BRANCH OF WILDLIFE REFUGES

NARRATIVE REPORT

ROUTING SLIP DATE October 1, 1952

Mr. Salyer _____ Mr. ~~DeMont~~ PHD

~~Mr. Kramers~~ wk ~~Miss Baum~~ _____

Section of Operations:

~~Mr. Ball~~ 4.13. ~~Dr. Morley~~ Lem

~~Mr. Regan~~ mjc

Section of Habitat Improvement:

~~Mr. Griffith~~ RB Mr. Kubichek later

Dr. Bourn WS later Mr. Stiles _____

Section of Land Management:

~~Mr. Aokerknecht~~ wa Mr. Davis adv

Stenographers:

jm _____ _____

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_____ _____

REFUGE Swan Lake National Wildlife Refuge

PERIOD May - August 1952

Narrative Report
Swan Lake National Wildlife Refuge
May - August, 1952

PERMANENT PERSONNEL

Robert F. Russell	Refuge Manager
Marvin F. Lentz	Clerk-Typist
William H. Thornsberry	Maint. Man, Equipment

TEMPORARY EMPLOYEES

Floyd A. Holland	Dragline Oiler
Benny N. Howerton	Operator, General
Gerald L. Moberg	Dragline Operator
Roy T. Warren	Tractor Operator, Light

United States Department of Interior
Fish and Wildlife Service
Sumner, Missouri

Swan Lake National Wildlife Refuge

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Narrative Report
Swan Lake National Wildlife Refuge
May - August, 1952

I GENERAL

A. WEATHER CONDITIONS

The following weather data ~~was~~ were obtained from the U. S. Weather Station at St. Joseph, Missouri.

Month	Precipitation		Maximum Temperature	Minimum Temperature
May	2.88		91	39
June	1.16		103	50
July	2.35		105	56
August	7.04		92	54
Total	13.43	Extremes	105	39

Precipitation for the period was 3.63 inches below the average. May through July were 7.04 inches below the norm, while August was 3.21 inches above that of a normal year. Average monthly temperatures were near normal throughout the four months.

B. WATER CONDITIONS

With minor fluctuations, Swan Lake was maintained at operating level, i.e., 658' from May 1 to June 15 and 656' June 15 to August 31.

Silver Lake was maintained at or near elevation 665' until June 15, when the gate was opened to draw down to 663'. Dispite the 4' x 4' gate being wide open, a 6" down-pour June 21-22 raised the lake to 666.50'. This inundated approximately 100 acres of cultivated lands on the east shore of the lake. The lake was finally brought down to 663' July 24. Shortly thereafter permission was granted to further lower the lake to 662' to facilitate reconstruction of the slope of Levee # 3. Elevation 662' was reached August 8, but rains during mid-August and at the end of August caused fluctuation up to 6".

C. FIRES

There were no fires on the refuge during the period.

II WILDLIFE

A. MIGRATORY BIRDS

1. Populations and Behavior

Ducks

The summer resident duck population was very low. Three Class III Mallard broods were observed. Production of this species on the refuge and immediate vicinity is again estimated at 100 birds. A few Wood ducks were seen during the period, and we received reports of several broods along Yellow and Locust creeks. However, none were observed on the refuge.

Approximately 75 Blue-winged teal were observed on the refuge August 21, one day later than first arrivals of the previous year. There was no apparent build-up of Blue-wings during the latter part of August, although a few small flocks were seen from time to time.

Geese

A few spring migrant Canada geese remained on the refuge through the first week in May. No fall migrants had made their appearance at the end of the period.

Water, Marsh, Shorebirds, etc.

Killdeer, Sora rails, King rails and Spotted sandpipers nested in approximately the same numbers as the previous year.

Upland plovers were observed occasionally.

A small number of White pelicans were present on Silver Lake throughout most of the summer. The last two weeks in August their numbers increased rapidly, with an estimated 500 present August 31. Green herons and American egrets showed a substantial increase over 1951.

Mourning Doves

The Mourning dove population on the refuge and vicinity was slightly higher than a year ago. However, a heavy rainstorm August 30-31 moved some of the birds south for the opening of the dove season, September 1. Nesting success was good, and the young were out of the nest somewhat earlier than last year.

2. Food and Cover

Primarily due to the drier summer, production of volunteer wild foods was much lower than last year. There was very little Smartweed produced either on or off the refuge. Our old stand-by for wild millet, the east shore of Silver Lake, looked only fair at the end of the period. Lower production of Smartweed and Wild millet is off-set to some extent by an unusually heavy stand of Chufa on the east shore of Silver Lake ordinarily occupied by Wild millet. This is the first time in recent

years that this area has not produced an excellent stand of volunteer Wild millet.

Approximately 230 acres along the shoreline of Swan and Silver Lake and the flats east of Silver Lake were broadcast to Jap millet, or a mixture of Jap and Wild millet, using our Ford tractor with half-tracks and broadcaster operating off the power take-off. (See photograph numbered 1 & 2). The crop produced ranged from excellent on low moist situations to fair on higher, drier areas where the dearth of precipitation from May through July showed its effect. Jap millet sown on cultivated lands is discussed under Cultivated Crops.

3. Lead Poisoning and Other Diseases

There was no evidence of lead poisoning or other diseases during the period.

B. UPLAND GAME BIRDS

1. Population and Behavior

Bob White Quail

All indications point toward a good quail year. The hatch appears much heavier and earlier than in 1951. At least twice as many broods were seen during the period as a year ago.

Prairie Chickens

The Prairie Chicken population continues low in this locality. No birds were seen on the refuge during the period. Several broods of Prairie chickens have been reported in the vicinity, and it appears that this species is at least holding its own.

2. Food and Cover

Food and cover were plentiful during the period.

3. Disease

There was no evidence of disease.

C. BIG GAME ANIMALS

1. Populations and Behavior

White-tailed Deer

The deer population continued to increase. One doe with triplets was observed west of Silver Lake in August.

The Missouri Conservation Commission announced that a three-day

hunting season, November 6-8, would be held on bucks only in Chariton, Livingston, and Carroll counties, with deer to be taken with shotguns with slugs or rifles shooting a 60 grain bullet or heavier. This has aroused considerable controversy among some of the farmers in this locality, who claim that the use of high-powered rifles in this flat, thickly settled area will result in loss of stock and possibly human life. Several petitions are being circulated to prevent the use of rifles.

2. Food and Cover

There is a plentiful supply of food and cover for deer despite their increase.

D. FUR ANIMALS, PREDATORS, RODENTS AND OTHER MAMMALS

There has been no appreciable change in Raccoon numbers since the previous period. The Muskrat population appeared to be increasing slightly, although numbers are still limited by the lack of suitable marsh habitat.

Striped and Spotted skunk remained about the same.

Only one Coyote was seen during the period; however, from the tracks observed it is evident that a few individuals occupied the refuge from time to time.

There was no change in the status of Mink using the refuge.

Cotton-tail rabbits continued to be plentiful.

E. PREDACEOUS BIRDS, INCLUDING CROWS, RAVENS AND MAGPIES

Predaceous birds occupied the refuge in usual numbers. There was no change in their migration pattern over past years.

F. FISH

There was no appreciable change in the fish population in Swan and Silver Lake. The 662' elevation of Silver Lake (1' lower than heretofore) had no apparent effect upon fish life.

III REFUGE DEVELOPMENT, MAINTENANCE

A. Physical Development

Construction of the new South Pool unit was started May 6 with the Model 6 Northwest dragline. During the period 1,475 lineal feet of levee No. 2 was completed, with an estimated 30,000 cu. yards of material moved. All work was done from mats, with the exception of a two-week period in July, when it was dry enough to operate without them. (See photographs # 3-5).

