SAND LAKE NATIONAL WILDLIFE REFUGE
COLUMBIA, SOUTH DAKOTA

QUARTERLY NARRATIVE REPORT
February 1, 1941 to April 30, 1941

REFUGE PERSONNEL

Watson E. Beed
Refuge Manager

Ralph H. Katus
Clerk

William Ellinghausen
Patrolman

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I. General

A. Weather Conditions

CAA

WEATHER CHART

Following is a chart showing the daily maximum and minimum temperatures and precipitation during the last three months as recorded at the U.S.D.A. weather bureau station at Aberdeen, South Dakota

	February			March			April		
Date	Max.	Min.	Precip-itation	Max.	Min.	Precip-itation	Max.	Min.	Precip-itation
1.	40	22					62	29	.05
2.	29	19		29	19		38	30	.01
3.	30	27	trace	22	8	.11	35	21	.02
4.	31	15		24	22		44	32	
5.	28	5	trace	30	18	.12	46	31	.01
6.	17	3	trace	35	2	.08	50	42	.13
7.	16	2		37	17		53	42	.60
8.							47	39	.58
9.	28	11		37	23		60	44	.03
10.	37	15		35	21		62	45	.09
11.	37	19		29	15	.03	73	49	trace
12.	29	23	trace	30	12		78	52	.28
13.	24	4		32	21		58	51	.64
14.	30	11		33	22	.01	49	42	.41
15.							58	36	
16.	33	11		10	-2		52	36	.05
17.	19	-15	trace	20	15		58	43	.09
18.	-3	-16		37	26		47	37	.80
19.	4	-8		54	26		45	32	trace
20.	11	1	trace	32	30		48	33	.10
21.	12	-6					58	25	
22.							52	44	
23.	22	-2	trace	34	20		53	29	
24.	11	-10		42	30	.02	72	32	.01
25.	12	10	.30	38	26	.02	61	39	
26.	16	38	.08	46	34	.06	75	42	trace
27.	20	11		37	22		78	46	
28.	29	19		44	29		76	51	
29.							69	50	.02
30				63	27		70	53	.04

Precipitation	
February	.32
March	.45
April	3.99

Temperatures during this quarter were normal with a low of -16° F. on February 17 and the high of February was 40° F. on the 1st. The high for March was 54° F. on the 19th while the low was -2° F. and occurred on the 16th. Temperatures during April were relatively high, the low being 21° F. and the high 78° F.

Precipitation during February and March was low being .32 and .45 of an inch respectively. Precipitation for April was above normal. 3.99 inches were recorded. During the period April 2 to 25 inclusive, there was some precipitation each day. This continued rainy weather delayed farming operations in this territory but helped to raise water-levels and soaked up the areas soon to be flooded.

B. Water Conditions

As previously stated above precipitation was not high during February and March and the amount of snow on the ground was not as great as in past years. By March 30 all snow had melted and the runoff was greater than in former years as the ground was still frozen which resulted in little absorption by the soil. The runnoff into the Mud Lake a rea caused the water to start flowing north into the James River.

Snowfall in the James River valley north of Sand Lake Refuge was evidently greater than usual as Dakota Lake Spillway started flowing on March 26 reaching a high of 21 inches in depth at the spillway on April 5. This water came down the James Valley and met the water flowing north from Mud Lake just south of the Hecla Grade. This water piled up for a short time and then came down the river in a flood. At Four Mile Grade the water was checked but rose rapidly, washing around both ends of the bridge and in places over the road grade. Low water control control structures No. 1 and No. 2. were flooded and damaged. The water

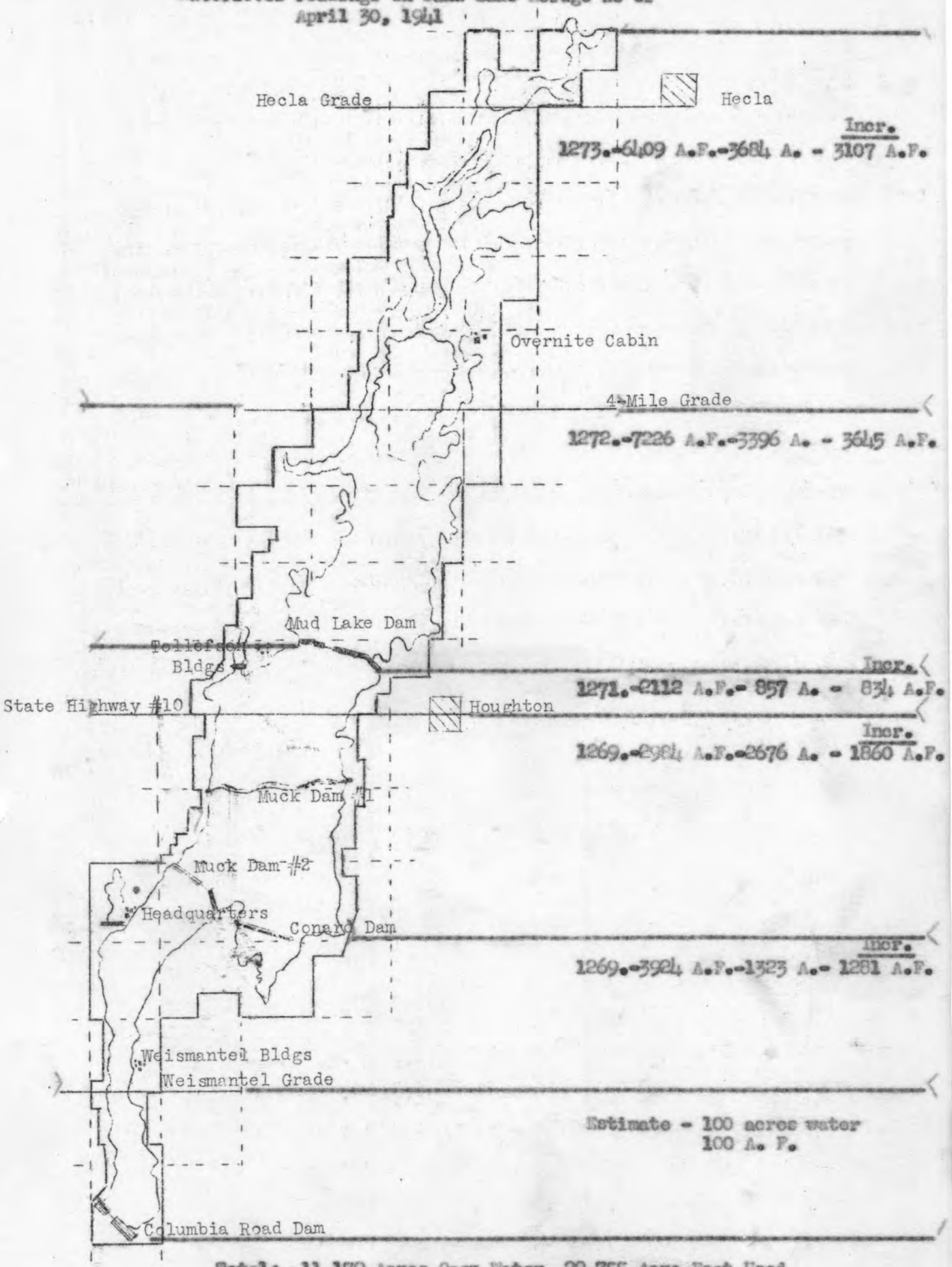
then flattened out over the Mud Lake area and reached spillway elevation at Mud Lake on April 7. This water steadily rose to 1273.0 at Mud Lake on April 14. The natural spillway at the east end of Mud Lake Dam was flowing 182 yards wide with an average depth of about six inches. On April 30 this natural spillway was still being utilized as the Mud Lake Dam level was still 1272.40 on that date.

The water swept on into the unit between Mud Lake Dam and State Highway No. 10. This unit soon filled and although both control gates were open just south of the highway, the water poured through the east bridge and over the control structure, washing it out. The west control structure was not flooded and did not wash out as Sandell pond in filling, checked the rush of water and gave a gradual flow through this gate.

It was quite apparent that all units of Sand Lake would be filled so all control gates were opened and stop logs were removed to the Weismantel grade. The water swept merrily down and over all control structures, reaching spillway elevation at Weismantel grade on April 29. Water was flooding over the area south of the Weismantel grade but had not reached the gauge at Columbia Dam on April 30. It is quite apparent that this unit will also be filled.

Dakota Lake spillway continued to flow throughout April, however the flow towards the last of April was intermittent, depending on wind direction. Stop logs were removed from the control at Dakota Lake to a point about 3 inches below spillway level and water has continued throughout the month to flow barrel full. At times water was flowing around both ends of Dakota Lake Dam and spillway, the water on the west side at times being an average of 1 foot deep and a quarter mile wide. By April 30 this flow had subsided and the meadow was practically dry. There was no damage from washing.

Waterlevel readings on Sand Lake Refuge as of
April 30, 1941



Total: 11,179 Acres Open Water 22,755 Acre Feet Used.

Display Pond No. 1. filled to spillway elevation in late March and continued to flow over the spillway during most of April. Display Pond dyke No. 2 was completely submerged late in April and now in places has 12 inches of water over it. This dyke was much damaged by wave action. Most of the lateral and parallel ditch banks in Sand Lake are submerged or nearly so and are suffering from wave action.

According to the topographic survey map of this refuge we now have a water area of 11,179. acres.

C. Fires

No fires occurred on this refuge during the past quarter except controlled burning of areas to be flooded. Protacted wet weather prevented most burning but a good burn was secured on the first mile north of Weismantel grade on April 21. These burned areas were very attractive to geese. A complete check of burned areas showed no nests burned. Several cottontail rabbits were singed. One fox and one white-tailed deer were driven from the area burned. Pheasants left the area quickly as the fire progressed.

Flooding of the area south of Mud Lake Dam will require a revision of fire lines and the fire control plan for this refuge.

II. Wildlife

A. Waterbirds

1. Population and Behavior
(a) Species

The first pintails arrived at Sand Lake Refuge on March 21. Canada geese, Buchins' geese, Mallards and bufflheads were first seen here on March 26. American merganser ducks arrived on March 28. Blue and Snow geese, redheads, canvasbacks, lesser scaup arrived on March 29. On this same day Herring gulls, ring-billed gulls and killdeers were first

seen. Shovellers, green-wing teal and White-fronted geese were first seen on April 2. The first blue-wing teal arrived on April 3 and the first Whistling swan were seen on April 4. Coots and baldpates arrived on April 6. The first Franklin gull was seen on April 9. Several pied-billed grebes were seen on April 10. A few sandhill cranes were seenson April 12. The double-crested cormorant arrived on April 14 and on April 15 the first ruddy duck, black-crowned night heron, American bittern and Wilson's snipe were seen.

The avocet and the least sandpiper arrived on April 20. White pelicans, the western willet, the marbled godwit and the kingfisher were first seen on April 27.

Pintails were seen in smaller numbers than last spring but Mallards, gadwall, baldpate and blue-wing teal were present in numbers much greater than in previous years. Lesser scaup were especially abundant and there was also a slight increase in redheads and canvasback.

Canada and White-fronted geese stopping on Sand Lake Refuge showed and excellent increase over previous years. Many Canada geese are nesting on the refuge. Twelve nests have been found and there are surely more which have not been discovered. Three nests are on artificial islands, one in Mud Lake and two in Sandell pond.

Blue and Snow geese were present on this refuge and vicinity in numbers that far exceeded those of previous years. The peak concentration was during the last week in April and by April 30 the larger flocks had moved north.

