BRANCH OF WILDLIFE REFUGES

NARRATIVE REPORT

ROUTING SLIP DATE February 14, 1952

Mr. Salyer _____ Mr. DuMont _____

~~Mr. Thomas~~ WK Miss Baum _____

SECTION OF OPERATIONS:

Mr. Ball _____ Dr. Morley _____

Mr. Regan _____

SECTION OF HABITAT IMPROVEMENT:

~~Mr. Griffith~~ EG Mr. Kubichek _____

Dr. Bourn _____ Mr. Stiles WBS

SECTION OF LAND MANAGEMENT:

Mr. Ackerknecht _____ Mr. Davis _____

STENOGRAPHERS:

_____ _____

_____ _____

REFUGE Lower Souris

PERIOD September-December, 1951

PERSONNEL

Donald V. Gray.....Refuge Manager

Raymond M. Glahn.....Pilot-Biologist

Howard S. Huenecke.....Asst. Refuge Manager (Acting in charge of Des Lacs Refuge)

Robert W. Arrowsmith.....Refuge Mechanic

Sigfred A. Nygard.....Refuge Clerk

Thomas W. Lawson.....Maintenance Man

Alvin Brandt.....Maintenance Man

Kenneth B. Baker.....Maintenance Man

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Merrill C. Hammond.....Biologist

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I. GENERAL

A. Weather Conditions:

Month	Snow	Precip.	53 Year Normal Precip.	Max. Temp.	Min. Temp.
September		1.99	1.46	83	21
October	T	0.84	0.93	78	11
November	6.4	0.32	0.59	55	-22
December	5.4	0.33	0.44	46	-27
TOTALS	11.8	3.48	3.42	Ext. 83	-27

All weather records for the period from official Weather Bureau Station at Refuge headquarters.

September was a relatively wet month, though not particularly cool. The high of 83° was 12° lower than the September, 1950. The rainfall spread well through the month, made it a very unfavorable month for harvesting operations. The precipitation for the month was .65 inch more than in 1950 and .53 inch more than the average. October dropped down in rainfall from the average but was .64 more than in 1950 so that it too was very unfavorable for harvesting operations. Temperatures averaged a little colder than for 1950. November was colder than the same month in 1950 though precipitation was about 1/10 inch higher. There were six days with subzero temperatures ranging from -1 to -22. Though some snow fell in September and October it was not until mid-November before there was enough to cover the ground and stay for more than a day or so. On November 15 - 6 inches of snow fell and looked like it was here to stay until a warm spell the last week of November melted all of it, and on the 30th it was gone in all but the shady spots.

December came in on the warm spell that carried through from November and highs of above freezing temperatures were experienced for the first seven days. A cold spell hit on the 13th and lasted through the end of the month, with the winters low to date being -27°.

All in all the winter so far has been quite agreeable as there has been but little snow and very little wind. All roads are open and the local governing bodies haven't had to put out any money for snow plowing as yet. While the temperature has dropped into the sub-zero readings the absence of wind has made the cold less bothersome.

B. Water Conditions:

Water levels varied somewhat during the period, but were kept fairly well in line with the approved water management plan. A summary of conditions by units follows:

Rubble Masonry Unit: This unit is dry except for water in the channels.

320 Unit: Kept within a few tenths of level 23.00 until the first week in October when gradual drawdown for winter drainage started. Unit empty and gates opened wide on October 26.

326 Unit: Held slightly above 17.50 until drawdown of 320 when level came up to 19.20. This level was also helped by opening of gates at Lake Darling and some release from DesLacs in late November. At the end of December the level was back down to 18.20.

332 Unit: On September 1 this unit was at 16.15 level and held in this general vicinity, into October when it gradually built up to 17.00 by the end of October. Then releases from Upper Souris and Des Lacs pushed the water up to 17.70 and gates had to be opened to lower the level as the flow could be handled faster and not build up in 326. The gates froze in in December and before they could be let down the level had dropped to 15.33 at the end of December, not counting all the water locked up as ice.

341 Unit: The level of this unit has been held pretty close to the 15.00 mark, though it rose during the time gates at 357 had to be closed to allow work on Canadian structures downstream. At the end of the period it stood at 14.70.

357 Unit: Heavy rains in late August pushed this unit up in September as Boundary Creek flowed a considerable stream for a long time, draining the excess from the Souris, North Dakota locality. It was brought down in October to the 12.50 mark and kept there during November. At the end of December it had risen to 13.25.

C. Fires

None to report.

II. WILDLIFE

A. Migratory Birds

The noticeable features of the period's fall flight was the decrease in the numbers of geese and a large increase in the number of whistling swan using the refuge. The goose flock composition consisted solely of white-fronts and Canadas with no numbers of Richardson's present, and a top figure of 30 blues and snows. The population of whitefronts was a little over half that of 1950 with the Canadas at about the same figure or slightly less.

Whistling swan on the other hand took a large jump in numbers, the peak population recorded being 1800 on October 29th. This was evidently the peak as on November 4 when a beaver census was made ohly two swans were left on the refuge. The majority of the swan used the 357 unit from the Great Northern Railroad north, one count being 700 between the railroad grade and the Westhope-Landa road grade.

Waterfowl Movements - Fall 1951
Lower Souris Refuge and Vicinity

August 28 to Sept. 12

Decreases	Increases
Coots	Mallard
Baldpates	Shoveller
Bluewinged teal	Pintail
	Redhead (large)

September 7 - 50,000 + mallards and Pintails headed south from Souris Area

September 12-26 -

Mallard	Gadwall
Pintail	Redhead
Bluewinged Teal	Canvasback
Shoveller	Whitefronts
Ruddy	
Coot	

September 13-18 - White front wave came in 9-18. Best single day

September 20-30 - Major flight of pintail and mallard out of area (Rain and snow 9-24-25-26).

September 28 - Increase of 400-500 Canada geese.

October 9 - First snows and blues (14) (Greatest number observed - 30).

October 15 - Gadwall and shoveller flight through area.

October 19 - General duck migration. Seen between Minot and Coleharbor, North Dakota.

October 25-26 - General movement out of area - most whitefronts gone.

October 28 - Scaup wave into and through area. (Potholes and sloughs froze up - most open water areas also).

October 29 & 30 - Exodus of ducks, geese and swan from Lower Souris area.

November 4 - 6500 ducks left on the refuge 95% mallard, 5% scaup.

November 14 - Several hundred mallards observed in migration south. (6" snow night of November 14-15.)

Following are results of censuses taken on dates indicated:

Lower Souris Waterfowl Census
Hammond - Glahn
September 12, 1951

	Mallard Pintail	Other Ducks	Coots	Totals
North of 357 Unit	700	700		1,400
357 Unit	79,400	25,800*	23,000	128,200
341 Unit	14,100	15,600	9,000	38,700
332 Unit - Total Count	28,000	10,000	3,000	41,000
326 Unit - Transect Method**	39,000	4,750	1,000	44,750
320 Unit - Transect Method**	8,500	20,000	4,700	33,200
R. M. Unit	2.000	500		2,500
Total	171,700	77,350	40,700	289,750

357 Unit	Mallard Pintail	Other Ducks	Coots	Total
W.L. road to 357 dam	3,000	5,000	4,500	12,500
R.R. to W.L. road	-	4,200	4,000	8,200
#5 to R.R.	61,200	11,600	10,000	82,800
341 Dam to #5	15,200	5.000	4.500	24.700
	79,400	25,800	23,000	128,200

341 Unit	Mallard Pintail	Other Ducks	Coots	Total
N. of Newburg road	13,600	15,000	7,500	36,100
S. of Newburg road	500	600	1,500	2,600
	14,100	15,600	9,000	38,700

Canada geese-No change - 303 ±

Changes since 8/28/51 - Coots - decrease
Mall-Pintails - increase
Gadwall - no change
Baldpate - big decrease
B.W. Teal - big decrease
Shoveller - increase
Redhead-- big increase
Canvassback -? - some seen
Ruddy -? - seen
G.W.Teal - Several flocks
Geese - no change

** Total Count on Mallard and Pintail
* About 10,000 of these were redheads

September 26, 1951 (Glahn)

	Mallards Pintails	Other Ducks	Coots	Total	Geese
Units 326 & 332	21,000	24,500	6,500	51,500	900
Rubble Masonry & Unit 320	8,000	22,000	2,800	32,000	1,200
Unit 341	26,000	17,600	11,000	54,600	1,100
Unit 357	56.000	39,600	18,700	114,300	900
Totals	111,000	103,700	39,000	252,400	4,100
Sandhill Cranes				51	

Changes since the census flight of September 12, 1951:

Mallard-Pintail	Decrease
Gadwall	Large increase
Baldpate	No change
Bluewinged teal	Decrease
Shoveller	Decrease
Redhead	Increase
Canvasback	Increase
Ruddy	Only a few observed
Greenwinged teal	No change
Geese	Decided increase in white fronts
Coot	Decrease

Goose Census - Oct. 10, 1951 (Hammond-Glahn)

Unit		
320	1200 geese	150 swans
326	4020	10
332	1	
341	365	31 . . . . . 4 cranes
357	690	70
	6276	261

Rough count of waterfowl in 341 and 357 units

357 Unit

North of 357	1200
North of W. L. road	21000
North of RR	1000
North of #6	7700
North of 341	3800
	34700

341 Unit

North of Newburg road	7200
South of Newburg road	3100
	10300

Composition Count, Units 332, 341, and 357 (Glahn)
October 15. 1951

Species	Number	Per Cent	
Mallard	510	.256	
Pintail	572	.241	
Shoveller	576	.242	flocks 15 to 150
Gadwall	156	.066	" 15 to 50
Green Wing Teal	110	.047	No large flocks
Blue Wing Teal	21	.008	
Baldpate	22	.008	
Scaup	84	.036	Flocks on 357
Redhead	62	.026	" " "
Canvasback	6	.002	No flocks seen
Coot	156	.065	
Ruddy	4	.002	
Bufflehead	2	.001	
Total	2381	1.000	

Migration of shovellers and gadwall appears to be passing through. We noticed the flocks of gadwall October 13 but not the shovellers. They both showed in composition count.

Waterfowl Census, Oct. 29, 1951

Unit 320 - 4,900 ducks, 12 geese (Canada)
85% mallard
15% divers, mostly scaup
Unit 326 - 5,600 ducks, mostly mallard
650 geese, Canada & White front
Unit 332 - 2,700 ducks, 90% mallard
150 geese (Canada)
Unit 357 - 14,500 ducks, 90% mallard & 10% divers
710 geese, Canada and White front
1800 Whistling swan

Waterfowl Census, November 4, 1951

Ducks - 6,500, 95% mallards, 5% scaup
Swans - 2
Canada Geese - 1,(Crippled)

All but 1500 ducks in river holes kept open by them in south end of refuge. Remaining 1500 in hole near 357 and from that structure to the U. S. - Canada line.

Status of waterfowl by species follows:

Whistling Swan - decided increase over 1950. Perhaps the largest fall concentration.

Common Canada Goose - numbered slightly below the population in 1950. Resident flock produced 193 young.

Lesser Canada Goose - as in 1950 - very few if any; none positively identified.

Richardson's Goose - A drop from 1950 to near zero. Only one flock of 65 reported seen on the refuge, September 17. These were in company with a flock of 354 white fronts.

White-fronted Goose - About a 50% decrease in these compared to 1950. Peak hit here about September 18 when Brevig (GMA-Pilot) reported 4-5,000 birds.

Snow-blue Goose - Maximum number seen was 30. Flight evidently either missed or passed over here.

Mallard-Pintail - The numbers resident on the refuge were a little less ~~on the refuge~~ compared to 1950 though in the area the number passing through was probably greater. The large acreage of water in the Souris, North Dakota area held many of these birds as flooded grain fields were common there.

Black Duck - Never very many of this species here, the numbers did show quite an increase over 1950.

Gadwall - Normal numbers present on the refuge about the same in 1950, but two definite migrating waves noted, one on September 26, the second on October 13.

Baldpate - Down a little in numbers from 1950 count.

Green-winged Teal - Very little if any change from 1950.

Blue-winged Teal - Peak reached in late August and decreased gradually into mid-October. Departure was not sudden as in some past years.

Shoveller - An increase was noted in this species with a noticeable migration wave through here on October 15.

Redhead - An increased number of redheads passed through here, but did not tarry long. On September 12 Hammond and Glahn noted one flock of 10,000 on 357 unit. The redheads did not show up in the hunters bags on Deep River as often as in the past few years, indicating that the number using the refuge was smaller or had passed directly on through.

Canvasback - No change from the numbers in 1950. Few showed up in the hunters bag.

Lesser Scaup - Decided increase over 1950. This bird took the brunt of the hunting pressure on Deep River and replaced the redhead in take. They remained here until only a few holes were left open in the ice.

Ruddy duck - Although there did not appear to be any great number of ruddies on the refuge, they did appear fairly regularly in the diver bags taken on Deep River. Total numbers approximated those of 1950.

Coots: Showed a large increase in peak population over 1950 and probably a total use increase some better than that of 1949.

Golden-eye, bufflehead and hooded mergansers were present in usual small numbers. These ducks could be seen consistently during the season below most of the structures. American mergansers were also present in normal numbers. They seem to prefer the area immediately below the 341 structure.

Food and Cover

Aquatic food conditions were reported on last period. The small amount of pondweed seeds undoubtedly forced the migrants to turn to vegetative parts more especially those species feeding principally on pondweeds. The large numbers of coots present would account for a great part of the seed crop produced. The mallards and pintails were well provided for on the refuge feeding fields as well as in the fields of grain where so much difficulty was experienced in getting the crop harvested.

Depredations: (Excerpts from 1951 Report by M. C. Hammond)

The 1951 depredation season was one of the worst on record, not because there were more complaints than in the past (there were only 6 more) but because of the extended harvest season that began on July 20th and continued past mid October. Near the Village of Souris heavy rains in August flooded standing grain forcing farmers to abandon part, or in some instances all of their crop before it was swathed.

Wet weather further hampered the feeding program insomuch as trucks were unable to reach the stations when feeding was most necessary. One of the important trouble areas between Roth and Souris lay only two to four miles south of the Canadian boundary. Birds appeared to know that the aircraft could not pursue them across the Canadian boundary and would alight a mile on the other side only to return when the aircraft or game management agent left the trouble area. Fortunately, some of the fields in the area were completely innundated, and the grain was lost to the farmer before the ducks moved in. In many instances, however, the ducks were credited by the farmer with the loss.

Scaring Devices: The following types of frightening devices were used: the scarecrow, simulated hand grenades, rotating-flashing beacons, and streamers (oil station type). The rotating flashing beacon was successful only after daylight hours. The streamers were most successful during sunny daylight hours, but were easily damaged by wind. Scarecrows of all descriptions were used with good results. It is interesting to note that no instance of damage was known to fields where scarecrows were put up before ducks started feeding in the field. The simulated hand grenades were used to frighten birds already feeding in the fields, and in most instances were dropped from an aircraft. The explosion of these large fire crackers frightened the ducks into the air and assisted the pilot in driving the waterfowl toward the refuge.

The cost of the 1951 duck control operation which included truck operation and drivers wage, along with refuge and game management aircraft, automobile fuel and oil, miscellaneous repairs and telephone bills was $1,823.43. Not included in the above figure was the cost of 21,984 bushels of grain (produced on refuges), wages of service personnel, game agents per diem, and truck drivers from other refuges.

Damage Complaints: It is not known what relationship exists between the amount of damage and the number of complaints received by the game agents and can only suspect that a great increase in damage might result in some increases in complaints. In 1950 there were 20 instances of observed or reported loss with damage estimated at 1275 bushels. In 1951, with damage probably two to three times that in 1950 only 26 instances of observed or reported loss are on record with damage amounting to 4651 bushels (very rough estimates from inadequate data on the damage complaint forms.)

As near as can be determined .5 to 4.5 times as much grain is damaged by waterfowl (that is grain that threshed out on the ground while the ducks are feeding on the swath) than is actually eaten. Thus the reason for feeding combined grain rather than mowing to eliminate waste.

Waterfowl Population 1951 - Lower Souris Refuge

Period	Refuge	Off Refuge	Total
8/1/15	100,000	50,000	150,000
8/16/31	135,000	25,000	160,000
9/1/15	170,000	35,000	205,000
9/16/30	120,000	10,000	130,000
10/1/15	100,000	8,000	108.000
10/16-18	80,000	5,000	85,000

Waterfowl Population 1950 - Lower Souris Area

Period	Refuge	Off Refuge	Total
8/1-15	60,000	10,000	70,000
8/16-31	110,000	10,000	120,000
9/1-15	157,000	10,000	167,000
9/16-30	170,000	30,000	200,000
10/1-15	190,000	15,000	205,000
10/16-18	190,000	10,000	200,000

Although the calculated refuge use in 1951 was below that for 1950 a somewhat greater quantity of grain was fed and shortages were of more regular occurrence. The greater needs in 1951 may have been due to the near failure of the pondweed crop on the refuge that year. There was a great deal less natural food available than in 1950.

Disease

No outbreaks of disease were noted

B. Upland Game Birds

Prairie Chicken: It appears that we have lost our last numbers of prairie chicken as none have been reported for quite some time.

Sharp-Tailed grouse: According to District Warden Charles Decker this species was in abundance in favorite areas of grass and aspen thicket associations in the general vicinity. He reported, however, that few hunters troubled to go after them. On the refuge this grouse was in numbers about the same as last year. They were most common in the southern part of the refuge, although there was a fair sprinkling of them in the northern end.

Equopean Partridge: Appears to have been little change in numbers of this species in 1951 over 1950. The season was opened, but not many birds were taken. The North Dakota law prohibiting shooting within 40 rods of dwelling favors these little fellows considerably, as they appear to prefer to stick around close to farmsteads.

Ring-necked Pheasant: The population of the pheasant seems to remain fairly static as there was definitely not an increase this year. The severe winter the past few years have had quite an effect on the general population. No open season was permitted on this species in this vicinity this year, although there were parts of the state that had an open season.

Food and Cover

Weather conditions so far this winter have been excellent for the upland game birds so far. With only 5" of snow on the ground at the end of December the birds were unrestricted in their movement in search of food. The berry crop as reported previously was very poor, so that this lack is being made up by weed seeds and waste grain in the stubble fields. If a mild winter is experienced we may see a definite upswing in the upland game birds in 1952.

Disease

None noted.

Birding Activities

The Audabon Christmas bird count was taken on December 27 by Hammond, Dorothy Gray and Don Gray. This is the 13th consecutive count, and a drop of 5 species was noted - 18 for 1950 and 13 for 1951.

A late observation of a yellow headed blackbird on December 2 was made by Gray. It was in company with 16 red-winged blackbirds.

C. Big Game Animals

Snow conditions have not been such to afford a good chance for a deer census, so none has been taken to date. There has been an increase in the herd if past production figures hold. During the Christmas Bird Count, the party walked up 23 deer, one bunch totalling eleven.

There was no deer season in the entire state in 1951.

Food and Cover

Food and cover conditions are excellent for deer on the refuge. Browse species are plentiful and utilization is not near the danger point. There has not been enough snow to hinder the movements of the deer so that they are well scattered throughout the river bottom and sandhills where the major portion of the herd is, as well as along the refuge area to the north.

Diseases

None noted. All observations indicate the deer to be in excellent condition.