Under the supervision of Mr. Arthur Jamieson, wing walls and a ramp with baffle blocks were added to the west end of the Levee # 2 water control structure and short additions made to the wing walls on the east end. (See photographs numbered 6-9.)

Hobson and Company gave the D-7 tractor a motor overhaul, built up the track rails and front idlers, installed new track pins and bushings and rebuilt the master clutch. Upon return of the tractor it was painted and work started on reconstruction of Levee #3 August 14, using the 6-yard scraper obtained from Necedah refuge. (See photographs numbered 10-11). Fifteen hundred fifty-six lineal feet of the levee was rebuilt, with 3,045 cubic yards of material placed during the remainder of August.

Five hundred fifty cubic yards of road gravel were received and spread on refuge roads under contract.

Thirty-five acres of land were cleared of brush and plowed. Ten acres of this were cultivated and planted to Jap millet; the remainder never dried sufficiently to farm. (See photographs numbered 12-13).

Seventy-five acres of levee slope and shoreline east of Silver Lake were sprayed with 2-4D and 2-4,5T to eliminate encroaching brush and weeds, using the Ford tractor and spray rig constructed for that purpose. A fair to good kill was obtained.

A front sidewalk was poured at Quarters No. 2.

The following maintenance work was accomplished during the period:

The barn at Secondary headquarters was re-roofed and the roofs of all other Secondary buildings repaired.

The well pipe was pulled at Secondary headquarters, the well cleaned with a sand bucket and the pipe replaced, with an additional length added.

Quarters #1 received a complete interior and exterior paint job. The interior was painted largely by the refuge manager's wife. A new gas hot water heater was also installed, doing away with the antiquated coal heater.

The foundation of the bridge at the north end of the road to the White Barn was replaced.

The headquarters gasoline pump was overhauled.

Mr. Thornsberry made a trip to Crab Orchard refuge after construction materials and another to Necedah refuge for a six-yard scraper.

All levee slopes and both headquarters areas were mowed three times; Secondary pasture once, and Headquarters pasture twice.

B. PLANTINGS

1. Aquatic and Marsh Plants

The shorelines of Swan Lake and Silver Lake were broadcast to Jap and Wild millet in late June and July, when water levels were lowered to promote volunteer growth. Approximately 230 acres in all were seeded, using the Ford tractor with recently acquired half-tracks and broadcaster operating off the power take-off.

2. Trees and Shrubs

No plantings were made during the period.

3. Upland Herbaceous Plants

Fifty-five hundred multi-flora rose seedlings were set out on the east side of the Headquarters pasture, around Secondary headquarters area as a border on the old field levee north of field 2A. Planting stock was received in poor condition and had already broken dormancy. Survival was approximately 25 per cent.

4. Cultivated Crops

The year 1952 has been as excellent a crop year as the previous year was poor. Relatively dry weather from April through July was ideal for Corn, Soybeans and Milo, but somewhat dry for oats, grasses and legumes.

Very little of the lowland acreage farmed was lost to high water, and with good to excellent Corn, Soybeans and Milo, a record crop year for Swan Lake refuge is all but made. (See photograph # 14) The refuge share of crops farmed on a share-crop basis, plus that grown by refuge personnel, is tentatively estimated at 24,000 bushels; a 100% increase over 1951! As usual, the bulk of this is in corn. However, we also have 146 acres of very good Dwarf Milo, 15 acres of Higari, and 108 acres of cultivated Jap millet. Of this, 45 acres of the Dwarf milo, all of the Higari, and 88 acres of Jap millet were grown by refuge personnel. Although Jap millet produced well on some fields, the crop as a whole was much lighter than that of last year.

At this writing 205 acres of winter wheat (75 by refuge personnel) are in the ground and all but one field sown showing green. This is quite in contrast with last year, when wet weather prevented sowing wheat until September 19. Thirty acres of Alsike clover grown as a green manure crop should also be browsed by the Canada geese.

In addition we have 5 acres experimental plantings of Hairy vetch and Wong barley made this fall, and small plots of perennial ryegrass and Alta fescue planted two years ago.

C. COLLECTIONS

1. Seed and Other Propagules

One hundred seventy-five bushels of wheat was combined from refuge fields.

There is very little Smartweed in this locality this year, and none has been located suitable for combining. The Wild millet crop east of Silver Lake is much lighter than usual, but we plan to combine as much as possible in September.

D. RECEIPTS OF SEED AND NURSERY STOCK

Fifty-five hundred multi-flora rose seedlings were received from the Illinois Natural History Survey. from State of Ill. in partial payment for seed of this species obtained from Crab Orchard Refuge, RCG.

IV ECONOMIC USE OF REFUGE

A. GRAZING

The following grazing permits were in force during the period covering grazing of mixed cattle:

Permit Number	Name	Period of Use	AUM's	Grazing Unit
Swan Lake #35	Arch McGilvray	5/3 - 9/3	176	2G
Swan Lake #19682	Reams Downey	5/24 - 6/23	25	4G

There was no indication that grazing conflicted with wildlife.

B. HAYING

A timothy-lespedeza hay crop was taken off the 17 acres of Unit 1 H. Two red clover cuttings were harvested from 34 acres of second-year clover south of pasture 3-G. The permittees took all the hay, and the Service, in turn, will receive one-third of the hay acreage in cultivated crops.

V FIELD INVESTIGATIONS

The goose browse study started in 1950 was continued. Plots of Perennial ryegrass and Alta fescue planted in 1950 have firmly established themselves. These were mowed twice to keep down the weeds and make them more palatable. Unfortunately, White dutch clover is encroaching to some extent and will make evaluation of the use of the grasses difficult. Twenty-five acres west of these plots on higher, better drained land was also set aside for experimental plantings. Five-acre plots of Ladino clover, Birdsfoot trefoil, and Alsike clover were planted this spring, but failed to establish themselves, probably because of the dearth of moisture. Five-acre plots of Wong barley and Hairy vetch were planted this fall, and both are doing nicely. All experimental plantings are within one-half mile of the White Barn, which will be used as a vantage

point to observe utilization.

A report on the Cooperative Canada goose research project carried on with the Missouri Conservation Commission since 1949 entitled "An Ecological Study of Canada Geese" by Commission Biologist Charles E. Shanks is appended to the Narrative. Unfortunately the conclusions reached regarding shooting pressure on the Canada goose flock during 1951-52 must be re-evaluated, as quite recently, we received 130 more band returns, most of them recovered during the hunting season.

The following band returns were received during the period.

