SAND LAKE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

September 1, 1947 to December 31, 1947

PERSONNEL

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I. GENERAL

A. Weather Conditions

The following data was obtained from the official Weather Bureau station at Aberdeen which is located 29 miles southwest of the Refuge Headquarters:

	Snowfall '46	Snowfall '47	Precipitation '46	Precipitation '47		Max. Temp. '46	Max. Temp. '47	Min. Temp. '46	Min. Temp. '47
Sept.	-	-	3.28	1.00		91	101	28	21
Oct.	T	-	3.27	2.03		78	94	17	25
Nov.	2.1	17.1	.94	2.07		60	52	-2	-9
Dec.	0.8	0.7	.10	.06		45	42	-19	-11
Totals	3.9	17.8	7.59	5.16	Ext.	91	101	-19	-11

In general, the weather was warmer during September, October and December than last year while November was colder. Average temperature for October was 7.4 degrees above normal and made this the warmest October since the record began in 1890. Rainfall exceeded that of last year only during November and the total for the period was only 68 percent of that received during 1946. The first snow fell on November 6 and some fell every day at the refuge from November 15 to 26. Total snowfall for the period exceeded that of 1946 by 356 percent.

The first light frost occured on September 15 and was soon followed by a hard freeze on September 22. This was about 2 weeks earlier than last year in both cases. The weather turned colder the first week of November and practically all water areas were frozen over for the winter on November 10.

B. Water Conditions

Water levels have been somewhat lower than last year in the Mud Lake unit and slightly higher at Sand Lake. Precipitation for the first two months of the period was less than one-half that of last year and the water supply coming into the refuge was much reduced. The water level ranged from 11.20 during September to 11.45 for December at the Mud Lake Spillway which has a crest elevation of 12.10. At the Columbia dam the range was from 10.45 during September to 10.80 for December with a structure elevation of 11.00. Although the units are not full it is amazing how well the levels held up in view of the dry period which extended from mid-July to the latter part of October.

All water areas have been frozen over since November 10 and have been blanketed with snow since a few days after that date. The snow has reduced the expansion of ice so that very little heaving has been noted to date. The ice has started to shove up in front of the Mud Lake spillway but since there is less than

one foot difference in the water elevation from one side to the other, we do not anticipate any serious trouble there.

C. Fires

Fortunately, no fires occured during this period. Conditions were extremely hazardous owing to heavy cover and dry weather until late October. Ordinarily there is much fall plowing outside of the refuge to reduce the danger of fires but very little plowing was done this year. The possibility of fires also increases many times with the opening of the waterfowl hunting season because of the heavy hunting pressure.

II. WILDLIFE

A. Migratory Birds

1. Populations and Behavior

(a) Waterfowl: In general, it is estimated that the waterfowl population increased 64 percent as compared to the same period of 1946. Since geese make up an important part of the flight, both spring and fall, they have also been considered separately from the ducks in order to show the trend of both groups. Records indicate that the goose flight dropped below that of last year by 59 percent. On the other hand we have an increase of 109 percent in ducks as a result of a heavy flight of Mallards early in November.

The first migrant geese, White-fronts, dropped in just a week earlier than last year and all other varieties arrived on about that same schedule except the Snows. A single Snow goose was first noted on September 25, fully 2 weeks earlier than usual.

At least 4500 geese were present for the opening of the waterfowl hunting season on October 7. All species commonly occuring at this station were present at that time except the Blues which were first noted about a week later. The White-fronts had reached the peak by October 5 but remained in numbers throughout the month. The population of "Hutchin's" or Lesser Canadas built up rather slowly with the peak occuring about October 20. It is estimated that the peak for all geese for the season occured at this time. The number tapered off gradually until November 8 at which time most of them had moved south.

With fewer birds the usual noticable changes in population numbers was less apparent. Sudden changes, resulting from the arrival or departure of large numbers of migrants, did not occur or went unnoticed. Despite the unusually mild weather there is no doubt but what the birds were continually moving south although fewer birds did stop at Sand Lake. On two different occasions State Wardens reported a migration of geese all over the northeastern part of the state, while there was very little change in the population at Sand Lake at that time.

The population of White-fronts was about the same as last

year. Drastic reductions occured from the other species as follows: Snow - 80%, Blue- 75%, "Hutchin's" - 66%, and Canada - 50%. This is the second consecutive year in which the Canada has suffered a serious drop.

The duck flight increased sharply and accounted for the entire gain for waterfowl in general. Migration was relatively light until early November when the last wave of Mallards came in. The summer population was very low and there was no noticable increase until late September. Most of the Pintail and Blue Wing Teal came in between September 29 and October 12. These birds gradually moved on south and most of the Pintail had left by October 19. A good flight of Mallards came in at this time to replace the Pintail. The population varied but little after that until November 6 when another flight of Mallards arrived. The population built up rapidly during the next few days to reach a peak a week later.

The diving ducks have been conspicious by their almost complete absence. These birds have not been plentiful for years but we usually expect a small sample of the common kinds. Our only records this period are 2 Redheads and 2 Scaups. The pothole and lake region east and west of Sand Lake supported a good population of divers, particularly Redheads and Canvasback. In fact, the heaviest flight of Canvasback in 20 years was reported for Marshall County on the east.

Water levels were slightly lower at Mud Lake than last year but there was very little difference in the Sand Lake unit. Practically all of the potholes, in the county, except the very largest, dried up during the late summer and early fall as a result of a prolonged dry period. This would naturally be expected to move some ducks into the refuge. However, the population was very low throughout the county and there was no apparent increase on the refuge.

The water areas froze over on November 10 except for several holes kept open by the birds. Fortunately, most of the ducks left between November 17 and 22 but there was from 15,000 to 20,000 remaining. The snow was becoming deep by that time making it easy for the birds to feed on the standing corn. There was considerable acreage of standing corn on the refuge but most of the ducks would still go outside to feed. Numerous reports of crop damage were received by the Game Management Agent and it was necessary to take steps to close up the open water holes and attempt to drive the birds south.

Two waterholes in the south end of the refuge and the one farthest east on Sand Lake were frozen over by December 20. The birds using these locations simply moved to the two remaining holes on Sand Lake. Milder weather prevailed for some time then and no further progress was made until the last days of the period. The population was estimated at 20,000 Mallards and 200 Canada Goose after the birds were crowded into the last 2 holes. However, about

12,000 ducks and all of the migrant geese left between December 26 and 29. Colder weather made it possible to freeze up the last holes on December 30 and 31 for the winter we hoped. This was not the case, however, as the last hole was partially open again on the New Year. Apparently the weight of about 8,000 ducks massed on the new ice, which was nearly 3/4" thick, had broken the ice during the night.