D. Fur Animals, Predators and Other Mammals

1. Beaver

The beaver census was taken November 4 by Glahn and Gray in the aircraft. A very good day was at hand for the flight, and we were able to cover the area well, as well as check some of the larger sloughs in the south end adjacent to the river bottom. The largest number of the beaver lodges was as usual (and to be expected) in the wooded river bottom. A total of 31 beaver lodges or food caches were counted there with 15 lodges counted in the remainder of the refuge from 320 unit north. This indicates an estimated 335 beaver present on the area, an increase of 23 lodges over 1950 and 154 animals over the 1950 population.

Authorization was requested and received to remove 100 animals and same was granted. A permit was secured from the state, and the season set at March 15 to April 30. So far, however, we have been unable to sign up any trappers to take the 100 beaver as most of our trappers are not too interested due to the considerable harder work to beaver trapping as compared to mink and muskrat, and the lower price per pelt that now exists.

Muskrat

An aerial muskrat census was made on the units by Glahn and Brandt on October 17. The following information was obtained:

Unit	Houses	Population
320	8	40
326	13	85
332	6	30
357	163	815
Total House Count	190	960

This indicates a considerable drop in the muskrat house count due principally to the lower water levels held in 320, 326, and 357. The population does not appear to be down accordingly, as muskrats were observed about as frequently as in 1950. More evidence of bank burrows were found, but our system of intensive trapping at and in the immediate vicinity of the dikes has helped reduce burrowing into them.

These population figures are for house rats only, so the population of bank rats will swell this. We have no accurate method of determining the numbers of bank rats on the refuge, but believe them to outnumber the house rats.

Trapping began November 7 for muskrats and will continue to April 30.

Raccoon

The raccoon population was high, and the trappers have been quite active in taking them. The highest population is in the wooded river bottom where the presence of den trees, plus good food availability exists. There have been more raccoon taken this period than for several years past. Season for raccoon is from November 1, 1951 to February 15, 1952.

Badger

This animal is holding its own without too much difficulty. The trappers have not been taking many and being rather spread out in range from near the waters edge to some distance away makes intensive trapping of them rather difficult. Then, too, when trapping does get started the ground is usually frozen so that there is not too much activity on the part of the animals.

Skunk

Skunks remain very common, and a good take of them has been made by the trappers. The trapper on Units 1-5 has been most diligent in taking them, having accounted for over 150 skunks since the opening of the trapping season.

Mink

The take by the trappers has borne out our observations of the summer and fall that we have had an increase in the mink population. Weather for trapping them has been ideal as the trappers are unhampered in their efforts at covering their areas well. Then too, with less snow the mink are more in evidence and not travelling in tunnels under the snow. The mink taken are in good shape, and the pelts appear to be prime.

Red Fox

There apparently were more foxes using the refuge than our observations indicated as one trapper alone took 26 in Units 1-5. These 5 units being the northern half of the refuge and the narrowest it is quite probable that some at least were just passing through, probably on regular runs.

Coyote

There does not seem to be any great change one way or another in the coyote population. Sight records of them are few.

Rabbits

The population of all three - jack, snowshoe and cottontail appear to be increasing over that of last year.

Porcupine

No change

A summary of the fur take by units to December 31 follows:

Unit	Muskrat	Mink	Weasel	Raccoon	Skunk	Fox	Badger	Coyote
1-5	162	70	6	9	170	26	4	
6	16	8	7	2	8	1		
7		22	10	11	29			
8-9		49	4	9	17	1		
10	6	16	8	22	7			
Aircraft						2	-	1
	184	165	35	53	231	30	4	1

E. Predaceous Birds

The various hawks were here in normal numbers. The two species of eagles number less than a year ago, although both have been seen very occasionally.

The first snowy owl was seen very early, the sight being made September 20th. The next record was made on October 2nd and from then on sightings were common. During the month of December, they seemed to have thinned out considerably and were not near so common as previously.

F. Fishing

Fishing season closed on September 15, and but little success was had by those fishing during the last two weeks. The usual thing is that fishing success falls off in early September, and then picks up again slightly a little later on. An attempt to take some northerns in early October was unsuccessful, though the fish were continually breaking water. Winter fishing through the ice is permitted on Deep River outside the refuge boundary, but not much activity has been seen along this line so far.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Cold weather and freezup halted construction activities on November 14. Up until that time we were able to carry on our concrete work quite well with not too much inconvenience from the freezing weather.

A summary by Projects follows:

Project 622-C-1. - Raise wingwall 357; construct buttresses, spillways 332 and 341

1. Completed pouring 70 buttresses, 690 feet of beam, and two end walls at 332 spillway.

2. Completed pouring 26 buttresses and 268 feet of beam at 341 spillway.

3. Hauled 24 cubic yard of rock riprap to 357 structures and placed 35 cubic yard. Some rock being hauled previously.

4. Moved equipment and stored for over winter.

Project 622-C-2 - Fence Construction

No activity on this project during the period

Project 622-R - Purchase and install water softeners, construct Partial basement under barracks apartment, repairs to Cottonwood Lake and Willow Lake.

4 water softeners purchase. No other activity this period.

Miscellaneous Activities:

1. Bladed patrol and access roads so that they would be in shape for snow removal operations when necessary.

2. Cut willows and gave 16 miles of patrol roads final mowing to remove snow catchers.

3. Preventive maintenance and safety inspection on vehicles as needed.

4. Hauled straw for plugs in front of structures 326, 341 and 357.

5. Spent 14 man days chopping ice to free gates for regulation of water.

6. Installation of heating system partially completed in machine shed.

7. Installed circuit breakers, hooked up with power and installed 6 fluorescent light fixtures in shop end of machine shed.

8. Hauled 179 tons of coal from Garrison Dam to headquarters.

9. Minor overhaul on Pontiac Sedan, I-18272 including rings, bearing inserts, replace timing chain, headlight relay and general tightening up.

10. Winterized all vehicles for winter service and stored those that will not be used until spring.

11. Periodic cleanup in buildings and storage of small equipment.

12. One trip with Diamond T semi to Crab Orchard Refuge for reinforcing steel, with stop at Arrowwood on return to pick up 1800 gallon tank.

13. One trip with Federal trailer unit to Upper Mississippi, Necedah, and Horicon to pick up D-7 dozer and pump and return to DesLacs Refuge.

14. Storm windows installed in office, machine shed, and Quarters #1.

15. Periodic checking of ice conditions and water control structures.

16. Hauled and stored 600 sacks of cement from Upham to refuge.

B. Plantings

4. Cultivated Crops

As mentioned earlier combining operations were hampered considerably by wet weather. With our heavy feeding schedule our grain in storage ran short, and we were able to help the permittees by taking the refuge share of grain that was much more moist than would be accepted by the elevators, or by us for storage. Grain was harvested as soon as it could be run through the combine, and in several instances was delivered directly to the feeding field.

32 agricultural permits were in force during the year, two more than in 1950. The demand for land is high and some reassignments have been made this fall.

C. Collections

1. Seed or Other Propagules

No bluegrass seed was harvested on the refuge this year, as high water in one of the large areas, and dry weather in a second prevented harvesting. The largest field close to the Melhoff barn was flooded

twice this year, the second time in June resulting in an extremely thin crop. The permittee advised that even had the grass been good, the meadow was too wet to permit operation of the strippers. The other large field in the southeast end of the refuge is considerably higher ground, but did not produce seed because of the extremely dry weather at the time the plants were heading out.

The crop in general off the refuge was light, and only one company showed up to do the harvesting. This is the company that has the permit on the refuge. About every four years there appears to be a larger crop, with considerable competition for the stripping rights.

IV ECONOMIC USE

A. Grazing

Demand for grazing has been strong again this year, with more requests than can be furnished. Pasture conditions were good in all months except July, but rains in August brought them back into full production. A total of 34 permits were issued during 1951 for grazing peivileges. 6,903.95 A.U.M.'s were used to net a return of $3,451.98. This is an increase over 1950 of 1,059.65 A.U.M.'s and $518.83, due to our checking more closely on the amount allowed and the amount utilized in 1950. We were able in some instances to take another permittee in a grazing unit, where the original permittee was consistently using less A.U.M.'s than the pasture afforded.

With the high price of beef we wondered whether a sucking calf was of any great consequence as a grazer and accordingly directed a letter to the Northern Great Plains Field Station inquiring about it. The following reply from Mr. George A. Rogler, Agronomist, indicates that they are negligible as to any effect on grazing capacities:

> "From my own experience I would say that a first year calf eats so little forage that it should not be considered of any significant importance when figuring grazing capacities. The general practice is to consider a cow and calf (of less than 6 months) to be one animal unit. We do know of course that a March calf will start eating a little grass some time in August. Since it will eat so little and since late season grazing should have little influence on setting seasonal grazing capacities its influence on total forage consumed is insignificant. Under our conditions we suggest a grazing rate of one cow per 10 acres for the summer season. This is considering a long time grazing capacity set up."

B. Haying

Hay apparently was in good demand again this year, though we did not have takers for all the hay we had available. The total tonnage was down as was the monetary return. The second period of high water

in June thinned out some of the river bottom meadow stands so that less tonnage was cut. The total tonnage cut was 3,268.5 tons for a return of $4,910.75.

C. Fur Harvest

Five permits have again been issued for the ten trapping units on the refuge as follows:

Unit 1-5	Ben Clark, Kramer, N. Dak.
Unit 6	Theo. Miller, Upham, N. Dak.
Unit 7	L. Benedicktson, Upham, N. Dak.
Unit 8-9	Tom Counts, Carbury, N. Dak.
Unit 10	H. Liebelt, Willow City, N. Dak

One permit covering Units 1-10 has been issed to Albert Brandt, Pilot and James Barrett, Gunner, both of Willow City, North Dakota to take coyotes and foxes by aircraft.

D. Timber Removal

The demand for wood remains much the same as for the past few years, light. Complete information on processed permits is shown in form NR-11.

E. Other Uses

The permit issued to the Westhope Country Club for use and maintenance of the Meddaugh Park Recreational Area remains in force, all terms of the permit for the year havinb een complied with.

The Melhoff barn on the Willow City Road was again rented to the Lang Bluegrass Farm, Benson, Minnesota, for the storage of their bluegrass strippers.

Gravel permits issued during the year were as follows:

Mouse River Township, Bottineau Co.,	1620 c.y.	$162.00
Elysian Township, Bottineau, Co.	2630 c.y.	$263.00
Elysian Township, Bottineau, Co.	2000 c.y.	(not completed)
Willow Creek Township, Bottineau Co.	1794 c.y.	$179.40
Meadow Township, McHenry Co.	2000 c.y.	(not completed)
Mr. Lawrence Kitzman, Willow City, N. Dak.	100 c.y.	$ 10.00

These gravel permits are the largest number issued for some time, and though the gravel is not the best, the refuge has about the only pits in the area between Upham and Willow City.

Topsy, our old mare, was sold duringg the quarter for the sum of

$21.50. Having reached the ripe old age of 21, and suffering continually from sore legs it was decided to get rid of her. Very little use has been made of her for the past few years.

V. INVESTIGATION AND RESEARCH

No activities to report this period.

VI. PUBLIC RELATIONS

A. Recreational Uses

Fishing was the main recreational use on the refuge during the period, though it was of short duration, the fishing season closing on September 15, one month before the close of the regular state season. Fishing during the last part of the season was not as good as a year ago, following the trend of the entire season. The Freeman Bridge area remained the place of largest success, with the Westhope-Landa Road crossing probably second best. Highway 14 spots were fairly regular in supplying their share except that when the water lowered in 332 unit the Cutbank Creek Bridge area dropped off in returns considerably.

The recreational area east of Westhope received considerable use by picnickers, and golfing on the 9 hole course was observed until just before permanent cold weather. Additional improvements to the golf course have been made by the permittee, and the course is drawing players from quite a distance.

Visitor days use of the refuge based upon periodic weekend checks, and notations while on regular refuge activities are as follows:

1. Hunting Use - none
2. Fishing Use - 10,500 visitor days
3. Miscellaneous Use - 1500 visitor days

B. Refuge Visitors

Sept. 14, Mr. Chas. Evans, FWS, Minneapolis, Pothole Investigations
" 15-16 Mr. F. H. Davis, FWS, Minneapolis, Duck Depredations
" 15, Messrs Harlan Morgan, Don Lieboldt, FWS, Duck Depredations
" 16, Mr. Wes Newcombe, FWS, GMA, Tarkio, Mo., " "
" 16-17 Mr. Chas. Ladieux, N.D.G.& F Dept, Editor, N.D. Outdoors - story & Pictures Duck Dep.
" 18-19 Mr. C. J. Henry, Seney Refuge, Equip. Trf.
" 22-24 Dr. J. Linduska, FWS, Wash. D.C., Duck Depredations
" 24 Messrs Davenport, Stephenson, Whitlock and Kaller, Michigan Conservation Dept., visit enroute to Canada
" 24-27 Mr. Jesse Thompson, FWS, Wash. D.C., Duck Depredations
" 25-27 Mr. F. H. Davis, FWS, Minneapolis, Duck Depredations

Oct. 13-14 Messrs Gillett & Carpenter FWS, Minneapolis, Ref. Inspection
" 13-14 Mr. Teppo Lampio, Helsinke, Finland, Refuge visit
" 20-25 Dr. J. A. Riegel, St. Croix Falls, Wis. Commissioner Wis. Conservation Dept., Hunting Trip
" 20-25 Mr. Ernest Swift, Madison, Wis. Director, Wis. Conservation Department, Hunting Trip
" 20-25 Mr. J. R. Leighton, Bismarck, N. Dak., Hunting trip
" 20-25 Mr. E. A. Rieke, Taylors Falls, Minn. Hunting trip
" 20-25 Mr. Burnett Larson, Grantsburg, Wis., Hunting trip
" 20-25 Mr. Stephen A. Reigel, Grand Forks, N.Dak. Hunting trip
" 20-25 Mr. Gustave Flannum, Madison, Wis., Wis. Conservation Department., Hunting trip.
" 21 Mr. & Mrs. A. Jamieson, FWS Minneapolis, visit
Nov. 3 Messrs Huenecke & Clark, DesLacs Refuge, Equip. Transfer
" 8 Mr. Roy Henderson, P.&.R.C. FWS, Minot, N. Dak. Predator Cont.
" 29 Mr. F. Cunningham, Upper Souris Refuge, Ref. Mgrs. Conf. Program
" 29 Mr. H. Huenecke, DesLacs Refuge, Ref. Mgrs. Conf. Program
" 29 Jack Frye, Lostwood Refuge, Ref. Mgrs. Conf. Program.
Periodic - Mr. Chas. Decker, Dist. Warden, N.D. Game & Fish Dept.
Sept 1 - Oct. 20 Mr. Harry Jensen, FWS, GMA, Duck Depredations
Periodic - Mr. James Foote, FWS, GMA, Duck Depredations
Sept. 1-Oct. 14 Mr. Rod Brevig GWS GMA-Pilot, Duck Depredations
Periodic - Mr. Irvin Riedman, Ch. Game Warden, N.D. Game & Fish Dept. Bismarck, N. Dak. Duck Depredations
Periodic - Mr. Glen Orton, Warden-Pilot, Duck Depredations.

D. Hunting

As in the past few years, goose hunting took precedence over duck hunting with the majority of the pressure being on the farmer. The "goose lines" remained about the same as previously, and were hunted about as heavily. The hunters with the best success, however, were the ones who spent some time following flights out from the refuge, and then setting decoys and digging pits for the following day in the areas used by the geese for feeding.

Posted lands were more in evidence this year, especially if the lands were feeding places for geese. The area in the vicinity of Russell and Newburg was quite heavily posted, much of it being done following the first few days of the season. Some farmers were rather chary, too, about throwing open their swathed fields to the hunters, claiming that in many cases the hunters damaged the swaths as much or more than the ducks did, plus the added hazard of pits in their fields that might break up expensive farm machinery.

Duck hunting ran fair to good, the mallard and pintail shooting being best east of the refuge in the Gardena area. Some good mallard shooting was also obtained along the fence from the Anderson granaries north on the east side of 357 unit, and also along the line running west

north of Boundary Creek. For diving ducks the most lethal place was Deep River from the refuge boundary running two river miles west. It was possible to get a limit of scaup very easily here and though it was pretty well known to be that way, not too much advantage of its offering was taken. The kill of redheads at this place was less than a year ago, but the kill of scaup was greater. Divers other than scaup in the order of their occurrence in the bag was redhead, ruddy duck and canvasback. Coots though showing a major increase figured only slightly in the bags.

A general summary of the waterfowl hunting season is as follows:

Populations	Increase	Decrease	Same
Goose		Major	
Duck			Same
Coot	Major		
Hunting			
Pressure			Same
Success		Slight	
Total Kill		Slight	

Weather: Rain and snow September 24, 25, 26; freezing weather October 16-31; general freeze October 25-27. Few real good duck days in the season (from hunters standpoint.)

Upland game open in the vicinity of the refuge was sharptailed grouse, Hungarian Partridge and in the Turtle Mountains - Ruffed grouse. On eht first two mentioned species the population was fair and hunting success likewise. Ruffed grouse shooting in the Turtle Mountains was excellent, and many limits were taken, though the pressure was not too great.

There was no deer season in the State this year.

E. Fishing

Covered under Sec. II-F

F. Violations

Cases increased over 1950, though were less than in 1949. Eight cases were made ranging from retrieving on the refuge to over the limit. A listing of the cases and their disposition follows. All cases were handled in state court through the cooperation of District Warden, Charles Decker and none are pending.

Agent	Violator	Violation	Date	Fine	Costs
Hammond & Gray	Ed. Hutchinson Sawyer, N. Dak.	Hunting geese with rifle	10/7/51	$25.00	$7.00
Brandt	R. E. Withey Rev. M. Wenzel Willow City, N.D.	Retrieving geese inside refuge	10/12/51	$50.00	$5.00
Brandt	Pvt. Paul J. Chainiere, Minot, N. Dak.	Hunting on Refuge	10/15/51	$50.00 45.00	$5.00 suspended
Brandt	Cpl. Francis E. Plante, Minot,ND.	Hunting on Refuge	10/15/51	$50.00 45.00	$5.00 suspended
Brandt	C. J. Plante Minot, N. Dak.	Hunting on Refuge	10/15/51	$50.00 35.00	$5.00 suspended
Arrowsmith & Gray	Herbert Knopfle	Hunting from car, unplugged gun	10/16/51	$35.00	$5.00
Lawson & Gray	Carl O. Isakson Jamestown, N.D.	Over the bag limit (7 ducks)	10/23/51	$25.00	$10.00

VII OTHER ITEMS

A. Aircraft Operations

During the quarter the aircraft was used primarily for muskrat, big game, and waterfowl census. Unlike past years the use of the refuge plane for duck depredation control in September was limited. Only 18.4 hours were spent herding waterfowl.

The aircraft was used to advertise the refuge and its program when Robert Cory, feature writer for the Minot Daily News, flew over the refuge. Mr. Cory registered amazement at the amount of waterfowl habitat on the refuge. He further stated during the flight that he "felt like he was seeing the refuge for the first time". Mr. Lampio, Game Research Biologist from Finland, also took an aerial tour of the Lower Souris Refuge and was equally impressed by the number of waterfowl and other forms of wildlife observed.

A total of 20 persons acted as observers during this period. Fifteen were refuge managers, two were game management agents.

Regional Refuge Supervisor, Francis Gillett, and two persons not connected with the Service (those mentioned previously) made up the remaining three.

This was the beginning of the first winter season for the new Piper PA-18 which is equipped with the Federal A-2000 skis. This aircraft with the present ski installation is a happy medium between the old Piper L-4 and the Stinson L-5 (both were used at Lower Souris between 1946 and 1950). The L-5 because of its weight was difficult to move when it became bogged down in snow, and the pilot usually had to call for assistance. This was especially true when one ski broke through the crust and the other rode on the surface. The L-4, on the other hand, was so light that it was grounded during high winds and was very uncomfortable in 18-25 miles per hour winds.