(b) Groups

The Snow and Blue geese ratio was about 2 Blues to 1 Snow. These geese were partial to burned over areas and to newly-flooded meadows. At times the numbers of these birds were very great indeed. On several

occasions there were flocks resting on the refuge which was four miles long and would average at least 100 yards in width. In addition to these large flocks there would be numerous smaller flocks scattered over our 16 miles of refuge. One refuge field containing 350 acres which had been planted to corn, millet and wheat was a favorite feeding place for geese and ducks. At times this entire 350 acres would look like a field of snow from the concentration of Blue and Snow geese.

All waterfowl used the artificial islands extensively during the migration season and Canada geese use these islands for nesting places.

Waterfowl as a whole on Sand Lake Refuge shows a great increase over previous years and now with ample water and marsh areas we may expect a great increase of nesting birds.

2. Food and Cover.

Thanks to good crops last year and the use in this section of the mechanical corn picker an abundance of food was present for migrating Mallards, pintails and geese. This plentiful food supply is without doubt one of the main factors in our increase in waterfowl on the refuge. Only 150 bushels of grain was used for supplementary feeding. This consisted of 50 bushel of corn, 50 bushel of wheat and 50 bushel of oats. This grain was used to feed refuge geese and in duck and other bird banding.

Cover conditions for waterfowl are excellent and it is quite evident from past inspection that many of the aquatic plants in Sand Lake are alive and that we may expect a good growth of round-stem bulrushes, river bulrush and sago pondweed.

3. Disease

All waterfowl on this refuge during the past quarter were healthy and in good condition. No sick birds were found.

B. Upland Game Birds

Prairie chickens were plentiful on this refuge during February and March but by April 15 most of them had moved north. A few chickens have remained to nest but we can hope for only a few broods. European partridge are quite common and are dedidedly on the increase in this vicinity.

The ring-necked pheasant population of this refuge is very large. The flooding of Sand Lake Refuge south of the Mud Lake Dam has forced many of these birds to seek new ranges. Thr birds forced out are quite erratic in their actions after flying back over the water in an attempt to locate their old range. At times these birds will light in the water, swim for a short time and then take off and fly to land again. No pheasants have been found drowned. These pheasants that have been forced to relocate are evidently about to start nesting as they scatter their eggs at random. It is believed these birds will relocate in time to raise broods this year.

Pheasant trapping operations by the State Game and Fish Department were quite successful; a total of 8,440 birds were taken for restocking purposes. This trapping made no appreciable difference in the numbers of pheasants present and it is believed that we have on this refuge and vicinity a population of ring-necked pheasants exceeded no place else on earth. Census attempts indicate a population ranging from 2 to nearly 5 birds per acre.

Live-trapping of pheasants can be accomplished satisfactorily only when the ground is covered with snow and when the weather is cold. The cold causes the birds to need more food and the snow covers other available food thus forcing the birds to enter the traps to secure the grain. When conditions are best the birds will enter traps a few minutes

after they have been erected and baited. When the weather warms and snow melts the birds range for food and avoid the traps.

All upland game on Sand Lake Refuge had ample food and cover and no birds were lost.

C. Other Birds

Golden eagles were seen during February and March. One bald eagle was present on the refuge during February. Marsh hawks and short-eared owls were present on the refuge during the entire quarter. These birds have been present during the entire winter. A few blackbirds and and meadowlarks also wintered on the refuge. Prairie falcon were present throughout the quarter. American rough-legged hawks were quite common and by March 1 the great-horned owls were nesting. The great-horned owls eat a great many cottontail rabbits and ground squirrels and no doubt earn the few game birds they eat.

D. Big Game Animals

The flooding of Sand Lake forced the white-tailed deer to leave this area and they are now often seen. The deer on the refuge is estimated at 15 to 20 head.

E. Fur-bearing Animals, Predators, Rodents and Other Animals

1. Population and Behavior

With the flooding of the area south of Mud Lake Dam the muskrats moved down and are now seen at the extreme south end of the refuge. This increase in water and marsh area will be conducive to an increase of these animals on the refuge. A careful check of all dams is necessary and all muskrat burrows have been excavated and plugged.

This quarter for the first time share-trapping has been carried on on this refuge. Three permits were issued but only two permits were used. A total of 632 muskrats and 1 mink were taken. The muskrats av-

eraged small and were not in the best of condition. This is perhaps due to crowding as the muskrats are forced by receding water in the fall into the James River proper out of the Mud Lake marshes. This results in crowding and scarcity of food for the large population. With our increased water, conditions will be better this year.

Foxes are not as numerous as in the past. Thirteen redfox puppies were destroyed during April. Skunks have been reduced by trapping to the point where they will do little damage to nesting waterfowl. The raccoon is quite common and a determined effort must be made to reduce their numbers as they molest the Franklin gulls during the nesting period.

At least two beaver were seen on the refuge during the past quarter. This is believed to be the first record of this mammal on Sand Lake Refuge.

Cottontails are quite numerous locally and caused some damage to trees. Damage was confined almost entirely to Chinese elms. Rabbit repellent paint was used at the plantings at the Tollefson place and was found satisfactory but is too expensive for extensive use. It is believed local shooting and trapping of cottontails would be most effective and least expensive. Over 300 cottontails were killed during the pastequarter.

F. Fish

Very few fish of any kind "winter killed" in Mud Lake last winter. When the water started over the spillway at Mud Lake vast numbers of fish passed over not only the concrete spillway but also down the natural spillway. The majority of these fish were carp but there were also large numbers of perch, bullheads, suckers, chubs and shiners. This abundance of fish has resulted in an increase in the fish-eating birds on this

refuge, notably mergansers and cormorants.

III Refuge Development and Maintenance

A. Physical Development

WPA Project No. 165-2-74-57 employing an average of 30 men was in operation during the past quarter.

Eight miles of service roads were gravelled using a total of 3357 cubic yards of gravel. Ten miles of service roads were reshaped and reconditioned. The blade for use on the F-30 Farmall tractor is an excellent machine for light work.

The drive on Mud Lake was gravelled to permit inspection during wet weather. The drives at the Secondary Headquarters and at Headquarters were regravelled and reconditioned.

At Control structure No. 1. 1280 board feet of sheet piling was driven and 50 cubic yards of riprap layed. Four hundred fifty sand bags were used in an attempt to prevent damage to this structure from washing but the water raised over the entire structure. An attempt was made to finish the control structure at Display pond No. 2. but the site was flooded before the concrete could be poured.

Two artesian ponds were enlarged and the pipes were repaired where leaks had developed.

Extreme cold and rain made work difficult during the past quarter.

B. Plantings

1. Trees and Shrubs

One thousand buffalo berry shrubs and 20 red-twig dogwood shrubs were secured from Waubay Refuge on April 28. The red-twig dogwood were planted at the Tollefson and Weismantel Secondary Headquarters. The buffalo barries were used to replace dead trees in the shelterbelt

planting near the headquarters buildings and at the Tollefson place.

2. Grasses

Last fall the area north of the headquarters buildings between the NYA camp was planted to Fairway strain crested wheat grass. This grass is growing very well and a good stand was secured. The lawn at the Weismantel place was also planted to crested wheat grass and the stand is good.

IV Public Relations

1. Refuge Visitors

During "Wildlife Week" many people visited this refuge and with the coming of water into Sand Lake and the hordes of Snow and Blue geese the numbers of people who visited this refuge was great indeed. All visitors were pleased with the refuge and expressed amazement at the tremendous numbers of geese. Many sportsmen said that it looked like old times.

Photographer-reporters from the Aberdeen News visited the refuge and took pictures for an article on the comeback of Sand Lake.

Miss Lenore Squire, photographer, visited this refuge on several occasions to secure pictures of the Snow and Blue geese and other wildlife.

Following is a list giving the names of a few of our visitors during the past quarter

Mr. F. C. Gillett	Regional Office
Mr. Carl Pattee	Member State Game and Fish Commission
Mr. Elmer Leibig	State Game Warden
Mr. George Woods	State Game Warden
Mr. C. B. Gunderson	State Game Warden
Mr. E. E. Allgier	State Game Warden
Mr. Arthur G. Huey	Engineer
Mr. Warren Hall	District Engineer
Mr. M. O. Steen	Federal Aid Inspector
Dr. Swanson	Biologist

Mr. J. W. Cluett	Director, S.D. Dept. of Game and Fish
Mr. Elmer Peterson	Chief State Game Warden
Mr. J. A. Heinrich	WPA District Finance Officer
Mr. Melvin Murphy	WPA Area Timekeeper
Mr. Leo Childers	U. S. Game Management Agent
Mr. C. P. Cutting	Aberdeen, S. D.
Mr. Tony Hoover	Aberdeen, S. D.
Mr. Chas. Robertson	U. S. Marshal
Judge A. Leo Wyman	Federal Judge
Mr. George Philipps	U. S. Attorney
Dr. George Williams	U. S. Chemist
Mr. Merton Caine	Chief NYA Examiner
Mr. Vernon Clark	State NYA Administrator
Mr. Ben Strool	State NYA Requisition Officer
Mr. Marshal Truax	NYA Personnel Director
Mr. Ford Zitlow	Executive, N.W. Bell Telephone Co.
Mr. J. B. Hynes	Conde, S. D.
Mr. George S. Slater	Aberdeen, S. D.
Mr. L. H. Herschlob	Clothier, Aberdeen, S. D.
Mr. Blaine Rowlie	Reporter-photographer, Aberdeen News
Mr. Lathe Johnson	" " " "
Mr. Neill Hotchkiss	Biologist, Washington Office.
Rev. Fr. Machonachie	Waubay, S. D.
Dr. B. F. Markin	Columbia, S. D.

8. Violations

No violations occurred on Sand Lake Refuge during the past quarter but two men were apprehended shooting ducks out of season near Forman, North Dakota. These men were taken into state court and each fined $25.00 and $5.36 costs.

V Economic Uses of Refuge

(a) Cooperative Farming.

Ten cooperative farming permits have been issued for farming on Sand Lake Refuge covering 1337 acres and one additional application has been submitted which would bring the acreage up to 1497. This is an increase over former years but is necessary to feed the increasing numbers of waterfowl on this refuge and to provide a surplus of grain for transfer to other refuges.

An abundance of rain has caused delay in farming operations but the crops already planted on the refuge are doing very well.

