SAND LAKE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY1, 1954 TO AUGUST 31, 1954

PERSONNELL

Herbert H. Dill - - - - Refuge Manager in Charge
Dale E. Sutherland - - Refuge Manager
Theodore O. Wahl - - - Refuge Clerk
Elmer P. F. Podoll - - Maintenance Man - Equipment
Albert W. Krege - - - - Maintenance Man - General

CONTENTS

Sand Lake National Wildlife Refuge

May 1, 1954 to August 31, 1954

I. GENERAL

A. Weather Conditions

A summary of weather data for the Sand Lake Refuge and vicinity as recorded at the official weather station maintained at Refuge Headquarters is given in Table No. 1.

TABLE NO. 1

Sand Lake Weather Data

Month	Precipitation '52	'53	'54	Max. Temp. '52	'53	'54	Min. Temp. '52	'53	'54
May	.82	3.18	1.11	90	86	80	28	25	21
June	2.76	7.93	2.60	95	95	90	39	38	34
July	1.11	.87	1.34	96	93	100	42	45	42
August	.72	2.03	2.12	104	95	90	40	47	45
Totals & Extremes	5.41	14.01	7.17	104	95	100	28	25	21

The last hard freeze of the season occured on the 8th and 9th of May when temperatures fell below freezing over the entire state. Early May temperatures were nearly 10° below average. Light frosts occured again later in the month of May when temperatures dipped to the low 30's. Seeding was completed early in May with the exception of flax and corn and other normally late seeded crops. Early moisture was below normal but adequate for starting growth; prospects were high.

Spotted areas received rains during the season and showed quite a contrast in crop conditions in the immediate area. Growth of pastures and ranges were slow starting due to cool temperatures and below average rainfall. The outlook brightened in June with as average rainfall over the entire state, while the temperature was a little below normal. The cool temperatures seemed to slow early corn growth to a point where it became the main topic of

conversation, only to be followed by a dry and plenty warm July.

Rust was coming on but in this area it seemed of little consequence, as the weather changed, lending conditions not so ideal for its development as a year ago. Temperatures climbed in July, and while we had more rainfall in that month than a year ago, it was all in one week and we felt we had had a hot and dry month. Crops began to feel the effect too and some disappointment was becoming evident. Spotted rainfall was the highlight of the weather in August.

For the four months included this area has received 6 inches less than the normal amount of precipitation, while temperatures were a trifle below average.

B. Water Conditions

The starting of the period showed the water levels only slightly above the authorized levels. Below normal rainfall, 6 inches below for the period, tended to lower the lake. However some cloudbursts north of us sent some water down the James River and our levels remained quite near constant. Some developments on the James river at Jamestown, N. D. have stabilized spring runoff to give us a more even flow.

C. Fires

No uncontrolled fires have occured on the refuge this period.

II. WILDLIFE

A. Migratory Waterfowl

1. Populations and Behavior

a. Whistling Swans. Whistling swans had disappeared from the refuge at the start of this period, although a few of them were still present at Putney Slough, a few miles to the east, during the first week in May.

b. Geese. At the beginning of the period there were still migrating geese in the area. On an aerial count of May 4 it revealed 2000 snow-blues and 1000 Richardson's geese in addition to approximately 100 Common Canadas representing the Sand Lake breeding population. Many of these big Canadas were already nesting at this time.

By May 10 all but 200 Richardson's geese and 500 snow-blues had moved northward, and they too disappeared within the next few days.

Pairs of geese, assumed to be nesting birds were seen at the following locations at different times during late April and May;

No. of Pairs	Location
2	South End (Columbia Dam)
1	Silo Bay
2	Herseth's Island
2	½ mile south of Hecla Grade
1	Just north Mud Lake Dike
1	On island south of Houghton Grade

The only nest located was found on the island just west of the Herseth Ranch, and it was successful.

It is known that the two pairs of geese seen repeatedly at the Columbia Dam did not nest. The birds were seen until mid-July when they disappeared, presumably to moult. Apparently some of the young geese pair up, and spend most of their time in some preferred area, but donnot nest. The State Waterfowl Biologist reports similar observations of Canada goose pairs on a large lake south of Webster, always in the same general location for a number of weeks in the early part of the summer, but no nests could be found nor broods. It appears that pairs of geese seen on an area are not always breeding pairs.

The first Canada goose brood - 6 young - was seen along the Houghton Grade on May 23. They were just under one week of age at that time. Subsequently, through the remainder of May and June, 8 other broods were observed on the refuge. One phenomanally large brood of 9 young was seen. Whether or not this represents the productive efforts of a single pair is a little questionable. Yet, the birds were only about one week old when first noted, and they were all the same size.

No broods of less than 4 young were seen; the average size was 5.1. Therefore, at least 46 young were raised this summer on the refuge on the basis of those acutally seen. There may have been a few more broods in some other less traveled areas that escaped us. At any rate, the Sand Lake goose population remains at about the same level as it has for the past few years.

Three, and often 4 broods loafed along State Highway 10 where it passes through the refuge (the Houghton Grade), and they were seen by hundreds of motorists. The people got "quite a kick" out of seeing the birds, as shown by repeated comments from our neighbors and visitors.