The wide skis (11-3/4 inches in width) have a tendency to stick on warm days, but the aircraft can always be moved without assistance regardless of the depth of snow. In deep snow from 12 to 24 inches while operating from unmowed hay fields the wide skis enable the PA-18 to "plane along" on top of the crust and become airborne with little effort in 300 ft. Although it is impossible for one person to shove the aircraft into the hanger as was the case with the old L-4 it can be cranked in by winch and affords a means of exercising after spending an uneventful day sitting in the cockpit. To date we have had no severe weather to test the starting ability of the Lycoming engine, but temperatures from 0° to -10° have caused no difficulty thus far. Although the cabin isn't oxygen tight it is a tremendous improvement over the old L-4 and L-5. The heater keeps the front seat quite comfortable (observer sits in the rear). The cabin noise has been reduced on the new aircraft due to insulation material behind the firewall, This enables the pilot and observer to converse while in flight without the use of megaphones. This is particularly important in cases where the observer is trying to tell the pilot that he is becoming ill and wished to land as soon as possible.

The following is a list of aircraft activities and the flying time expended for each activity. It includes cross country time to and from the areas censused:

Muskrat Census	62.5 hrs.
Waterfowl Census	18.1 hrs.
Depredations	18.4 hrs.
Law enforcement & Patrol	4.5 hrs.
Aerial Photography	4.1 hrs.
Maintenance (to approved shops for repairs)	5.8 hrs.
Public Relations & selling the importance of Refuge program	3.6 hrs.
TOTAL TIME	153.5 hrs.

Credits:

Mr. Glahn - Depredations - Section II
Aircraft Operation - Section VII

Mr. Nygard - NR Forms 6, 8, 8a, 10, 11

Mr. Hammond - All photographs

Respectfully submitted

Donald V. Gray

Donald V. Gray
Refuge Manager

APPROVED:

Regional Director
January 11, 1952

SUMMARY
NORTH DAKOTA GAME LAWS
1951 - 1952
Hunting, Trapping, Fishing, Big Game, etc.

Hunting License Requirements: Upland Game Resident, $1.50; Upland Game Non-Resident, $25.00 Licenses sold by County Auditors. Farmers and members of their family, permanently residing with them, may hunt, fish, and trap without a license on land owned or leased by them; but are otherwise governed by seasons, limits, etc. However, a license is required for the taking of deer and beaver by farmers on land owned or leased by them. Those hunting on land not belonging to them must have a license regardless of age. Migratory waterfowl hunters are required to have duck stamp regardless of where they are hunting if they are sixteen (16) years of age or over.

No person shall hire another person to hunt for him nor shall a person hunt for another for hire. Unlawful for any person to use the license of another for the purpose for which that license is issued, or to attempt to deceive any game warden or other official by claiming such license as his own.

Unlawful for any person to knowingly aid or assist in the concealment of game unlawfully taken or possessed. Shipping or transporting game out of State in excess of legal possession limit constitutes a Federal as well as State offense.

Unlawful to carry shotgun afield between July 1st and opening day of hunting season, but it shall be legal for a farmer to carry a shotgun for the purpose of shooting predatory birds or animals upon land owned or leased by him at any time.

Unlawful to shoot game birds with rifle, and both State and Federal offense to use rifle, pistol, or ball cartridge to raise waterfowl from their resting or feeding places.

Unlawful to shoot at game birds from motor vehicle or to use gun capable of holding more than three shells at one loading. Magazine of gun must be "plugged" with one-piece wood or metal filler in such a way that it cannot be removed without disassembling the gun.

Unlawful to shoot within forty (40) rods of occupied farm dwelling without occupant's permission.

Unlawful to enter posted land without owner's consent. Failure to close gates upon entry or exit is also unlawful.

Unlawful to go afield with gun while intoxicated.

No person, shall at any time, set, lay, or prepare any trap, snare, artificial light, net, birdlime, swivel gun, or any contrivance whatever, or drag any wire, rope or other contrivance in any manner for the purpose of catching, taking, killing or raising game birds, animals or fish.

Unlawful to barter or sell any game animal, game fish, game or harmless bird.

Blinds: Stationary blinds on land, constructed of natural material permitted. Blinds manufactured using artificial materials unlawful. Also unlawful to shoot from sunken device or any floating vessel in open water, or to use or cause to be used any floating battery, electric, steam, gasoline or other powered vessel in attempt to take waterfowl.

License Inspection: License must be carried on person and be shown to game warden or peace officer upon request.

Receipt for Money Tendered for License Purchase Unlawful: Receipt for money tendered for license cannot be legally used for the taking of game. Duplicates for licenses lost or destroyed shall be unlawful.

Powers of Bonded Wardens: Searches for contraband may be made without warrant in any building, automobile, box, crate or wherever game may be stored, except dwelling house or living quarters of any person, or sealed railroad car. Willful hindering, obstructing, interfering or refusing inspection considered a misdemeanor.

Bonded game wardens may examine and open any package in the possession of a common or private carrier, which they suspect or have reason to believe contains contraband, wild game or fish, or carcasses or parts thereof, or is falsely labeled in violation of the law.

Confiscation of any part of shipment shall include the entire shipment and whenever two or more wild animals, birds or fish, carcasses, hides or parts thereof are packed, stored or contained in the same bag, crate, box or other receptacle or are otherwise comingled and one or more thereof are contraband, the whole shipment or parcel shall be deemed contraband.

Prairie Fires Forbidden: Unlawful to set on fire any woods, marsh, prairie, grass or stubble lands. Persons convicted also subject to civil action for damages.

Hunting dogs, Retrievers: All types permitted in season except on big game and mink. Unlawful to train or run any dog, or dogs known as "bird dogs" or allow the same to run loose in fields or upon lands frequented by game birds between April 1 and August 1, both dates inclusive.

Game Refuges: Unlawful to carry firearms of any kind on, or to shoot within one hundred fifty (150) feet of State Game Refuges. Permission of land owner and permit from Game and Fish Commissioner necessary for trapping on State Game Refuges. Unlawful to deface refuge signs. Islands in the Missouri River or Devils Lake are State Game Refuges.

Big Game: (See Proclamation). In years when season is open license is required of anyone hunting or assisting in the taking of big game. Resident License, $5.00; Non-Resident License, $50.00. Licenses sold by County Auditors. The aid of horses, motor vehicles, dogs or other animals forbidden in the taking of big game.

Licensee must attach tag furnished on license immediately upon killing animal and must also lock metal locking seal around leg bone and under tendon of leg before transporting carcass. Failure to properly attach tag and seal subject to prosecution. Sale of legally tagged deer hides permitted. Season to open at noon on first day.

Guns Unlawful in Deer Territory: Unlawful to carry, in any manner, between sunset and sunrise, rifle or shotgun in territory commonly frequented by deer or antelope. During forbidden time, guns in possession construed as presumptive evidence of violation.

Spotlight Hunting: Unlawful to use any artificial light in pursuit of game between sunset and sunrise except by farmers on their own premises in pursuit of coyotes or other predatory animals or birds attempting to destroy poultry, livestock or other property.

In possession of a trapping license it is permissible to use flashlight of not more than two cells in the aggregate of three volts and .22 rifles and .410 shotguns as an aid in the taking of raccoon. Dogs may be used to assist in the taking of raccoon while hunting with flashlight.

FISHING
(Subject to change by Proclamation, Executive Order, or Legislation)

License Requirements: Required of all resident anglers eighteen (18) years of age or over, and non-residents twelve (12) years of age or over. Resident, fifty cents, (50¢); Non-Residents, three dollars, ($3.00). Licenses sold by County Auditors. Fish house license, one dollar ($1.00), obtainable direct from Game and Fish Department, Bismarck, N. D.

Seasons: Wall-eyed Pike, Northern Pike, May 16th to October 31st, both dates inclusive.

Black Bass, June 16th to October 31st, both dates inclusive.

Size: Unlawful to take Black Bass less than 10" long, or Pike less than 14" long.

Limits: Daily creel must not exceed: Black Bass, five (5); Pike, five (5); Blue Gills, Sunfish, and Rock Bass, fifteen (15).

Unlawful to have in possession at any time more than four-days creel limit. May be kept in storage without permit or time limit.

Manner of Taking: Fish shall be taken by angling for them with hook and line held in the hand or attached to rod so held with only one line, rod, hook or artificial lure. Minnow seine must not be more than twenty (20) feet long and can be used for the taking of minnows only. Minnow traps are illegal.

Commercial Fishing: Permitted only in Missouri and Yellowstone Rivers. License issued directly by the Game and Fish Department. Anglers license required before issue of commercial license. Fee, five dollars ($5.00) for each trap or hoop net, five dollars ($5.00) for each fifty feet or fraction thereof of net or seine, except gill and trammel nets, one dollar ($1.00) for each set line of not more than ten hooks. Metal identification tags furnished with Commercial license must be attached to each item of equipment which shall be checked at least every forty-eight hours.

Gill and trammel nets prohibited. Holders of commercial license may sell rough fish. Sale of protected fish unlawful except when imported from outside of state where sale of same is permitted. Sale of Bass forbidden by Federal Law regardless of where taken. Protected fish taken with commercially licensed equipment must be returned to water immediately.

No person shall use, set, or have in possession or under control or upon his premises with intent to use or set, any set net or seine, for the purpose of catching or taking any fish from any public water of this state, except by the holder of a commercial license who may fish only in waters open to commercial fishing. Provided further that waters within one thousand (1,000) feet of the mouth of any tributary stream shall not be open to commercial fishing.

Frogs: Unlawful to take, catch or kill any frog between first day of April and the 31st day of May, nor at any time except for scientific purposes, any frog that is less than 2½" from the tip of nose to end of spinal column. Shipping of frogs out of the state must be covered by permit from Game and Fish Department.

TRAPPING
(Subject to change by Proclamation)

Seasons: Mink and Raccoon—See Proclamation. Weasel—November 15 to February 15, inclusive.

Unlawful to pour water in badger hole or retreat or damage or injure the personal or real property of another in taking fur-bearing animals. Unlawful to, in any way, molest or destroy the natural burrow, den or retreat of the raccoon. Muskrat house may be opened by cutting a wedge shaped portion not to exceed one square foot (1) in wall of house either by saw or a hayknife. After the trap is inserted the part removed must be replaced and sealed in place; this also to be done after removal of trap. Traps shall not be placed under the ice near muskrat house or in channels or in runways used by the muskrat. May be shot with a .22 calibre rifle during open season. Unlawful to trap upon the land of another without first getting permission of landowner or lessee.

License: Resident, one dollar ($1.00); Non-resident, one hundred dollars ($100.00). Required of all except those who trap on land owned or leased by them. License not required to trap or take coyote, fox, bobcat or wolf. Licenses sold by County Auditors.

Beaver: Beaver taken by permit only. A license may be issued for the taking of beaver by applying to the Game and Fish Department for such license. Application must be made to the Game and Fish Commissioner prior to November 1, 1950, giving the legal description of the land upon which the beaver are to be taken and the name and address of the owner or lessee of such land. License fee, three dollars ($3.00). Each pelt must be exhibited to the State Game and Fish Department for attaching metal locking seal within twenty (20) days after beaver is taken. Unlawful to sell, offer for sale or barter, buy or dispose of beaver pelt without seal properly attached. Metal seal twenty-five cents (25¢). Illegal to shoot beaver with any type of gun under any circumstances.

Fur Buyers License: Required of any person or firm engaged in the business of buying raw furs. Resident, five dollars ($5.00); Resident traveler, fifteen dollars ($15.00); Non-resident, one hundred dollars ($100.00). Records must be kept by fur buyers on forms provided by the Game and Fish Department, with license; such records subject to inspection at any time by wardens.

Aircraft: Unlawful to hunt or pursue any wildlife by aircraft without permit from Game and Fish Commissioner.

HOURS OF HUNTING

(All hours of hunting in North Dakota shall be based on Central Standard Time.)

MIGRATORY WATERFOWL—One-half hour before Sunrise to one hour before Sunset, except first day starts at noon.

UPLAND GAME BIRDS—Noon to Sunset, except one-half hour before Sunrise to Sunset on each Saturday and Sunday during Open Season.

SUNRISE AND SUNSET CENTRAL STANDARD TIME

Hours of Sunrise and Sunset are given at the U. S. Weather Bureau Station at Bismarck. The sun rises and sets one minute later for each 12½ miles westward of the station and one minute earlier for each 12½ miles eastward of the station.

BISMARCK, NORTH DAKOTA

Date	Sunrise A.M.	Sunset P.M.	Date	Sunrise A.M.	Sunset P.M.	Date	Sunrise A.M.	Sunset P.M.
Sept.			Oct.			Nov.		
28	6:38	6:29	17	7:04	5:53	5	7:32	5:21
29	6:39	6:27	18	7:05	5:51	6	7:33	5:20
30	6:41	6:25	19	7:07	5:49	7	7:35	5:19
Oct.			20	7:08	5:47	8	7:37	5:17
1	6:42	6:23	21	7:10	5:46	9	7:38	5:16
2	6:43	6:21	22	7:11	5:44	10	7:39	5:15
3	6:45	6:19	23	7:13	5:42	11	7:41	5:13
4	6:46	6:17	24	7:14	5:40	12	7:42	5:12
5	6:47	6:15	25	7:16	5:38	13	7:44	5:11
6	6:49	6:13	26	7:17	5:37	14	7:45	5:10
7	6:50	6:12	27	7:19	5:35	15	7:47	5:09
8	6:51	6:10	28	7:20	5:33	16	7:48	5:07
9	6:53	6:08	29	7:22	5:32	17	7:50	5:06
10	6:54	6:06	30	7:23	5:30	18	7:51	5:05
11	6:56	6:04	31	7:25	5:29	19	7:53	5:04
12	6:57	6:02	Nov.			20	7:54	5:04
13	6:59	6:00	1	7:26	5:27	21	7:55	5:03
14	7:00	5:58	2	7:28	5:26	22	7:57	5:02
15	7:01	5:56	3	7:29	5:24	23	7:58	5:01
16	7:03	5:55	4	7:31	5:23			

For Information Not Contained in This Folder Write:

STATE GAME & FISH DEPARTMENT
BISMARCK, NORTH DAKOTA

H. R. Morgan, Commissioner

E. S. Brynjolfson....Deputy Com.
Irvin Riedman.....Chief Warden
Dale Henegar..Fisheries Manager

ElaNor Weber.....Accountant
Betty Stephens.....Secretary
Pauline Rambur.....License Clerk

DISTRICT WARDENS

R. G. Borden.....Watford City
Ben Boss.....Carrington
Edwin O. Bry, Jr.....Park River
A. M. Caven.....Jamestown
Charlie Decker.....Upham
Clarence Heyd.....Mott
W. H. Johnson.....Edmore
Henry J. McKirdy.....Gladstone
Martin Myhre.....Washburn

T. O. Olsen.....Williston
Walter Pfeifer.....Oakes
Carl Rich.....McClusky
A. M. Ross.....Fargo
Harold Spitzer.....Napoleon
Martin VanRay.....Valley City
Glen Orton.....Bismarck
R. E. Williams.....Bowman
Ray Buck.....St. John

Buy "Dakota Maid" Flour



Official North Dakota # HUNTING REGULATIONS

Fall of 1951

Proclamation of the Governor concerning the open and closed seasons, bag limits, and other matters governing the hunting, killing and taking of game birds, big game and other animals in North Dakota with a summary of the North Dakota Game Laws.



North Dakota
GAME & FISH DEPT.
Bismarck, N. D.

PROCLAMATION

of NORMAN BRUNSDALE, Governor of North Dakota

Relating to the times and places where Upland Game Birds, certain fur-bearing animals, certain species of fish, and Migratory Waterfowl may be hunted, taken, killed and possessed; providing for closing the seasons on deer, Sage and Pinnated grouse; and prohibiting the shipment of game birds by residents to points outside of the State of North Dakota.

By virtue of the authority vested in me as Governor of the State of North Dakota under the provisions of Chapter 20-08 of the North Dakota Revised Code of 1943, as amended, and in pursuance of the recommendations of the Game and Fish Commissioner on the taking and possession of Upland Game Birds, certain fur-bearing animals, certain species of fish and of the Migratory Bird Treaty Act Regulations for the 1951-1952 seasons relating to the taking and possession of Migratory Waterfowl; I hereby Order and Proclaim:

FIRST: Deer, Sage and Pinnated Grouse: That the hunting, killing or possession of deer, Sage Grouse and Pinnated Grouse shall be prohibited throughout the entire State of North Dakota during the year of 1951.

SECOND: Hen Pheasants Illegal: That for the purpose of preserving the breeding stock, the killing of pheasants shall be confined to the taking of male birds only, and evidence of sex must remain a part of the bird while in transit or storage in North Dakota.

THIRD: Possession: That legally taken Upland Game Birds and Antelope may be held in possession during and immediately after the close of the respective seasons thereon, not later than September 1, following, when properly tagged identifying species, and showing owner's name, address and hunting license number.

FOURTH: Tagging and Identification of Game Birds by Non-Resident Hunters: No person holding a non-resident hunting license for North Dakota shall at any time ship or transport from the state by public or private carrier or store within the state, game birds, unless such game birds have attached or affixed to them the tag or tags which accompanies and is a part of the non-resident hunting license, showing date placed in transit or storage, and licensee's name and address written in ink. A current day's bag limit may be possessed (within possession limit) without tagging.

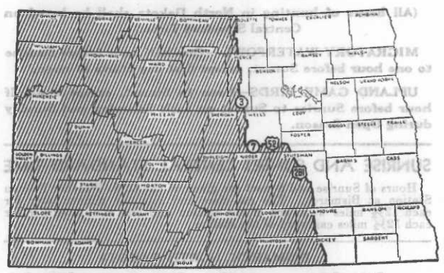
FIFTH: Shipping Privileges for Game: No resident of the State of North Dakota shall have the privilege of shipping game birds or big game outside of this state as provided by Section 20-0329 of the North Dakota Revised Code of 1943. Non-residents may ship or carry their possession limit of game from the state.

SIXTH: Aircraft: That the use of aircraft for the purpose of aiding or assisting in the hunting, killing, or taking of game birds or animals, or concentrating, raising, rallying, spotting, stirring up, chasing, driving or disturbing game birds or game animals with or by the use of aircraft shall be prohibited.

SEVENTH: Hunting Dogs: It shall be illegal to bring into North Dakota any dog or dogs, or to use while hunting any such dog which has not been vaccinated against rabies at least thirty days prior to such entrance into the State. Proof of such vaccination must be available and must be shown to game warden or peace officer upon request.

EIGHTH: Sharptailed Grouse: That the season for the hunting, killing and taking of Sharptailed Grouse shall be **from 12:00 o'clock noon, Central Standard Time, on September 28,** until sunset of that day, and continue from noon until sunset of each and every **day until sunset of November 4, following;** except that the hours

SHARPTAILED GROUSE



Sharptailed Grouse: Open Season Sept. 28–Nov. 4, noon to sunset, except half hour before sunrise to sunset Sat. and Sun. Daily bag limit 3 birds. Possession limit 6.

for shooting and taking sharptailed grouse shall be **from one half hour before sunrise until sunset of each Saturday and Sunday falling within the legal open season** as prescribed in this section; and that all counties and parts of counties lying west of a boundary formed by State Highway Number 3 beginning at a point at the Canadian Border and running south from that point to its junction with State Highway Number 7 at Hurdsfield, North Dakota, thence east on State Highway Number 7 and U. S. Highway Number 52 to their junction with U. S. Highway Number 281, thence south on U. S. Highway Number 281 to the South Dakota State Line shall be open to the taking of not more than three (3) sharptailed grouse in any one day. A two day's bag limit may be possessed.