Species	Date Banded	Date of Return	Locality
Canada Goose	10-29-51	12-13-51	Louisiana
" "	11-15-51	1-3-52	North Carolina
" "	11-1-51	12-16-51	Tennessee
" "	11-8-49	7-18-52	Staying with geese - Pleasant Hill, Missouri
" "	12-26-48	12-2-51	Nebraska
" "	11-30-50	6-10-52	Ontario
" "	11-18-50	1951 Season	Missouri
" "	11-25-49	1951 Season	Iowa
" "	12-3-49	4-20-51	Ontario
" "	12-3-49	10-15-50	Wisconsin
" "	12-14-49	10-28-51	Missouri
" "	10-25-51	12-7-51	Missouri
" "	10-25-51	12-7-51	Missouri
" "	10-25-51	12-5-51	Missori
" "	12-7-50	11-3-51	Oklahoma
" "	12-4-50	12-19-51	Texas
" "	11-30-50	11-26-51	Missouri
" "	11-21-51	1-5-52	Arkansas
" "	11-14-51	12-11-51	Texas
" "	11-19-51	1951 Season	Missouri
" "	11-16-50	12-27-51	Arkansas
" "	11-17-50	12-27-51	Arkansas
" "	10-23-50	11-7-51	Missouri
" "	11-25-49	11-4-51	Missouri
" "	3-21-49	1951 Season	Texas
" "	3-21-49	1951 Season	Missouri
" "	11-8-49	12-5-51	Missouri
" "	11-7-49	12-20-51	Texas
" "	11-1-51	12-18-51	Arkansas
" "	11-21-50	11-26-51	Missouri
" "	11-21-50	12-8-51	Missouri
" "	11-27-50	12-7-51	Missouri
" "	11-28-50	12-20-51	Texas
" "	11-25-49	9-20-51	Manitoba
" "	11-14-50	9-22-51	Manitoba
" "	11-16-51	11-20-51	Missouri
" "	11-25-49	1951 Season	Missouri
" "	11-15-51	11-30-51	Missouri
" "	11-20-51	12-7-51	Missouri
" "	11-8-51	12-12-51	Louisiana
" "	11-2-51	11-15-51	Missouri
" "	11-18-50	12-20-51	Texas
" "	11-17-50	11-29-51	Missouri
" "	11-14-50	12-2-51	Missouri
" "	11-7-50	11-7-51	Missouri
" "	11-4-50	1-1-52	Arkansas
" "	11-6-50	11-11-51	South Dakota

Species	Date Banded	Date of Return	Locality
Canada Goose	12-12-49	1951 Season	Mississippi
" "	11-7-50	12-16-51	Tennessee
" "	11-29-49	12-6-51	Texas
" "	11-25-49	12-28-51	Texas
" "	11-14-50	12-15-51	Louisiana
" "	11-23-49	5-52	Manitoba
" "	11-21-50	11-28-51	Louisiana
" "	11-15-51	12-10-51	Louisiana
" "	11-18-50	12-28-51	Texas
" "	12-15-51	12-28-51	Texas
" "	11-21-50	12-15-51	Texas
" "	12-27-48	11-18-51	Louisiana
" "	11-2-51	5-20-52	Manitoba
" "	12-9-49	1951 Season	Arkansas
" "	12-7-49	12-11-51	Louisiana
" "	12-3-49	11-18-51	Wisconsin
" "	11-29-49	12-27-51	Texas
" "	12-5-49	12-7-51	Missouri
" "	11-23-50	1-25-52 Found Dead	Arkansas
" "	12-14-49	10-26-51	Iowa
" "	11-28-50	12-1-51	Illinois
" "	12-7-49	1951 Season	Texas
" "	12-14-49	11-3-51	Wisconsin
" "	11-6-50	12-16-51	Mississippi
" "	11-3-50	4-18-52	Manitoba
" "	11-19-49	1951 Season	Kansas
" "	11-18-49	1-4-52	Arkansas
" "	11-18-49	1951 Season	North Dakota
" "	11-17-49	12-9-51	Missouri
" "	11-10-49	12-16-51	Texas
" "	11-10-49	1-1-52	Arkansas
" "	11-22-49	12-14-51	Louisiana
" "	11-16-49	1-4-52	Arkansas
" "	11-22-49	1951 Season	Missouri
" "	12-27-48	12-16-51	Louisiana
" "	11-9-49	10-20-51	Minnesota
" "	11-28-51	12-28-51	Texas
" "	11-27-51	12-3-51	Missouri
" "	11-15-51	12-9-51	Missouri
" "	11-6-51	11-19-51	Missouri
" "	11-2-51	12-15-51	Texas
" "	11-2-51	12-9-51	Missouri
" "	12-7-50	Spring 1952	Manitoba
" "	11-28-51	May 1952	Manitoba
" "	11-28-51	12-2-51	Missouri
" "	11-29-51	12-10-51 Found Dead	Missouri
" "	11-29-51	12-30-51	Arkansas
" "	11-28-50	1951 Season	Missouri
" "	11-20-50	May 1952	Manitoba
" "	11-28-50	12-26-51	Texas

Species	Date Banded	Date of Return	Locality
Canada Goose	11-28-50	12-6-51	Louisiana
" "	11-21-50	Fall 1951	Ontario
" "	11-28-50	11-18-51	Missouri
" "	11-19-51	May 1952	Manitoba
" "	11-1-51	12-2-51	Missouri
" "	11-6-51	1951 Season	Missouri
" "	11-23-51	12-8-51	Missouri
" "	12-4-51	4-17-52	Manitoba
" "	12-7-50	11-23-51	South Dakota
" "	12-7-50	12-10-51	Missouri
" "	10-24-51	12-6-51	Missouri
" "	10-25-51	12-28-51	Texas
" "	10-25-51	11-27-51	Texas
" "	11-29-51	May 1952	Missouri
" "	11-20-51	April 1952	Manitoba
" "	11-26-51	11-30-51	Missouri
" "	11-15-51	12-7-51	Missouri
" "	11-21-51	12-17-51	Texas
" "	11-23-51	12-9-51	Missouri
" "	11-27-51	12-28-51	Texas
" "	10-29-51	11-23-51	Missouri
" "	11-19-51	May 1952	Manitoba
" "	11-20-1951	1-2-52	Arkansas
" "	11-15-51	11-30-51	Missouri
" "	11-23-51	12-8-51	Missouri
" "	11-16-51	11-20-51	Missouri
" "	12-2-49	1951 Season	Texas
" "	11-25-49	1-1-52	Arkansas
" "	11-6-50	1951 Season	Arkansas
" "	12-27-48	Fall 1951 Found Dead	Missouri
" "	11-7-49	1951 Season	South Dakota
" "	11-22-49	12-15-51	Louisiana
" "	11-21-50	4-16-52	Manitoba
" "	12-7-49	August 1951	Manitoba
" "	11-27-51	1-3-52	Arkansas
" "	10-29-51	5-16-52	Manitoba
" "	12-23-48	12-9-51	Illinois
Mallard	11-25-49	1951 Season	Arkansas
"	4-10-52	August 1952	Saskatchewan
"	12-19-49	1951 Season	Louisiana
"	2-25-50	11-21-51	Oklahoma
"	12-19-49	11-22-51	Missouri
"	12-19-49	1951 Season	South Dakota
"	2-17-50	12-4-51	Illinois
"	12-19-49	11-6-51	Arkansas
"	3-10-50	11-29-51	Missouri
"	3-10-50	1-1-52	Arkansas
"	11-15-49	12-3-51	Louisiana
"	11-25-49	12-23-51	Arkansas
"	12-13-51	1-4-52	Tennessee