On August 23, 122 geese were seen in one flock feeding in disced oats stubble just north of the headquarters area. This figure probably represents most of the Sand Lake resident goose population.

Most of the geese were produced in the south half of the refuge, and used fields in this area much more than the north half. The one goose nest in the display pool was not successful.

c. Ducks. On May 1, approximately 5000 ducks were using Sand Lake, many of them migratory blue-winged teal. There were also 700 lesser scaup and canvasback transients on the refuge. Most mallards and pintails had, of course begun nesting by this time.

By the second week in May, duck numbers had stabilized at the estimated breeding population of 2300 birds, and with little change, except in redhead and scaup numbers, occurred. Groups of 4 or 5 male pintains were seen at that time. A few buffleheads were present until early in the second week and one common merganser was seen on May 10. Of particular note was the presence of two lone drake wood ducks mear the end of the month. One was found adjacent to the Stensland hay unit, and the other just below a grove of trees south of the Ed Weismantel farm. No wood ducks nests or broods were found, however.

The first duck brood, a pintail with 5 downy young, was seen on May 29. Subsequent brood counts during June, July, and August indicate that at least 4.53 broods were produced per mile of duck producing shoreline. On the basis of 4.53 broods per mile projected over 75 miles of shoreline, the species composition of the total number of broods seen, and using the mean average brood sizes contained in the Griffith Memorandum it is estimated that 2240 ducks were raised on the refuge. This fugure is nearly the same as 1953. However, a comparison of the number of broods produced for the two years indicates that quite a few more pintails nested on the refuge. Tables V, VI, VII, VIII and Figures 1, summarizes brood count data, and a further discussion of brood counts is found in Section V.

During the nesting season, no notable movements of birds occurred, except for a minor increase in redheads at the end of May, and an influx of baldpates, mostly drakes, beginning in the middle of June. The redheads were predominantly unattached males although females and paired birds were also well represented. These birds were seen frequentingthe abundant beds of sago until mid-July when they disappeared. Only one redhead brood was seen this summer, and apparently very few of these birds nested here. The baldpates were abundant until mid-August. Pintails became one of the dominant duck species near the end of August.

Other items of general interest pertain to black ducks and woodies. Although few blacks were seen during the month of May, they were noted more and more frequently as the season progressed. It is estimated that there were 400 present in August. Wood ducks were seen quite often, also. In addition to the (apparent) lone drakes, groups of 3 and 4 woodies were seen along the Mud Lake Dike and the Houghton grade during July and August, and 4 mates in eclipse pulmage noted along the Hecla Grade on August 31.

The duck population at the end of the period stood at about 7200. This was only a little more than one-third of the usual

number using Sand Lake in late summer. However, there were 50% fewer water areas in the James River Valley this year and 36% fewer in the state. The breeding population was 7% less in the James River Valley and 21% less state-wide. If it is assumed that many birds in the past moved into Sand Lake when other water areas on the outside dried up, we can at least partially explain the decrease. Further, heavy late summer rains filled potholes in the hill region west of the refuge, providing more good duck habitat there. These are, of couse, theories only.

d. Coots. At the start of the period, there were approximately 1400 coots on the area, but within 10 days most of these had moved out. On the basis of counts of coots along the shoreline while making breeding pair counts, the breeding population was approximately 400 birds, a decrease of 20 percent from last year. Counts of young and adults during July and August indicated that there was about one young per adult. Therefore, on this basis, the refuge produced approximately 400 coots. Most of the coot population was found in the south one-half of the refuge, and at the end of the period they were feeding about the sago beds.

e. Water and Marsh Birds. Pied-billed grebes were common during the summer months. The first nest of this species was seen on May 24.

Western Grebes were abundant in numbers approximately equal to last year. The first young were observed on June 14. Western grebes did not use the part of the refuge north of the 4-mile Grade at all, and were found between 4-Mile Grade south to Mud Lake Dike only sparingly. More than 90 percent of the grebe population used the south one-half of the refuge. It was estimated that there were about 500 of these birds present at the end of the period.

White pelicans were present throughout the period, but only a very few nests could be found on the two nesting islands on the refuge. Nine hundred were seen early in May, and 2400 were seen on August 30 when an aerial count was made.

Cormorants had begun nesting on May 10 and on the island just south of the Houghton Grade. This island is now the principal nesting place for this species. There were 230 nests on the island when it was visited early in July. Approximately 2000 cormorants were using Sand Lake at the end of the period.

Great-blue herons were seen daily throughout the summer months feeding along the marsh edge, but no colonies were found. Forty, the most seen on any one day, were counted during the aerial census on August 30. Black crowned night herons were seen daily.

American Bitterns were seen from time to time throughout the period.

Two least bitterns were seen at two different locations on

the refuge during the course of the summers work.