In all other parts of the state including all areas marked or designated as refuges, sanctuaries or rest areas in the open area, the hunting, killing and taking of Sharptailed Grouse shall be prohibited.

NINTH: Hungarian Partridge: That the season for the hunting, killing and taking of Hungarian Partridge shall be **from 12:00 o'clock noon, Central Standard Time, on September 28,** until Sunset of that day, and continue from noon until sunset of each and every day **until sunset of November 4, following;** except that the hours for shooting and taking Hungarian Partridge shall be **from one half hour before sunrise until sunset of each Saturday and Sunday falling within the legal open season** as prescribed in this section; and that the entire State of North Dakota shall be open to the taking of not more than three (3) Hungarian Partridge in any one day. A two day's bag limit may be possessed.

In all other parts of the state including all areas marked or designated as refuges, sanctuaries, or rest areas in the open area, the hunting, killing and taking of Hungarian Partridge shall be prohibited.

TENTH: Ruffed Grouse or Woodland Partridge: That the season for the hunting, killing and taking of Ruffed Grouse shall be **from 12:00 o'clock noon, Central Standard Time, on September 28,** until sunset of that day, and continue from noon until sunset of each and every day **until sunset of November 4, following;** except that the hours for shooting and taking Ruffed Grouse shall be **from one half hour before sunrise until sunset of each Saturday and Sunday falling within the legal open season** as prescribed in this section; and that all of the counties of Pembina, Cavalier, Rolette and Bottineau shall be open to the taking of not more than three (3) Ruffed Grouse in any one day. A two day's bag limit may be possessed.

In all other parts of the State including all areas marked or designated as refuges, sanctuaries or rest areas in the open area, the hunting, killing and taking of Ruffed Grouse shall be prohibited.

ELEVENTH: Pheasants: That the hunting, taking and killing of male pheasants, only, shall be permitted **from 12:00 o'clock noon, Central Standard Time, on October 5** until sunset of that day and shall continue from noon until sunset of each and every day **until sunset of November 4, following;** except that the hours for shooting and taking male Pheasants shall be **from one half hour before sunrise until sunset of each Saturday and Sunday falling within the legal open season** as prescribed in this section, in all counties and parts of counties of the State lying west and south of a line beginning at a point on the Montana State Line on U. S. Highway Number 2, thence east on U. S. Highway Number 2 to State Highway Number 8, thence south on State Highway Number 8 to the Missouri River, thence south along the east bank of the Missouri River to Washburn, North Dakota, thence southeast on U. S. Highway Number 83 to its junction with U. S. Highway Number 10 at Bismarck, North Dakota, thence west on U. S. Highway Number 10 to the Missouri River; thence following the west bank of the Missouri River to the South Dakota State Line; and that not more than three (3) male Pheasants may be killed or taken in one day in the above described area. A two day's bag limit may be possessed.

TWELFTH: Pheasants: That the hunting, taking and killing of male Pheasants only, shall be permitted **from 12:00 o'clock noon, Central Standard Time, on October 24** until sunset of that day, and shall continue from noon until sunset of each and every day **until sunset of November 4, following;** except that the hours for shooting and taking Pheasants shall be **from one half hour before sunrise until sunset of each Saturday and Sunday falling within the legal open season** as prescribed in this section; and that all counties and parts of counties lying south and east of a boundary beginning at a point on the west bank of the Red River directly east of State Highway Number 46, thence running west on State Highway Number 46 to the Junction of State Highway Number 46 and State Highway Number 1, thence south on State Highway Number 1 to its junction with State Highway Number 13 at Verona, North Dakota, thence west on State Highway Number 13 to its junction with U. S. Highway Number 281 at Edgeley, North Dakota, thence south and east on U. S. Highway Number 281 to the South Dakota State Line; shall be open to the taking of not more than two (2) male Pheasants in any one day. Only one day's bag limit may be possessed.

The hunting, taking and killing of Pheasants shall be prohibited throughout the year 1951 in all other parts of the State of North Dakota not described in Sections Ten and Eleven, including all areas marked or designated as refuges, sanctuaries or rest areas in the open area.

THIRTEENTH: Badgers and Skunks: That the season for the hunting, taking and killing of Badgers and Skunks shall remain open for the entire State of North Dakota until closed by Proclamation or Executive Order.

FOURTEENTH: Muskrats: That the season for the hunting, taking, trapping and killing of Muskrats shall **open at 12:00 o'clock noon, Central Standard Time, December 1, 1951,** and remain open

HUNGARIAN PARTRIDGE



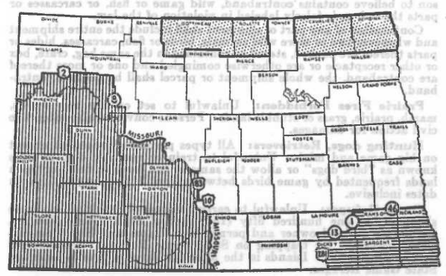
ENTIRE STATE—**Open Season Sept. 28–Nov. 4,** noon to sunset, except half hour before sunrise to sunset Sat. and Sun. Daily bag limit 3 birds. Possession limit 6 birds.

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PINNATED AND SAGE GROUSE - DEER

No Open Season

RUFFED GROUSE - PHEASANTS



Ruffed Grouse: Open Season Sept. 28–Nov. 4, noon to sunset, except half hour before sunrise to sunset Sat. and Sun. Daily bag limit 3 birds. Possession limit 6 birds.

Pheasants: Open Season Oct. 5–Nov. 4, noon to sunset, except half hour before sunrise to sunset Sat. and Sun. Daily bag limit 3 cocks, no hens. Possession limit 6 cocks.

Pheasants: Open Season Oct. 24–Nov. 4, noon to sunset, except half hour before sunrise to sunset Sat. and Sun. Daily bag limit 2 cocks, no hens. Possession limit 2 cocks.

until 12:00 o'clock noon, Central Standard Time, December 31, following, throughout the entire State of North Dakota unless closed by a subsequent Executive Order or Proclamation.

FIFTEENTH: Beaver: Application for the trapping of Beaver shall be made prior to November 1, 1951.

SIXTEENTH: Raccoon and Mink: The season for the running, shooting or killing of Raccoon **shall open at midnight, Central Standard Time, of September 15, 1951,** and remain open **until midnight of December 31, following;** in all portions of the State of North Dakota.

The season for the taking by trapping, of Raccoon shall **open at midnight, Central Standard Time, of November 15, 1951,** and **remain open until midnight of January 15, following,** in all portions of the State of North Dakota.

The season for the taking or trapping of Mink shall **open at midnight, Central Standard Time, of November 15, 1951,** and remain open **until midnight of January 15, following;** in all portions of the State of North Dakota.

SEVENTEENTH: Fish: The season for the taking of Crappies, Bluegills, Sunfish, Rock Bass, and Perch shall remain open **until 12:00 o'clock midnight, Central Standard Time, of February 28, 1952,** but shall be closed **from 12:00 o'clock midnight, Central Standard Time of February 28, 1952 until May 16, following.** Any Crappies, Bluegills, Sunfish, Rock Bass or Perch taken, regardless of size, must be kept and counted in creel limit. Because populations of some fish are deemed to be sufficiently large in most waters of the state, creel limits shall be suspended on Perch and Crappies in all waters of the state for the seasons of 1951-1952.

EIGHTEENTH: Bait and Transportation: It shall be unlawful to use live carp as bait, and unlawful to liberate live minnows or other fish to any waters other than those from which they were originally taken, or to transport any live fish, except ornamental or gold fish, from or into the State of North Dakota.

NINETEENTH: Closed Fishing Areas: The following waters shall remain closed to the taking of any fish for the years 1951-1952 unless opened by a subsequent Executive Order or Proclamation: North Lemmon Lake and Wolf Butte Dam in Adams County, Baldhill Dam in Barnes and Griggs Counties, Amor Dam and Spring Lake in Bowman County, Frettum Lake in Kidder County, Coldwater Lake in McIntosh County, Danzig Dam in Morton County, Lake Elsie in Richland County, Lynch Dam in Steele County, Homme Dam in Walsh County, Sykeston Dam in Wells County, and the Heart River and all tributaries from the Heart Butte Dam to its headwaters, including the Dickinson Dam Impoundment.

The following waters shall remain closed to the taking of the fish described for the years 1951-1952 unless opened by a subsequent Executive Order or Proclamation· Lake Hoskins in McIntosh County; closed to the taking of Northern Pike and forage fish or bait minnows. Epping-Springbrook Dam in Williams County; closed to the taking of Northern Pike.



TWENTIETH: Migratory Waterfowl: That the season for hunting, killing, and taking of all species of Waterfowl permitted to be killed by law shall be **from 12:00 o'clock noon, Central Standard Time, October 5, 1951,** to one hour before sunset of that day, and shall continue to be open from one half hour before sunrise until one hour before sunset of each and every day following; **until one hour before sunset on November 23, 1951, following;** and that the taking and possession of such Waterfowl shall be subject to the Migratory Bird Treaty Act Regulations governing the taking and possession of Migratory Waterfowl during the year 1951.

TWENTY-FIRST: Bag Limit: That not to exceed five singly or in the aggregate of all species of Ducks combined, except Wood Ducks, and not to exceed five Geese, two of which may be Canada, Hutchins, Cackling or White Fronted Geese, or a combination of any two of the above species may be taken in one day. The other three geese, or the entire daily bag, may consist of any other species.

TWENTY-SECOND: Possession: That the possession limit of Ducks shall not exceed a two day's bag limit and that the possession limit of Geese shall be a single day's bag limit. Migratory Waterfowl may be possessed for a period of 90 days immediately after the close of the season when properly tagged showing owner's name, address and hunting license number.

TWENTY-THIRD: Federal Duck Stamp: That any person sixteen (16) years of age or over, who shall hunt, kill or take Migratory Waterfowl, shall have in his possession a Federal Duck Stamp for the year 1951, validated by his signature written across the face thereof in ink.

TWENTY-FOURTH: Trespass and Refuges: It is further provided that the purchase of a hunting, fishing or trapping license does not give the holder thereof the privilege of trespassing on privately owned or on Indian Reservation lands without the permission of the individual landowner, Indian Agent or the Tribal Council. Upland Game Birds, game animals, or migratory birds shall not be taken at any time, by any means, from, on, or across any highway, road, trail, or other right-of-way, whether public or private, within the exterior boundaries of any duly established state game or national wildlife refuge.

TWENTY-FIFTH: It is further directed that the foregoing order be published once in the official newspaper of each county within the State of North Dakota on or prior to the first day of October, 1951.

Given under my hand and the Great Seal of the State of North Dakota at my office in the City of Bismarck, North Dakota, this 30th day of August, 1951.

NORMAN BRUNSDALE
Governor, State of North Dakota

ATTEST: THOMAS HALL
Secretary of State

ON THE 22nd of September, 1951, North Dakotans hunted antelope for the first time since 1899. A two and one half day season, promulgated for the dual purpose of allowing the sportsman the maximum hunting consistent with good game management and reducing the crop damage in the area, was declared in parts of McKenzie, Golden Valley, Slope and Bowman counties.

All hunters were the holders of special permit system licenses, 1,000 in all, granted first to owners and operators of land lying within the open area, and then to all residents who were lucky enough to have their names drawn in a special state wide drawing.

By the night of the 21st, Bowman, Beach and Watford City had become overcrowded cities. Bowman, especially, felt the influx of hunters as it is located right on the dividing line between Units 2 and 3. One woman in Bowman reported that, although she was not in business of renting out rooms, she had seventeen telephone calls, requesting a place to sleep, between supper time and midnight of the 21st. Doubling up was the order of the day, with hotel and restaurant facilities taxed to the limit.

In the southwestern part of the state, the 21st dawned bright and sunny, but the weather gradually got worse, and the season opened at noon with a cold high wind blowing. Many hunters had their sights lined on an antelope at 12:00 and collected their trophy within a minute or two of the opening time. Hunter success was exceptionally good in the first three hours of the season. In Units 2 and 3, the season was practically a half day one, as over 75% of the permit holders filled their license on that day. By four o'clock, 34 antelope had been brought in to the checking station operated by Pittman Robertson personnel of the Game and Fish Department at Bowman. Between four and six o'clock fifty-one more animals were brought in to that station, as more parties left the high rugged country to the southwest.

Most of the antelope were found in country that was fairly easy to get to. Fairly easy that is, for the southwest. Isolated herds were found on top of the buttes. These herds escaped hunter attention until later in the season, and it is certain that some of the herds never even saw a hunter in the entire season.

Many eastern hunters were getting their first look at the wild, sparsely populated terrain of the southwest. More than seven hundred hunters went into Units 2 and 3, and they just disappeared. Your reporter drove over one hundred miles in the heart of the antelope range on that first Saturday afternoon. Of the seven hundred hunters known to be working in the area, I saw only seven. It wasn't crowded; each hunter had plenty of elbow room.

Over ninety percent of the hunters were trying their luck on pronghorns for the first time, and their shooting luck was a credit to the long tradition of good gun handling in the west. Of the first ninety animals brought into Bowman, only four were does, although the season was open on any antelope. Large bucks were the order of the day, showing that the nimrods found enough game to permit them to be selective in their shooting. The antelope were found to be uniformly fat and in excellent condition. Biggest buck brought in that first day was the 105 pound (dressed weight) antelope brought in by Dick Bird of the Hillsboro Wildlife Club. Several other hunters brought in bucks weighing within a pound or two of this buck, and a couple went to 107 pounds. There may have been larger animals bagged, these figures are only for animals weighed by Pittman - Robertson Field Biologists at their checking station. Smallest animal we heard of was a doe fawn that topped the scales at thirty-seven pounds dressed.

Several trophy heads, well up in the near record class, were obtained. This, of course, was to be expected as the antelope has enjoyed complete protection long enough to grow some fine racks. Best head we saw was the one bagged by Bob Kernkamp, well known wildlifer from Valley City. That trophy was remarkable, not only for the size of the horns, but for the almost perfect symmetry of development.

When speaking of the antelope bagged by hunters, it might be appropriate to note that far fewer antelope were crippled and lost than had been anticipated. Hunters were very good about reporting the whereabouts of dead and crippled animals, making it possible to recover most of these animals before any loss by spoilage had occurred. In addition to the hunter cooperation in this matter, several dead antelope were spotted from the air. One plane, attached to the Law Enforcement Division and two planes working for the Pittman-Robertson Division were in the air at all times, except when the high winds of Saturday afternoon grounded them for a time.

Law enforcement for the short season was the most efficient ever. For the first time, wardens had the use of two way radio to coordinate their patrol activities. With the two way radio in the Law Enforcement plane, it was easy to effectively cover the area. Although there were violations, as there always are, it was the consensus of opinion of all wardens working in the area that this was an exceptionally "well - behaved" group of sportsmen who went after North Dakota's fastest game animal.

Riflemen found the ranges long, the target small, still scored a surprising number of clean one shot kills. However, a few inexperienced riflemen afforded a few laughs for the more experienced, more accurate hunters.

One nimrod had a very curious buck antelope as his target. The buck was on top one of the big buttes, and the hunter was in the valley below. The range was about 225 yards, mostly uphill. Our marksman was shooting uphill, using the offhand position. The antelope looked over the edge of the bluff, and the hunter jerked off a shot. It missed. The buck strolled back out of sight. Hurriedly the hunter levered another .250 into the barrel of his scope sighted Savage Model 99. The antelope stuck his head over the rim again, and another slug whined through the air. Mr. Antelope ducked again with another wild shot. This continued until the hunter had shot 19 times. Attracted by all the cannonading, one of the wardens approached the hunter, who turned to him with desperation in his voice, "Here, shoot him for me, I'll never hit the son-of-a-gun." The warden explained that it would be illegal to shoot for him. "But I've only got one shell left," was the anguished answer. So the warden talked the hunter into shooting from a kneeling position with the gun resting over a big rock. Advising him where to hold the crosshairs, the warden advised taking a deep breath and holding it while he squeezed off the shot, instead of jerking it. The hunter followed directions eagerly, the .250 barked and the big buck collapsed. That was the twentieth and last shot, and it did a clean job of breaking the neck. I wonder if that hunter told about his kill when he got home. I'll bet it went like this, "So this big buck, see, was running away from me, going like the wind. The range was about three hundred and fifty yards when I shot. I had a narrow target as I wanted to get him in the neck and not spoil none of the meat. I got him first shot and he was going so fast he slid sixty-two feet." Ah, well, that's one of the joys of going hunting a long way from home.

A report card on which the hunter was asked to record his hunting luck was made a part of each license. All of the returns are not in yet, so we cannot announce just exactly how many hunters got their antelope. When this information is completely tabulated, it will be announced in OUTDOORS. Many of the cards have come in, however, and we looked some of them over to get an idea what the hunters thought of the season. As usual, most of the comments

(Continued on Page 18)

Migratory Waterfowl Harvests in N. D.

by Brandt Hjelle

NORTH DAKOTANS are presently enjoying another good migratory waterfowl hunting season. Our state is fortunately one of the outstanding duck producing and duck hunting areas in North America. Few other, if any, areas of similar size offer such favorable conditions either for duck production or duck hunting. In addition there are several places in North Dakota which provide excellent goose hunting.

Throughout most of central North Dakota the abundant and widely distributed lakes and marshes, well filled with water these last few years, annually attract millions of ducks of many species—both in the spring as the birds settle down to the business of raising broods, and also in the fall as gunners go afield. Besides the "local" ducks, great numbers of migratory birds, geese and ducks, pass through on their southward migration each fall. These migrants from Canada stop over on our lakes and marshes to rest and feed before continuing on to their wintering grounds in the south.

Many types of hunting can be had in North Dakota. Pass and decoy shooting for redhead, canvasback, scaup and other species is available from the opening day until the end of the flight in November. Jump shooting, and marsh hunting with or without decoys, for gadwall, pintail, teal, shoveler and baldpate produce good results for all hunters earlier in the season. Mallards, the favorite of most Dakota nimrods, provide excellent marsh, pass and field shooting in favorable weather throughout the entire season.

Selective shooters who are willing to spend a little time in study and observation can easily take limits of any one of six or eight different species if they so desire, while at least fourteen different species are commonly included in hunters' bags. Occasionally a few other species are bagged.

Goose hunters find a good variety of birds. The wily, hard to bag Canadian honkers, while not too numerous, are usually available during most of the season, as are the numerous lesser Canadians. The smaller whitefronts, one of the most preferred for eating, are usually fairly numerous. During the seasons of 1949 and 1950—and we hope 1951—great numbers of the more easily bagged snow and blue geese have been present in certain parts of the state during the first few weeks of the season.

One of the important factors making for fine hunting is the widespread dispersal of water areas over a good portion of our state. This, coupled with the fact that we have a rather small statewide population, no large centers of population, and few nonresident hunters, results in the dispersal of limited hunting pressure over wide areas without the serious overcrowding found in areas of greater population. Up to now there has been only a limited amount of commercialization of hunting in North Dakota. It is true that a few choice duck and goose hunting spots have been sold or leased for hunting purposes, but the majority of both hunters and landowners have kept away from this practice with the result that hunting is still a public affair with plenty of opportunity open to everyone at nominal cost. It is hoped that this condition will persist so we will never see the day when hunting in our state will be the privilege of only the few.

