 1 to April 30, 19454

(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'd.	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name					Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ruffed Grouse	Willow, aspen hardwood groves approx. 5000 acres								400-500	
Sharptailed Grouse	Upland 10,000 acres								550-600	
Ring-necked Pheasant	Very little true pheasant habi- tat on refuge.								10-15	
Hungarian Partridge	Upland 10,000 acres								35-50 XXXX	
Pinnated Grouse	Upland 10,000 acres								5-10	
Spruce Grouse	Spruce-Tamarack bog, 1500 acres								10	6 males & 4 females ob- tained from Red Lake Game Refuge and transplanted in Whiskey Lake Area.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

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

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

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Mud Lake

Year ending April 30, 1954

(1) Species	(2) Density	(3) Removals						(4) Disposition of Furs						(5) Total Popula tion		
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed			
								Permit Number	Trappers Share	Refuge share						
Muskrat	App. 20,000 acres marsh and water			9				T-7898	4	5	5	Sold		750-1000		
				8				T-7899	4	4	4					
				6				T-7900	3	3	3					
				2				T-6053	1	1	-					
				18				T-6054	9	9	9					
				22				T-6055	11	11	11					
				1				T-6056	-	1	-					
Mink				14				T-6057	7	7	7	Sold				
				8				T-7898	4	4	4					
				13				T-7898	6½	6½	6				Split on	1 mink
				10				T-7899	5	5	5					
				7				T-7900	3½	3½	3				Split on	1 mink
				10				T-6051	2	2	2					
				8				T-6052	4	4	4				Split on Extra to refuge	1 mink refuge
				7				T-6054	3½	3½	3					
				19				T-6055	9	10	10					
				1				T-6057	½	½	1					
								Refuge		1	1					
				* List removals by Predator Animal Hunter												

* List removals by Predator Animal Hunter

REMARKS:

Reported by

J. C. Carlsen

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.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Mud Lake

Year ending April 30, 1954

Page 2

(1) Species	(2) Density	(3) Removals	(4) Disposition of Furs							(5) Total Popula tion				
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers Share	Refuge share				
Weasel				4 12 2 4 11 2 1				T-7896 T-7898 T-7899 T-6051 T-6052 T-6054 T-6055	2 6 1 2 5 1 -	2 6 1 2 6 1 1	2 6 1 2 6 1 1			300-400
Beaver	App 20,000 acres marsh			6 2 7 4 8				T-7899 T-7899 T-7900 T-6051 T-6055	3 1 3 2 4	3 1 3 2 4	3 - 3 2 4	Two sold, Split on 1 beaver		
Skunk	App 30,000 acres upland & marsh				(46 53	sold for	\$27.50	all	none					200-300
Raccoon	"				11	(Sold for	\$13.75							100-150
Red Fox	"				6	Trappers rec'd	\$4 bounty							50-60
Bobcat	"													5-15
Badger	"													10-20
Coyote	"													10-20

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Reported by J.C. Carlsen

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.)
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 - (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 unprimeness 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.

UNITED STATES DEPARTMENT OF INTERIOR
Fish and Wildlife Service
Mud Lake National Wildlife Refuge
Holt, Minnesota

NEWS RELEASE !

Feb. 23, 1954

The annual big game census on Mud Lake National Wildlife Refuge near Holt, Minnesota revealed there were 645 deer and 74 moose on the area. These numbers constitute a slight drop in the total number of deer from last year and a slight increase in the total number of moose.

The plane census revealed that the deer are well distributed over the 30 to 40,000 acre upland area suitable for deer habitat. Most of the area burned over in the fall of 1952 has come back to an excellent stand of willow suitable for deer browse. The over-all condition of the herd is excellent despite the severe cold and rather heavy snowfall during January. Weights of the 17 deer that have been live trapped this winter are above average for Minnesota deer.

It is amazing that the refuge moose herd managed to make a slight increase despite the opening of the refuge to deer hunting. At least five moose were found that had been killed by deer hunters and there is a good possibility there were more. Moose are a creature of the wilderness and solitude and will not tolerate any great amount of human disturbance before abandoning an area.

About 24 moose calves were counted indicating the calf crop this year was one of the largest since the establishment of the refuge. If the herd continues to show increases it is

quite possible that the casual sightseer may frequently observe moose while driving on the County Highway which extends thru the refuge.

Ten deer having ear-tags were killed during the deer season last fall. Of this number, four were shot inside the refuge and six were shot outside the refuge. The longest return was a deer shot in Polk County, 55 air miles from the point of tagging. The other returns were from 42, 35, 33, 32 and $6\frac{1}{2}$ miles respectively. These returns serve to demonstrate that a substantial number of refuge deer are shot outside the refuge boundaries and would be shot regardless of whether the refuge was open to hunting or not.