Sora and Virginia rails were seen or heard occasionally.
Yellow rails were seen on two occasions, once by Merrle Howard in May just No 4-Mile, one by Southerly, So end, August 22

f. Shorebirds, gulls and terns. Most of the shorebirds mentioned in the January-April Narrative report still remained at the beginning of this period. Amovement of small unidentified "peep-type" shorebirds was noted during the early part of the second week in May. Bairds , and semi-palmated sandpipers were seen often during the second week of the month, and the first spotted sand-piperwas noted May 14. Seven turnstones, two piping plovers, a Wilson's phalarope female, three red-backed sandpipers, one dowitcher and a ringed plover were seen along the Houghton Grade on May 17.

Avocets, willets, and marbled godwits were observed throughout the summer months, and were believed to have nested on the refuge although no nests nor young were found.

Two known Forster's tern colonies were noted. One of about 40 individuals plus a few black terns was located out in the marsh just west of Site # 2. The other, of about 50 individuals was found just east of the Harold Dennert farm out in the marsh. A common tern colony of about 200 birds was located on one end of the cormorant nesting island just south of the Houghton Grade.

Franklin's gulls were very abundant again this year. It was estimated that there were close to 100,000 present on August 21 flying about apparently snatching insects out of the air.

2. Food and Cover

Aquatic foods were abundant throught the period, particularly sago pondweeds. Most of the smaller bays and a considerable area of Sand Lake and Mud Lake were covered with this good duck food. There was no shortage of food during the summer months.

Cultivated crop yields on the uplands were near normal - somewhat surprising when the very dry spring and summer all taken into account. A total of 74 acres of wheat, 87 acres of millet, 211 acres of barley and 395 acres of corn were left in the fields to provide a good many bushels of feed.

Good green goose browse is abundant this summer and will be this fall, as a result of frequent thunderstorms during August.

Brood cover was more than adequate, and emergent growths are extending outward from the shore in many places.

3. Botulism

No botulism nor toxic algae poisoning was noted this year. Water levels remained near normal, and a flow through the area was maintained until the end of August.

B. Upland Game Birds

1. Population and Behavior

a. Ring-necked pheasant. The pheasant population in this part of South Dakota and on the refuge is high following an excellent hatch. The population is at about the level it was in 1949, a "good" year.

One nest was found on the refuge containing 23 eggs. All but one had hatched by May 29.

The pheasant hunting season will extend for 20 days beginning on October 23, with a limit of 3 cocks daily.

b. European partridge. Only one pair of Huns were seen around the refuge this spring, and only one covey -5birds- has been noted so far this summer during our travels. According to the State Game technician, the partridge population appears to have declined somewhat. Very few were observed while making pheasant counts.

c. Pinnated grouse. No pinnated grouse were seen during the period, and none are nesting on the refuge.

2. Food and cover.

Pheasant foods were plentiful, of course, throughout the summer, and crop yields were good, thus leaving a wealth of feed for the fall. On the refuge, the extent of use of cultivated foods by waterfowl during the fall will determine food conditions for these birds for the enduing winter. There are, however, abundant supplementary foods in the form of weed seeds and fruits on shelterbelt shrubs.

Escape cover and nesting cover were adequate on the refuge. The past summer was a "sweet clover" year, providing much additional good winter cover. Phragmites and some of the other marsh edge emergents will provide the bulk of the preferred winter cover for refuge pheasants.

3. Disease. None noted.

C. Big Game Animals

1. Populations and behavior.

White-tailed deer (and a very few mule deer) constitute the big game at Sand Lake. It was estimated that the spring breeding population of white-tailed deer was 325 animals. Since most does, in areas like this one where food conditions are excellant, bear twins, the refuge deer population is conservatively estimated at 450 animals.

It will be necessary to have a deer hunting season this fall for sure, if we are going to continue to get along with our neighbors. A season for the East River country has not yet been set, but it is expected that there will be one following the waterfowl season.

2. Food and cover.

Neither food nor cover are a problem on the refuge during the summer months. Deer fed on alfalfa quite extensively earlier in the summer, but did not seriously injure any of the stands. They did feed quite heavily on corn in some areas in the refuge. Minor overbrowsing of trees and shrubs in some areas has been noted. For cover they used phragmites and other emergents along the marsh edge as well as the numerous shelterbelts on the area.

3. Disease. None noted.

D. Fur Bearers and Other Animals

The raccoon population is very high, both on the refuge and in the surrounding countryside. There are at least 800 animals on the refuge, the number estimated last fall prior to removals. Many farmers have complained amoung themselves about coons killing their chickens (they are not holding the refuge responsible, however) The statewide season was opened in the fall of 1952 and never closed. Yet, it has not resulted in a lower population. The program by permittee trappers to reduce the refuge population will be continued this fall.

Mink appear to be abundant, if frequency of observation is any criterion, and the population probably exceeds 100 animals.

Beaver numbers, in six known colonies and one probable, are estimated to have increased to at least 45 animals. They are not yet damaging any of our valuable shelterbelts.

Muskrats appear to be increasing in numbers. A count will be made later in the fall in order to obtain a population estimate.

Striped skunks have been seen from time to time during the summer months, but not as frequently as during the past year. There are a few spotted skunks in the area.