Perhaps the most important factor responsible for good waterfowl hunting is the hospitality of the private landowner—mainly the farmers—who generously allow hunters on their premises. All sportsmen owe a debt of gratitude to these friendly people and there is no time like "now" to express our appreciation.

The harvest of migratory waterfowl presents complex problems to the United States Fish and Wildlife Service responsible for their management. Many species of ducks and geese are involved and they range seasonally over widespread areas of diversified habitat. Species that cause depredations in one area may be neutral or beneficial in other areas. A species that is not considered a desirable bird in one region may be highly regarded in others. The coot, for instance, is not regarded as a game bird in North Dakota, but is eagerly hunted in other areas. Some species of waterfowl are limited to restricted ranges and are never seen by hunters outside their limited range—yet they are an integral component of our waterfowl resource. Some species are early migrators, some late migrators. Some easily taken in some areas and hard to get in others.

The ideal harvest setup would perhaps have separate regulations for each species in each of many varying habitat and seasonal situations, with enough elasticity for quick revisions. However, the complexity of such a set-up would be well nigh prohibitive. There is some attempt at individual species and individual area regulation of goose harvests, but it has been found most practical to treat all species of ducks as a group so far as harvest is concerned, with regulations set up on the basis of all species combined over large general areas. There have been few exceptions to this.

The final harvest regulations mu necessarily represent a compromise be tween many varying facts, figures, and viewpoints. One of the important considerations is to insure an adequate breeding stock after the annual harvest so that waterfowl populations will be maintained at desirable levels. Intensive population studies are conducted twice each year, one in the winter and one in the spring, to determine the trend of waterfowl populations. The results of past seasons' shooting pressure are analyzed to help formulate regulations which will permit the desirable harvest. Local problems and situations are considered when possible.

Whatever the regulations, when the North Dakota hunter goes afield in quest of waterfowl, he is extremely fortunate. With large areas to hunt over, a wide variety of species to choose from, com paratively few hunters afield, and grea numbers of both geese and ducks available, he enjoys hunting conditions that few other areas can offer.

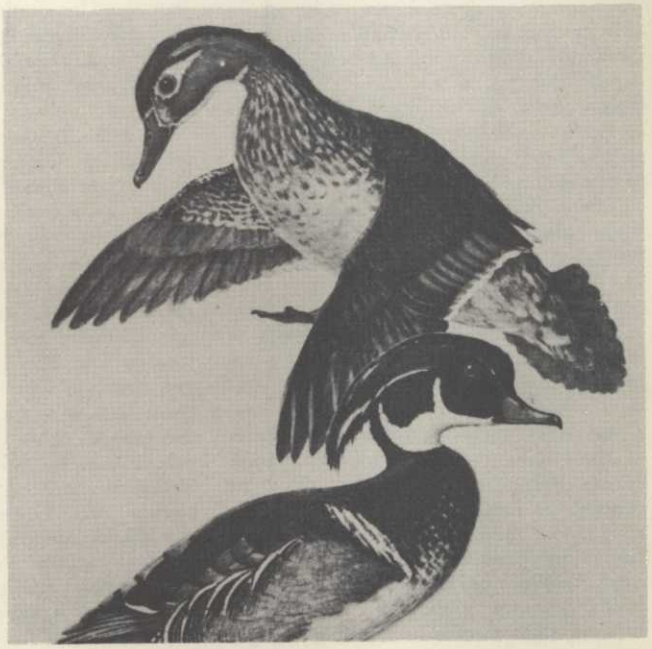
It is gratifying to realize that North Dakota annually produces far more ducks than North Dakota hunters annually harvest. Annual harvests approximate half a million ducks, while annual production will approximate five or more times that amount. Band returns of locally raised ducks show that more of them are harvested outside our state than are taken within the state. South American gunners take many North Dakota reared bluewinged teal, while our good neighbors in states farther south each year bag North Dakota hatched ducks. This is to be expected, and is a fair situation as these southern areas provide the wintering habitat essential to the maintenance of our waterfowl resource.



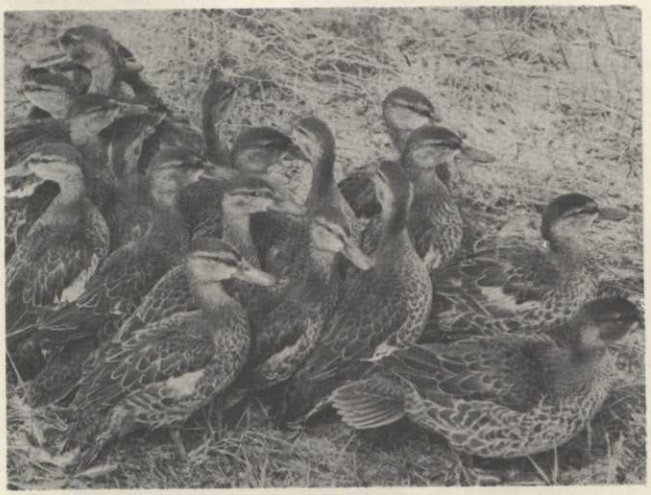
North Dakota raises about five times as many ducks each year as our local hunters take during the season.



One of the fastest flying ducks, Canvasbacks are preferred targets for many North Dakotans.



Don't shoot this one. The brightly colored Wood Duck, although not plentiful, are far from rare here. They are fully protected at all times.



Bluewing Teal make up a large part of the early season bag, especially in warm weather.



Snow Geese and Blue Geese have afforded fine shooting during the last few years. Their numbers are increasing.

HUNGRY DUCKS!

THE DREAM of every confirmed duck hunter is the same. In that dream, the hunter is well concealed in a blind in the early hours of the morning. Tens of thousands of hungry ducks come pitching in to feed near the blind. The ducks seem completely without fear and practically crawl all over the hunter. And to make the dream perfect, all of the ducks are mallards or pintails.

That dream came true for me! Early in September, before the opening of any hunting seasons, I went to the Lower Souris Wildlife Refuge near Upham, North Dakota, to see what the United States Fish and Wildlife Service was doing to combat the grain eating habits of the large numbers of ducks concentrated within the refuge fence.

Lower Souris Refuge sprawls its fifty-eight thousand some odd acres along both sides of the Mouse River. Created by the Department of the Interior during the dry years, it forms an ideal nesting and resting place for waterfowl. A series of low dams spreads the river out over a wide area, conforming to the duck's idea of how a river should be—a mile wide and six inches deep. Each of these dams has a control gate which allows Refuge Manager Don Grey to control the level of the water impounded behind those dams. Man made islands, draglined out of the silt of the river bottom, provide excellent protection for nesting birds.

Since the creation of this big refuge, the number of ducks using the area each summer has snowballed. Early in September, state and federal personnel working on the duck depredation problem near the Souris, estimated that there were 171,000 ducks of the mallard or pintail species and 73,000 of other species using the refuge.

Naturally, the presence of so many ducks in that immediate area poses a threat to grain-farming operations on nearby farms. The refuge is important, as it is a definite help in providing shootable numbers of ducks, not only for North Dakota hunters, but for all the states to the south of us in the Central and Mississippi flyways. How can we allow great concentrations of ducks, and at the same time minimize the loss to farmers?

To make the ducks stay within bounds, and off of the farmers' fields, two objectives are worked for. First, make the refuge as attractive as possible to the ducks, and secondly, make the farmers' fields as unattractive as possible. To entice the ducks into the refuge, grain is spread out on feeding grounds. About one hundred and fifty bushels to each feeding lot. The feeding lots are about two acres in size and there are five of them spread along the entire length of the refuge. This grain is raised on the refuge land, by farmers working the land under a share agreement. Most of it comes from Lower Souris, but when the ducks are very greedy, additional grain is trucked in by Fish and Wildlife Service personnel from Arrowood Refuge near Jamestown, and even from the Sand Lake Refuge in South Dakota.

To make the farm fields unattractive, scarecrows and other frightening devices are set up on the fields. (See the article, "Duck Depredation," in the August, 1951, issue of Outdoors.) In addition to this, planes and guns are used in attempts to scare the ducks off the fields.

A Fish and Wildlife Service airplane flies a couple of hours each morning and evening, bombing ducks out of the fields of the neighboring farms. These bombs, a simulated hand grenade type, produce a loud blast and a big cloud of smoke but are not harmful to the ducks unless they happened to land right on one of them. It seems to work. The ducks dislike being bombed and quickly learn that food is easily available, on the refuge, and away from those bombs.

As every old duck hunter knows, the grain eating species of ducks, mallards and pintails, go out to feed near the hour of sunrise and sunset. Near one of the feeding stations, refuge personnel have constructed a straw and burlap blind to be used to hide personnel observing the feeding. United State Game Management Agent Harry Jensen suggested that I spend a couple of hours in the blind to see for myself. The idea of seeing that many birds within range appealed to me, even if it was on a refuge and I couldn't carry a gun. So Game Management Agent Newcomb drove me out to the field. It was still a half hour before sunset. I noticed that the grain was spread thinly over a series of concentric circles on bare ground. When I asked Agent Newcomb how they scraped the stubble off, he just grinned and told me that I would have to ask the ducks; they did it.

It was a beautiful evening and it was pleasant sitting in the blind. Soon after my arrival, the geese began heading out to feed. Canadas and whitefronts, they passed high overhead, not the least interested in grain. But the ducks were! Just as the sun dipped down to touch the horizon, the first whistle of wings told me that a couple of hungry ducks



Be Thankful for the Good Earth

by ADRIAN C. FOX, *U. S. Soil Conservation Service*



". . . The whole land is made desolate because no man layeth it to heart." (Jeremiah 12:11)
—U. S. Soil Conservation Photo



"Where there is no vision, the people perish . . ." (Proverbs 29:18)
—U. S. Soil Conservation Photo

were swinging over the feed lot to make sure the handout was there. They headed back to the sloughs. Evidently they carried the news of a good feed back with them, for the air was soon full of ducks, in bunches of from one to five hundred. With typical wariness they circled the field eight or nine times before setting down to dinner. As they swung into their lowest circles, they passed so low over the blind that I could feel the rush of air from the hundreds of wings.

Flock after flock slid in and joined the circling thousands. At first you could tell the separate flocks as they passed overhead, but after a few more flocks arrived, the rushing roar of sound from their wings blended into one solid mass, as the sound of individual breakers blends into the constant roaring of the surf.

After the first couple of hundred ducks dropped into the grain and started eating, the rest lost their caution and quickly cut their circling to pitch into the feed. Then the sound of wings was gone and there remained only the sound of one-fortieth of a million ducks acting like gluttons, gorging themselves with the grain, a combination of wheat, barley, oats and speltz.

Do you know what it sounds like? 25,000 ducks eating all at once? It reminded me of standing alongside an old fashioned threshing machine while a couple of husky farmers tried to choke the separator by feeding the straw too fast. Latecomers flopped awkwardly down to the living carpet of ducks, lit on their backs, fell off and rushed and pushed other ducks aside to get at the



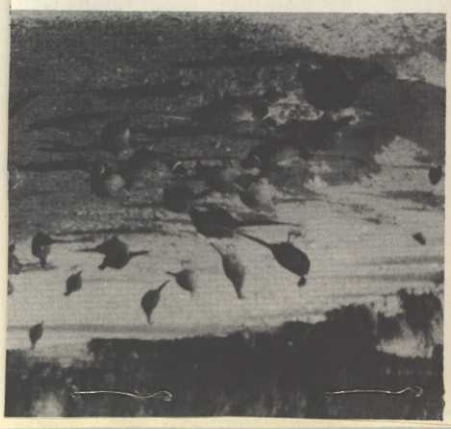
Grain, mostly wheat, is spread out over an area of about one acre, which has been tramped down to bare ground by the busy feet of thousands of hungry ducks.



From this blind, on the Lower Souris Refuge, the observer can watch upwards of 25,000 ducks feeding within a distance of 200 yards.

The ducks continue feeding on the free handout until well after dark. Flashgun photo by Edwin O. Bry Jr., State Warden assisting in the duck depredation work.





The same shelterbelt provides homes for wildlife, n
and food in the winter. Thi

EMBER, 1951

example of the best type of farmstead windbreak planting. A wide and dense belt of trees and shrubs surrounds the yard on the north and west sides. As you can see in the top picture on this page, buffaloberries make up a large part of the planting. The buffaloberry not only provides thick, snow-stopping cover, but

years later, 28 geese from Bear River, Idaho, joined the original 22. The young birds raised by these captive geese flew south in the fall, but the next spring they returned to the Souris to nest. Bands have been returned from Colorado and Nebraska showing that the geese have added to the weight of the hunter's bag there as well as in North Dakota. The resident flock at Souris now numbers 303, although all of the original pinioned birds have been dead for years. It is hoped that this plan will induce more and more geese to nest in North Dakota.



The same shelterbelt provides homes for wildlife, n
and food in the winter. Thi

TREE PLANTINGS which beautify the farmstead also serve as homes for wildlife, and especially for pheasants. On the Ed Flanagan farm, just a short distance to the east of Highway 83 north of Bismarck, is an excellent example of the best type of farmstead windbreak planting. A wide and dense belt of trees and shrubs surrounds the yard on the north and west sides. As you can see in the top picture on this page, buffaloberries make up a large part of the planting. The buffaloberry not only provides thick, snow-stopping cover, but

HUNGRY DUCKS!

(Continued from Page 9)

Grey planning the feeding work for the next day. The Pilots, Rod Brevig and Ray Glahn, were also sitting in on the planning session. They told Jensen and Grey which feeding areas were being used the heaviest and which were not being used. This information from the air saves lots of driving to investigate the next morning.

From Don Grey I learned a few facts about the refuge. In 1937 a flock of Canada geese was obtained for the refuge, pinioned and turned loose to nest. A few

3-1750
Form NR-1
(Nov. 1945)

WATERFOWL

Refuge **Lower Souris** Months of **September** to **December** 19**51**

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I. Swans:									
Whistling swan	13	10-4	1800	10-29	2	11-4			3500
II. Geese:									
Canada goose			900	9-28	36	11-18			3800
Cackling goose									
Brant									
White-fronted goose	12	9-13	4000	9-18	10	10-29			7500
Snow goose } Blue goose }	14	10-9	30	10-18	30	10-18			100
Richardson's geese	65	9-17	65	9-17					100
III. Ducks:									
Mallard			85000	9-12	100	12-31			700000
Black duck			85	9-9	1	10-11			800
Gadwall			10000	9-26	4	10-28			80000
Baldpate			1000	9-12	6	10-26			18000
Pintail			85000	9-12	30	12-31			675000
Green-winged teal			7000	9-6	7	10-11			20000
Blue-winged teal			10000	9-3	30	10-20			45000
Cinnamon teal									
Wood duck									
Red head			13000	9-12	2	11-3			20000
Ring-necked duck									
Canvas-back			1800	9-12	6	10-29			7000
Scaup			3000	9-12	13	12-31			10000
Golden-eye									
Buffle-head									
Ruddy duck			6	9-14	2	10-27			200
Shoveller			3500	10-15	4	10-26			25000
IV. Coot:			41000	9-12	3	9-28			150000

(over)

SUMMARIES

Total Production:

Geese.....

Ducks.....

Coots.....

Total waterfowl usage during period 1,766,000

Peak waterfowl numbers 267,186

Areas used by concentrations All units except 332 and rubble masonry unit.

Principal nesting areas this season.....

Reported by Refuge Personnel

INSTRUCTIONS

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

(2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.

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

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

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

Refuge Lower Souris MIGRATORY BIRDS (Other than waterfowl) Months of September to December 195 51

(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:										
Sandhill crane			80	9-17	4	10-10				200
White Pelican					13	10-15				800
Western Grebe			30	9-26	6	10-11				200
Great Blue Heron					1	10-19				
Black Crowned Night Heron					2	10-15				
II. Shorebirds, Gulls and Terns:										
Wilson's Snipe			15	9-24	2	10-5				100
Woodcock					1	9-21	Seen by GMA November near Souris, N.D.			
Avocets			50	9-24	6	10-11				300

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove			200	9-13	1	11-24		500
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	10-30						
Duck hawk	Seen regularly - Sept. & Oct.							
Horned owl	Seen Occasionally in wooded river bottom							
Magpie	Common after November 15 in Sandhills							
Raven								
Crow			75,000	10-2	1	12-26		
Bald Eagel	2	10-18						
Snowy Owl	1	9-20	3	10-18				

Reported by Refuge Personnel

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

Interior—Duplicating Section, Washington, D. C. 82362

Form NR-2 UPLAND GAME BIRDS 1613

Refuge Lower Souris Months of September to December, 1951

(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	P1B 2960 P2B 6945 M-G 39820 U12 5210 A 3990								400	
European Partridge									200	
Sharp-tailed grouse									1000	
Prairie chicken									-	None seen during period

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

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

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Lower Souris Calendar Year 1951

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White Tailed Deer	F_1B 2960 F_2B 6945 M-G 39820 H_y2 5210 A 3990											223	223	

Light snow conditions not favorable for deer census. Total estimated on basis of 159 deer counted last January and 17 year average of 40% increase

Remarks:

Reported by _____

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: 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 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</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

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

116008

3-1755
Form NR-5
(April 1946)

DISEASE

Refuge Lower Souris Year 1951

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 None

Species affected

Number Affected Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

3-1756
Form NR-6
(April 1946)

FISH

Refuge Lower Souris Year 1941

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	
Common sucker	common							
Common bullhead	occasional							
Northern dace	present							
Common shiner	present							
Northern pike	common							
Walleyed pike	present							
Yellow perch	present							

REMARKS:

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Lower Souris Year 1951

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
NONE								

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches.....
Forest plantings.....

Form NR-8
(Revised)

CULTIVATED CROPS

Refuge Lower Souris Year 1941

42675

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Ave. 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.	
Andersen, A.	R03-169	A-8	Durum	9	30	240	10	120			S.fallow 20 acres
			Barley	15	20	266-3/4	5	133.3			
Atkinson, Harlan	R03-221	A 37 A 38	Durum	7	22½	157½	7½	52½			S.F. 30 A.
Ballantyne, D.	R.O.3-334	A-9	Barley	23	28	644	7	161	3	69	S.F. 35 A.
Ed. Brandt	RO 3-172	A-15	Wheat	16	68	1150	23	350			S.F. 29 A.
Brandt, Gideon	RO 3-80	A-23	Barley	35	25½	894	8½	298			S.F. 60 A
			Durum	18	45	810	15	270			
Christiansen, C. T.	R03-344	A-32	Barley	45.5	10.6	485	9.4	425			S.F. 30 A
			Oats	48.75	20	975					
			Wheat	30	30	900					
			Durum	21.8	14	310	16	345			
			Corn	30	12	360			3	90	
Dahl, Arthur	R03-170	A-4	Wheat	15	30	450	10	150			S.F. 15
			Barley	15	26	393	9	132			
			Flax	10	6	60					

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Crops Report Form NR-8 should be prepared on a calendar-year crops harvested or utilized during the calendar year and sub- December 31 refuge report.

– List each permittee separately. If lands of the refuge are e personnel or hired labor, this should be indicated in the Per-

– List the number of the Special Use Permit issued to the in-

ation – The Unit No. or name specified in the Economic Use Plan l in this column.

– A separate line of the form should be used for each crop ermittee or by refuge personnel. This is important, since if by each operator is not specifically enumerated, the report will or statistical purposes.

ld per Acre – It is important that the average yield per acre of by each operator should be shown.