(b) Fur Harvest

The following is a tabulation of the fur harvest for the past winter:

Skunk - - - - - - - - - - - - 99
Weasel- - - - - - - - - - - - 8
Red Fox - - - - - - - - - - - 3
Badger- - - - - - - - - - - - 1
Muskrat - - - - - - - - - - - 632
Raccoon - - - - - - - - - - - 2
Jackrabbits - - - - - - - - - 49
Housecat- - - - - - - - - - - 4

Listed below are the numbers of furs taken on the respective dates:

November, 1940	Skunk	Weasel	Badger	Housecat	Jackrabbit
Nov. 18	9				
19	2				
20	3				
22	3	1			
23	2	1			
25	3		1		
26	23			1	
27	10			1	
29					6
November Total:	55	2	1	2	6

December, 1940	Skunk	Weasel	Badger	Housecat	Jackrabbit
Dec. 5	1				2
9	4	3			
26	3				
27	1			1	
30	3	1			
December Total:	12	4		1	2

January, 1941	Skunk	Weasel	Badger	Housecat	Jackrabbit	Red Fox
Jan. 13	2				2	
17						1
20						1
22					3	
27					2	1
29					4	
January Total:		2			11	3

February, 1941	Skunk	Jackrabbit	Housecat
Febr. 3	1		
5	2	3	
7		2	
10	2		
11	2		
12	3	2	
13	5		
14	1		
15	1		
16	1		1
17	1		
20	1	1	
24	1	2	
25	2	5	
28		1	
February Total:	23	16	1

March, 1941	Skunk	Jackrabbit	Housecat	Raccoon
Mar. 1		1		
3	8			
6		2		
8		2		
10	1			2
12		1		
15		2		
18		3		
19		3		
March Total:	9	14		2

	Skunk	Badger	Housecat	Jack Rabbit	Raccoon	RedFox	Weasel
Grand Total:	99	1	4	49	2	3	8

632 muskrats were taken by share-trappers on this refuge during the past quarter. Mr. Fay Hirleman of Houghton, S. D. trapped 338 muskrats under Special Use Permit No. 3990. He sold his share or 167 pelts for .80¢ each and 1 mink for $2.00/ Mr. Ray L. Mayo of Hecla, S. D. trapped 294 muskrats under Special Use Permit No. 3994 and sold his share or 147 pelts for $1.00 each. Special Use Permit No. 3989 was issued to Mr. Ernie Gilchrist of Columbia, S. D. who did no trapping under this permit.

Prices received for furs shipped to the Seattle Fur Exchange, Seattle, Washington:

99	skunk - - - -	$207.50
8	weasel - - -	$ 7.04
3	redfox - - -	$ 15.00
1	badger- - - -	$ 1.50
318	muskrat - - -	$287.20(Est.)
2	raccoon - - -	$ 5.00(Est.)
49	jackrabbits -	$ 12.63
2	housecat - -	$ .30
	Total - - - - -	$536.17

(c) Commercial Fishing

No commercial fishing has been done on Sand Lake but since the carp have increased to the point where they are a detriment to desirable aquatic plants it is believed that removal of these carp under special use permit might be the answer to this problem.

VI Field Investigation or Applied Research

1 Bird banding

The following is a tabulation of bird banding during the past quarter:

Bird	February	March	April
Mallard	153	65	
Tree sparrow	22	33	10
Slate-colored junco		2	32
Sparrow hawk			1
Migrant shrike			1
Starling	2		
Arctic towhee			1
Cowbird			2
Song sparrow			8
Red-wing blackbird			2
Bronzed grackle			3
Total	177	100	60

Grand total 337

VII Other Items

A. Easement District # 5

The easement refuges in District # 5 are all in good condition. Maple River refuge has more water than ever before and has a good population of puddle ducks. There is litte water in the marsh but the river has considerable water. Dakota Lake refuge has plenty of water and the spillway has been flowing for over a month. This refuge lacks rearing cover as the entire lake shore is pastured. Carp are numerous here and evidently are a controlling factor on the aquatic vegetation. This refuge is a good resting place but will produce few ducks.

Clouds Lake and Lake Tewauken refuges have more water than during previous years. Aquatic growth is good in both these lakes and each has some rearing cover. These refuges will produce ducks as well as being excellent resting and feeding places during migration. Clouds Lake and Lake Tewauken usually have good populations of redhead, canvasback and ruddy ducks.

Lake Elsie waterlevel is slightly below that of last year but there is ample water for the south marsh. This area is small but is ideal nesting habitat for ruddy ducks, redheads and coots.

Wild Rice refuge has plenty of water as the spillway has been flowing for over a month. This area has little marsh but is a favorite spot for puddle ducks as there is ideal nesting area near the lake. The repair work done on the spillway the spring of 1940 seems to be in good condition.

Storm Lake refuge has more water than during previous years. The marsh south of the railroad tracks has more water than last year. This area has a fine growth of roundstem bulrush and is good nesting area for diving ducks and coots. Muskrats are very numerous on this area.

B. N. Y. A.

During the quarter just past the NYA camp has given the refuge much more labor and cooperation than in the past. The NYA repair shop will repair all refuge equipment when parts are furnished. The welding shop does all necessary welding on refuge equipment. The woodshop has refinished and relettered nearly all refuge signs. Arrangements have been made to paint the refuge tower and do other necessary painting at Headquarters and at the Secondary Headquarters buildings. During the past quarter all refuge farming equipment except the Farmall tractor was painted.

NYA boys are used in tree planting and cultivation, on care of refuge lawn and in general cleanup and maintenance. The boys are also used on predator and rodent control and on game census work.

Respectfully submitted

Watson E. Beed
Refuge Manager

Canada Geese on refuge lawn
March 18

Pheasants in trap SD_SDL_350
March 3

SD-SDL-351

Snow and Blue Geese feeding in
Refuge Field (This flock 1 mile long)
April 15

SD-SDL-352

Sand Lake looking north from Weismantel place
Snow and Blue geese resting on burned over area
April 26

SD-SDL-353

Mud Lake Spillway
April 11

SD-SDL-354

Weismantel Grade Spillway
April 30

SD-SDL-355

Dakota Lake Spillway
April 1

SD-SDL-356

Dakota Lake Spillway
Water flowing around west side
April 9

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1. General

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1.	78	53	trace	66	51	trace	65	49	
2.	84	60	trace	76	56	trace	64	50	trace
3.	86	59		73	51	trace	80	52	
4.	81	57	trace	80	59		86	63	.03
5.	66	56	.24	83	61	2.87	85	62	
6.	68	45	.01	72	43	.61	88	62	trace
7.	60	47	.04	51	44	trace	85	59	
8.	47	32	trace	54	47		96	63	trace
9.	54	32		59	53	.38	94	59	.01
10.	74	31		68	52	.11	79	46	.16
11.	70	36		58	51	1.17	71	40	
12.	79	39		53	50	.26	77	56	.02
13.	87	58		66	52	.01	69	52	.14
14.	85	52	trace	76	53		78	59	
15.	69	47	trace	79	50		79	50	.01
16.	71	41		79	62		86	63	trace
17.	86	48		87	62		98	57	
18.	92	63		91	69		83	53	
19.	78	51	.06	85	59	.47	92	69	
20.	79	45		85	59		101	68	trace
21.	86	43		77	56	trace	98	62	
22.	68	50	.06	84	59		106	68	.01
23.	70	28		90	69		109	65	
24.	80	48		94	67		104	67	
25.	93	61		90	69	.13	104	74	
26.	74	54		90	64		102	73	
27.	69	51	trace	90	63		96	72	
28.	82	57	.02	84	62	.26	96	72	
29.	66	57	.52	91.	56		100	64	.46
30.	63	56	.31	87	53	trace	95	66	
31.	71	52					89	56	

Precipitation	
May	1.25
June	6.27
July	.84

Temperatures during May, June and the first half of July were normal. During the last fifteen days of July the weather was extremely hot and dry with high winds.

Precipitation for May was below normal, while in June precipitation was above normal. During July precipitation was light with only .84 of an inch recorded.

High winds during June destroyed some birds nes ts in trees and some nests of the more open water marsh nesters such as coots and grebes.

B. Water Conditions

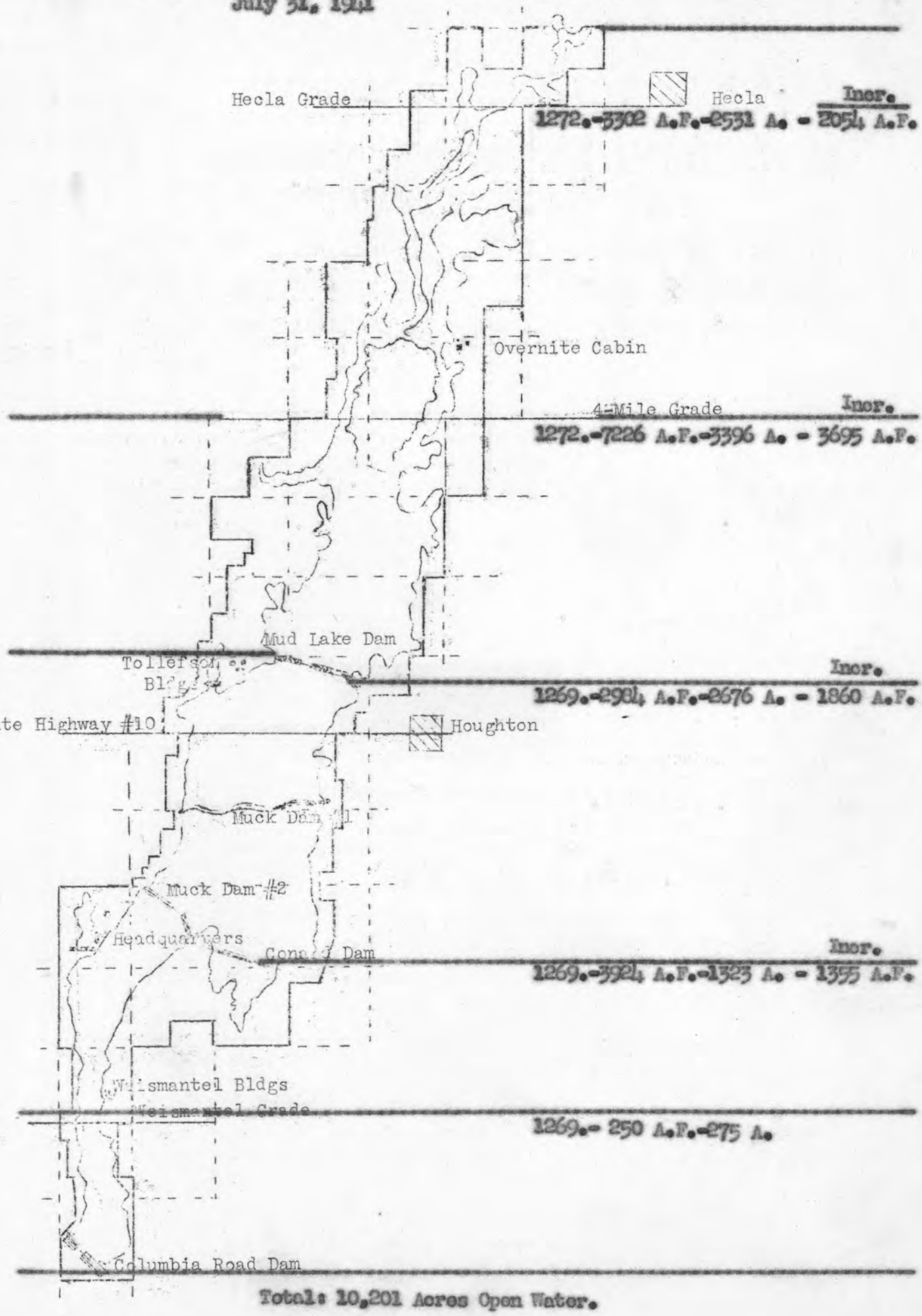
Waterlevels in the Sand Lake area slowly rose during May and June and thefirst few days of July due to continued rains. The water rose in Columbia Dam to within 12 inches of spillway elevation. Columbia Dam is well constructed and no sign of weakness or defectiveness has been found.

The last fifteen days of July were hot and dry. Hot winds caused excessive evappration and waterlevels dropped sharply.

All waterlevels are far above those of any previous year since the establishment of this refuge. Infact, the marsh and open water area is at least twice that of any previous year.