Red Foxes apparently are increasing on the refuge. Four dens were located in the Silo Bay area.

Cottontails and white-tailed jackrabbits are abundant.

Fox squirrels are also plentiful in many groves.

Rats and mice in the granary and other out-buildings have

been kept in check by the use of warfarin, and the activities of the Krege cat.

E. Predaceous Birds

Marsh hawks, Swainson's, red-tailed, and sparrow hawks have been seen throughout the summer. There appeared to be a movement of marsh hawks, very predominantly females, at the end of August. One peregrine falcon was seen on May 5 along the Houghton Grade, a rarity in these parts. The bird acted quite sluggish and may have just finished a meal.

Short-eared owls were seen quite often earlier in the summer. Horned owls have been seen throughout the summer, and at the end of the period they have been heard questioning the darkness almost nightly around Site # 2.

Crows were not abundant in these parts.

F. Fish

Carp, bullheads, bigmouth buffalo, suckers, and yellow perch are the most abundant fish species in the refuge, Northern pike and a few crappies are also present. One fisherman fishing at the Weismantel Grade bridge reports catching a bass, but this report was not verified. The rough fish have formed the staple of the and cormorants, and other water birds.

III. REFUGE DEVELOPMENT MAINTENANCE

A. Physical Development.

1. 268 loads of rock (approximately 804 cubic yards) for rip-rapping were hauled and placed along shorelines to counteract eroding and washing. Banks were sloped and seeded and have greened over nicely.

2. Recreation area trees were trimmed to afford picnic tables a shady setting. The old baseball backstop was replaced and added a great deal to the appearance.

3. 22 loads of gravel were spread over headquarters roads to prevent further development of some bad chuck holes.

4. A borrow pit north of Houghton Grade was partly leveled with the dozer and trucks.

5. Refuge trails were mowed and raked, also shoulders bladed in to round off and reclaim gravel before new graveling starts.

6. An old lawn sprinkler system was put back in operating order and saved the headquarters lawn, adding immensely to the appearance.

7. The sewer system at site # 4 was revamped to allow proper

disposal-field capacity.

8. Minor repairs were made to the John Deere tractor and loader.

B. Plantings

1. Aquatic and marsh plantings. None

2. Trees and shrubs. Two thousand cedars were planted to provide understory in mature shelterbelts.

3. Upland herbaceous plantings. None

4. Cultivated crops. A total of 2827 acres of crops were harvested on the refuge this year, 272 acres more than last year. Yields were about average. In some areas where they had rain, yyields were good while the dry areas were ~~real~~ poor. The corn crop suffered a week to 10 day setback by cool spring temperature and then a hot and dry July. Some comeback was made in late August but an early frost is predicted.

Refuge shares include 73 acres of barley, 13 acres of oats, 17 acres of wheat and 30 acres of corn for storage at the elevator. In addition, left standing in the fields are 87 acres of millet, 395 acres of corn, 211 acres of barley and 74 acres of wheat. These figures do not include 473 bushels of oats and 215 bushels of barley stored at the elevator in compensation for the cost of fertilizer; that was used quite extensively this year. Resutls will be determined in greater value in following years.

C. Collections

1. Seed and other propagules. None

D. Receipt of seed and nursery stock.

1. Two thousand cedars were received this period from the State Forest Service.

E. Weed Control

Applications of 2,4-D to 486 acres of sow thistle Sonchus arvensis was made with a locally-rented aircraft. In addition all leafy spurge perrenial peppergrass and Canada thistle patches were given two applications of weed killer.

The results on sow thistle appear to be highly successful. The perrennial peppergrass around Site # 3 appears now to be almost completely eliminated. Leafy spurge patches have been weakened so that heavy applications in September should result in their elimination.

A second application to 300 acres of sow thistle is yet to be made, as well as to persisting patches of the other primary noxious weeds. A complete report will appear in the December Narrative.

IV. ECONOMIC USE OF REFUGE

A. Grazing

In addition to the regular permits for 715 acres of grazing, three special permits were issued for a new development, covering approximately 157 acres. These grazing areas are marsh uplands with high vegetation, unfit in their present state for waterfowl nesting and loafing areas. It is planned that grazing cattle will knock down the vegetation in these areas and provide more desirable habitat. Better than expected results have been evidenced to date. Some of these areas will be allowed longer use-periods than the regular July 16 to November 15 dates. Fees remain the same at $1.00 per head per month, allowing one head per five acres.

B. Haying

Permits covering approximately 1000 acres of hayland have been issued, with a fee of $1.50 per ton for hay put up on the refuge.

C. Other uses

One permit has been issued for the keeping of 150 bee hives at .15¢ per hive.

V. FIELD INVESTIGATIONS AND APPLIED RESEARCH

A. Breeding Pair Counts

Again this spring, an aerial breeding pair count was made over the whole of the refuge in a effort to further determine if such a count could be used as a breeding population index, and to provide further data on just what the Sand Lake breeding population is. The count was made on May 10, under similar conditions and at approximately the same point in the breeding cycle as in 1953. Table III. summarizes the data for the past two years.