Species	Date Banded	Date of Return	Locality
Mallard	3-16-50	11-16-51	Nebraska
"	2-14-52	4-21-52	Saskatchewan
"	10-26-51	4-18-52	Manitoba
"	11-1-51	1951 Season	Arkansas
"	10-26-51	12-11-51	Arkansas
"	11-2-51	12-30-51	Tennessee
"	11-27-51	12-24-51	Arkansas
"	11-2-51	12-30-51	Arkansas
"	11-2-51	1951 Season	Indiana
"	11-2-51	11-51 Found Dead	Missouri
"	11-2-51	1951 Season	Arkansas
"	11-2-51	1-3-52	Arkansas
"	11-2-51	1951 Season	Arkansas
"	11-2-51	12-3-51	Kansas
"	11-1-51	12-7-51	Arkansas
"	11-1-51	11-24-51	Arkansas
"	11-1-51	11-15-51	Missouri
"	11-1-51	1-1-52	Arkansas
"	11-1-51	12-9-51	Missouri
"	11-1-51	12-17-51	Arkansas
"	11-2-51	12-22-51	Arkansas
"	10-29-51	12-29-51	Arkansas
"	10-29-51	12-14-51	Arkansas
"	10-26-51	11-10-51	Missouri
"	10-26-51	1951 Season	Missouri
"	10-26-51	12-26-51	Mississippi
"	11-1-51	12-4-51	Missouri
"	11-2-51	1951 Season	Missouri
"	11-2-51	1951 Season	Missouri
"	11-6-51	12-7-51	Missouri
"	11-2-51	11-25-51	Missouri
"	11-1-51	11-22-51	Tennessee
"	11-1-51	12-19-51	Arkansas
"	11-1-51	11-20-51	Missouri
"	11-1-51	12-28-51	Arkansas
"	11-1-51	1-2-52	Tennessee
"	11-1-51	12-13-51	Tennessee
"	10-29-51	12-8-51	Missouri
"	10-29-51	11-26-51	Missouri
"	10-29-51	12-29-51	Arkansas
"	11-6-51	11-11-51	Illinois
"	12-13-51	1-3-52	Arkansas
"	12-28-51	1-4-52	Arkansas
"	12-13-51	12-21-51	Arkansas
"	12-13-51	12-21-51	Tennessee
"	11-6-51	11-30-51	Missouri
"	11-6-51	11-24-51	Missouri
"	11-13-50	12-8-51	Missouri
"	3-8-49	10-13-51	Manitoba
"	12-20-48	10-31-51	Missouri

Species	Date Banded	Date of Return	Locality
Mallard	11-2-51	12-9-51	Illinois
"	11-2-51	11-24-51	Missouri
"	11-1-51	12-4-51	Tennessee
"	11-1-51	12-4-51	Missouri
"	11-2-51	12-4-51	Missouri
"	11-2-51	1951 Season	Missouri
"	11-2-51	1-2-52	Arkansas
"	11-2-51	11-17-51	Missouri
"	11-2-51	12-17-51	Missouri
"	11-2-51	12-31-51	Arkansas
"	10-26-51	12-15-51	Kentucky
"	10-26-51	11-20-51	Missouri
"	11-2-51	11-23-51	Missouri
"	12-13-51	1-1-52	Arkansas
"	12-28-51	1-3-52	Arkansas
"	12-13-51	12-27-51	Mississippi
"	12-12-51	12-18-51	Arkansas
"	11-6-51	12-6-51	Missouri
"	11-6-51	11-20-51	Missouri
"	11-6-51	12-24-51	Arkansas
"	12-13-51	12-23-51	Arkansas
"	12-13-51	12-29-51	Mississippi
"	11-19-51	12-8-51	Missouri
"	11-19-51	1-5-52	Arkansas
"	11-19-51	12-8-51	Tennessee
"	11-6-51	12-19-51	Tennessee
Black Duck	12-19-49	1951 Season	Missouri
Pintail	11-8-51	1-1-52	Arkansas
"	11-8-51	11-24-51	Florida
Baldpate	4-16-51	12-24-51	Texas
Blue-winged Teal	4-20-51	6-12-52 Found Dead	Saskatchewan
" " "	4-28-51	10-20-51	Quebec
Green-winged Teal	4-11-51	11-23-51	Texas
" " "	4-3-51	12-24-51	Texas
American Coot	4-10-52	8-52 Found Dead	Sasketchewan
" "	4-15-52	4-22-52 Found Dead	North Dakota
" "	3-26-51	6-22-52 Found Dead	Alberta
" "	4-11-51	11-24-51	Louisiana
Shoveller	4-16-51	12-16-51	Texas

VI PUBLIC RELATIONS

A. PUBLIC USES

2. Fishing Use

An estimated 3,400 visitor-days were spent fishing on the refuge. This represents a substantial increase over the previous year.

3. Miscellaneous Use

There was an estimated 4,000 visitor-days of this type, principally sight-seers and picnicers.

B. REFUGE VISITORS

The following is a list of visitors during the period:

Name	Title	Date
Mr. Ray Wright	Engineer, Regional Office	5/6 - 5/9-52
Mr. Joe Richey	Engineer, Regional Office	5/6 - 5-14-52
Mr. Arthur B. Jamieson	Construction Foreman	5/9 - 6/12/52
Mr. Joe E. Smoke	Realty Assistant	5-22-52
Mr. Clair T. Rollings	Supervisor, Economic Use	5-22-52
Mr. J. D. Beets	Land Acquisition, Mo. Consv. Comm.	5-22-52
Mr. Long	Land Acquisition, Mo. Consv. Comm.	5-22-52
Dr. Morley	Economic Use	5-22-52
Mr. Davis	Economic Use	5-22-52
Mr. Howard Wight	Biologist, Missouri Consv. Comm.	6-11-52
Mr. Dave McGlauchlin	Student, Univ. Of Missouri	6-11-52
Mr. William V. Taylor	Engineer, Central Office	6-27-52
Mr. Robert Dougall	Engineer, Regional Office	6-27-52
Mr. Claud R. Alexander	U. S. Game Management Agent	7-10-52
Mr. Wesley C. Newcomb	U. S. Game Management Agent	Numerous
Mr. Harry T. Maltby	U. S. Game Management Agent (Iowa)	7-22-52
Mr. Charles E. Shanks	Biologist, Missouri Consv. Comm.	Numerous
Mr. Lee R. Crail	Biologist, Missouri Consv. Comm.	Numerous
Mr. Hamlet B. Clark	Manager, Fountain Grove Wildlife Area	Numerous
Mr. Harris White	Agent, Missouri Consv. Comm.	Numerous
Mr. Paul Brooks	Agent, Missouri Consv. Comm.	7-23-52
Mr. Neilan Hart	Agriculture Teacher, G.I. Class	7-23-52

C. REFUGE PARTICIPATION

On May 12 the refuge manager gave a talk and showed personal kodachrome slides of Minidoka and Tule Lake refuges to the Forest Green Community group.

The refuge manager showed the Service films "Hunting the Puma", "Birds of Woody Island" and "Canadian Porcupine" to the Swan Lake Sportsman's Club May 27.

As the first step toward taking over the Swan Lake Recreational Area, (this was turned over to the town of Sumner on Special Use Permit for a ten-year period), an American Legion sponsored "work day" was held May 18 at the Swan Lake refuge recreational area to clean up and improve the area. Approximately 50 local citizens donated their services and use of equipment, ranging from posthole diggers to chain saws and tractors, for the rehabilitation of the area. (See photographs numbered 15-17). A great deal was accomplished toward getting the area up in shape, but probably even more important was the better understanding and feeling

resulting from the get-together. Mr. Thornsberry was instrumental in organizing and directing the "work day."

On July 7 the refuge manager showed the Service film "Know Your Hawks" and personal kodachrome slides of hawks and other birds to the Swan Lake Scouts.

The Swan Lake Sportsmens Club suspended activities during the summer. First fall meeting is scheduled for September 30.

D. HUNTING

None during the period.

E. FISHING

The fishing season on the refuge was open throughout the period. At least 90 percent of the fishing was on Silver Lake and most of this along Levee # 3. Fishing was somewhat better than the previous year, although most of the fish taken were of the rough variety. Carp and buffalo made up the bulk of the catch, with bullheads, drum and channel catfish accounting for most of the remainder.