The quality of the water is good and in the newly-flooded Sand Lake area the wind causes much circulation of the water which would cause diffusion of any toxin which might be formed and thus prevent any serious outbreak of botulism. This circulation of water is helped and accented by the series of dykes and ditches. For example, when we have a high south wind the water in Sand Lake is pushed north around the west end of a dyke, then flows east behind the protection of the dyke and then flows south through the control

Waterlevel readings on Sand Lake Refuge as of July 31, 1941



Total: 10,201 Acres Open Water.

gate at the east end of the dyke. This circulation of water in addition to lessening chances of botulism will make conditions more favorable for the growth of wild rice and other aquatic plants that thrive when a gentle current of water is present.

Water continued to flow over the spillway at Dakota Lake and at Mud Lake during most of May and June and the early part of July but by the end of July all flow had ceased.

C. Fires

No fires occurred on this refuge during the past quarter. Service trails were put in condition to act as fire lines and work on the fire guard lines was started late in July and will be reconditioned before the season of greatest fire hazard arrives.

II. Wildlife

A. Waterbirds

1. Population and behavior.
(a) Species

Western Grebes, horned grebes and eared grebes nested on this refuge in larger numbers than during past years. Pied-billed grebes were not as numerous as formerly.

The Franklin gulls returned to their old nesting area in Mud Lake marshes in greater numbers than last year. This area now contains about 1200 acres. This year, due to higher waterlevels, the gull nesting was mainly in phragmites while in former years most nesting was in river bulrush. Early in June, but after nesting in the Mud Lake area was well along, Franklin gulls moved into the newly-flooded marsh area at the north end of Sand Lake. The nesting area there covers about 300 acres and most nests were in river bulrush. The concentration of nests this year was less dense than formerly, there being only about 50 nests per acre. This lack of

density of the nests was perhaps due to the difference in types of nesting cover used as the gulls have difficulty taking flight from heavy stands of phragmites and most nests were located in the margins of the brakes.

Common and black terns nest in large numbers on this refuge. To the best of our knowledge, this year was the first record of common terns nesting here.

Double-crested cormorants established two rookeries on this refuge. One is on an artificial island in Mud Lake and the nesting there is on the ground. The other nesting area is in trees on the large natural island in Sand Lake. The tree nests were blown down by a high wind in June but within a few weeks the nests were repaired and new clutches of eggs laid.

Three white pelicans nested on an island in Mud Lake but no young were hatched. Cormorants appropriated the nesting site and the pelicans left. White pelicans were common during the past quarter and during July large numbers came to feed on the fish in Sand Lake. By July 31 the numbers of pelicans exceeded 2,000.

Redheads, Ruddy ducks and Canvasback ducks show very good increases over former years. Especially is this true of redheads. By July 15 many broods of the diving ducks were in evidence.

Mallards, pintails and shovellers are early breeders and many broods were flying by the end of this quarter. Nesting pintails and gadwalls show an increase over previous years.

Wood ducks were seen on many occasions during the past quarter and one was captured and banded.

Canada geese nested in the Mud Lake area, in Sand Lake, in

Sandell pond and at the Display Pond. A total of twelve nests were discovered and a total of 50 goslings were counted. Artificial islands were used in Sandell pond and Mud Lake as nesting places by the goose.

American bitterns are common nesters. Great blue herons are summer residents but none were found nesting on the refuge. Black-crowned night herons are very common and have a large rookery in the Mud Lake marshes. A few nests have been found in trees. While banding night herons it was found that their food consisted almost entirely of young carp.

During this quarter the Least Bittern was seen for the first time on this refuge. In company with James Sieh I was inspecting the new growth of roundsten bulrush in Sand Lake. A female least bittern was flushed and alighted in a small cottonwood tree in the water. The bird was observed for several minutes at a distance of about 10 feet and identification was positive.

Coots have increased greatly, their numbers greatly exceed thos of previous years. The shallow marsh areas of Mud and Sand Lake contained thousands of nests of this bird.

(b) Groups

Waterfowl in general showed a decided increase over former years. The increase being mainly in pintail, gadwall, redhead canvasback and ruddy ducks.

Most ducks were through the molt by July 31 and by July 15 groups of pintails and Mallards were feeding in surrounding grain fields. Because of the large numbers of ducks on the refuge this year we may expect some complaints from farmers.

An attempt at a duck-nesting census was made during June. A modified quadrate method was used and samples of all types of ground nesting cover found on the refuge was taken. The results of this study indicated that we had at least one duck nest for each acres of refuge area. This would give us about 25,000 duck nests and would indicate production of between 100,000 and 150,000 young ducks. The study also indicated preference of ground nesting ducks for certain types of cover. Burned over areas were not used at all for nesting. Areas of very high vegetation were little used. Most nests were located in a moderately dense growth of grass. Areas cut for hay last year were well used. Most nesting occurred within the first hundred yards of the shore and few nests were located beyond ¼ mile of a shoreline.

This refuge usually has few shore birds but receding water in late July left some wide mud flats. These mud flats were favorite feeding places. Dowitchers, lesser yellowlegs congregated in quite large groups on these areas.

Knots were seen on several occasions and are not uncommon. Marbled godwits, western willets and upland plovers were numerous. Spotted sandpipers and killdeers nested on the refuge lawn.

2. Food and Cover.

Food and cover plants in the Mud Lake area and in the Newly-flooded Sand Lake area have made an excellent growth. Rearing cover has been very good and has resulted in the production of large duck broods.

In the Mud Lake area, where last year there was very little sago pondweed is this year a solid bed of this plant. Large areas

of sage pondweed are growing in Sand Lake and is seeding heavily. This excellent growth will insure food for resident and migratory diving ducks. Roundsten bulrush, S aquatus, has made a very good comeback in Sand Lake and large beds are present. There has been, however, very little seeding of roundsten this year in the newly-flooded areas.

River bulrush and smartweed are growing very well in both the Mud Lake and Sand Lake areas.

Small grain crops on and surrounding the refuge have done very well and yields are high but corn has suffered from the July drought and unless rain comes soon there will be very little corn raised here this year.

3. Disease.

No disease has been noted in ducks or other wildlife during the past quarter. Botulism is always a threat in this area and almost daily checks are being made. Only a very few dead birds have been found and it seems probable that we may escape duck sickness this year. Higher waterlevels and circulation of water areas, especially in the Sand Lake area is a factor which may aid in preventing botulism.

B. Upland Game Birds

The flooding of the Sand Lake area caused a migration of ring-necked pheasants out of the area. Some of these birds went into neighboring farms but many remained on the refuge. Pheasant broods were large and it is believed the pheasant population of this refuge is very near that of last year. Investigations along refuge service trails indicate one brood for every 400 feet of trail.

Prairie chickens are rare on this refuge, only one brood of chickens were observed during the past quarter. We may expect a seasonal migration into the refuge this fall. This migration usually coincided with the opening of the hunting season in North Dakota.

European partridges have done very well and the broods are large. There will be a substantial increase of these birds on the refuge this fall.

D. Big Game Animals

White-tailed deer have remained on the refuge in increased numbers. Several individual fawns were seen and one set of twin fawns were discovered. The number of deer on this refuge are now estimated at between 25 and 30.

E. Fur-bearing Animals, Predators, Rodents and Other Animals.
(1) Population and Behavior)

Muskrats have shown a great increase over previous years. Brood houses are scattered over the Mud Lake and Sand Lake marshes. Constant control of these animals must be conducted on refuge dams. During the past quarter after excavating and refilling the burrows sheet piling made up of lumber unfit for building purposes was driven along the waters edge in front of the excavated burrows. This practice has been successful in discouraging the rats and may be one of the answers to this problem where an abundance of surplus or cheap lumber is available.

Foxes are not so numerous as in the past and very few of these animals have been seen during the past quarter. Skunks and raccoon are common and show a slight increase over last year.

Beaver were seen on several occasions during the past quarter. It is believed the beaver on this refuge migrated in

from the Elm River.

Cottontail rabbits have increased very much and control of these animals to prevent damage to trees will be a problem. Brush heaps are being cleaned up and many dozens of cottontails have been killed by refuge personnel.

F. Fish

Fish, especially carp, have increased unbelievably in the newly-flooded Sand Lake area. Their numbers must be reduced or they will seriously affect the growth of desirable aquatic vegetation. The construction of traps at strategic locations and spot seining may prove successful.

The increase in fishes on this refuge is responsible for the great increase in pelicans, cormorants, herons, ring-billed gulls and other fish-eating birds.

III. Refuge Development and Maintenance.

A. Physical Development.

Our Service-sponsored WPA project of approximately 30 men was suspended on July 18 for the duration of the harvest.

During May, June and the portion of July worked, 7 miles of service trails were gravelled.

Two hundred feet of 1" pipe was used in repairing the artesian well at the Tollefson place. One artesian pond was finished and another was nearly finished.

All tree plantings were cultivated three times with a disc. Most service trails were conditioned and put in shape to serve as fire trails. Fire lines were mowed and prepared for plowing or discing.

C. Collections

1. Plant materials.

Several bushels of chokecherry Prunus sp and about a bushel of Tartarian honeysuckle seeds were collected. These seeds were scattered on a clean floor to dry.

2. Specimens.

Two study skins of the Franklin ground squirrel, Citelus franklini, were made during the past quarter.

IV. Public Relations

1. Recreational areas

The public recreational areas on this refuge are very little used. The trees at both the Hecla and Columbia areas are small. The Britton Garden Club and the Sand Lake Club visited this refuge during the past quarter.

2. Refuge Visitors

The following is a partial list of Refuge visitors for the past quarter:

Mr. Burnie Maurck	Regional Director
Mr. J. Clark Salyer	Washington Office
Mr. W. C. Henderson	Washington Office
Mr. F. C. Gillett	Regional Office
Rev. Fr. Mathonnchie	Waubay, S. D.
Dr. Engdahl	Watkay, S. D.
Dr. B. F. Markin	Columbia, S. D.
Mr. R. W. Dougall	Minot, N. D.
Mr. Ben Schaub	Co. Extension Agent, Aberdeen, S.D.
Mr. Jerry Olson	4-H Club Leader, Aberdeen, S. D.
Mr. Geo. McCullough	Fed. Coordinator, Minneapolis, Minn.
Mr. J. E. Schrader)	Fed. Writers Project, Aberdeen, S.D.
Mr. Eugene Lavine)	
Mr. Carl Ashburn	Flint, Michigan
Mr. Rognlie	Ref. Mgr., Kensal, N. D.
Mr. Childers	U. S. G. M. A., Aberdeen, S. D.
Mr. C. P. Cutting	Merchant, Aberdeen, S. D.
Mr. Harkness	Attorney, Aberdeen, S. D.
Mr. Carl Pattee	Member, State Game and Fish Comm.
John Wahl	Columbia, S. D.

Mr. Herman Krage	Columbia, S. D.
Mr. Henry Brunsel	Area NYA Sup., Aberdeen, S. D.
Mr. J. A. Bailey	Editor, Aberdeen American News
Mr. L. A. Hennings	U. S. Army, Fort Ord, California
Britton Garden Club	Britton, S. D.
Mr. Warren Hall	District Engineer
Mr. Idwal Jones	Brookings, S. D.
Blaine Poulee	

B. Violations

No refuge violations occurred during the past quarter.

V. Economic Uses of Refuge

A. Haying

Several Special Use Permits for putting up hay on the refuge have been issued. With the exception of alfalfa no haying will be permitted prior to August 1.

B. Cooperative Farming.

Cooperative farming permits have been issued for the farming of 1497 acres of land. Some of the land was not farmed and the total acreage actually farmed will not exceed 1200 acres. Small grain crops are good but due to drought during July the corn crop will be very poor.