When the comparison is taken at face value, it shows an increase in breeding pairs for all four of the principal nesting species at Sand Lake, the mallard, pintail gadwall, and blue-winged teal, as well as for some of the other species.

However, subsequent brood counts failed to uphold the breeding pair count in all instances. Apparently the count has been established at a point in the breeding cycle after the peak of early nesting mallards and pintails and before most of the later nesting blue-winged and gadwalls are on territory. A comparison with brood counts cannot be made because of this, and also because of movements onto the refuge during most years.

Neither did the count givean estimate of the breeding population because it was later ascertained that only a fraction of the birds present were seen.

The counts chied value appears to be as a rough breeding population index; an index that can be obtained with a minimum of time and effort expended. Possibly some sort of correction can be obtained from ground counts to enhance its value.

Because the data obtained from the aerial counts were so contradictory and of somewhat questionable value, ground breeding pair counts were made along 12 miles of shoreline representing 17 percent of the total. The counts were made periodically from May 24 to June 9 in different areas throughout the refuge. It is believed that the sample was large enough and covered enough of the different shoreline types that a breeding pair figure for the later nesting blue-winged teal and gadwall could be obtained that could be projected, giving a fairly accurate breeding pair density for those species. It was believed, too, that a reasonably accurate index, if not a near actual figure for re-nesting mallards and pintails was obtained. The data are summarized in Table IV.

A total of 94 pairs were seen along 12 miles of shoreline, for an average of 7.52 pairs per mile. When projected over 75 miles of shoreline, we arrived ata total of 564 pairs. From the species composition of the breeding pairs counted, there were 270 potential blue-winged teal broods, and 115 potential gadwall broods. This is believed to be close to the actual breeding population for those two species.

These data, however, cannot be directly compared with brood count data because not all broods are seen. Further, brood movements onto the refuge in most years prevent a direct comparison.

It may be that two series of these ground count samples can be made, one during the period of the nest establishment of mallards and pintails, and another to cover that part of the blue-winged teal and gadwall breeding cycle. The counts will hepl us determine what the breed ng population actually is at Sand Lake, as well as help us find answers to many of the other production questions.

B. Brood Counts

Brood counts again formed the basis for the production setimate this year. Three series of counts were made in order to find the broods of early nesting species as well as the later nesters. The data for this past season are more nearly actual refuge production in that very few broods moved onto the refuge as compared with farmers years. There just was no water in potholes surrounding the refuge during the period of nest establishment.

A total for all three series was 4.53 broods per mile of

shoreline sampled. This figure projected over 75 miles of duck-producing shoreline gives us a minimum total of 340 broods produced at Sand Lake. To obtain the production figure, the average brood sizes given in the Griffith Memorandum were used, because it was thought that the number of broods seen here was not adequate to obtain an average size. From this then, a total of 2240 ducks were raised at Sand Lake. This fugure, of course, represents the mimimum number produced, since all broods present were not seen. The figure is, of course, more of an index rather than a true production figure, and is approximately the smae as 1953. However, there was an increase in pintails and gadwalls broods of 27 and 42 percent respectively, with a decrease in mallards, and most of the other less important nesting species.

Broods were placed in seven age classes based on plumage variations, and the week of hatching was calculated. This data is shown in Figure 1. Tables V, VI, VII, and VIII summarize brood count data.

VI. PUBLIC RELATIONS

A. Recreational Uses

The recreation area was a very popular spot again this summer. Much improvement has been made in the nature of shade. The trimming of heavy undergrowth to allow tables access to the shade made a big hit with the picnickers. Very little swimming was done this year to the bank sloping and rip-rap work that stirred up the water during the hottest weather. Great many visitors came to

(Continued to page 13)

Table # III
Aerial Count of Breeding Pairs
Sand Lake Refuge

Species	Number of Pairs 1953	1954
Mallard	16	44
Gadwall	27	49
Pintail	8	18
BW Teal	63	73
Sub total	114	184
Baldpate	5	6
GW Teal	-	5
Shoveler	9	16
Redhead	34	15
Canvasback	-	2
L. Scaup	22	25
Ruddy	20	1
Total	210	276

Complete count of refuge
Breeding pairs per mile - approx. 3.8

Table # IV
Ground Count of Breeding Pairs
Sand Lake Refuge

Species	No. of Pairs	Percent Composition
BW Teal	45	47.9
Gadwall	19	20.2
Mallard	11	11.7
Pintail	10	10.6
Black	2	2.1
Baldpate	2	2.1
Redhead	2	2.1
L. Scaup	1	1.1
Ruddy	1	1.1
Woodduck	1	1.1
Total	94	100.0

Miles of shoreline sampled - 12
Breeding pairs per mile - 7.52

Table V
Brood Counts

Series I

Species	Class I	Class II	Class III	Total Broods
Mallard	2	1	1	4
Pintail	4	5	2	11
BW Teal	3	-	-	3
Shoveler	-	1	-	1
Unidentified	-	-	1	1
Totals	9	7	4	20