(b) Other Waterbirds: In general, there was a large increase in other water and marsh birds with the exception of Great Blue Herons and Black-crowned Night Herons which remained the same. Cormorants and White Pelicans were especially numerious during the early part of the period.

(c) Shorebirds: The habitat for shorebirds was increased considerably this period as a result of lower water levels in the Mud Lake unit. A favorable increase in the number of migrants was noted over that of last year. Dowitchers and Franklin's Gulls made huge gains but most of the other birds of this class are never present in numbers.

2. Food and Cover

In General, there has been less food available on the refuge this period but the cover was as good or better than last year. Smartweeds and bulrushes produced good crops of seed but there was a reduction for sago owing to heavy wave action during the summer. There was considerable hail damage to cover during the early summer but the recovery was remarkable and there was a wider margin along shorelines owing to high water levels during the spring.

The reduction of food resulted from hail damage on refuge crop lands and also because of dry weather.

As a general practice there is much fall plowing of stubble fields in this territory on the heavy soils on the west side of the refuge and outside for miles in all directions. With normal rainfall such lands produce an unlimited supply of volunteer grain which makes excellent forage for the geese. The ground was so hard and dry this fall that it was very difficult to break and in most cases disc plows were used. As a result of these conditions a relatively small acreage was plowed and there was very little volunteer growth on that. Severe hail damage to crops occured on some of our best goose feeding fields on the west side of Mud Lake. There was a little shriveled grain on the ground so those fields were disc or plowed rather early. A fair stand of grain was obtained for the geese. There was also some standing corn broken down and a small acreage of rye along the west side of Mud Lake. Swathed grains were also available to the birds on the east side of Sand Lake northeast of Site 2 and near the south end of the refuge.

A total of 922 acres of grain, which should have produced 12,783 bushels if harvested, was left in the fields for wildlife.

With the exception of 17 acres of wheat which was harvested, this acreage represented the entire refuge share from all crop lands. A larger acreage of corn was left in the field this year owing to the increasing deer herd but the way conditions turned out this was also utilized by waterfowl which apparently planned on wintering at Sand Lake.

It is estimated that at least 10,000 geese and about the same number of ducks feed on the refuge at one time. Although there was less food on the refuge there also was fewer birds, particularly geese, until the latter part of the season. Many birds would go outside to feed and with less green food available this year there was definitely more feeding in stubble fields.

Geese and ducks both traveled considerable distances outside of the refuge in all directions when searching for food. Geese from the refuge were noted feeding near the North Dakota line and quite likely they went even farther north. However, the main flight routes for ducks and geese appeared to be east and southeast and west and northwest. Although hunting pressure was lessened somewhat by the absence of non-residents it was still so heavy that the geese seldom had a chance to feed in any one location outside of the refuge for long.

3. Botulism

None

4. Lead Poisoning

There has been a rather heavy loss of birds from lead poisoning this period. Snow began falling soon after the freezeup to retard the formation of ice and it was quite some time before the open water holes could be reached. Five water holes were maintained by the ducks and geese by early December and there was definite evidence of lead poisoning at each location.

Fifty stomachs were collected and examined for lead. Of t this number 43 or 86 percent contained remains of from 1 to 5 lead shot with the majority averaging 1 or 2. In most cases the shot was well worn which indicated that it had been carried for quite some time. There are still many weak birds present which can fly but are reluctant to leave the water hole. It would appear that the reason these birds have survived so long is the fact that most of them have a relatively light dose of lead.

Without a doubt some of the losses at the water holes were crippled birds, especially soon after the freezeup when we could not retrieve the birds. It is estimated that 1000 Mallards and 1 Canadian goose has been lost to date. Lead poisoning probably accounted for 800 or 80 percent of this number. While this is a considerable loss it is not so serious considering the average population present since the freezeup. Immediately after the freezeup on November 10 the population was estimated at 188,000. These remained until the week of November 17-22 and dropped to

15,000 at that time. Then there was an increase to 20,000 about December 20 and a drop to 8,000 just before the close of the period. This would indicate a daily average of about 50,000. Therefore, the loss this period would average only 2 percent. Had these birds moved on south thru one and possibly 2 hunting zones we feel certain that the loss from hunting alone would have exceeded our losses to date.

In addition, about 170 weak Mallards and one Canda goose were picked up at the end of the period and moved to the duck hospital where food and water is available. There are still quite a number of birds at the last water hole which show signs of weakening but can fly quite well. There is little doubt but what we will loose 500 more ducks before spring.

In our opinion the occurance of lead poisoning this year has resulted from lower water levels during the late summer and fall over a part of the country.

B Upland Game Birds

It is estimated that the pheasant population made an increase of 33 percent over that of a year ago. The early part of the breeding season was not favorable but there was a decided improvement later in the year. Lower bag limits, protection of hens, and a shorter season were finally decreed after the population had been continually dropping during the past two years. Non-residents were not permitted to hunt until after the first 10 days of the hunting season and this reduced the hunting pressure considerable. Inspection of hunters bags showed a higher ration of young to old birds to indicate much better nesting success than the previous year. There is a marked difference in the ratio of males to females outside of the refuge now that hens are protected. However, this does not apply to such an extent on the refuge as most of our birds stay rather close to home during the hunting season. Some predation by red fox occurs and this has been more noticable this period with a heavy blanket of snow on the ground. However, such losses are not more than normal considering the population present.

Limited observations indicate that the number of prairie chickens has dropped 33 percent. These birds are scarce and usually appear at the refuge only during the cooler months. Previously most observations have been made in the northeast part of the refuge but a covey of 15 or 16 birds have been noted southeast of headquarters this period.

Hungarian partridge have been noted much more frequently this period both outside of the refuge and in southern North Dakota. Despite this it is estimated that the number on the refuge has dropped 50 percent as compared to last year. Over the country as a hole the birds appear to have increased by at least 50 percent but the population still remains low.