Several parties were permitted to seine on the refuge under supervision of refuge personnel during the State Seining season, July 15 to August 15. Approximately 1,000 pounds of rough fish were taken in this manner, compared with 300 in 1951 and 500 in 1950.

Fishing remained poor on Swan Lake.

F. VIOLATIONS

None apprehended.

VII OTHER ITEMS

A ITEMS OF INTEREST

The state has taken over maintenance of the Mendon road running along the north and east sides of the refuge from roads intersection with the R21-20W line east and south approximately 7 miles to Mendon. State plans call for straightening and otherwise improving the road.

A number of photographs are attached at the end of the report.

Respectfully Submitted,

Robert F. Russell

Robert F. Russell

September 25, 1952

Approved _____.

Acting Regional Director

SEP 29 1952

Photograph # 1. Sowing Jap millet northwest corner of Swan Lake with Ford tractor with half tracks and broadcaster operating off power take-off. (Exp. # 9 7-5-52)

Photograph # 2. Same view of above showing Jap millet growth. (Exp. # 10 - 8-31-52)

Photograph # 3. Starting Levee # 2 south of Elk Creek. Model 6 Northwest recasting material to form west slope of levee. D-7 tractor with dozer shaping and smothing up. (6-1-52)

Photograph # 4. Looking north over section of Levee # 2 completed. Note water control structure at arrow. (Exp # 11 - 8-31-52)

Looking south from water control structure over Levee No. 2 recently thrown up with Model 6 Northwest dragline. (Exp. # 12 - 8-31-52) Photograph # 5

Photograph No. 6. Addition to water control structure. Getting ready to drive piling at west end of Levee # 2 water control structure. (5-16-52)

Photograph # 7. Addition to water control structure. Driving piling west side of water control structure Levee # 2. (5-6-52)

Photograph # 8. Addition to water control structure completed with exception of pouring two baffle blocks. (6-10-52)

Photograph # 9. Another view of addition to water control structure completed with exception of two baffle blocks. (6-10-52)

Photograph # 10. D-7 tractor overhauled and painted. Exp. # 13 - 8-13-52

Photograph # 11. D-7 with 6-yard scraper obtained from Necedah refuge, repairing face of Levee # 3 one-half mile south of water control structure. (Exp. 14 - 8-20-52)

Photograph # 12. Section 31, looking south toward Elk Creek. A portion of 35 acres cleared and plowed with bush and bog plow. (Exp. # 15 - 7-15-52)

Photograph # 13. Section 31 looking Southwest toward Elk Creek. Soybean crop belonging to Permittee Washam on land reclaimed summer 1951. (Exp. 16 - 7-15-52)

Photograph # 14. Portion of 45 acres of Dwarf Milo grown by refuge personnel. (Exp. # 17 - 8-31-52)

Photograph # 15. Work Day at Swan Lake Recreational Area. Time out for chow. (5-18-52)

Photograph # 16. American Legion "Work Day" at Swan Lake Recreational Area. Clearing out underbrush and thinning trees along shoreline of Swan Lake.
(Exp. # 18 - 5-16-52)

Photograph # 17. American Legion "Work Day" at Swan Lake Recreational Area. Pulling out stumps and snags along beach with R-5 tractor. (5-16-52)

AN ECOLOGICAL STUDY OF CANADA GEESE

Objectives:

To determine migrational routes of Canada goose flocks using Missouri, shooting pressure upon refuge flocks, and general stability of flocks using refuges. Further, to determine the extent of Canada goose nesting habitat in the vicinity of The Pas, Churchill, and York Factor, Manitoba, Canada, extent to which this habitat is being used, and the practicability of banding geese on these grounds during the nesting period.

Techniques Used

The project and data herein reported result from a cooperative study by Messrs. H. H. Dill and Robert F. Russell, refuge managers of Swan Lake Federal Waterfowl Refuge and representing the U. S. Fish and Wildlife Service, and the writer, representing the Missouri Conservation Commission. Survey work in Manitoba, Canada, was accomplished at Commission expense by Mr. Ronald W. Balham, student, Wildlife Research Unit, University of Missouri.

The major portion of the data herein results from the trapping, banding, and fluoroscoping of Canada geese at Swan Lake Refuge in north-central Missouri. All birds were aged and sexed at the time of capture. Band returns were obtained from the U. S. Fish and Wildlife Service through normal channels. Kill records were maintained by all major clubs surrounding the refuge, and all farmers within five miles of the refuge boundary were personally interviewed within five days after the close of the hunting season to ascertain total kill.

Through the cooperation of the U. S. Fish and Wildlife Service, the Manitoba survey was made in the Service's plane stationed at Delta, Manitoba, Canada. The sum of $400.00, provided by the Missouri Conservation Commission, was spent in buying gasoline and oil for the plane and for sundry expenses enroute. Approximately 3,100 miles were flown, giving an estimated coverage of 700 square miles. In general, geese were counted along a 1/4-mile transect. A departure from this procedure was made in certain cases -- such as shorelines of productive areas. North of Churchill, lesser Canada geese may have been observed, but the difference betweed these sub-species cannot be determined from the air.

Findings

During the course of this study to date, at the Swan Lake Refuge a total of 4,438 Canada geese have been trapped, banded, and released as follows: 305 in 1948-49; 1,671 in 1949-50; 1,467 during the fall of 1950; and 986 during the fall of 1951. Approximately 200 birds were captured early in 1951, but were wing-clipped and held for experimental nesting studies, and are therefore not included with other data presented

here. Of all birds handled, 1,503 were fluorescoped in 1949, 1,540 in 1950, and 410 in 1951, some of which included re-trapped birds.

Returns from birds shot or being found dead (hereafter referred to as recoveries) total 346, or 7.8 per cent of all birds banded. A total of 136 birds previously banded have been recaptured in the traps (hereafter referred to as retakes).

Approximately 675 geese were counted in the aerial transects flown over Manitoba, 220 of which were observed at Lakes Kelsey and Connolly (see attache map) on the return flight.

The attached maps show the flight route made over the nesting area and recovery points for birds banded at Swan Lake Refuge. All other data are recorded in tabular form.

TABLE 1

Canada Geese Seen on Aerial Transects - Manitoba - June 1951

(See attached map)

Location Symbol	Area	Geese Seen	
		Adult	Juvenile
A ------	Dog Lake	26	35
A_1 -----	Goose Island, Lake Winnipegosis	4	7
C ------	Kelsey Lake	15	27
D ------	Connelly Lake	21	30
E ------	Kiskitto (Connelly Lake) - Wabowden	6	1 brood
F ------	Pennycutaway River	7	7
H ------	Lower Tundra (York Factory Churchill)	22	4
J ------	Caribou River (Churchill to the Anne Delta)	9	-
K ------	Anne River Delta	79	44
L ------	Hyde Lake	4	-
M ------	Cape Churchill Area	113	2 broods
N ------	Churchill-Lac Brochet	2	4
P ------	Lac Brochet - The Pas	1	1 brood
Return Flight -----	The Pas - Delta		
	Kelsey Lake	61	88
	Connelly Lake	28	40
TOTAL ----------		398	275 - 8 broods

Findings: (Continued)

TABLE 2

Date of Banding and Rate of Band Recoveries of Canada Geese Banded at Swan Lake Refuge

Year of Banding	Total Birds Banded	RECOVERIES			
		Direct*	1st Year** Indirect	2nd Year*** Indirect	3rd Year**** Indirect
1948-49	305	2	26	15	4
1949-50	1,671	79	90	29	
1950	1,476	57	40		
1951	986	11			

*Recovered in the year of banding prior to August 1 of following year.
**Recovered August 1 to August 1 one year following banding.
***Recovered August 1 to August 1 two years following banding.
****Recovered August 1 to August 1 three years following banding.