Sampled 17.5 miles of shoreline - Broods/mile - 1.14

Series II

Mallard	1	2	3	6
Gadwall	8	4	-	12
Pintail	1	2	-	3
BW Teal	4	5	3	12
Redhead	1	-	-	1
Unidentified	3	1	2	6
Totals	18	14	8	40

Sampled 17.9 miles of shoreline - Broods/mile - 2.24

Series III

Mallard	-	-	1	1
Gadwall	-	1	-	1
Pintail	-	1	1	2
BW Teal	-	1	-	1
Shoveler	-	1	-	1
Totals	-	4	2	6

Sampled 5.2 miles of shoreline - Broods/mile - 1.14

Broods/mile - Series I	1.15
Broods/mile - Series II	2.24
Broods/mile - Series III	1.14
Total Broods/mile	4.53

Table # VI

Species	I NO.	I Av. Size	II No.	II Av. Size	III No.	III Av. Size	Total No.	Total Av. Size
Pintail	2	5.00	7	4.15	4	4.00	13	4.23
Mallard	4	8.25	4	5.00	7	5.43	15	6.07
BW Teal	5	9.60	5	5.20	3	5.33	13	6.92
Gadwall	8	8.25	3	6.67	- - - - - - - -		11	7.82
Shoveler	-	- -	2	3.00	-	- -	2	3.00
Canvasback	1	9.00	-	- -	-	- -	1	9.00
Redhead	1	6.00	-	- -	-	- -	1	6.00
Unidentified	1	5.00	-	- -	3	5.33	2	5.00
	22	8.05	21	4.52	17	5.41	57	5.65

Table # VII
Species Composition of Broods

Species	Number	Percent
Pintail	18	25.0
Mallard	16	22.2
Blue-winged Teal	15	20.8
Gadwall	12	16.7
Shoveler	2	2.8
Redhead	1	1.4
Canvasback	1	1.4
Unidentified	7	9.7
	72	100.0

Table # VIII

Calculated
No. of Broods of Principal*
Nesting Species
Sand Lake Refuge

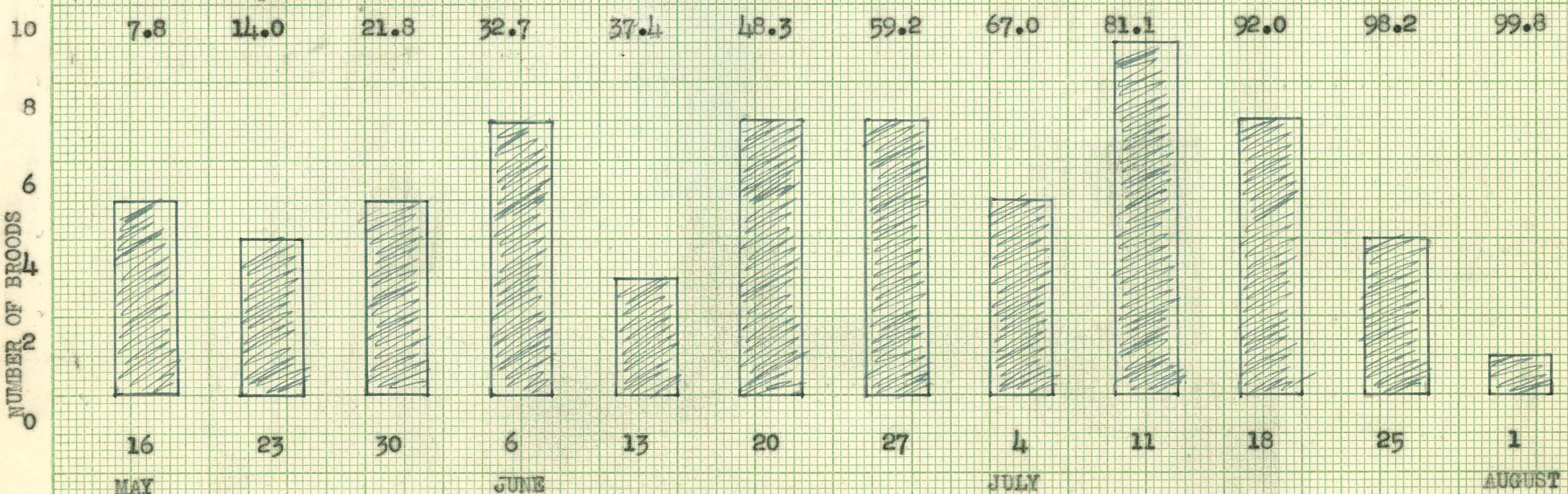
	1953	1954	% Change
Mallard	96.5	75.6	-22
Gadwall	30.5	56.8	42
Pintail	61.1	85.0	27
BW Teal	66.1	70.7	minor
% of total Production	78.0	85.0	

*Based on Brood Counts

Figure # 1

NUMBER OF BROODS HATCHED PER WEEK

SAND LAKE REFUGE 1954



climb the tower and observe the local waterfowl again this summer.