2. Food and Cover

Food and cover on the refuge have been adequate and much im-

proved on the surrounding territory over that of last year. Wet weather during the spring provided ample moisture for heavy cover and this same condition resulted in more cover outside. Considerable acreages of farm lands were too wet for cultivation and later grew up to weeds. The reduction in fall plowing also left a large portion of the stubble fields for the birds.

All of the refuge share of corn, with the exception of one field, was left standing for winter feed. This proved to be a lucky move in view of the early heavy snow which fell later. A field inspection of the standing corn, during the latter part of the period, disclosed that practically all of the corn had been eaten in the northeast part of the refuge. There has always been a relatively large number of pheasants in that area and also deer. The deer have taken the corn in that particular area and have been feeding in other fields outside. There is a bountiful supply of weed seeds for the birds in that area but the supply of corn will be short and waste grain is now covered by snow. In other parts of the refuge utilization of corn run only from 15 to 35 percent.

3. Disease

None to our knowledge.

C. Big Game Animals

The deer herd has made a large increase again this year and now exceeds what should be considered the normal carrying capacity. Definite figures will not be available until an aerial census can be taken but it is estimated that the number if rom 375 to 400. There have been several outside reports of from 200 to 300 deer in one small area around the old Stehley building site but we have failed to locate any number approaching that figure. There are also rumors to the effect that some deer moved into the refuge from the east during the special deer season in the northeastern part of the state. That is possible and if true our estimate may be far below the actual figure but there is no definite evidence as yet.

It is not at all uncommon to observe groups of from 30 to 40 deer at a time at several locations on the refuge. They are known to be feeding outside of the refuge near the northeast part and also south on the Tollefson farm. Several complaints have been received and all parties have been advised to contact the Department of Game, Fish, and Parks concerning deer. A request for a hunting season on the refuge was made last summer to the Department and we were turned down because they stated that no complaints had been received from this county. The State Department have already received several complaints to date and since the winter season is just starting we feel safe in predicting that many more will be received in the future. Perhaps by next fall a removal program may be initiated.

2. Food and Cover

Cover conditions are good with an abundance of wild sunflowers, giant ragweed, and marsh vegetation in addition to the shelter belt plantings and other trees and shrubs. However, there is a definite browse line on trees and shrubs at several locations where the deer concentrate during the winter months.

The food supply has been adequate to date but in certain sections of the refuge, as already pointed out, there will be a scarcity during the remainder of the winter. In the event of severe weather this may develop into a serious situation. However, we believe that most animals will pull through as long as there is any standing corn outside of the refuge. That supply is more than adequate at present but it is not evenly distributed.

All animals, except fawns of the year, appear to be in fair condition. Some fawns are a little gaunt already.

3. Disease

None to our knowledge.

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

Muskrats: Apparently the muskrat population has dropped again this year but it is now believed that our former estimates were too high. No aerial house count was made last year because the count was scheduled too early and there were too many geese present. An aerial survey this season on November 13 disclosed a total of 438 houses. It is estimated that almost an equal number of animals live in bank dens.

The food supply was as good or better than last year and all animals handled during the trapping season were in excellent condition. All carried much fat and heavier pelts while last year there was a definite lack of fat making them more difficult to skin. P elts were also thin and the size averaged smaller last season.

A total of 105 muskrats both male and female, were weighed and these averaged 1.77 pounds each. A random selection of 30 males averaged 1.76 pounds and 19 females averaged 1.94 pounds.

Mink: At this time there seems to be little change in the number of mink. Several were noted during the summer but signs have been scarce this period. No doubt our estimate for the fur harvest was too high.

Raccoon: There has been a moderate increase in these animals and they are far too numerous. Low fur prices in the past made it impossible to control the number by share trapping. We did hope to remove a good number this year but early heavy snows disrupted all trapping activities.

Skunk: Skunk are also abundant and increasing. Here again fur prices have been extemely low and the weather has prevented any intensive trapping.

Weasel: These animals have not been common and can almost be considered rare at this time. No observations have been made and signs are seldom noted.

Badger: Badger are not numerous but should be reduced to a minimum in view of the continual damage to roads and trails. The Predator and Rodent Control Division now desire to carry on some experimental control work at Sand Lake which will be welcome.

Red Fox: It appears that the fox population has increased this period. A considerable number of fox were taken from the sourrounding country during the previous period. However, we can always expect an increase after the opening of the hunting season as the crippled birds make easy picking for them. The Foxes really have had a banquet during this period with being able to pick from all the ducks suffering from lead poisoning. Trapping was started just prior to the storm which stopped all operations plans are now underway to reduce the animals by airplane hunting.

Coyote: The coyote population is about the same as last year or possibly smaller. They too have been attracted to the refuge by the supply of crippled and weak ducks. Animals have been noted on 2 occasions and signs indicate that from 2 to 4 individuals have made use of the refuge.

Rabbits: Jack rabbits appear in about the usual numbers but are not common at any time. Cottontails are on the increase and very plentiful at this time. As many as 22 have been counted in a half mile section of shelter belt planting. With heavy snow on the ground there has been considerable damage to trees. So far this seems to be restricted entirely to Russian Olive. Much bark has been removed from all branches within reach of the animals but no girdling of trunks has been noted.

E. Predaceous Birds, including Crows, Ravens, and Magpies

The first Snowy Owl appeared on December 15 much later than our first record on November 5 last year. Fewer of these birds have been present this year and it is seldom that more than one bird is noted at a time. Golden eagles have been common since mid-Novembe r with a total of 7 birds present during late December. The bald eagle has been rare as usual with only one record during the period. Great Horned and Short-eared owl are present throughout the year but the number is not large. Hawks are never plentiful and predation by this class of birds is not serious. It is estimated that crows have increased during the year but the population is relatively small and they are noticable only during the spring and fall.

F. Fish

Conditions for fish life on the refuge have only been fair this period. Water levels have been adequate in all units but the blanket of snow on the ice may result in a shortage of oxygen before spring. In fact, it is apparent that a shortage has already developed. A few dead fish have been noted at the Mud Lake spillway and at times the water was litterally alive with minnows and young fish at the water holes maintained by the ducks and geese.

As a result of these conditions we discovered the presence of Crappies and Buffalo for the first time in recent years. Since spring, water levels usually make it possible for fish to move up or down the James River at will, it is possible these fish have been present for some time but heretofore we did not have any definite proof. Carp and bullheads are abundant and the bullheads are small.