Due to the fact that we have the required amounts of grain on hand the refuge share of the crops will be left in the fields for the ducks to harvest. There is no danger of any grain being wasted as already at least 50,000 ducks are feeding daily on refuge and surrounding grain fields.

VI. Field Investigation Or Applied Research.

A. Bird Banding.

Bird banding was carried on during the past quarter. New species banded for the first time at this refuge included the European starling, wood duck and double-crested cormorant. A ruby-

throated humming bird was captured but was liberated without banding. I believe this is the first record of this bird for Sand Lake. Several outstanding recoveries of banded Franklin gulls were received. These returns were mentioned in the Service Survey, July 1941, Volume 1, Number 7.

VII. Other Items

A. Easement District # 5.

All refuges in Easement District # 5 have more water than during previous years and the production of ducks is good. Aquatic growths are excellent except in Dakota Lake. During next quarter aquatic plantings will be made there.

The cabin at Lake Tewaukon was painted and the yard cleaned up. Grass and weeds near all buildings were cut short to reduce the fire hazard. The weeds were cut on Wild Rice Dam. Gravel was placed on several sunken spots on Dakota Lake Dam. The sunken spots were due to settling of frozen material which had been placed after the piling along the face of the dam had been driven.

B. NYA

The NYA camp at this refuge gave us much labor and cooperation with refuge work during the past ~~week~~ quarter

NYA boys were used for duck nesting census work, tree cultivation, weed cutting and pulling, work on fire lines, care of refuge lawn and general cleanup. NYA boys also assisted at the NYA repair shop in repairing Service automotive equipment and at the NYA woodshop on making, relettering and refinishing refuge signs and repairing and painting refuge boats.

Respectfully submitted,

Watson E. Reed
Refuge Manager

Sago Pondweed in Mud Lake SD-SDL-357

Sago pondweed in Sand Lake SD-SDL-358
This area had not been flooded
since 1936.

SD_SDL_359

SD_SDL_360

Roundstem bulrush growing in Sand Lake
This area had not been flooded since 1936
not seeding cottonwoods in 3 ft. of water.

Our copy June 2

SD-SDL-361

Young cormorants on artificial island in Mud Lake.

NYA boys banding cormorants. SD-SDL-362

July 30

Nest of spotted sandpiper on refuge lawn.
June 27 SD-SDL-363

Young cormorants. SD-SDL-364
June 10

SAND LAKE NATIONAL WILDLIFE REFUGE
COLUMBIA, SOUTH DAKOTA

QUARTERLY NARRATIVE REPORT
AUGUST 1, 1941 to OCTOBER 31, 1941

REFUGE PERSONNEL

Watson E. Reed
Assistant Refuge Manager

Ralph H. Natus
Clerk

William Ellinghausen
Patrolman

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1. General

A. Weather Conditions.

WEATHER CHART

Following is a chart showing the daily maximum and minimum temperatures and precipitation during the last three months as recorded at the U.S.D.A. weather bureau station at Aberdeen, South Dakota.

	August			September			October		
Date	Max.	Min.	Precip-itation	Max.	Min.	Precip-itation	Max.	Min.	Precip-itation
1.	96	62		88	55	.04	67	48	
2.	102	65		90	67		52	36	.87
3.	95	74		93	63	1.74	60	39	
4.	98	71	.04	78	56	.02	65	41	.04
5.	100	73		78	50		50	46	.04
6.	107	74		79	57	.03	59	39	.06
7.	108	67		64	49	.15	60	35	
8.	93	61		53	46	.04	64	38	
9.	98	69	trace	61	39		62	29	
10.	102	72		67	46		67	36	
11.	84	48		86	62		70	38	
12.	85	52		83	57	trace	75	56	trace
13.	89	63	.11	80	61	trace	67	34	trace
14.	83	56		67	49	.70	67	38	
15.	84	52		78	50	.52	66	42	
16.	79	56		70	45		68	42	
17.	72	48	.06	81	67	.03	64	42	trace
18.	79	46		92	71		50	47	.29
19.	87	49		89	73	trace	59	46	.02
20.	87	51		92	59	.62	61	51	
21.	86	43		59	46	.13	64	47	trace
22.	86	47		55	50	.02	64	31	
23.	94	60		59	53	.23	59	31	
24.	93	57	.48	53	35	.02	61	28	
25.	72	50		54	37		65	55	
26.	69	39		74	36	trace	55	19	.04
27.	75	56	.19	40	29	trace	39	18	
28.	79	61		51	34		44	35	.09
29.	84	60		63	43	.22	39	30	.07
30.	81	55	.52	66	39		36	26	
31.	81	55					40	21	

Precipitation	
August	1.34
September	4.51
October	1.52

Temperatures during August, September and October were normal. Light frosts occurred near the end of September but killing frosts did not occur until late in October.

Precipitation for the quarter was above normal. There were forty days in which precipitation was registered and the total precipitation for the quarter was 7.37 inches.

B. Water Conditions

During August there was a slight drop in waterlevels but during September and October waterlevels rose steadily. Winds were not strong and the relative humidity was high. This resulted in slight evaporation and continued rains kept waterlevels raising.

At the end of this quarter Mud Lake Dam was only 5 inches below spillway elevation and Columbia Dam lacked only 24 inches of spillway elevation. The Mud Lake area waterlevels stood up better than the Sand Lake area because of the constant flow of water during the entire quarter through the control gate at Dakota Lake Dam. Spillway flow at Dakota Lake was not constant but on occasions of strong northwest wind the spillway would flow. At times this flow reached 12 inches in depth.

When considered as a whole, water conditions on this refuge are very good and with even less than normal precipitation during the coming winter and spring the maximum water capacity will be reached and exceeded.

C. Fires

No fires occurred on this refuge during the past quarter. All fire lines were reconditioned and fire boxes were furnished with water barrels shovels and torches for fire fighting. The flooding of the south half of the refuge has reduced fire hazards on this refuge and will facilitate

control should a fire break out.

II. Wildlife

A. Waterbirds

1. Population and behavior
(a) Species

By September 1 the Franklin's gulls that nested on this refuge had moved south but large flocks moved into the refuge from the north. For several days at a time there would be few of these birds on the refuge and then an enormous flock would appear on Sand Lake. At times these flocks would cover at least a square mile of lake surface.

On October 16 a great migration of Franklin's gulls was observed while enroute from Sand Lake Refuge to Waubay Refuge. This flock was at least ten miles long and would average nearly a mile in width. The birds were moving leisurely southwestward in their meandering flight and from time to time large flocks would alight and feed for a few minutes and then rise and continue their migration. A conservative estimate of the numbers of birds in this migration would be well over a million. By the end of October all Franklin gulls were gone.

While banding young cormorants and black-crowned night herons it was found that these birds were feeding almost entirely on young carp. When handled these birds would regurgitate the fish. Nesting cormorants and night herons have shown a great increase over former years which was due to an abundance of fish and ideal nesting conditions.

White pelicans were abundant during the entire quarter, their numbers ranged from about 200 to 4000 and their systematic fishing operations were interesting spectacles. Long lines of the birds would drive the fish and at times the fish in their flight from the birds would jump from the water onto dry land. Pelicans no doubt removed many tons of carp from the waters of Sand Lake during the past summer. Cormorants

also remove many carp from the waters of this refuge but their fishing is apparently on an individual basis as no cooperation between individuals was observed. By the end of the quarter all white pelicans had migrated.

Redhead ducks, canvasbacks and ruddy ducks nested in numbers slightly greater than in former years. Migration of these ducks is in advance of most other ducks except blue-wing teal and by the end of October very few redheads, canvasback or ruddy ducks were left on the refuge.

Nesting and migrating green-wing teal showed a substantial increase over previous years. This same observation applies to blue-wing teal. By the end of October all blue-wing teal had migrated and only a few green-wing teal remained on the refuge.

The migration of lesser scaup occurred during the last two weeks of October but many were present on this refuge at the end of the quarter.

Geese were exceptionally numbsous on this refuge during the past quarter. Many old hunters said that never since the turn of the century had there been so many geese on Sand Lake in the fall or had goose hunting been so good. It is estimated that between 2000 and 3000 geese were killed during October in the vicinity of this refuge.

White-fronted geese arrived at this refuge on September 26 and Huchins's geese on September 17. By October 15 all geese were present in large numbers to the end of the quarter. Unusual is the fact that considerable numbers of snow and blue geese arrived at this refuge on October 1 and have remained during the entire month.

Seven whistling swan arrived at this refuge on October 31.

Wood ducks have increased and many individuals and several small flocks were seen during the past quarter.

(b) Groups

Waterfowl production of this refuge has greatly increased and also there has been a sharp increase in the numbers of waterfowl using this refuge for resting and feeding during migration. At times during October the numbers of ducks on this refuge approached the half million mark. During the entire month of October the goose population of this refuge ranged at from 5000 to 10,000 birds. Ruchins's geese made up about 85% of the total, Canadas about 5%, Snows about 5% and the remaining 5% were blues and white-fronts.

Coots were very numerous, in fact they are far too numerous and offer competition to the more desirable ducks.

Mallards and pintails continued to feed in neighboring grainfields surrounding this refuge during the entire quarter but complaints were few as the farmers have learned to harvest their crops in time to avoid duck depredations.

Due to improved habitat, in particular the mud flats made by receding waterlevels, the numbers of shore birds using this refuge during the late summer has increased. Large flocks of dowitchers, lesser yellow-legs and Western Willets have shown a decided increase. Several small groups of avocets were seen. By the end of October all shore birds had migrated.

2. Food and Cover

Food and cover conditions on this refuge are excellent. Share crops are good, especially small grain and refuge fields are utilized to the fullest extent by wildlife. Geese especially like to feed in millet fields while ducks seem to prefer barley fields. When corn is picked with mechanical pickers and much grain is shelled both the ducks and geese move into these fields to feed.

Sago pondweed grew quite well in both the Mud Lake and Sand Lake

areas but there was little seeding.

Late fall growths of cover and food plants has been exceptionally good due to abundant rain and mild weather.

3. Disease

The botulism outbreak on this refuge was very mild. A continuous check on the area affected, which indidentally coincides with the gull-nesting areas, was made and all sick and dead birds collected. A total of 89 dead ducks were found. Fifteen sick birds were treated and hospitalized. Six recovered. Most of the ducks treated which died were found to be suffering from lead poisoning.

Lead poisoning is showing up again this fall and a few birds have been hospitalized but they invariably die. Ducks suffering from lead poisoning are always underweight and after reaching the stage where they cannot fly they usually die within a day or two.

B. Upland Game Birds

The pheasant population of this refuge is very great. The number is estimated at 100,000 birds. Careful observations were made during the hunting season on migration of pheasants into the refuge. It was observed that when flushed within one half mile of the refuge fence that the birds would usually head for the refuge. Beyond 3/4 mile the birds usually made no attempt to reach the refuge but sought other cover. Counting only the half mile margin it is safe to say that on days of heavy hunters around the refuge most of the birds in this area which amounts to approximately 20 square miles, are forced into the refuge. With the close of the hunting season many of these birds will return to their former range.

The South Dakota Game and Fish Department has been issued a permit to remove 25,000 pheasants from the refuge for restocking purposes and it will not be difficult for them to trap this number.

Hungarian partridge have shown a slight increase and during the hunting season there was a migration into the refuge. This bird prefers less vegetation than we have on the refuge but when severe weather comes there is a migration into the refuge. Three coveys of partridges have ranges near refuge headquarters and come each evening to feed on the lawn just outside the office window. Each day I place a little feed for them and it is a pretty sight to see these birds running for their supper.