TABLE 3

Date of Banding and Rate of Retakes (Trap Recaptures) of Canada Geese Banded at Swan Lake Refuge

Year of Banding	TOTAL Birds Banded	RETAKES			
		Direct*	1st Year**	2nd Year***	3rd Year****
1948-49	305		6	3	1
1949-50	1,671	48	25	8	
1950	1,471	40	24	8	
1951	986	3	4		

*Recovered in the year of banding prior to August 1 of following year.
**Recovered August 1 to August 1 one year following banding.
***Recovered August 1 to August 1 two years following banding.
****Recovered August 1 to August 1 three years following banding.

TABLE 4
Per Cent of Recoveries, by Regions

Region	PERCENTAGE				
	1948 1st yr Indirect*	1948 2d. yr Indirect**	1949 1st yr Indirect*	1949 2d yr Indirect**	1950 1st yr Indirect *
North of Swan Lake	55 %	75%	58 %	60 %	64 %
At Swan Lake	19 %	7 %	10 %	20 %	22 %
South of Swan Lake	27 %	20 %	32 %	20 %	14 %
Year of Recovery	1949	1950	1950	1951	1951
Total Recoveries	26	15	84	25	36

* Recovered one year after banding.
** Recovered two years after banding.

Findings: (Continued)

TABLE 5

Peak Concentrations and Computed Kill at Swan Lake Refuge

Year	Peak Fall Concentration	Wintering Concentration	Total Kill
1948	18,000	6,000	2,500
1949	34,000	7,500	5,000
1950	32,000	28,000	1,700
1951	50,000	12,000	3,500

TABLE 6

Age and Sex Composition of Canada Geese Trapped at Swan Lake Refuge

Year of Banding	Size of Sample	Adult Male	Adult Female	Young Male	Young Female	Yg.M. Per 100 Yg.F.	Ad.M Per 100 Ad.F.	Young Per 100 Adults
1949	1,503	459	378	279	387	72	121	79.5
1950	1,467	484	379	261	325	80	122	66.5
1951	840	184	161	242	253	96	114	143.0

TABLE 7

Per Cent of Geese Trapped at Swan Lake Carrying Body Shot

Year	% Adult with Shot	% Young With Shot
1949	46.0 %	22.0 %
1950	51.7 %	26.2 %
1951	56.0 %	13.0 %

Analysis and Recommendations:

Reference to the band recoveries map (attached) gives a clear picture of the migration routes followed by Swan Lake Canada geese. The wintering area is clear-cut, extending from Refugio County, Texas, northeastward along the Gulf Coast to include Calcasieu, Cameron and Vermilion parishes in Louisiana. The major concentration point in this vicinity is Cameron Parish, Louisiana, and the neighboring Jefferson and Chambers counties, Texas. The influence of the Lacassine and Sabine federal refuges in Louisiana is obvious. Only one other apparent concentration point exists between the wintering area and Swan Lake; this is in the Arkansas and White River delta region along the Mississippi. The attached map indicates an obvious split in the flight pattern southward from Swan Lake to the wintering grounds, with one group moving southwest to finally follow the Sabine River south along the western edge of Louisiana; the other group going southeast to follow the Mississippi south. This split is evident for both direct and indirect recoveries and is therefore not a phenomenon of any one season. This strongly suggests that the concentration of geese using the Swan Lake Refuge may consist of two flocks, each somewhat independent of the other, with one having an affinity to the Mississippi Flyway, the other being aligned with the Central Flyway. These two groups, however, get together again on the wintering ground. To the north of Swan Lake several concentration points are evident. These are: Squaw Creek Refuge, in northwest Missouri; the Missouri River Refuge, in southern South Dakota; the Lake Traverse region, in western Minnesota; an area northwest of Winnipeg, Canada; and finally in the vicinity of York Factory, at the mouth of the Nelson River in Manitoba. A small concentration point is also evident near the mouth of the Severn River in Ontario. It was first thought, on the basis of band returns, that the major nesting area for the Swan Lake geese was in the vicinity of York Factory, Manitoba. However, reference to Table 1 and the attached map of aerial coverage of the nesting grounds does not indicate this to be true, since no geese, adult or young, were encountered at this site. It is concluded, therefore, that band recoveries from York Factory represent birds shot in transit to the nesting area and the actual location of the nesting area for that particular flock remains unknown.

From the aerial survey made, it is apparent that the nesting population is widely scattered, with scattered breeding pairs occurring throughout the region. However, there is a vast amount of water area unoccupied during the nesting period, implying that future expansion of Canada goose populations is not dependent upon available nesting habitat but some other factor. Of course, the possibility exists that these unused water areas contain no nesting Canada geese, due to certain biological factors as yet unknown. The latter could only be determined by a detailed habitat and ecological study of the birds and the area involved. From the air, however, there is no apparent difference between used and unused areas, leaving one with the tentative conclusion that unused water areas are devoid of geese simply because there are not enough geese to go around It would appear, therefore, that the only means of increasing Canada goose populations is by holding total annual mortality at a level lower

than total annual replacement in the form of young birds. The proper means for accomplishing this latter remains a debatable issue. Since there is no lack of nesting habitat, it is obviously a problem for the mid- and southern continent regions. One of the purposes of this study is to evaluate Canada goose refuges and the role they play in maintaining or increasing goose numbers.

The aerial survey revealed that there are few areas where banding would be feasible. The scattered populations, the extreme inaccessibility of the areas, and the difficulties connected with transportation rule out the majority of the areas indicated on the attached map, with the possible exception of Lakes Kelsey and Connelly near The Pas, and Dog Lake near Delta. If a banding project were undertaken in these areas, it would be necessary to have an airplane to spot the geese on the day or days that the drive was in progress. This would save perhaps days of fruitless search in a canoe.

The scattered birds seen during the aerial survey were post-breeders and juveniles. This situation would not prevail during the spring and fall. It might be possible to net-trap geese in the fall when the birds concentrate at Marsh Point, near York Factory, and the area northwest of Winnipeg, Manitoba. However, there would be no way of determining which nesting population was being trapped, and the resultant data would be no better probably than that currently being obtained at the Swan Lake Refuge. Also, at present sufficient details are lacking to set up a net-trapping operation in Manitoba with any assurance of success.

It appears from the data at hand that fall hunting pressure on the Swan Lake flock of geese was not as great in 1951 as in previous years. This is evident in Table 7 (Page 4), where only 13 per cent of young birds were shown to be carrying body shot, as compared to 26.2 per cent and 22 per cent for the previous two years, respectively. This is undoubtedly a significant difference, assuming that fluoroscopic data for body shot evidence the current Year's shooting pressure only in the young birds which start southward migration free of any body shot. This lowered shooting pressure is further evident in Table 2 (Page 3), which shows a lower rate of recovery in 1951 than was experienced in previous years. Only 84 recoveries were obtained in 1951, as compared to 162 recoveries in 1950. This difference is accentuated when it is considered that more banded birds should have been available for recovery in 1951 than in 1950. This difference in recovery rate, however, could be partly due to the increased proportion of young in the flock in 1951, as compared to previous years (Table 6, Page 4), this adding a diluting factor which would tend to reduce the chances of recovery in 1951, regardless of shooting pressure. Whether an increased proportion of young in the flock would tend to mathematically reduce the per cent of young carrying body shot has not been determined. That the increased proportion of young birds reduced chances of recovery is evidenced in Table 3 (page 3), where the total number of trap recaptures also dropped significantly.