III. REFUGE DEVELOPMENT MAINTENANCE

A. Physical Development

(a) Construction

Mud Lake Emergency Spillway - Job 4897: There had been frequent washouts at the old 500' spillway at this location so the structure was moved 250' east. A new cut was made to the east and the material removed was used to replace the dike on the west and for building a 200' training dike. Oversized gravel w as used for covering the crown of the new section of the spillway and for protection along the upstream slope of the new dike fill. A total of 6665 cubic yards of dirt and 102 cubic yards of oversize were moved and used on this project. All labor was performed by refuge personnel and a Construction-Maintenance Foreman.

(b) Maintenance

1. Completed mowing refuge trails and roads.

2. Cut weeds around recognition signs.

3. Placed 100 cubic yards oversize gravel at hole in cofferdam at east end of Columbia dam, hauled 20 cubic yards oversize for fill on west end and 8 cubic yards of heavy riprap for east end.

4. Made excavation, repaired leaks, and replaced fill and riprap on spillway at Lake Tewaukon Easement Refuge.

5. Removed cap and necessary riprap, hauled 48 cubic yards aggregate, filled void between rubble masonry and sheet piling and under east wing wall with concrete, cut off top of piling and poured new cap at spillway on Maple River Easement Refuge.

6 Division of corn crop with 17 permittees covering 879 acres.

7. Loaded out 120 bushel ear corn, 20 bushel shelled corn, and 185 bushel of wheat for transfer.

8. Checked posting and replaced and added signs as necessary on the following area:

Dakota Lake Easement	Entire Boundary	17	miles
Maple River Easement	Entire Boundary	7-1/2	miles
Storm Lake Easement	Entire Boundary	14-3/4	miles
Lake Tewaukon & Cloud	Entire Boundary	17-1/2	miles
Lake Elsie Easement	Entire Boundary	4-1/2	miles
Sand Lake Refuge	Part of Boundary	30	miles
	Total	81	miles

9. Patrol of Sand Lake Refuge and 5 man-days patrol at Waubay Refuge during special deer season.

10. Total of 30 man-days for pickup of Autocar semi-trailer at Minneapolis, moving equipment to Upper and Lower Souris Refuges, and returning Autocar to Minneapolis. Also 6 man-days to obtain cement at St. Paul and 2½ days for pickup of cement mixer at Rice Lake Refuge.

11. Completed exterior painting on residence at Site 2.

12. Completed redecorating living room and dining room of quarters at Site 4 (work done by Nowak on his own time.)

13 Moved old shed to Site 4, remodeled it for coal storage and painted structure.

14. Put down point at Site 3 for temporary water supply.

15. Continued maintenance and repair on 3 pickups, 4 dumps, and 1 stake. Also Farmall and 40 Caterpillar tractors, 2 light plants, and power mower. Complete motor overhaul at commerical shop for 2 Dodge dumps I-16892 (on loan from Lang Lake Refuge) and I-16938.

16. Considerable time spent near end of period attempting to drive waterfowl from refuge because of depredations to standing corn.

17. 6 man-days spent in plowing open roads to Sites 2 and 3 and into Headquarters.

18. Scrubbed and painted walls and ceilings in office.

B. Plantings

1. Aquatic and Marsh Plants - none

2. Trees and Shrubs - none

3. Upland Herbaceous plants - none

4. Cultivated Crops

A total of 2741 acres were under cultivation during the year in connection with share-cropping operations as compared to 2834 acres last year. Two severe hail storms occured during June and July with damage running from 10 to 100 percent on many units. The small amount of grain which was salvaged from some units was of inferior quality. In view of these conditions practically the entire refuge share of all crops were left in the field for wildlife. It was fortunate this was done in view of weather conditions during the past 2 months.

Total hail damage was equilivent to a total loss on 1040 acres: corn - 290 acres, wheat - 289, barley 165, oats - 228, rye - 50, and millet - 18. This acreage should have produced 22,918 bushell of grain had no loss occured.

A total of 922 acres of grain, representing about 12,783 bushel if harvested, was left in the field. Practically all of the small grains were mowed. swathed, or windrowed while all of the corn, except one unit, was left sanding. The varieties of grain left in the field and estimated yield are as follows:

	Acreage	Yield
Corn	351	5380
Wheat	194	1813
Barley	105	1402
Oats	218	3958
Rye	18	0
Millet	36	230

The growing season was very short and an early killing frost caught some corn before it was mature. The crop was also damaged by dry weather. We did expect to harvest a small isolated acreage of corn but the snow came too early and the unit has now been cleaned up by waterfowl.

The acreage left in the field was more than double that of the previous year while the total yield only increased 17 percent.

C. Collections - none

D. Receipts of Seed and Nursery Stock - none

IV. ECONOMIC USE OF REFUGE

A. Grazing

Only 3 permits, covering 695 acres, were issued this year and grazing operations had been completed by the end of October. There has been no apparent conflict with Wildlife but we feel that some areas might be improved by heavier usage.

B. Haying

A total of 10 permits were previously issued to cover 1132 acres of hay land. The yeild per acre was definitely higher this year and the demand less. In such cases certain units are not fully utilized and that is what happened this year. Actually only 742 acres was harvested which produced 547.81 tons.

C. Fur Harvest

One permit was issued for the removal of all fur-bearers, except muskrat, and a good trapper was lined up for this work but early, heavy snows brought a sudden halt to all operations. The fur season opened November 1 and trapping was intentionally delayed for a week owing to the number of geese on the refuge. Trapping was started just before the stormy weather so very little was accomplished. Side roads and refuge trails are still blocked and probably will remain in that condition until spring. It is hoped that the foxes can still be reduced by airplane hunting.

Only 2 permits were issued for the removal of muskrats owing to the low quota set up this year. Trapping operations started on December 15 and were completed on the 23rd with the 2 permittees averaging a total of 100 muskrats per day. The trappers spent full time on this job and it was cleaned up in short order with the quota being taken for both zones.

The following animals have been taken to date:

Mudkrat - 815, Raccon - 6, Red Fox - 1.

Local fur prices on muskrat and mink have increased considerably over that of a year ago but other furs are very low. We received a local offer of $2.40 straight for our rats and the trappers have received $2.60 straight for their share. In view of past experience the price for the refuge share of the pelts will be far below the above figures.