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

s Share or Return – Harvested – Show the number of bushels har- Government and the acreage from which this share is harvested, aised by refuge personnel and by permittees. Unharvested – show of acres of crops allowed to remain unharvested as food and fe. An estimate of the number of bushels of grain that is avail- dlife in such unharvested crops should be shown in the Bushels

y Services, or Cash Revenue – Show other services received by n cooperative farming activities, the number of acres of food or wildlife, the amount of wildlife crops not otherwise reported by cooperators for the Service, or the cultivation of wildlife the permit is on a fee basis, the total cash revenue received

42675

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Form NR-8
(Revised)

CULTIVATED CROPS

Refuge Lower Souris Year 1941

42675

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Ave. 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.	
Faa, Berry	R03-198	A-19	Barley	14.7	11	190	3.7	52			S.F. 5 A.
Fecho, E.	R03-199	A-35	Wheat	13.5	21	283	7	94			S.F. 15 A.
Goodman, S.	R03-82	A-34	Durum	12	66	793	22	294			S.F. 52 A.
			Oats	33	33	1096					
			Barley	30			13	390			
Grann, L.	L.S. 358	A-5	Barley	33.3	15	503	5	167			S.F. 10
Hanson, Rolf	L.S. 348	A-18	Barley	25	22½	563	7½	187			S. F. 30 A
			Wheat	20	23¼	465	7-3/4	155			
Haugen, S. H.	R03-83	A-20-21	Barley	10	75	750	37	350			S. F. 28
			Wheat	12	20	240	10	120			
Hillman, Peter	LS 354	A30-31	Corn	30	20	600			4	120	
			Wheat	18	36	660	12	220			S. F. 10
			Oats	30	15	450	5	150			
			Barley	25	15	475	5	125			
Kregen, Selmer	LS 341	A-11	Durum	18	24	432	8	145			S. F. 16

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Crops Report Form NR-8 should be prepared on a calendar-year
crops harvested or utilized during the calendar year and sub-
December 31 refuge report.

- List each permittee separately. If lands of the refuge are
e personnel or hired labor, this should be indicated in the Per-

- List the number of the Special Use Permit issued to the in-

ation - The Unit No. or name specified in the Economic Use Plan
d in this column.

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permittee or by refuge personnel. This is important, since if
by each operator is not specifically enumerated, the report will
for statistical purposes.

eld per Acre - It is important that the average yield per acre of
by each operator should be shown.

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

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

ry Services, or Cash Revenue - Show other services received by
in cooperative farming activities, the number of acres of food
for wildlife, the amount of wildlife crops not otherwise reported
d by cooperators for the Service, or the cultivation of wildlife
f the permit is on a fee basis, the total cash revenue received

42675

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Form NR-8
(Revised)

CULTIVATED CROPS

Refuge Lower Souris Year 1951

42675

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Ave. 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.	
Lattendress, Leo	LS 229	A25	Wheat	18	19½	324	4½	107			S. F. 40 A.
			Durum	15	12	185	4	61			
			Barley	26	10	262	3.5	89			
Lee, Selmer	R03-173	A-1	Wheat	17	61	1037					
			Durum	11	2½	27½	27½	192½			S. F. 32 A.
			Barley	18	3	54	19	342			
			Flax	8	43	344					
Liebelt, Herbert	R03-81	A-27	Unit too wet to farm this season								
Lunderveld, E.	R03-81	A-27	Durum	12	9	100	41	500			
			Wheat	21	115	2450	21	380			
			Flax	7½	4	30					
Matthews, C. A.	R03-168	A-6	Barley	21	15	420	5	105			S. F. 25
		A-7	Durum	19	12	225	4	75			
Moen, Orris	LS 227	A-18	Wheat	13½	60	825					
			Durum	18	1½	25	16½	300			S. F. 20
			Millet	6	5	30					

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Crops Report. Form NR-8 should be prepared on a calendar-year crops harvested or utilized during the calendar year and sub- December 31 refuge report.

- List each permittee separately. If lands of the refuge are e personnel or hired labor, this should be indicated in the Per-

- List the number of the Special Use Permit issued to the in-

tion - The Unit No. or name specified in the Economic Use Plan l in this column.

- A separate line of the form should be used for each cro ermittee or by refuge personnel. This is important, since if by each operator is not specifically enumerated, the report will or statistical purposes.

ld per Acre - It is important that the average yield per acre of by each operator should be shown.

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

s Share or Return - Harvested - Show the number of bushels har- Government and the acreage from which this share is harvested, aised by refuge personnel and by permittees. Unharvested - show r of acres of crops allowed to remain unharvested as food and fe. An estimate of the number of bushels of grain that is avail- ldlife in such unharvested crops should be shown in the Bushels

y Services, or Cash Revenue - Show other services received by in cooperative farming activities, the number of acres of food or wildlife, the amount of wildlife crops not otherwise reported l by cooperators for the Service, or the cultivation of wildlife the permit is on a fee basis, the total cash revenue received

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Form NR-8
(Revised)

CULTIVATED CROPS

Refuge Lower Souris Year 194~~4~~

42675

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Ave. 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.	
Mann, Daryl, E.	LS 360	H-10	Wheat	15	27	405					
			Barley	35			10	350			
Matwick, Ray	R03-91	A-24-29-33	Durum	18	56	1008	17	170			
	LS 231		Flax	10	30	300					
			Rye	25	30	750					
			Oats	40	20	800					
			Wheat	16	140	2240					
			Barley	27			74	2000		S. F.	135
Olson, Theo.	R03-165	A-10	Durum	22	17.3	381	5.7	127			S. F. 14
			Barley	26	12	362	6	122			
Rice, Fred F.	LS 442	A-22	Wheat	6	34	210	11	70			S. F. 25
			Oats	35	6	211	2	70			
			Barley	26	203	529	6.7	176			
Rubbert, L	LS 446	A-41	Barley	17	1.2	20	23.8	400			
			Flax	18	49	909					
Sheflo, Rudolph	R03-345	A-14	Wheat	18.4	5	92	15	276			S. F. 10 A

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

d Crops Report Form NR-8 should be prepared on a calendar-year
crops harvested or utilized during the calendar year and sub-
e December 31 refuge report..

- List each permittee separately. If lands of the refuge are
ge personnel or hired labor, this should be indicated in the Per-

. - List the number of the Special Use Permit issued to the in-

cation - The Unit No. or name specified in the Economic Use Plan
ed in this column.

wn - A separate line of the form should be used for each crop
permittee or by refuge personnel. This is important, since if
n by each operator is not specifically enumerated, the report will
for statistical purposes.

ield per Acre - It is important that the average yield per acre of
n by each operator should be shown.

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

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

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

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Form NR-8
(Revised)

CULTIVATED CROPS

Refuge Lower Souris Year 1951

42675

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Ave. 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.	
Sivertson, Alfred	RO3-171	A-3	Wheat	20	56	1125	19	375			
			Durum	19	42	780	33	620			S. F. 65 A.
			Flax	9	65	600					
Sivertson, Gilbert	RO-3-164	A-2	Flax	5	35	175					
			Wheat	18	50	595	17	305			S. F. 50 A
			Durum	8	33	260	27	220			
Teske, Max	RO 3-343	A-40	Barley	22.5	26	588	9	199	4	90	S. F. 30
			Wheat	8	30	250			20	160	
Vedquam, Richard	LS 449	A-13	Durum	14	38	525	12	175			S. F. 7
			Barley	22	22.5	480	7.5	160			
McMea, Floyd	LS 353	A-16	Wheat	6	30	176					
			Barley	12			15	176			S. F. 10

SUMMARY OF CROPS GROWN:

Total Crop acreage - 2,697
Total Bushels grain - 48,512
Total Acres summer fallow - 848

Crop	Acreage	Permittees' Share Acres	Permittees' Share Bushels	Government's Share Harvested Acres	Harvested Bu	Unharvested Acres	Unharvested Bu.
Durum	681	428.8	6259	256.2	3667		
Wheat	1033	855-3/4	13877	157¼	2602	20	160
Barley	655.2	358.6	7878-3/4	289.6	6539-1/3	7	159

Summary of Crops Grown:

Crop	Acreage	Permittee's Share Acres	Permittee's Share Bushels	Government's Share Harvested Acres	Harvested Bu.	Unharvested Acres	Unharvested Bu.
Corn	39	32	960				
Oats	101	94	3532	7	220		
Flax	183	183	2418	Govt. share in other grain			
Millet	5	5	30	"	"	"	"
Totals			34954-3/4		13028-1/3		529
			TOTAL GOVERNMENT SHARE			13557-1/3	

Total Revenue $.....

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.

42675

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Lower Souris Months of Sept. thru Dec. 1951.

(1) VARIETY	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED USE		
				TRANSFERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Wheat	500	9,765	10,265			9,655		610		610	
Barley	500	5,745	6,245			6,185		60		60	
Mixed		1,075	1,075			1,075		-			
Spelts		665	665			665		-			
Millet		110	110			110		-			
Oats		220	220			220		-			

(8) Indicate shipping or collection points.....

(9) Grain is stored at.....

(10) Remarks.....

NR-8a . REFUGE GRAIN REPORT

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

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)--55 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately: Corn, wheat, proso millet, etc. Include only domestic grains; aquatic and other seeds will be listed on NR-9.

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

(4) A total of Columns 2 and 3.

(6) Column 4 less Column 5.

(7) This is a proposed breakdown by varieties of grain listed in Column 6.

(8) Nearest railroad station for shipping and receiving.

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

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

3-1759
Form NR-9

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)

Refuge Lower Souris Year 1951

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
NONE								

3-1760
Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge L[illegible]r Souris Year 1951

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
Anderson, A. C.	LS415	H-3			26.75	8/1/51-2/28/52	$1.50	$ 40.13	
Asmundson, J.	413	H-19			37.50	8/1/51-2/28/52	1.50	56.25	
Atkinson, H.	435	H-30			12.67	7/19/51-2/28/52	1.50	19.00	
Bell, J.	425	H-33			40.50	7/19/51-2/28/52	1.50	60.75	
Benson, J. K.	438	H-14			48.00	8/1/51-2/28/52	1.50	72.00	
Bernstein, L.	414	H-1			35.75	8/1/51-2/28/52	1.50	53.63	
Bieberdorf, J.	393	H-31			74.00	9/19/51-2/28/52	1.50	111.00	
Bieberdorf, L.	392	H-31			24.00	9/19/51-2/28/52	1.50	36.00	
Bieberdorf, W.	416	H-31			33.00	9/19/51-2/29/52	1.50	49.50	
Boehnke, A. M.	409	H-21			126.00	7/19/51-2/28/52	1.50	189.00	
Boye W. J.	423	H-21			33.33	8/1/51-2/28/52	1.50	50.00	
Brandt, G.	405	A-23			7.75	9/19/51-2/28/52	1.50	11.63	
Brandt, J.	437	D-11			-	8/1/51-2/29/51	1.50	5.00	(down payment forfeite
Cook, J.	426	H-33			74.50	7/19/51-2/29/52	1.50	111.75	
Dreyer, H.	382	H-30			32.50	7/19/51-2/28/52	1.50	48.75	
Ellsworth, L.	395	H-33			45.00	7/19/51-2/28/52	1.50	67.50	
Einarson, J.	432	H-29			45.33	7/19/51-2/28/52	1.50	68.00	
Erdman, E.	411	H-27			34.00	7/19/51-2/28/52	1.50	51.00	
Fecho, E.	417	H-27-33			267.00	7/19/51-2/28/52	1.50	400.50	
Ferstad, N.	390	D-7-8			18.00	8/1/51-2/28/52	1.50	27.00	
Garnant, G. B.	412	H-25			37.00	7/19/51-2/28/52	1.50	55.50	
Getzlaff, A.	421	H-27			151.00	7/19/51-2/28/52	1.50	226.50	
Gibbs, M.	427	H-33			79.80	7/19/51-2/28/52	1.50	119.70	
Goodman, A.	403	H-26			23.50	7/19/51-2/28/52	1.50	35.25	
Goodman, B.	401	H-24-26			107.50	7/19/51-2/28/52	1.50	161.25	
Goodman, H. J.	415	H-18			18.00	7/19/51-2/28/52	1.50	27.00	

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Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge Lower Souris Year 1951

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
Goodman, M.	LS431	H-18			20.00	8/1/51-2/28/52	1.50	30.00	
Goodman, W.	407	H-24			9.00	7/19/51-2/28/52	1.50	13.50	
Hahn, F.	408	H-27			18.00	7/19/51-2/28/52	1.50	27.00	
Halley, K. C.	386	H-33			57.00	7/19/51-2/28/52	1.50	85.50	
Henderson, J. D.	417	D-2			31.50	7/19/51-2/28/52	1.50	47.25	
Hoff, S.	394	D-33			58.20	7/19/51-2-28/52	1.50	87.30	
Hovland, O.	429	H-27			38.50	7/19/51-2/28/52	1.50	57.75	
Jensen, T.	440	H-12-14-16			60.00	8/1/51-2/28/52	1.50	90.00	
Johnson E.	400	H-23			103.50	8/1/51-2/28/52	1.50	155.25	
Kitzman, L.	377	D-12			47.00	7/19/51-2/28/52	1.50	70.50	
Kitzman, W.	420	H-33			56.00	7/19/51-2/28/52	1.50	84.00	
Klabo, W.	384	D-6			13.50	8/1/51-2/28/52	1.50	20.25	
Klebe, E.	410	G-13			16.00	7/19/51-2/28/52	1.50	24.00	
Klebe, R.	381	H-27			86.00	7/19/51-2/28/52	1.50	129.00	
Lashman, W.	424	H-33			105.00	7/19/51-2/28/52	1.50	157.50	
Lattendresse, E.	409 9	H-17		Alfalfa	21.00	8/1/51-2/28/52	2.50	52.50	
				Hay	29.00	8/1/51-2/28/52	1.50	43.50	
Lee, S.	405	H-2			2.67	8/1/51-2/28/52	1.50	4.00	
Lehman, E.	408	H-27			64.00	7/19/51-2/28/52	1.50	96.00	
Liebelt, H.	430	H-32			39.00	7/18/51-2/28/52	1.50	58.50	
Matthews, C. A.	388	D-2			5.80	8/1/51-2/28/52	1.50	8.70	
Moen E.	399	D-10			46.00	8/1/51-2/28/52	1.50	69.00	
Moen, R.	412	H-9-10			11.00	8/1/51-2/28/52	1.50	16.50	
Moum, D.	420	H-10			16.00	7/19/51-2/28/52	1.50	24.00	
Natwick, H. C.	434	H-28-33			108.50	7/19/51-2/28/52	1.50	162.75	
Natwick, R. M.	387	H-22			33.00	8/1/51-2/28/52	1.50	49.50	

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Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge Lower Souris Year 1951

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
Nermoe, J.	LS402	D-9			$57.50	7/19/51-2/28/52	1.50	$86.25	
O'Brien, E. E.	406	H-13			17.00	8/1/51-2/28/52	1.50	25.50	
Prellwitz, W.	396	H-33			51.30	7/19/51/2/28/52	1.50	76.95	
Resler, A. C.	433	H-27			23.00	7/19/51-2/28/52	1.50	34.50	
Ringen, O.	410	H-27			39.00	7/19/51-2/28/52	1.50	58.50	
Roalkvan, L.	436	H-33			51.00	7/19/51-2/28/52	1.50	76.50	
Rosendahl, L. A.	418	D-4			18.00	8/1/51/-2/28/52	1.50	27.00	
Shafer, F.	406	H-33			71.30	7/19/51-2/28/52	1.50	106.95	
Smette, D.	397	H-18			11.50	8/1/51 -2/28/52	1.50	16.50	
Solseng, L.	319	D-7			25.00	7/19/51-2/28/52	1.50	37.50	
Stigen, R.	428	D-14			22.00	7/19/51-2/28/52	1.50	33.00	
Swanson, E.	418	H-24			84.00	7/19/51-2/28/52	1.50	126.00	

Totals:

Acreage grazed..... Animal use months..... Total income Grazing.....

Acreage cut for hay..... Tons of hay cut 2998.15 Total income Haying $4,522.49

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Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge Lower Souris Year 1951

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
Atkinson, H. J.	LS371	D-13		188.5		6/1/51-11/15/51	.50	94.25	
Benson, J. K.	374	G-11		220		6/1/51-11/15/51	.50	110.00	
Block, W. A.	372	G-17		236		6/1/51-11/15/51	.50	118.00	
Boehnke, A. M.	347	D-11		248		7/16/51-11/15/51	.50	124.00	
Ellsworth, L.	370	D-14		174.25		6/1/51-11/15/51	.50	87.13	
Evenson, J. S.	351	G-7		240		7/16/51-11/15/51	.50	120.00	
Ferstad, J.	391	D-8		28		7/16/51-11/15/51	.50	14.00	
Fraser, J.	356	D-3		83.4		7/16/51-11/15/51	.50	41.70	
Getzlaff, A.	363	G-16		388		6/1/51-11/15/51	.50	194.00	
Gibbs, P	366	G-18		80		6/1/51-11/15/51	.50	40.00	
Halley, K. C.	350	D-18		598.5		6/1/51-11/15/51	.50	299.25	
Haugen, S. H.	414	D-4		60		7/16/51-11/15/51	.50	30.00	
Hegg, M. E.	359	G-4		63		7/16/51-11/15/51	.50	31.50	
Hoff, S.	373	G-21		300		6/1/51-11/15/51	.50	150.00	
Jensen, Thor	439	G-8		156		6/1/51-11/15/51	.50	78.00	
Kitzman, L.	376	D-12		260		6/1/51-11/15/51	.50	130.00	
Klabo, W.	383	D-6		51.5		7/16/51-11/15/51	.50	25.75	
Klebe, R.	375	G-14		82		6/1/51-11/15/51	.50	41.00	
Kvalheim, A.	416	G-6		205		7/16/51-11/15/51	.50	102.50	
Lattendresse, E.	411	G-12		190		7/16/51-11/15/51	.50	95.00	
Lee, S.	404	D-1		32		7/16/51-11/15/51	.50	16.00	
Liebelt, H.	367	G-15		125		6/1/51-11/15/51	.50	62.50	
Matthews, C. A.	355	D-2		194.8		7/16/51-11/15/51	.50	97.40	
Miller, C.	361	D-17		672		6/1/51-11/15/51	.50	336.00	
Moen, E.	398	G-9		88		7/16/51-11/15/51	.50	44.00	
Natwick, H.	369	D-19		594		6/1/51-11/15/51	.50	297.00	

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Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge Lower Souris Year 1951

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
Nermyr, P.	357	D-5		154		7/16/51-11/15/51	.50	77.00	
Olson, T.	45	G-2		45		7/16/51-11/15/51	.50	22.50	
Peterson, F.	368	G-20		451		6/1/51-11/15/51	.50	225.50	
Prellwitz, E.	365	D-16		75		6/1/51-11/15/51	.50	37.50	
Scheflo, R.	385	G-5		32		7/16/51-11/15/51	.50	16.00	
Scheflo, S. M.	413	G-3		27		7/16/51-11/15/51	.50	13.50	
Stigen, R.	364	D-15		120		6/1/51-11/15/51	.50	60.00	
Swanson, E.	362	G-22		442		6/1/51-11/15/51	.50	221.00	

Totals:

Acreage grazed..... Animal use months 6,903.95 Total income Grazing $3,451.98

Acreage cut for hay..... Tons of hay cut..... Total income Haying.....