Table 4 (Page 3), showing per cent recoveries by regions, gives

some insight into the reduced kill upon this flock of geese in the vicinity of refuges. As indicated in Table 4, a maximum of 22 per cent of this flock is shot in the vicinity of Swan Lake Refuge, with 14 to 32 per cent being shot south of Swan Lake. To the north of Swan Lake the percent of total kill, as indicated by total recoveries, ranges from 55 to 75 per cent. From Table 4, a rough average of all years (unweighted) indicates 62 per cent of the total kill to be occurring north of Swan Lake, 16 per cent at Swan Lake, and 22 per cent south of Swan Lake. Recoveries from south of Swan Lake are concentrated primarily around the federal refuges of Lacassine and Sabine. North of Swan Lake two concentration points are in the vicinity of refuges -- the federal refuge at Squaw Creek, in northwest Missouri, and the State-operated Missouri River refuge, in southern South Dakota. However, the number of recoveries from these two points is only a small proportion of the total recoveries north of Swan Lake. The establishment of a refuge in the Lake Traverse region of western Minnesota and the area northwest of Winnipeg, Manitoba, Canada, would undoubtedly serve to increase total numbers of geese comprising this flock of birds. This increase would result from the added protection which would further lower the total annual mortality level, so that more birds would return to the nesting area, resulting in an increased population. This would reduce hunter kill for several years, but would, in the end, produce a larger annual harvestable surplus than is now available. This is simple mathmatics, since the harvestable surplus of 100,000 geese, in actual numbers, is twice that for 50,000.

Summary

An Ecological Study of Canada Geese

1. In late June 1951, an aerial survey of Canada geese nesting areas in Manitoba, Canada, was made. A total of 3,100 miles were flown, giving an estimated coverage of 700 square miles. A total of 398 adult geese and 275 young were counted. Banding in this area is considered impractical, with the exception of Lakes Kelsey and Connelly near The Pas, and dog Lake near Delta, Manitoba.

2. A total of 4,438 Canada geese have been trapped, banded, and released at the Swan Lake Refuge to date. Of this number, 3,453 have been fluorescoped for incidence of body shot during the course of the study. A total of 345 recoveries have been obtained to date; this is 7.8 per cent of all banded birds.

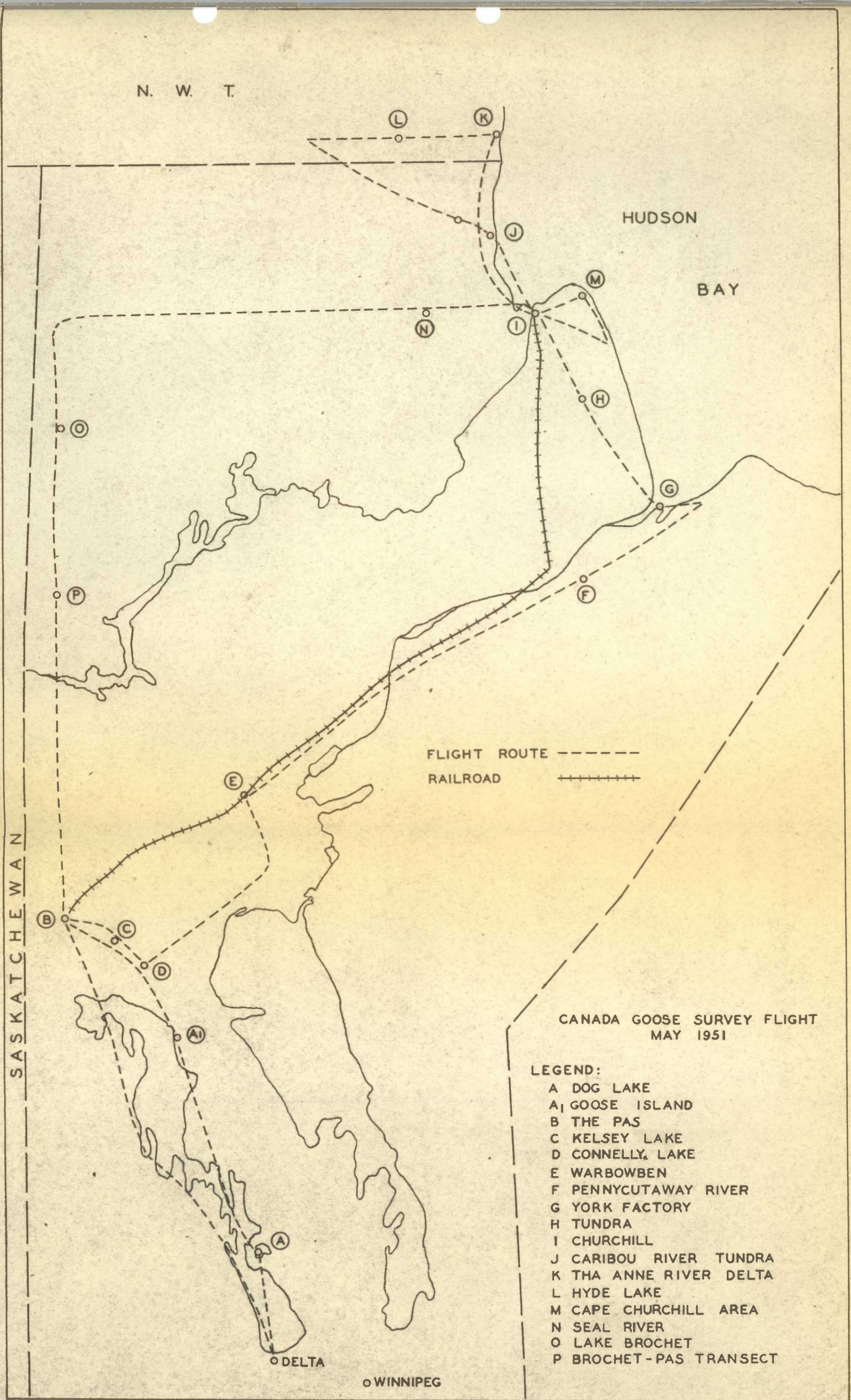
3. Band recoveries at present give no indication of the true nesting area used by birds banded at Swan Lake. The wintering area for this flock of Canada geese is known to be concentrated on the Gulf Coast in the vicinity of the boundary between Texas and Louisiana. Several fall concentration points are evident north of Swan Lake. Band recoveries indicate that the establishment of refuge areas in the vicinity of Lake Traverse, Minnesota, and approximately 25 miles northwest of Winnipeg, Manitoba, would help to increase this particular flock of

birds. Canada geese leaving Swan Lake split up in their southward migration to the wintering ground, with a portion moving southwest and the remainder moving southeast, both groups rejoining on the wintering grounds. This would indicate that part of the birds stopping over at the Swan Lake Refuge during the fall have an affinity to the Mississippi Flyway, with the remainder being influenced by the Central Flyway.

4. The aerial survey in Manitoba indicates that nesting Canada geese are widely scattered, leaving extensive areas at present available for possible nesting. There is no apparent reason to believe that any future expansion of Canada geese is limited by a lack of suitable nesting sites.