D. Timber Removal - None

E. Other Uses - None

V. FIELD INVESTIGATION

None

VI. PUBLIC RELATIONS

A. Recreational Uses

A very limited amount of sport fishing is all that we have to report this period. A few of the "old timers" pass the time by trying their luck for bullheads at bridges on the road grades. However, the fishermen are few and the catches small in number and size.

The continual parade of hunters seeking information also dropped far below that of last year. Heretofore, non-residents were in the majority but that was changed by the state prohibiting the hunting of waterfowl by non-residents for 2 years. Although non-residents are permitted to hunt upland game it is seldom that type of hunter stops at the refuge.

B. Refuge Visitors

NAME	TITLE OR AFFILIATION	DATE	TIME
Seth Low	Refuge Mgr. Salt Plains,	9/1	2½ hr.
Robley Hunt	Refuge Mgr. Mud Lake	9/4	1 hr
R. Forder	Patrolman, Mud Lake Refuge	9/4	1 hr.
W. L. Johns	Chairman, S.D. Game Dept.	9/9	½ hr
A. Huey	Regional Engineer	10/21	5 hr
F. C. Gillett	Regional Refuge Super.	11/5-6	1½ days
R. Wright	Civil Engineer	11/18	2 hr.
Marvin West	Mechanic, Valentine Refuge	12/6-7	10 hr.
Donald Crabb	River Basin Studies, Billings	12/15-17	10 hr.
Leo Childers	GMA, Aberdeen, S. D.)	Periodic visits	
L. C. Richardson	State Warden, Aberdeen, S. D.)	thruout period.	

C. Refuge Participation

The Service film "Fighting Large Grass and Brush Fires" was furnished to the Aberdeen School System during October. This film was shown to about 500 students and 12 adults. Many more persons could have viewed this film had it not taken so long for shipment between stations.

Another Service wildlife film was shown to about 400 persons on October 18 at the Brown County 4-H Recognition Banquet at Aberdeen.

The Refuge Manager also gave a talk concerning refuge operation and maintenance before 100 members of the Kiwanis Club at Aberdeen on December 16.

D. Hunting

Hunting pressure continued to be heavy around the refuge this season despite the absence of non-resident waterfowl hunters. The increase of resident hunters nearly off-set the reduction of out of state gunners. At the peak of the season as many as 41 hunters were counted along a half mile section of the refuge boundary. There are several "hot spots" similar to this around the refuge in addition to numerous other sections with fewer gunners.

The average hunter appears to have little knowledge of the effective range of guns or the altitude at which birds may be flying. Every bird passing over or near the hunters are sped on their way by a barrage of shots regardless of distance. This definitely reduces the possible kill but also results in many injured birds which are never bagged. There is a growing tendency toward

the use of magnum guns with the hope of "reaching out" just a little farther.

It is estimated that fewer geese were taken by field shooting over decoys this year. The population present during the hunting season was smaller and there was a sharp drop in plowed fields where green food is usually available.

In general, duck hunting was only fair in the vicinity of the refuge and in the county as a whole. Mild weather prevailed until near the end of the season and restricted shooting hours definitely saved many ducks. Ducks leaving the refuge to feed would usually be coming back high by time to shoot in the mornings and few would leave in the evenings until after shooting time. Hunting did improve the last days of the season. Considerable corn had been picked by that time and the birds would feed throughout the day. However, hunting pressure had dropped very low because most of the geese had left.

Duck hunting was very good in the pothole-lake region to the west in the Leola Hills and in the extreme northeastern part of the state.

Pheasant hunting was much improved over that of a year ago but reported to be still better in counties to the west. There was a large reduction in the number of non-residents as compared to previous years. This was to be expected with no hunting by non-residents permitted the first 10 days of the season, reduced bag, shorter season, and licenses good for only 10 days. Even then the non-resident was allowed to possess 15 birds while the resident was restricted to 9.

It is estimated that the goose kill was somewhere between 1500 and 2000 in this territory. The take of ducks was about the same as last year. The pheasant kill probably did not exceed that of last year in this vicinity owing to the shorter season.

E. Fishing

Most sport fishing thakes place during the spring and early summer when there is a flow of water thru the refuge. Relatively few persons fish at any time and the number is very low during this period. Bullheads are the only fish taken, catches are small, and the fish run small in size.

F. Violations

Less time was available for patrol during the hunting season and fewer violators were apprehended. However, the reduction in cases made is attributed entirely to the absence of non-resident waterfowl hunters. A high percentage of cases made last year were non-residents and many cases this year were of a minor nature resulting in recommendations of no prosecution.

A total of 12 cases were made as follows: Improperly plugged gun - 5, early shooting - 2, late shooting - 2, no license - 1, unplugged gun, no license, and no stamp - 1, and exceeding daily bag limit - 1.

One case, that of exceeding the daily bag limit, was taken to state court where a $10.00 fine and costs of $7.30 were assessed. Two other cases covered by state law, one no license and the other no license or stamp and unplugged gun, were turned over to the local State Warden for investigation. The remaining 9 cases were turned over to the Game Management Agent for further action and all are pending at this time.

VII OTHER ITEMS

A. Easement Refuges

Maple River: Considerable time was spent at Mpale River this period in connection with the repair of the spillway. The rubble masonry face of the spill had pulled away from the steel sheet piling allowing the water to cut out under the face and one end of the structure. Riprap was removed from along the piling and the piling cut off so a new cap would make a good seal. The old cap was torn out and holes cut in the retaining wall to expose the void. This cavity was then filled with low mix concrete, a new cap poured, and cracks grouted in the face of the structure. Some riprap was added on the roadway upstream of the spillway but that work was not completed owing to heavy snow.

Water levels were quite low during this period owing to dry weather. The stage at the end of the period was about 3' below the spillway.

A moderate number of ducks made use of the area during the fall months. Most of these birds were feeding in the surrounding stubble feilds.

The posting was checked on the entire refuge boundary prior to the hunting season and signs were replaced and added where necessary.

Dakota Lake: Periodic visits were made to this area for the purpose of checking water levels. The water supply has been less than last year with levels averaging from 6 to 14" below the spillway. Last year there was a small flow over the spillway for a few days during November.

Relatively few ducks and very few geese were noted during the period although all small sloughs and potholes had dried up in that vicinity by October.

The posting on this area was checked during the period and signs replaced and added where necessary. That part of the refuge lying north of the Ludden bridge had never been posted or all signs had been destroyed because all were missing.