Form NR-11

TIMBER REMOVAL

Refuge Lower [illegible]ris Year 1951

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B.F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
				Cords			All below as marked	
Block, W. A.	LS 450 (2)			4 fuel	2.50	10.00	by Refuge personnel	Ash
				2 poles	5.00	10.00		Ash
Boye, W. J.	LS 344 (1)			5 poles	5.00	25.00		Ash
				13.2 fuel	2.50	33.00		Ash
Cook, J.	LS 448 (2)			8 Fuel	2.50			Ash
				4 poles	5.00			Ash
				5 fuel	.50			Aspen
Einarsom, J.	LS 338 (1)			10 fuel	.50	5.00		Aspen
Getzlaff, A.	LS 451 (2)			20 poles	5.00			Ash
				5 Fuel	2.50			Ash
				5 Fuel	.50			Aspen
Gibbs, P.	LS 443 (2)			25 Aspen fuel	.50			Aspen
Goodman, Barthl	LS 341 (1)			3 fuel	.50	1.50		Aspen
				2 poles	5.00	10.00		Ash
Kelebe, R.	LS 444			15 fuel	2.50	37.50		Ash
				1 pole	5.00	5.00		Ash
Lee, R. E.	LS 445			1 pole	5.00	5.00		Ash
Lehman, E.	LS 447			9.5 poles	5.00	47.50		Ash

Form NR-11

TIMBER REMOVAL

Refuge Lou[illegible] Scuris Year 1951

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B.F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
				Cords				
Liebelt, H.	LS 345			3.5 poles9	5.00	17.50		Ash
				6 fuel	2.50	15.00		Ash
				4 fuel	.50	2.00		Aspen
Lovly, Theo	LS 424			11 fuel	.50	5.50		Aspen
Prellwitz, W.	LS 342			1 poles	5.00	5.00		Ash
				14 fuel	2.50	35.00		Ash
Torr, Emery	LS 441			10 fuel	.50	5.00		Aspen
		Totals paid for						
			38 Cords	aspen @ $0.50	$19.00			
			48.2 Cords	Ash fuel @$2.50	120.50			
			23 Cords	" Poles @$5.00	115.00			
					$254.50			

(1) These permits issued in 1950 but cutting operations not completed and final payments not made until 1951.

(2) Cutting operations not completed at end of period.

Total acreage cut over_____ Total income_____

No. of units removed B. F._____ Method of slash disposal_____
Cords_____
Ties_____
_____

1622



Acres of ducks
Mallards at the 326 feeding station. These
These birds cover an area of approximately
four acres.



These birds are making their final wheel
over the spread out grain just before set-
ting in.



Coming in -- Going -- Feeding
326 feeding field



Pouring concrete in buttress footings, 332 spillway. Seepage water filled every excavation, and had to be pumped out immediately before placing concrete.



Dumping concrete into footing excavations.



Mixer crew and conveyors.

BRANCH OF WILDLIFE REFUGES

NARRATIVE REPORT

ROUTING SLIP DATE Oct. 16, 1951

Mr. Salyer _____ Mr. DuMont _____

Mr. Krummes _____ Miss Baum _____

SECTION OF OPERATIONS:

Mr. Ball _____ Dr. Morley _____

Mr. Regan _____

SECTION OF HABITAT IMPROVEMENT:

~~Mr. Griffith~~ REG Mr. Kubichek _____

~~Dr. Bourn~~ WBS Mr. Stiles WBS

SECTION OF LAND MANAGEMENT:

Mr. Ackerknecht _____ Mr. Davis _____

STENOGRAPHERS:

_____ _____

_____ _____

REFUGE Lower Souris

PERIOD May-August, 1951

LOWER SOURIS NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY, JUNE, JULY, AUGUST, 1951

United States Department of the Interior

Fish and Wildlife Service

Upham, North Dakota

PERSONNEL

Donald V. Gray.....Refuge Manager

Raymond M. Glahn.....Pilot-Biologist

Howard S. Huenecke....Ass't..Refuge Manager

Robert W. Arrowsmith.....Refuge Mechanic

Sigfred A. Nygard.....Refuge Clerk

Thomas W. Lawson.....Maintenance Man

Alvin Brandt.....Maintenance Man

Kenneth B. Baker.....Maintenance Man

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Merrill C. Hammond.....Biologist

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I. GENERAL

A. Weather Conditions:

Month	Rain	Normal	Max Temp.	Min. Temp.
May	1.44	2.18	90	29
June	3.98	3.36	88	37
July	.91	2.49	100	37
August	4.61	1.97	89	41
	10.94	10.00 Ext.	100	29

Records indicate that our summer was the dryest since 1946. Although pr precipitation was above normal in June and August, May and July fell far short of normal years. The temperature in May was above normal with five days of blowing dust during the later part of the month. The temperature dropped the first of June but became warmer toward the end of the month when we encountered a sharp hailstorm which damaged crops on and adjacent to the refuge. The warm dry weather continued through the entire month of July which aided the small grain to a great extent. During August the mean temperature dropped and more moisture fell than in any of the preceding three months, going two and one-half inches above normal years. This caused considerable loss to the farmers who were forced to let swathed grain lie for a week to three weeks before harvesting. In many cases the grain had began to sprout before it was dry enough to combine.

B. Water Conditions:

The second crest of the year hit the 320 unit on May 17 when the elevation read 23.20 following a low reading on May 15 of 23.00. This was due to a large amount of water finally breaking loose from Canada and coming down the river. 320 hit a high of 24.20 on June 11 and was then brought down to 22.88 by June 25 and has been held constant within .1 to .2 of the 23.00 mark.

The second high of the year in 326 unit occurred on June 15, the gage reading 19.40. The rest of the period the elevation was a little below the approved level of 18.00 in July, but held within a few hundredths of that mark through August.

332 Unit was held close to 17.00 all through June coming down from 18.40 the first of May. At the end of July the unit had been pulled down to 16.70 and at the end of August to 16.10, following the Water management plan.

341 Unit hit the second peak of 15.60 on June 27 and then dropped down to 15.00 the first week in July. Normal recession pulled the unit down to 14.40 and held there through the dry month of July and then started slowly filling so that by the end of August it was up to 15.36.

357 Unit hit a high of 15.70 on June 4 and then tapered down to 11.75 on June 22, and back up to 12.50 at the end of June. Normal recession carried it at 12.25 through the rest of the period until toward the end of August it was up around 13.25. A very heavy rain of between 5-7 inches (variously reported0 in the Souris, North Dakota area caused Boundary Creek which flows into this unit to flow at near capacity. Construction activities at 357 structure prevented opening gates to release much water, the only outflow being through the spillway structure. The minimum flow of 20 cfs was maintained through the period.

This season was a rough one on the hay meadows along the Souris River above the refuge, as the water had not gone completely off the meadows from the first runoff before the second high came, and that remained until well into July. The telephone line and the road to headquarters were kept hot by persons inquiring as to the position of the refuge gates. Several of the ranchers, and some officials of the Mouse River Cattlemen's Association made a trip to the refuge and personally checked gates to see if we were telling the truth as to the position of the gates in the various structures.

C. Fires.

There were no firesto n the refuge this period. Cattlemen and permittees haying on the refuge were cautioned regarding fire, especially through the month of July, and fortunately none occurred.

II. WILDLIFE

A. Migratory Birds.

1. Population and Behavior

The first few days of May saw a heavy migration of blue-winged teal and gadwall riding in on SE winds. This was the only major movement of ducks northward in the period.

A breeding pair count was made on June 7 from the air and gave the following figures:

320 Unit	1514 pairs
326 Unit	1324 pairs
332 Unit	1172 pairs
341 Unit	1176 pairs
357 Unit	1120 pairs
Total pairs	6306

The species composition as estimated from the air the same date was as follows:

Blue-winged teal	24%
Mallard	18
Pintail	16
Shoveller	12
Gadwall	10
Redhead	7
Canvasback	5
Scaup	3
Baldpate	1
Greenwing teal & blackduck	1
Coot	3
	100%

This was the last attempt to census breeding pairs from the air as males, especially pintail and mallards were gathering on most of the units in numbers from 10 - 200 birds.

On July 6 an aerial census disclosed the following figures as to total refuge population, numbers only:

320 unit -	15,500
326 unit -	5,200
332 unit -	3,900
341 unit -	10,500
357 unit -	2,200
Total	37,300

Due to the absence of the aircraft during most of July, and its being out of commission during August it was not possible to get as many aerial counts as we wanted to take. On August 28, Agent-Pilot Brevig flew Hammond on a flight over the refuge to check for grain eaters and also to make a count of all the waterfowl. The following is the information obtained on that flight:

	Canada Geese	Ducks	Coots*
No. of 357 Unit to Canadian Line		1,500	
357 Unit (total count)		106,000	37,000
341 Unit (total count)		24,000	10,000
332 Unit (transect sample method)		15,000	6,000
326 Unit (transect sample method)	101	25,000	2,000
320 Unit (transect sample method)	202	30,000	10,000
Rubble Masonry Unit (Total count)		800	
Totals	303	202,300	65,000

Conjectured mallard-pintail 120,000 - 150,000

*Relative proportion of ducks and coots roughly estimated - not separated on count.

The coot population of the refuge was double that of last year, and the production is now high on the refuge and all water areas surrounding the refuge.

Brood Counts and Production

Brood averages, proportions of the various species for the past three years and a comparison between certain designated areas in the number of broods are given in tables on the following page.

A rough estimate of production shows that from the June 7 pair count of 6306 pairs with 60% producing young and an average of 6.9 young per brood, our production was 26,000 birds, a drop in the calculated total from last year of 12,000 birds.

The islands in 320 unit and 326 unit were again heavily utilized, from observations made, the use being about the same as last year.

The albino gadwall returned again this year and Hammond was fortunate in getting pictures of her and included some in this report. She was not seen with a brood.

Canada Goose Production

This year was the best from the standpoint of goose production in the history of the refuge. The highest number of nests were found, and the counts of young were the highest. A total of 55 nests were located, first from the air and then checked on the ground where 48 were located. Of the 48, 41 were active nests with a total of 239 eggs or 5.83 eggs per nest. Seven abandoned nests were found with a total of 26 eggs or 3.71 eggs per nest. In addition whole eggs outside nests and away from them totaled five and eggs outside nest and destroyed totaled two.

A brood count the week of June 10-16 showed the following:

1 brood of 3
3 broods of 4 each
4 broods of 5 each
2 broods of 6 each
3 broods of 7 each
2 broods of 8 each
1 brood of 9 each (probably 2 combined)
1 brood of 10 each (probably 2 combined)
19 broods of 104 young averaging 5.4 per brood

The most complete count was made on Aug. 28 by aircraft with a total of 303 birds. With 110 adults accounted for on the 55 known nests we have a total of 193 young in the flying stage. 95% of the geese reared here were raised in 320 and 326 units, these units providing the best nesting territories.

Table I

BROODS - 1950-1951
Comparative Areas

R.M. Unit	320 #1		320 #1a		326 #1b&c		326 #7		326 #2		326 #6		332 #3		332#1a to c		357 #1		TOTAL	
8/2 8/8	7/25	8/7	8/16	8/8	8/2	8/14	8/16	8/8	7/31	8/15	8/14	8/6	7/20	8/6	8/3	9/10	7/24	8/14		
1950 1951	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950	1951
Mall. - 7	-	1	-	1	-	4	-	-	-	2	-	1	-	1	2	3	1	1	3	21
Gad. 5 2	3	3	-	9	1	6	6	6	1	2	20	6	1	4	23	31	-	7	60	76
Bald. - 2	-	-	-	-	1	2	-	-	-	2	-	-	-	-	-	7	-	-	1	13
Pin. - 1	-	-	-	-	-	-	-	1	-	1	-	1	1	-	-	1	-	3	1	8
BWT. 5 9	-	7	-	3	1	23	4	6	-	20	1	10	-	15	11	32	-	10	32	135
Shov. - 1	1	-	-	3	1	6	-	2	-	-	-	1	-	-	-	4	-	2	2	19
GWT. - -	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	2	-
Red. 3 -	-	-	-	2	-	2	-	1	-	-	3	4	-	2	10	24	-	6	16	41
Can. - 1	3	1	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	4	6	6
Scaup - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	1
Ruddy 1 -	-	-	-	-	1	-	-	-	-	-	4	-	2	1	4	11	1	1	13	13
Unid. - -	-	7	14	1	1	4	5	-	-	2	-	13	-	4	-	16	-	8	20	55
TOT. 14 23	7	19	14	19	6	47	16	16	2	29	28	36	4	28	54	130	2	42	147	388
% Countable (79) (63)	(69)	(63)	(67)	(63)	(79)	(51)	(67)	(63)	(79)	(51)	(67)	(63)	(54)	(63)	(79)	(63)	(69)	(51)		

Table II

JULY 10, 1951 BROOD COUNT, LOWER SOURIS REFUGE

SPECIES	I			II			III			Total		
	Birds	Broods	Ave.	Birds	Broods	Ave.	Birds	Broods	Ave.	Birds	Broods	Ave.
Mallard	20	4	5.0	69	11	6.9	29	5	5.8	118	20	5.9
Gadwall	309	35	8.8	85	12	7.0	20	3	6.6	414	50	8.3
Baldpate	26	3	8.6	11	2	5.5	-	-	-	37	5	7.4
Pintail	38	6	6.3	16	2	8.0	55	10	5.5	119	18	6.6
Bluewing T.	167	22	7.6	147	20	7.3	24	3	8.0	338	45	7.5
Shoveller	13	2	6.5	23	4	5.7	10	1	10.0	46	7	6.5
Redhead	26	4	6.5	3	1	3.0	-	-	-	29	5	5.8
Ruddy	117	23	5.0	16	4	4.0	-	-	-	133	27	5.0
Canvasback	71	12	5.9	23	3	7.6	-	-	-	94	15	6.2
L. Scaup	18	3	6.0	4	1	4.0	-	-	-	22	4	5.5
Unidentified	139	18	5.0	186	29	6.3	21	3	7.0	346	50	6.9
TOTALS	944	132	7.1	583	89	6.6	159	25	6.3	1696	246	6.9

Table III

AUGUST BROOD COUNT, LOWER SOURIS REFUGE

SPECIES	I			II			III			Total		
	Birds	Broods	Ave.	Birds	Broods	Ave.	Birds	Broods	Ave.	Birds	Broods	Ave.
Mallard	31	6	5.1	49	7	7.0	47	7	6.7	127	20	6.3
Gadwall	373	59	6.3	485	72	6.7	159	23	6.9	1017	154	6.5
Baldpate	11	2	5.5	68	14	4.8	-	-	-	79	16	4.9
Pintail	11	2	5.5	67	9	7.4	19	4	4.9	97	15	6.5
Bluewing T.	255	45	5.6	554	96	5.7	197	40	4.9	1006	181	5.5
Shoveller	32	3	10.6	57	10	5.7	56	15	3.7	145	28	5.2
Redhead	112	23	4.9	180	29	6.2	28	5	5.6	320	57	5.6
Ruddy	37	12	3.0	55	10	5.5	13	3	4.3	105	25	4.2
Canvasback	15	3	5.0	87	14	6.2	9	2	4.5	111	19	5.8
L. Scaup	15	2	7.5	9	1	9.0	3	1	3.0	27	4	6.7
Unidentified	182	31	5.8	381	61	6.2	84	10	8.4	647	102	6.3
TOTALS	1074	188	5.9	1992	323	6.1	615	110	5.6	3681	621	5.9

Table IV

Proportion of Species in Brood Counts 1949. 50. & 51

Species	1949		1950		1951 July		1951 August	
	No.Broods	%	No.Broods	%	No.Broods	%	No.Broods	%
Mallard	23	3.9	21	5.6	20	8.2	20	3.3
Gadwall	99	16.7	116	31.0	50	20.3	154	24.8
Baldpate	19	3.2	19	5.1	5	2.1	16	2.5
Pintail	26	4.4	6	1.6	18	7.3	15	2.5
Bluewing	251	42.4	69	18.4	45	18.2	181	29.2
Shoveller	43	7.3	6	1.6	7	2.8	28	4.5
Redhead	63	10.6	37	9.9	5	2.1	57	9.2
Canvasback	8	1.3	17	4.5	15	6.2	19	3.2
Scaup	6	1.0	2	.5	4	1.6	4	0.6
Ruddy	37	6.2	71	19.2	27	10.9	25	4.0
Greenwing	-		1	.3				
Unidentified	18	3.0	9	2.4	50	20.3	102	16.2
Total	593	100.0	374	100.0	246	100.0	621	100.0

Of Special Interest Items

First blackduck brood for the refuge seen by T. W. Lawson, Refuge Maintenance Man, in July while working on the structure at 357 unit.

First wood ducks breeding. State Warden Brey saw several broods between Towner and 320 dam - two on the refuge. This was in conjunction with a complete survey of the Souris River from entry into the United States from Canada on west to 320 dike on the refuge in the east. Several adult wood ducks were noted between Towner and the refuge on the river.

First Mergansers. A brood of twelve were either American or red-breasted mergansers seen below Dam II. C. J. Henry, former Lower Souris Refuge Manager believed that " Americans" would be more likely for the environment where the birds were seen.

On June 20 an American Egret was sighted at 357 structure while on routine checking of unit and structure by Gray. This bird was not seen again for several weeks and was next sighted during the period July 20 - 30 by the crew engaged in raising the structure. This is the second record of American Egret on the refuge.

C. Trapping and Banding

On July 17 Game Agents Harry Jensen and Jim Foote started construction of duck traps at refuge headquarters and for the following six weeks they and other agents on detail at Lower Souris for depredations work operated these traps and trapped and banded the following number of ducks:

Bluewing Teal	1,079
Pintail	450
Mallard	312
Greenwing Teal	51
Baldpate	39
Redhead	13
Gadwall	9
Blackduck	2
Canvasback	1
Total	1,956

Most of these birds were trapped in throat traps but in addition to these drive trapping was operated on several occasions but the difficulties of setting up in the deep water of the river, plus transporting materials to likely spots proved to be too time consuming so the drive trapping was given up in favor of the throat traps.

Lack of materials in the line of poultry netting and other suitable wire was the main reason we did not get any of the Canada Geese banded. Experience of the last year showed that we would have had to purchase a considerable amount of poultry netting which is rather expensive in order to catch these geese so that we were unable to get the wire for this purpose.

Duck Depredations

In late July when harvesting operations began getting under way we had fond hopes of coming through with a normal harvesting season. The month of July had been very dry and we anticipated a continuation of the same conditions. Shortly after the turn of the month, however, rains started falling and curtailed harvesting operations considerably and for many days stopping it completely. The Game Management Agents were on duty in connection with the banding work and on August 13 Game Management Agents Stinnett and Alexander were detailed here from Minnesota to assist agents Jensen and Foote in depredations operations. Shortly afterward Game Agent-Pilot Rod Brevig reported with aircraft N735 and the control operations were definitely underway.

Very good success has been achieved through the contacts made with farmers in getting them to put up scarecrows and do their frightening as soon as ducks appeared, plus actual ffightening operations by the agents themself. The aircraft was very busy night and morning bombing ducks out of the potholes using simulated hand grenades, and after getting them up in the air, attempting to herd them back to the refuge.

The first indication of use of our feeding fields where grain was swathed down was at the Boundary Creek on the 11th of August when two pintails were seen to go into the field. On the 16th the first grain of the season was placed in Boundary Creek feeding station and from then on it was a daily process of feeding this field. Some of the other stations that we fed were the 320 feeding station where feeding started on the 20th of August; Nelson field on the 22nd of August; Melhoff field on the 27th of August; Benson field on the 9th of Sept. and the Jevne field on the 23rd of August.

Amount if Bushels Fed Thru. Aug. 31	
326 Unit	375
Boundary Creek	3,295
Brandt field	150
Nelson field	950
Melhoff field	200
Jevne field	525
Total	5,495

During the last week in August we had the wetest conditions of the whole month and the grain was starting to sprout in swaths and in some instances in standing heads. The farmers were beginning to become more concerned about the weather than they were about ducks, but, even so, ducks were being accused of rather bad depredations although in several instances it was found that many farmers who gave an indication of being damaged were in reality "hollering before they were hurt."