With the opening of the hunting season in North Dakota the usual migration of prairie chickens into the refuge occurred. At present there are only a few hundred birds but colder weather always causes a larger migration.

D. Big Game Animals

The white-tailed deer population of this refuge has greatly increased. There are now at least 40 of these animals on the refuge. To date these animals have done little damage to trees on the refuge. A few trees have been skinned by bucks brushing the velvet from their antlers but few trees have been eaten.

E. Fur-bearing Animals, Predators, Rodents and Other Animals.

1. Population and Behavior.

Muskrats have shown a tremendous increase this year. There are in the neighborhood of 4000 houses of these animals and a harvest of this crop must be made. Constant control of these animals must be made at refuge dams.

Foxes are plentiful and their numbers must be reduced. Raccoon are abundant and their numbers will be controlled by share-trapping.

A few beaver have elected to remain on the Mud Lake area but to date very little damage to trees has been done and the damage is confined to a few willows.

Jack rabbits are plentiful and cottontail rabbits are very abundant at certain locations. Control of the rabbit population will be necessary to prevent damage to tree plantings.

F. Fish

Fish, especially carp are abundant in Dakota Lake, Mud Lake and Sand Lake. Steps have been taken to secure commercial fisherman to remove these rough fish.

III Refuge Development and Maintenance.

A. Physical Development

Our WPA project which was suspended in July was reopened late in October. A septic tank and sewage disposal system was the first job started and was well under way by the end of the month. The funds for the septic tank construction were from a State-wide sanitation project and did not come from our regular refuge project.

About 50% of our Service trails were reconditioned. All fire lines were plowed. Fire boxes were furnished with water barrels, tools and back fire torches.

Muskrat control was carried out on Mud Lake Dam and an additional 400 feet of piling was driven. This piling lessens muskrat damage and will serve for wave erosion control.

Six miles of tree plantings were hand cleaned of weeds by NYA boys and refuge headquarters and both secondary headquarters were cleaned of weeds and put in condition. Refuge headquarters lawn was kept mowed and in good condition.

The cabin at Lake Tewaukon Refuge was painted and the lawn cut. Weeds were cut around tree plantings.

The dams at Wild Rice Refuge and Dakota Lake Refuge were cleared of weeds and a part of the ditch at Storm Lake Refuge was cleared of weeds and rubbish.

Sand Lake Refuge, Dakota Lake Refuge, Lake Tewaukon Refuge and Lake Ethele Refuge were reposted with new refuge signs.

All refuge fences at Sand Lake were inspected and repaired. One half mile of refuge fence which had been removed for County road building was replaced. The nursery at this refuge having been abandoned, the fence was removed and salvaged.

1. Plant Materials

The following list of dried seeds were collected and will be shipped to Lower Souris Refuge for planting in the nursery there. Most seeds lose at least 50% of their weight when cleaned and dried.

Rose hips	17 lbs.
Chokecherry	42 lbs.
Wild plum	48 lbs.
Buffalo berry	15 lbs.
Honeysuckle	12 lbs.
Wild Currant	5½ lbs.

About 35 tons of sago pondweed straw which had seeded heavily was stacked at Lake Tewaukon Refuge. When dry, this material will be threshed.

2. Specimens

Four study skins of Franklin's ground squirrel and two long-tailed weasels were made.

IV. Public Relations

1. Recreational Areas

The recreational area at Hecla is used a little but the Columbia area is not used because the trees are small and offer no shade or protection.

2. Radio

The radio programs "Your Wildlife" given on Radio Station KABR have been well received.

3. Refuge Visitors

The following is a partial list of refuge visitors for the past quarter:

Mr. Brice McBride	Salt Lake City, Utah
Mr. Richard Griffith	Washington Office
Mr. Neill Hotchkiss	Washington Office
Mr. J. Stokely Ligon	Albuquerque, New Mexico
Mr. Don Ambrosen	Waubay, S. D.
Mr. George Woods	State Game Warden, Aberdeen, S. D.
Mr. Richardson	State Game Warden, Aberdeen, S. D.
Mr. Robert Cavanaugh	Detroit, Michigan
Mr. Howard Swinney	Louisville, Kentucky
Mr. Ross Davies	Federal Coordinator, Brookings, S. D.
Mr. D. E. Dahlgard	WPA Area Engineer, Aberdeen, S. D.
Mr. Ford Zetlow	Aberdeen, S. D.
Mr. Peterson	Chief Game Warden, Pierre, S. D.
Mr. Carl Pattee	Member, S.D.Game and Fish Commision
Mr. Fred Wilgers	State Game Warden
Mr. Leo Childers	U.S.Game Management Agent,Aberdeen,S.D
Dr. B. F. Markin	Columbia, S. D.
Mr. Paul J. Clovis	Chicago, Illinois

In addition to the above list there were many other local and state visitors.

B. Violations

Two minor violations occurred during the past quarter. Forms 3-300 were submitted in these cases and it was recommended that no further action be taken. One man was apprehended shooting 4 minutes before sunrise. Form 3-300 was submitted and it was recommended that no further action be taken. A man was apprehended pursuing and shooting at wild geese from an automobile on a public highway. This case was turned over to U. S. Game Management Agent Childers with the recommendation that the case be taken into Federal Court.

V. Economic Uses of Refuge

A. Haying

Haying operations were conducted on the refuge this quarter. Wild hay was of better quality than usual this year. Drought and grasshoppers caused a complete loss of the second cutting of alfalfa.

B. Cooperative Farming

Cooperative or share-farming is quite successful on this refuge and

and is a very decided advantage to wildlife with the least expenditure of refuge funds. Small grain crops were very good but corn suffered from the fall drought.

C. Commercial Fishing.

Steps have been taken to secure removal of rough fish from this and Dakota Lake Refuge but no fishing was done during the past quarter.

VI. Field Investigation or Applied Research

Bird banding was conducted on this refuge during the past quarter. During the next quarter our bird banding will be confined mostly to waterfowl.

VII. Other Items.

A. Easement Refuges.

All easement refuges in District No. 5 have very satisfactory waterlevels. All have waterlevels above those of last year and all have satisfactory aquatic growths except Dakota Lake Refuge where the poor growth is no doubt due to the activity of carp.

Wildlife on the easement refuges was very satisfactory. Especially is this true of Lake Tewaukon Refuge which during the month of October had almost maximum populations of geese and ducks.

B. NYA

The NYA camp at this refuge gave us much labor and cooperation with refuge work during the past quarter. A better class of supervisors and instructors are now in charge and the camp is kept clean and orderly.

During the past quarter NYA boys were used for tree cultivation, weed pulling, fire line reconditioning, repairing and building refuge fence, servicing and repairing Government equipment, refinishing and constructing signs, constructing carp control traps, care of refuge lawn and many other maintenance jobs.

Respectfully submitted,

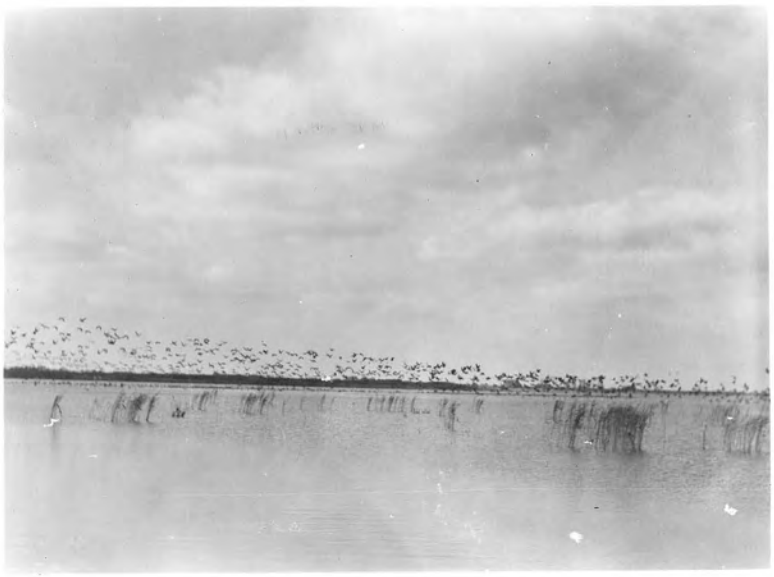
Watson E. Boed
Assistant Refuge Manager

SD-SDL-365

Sand Lake NYA Camp showing Sand Lake Marsh in the background.

Sign made for Regional Office By NYA
October 13

SD-SDL-366



SD-SDL-367

Geese raising from Sand Lake
October 13

SAND LAKE NATIONAL WILDLIFE REFUGE
COLUMBIA, SOUTH DAKOTA

QUARTERLY NARRATIVE REPORT
November 1, 1940 to January 31, 1941

REFUGE PERSONNEL

Watson E. Beed
Refuge Manager

Ralph H. Katus
Clerk

William Ellinghausen
Patrolman

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1. General

A. Weather Conditions

WEATHER CHART

Following is a chart showing the daily maximum and minimum temperatures and precipitation during the last three months as recorded at the U.S.D.A. weather bureau station at Aberdeen, South Dakota.

	November			December			January		
Date	Max.	Min.	Precip-itation	Max.	Min.	Precip-itation	Max.	Min.	Precip-itation
1.	59	29		20	10	.04	24	9	
2.				27	1				
3.	56	40	trace	6	-12		23	3	
4.	40	30	.05	30	19		3	-7	
5.	31	27	trace	34	15	trace	3	-7	
6.	40	20		38	19		11	2	.05
7.	44	32		46	22		22	19	.04
8.	55	29		46	22		25	7	
9.				49	28		8	-10	
10.	23	7		45	24		30	15	
11.	9	-1		39	20		25	7	
12.	9	-7		28	-10	.06	25	7	
13.	9	-12		-4	-20		25	11	
14.	10	0		4	-4		25	18	trace
15.	34	25		4	-4	trace	30	28	
16.				19	-3		30	25	.13
17.	47	28		17	-6	.03	26	3	.05
18.	49	32		22	-7		4	-20	
19.	37	18					4	-20	
20.	40	27		37	23		16	11	
21.	35	25		43	23		27	23	.03
22.	28	24		43	23		23	-8	.03
23.				43	27		3	-2	trace
24.	38	32		42	27		5	-10	.03
25.	39	26					14	-12	.01
26.	29	15		37	27	trace	14	-12	.01
27.	24	2		31	27		19	4	.01
28.	26	8		40	32	.43	9	1	
29.	20	10		40	32	.42	29	1	
30.				31	27		38	17	
31.				32	30	.12	34	13	

	Precipitation
November	.05
December	1.10
January	.39

The weather during this quarter was normal for this season. Temperatures during November show a maximum of 59° F and a minimum of -12°F. A blizzard on November 10 and 11 caused most refuge ducks to migrate.

December temperatures reveal a maximum of 49° F and a minimum of -20° F. Most of the precipitation for the quarter came in December but many light snow falls during January added to the accumulation of snow until on January 28 there was about 12 inches on the level. The last three days of January were warm and much of this snow melted. The maximum temperature for January was 38° F and the minimum was -20° F.

Winds during November and December were normal. Winds during January averaged velocities above normal.