Storm Lake: The only visit to this area was on October 1 when posting along the entire boundry was checked. All damaged signs were replaced and others added where necessary. Water levels were normal for that time of the year. Waterfowl were very scarce and not present in sufficient numbers for reporting.

Lake Tewaukon and Clouds Lake: The main spillway at Lake Tewaukon has been in only fair condition for several years and there have been small leaks in the structure for some time. An excavation was made at the south end of the structure this period and the leak at that place sealed with clay. Riprap was removed at the other end and the leak sealed with concrete at that location. This is another rubble masonry sturcture which is difficult to maintain.

The posting along the refuge boundaries was completely checked prior to the hunting season and signs replaced and added where necessary. At this same time all broken glass was replaced in the basement windows at the cabin.

Water conditions were about normal for the period with the level about 15" below the spillway during September.

Only moderate numbers of ducks were noted at any time and our estimate for geese and total numbers for ducks are based on reports from local residents.

Two grazing permits, covering a total of 100 acres, were issued this year and all operations were completed during this period. The use of Unit G-2 was considerably reduced and the forage should show some improvement during the coming year. Grazing on Unit G-1 has never approached the carrying capacity and that area is in good condition.

Three hay permits, covering 90 acres, were also issued. A lighter demand for hay resulted in only 50 acres being utilized this year.

A total of 125 acres was under cultivation this year. This consisted of 4 units covered by 3 permits. Since we control only a very limited acreage on these easements, the entire refuge share of crops were left in the fields for wildlife.

34½ acres of wheat, oats and millet, equivilent to 567 bushels had it been harvested, was left in the field.

Fishing was reported as only fair during the summer and early fall. We now understand, from newspaper reports, that Lake Tewaukon has been selected as one of the few lakes in North Dakota where ice fishing will be permitted during January and February.

Lake Elsie: This area was visited on September 26 when posting along the entire boundary was checked. All damaged signs were replaced and additions made where necessary. Water levels

were normal at that time. Waterfowl were very scarce and not present in sufficient numbers for reporting.

January 9, 1948

Homer L. Bradley.
Homer L. Bradley
Refuge Manager
(title)

Approved: _____

JHN

WATERFOWL — Sand Lake Refuge — 9/1 to 12/31/47

SPECIES	FIRST SEEN		PEAK CONCENTRATION		LAST SEEN		YOUNG PRODUCED		TOTAL
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated For Period
I Swans:									
Whistling Swan									
II Geese:									
Canada Goose	50	9/29	500	10/26	200	12/26			1,000
Cackling Goose									- -
Brant									- -
White-fronted goose	70	9/21	4000	10/5	17	11/9			5,000
Snow Goose	1	9/25	600	11/5	22	11/13			800
Blue Goose	1	10/19	200	11/1	2	11/13			250
"Hutchins" Goose	150	9/29	5000	10/20	400	11/13			10,000
III Ducks:									
Mallard	-	-	188000	11/13	still present				200,000
Black duck	-	-	-	-	2	12/30			100ø
Gadwall	-	-	1500	10/5	5	10/26			2,500
Baldpate	-	-	250	9/29	2	10/19			500
Pintail	-	-	15000	10/15	1	11/8			30,000
G.W. Teal	2	10/5	500	10/19	2	10/26			750
B.W. Teal	-	-	2000	9/29	1	10/26			4,000
Cinamon Teal									- -
Shoveller	-	-	1500	10/19	20	11/2			2,500
Wood duck									- -
Redhead	-	-	2	10/15	2	10/15			2
Ring-necked duck									- -
Canvas back									- -
Scaup	2	11/27	2	11/27	2	11/27			2
Goldeneye									- -
Buffle head									- -
Ruddy duck									- -
IV Coot	-	-	1000	10/5	100	10/25			2,000

SUMMARIES

Total Watefowl usage during period 259,404

Peak waterfowl numbers 220,054

Areas used by concentrations: Geese: Lower end of Mud Lake and and in vicinity of old silo on Sand Lake. Ducks: Mud Lake unit and east side of Sand Lake.

Reported by Refuge Personnel

SPECIES	FIRST SEEN	PEAK CONCENTRATION	LAST SEEN	YOUNG PRODUCED	TOTAL
Common Name	Date	Number	Date	Broods Seen	Estimated Total	Estimated For Period
I Swans:						
Whistling Swan	10/25	500	12/26			1,000
II Geese:						
Canada Geese	9/29	500	10/26			
Cackling Geese						
Brant						
White-fronted Geese	9/21	4,000	10/5	17	11/6	5,000
Snow Geese	9/25	600	11/5	22	11/13	800
Blue Geese	10/19	200	11/1	2	11/13	250
"Hutchins" Geese	9/29	5000	10/20	400	11/13	10,000
III Ducks:						
Mallard	-	180000	11/13	present		200,000
Black duck	-	-	-	-	12/30	100
Gadwall	-	1500	10/5	-	10/26	2,500
Baldpate	-	250	9/29	-	10/19	500
Pintail	-	15000	10/15	-	11/8	30,000
G.W. Teal	10/5	500	10/19	-	10/26	750
B.W. Teal	-	2000	9/29	-	10/26	4,000
Cinnamon Teal						
Shoveller	-	1500	10/19	-	11/5	2,500
Wood duck						
Redhead	-	2	10/15	2	10/15	2
Ring-necked duck						
Canvas back						
Scaup	11/27	2	11/27	2	11/27	2
Goldeneye						
Buffle head						
Ruddy duck						
IV Coot	-	1000	10/5	100	10/25	2,000

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Sand Lake Months of September to December 194 7

(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			120	9/15	10	10/5				150
Pied-billed Grebe	-	-	-	-	1	11/9				300
White Pelican	-	-	5000	9/3	20	10/19				6,000
Double-crested Cormorant	-	-	-	-	1	11/9				4,000
Great Blue Heron	-	-	-	-	3	11/2				25
Black-crowned Night Heron	-	-	-	-	1	10/19				50
II. Shorebirds, Gulls and Terns:										
Wilson's Snipe	1	9/22	2	10/ 20	2	10/20				10
Greater Yellowlegs	2	9/27	2	10/5	2	10/5				10
Lesser Yellowlegs	50	9/17	50	9/17	50	9/17				50
Long-billed Dowitcher	1000	9/17	2500	10/5	2500	10/5				5,000
Wilson's Phalarope	50	10/2	50	10/2	50	10/2				50
Ring-billed Gull	-	-	20	10/5	2	11/9				50
Franklin's Gull	-	-	15000	9/3	20	10/19				20,000

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	-	-	2500	9/15	2	11/16		5,000
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	5	11/13	7	12/19	Still present			10
Duck hawk								
Horned owl								15
Magpie								
Raven								
Crow								
Cooper's Hawk	1	9/24	1	9/24	1	9/24		1
Red-tailed Hawk	1	9/17	-	-	1	10/19		10
Bald Eagle	1	11/13	1	11/13	1	11/13		2
Marsh Hawk	-	-	-	-	Still present			10
Prairie Falcon	1	9/16	1	9/24	1	9/24		5
Snowy Owl	1	12/15	-	-	Still present			5
Short-eared Owl	-	-	-	-	Still present			10

Annual Resident

Reported by.....