B. Refuge Visitors

NAME	TITLE OR AFFILIATION	DATE
Mrs. Harold Weismantel	Chaperon	5/14/54
Mrs. Elvin Jones	Chaperon	5/14/54
Joseph S. Hagar	Marshfield Hills, Mass	5/19/54
Clarice Pence	Teacher, Davis School	5/14/54
Ruth Dell	Teacher, Plana School	5/14/54
Mrs Elmer O. Jones	Bath, S. Dak.	5/14/54
Mrs. David D. James	Bath, S. Dak.	5/14/54
Mrs. August Bartz	Teacher, Ferney School	5/20/54
Miss Deloris Bahr	Teacher, Verdon School	5/20/54
S/Sgt. George La Bar	Sioux Falls Filter Center	6/10/54
Rev. Vern Neer	Hecla S. Dak.	7/2/54
Harold S. Peters	USFWS Atlanta, Ga.	7/14/54
R.J. Mayerding	USFWS Alexandria, S. Dak.	7/14/54
Bruce Stahling	Columbia, Mo.	7/8/54
Louis G. Helm	Columbia, Mo.	7/8/54
Dan Janzen	USFWS, Minneapolis, Reg. Dir.	7/8/54
Ernest Swift	USFWS, Assistant Director.	7/8/54
John M. Dahl	Tamarac, Rochert Minn.	7/20/54
Earl M. Brooks & Family	Collusa Refuge Collusa, Calif.	8/5/54
Don Vogtman	M R B Bismarck, N. Dak.	8/19/54
Cletus Kachel	State Warden, Madison, S.D.	8/24/54
Morris D. Johnson	Columbia, Mo.	8/31/54
Carroll R. Grondahl	Oakes, N. D. State Game Tech	8/31/54
Frank C. Freezon	Lamore N. D.	8/31/54
Edward L. Jones	Rolla, Mo.	9/3/54
Peter Goldade	Aberdeen, S. Dak.	9/3/54
Mr.&Mrs. Philip D. Tryson	Excelsior, Minn.	9/11/54
L. C. Richardson	State Warden	Frequent
Erling Podoll	State Game Tech.	"

C. Refuge Participation

The following is a summary of activities attended by refuge personnel;

5/7- Gwinner, N. Dak., Wildlife Club, 26 Attended, by Dill.
6/17- Brown Co. Sprotsmen Club 100 Sutherland, Dill.
6/26-6/27- N.D. Wildlife Federation, Devils Lake Dill
S.D. Sportsmen Inc., Pierre, Dill

D. Hunting

None this period.

E. Fishing

During May and June, fishermen congregated at the Weismantel Grade bridge, to fish for bullheads. There were an average of 20 fisher- men, women, and kids for a 40 day period accounting for 800 fisher-folk days. Very few left without 10 or 15 fine bull-heads, some of them a good 10 inches long. The activity tapered off towards the end of June.

A few fishermen caught bullheads and perch in the James River channel at the Hecla recreation area.

VII. OTHER ITEMS

A. Easement Refuges, District No. 5.

1. Tewaukon Refuge. When visited on May 7 it was still supporting 300 snow-blues. A movement of shovelers and blue-winged teals was the only other items noted there worthy of mention.

Brood counts taken there on August 6 turned up 13 broods in Clouds Lake, despite the bare shoreline. Three other broods were seen along 3 miles of shoreline of Lake Tewaukon. Table IX summarizes the brood count data for Tewaukon.

Table # IX
Summary of Brood Counts
Tewaukon 1954

	Class I		Class II		Class III	
Species	No.	Av. Size	No.	Av. Size	No.	Av. Size
Mallard	2	6.0	2	6.0		
Pintail					1	4.0
Gadwall	1	2.0	2	9.0		
BW Teal	2	2.5	2	5.0		
Redhead	1	10.0				
Unidentified	1	7.0	1	4.0	1	5.0

2. Storm Lake. Was also visited on August 6, and two large wood refuge signs were placed, and boundary signs that had been disfigured were replaced.

One gadwall brood of 8 Class I young was seen, as well as a few pintails and raddies. Beaver had been working along the south shore of the Lake.

3. Dakota Lake. Waterfowl populations were checked at the same time as aerial counts of Sand Lake were made. As has been found in the past, very few birds were present during the summer. For instance, the count on August 30 revealed the presence of 20

ducks, mallards, gadwalls, and blue-winged teals, 16 pelicans, 9 great-blue herons, and 3 cormorants.

C. PHotographs.

All photographs used were taken by Dill and Sutherland.