B. Water Conditions

All water areas on this refuge froze on November 11 and have remained frozen since that date. Water levels as a whole are above those of last year expecially is this true of the two display ponds. There is also more water in the marsh areas northeast of Mud Lake. Dakota Lake has a higher water level now than it had at this time last year and heavy snowfall in the James River valley gives promise of increased run-off this coming spring. It is hoped that there will be sufficient water this spring to fill the unit between Mud Lake Dam and Highway No. 10.

C. Fires

No fires occurred on this refuge during the past quarter. All refuge fire lines were reconditioned last fall and special care to prevent fires was exercised during the dry season.

All stoves and chimneys at all headquarters buildings were

carefully checked for defects before being put in use. A reel containing sufficient hose to reach any building at Headquarters was constructed in the engine room in the Service building. The hose can be attached to the refuge water system. Should a fire start in any of the headquarters buildings, within a very few minutes a steady stream of water could be playing on it.

II Wildlife

A. Waterbirds

1. Population and Behavior
(a) Species

The Mallards continued to be the most abundant ducks on this refuge during the past quarter their numbers showing a constant increase until November 10. At that date a severe wind and snowstorm caused most ducks to leave the refuge and migrate. Black ducks were seen in greater numbers than in past years but only a few are wintering on the refuge. Pintails were very abundant and were second in number only to Mallards. Blue and Green-wing teal were present in numbers equal to last year but gadwall and baldpate were observed in smaller numbers.

(b)

The waterfowl population of this refuge during the first ten days of November was tremendous, the number being well over 100,000. Migration from the refuge during this period was not noticeable until Sunday, November 10. On this date there was a constant stream of migratory flocks down the James River. These flocks were mostly Mallards and pintails but there were large flocks of canvasbacks and redhead. The birds would stop for a short time on Mud Lake or the James River and then continue their migration. At times it seemed that all water surface on Mud Lake was occupied. During the height

of the storm a flock of about 2000 bufflehead ducks stopped at Mud Lake for a short time. Six white-winged scoters were seen on the Display pond on November 10. These birds were observed from a close distance and positively identified.

On the morning of November 11 most of Mud Lake was frozen over and nearly all ducks were gone. 33 whistling swan were observed on Mud Lake but left during the day. All diving ducks with the exception of a few ruddies had left. A few ducks, particularly ruddies were found frozen in the ice. As a whole mortality was not high and losses were confined to sick and crippled ducks.

The numbers of Mallards, pintails and black ducks remaining on the refuge gradually reduced due to migration until by the end of January we had a wintering population of not more than 1000 birds. These ducks stay at two Artesian ponds and at the Display pond and the flocks are for the most part Mallards. There are a few pintails and a few black ducks.

Canadian geese were more numerous than usual and several wild birds have elected to winter with the refuge geese. The refuge geese consist for the most part of Canadians sent here from Bear River Refuge. Although most of these geese can fly they show no inclination to leave the refuge except to feed.

2. Food and Cover.

Food and cover conditions on Sand Lake Refuge are excellent and use made of refuge grain fields was much greater than in former years. After November 11 very few ducks fed off the refuge. During December and January no ducks were observed even in flight off the refuge.

Supplementary feed was given the refuge geese. During the

quarter 243 bushels of grain were fed to the sixty-odd geese. This grain consisted of 30 bushels of corn and 213 bushels of mixed corn, wheat, barley and oats. In feeding the geese at the Display pond it is necessary to feed some ducks. Some mixed grain was also fed to the ducks cared for in the refuge hospital.

3. Disease

No botulism occurred on the refuge during the past quarter.

During the first few days following the storm of November 10 and 11 a total of eighty two sick and crippled ducks were captured and placed in the refuge hospital. During this period 72 dead birds were collected. Twelve of the dead birds were posted and our superficial examination indicated that fully two thirds of the birds examined succumbed to the storm because of a weakened condition caused by lead poisoning.

Of the 82 ducks placed in the hospital 35 recovered and were banded and released. Of the forty seven that died in the hospital gizzard examination indicated lead poisoning in most cases. Wounded birds usually recover.

Mortality of ducks on this refuge during the past hunting season was much less than last year due to fair weather during most of the season, the abundance of food caused fewer ducks to leave the refuge to feed and severe weather early in November caused most ducks to leave at that time.

B. Upland Game Birds

During most of the past quarter about a thousand prairie chickens (Pinnated Grouse) have used this refuge. These birds feed in refuge grain fields and show a fondness for cut over alfalfa fields. These birds also feed extensively on rose hips.

A very few sharp-tailed grouse have been seen on the refuge this quarter.

The European partridge shows a decided increase over last year there being between forty and fifty coveys on the refuge. These coveys contain from five to twenty individuals. This partridge prefers to feed where vegetation is short and most covey ranges are located near the refuge boundary, the birds taking advantage of the better cover on the refuge for roosting. There has been no indications of predation of these birds on the refuge.

The population of ring-necked pheasants on the refuge is very large. Two attempts to count the birds on certain areas have been made. NYA boys were used as observers and the drive method was used. Observers counted only birds that passed over the line to their right and between the next observer. The observer on the extreme left counted birds both to his left and right.

The first count was made from the Weismantel Grade to the south end of the refuge. The acreage in this tract is about 1030. 2988 birds were counted which gives 2.9 birds per acre. 46 observers were used which placed them about 115 feet apart. The distance is too great and numerous pheasants were seen flushing behind the line. Two foxes were also seen to pass back through the line and the observers did not see them. Many birds also passed out the south end of the refuge. This attempt at a census may be regarded only as an indication of the numbers of birds present.

The second attempt at a census on January 31 was made on the north end of the refuge covering ~~the~~ W½ and the NE¼ of section 20, an area of about 480 acres. The line started at the Hecla Grade, moved north ½ mile and pivoted, swinging north by east and then east over the last 160 acres. On this drive 58 observers were used

and were placed about 50 feet apart. Two observers were placed on the east side of the NE¼ of Section 20 to count birds moving off the area. With observers at 50 feet apart few birds are passed and the observers at the end count only birds passing out of the area. This count was more nearly correct than the first one. 2244 birds were counted which gives 4.7 birds per acre. This area had been trapped by the State Department of Game and Fish in their pheasant restocking project and at least 1200 pheasants had just been removed by trapping.

These attempts at a pheasant census of this refuge indicates a population of three to four birds per acre. These counts will be continued and check counts will be made on all areas.

All pheasants and other upland game birds are in very good condition and there are no indications of disease and predation is at a minimum. No birds were lost because of weather conditions. Loss of pheasants because of weather conditions indicates an improper balance between population and available food and cover. Complaints of farmers living near the refuge because of pheasants eating their cribbed corn and corn in feed lots has been satisfactorily stopped by having the State place pheasant traps on the refuge adjacent to their farms.

C. Other Birds

Three Golden eagles and one Bald eagle were seen on the refuge during this quarter. Marsh hawks and short-eared owls are quite common on the refuge and are evidently going to remain all winter. Several short-eared owls were found dead following the storm of November 10. We also have a few Meadow larks and several hundred red-wing blackbirds wintering on the refuge. We have a few magpies and crows are abundant. Prairie falcons are rare but the numbers of rough-legged hawks exceed those of last year. Two individuals of the Melanistic phase

of the rough-legged were observed during the past quarter.

Great-horned owls are quite common and toward the end of January were showing signs of mating. The birds were seen in pairs and were active during daylight.

D. Big Game Animals

The numbers of white-tailed deer on the refuge have remained constant at between 15 to 20 individuals. Eleven head were seen at one time. These animals spend their days on the island in Sand Lake in the tall vegetation of the lake bottom. They feed at dawn and at dusk. They do much feeding in refuge grain fields and apparently do not harm trees and shrubs. The animals appear in excellent condition and health.

E. Fur-bearing Animals, Predators, Rodents and Other Animals.

1. Population and Behavior

Muskrats have increased decidedly on this refuge. A "house count" on the Mud Lake-James River a rea revealed that there are over two hundred muskrat houses. Since it seemed likely that these animals would be share-trapped this coming spring, no control work was carried on during the past quarter. No damage to the refuge dams or dykes was noted although there may be some deep burrowing. Past experience has taught that muskrat damage during winter is not readily apparent and requires diligent search and excavation to locate.

Skunk were controlled during the past quarter and a total of 70 were taken. A few weasels were taken but no special effort was made to catch them as the population on the refuge is not large and it is believed that they are advantageous because they kill mice, cottontails and ground squirrels which otherwise would damage trees and destroy the eggs and young of smaller ground nesting birds.

Foxes were trapped during the past quarter but only three were taken. It seems evident that the fox population of this refuge is much below that of last year.

Mr. Thomas Turner of the Predator and Rodent Control Division gave us excellent help and instruction on the setting of fox traps and on the care of the pelts.

No Raccoon were taken during the past quarter. The animals are evidently in hibernation as the tracks of only one individual has been seen recently. We have been unsuccessful in locating their dens or hibernating places.

Cottontails have been doing some damage to trees. This damgge was caused by the deep snow which buried other food of the cottontails thus forcing them to eat the bark of trees. No decided increase in cottontail rabbits has been noted. Cottontails and jackrabbits will be controlled by shooting and as many trees as possible will be protected by the use of rabbit repellent paint. During the past quarter about 200 jackrabbits and cottontails were shot on the refuge by refuge personnel.

F. Fish

A few carp have been discovered frozen in the ice but as there is in places two to four feet of water under the ice there seems little likelihood that all fish will freeze out. There has been no evident loss of perch or bullheads in the Mud Lake Area.

III Refuge Development and Maintenance

A. Physical Development

A small Direct Allotment WPA project of 6 men worked on this refuge during November and until Service-sponsored WPA Project No. 4269 of 32 men began operation on December 2 .

All excavation was completed for the water control structure at Display pond No. 2. The piling for this structure was also driven. Forms have also been made for the concrete work so when weather permits the pouring of concrete on this structure can be completed in a very short time.

Most of the rip-rap has been removed from control structures No. 1 and 2. Trenches have been made for the driving of piling and this piling will be driven soon. Since Control No. 1. is the most important it will be completed first. The fill will be made, forms set, steel in place and the concrete poured as soon as temperatures permit.

Approximately 7 miles of Service roads have been gravelled on the west side of the refuge. 3250 yards of gravel were used in this work. Some of this road had received "spot" applications of gravel in previous years. The refuge owned blade attachment for the F-30 Farmall tractor has been used for conditioning the trails for the application of gravel, for spreading the gravel and for snow removal. With the exception of removal of very deep snow the machine operates very well on the above-mentioned jobs.

B. Plantings

1. Cultivated crops farmed by Refuge personnel.

Approximately 350 acres of corn, wheat, barley and millet were planted by refuge personnel and left for the birds to harvest. These fields yielded very well and were used much by waterfowl, the wheat, barley and millet being almost entirely eaten. The corn furnishes excellent winter feed for ducks and upland game.

C. Collections

1. Specimens

Study skins of the following mammals were made:

Long-tailed Weasel Mustela longicauda longicauda

Bonaparte Weasel Mustela cicognani cicognani

Plains Least Weasel Mustela campestris

Maximilian Grasshopper Mouse Onychomys Leucogaster leucogaster

These specimens have been sent to the Washington Office for identification and disposition.

IV. Public Relations

1. Hunting

Duck hunting in the vicinity of Sand Lake Refuge was fair this year but continued clear weather resulted in a small kill. Goose hunting was better than in former years. More geese were present on the refuge and the kill was greater. Pheasant hunting in areas surrounding the refuge was excellent. This refuge received many compliments from out of state and local hunters on its' production and conservation of both waterfowl and upland game.