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 numb of the species using the refu during the period concerned.

WATERFOWL Maple River 9/1 to 12/31/47

SPECIES	FIRST SEEN		PEAK CONCENTRATION		LAST SEEN		YOUNG PRODUCED		TOTAL
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
Mallard									2,000
Gadwall									200
Pintail									400
B. W. Teal									200

SUMMARIES

Total waterfowl usage during period 2800

Peak waterfowl numbers - - - -

Reported by Refuge Personnel

WATERFOWL Dakota Lake 9/1 to 12/31/47

SPECIES	FIRST SEEN		PEAK CONCENTRATION		LAST SEEN		YOUNG PRODUCED		TOTAL
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated For Period
Canada Goose									200
Mallard									500

SUMMARIES

Total waterfowl usage during period 700

Peak Waterfowl numbers - - - -

Reported by Refuge Personnel

WATERFOWL Lake Tewaukon & Cloud's Lake 9/1 to 12/31/47

SPECIES	FIRST SEEN		PEAK CONCENTRATION		LAST SEEN		YOUNG PRODUCED		TOTAL
Common Name	number	date	number	date	number	date	broods seen	Estimated total	Estimated for period
Canada Goose									1000
Mallard									1000
Gadwall									400
Pintail									1000
B. W. Teal									500
Shoveller									600

SUMMARIES

Total waterfowl usage during period 4500

Peak Waterfowl numbers - - - -

Reported by Refuge Personnel

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Sand Lake Months of September to December, 1947

(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 Pheasant	8,000	0.4	-			0	0	0	20,000	
Prairie Chicken	1,000								50	
Hungarian Partridge	1,000								25	

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.

Form NR-3

BIG GAME

Refuge Sand Lake Year 1947

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population as of Dec. 31	(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Losses	Number	Source		Percentage
White-tailed deer	11,000	100	0	0	0	0	0	0	1	0		375-400	

1614

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.) exclusive of fenced herds. Detailed data may be omitted for species occuring 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 total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge as of December 31.

(8) SEX RATION: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5
(April 1946)

DISEASE

Refuge Sand Lake Year 1947

Botulism

Period of outbreak none

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage)

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Conditions of vegetation and invertebrate life

Remarks

Lead Poisoning or other Disease

Kind of disease Lead Poisoning

Species affected Mallard and Canada Goose

Number Affected

Species	Actual Count	Estimated
Canada Goose	2	--
Mallard	-	1500

Number Recovered None as yet

Number lost Canada goose - 1, Mallard 800

Source of infection Lead picked up prior to freeze-up.

Water conditions Mud Lake unit .10' to .75' lower than last fall. All except largest potholes and sloughs dried up during late summer and early fall in surrounding area.

Food conditions Good. Standing corn, which is easily taken because of deep snow, has been available on the refuge and outside since freezeup. Small grains also available on refuge prior to that time but a reduction ofaquatic foods.

Remarks Losses to date, including an estimated 200 cripples, are only 2 percent of average population.

Form NR-6

FISH

1617

Refuge Sand Lake Year 1947

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
Large-mouthed Black Bass	rare	-	-			None		none
Yellow Perch	scarce	-	-			"		"
Northern Pike	rare	-	-			"		"
Crappie	rare	-	-			"		"
Bullhead	Abundant	150	2250			"		"
Buffalo	Scarce	-	-	none	none			
Carp	Abundant			"	"			

REMARKS: Crappie found dead at Mud Lake Spillway and Buffalo also noted at that location.

3-1758
Form NR-8
(April 1946)

$10

CULTIVATED CROPS

Refuge Sand Lake Year 1947

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				HAIL DAMAGE	
							Harvested		Unharvested		Compensatory Services, or Cash Revenue	
					Acres	Bu. Harvested	Acres	Bu.	Acres	Bu.	PERCENT ACREAGE LOSS	
Hinderks, Joe	17369	44	Not Farmed									
	17321	38	oats		20	-			10	-	100	30
			barley		14	-			6	-	100	20
			corn		22	30			13	18	98	34.3
Dennert, S.	17337	37, 39, 40	wheat		87	75			43	37	98	115.6
	11745	20-22	rye		32	-			18	-	100	50
			corn		47	-			23	-	100	70
			wheat		54	-			26	-	100	80
			barley		37	-			18	-	100	55
Pfutzenreuter, C.	13243	16 - 19	barley	5	14	70			6	30	75	15
			oats	2	18	36			9	18	95	25.6
			corn	20	24	480			26	520		
	16213	42	corn	20	30	600			-	-		
			summer fallow		20	-			-	-		
Kenny, J.	13245	32a	oats	20	22	440			11	220		
Tollefson, B.	17331	5	corn	25	71	1775			36	900		
			oats	30	65	1950			62	1860		
			barley	30	60	1800	-	-	-	-		
Wilke, C.	13240	4	barley	11	55	640			45	495	75	75
			wheat	9	37	350			13	117	75	37.5
Seiber, W.	13242	3	corn	15	26	390			14	210	60	24
	17325	41	corn	30	68	2040			25	750		
					823				404			

Summary of Crops Grown:

Total acreage 2734

Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
		Acres	Bushels	Harvested		Unharvested		
				Acres	Bu.	Acres	Bu.	$

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or Location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number of acres harvested or utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge Sand Lake Year 1947