Credits: Portions of VII and editing - Herbert H. Dill
II, V, VII, and E. of III - Dale E. Sutherland
I, III, IV, VI - Theodore O. Wahl

Submitted by Herbert H. Dill
Herbert H. Dill

September 17, 1954

~~Approved: Regional Office~~

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

WATERFOWL

REFUGE SAND LAKE MONTHS OF MAY TO AUGUST, 1954

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	100	100	100	100	130	130	130	130	130	130
~~Cackling~~ Richardson	900	1040	1040							
Brant										
White-fronted	P									
Snow	2200	600	600							
Blue	5600	1400	1400							
Other										
Ducks:										
Mallard	600	600	600	600	600	600	600	600	600	600
Black				P	P	P	P	P	P	P
Gadwall	400	300	300	300	300	300	300	300	300	300
Baldpate	200	50	50	50	50	50	50	50	50	50
Pintail	400	400	400	400	400	400	400	400	400	400
Green-winged teal	200	50	50	50	50	50	50	50	50	50
Blue-winged teal	2300	600	600	600	600	600	600	600	600	600
Cinnamon teal										
Shoveler	P	P	50	50	50	50	50	50	50	50
Wood			P	P	P	P	P	P	P	P
Redhead	100	100	100	100	100	100	100	200	200	200
Ring-necked										
Canvasback	400	50	50	50	50	50	50	50	50	50
Scaup	300	200	200	50	50	50	P	P	P	P
Goldeneye										
Bufflehead	10	3								
Ruddy	100	100	100	50	50	50	50	50	50	50
Other										
Common Merganser	10	1								
Coot:	1400	1000	500	400	400	400	400	400	400	600

P - Present in limited numbers.

3-7150a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE SAND LAKE MONTHS OF MAY TO AUGUST, 1954

(1) Species	(2) Weeks of reporting period: 11	12	13*	14	15	16	17*	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	130	130	130	130	130	130	130		14630	9	46
~~Cackling~~ Richardson									20860		
Brant											
White-fronted									140		
Snow									26800		
Blue									58800		
Other											
Ducks:											
Mallard	2800	2800	2800	2800	2800	2500	2500		194600	16	493
Black	400	400	400	400	400	400	100		15400		
Gadwall	1800	1800	1800	1800	1800	1200	1200		101500	12	403
Baldpate	1000	1000	1000	1000	1000	450	450		45850		
Pintail	450	450	450	450	450	1750	1750		68250	18	519
Green-winged teal	50	50	50	50	50	20	20		6580		
Blue-winged teal	1300	1300	1300	1300	1300	900	900		112000	15	481
Cinnamon teal											
Shoveler	20	20	20	20	20	20	20		3900	2	60
Wood	P	4 plus	4 plus	4 plus	4 plus	10	10		550		
Redhead	50	50	50	50	50	250	250		14350	1	30
Ring-necked											
Canvasback	10	10	10	10	10	50	50		7000	1	30
Scaup									7000		
Goldeneye											
Bufflehead											
Ruddy	P	P	P	P	P	P	P		100		
Other									6000		
								Unidentified Broods		7	224
Coot:	700	700	800	800	800	900	900		76300	7	400

* Weeks that aerial count were made

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	121,230	8800	46
Ducks	582,480	72	2240
Coots	76,300	1400	400

SUMMARY

Principal feeding areas: South half of the Refuge- Sand Lake

Principal nesting areas:

Reported by: Dale E. Sutherland

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

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge SAND LAKE Months of MAY to AUGUST 1954

(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:										
Western grebe										
Pied-billed grebe										
White Pelican			2400	8/30						
Double-crested cormorant			2000	8/30						
Great-blue heron			40	8/30						
Black-crowned night heron										
American bittern										
Least bittern										
Sora rail	1	5/9								
Virginia rail	1	5/24								
II. Shorebirds, Gulls and Terns:										
Killdeer										
Upland plover										
Ringed plover										
Piping plover										
Lesser yellowlegs										
Greater yellowlegs										
Avocet										
Willet		See text								
Spotted sandpiper										
Bairds sandpiper										
Pectoral sandpiper										
Semi-palmated sandpiper										

Piping plover, Marbled godwit, Common tern, Forster's tern, Black tern, Franklin's gull

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove									
White-winged dove									
IV. Predaceous Birds:									
Golden eagle									
Duck hawk									
Horned owl									
Magpie									
Raven									
Crow									
Marsh Hawk									
Red-tailed hawk									
Swainson's hawk									
Peregrine falcon	1	5/3	1	5/3	1	5/3			
Short-eared owl	2	5/9							

Reported by Dale E. Sutherland

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.

INT.-DUP. SEC., WASH., D.C.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge SAND LAKE Months of MAY to AUGUST, 1934

(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.
Ring-necked Pheasand	Marsh edge and adjacent upland 10,000 acres		Insufficient data - see text							
European Partridge	Upland meadow and fields 4000 acres		Insufficient data - see text							

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.

SO_SOL_649

Badgers are an infernal nuisance most of the time, but this fellow made an interesting pet.

SO_SOL_650

Driver Clayton Buntrock
Dick Larson

SO-SOL-

Bank-sloping and rip-rapping about to be completed at Headquarters. This work was also completed at the Columbia Recreation Area.

Frank Daly SO-SOL-

SD-SDL-

Sutherland

Morning glories in a refuge oats field and an adjacent field where they were eradicated with 2-4-D.

SD-SDL-

Both fields were eventually treated successfully and yielded 50 bushels per acre.

SD-SDL-

Close-up showing the effect of the herbicide.

SD-SDL-

Dakota Lake dam and spillway. Picture was taken from the airplane during waterfowl census. Because this country is so flat, (the James River drops 1 inch per mile) frequent high winds cause flooding, especially when the impoundment is at spillway level.