2. Refuge Visitors

Refuge visitors during the past quarter

Dr. B. F. Markin	Columbia, South Dakota
Mr. Donald Ambrosen	Waubay, South Dakota
Mr. L. Engdahl	Indian Service, Sisseton, S. D.
Mr. George Woods	State Game Warden
Mr. Robert Hall	State Game Warden
Mr. Elmer Liebig	State Game Warden
Mr. Carl Pattee	Member State Game and Fish Commission
Mr. H. E. Bowers	Engineer, State Game & Fis Department
Mr. Fred Wilgers	State Game Warden
Mr. Fred Ege	WPA foreman
Mr. Leo Childers	U. S. Game Management Agent
Mr. D. E. Dahlgard	WPA Engineer, Aberdeen, S. D.
Mr. Kenneth MacDonald	Arrowwood Refuge
Mr. Orrie Long	LaCreek Refuge

V Economic Uses of Refuge

A. Haying

More hay was put up on Sand Lake Refuge this year than in any previous year.

Permittee	Tonnage	Revenue
Walter Bruns	87	$21.75
Stanley Dennert	9	6.50
Arthur Herseth	122.9	41.28
Ralph Herseth	124.4	56.95
W. A. Koch	82	24.00
Milo Kimball	43	10.75
Ernest F. Koch	21.7	21.70
Geo. Pfutzenreuter	115.2	115.20
Wm. D. Stolle	29.3	7.33
Preston Scott	140.4	35.10
Tunby Bros.	45.2	33.90
George Wilke	15.3	10.25
John Wilson	17.8	11.70
13	923.9	$414.69

B. Special Use Permits

Stanley Saugstad $ 16.85

C. Sale of Surplus Property

E. E. Hanson $206.00

D. Cooperative Farming

Cooperative farming on Sand Lake has been very successful both from a public relation angle and for the production of food for wildlife with a minimum expenditure of funds. Conflict with the A.A.A. has been ironed out by a careful selection of cooperators and proper explanation of the aims and necessity for cooperative farming.

The following is a complete list of cooperators, acreages, yields, etc. Practically the entire refuge share of the crops was left for the birds.

Permittee	Permit Number	Grain Planted	Acreage	Yield-Bu. Per Acre	Gov't.Share Bu. Harvested	Acres Left Standing
Wm. F. Jones	2992	Wheat	60	11		20
George Wilke	2997	Wheat	80	18		27
Harold Koch	3002	Wheat	45	13		15
John Lahmen	3004	Wheat	41	17		14
Wm. F. Jones	3058	Corn	30	35		10
John Wilson	2996	Corn	120	28		40

Permittee	Permit Number	Grain Planted	Acreage	Yield-Bu. Per Acre	Gov't.Share Bu. Harvested	Acres Left Standing
George Wilke	2997	Corn	62	34		21
Lloyd Leigh	2998	Corn	165	25		55
Harold Koch	3002	Corn	45	30		15
Kenneth Kimbal	3005	Corn	78	34		26
John Wilson	2996	Oats	138	29		46
Lloyd Leigh	2998	Oats	35	33		12
W. A. Koch	3003	Oats	30	37		10
K. Kimball	3005	Oats	22	22		7½
Wm. F. Jones	3058	Barley	20	10	50	
George Wilke	2997	Barley	70	13	240	
W. A. Koch	3003	Barley	40	8	80	
John Lehmen	3004	Barley	13	27		4 2/3
			1069			

VI Field Investigation or Applied Research

Bird banding was carried on during the entire quarter with the utilization of NYA labor. The numbers of ducks banded during the past quarter were less than in previous years as the storm of November 10 and 11 caused most ducks to leave the refuge.

Banding returns from ducks banded at Sand Lake during February, 1940 indicates that they were Canadian birds and that they were far into Canada by April and May.

Summary of Returns and Recoveries(Waterbirds)

	Mallard	Gadwall	pintail	Bald Pate	Red head	B.W. Teal	G.W. Teal	Franklin Gull	Lesser Scaup
Guatemala			1						
Guadalajara, Jalisco									
Villa General, Anaya			1						
La Barca, Jalisco								1	
Febrica de Loza								1	
Alberta									
Saskatchewan	6			1		1			
Ontario	1				1				

	Mallard	Gadwall	pintail	Bald pate	Red head	B.W. Teal	G.W. Teal	Franklin Gull	Lesser Scaup
Manitoba	5			1	1				
Wisconsin									1
Kentucky	1								
Louisiana	6	3					1		
Minnesota	1				1	1		2	1
Mississippi	2								
Missouri	3	2							1
Montana	1								
N. Dakota			1					1	
Nebraska			1		1				
N. Carolina					1				
Oklahoma	1								
S. Carolina		1							
S. Dakota	2								
Tennessee						1			
Texas	6	1		1	1				
Arkansas	4								
Florida				2					
Georgia	1								
Iowa	1								1
Illinois	3								
Kansas	5	2							

Summary of Returns and Recoveries (Song birds)

	Yellow-headed Black bird	Red-wing Black bird
Mexico	1	
Kansas	1	
Oklahoma		1
Texas		1
Canada	1	1

Record of Birds Banded during August, September, October, November and December, 1940 and January, 1941.

Species	August	September	October	November	December	January
Red-winged Blackbird		230	357			
Bronzed Grackle		56				
MacGillivray's Warbler		1				
Robin		3				
Mourning Dove	3	4				
Barn Swallow	1					
Myrtle Warbler			1			
Indigo Bunting		1	1			

Species	August	September	October	November	December	January
Swamp Sparrow			1			
Field Sparrow		1	4			
Slate-colored Junco		1	15	8		
Song Sparrow	35	54	27	1		
Clay-colored Sparrow	2	6	1			
Lincoln Sparrow	7	185	18			
Dicksissal		1				
Olive-backed Thrush		4				
Brown Thrasher	1	8	1			
Yellow-headed Blackbird			1			
Gadwall	1	1				
Black Duck				2		
Baldpate					1	
Redhead					1	
Arctic Towhee		7	19			
Fox Sparrow		1	1	1		
Gambel's Sparrow		22	8			
Catbird	5	2				
Harris's Sparrow		79	301	3		
Tree Sparrow			26	50	75	3
Green-wing Teal	1				3	
Mallard	4	3		584	1	
White-throated Sparrow		163	81			
Blue-wing Teal	2		1	1		
Saw-whet Owl				1		
Pintail				6	3	

VII Other Items

(a) Easement Refuges (District 5)

All of the easement refuges in District No. 5had very good populations of waterfowl until November 11 when open water froze and all ducks migrated. Maple River Refuge in spite of very little water was much used by Mallards as a resting place. These Mallards fed in surrounding grainfields.

Clouds Lake, Lake Tewauken, Storm Lake and Lake Elsie Refuges had excellent populations of waterfowl until the freeze-up. Clouds Lake and Lake Tewauken had large populations of redheads, canvasback and other diving ducks. This was no doubt due to the excellent growth of aquatic plants in these two lakes. Lake Tewauken also served as a resting place and feeding spot for many Canadian geese.

Construction work on Dakota Lake Refuge was completed during this quarter. In addition to the spillway and stop-log control, the dam was piled with sheet piling to strengthen it and prevent muskrat damage. All fills at the spillway and dykes to prevent escape of water onto the meadow on the west end have been completed and gravelled to prevent erosion. Mr. Fred Ege in charge of the work at Dakota Lake has done an excellent job which will last indefinitely with a minimum of maintenance.

Dakota Lake had it's usual large population of Mallards which fed on the refuge and in surrounding fields. It was noted that few diving ducks use this lake. This is no doubt due to the lack of desirable aquatic food plants. An abundance of carp in this lake no doubt contribute to this lack of aquatic growth.

(b) N. Y. A.

The NYA camp at Sand Lake Refuge has increased its enrollment and now gives the refuge enough labor so that definite accomplishments may be made. During the past quarter the boys were used for the following refuge work: Predator control, care of predator pelts, placing snow fences, snow removal (from refuge roads) shelling and cleaning corn, cleaning grains and seeds, preparing refuge agricultural implements for painting, greasing and minor repairs on trucks and on pheasant census work.

Respectfully submitted

Watson E. Reed

Watson E. Reed
Refuge Manager

SD-SDL-344

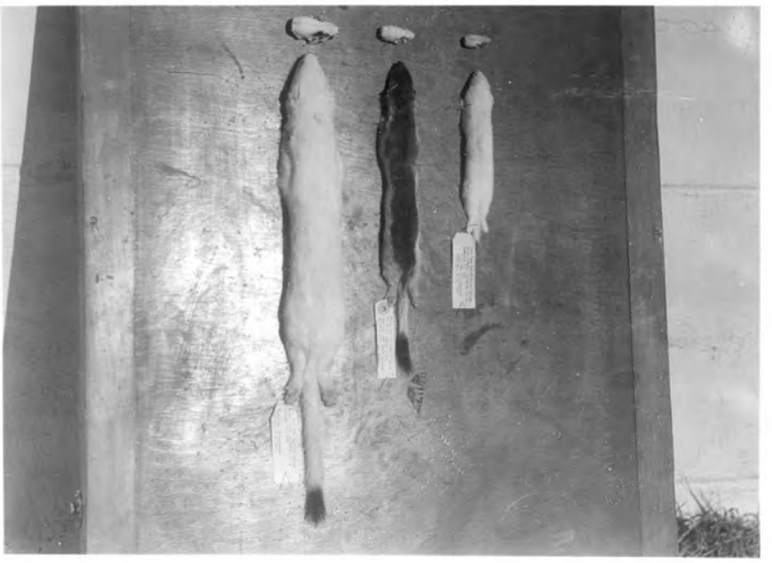
Mallard Ducks leaving Artesian
pond January 29, 1941

SD-SDL-345

Geese and ducks at Display pond
January 28, 1941

SD-SDL-346

Ventral view of hibernating
mouse January 28, 1941



Three species of weasel, showing
comparative size January 11, 1941

SD-SDL-347

Pheasant trap. (Note wire sides and fish net top. January 29, 1941. SD-SDL-348

NYA boy with skunks SD-SDL-349

QUARTERLY GRAIN REPORT

Station Sand Lake Refuge Period November 1, 1940 to January 31, 1941

This report should cover all grain received, or disposed of, during the quarterly periods ending January 31, April 30, July 31, and October 30. Reports in duplicate, clipped to, but not bound as a part of, the quarterly narrative report, should reach the Regional Office by the 10th of the month following the close of the period covered by the report. The Regional Director, after approval, will forward the original to Washington.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)--55 lbs, Corn (ear)--70 lbs, Wheat--60 lbs, Barley--50 lbs, Rye--55 lbs, Oats--30 lbs, and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels. Report all grain received during period from all sources, such as transfer, share cropping, or harvest from feed patches.

Variety	On Hand Beginning of Period	Received During Period	Grain Disposed of				On Hand End of Period	Proposed Use		
			Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn	2807	0	90	0	30	120	2687		300	2387
Wheat	1784	0	0	0	0	0	1784		300	1484
Barley	686	0	0	0	0	0	686		200	486
Rye										
Oats	1470	0	0	0	0	0	1470		100	1370
Mixed	253	0	40	0	213	253	0			
Millet	345	0	0	0	0	0	345		60	285

1. Indicate shipping or collection points _____

2. Grain is stored at _____

3. Remarks 40 bushels mixed grain transferred to S.D. Game and Fish Department.

90 bushels corn transferred to La Creek Refuge

Approved by: Submitted by:

Regional Director Signature and Title