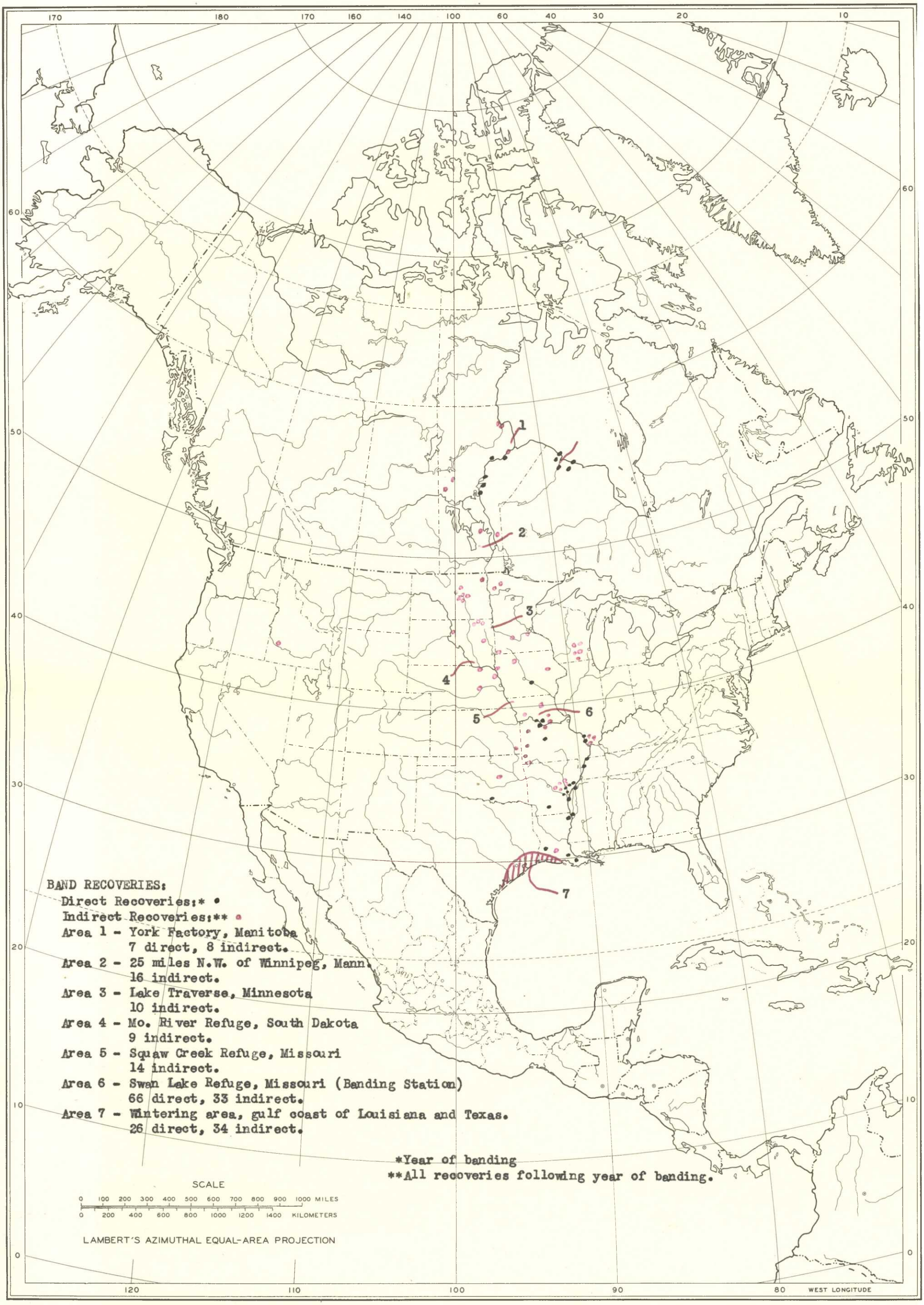
5. All data collected indicate a reduced shooting pressure on this flock of geese during the fall of 1951. This is evident from both band recoveries and fluoroscopy of trapped birds.

6. The protective influence of refuges is shown through band recoveries, where 62 per cent of all recoveries come from north of Swan Lake (the banding site), 16 per cent at Swan Lake, and 22 per cent south of Swan Lake. The latter two are influenced almost entirely by federal waterfowl refuge areas.



NORTH AMERICA

No. 102



GOODE'S SERIES OF BASE MAPS

HENRY M. LEPPARD, EDITOR

Prepared by Henry M. Leppard
Published by the University of Chicago Press, Chicago, Illinois

WATERFOWL

Refuge Swan Lake Months of May to August 194 52

(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. Swans:									
Whistling swan									
II. Geese:									
Canada goose	26	5-1	26	5-1 - 10	26	5-10			260
Cackling goose									
Brant									
White-fronted goose									
Snow goose									
Blue goose									
III. Ducks:									
Mallard	200	5-1	200	5-1	100	8-31	3	100	2,500
Black duck									
Gadwall									
Baldpate									
Pintail			10	8-31	10	8-31			10
Green-winged teal									
Blue-winged teal	100	5-1	150	8-31	150	8-31			1,100
Cinnamon teal									
Shoveller									
Wood duck			100	8-31			1	Unknown	2,000
Redhead									
Ring-necked duck									
Canvas-back									
Scaup									
Golden-eye									
Buffle-head									
Ruddy duck									
IV. Coot:									

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese -

Ducks 100

Coots -

Total waterfowl usage during period 5,670

Peak waterfowl numbers 486

Areas used by concentrations -

Principal nesting areas this season -

Reported by Robert P. Russell
Robert P. Russell

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.

2338

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Swan Lake Months of May to August 1952

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
White Pelicans	15	5-1	800	8-31	800	8-31				4,800
Great Blue Herons	10	5-1	100	8-1 -31	100	8-31				3,000
Green Herons	1	7-3	75	8-15	80	8-31				90
American Bittern	1	5-15	1	7-4						2
American Egret	5	7-1	800	8-1 -31	800	8-31				6,000
II. Shorebirds, Gulls and Terns:										
Killdeer	20	5-1	Common Summer residents							2,400
Spotted Sandpiper	10	5-5	Common Summer residents							1,000
Upland Plover	6	5-20								6
Sora Rail	20	7-1	Common Summer residents							1,800
King Rail	10	8-15								
Ring-Billed Gull	200	8-1	800	8-31	800	8-31				6,000
Black Tern	2,000	8-14	2000	8-14						5,000

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	2,000	3-1	2,500	3-1 - 28	2,000	3-31		250,000
White-winged dove								
IV. Predaceous Birds:								
Golden eagle								
Duck hawk								
Horned owl			Common Summer residents					6,000
Magpie								
Raven								
Crow	50	3-1	Common summer resident					6,000
Sharp-shinned Hawk	1	3-10		1	3-1			
Sparrow Hawk	1	3-1	Common Summer resident					50
Marsh Hawk	25	3-1	25	3-1	10	3-31		1,500
Barred Owl			Common Summer resident					1,000

Reported by Robert P. Russell

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 Gruiiformes)
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.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Swan Lake Months of May through August, 1952

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn	100		100			25	25	75		75	
Dwarf Milo Maize	27		27		27		27	0			
Jap Millet	102		102		102		102	0			
White Proso Millet	36.5		36.5			16.5	16.5	20		20	

(8) Indicate shipping or collection points Swan Lake Refuge

(9) Grain is stored at White Barn

(10) Remarks

*See instructions on back.

16—61482-1

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

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Form NR-2

UPLAND GAME BIRDS

1613

Refuge Swan Lake Months of May to August, 19* 62

(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.
Bob White Quail		6	5	300					600	
Prairie Chickens									Unknown	

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.