HAIL DAMAGE

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return					
							Harvested		Unharvested		Compensatory Services, or Cash Revenue	
					Acres	Bu. Harvested	Acres	Bu.	Acres	Bu.		Percent/acreage loss
Richardson, H.	17370	36	corn	35	5	175			2	70		
	17368	45	wheat	16	30	480			15	240	10	4.5
Herseth, R.	18042	42	corn	20	59	1180			29	580		
	13221	20-31	barley	40	30	1200			15	600		
			wheat	20	100	2000			50	1000		
			oats	40	27	1080			13	520		
Wells, H.	18100	23	wheat	21	50	1080	17	360	-	-		
Knecht, W.	17348		Too wet to farm									
Dinger, C.	11719	20 & 34	corn	15	-	-			65	975		
			oats	16	45	720			15	240		
			barley	20	35	700			-	-		
Dinger, R.	11718	15	oats	20	80	1600	-	-	-	-		
Lehman	13238	7 & 33	millet	no crop		-	-	-	-	-		
			oats	18	40	720			20	360		
Severin	11993	35	corn	-	18	-			9	-	100	27
			oats	-	18	-			9	-	100	27
Hinderks, John	12016	26-27	oats	-	67	100			33	49	98	98
Spurr, C.	13239	25	wheat	-	10	-			5	-	100	15
Mitchell, L.	11307	28	corn	-	26	-			18	-	100	54
Kimball	13213	6	oats	11	22	242			11	121	50	16.5
			corn	20	28	560			14	280	10	4.2
					690				323			

Summary of Crops Grown:

Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
		Acres	Bushels	Harvested Acres	Harvested Bu.	Unharvested Acres	Unharvested Bu.	$

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

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Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

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Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge Sand Lake Year 1947

HAIL DAMAGE

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return					
							Harvested		Unharvested		Compensatory Services, or Cash Revenue	
					Acres	Bu. Harvested	Acres	Bu.	Acres	Bu.	Percent/acreage loss	
Erickson,	13241	7 & 8	corn	10	8	80			34	340	75	31.5
			wheat	7	20	140			10	70	50	15
			oats	20	22	440	-	-	-	-	10	2
			millet	5	22	-	-	-	26	130	75	18.5
Scott, A.	13220	32	wheat	3	10	30			5	15	95	14.2
			oats	6	20	120			10	60	95	28.5
			corn	6	40	240			20	120	75	45.0
Koch, W.	11725 & 13250	9, 10, 11, 12 & 14	corn	28	28	784			14	392		
			barley	11	13	143			7	77		
			wheat	8	10	80			5	40	50	7.5
			oats	34	30	1020			15	510		
			wheat	12	28	336			14	168		
Jones, Wm.	11017	1	barley	25	16	400			8	200		
			wheat	22	16	352			8	176		
			corn	25	18	450			9	225		
Wickham	10261	13	Millet	10	20	200			10	100		
					299				195		Hail loss equivilent to total loss on 1040 acres	

Summary of Crops Grown:

Crop	Acreage	Permittee's Share		Government's Share				Total Revenue	Hail Loss	
		Acres	Bushels	Harvested Acres	Harvested Bu.	Unharvested Acres	Unharvested Bu.	$	bu.	acre
Rye	50	32	0			18	0	750		50
corn	879	528	8784			351	5380	7850		290
wheat	663	452	4923	17	360	194	1813	4913		289
barley	379	274	4953			105	1402	4125		165
oats	774	496	8468			218	3958	5720		228
millet	56	20	200			36	290	180		18
	2741	1802	27,328	17	360	922	12,783	22,918		1040

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CULTIVATED CROPS

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3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge Lake Tewaukon & Cloude Lake Year 1947

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
							Harvested		Unharvested		
					Acres	Bu. Harvested	Acres	Bu.	Acres	Bu.	
Skroch	18059	C-3	wheat	10	18	180			16	160	
			oats	20	11¼	225			4-3/4	95	
		C-4	wheat	18	17	306	-	-	-	-	
Thornberg	18246	C-2	Millet	10	15	150			5	50	
Lee	18098	C-1	Rye	30	20	600	-	-	-	-	
			oats	30	6¼	188			8-3/4	262	

Summary of Crops Grown:

Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
		Acres	Bushels	Harvested Acres	Harvested Bu.	Unharvested Acres	Unharvested Bu.	$
Wheat	51	35	486			16	160	
Oats	34	20⅛	475			13⅛	357	
Rye	20	20	600	-	-	-	-	
Millet		15	150			5	50	
TOTALS		90⅛	1709			34⅛	567	

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CULTIVATED CROPS

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Form NR-10

HAYING AND GRAZING

Refuge Sand Lake Year 1947

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Scott, P.	18295	4	200	87.9		7/16/47-10/31/47	.50	43.95	
Kimball, M.	18281	1	320	204.0		5/16/47-10/31/47	.40	81.60	
Crawford, G.	18302	3	175	42.0		7/16/47-10/15/47	.50	21.00	
Koch, E.	18274	16-8	125		86.09	7/16/47-2/20/48	1.00	86.09	
Pearson-Stearns	18309	16-W	50		43.25	"	"	43.25	
Herseth, A.	18296	6	150		113.25	"	"	113.25	
Brune	18639	15-E	50		35.08	"	"	35.08	
Cordes	17572	15-S	100		79.22	"	"	79.22	
	18601	14	80		30.27	"	.75	22.70	
Herseth, E.	18623	2 & 3	75		54.13	"	1.00	54.13	
Scott, A.	17579	10	75		56.66	"	"	56.66	
Tunby Bros.	18308	5	60		43.87	"	"	43.87	
Vitense	18301	20	7		5.99	"	"	5.99	

Totals:

Acreage grazed 695 Animal use months 333.90 Total income Grazing 146.55

Acreage cut for hay 742 Tons of hay cut 547.81 Total income Haying 540.24

Form NR-10

HAYING AND GRAZING

Refuge Lake Tewaukon Year 1947

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Skroch	18284	G-2	50	47		6/1/47-11/30/47	.50	23.50	
Thornberg	18630	G-1	50	30		9/1/47-11/30/47	.50	15.00	
Skroch	18602	H-3	15		19.10	7/16/47-2/28/48	1.00	19.10	
Thornberg	18631	H-2	5		5.00	"	1.00	5.00	
Gelinske	18322	H-1	30		13.69	"	1.00	13.69	

Totals:

Acreage grazed 100 Animal use months 77 Total income Grazing 38.50

Acreage cut for hay 50 Tons of hay cut 37.79 Total income Haying 37.79