One complication was a five to seven inch rainfall reported in the Souris, North Dakota area that flooded the swaths and standing grain alike and caused many potholes to remain in the vicinity having backed up from Broundary Creek which runs through that area.

The Souris River Duck Control Association has not been near as active as it was last year, and, in fact, has put out very little publicity relative to the depredation situation. One newspaper item that appeared was the result of a call from a newspaper to one of the officials of that organization rather than as last year from the organization officials to the newspaper. There were one or two other small items appearing on the back pages telling of duck damages but giving the Fish and Wildlife Service credit for doing all that could be done in operating feeding fields, instructing farmers on scaring devices, issuing permits for scaring and herding, and assisting farmers in particularly bad areas.

The Game Agents are deserving of a great deal of credit for the success of the program inasmuch as they make a great many contacts during the day with farmers and are able to talk quite convincingly to them and remove a lot of antagonistic thoughts that a great many of them had toward the refuge.

For the first time the State Game and Fish Department has authorized its personnel to assist in depredations work here in the vicinity of the refuge and had even sent one of their aircraft up for a period of three days to assist in the aerial work. Three Fish and Game department personnel have been here off and on working with the Game Management Agents and the cooperation received has been very welcomed.

2. Food and Cover

Sago pondweed, one of our biggest producers in the last few years produced very little seed this year in any unit except 357 where the stand was approximately one-third to one-half normal years production. While we are not certain as to the definite cause for this lack of seed produced we are of the opinion that the two highs in water levels came at a time when the seed was adversely affected inasfar as production was concerned. Redhead grass on the other hand seeded very well and windrows of the seed were common along the shores of Units 341 and 357 especially. Seed produced was good on river bullrush and soft-stem bulrush, and wild millet started showing up in fairly good stands along the exposed borders of 326 and 320 where water levels were reduced from last year.

Further information on detailed food surveys will be forthcoming in Mr. Hammond's marsh management report which will be submitted at a later date.

3. Botulism

No outbreak of botulism was found on the refuge this year although a few birds were found, one Pectoral sandpiper and one pintail, whose death was attributed to botulism during one week in July when we had temperatures up to 100°. Shortly after that, however, the weather cooled considerably and evidently nipped ~~it~~ outbreak so that it did not reach anywhere near serious proportions. Since that time the weather has been unusually cool due to the abundance of rainfall so that we have not had to worry about this disease.

4. Lead Poisoning and Other Diseases

None noted.

5. Migratory Birds Other Than Waterfowl

Pelicans arrived in their usual numbers and were here about two weeks when it was noted that their numbers had dropped considerably. This may have been due to travel to other water areas where fish were more abundant. At about July 15 they showed back on Lower Souris in about their usual numbers.

Franklin's gulls are again one of the big nesters on the refuge and started out using the nesting sites in 332 and 326. The nesting colony in 332 appeared to be as large as in previous years but on a flight over the refuge on the 6th of July the colony of 326 had apparently been abandoned. Mr. Huenecke reported that there seemed to be no activity in the nesting colony area and no young were seen. This may have been due to lower water levels making the colony less desirable, or it may have been that the heavy hail storm that we experienced on June 26 caused considerable damage in the area to nests.

Dowitchers again have been here in very large numbers and Greater yellowlegs and Lesser yellowlegs have been increasing on the refuge since about the first week in August. More Avocets were seen on and in the vicinity of the refuge this year than in the past few years, and two broods of young birds were seen, both off the refuge, one of 4 and one of 3.

As in the past Forster's, common, and black terns nested on the refuge in about their usual numbers. On the 16 of August nine cranes were noted flying south over the refuge headquarters area, and again on the 28th, sixteen cranes were seen.

Mourning Doves

The dove population at headquarters equals that of last year and some banding of nestlings was done as well as other cooperation with the mourning dove study when two "coo" road counts were operated during months of the summer by Huenecke and Gray. These counts were made in accordance with the outlines as set up by Harold Peters who is in charge of mourning dove investigations out of the Atlanta Regional Office. One mourning dove was found dead but to date no investigation has been made on the bird.

B. Upland Game Birds

1. Population and Behavior

From our observations it appears that a not too good hatch of pheasants has occurred on the refuge and in the general vicinity. Population has definitely not shown any great increase and it has only been in the last two weeks of August that broods started to be seen. Fewer broods of Hungarian Partridge and sharptail grouse have been seen than last year but in about the same numbers so that there has not been any great increase or decrease in either one, although of the two, sharptail grouse are the most numerous. No prairie chickens have been seen during this period.

2. Food and Cover

Food and cover has been plentiful for upland game birds on the refuge and in the immediate vicinity. Their natural foods have been abundant with wild fruits being probably the least plentiful, there being no June berries, very few cherries and about a three-quarters normal crop of plums.

3. Diseases

No diseases noted on any of the above species during the period.

C. Big Game Animals

1. Population and Behavior

From all indications a normal increase in the deer population has occurred from the 159 deer that were reported in our winter count. Several observations of twin fawns in the sandhills area have been made and the population in the northern part of the refuge from the Newburg road north have been a little greater than was observed last year.

2. Food and Cover

Food for deer has been adequate and especially so for several that roam around the headquarters area as evidenced by the condition of some of the corn stalks in the gardens of refuge personnel.

3. Diseases

No diseases noted during the period.

D. Fur Animals, Predator, Rodents and Other Mammals

Muskrat and Beaver

At the end of the period no muskrats had begun building houses and there is little evidence of their being around except in a few instances where some feeding spots have been located. They appear to be a little bit under the numbers of last year at this time due perhaps to the fact that we have lower water levels in three of the units than we had last year. The dikes were checked thoroughly for muskrat runs and no new runs in the dikes were found. Evidently our concentrating on the trapping of muskrat in the vicinity of the dikes during the last trapping season has paid off on this score.

Beaver are slightly more numerous than last year due to the fact that we were unable to get enough trappers to take off the number recommended for removal. The low price on furs and the difficulties involved in the trapping made it difficult to get enough interested trappers.

Mink

These animals appear to be more numerous than last year as we have made many additional observations of mink during the summer period. During one drive trapping operation in 320 unit three mink were seen in and around the traps where the ducks were being driven, and in one instance one of the men saw a duck with its feet flapping in the air with head down in the water. Thinking the duck was stuck in the mud he grabbed one of the legs and pulled the duck out and found a mink on the head. This was rather unusual to have them so bold when there were five or six men working around the area, but they evidently knew a good deal when they saw one and weren't a bit backward to help themselves. Several other observations have been made in the vicinity of 320 unit and it is apparent that these particular areas had not been covered too well during the regular mink trapping season.

Mr. Huenecke found evidence of mink bothering goose nests on one of the islands in 326 unit and also believes that he found a skunk on one of the islands that had been killed by a mink, as there were mink tracks around the carcass which was fresh and no other tracks in the vicinity. The mink had eaten into the carcass in a manner similar to the way they attack and eat muskrats. It is believed that the assumption is fairly accurate.

Weasel

Not as many weasel have been seen in this period as compared to a year ago but it is believed that they are relatively the same in number.

Raccoon

Raccoon have maintained their relatively high population and were quite a serious factor in our duck trapping operations. All in all approximately one hundred ducks were taken by raccoon and skunk in the duck traps during the night while we were operating the traps. In one night 35 had been killed. Two raccoon were killed by Game Management Agents in the vicinity of these traps but there were others in addition to these two that were raiding these traps.

Skunk

Despite a vigorous attempt to eradicate as many skunks as possible the population remains rather high. Nest destruction by skunks was very high and they too attributed to the loss of ducks in the duck traps. Further intensive action is going to be necessary to reduce the number of skunks on the refuge. It is unfortunate that there is no value to the furs so that trappers would be more interested in taking greater numbers of them.

Badger

Badgers are as numerous, if not more so, than in 1950. While none have taken up residence in the dikes, the patrol roads from headquarters south and on the west side of the refuge north of the Newburg road show much evidence of their working.

Red Fox

No apparent change in population with very few having been sighted during the period.

Coyotes

No coyotes have been seen during the period.

E. Predaceous Birds Including Crows

Our most common predaceous bird has been the short-eared owl. We have had a very high resident population this year, followed closely by the usual numbers of marsh hawks and redtailed hawks. Burrowing owls remained about the same and few sights of barred or great-horned owl have been made.

Toward the end of August small flocks of crows began to be seen but there has been no great increase in their numbers. A prairie falcon was shot at the Boundary Creek feeding station in August and this removed one factor in protecting the feeding station there. Last year one prairie falcon was able to get up all the ducks out of the feeding field by just one swoop over the field, but this year such has not occurred.

F. Fish

Fishing has not been as good on the fishing areas this year as in the past year. Of all the ten areas open for fishing the Freeman bridge area has been the most popular and the one that has consistently provided the most fishing. The 341 fishing area which last year was very good produced less than half the number of fish that it did in 1950.

It is surprising that fewer walleyes are taken than would seem to be indicated by their presence. While drive trapping operations were going on in 326 and 320 units several fine walleyes averaging two to three pounds were caught in the net that was strung across the river to lead the ducks into the trap. This seems to indicate that there are numbers of them around but not many are taken by the fishermen. An examination showed them to be in very good condition with no parasites apparently infecting them.

Revised fishing regulations were published this year covering the Lower Souris Refuge, copy of which follows:

U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

LOWER SOURIS NATIONAL WILDLIFE REFUGE, NORTH DAKOTA

FISHING

(The following are the current fishing regulations as of August 11, 1951, for the Lower Souris National Wildlife Refuge, North Dakota, which are derived from the regulations dated June 23, 1939 (4 F.R. 2502) and August 6, 1951 (16 F.R. 7938).

§ 33.101 Fishing permitted. Until further notice, in accordance with the provisions of Parts 18 and 21 of this chapter fishes may be taken for noncommercial purposes each day during the period May 16 to September 15, both dates inclusive, in any year, within certain waters of the Lower Souris National Wildlife Refuge, North Dakota, subject to conditions and restrictions specified in §§ 33.102 to 33.108, inclusive.

§ 33.102 Waters open to fishing. The following waters of the Lower Souris National Wildlife Refuge shall be open to fishing:

Area I: The south side of the Souris River from the Nelson Bridge in $SE\frac{1}{4}$ sec. 14 T. 158 N., R. 76 W., west one-fourth ($\frac{1}{4}$) mile, and both sides of the Souris River from the Nelson Bridge, south to the refuge boundary.

Area II: three-eighths (3/8) mile of the south bank of the Souris River, east and south of the Johnson Bridge located in the $SW\frac{1}{4}NW\frac{1}{4}$ sec. 32 T. 159 N., R. 76 W. Fishing permitted on the above described bank and bridge only.

Area III: One-half ($\frac{1}{2}$) mile of the south bank of the Souris River from the Freeman Bridge west in the $N\frac{1}{2}NW\frac{1}{4}$ sec. 17 T. 159 N., R. 77 W. No fishing permitted within 300 feet of the 320 dike water control structure.

Area IV: Waters of the refuge within the $N\frac{1}{2}NE\frac{1}{4}$ sec. 17 T. 159 N., R. 77 W. This area lies south and west of the Icelandic Cemetery located in the NE corner of the $NE\frac{1}{4}NE\frac{1}{4}$ sec. 17 T. 159 N., R. 77 W. No fishing permitted within 300 feet of the 320 dike water control structure.

Area V: 150 feet north and south of the bridge known locally as "Cutbank Ditch" bridge on the North Dakota State Highway No. 14 located on section line common to sec. 3 and 4 T. 159 N., R. 78 W. Fishing permitted from the bridge and 150 feet of road right-of-way. Also the bridge on the same highway in the SE¼ sec. 34 T. 160 N., R. 78 W. and 100' of the north river bank on either side of the bridge.

Area VI: The east and west banks of the Souris River from the Soo Line Railroad bridge to the bridge on the Russell-Kramer Road, the area described as follows: SW¼ sec. 18 T. 160 N., R. 78 W. and NE¼SE¼ sec. 13 T. 160 N., R. 79 W.

Area VII: The waters of the Souris River at the Newburg Road bridge and ditches 100' on either side of the bridge along the road, located in NW corner NW¼NW¼ sec. 1, NE corner NE¼NE¼ sec. 2, T. 160 N., R 79 W., and SE¼SE¼ sec. 31 T. 161 N., R. 78 W. Fishing permitted from bridge and road right-of-way only.

Area VIII: Both sides of the Souris River Bridge on the section line road common to secs. 11 and 14 T. 161 N., R. 79 W. Fishing permitted from bridge and road right-of-way only.

Area IX: The Souris River at the bridge on North Dakota State Highway No. 5 in the SW¼SW¼ sec. 27 and NW¼NW¼ sec. 34 T. 162 N., R. 79 W. Fishing permitted from bridge and road right-of-way only.

Area X: The Souris River and impoundment from the Westhope-Landa Road north approximately ½ mile to the old road dike located in SW¼ and SW¼SE¼ sec. 30 T. 163 N., R. 79 W. Fishing also permitted on both sides of the bridge and road right-of-way for a distance of 150 feet on either side of the bridge on the Westhope-Landa Road located on the section line common to secs. 30 and 31 T. 163 N., R. 79 W.

§ 33.103 Routes of travel. Persons entering the refuge for the purpose of reaching waters thereof for fishing shall follow such routes of travel as shall from time to time be designated by the officer in charge of the refuge.

§ 33.104 State fishing laws. Any person who fishes in any waters of the refuge must comply with applicable fishing laws and regulations of the State of North Dakota, and in the absence of a State law or regulation in respect to the number and size of the fishes that may be taken, the Director of the Fish and Wildlife Service may fix such limits.

§ 33.105 Fishing permits. Any person exercising the privilege of fishing within the refuge shall be in possession of a valid State fishing license issued by the State of North Dakota, if such license is required, and shall carry such license on his person while fishing, and when requested to do so shall exhibit it to any representative of the North Dakota State Department of Game and Fish authorized to enforce the game and fish laws of the State, or to any representative of the Fish and Wildlife Service.

§ 33.106 Use of boats. The use of motorboats, either inboard or outboard, is prohibited on all waters of the refuge except for official purposes. The use of boats without motors is permitted for fishing only in Areas IV, VI, and X. The use of boats, rafts, or other floating devices while fishing within all other waters of the refuge as designated in § 33.102 is prohibited.

§ 33.107 Hook-and-line fishing. Fishing is permitted only by the use of hook and line, as defined by State law, in such manner as will not interfere with the objects for which the refuge was established. The use of nets, seines, hoop nets, traps, set lines, or other similar contrivances is prohibited. Commercial fishing, as defined by State law, is prohibited in any waters of the refuge.

§ 33.108 Bait restrictions. No person shall use live minnows or any other fish or any part thereof for bait while fishing in any of the waters of the refuge, and no one may have in his possession within the boundaries of the refuge any live minnows or any seine or net that may be used in capturing minnows.

III. PHYSICAL DEVELOPMENT AND MAINTENANCE

A. Physical Development

Projedt 622-C-1

Gravel 320 Dike: 1081 cu. yds. of gravel were hauled from the Goodman pit and placed on the face of 320 dike. This gravel completed a stretch of 23 chains that had not been completed previously, and spotted several loads where the high water had washed away that which had been placed there last year. This gravel, while not the most desirable has beached out well and should hold up fairly well in the absence of extreme high water.

Buttress Spillway - 320 dike: The buttressing of this spillway was completed in the latter part of June, when the last of the 57 buttresses was poured. These plus the two end walls constituted quite a job, due to the necessity of rebuilding forms for each individual buttress, due to the unevenness of the rubble masonry wall, with the stones sticking out in different positions at each buttress. Running the 9" x 12" beam along the upper edge of the wall was not easy either, as the forms lumber had to be chopped out and fitted to the conformation of the outline of the stones. One pour a week was made, pouring ten or eleven buttresses at a time, it taking four days to set that many up. The pour was usually made on Friday, allowing until the first of the next week for setting sufficiently to remove forms to carry on.

Raise 357 Gate Structure: Work on this, the last of the structures to be raised three feet was started (believe it or not) on Friday, July 13 when the crew went up to throw a temporary bridge across the ditch at the spillway outlet structure, so that materials, supplies and equipment could be taken directly to the structure from the east side. An air compressor and hammers were rented from a contractor in Bottineau due to the service compressor being at Lake Ardoch, and the holes for dowels drilled and the downstream beams chipped out. Forming and placement of steel followed, and the pour made on Monday August 6. The pour was completed in one day, and everything went well. The forms were left on for over two weeks, but had been loosened after one week of the pour. On August 24 the forms were off and all lumber and other miscellaneous items hauled back to headquarters. In addition 35 cu. yards of rip-rap were hauled to the structure to use in rip-rapping after the pit run gravel is hauled in and placed around the elevated portion to complete the job. Maintenance Man Lawson was in charge of the job and turned in a very fine performance as is evidenced by the finished product. We were also very fortunate in having a good crew of local men to work on it, and there was little lost motion. This structure is the largest of the five gate structures, and the highest above the water, so that considerable extra work was required for proper and safe placement for our staging and bracing under the downstream beams. The gate lifters have been reinstalled and cables attached.

Project 622-O-2

Fencing: Due to shortage of available labor, and higher priority in getting the spillway work done, this project has not had too much accomplished. One mile of boundary fence on the N. and E. of the SW¼ Section 17, T158N R76W was razed and moved to the S. and W. sides, this quarters having been acquired after the erection of the boundary fence, Later in August a new section of fence was erected along the purchase line of the Rasmus O. Haugen Tract No. 135b in Sec. 7 T162N R79W. The original fence had been knocked down by ice action in past springs, and as the water was higher than the land owned, an additional five plus acres were purchased to take in the water's edge and allow for some freeboard. It was possible to salvage the original eight corner posts and about 90% of the line posts, though some of them were rusted badly after being buried for several years in the mud. Some of the posts were located under 10 inches of mud and silt. This stretch is only 60 chains long, but the line so crooked that 10 corner posts were needed.

Project 622R: Move Equipment Repair Building.

The building was divided into two sections by erection of a partition with space for a twelve by twelve foot door in it. The division is roughly 5/9th for shop, in the winter time, and total in the summer. During the period masonite board was received from Tamarac Refuge and the shop end has been completely sealed. The outside of the building has been given one coat of paint, and the doors and windows a coat of sash paint to match the other buildings. Approaches of concrete were poured, and a few other miscellaneous items taken care of. This building has already proved its worth, as we were able to do considerable work on large pieces of equipment such as the Hanson shovel, Kentucky trailer, and Federal truck-trailer unit.

Project 712

Paint buildings; and Repair Buildings: Quarters No's. 2, 4, 6, and 11 were painted with two coats each on the outside, and trim also. The shingle roofs were given a coat of shingle stain, and the storm windows, screens, and storm doors all gone over for repairs and painting. The garages at Quarters No. 6 and 2 and 11 (double) were also given two coats of paint and trim. This job was badly needed and the appearance of these buildings has been improved 100%, and we were able to make repairs and improvements that were sorely needed.

Patrol Roads: 176 cu. yds. of gravel was hauled onto the patrol road to the Thompson Place, and improvement that was much needed. Several wooden culverts on the patrol road from the Westhope-Landa grade north on the west side of the refuge were removed, and replaced where necessary, or filled in with fill if the need not too great. These culverts were original ones put in when the road was constructed, and all had rotted out leaving bad holes in the road.

Operate Federal-Truck-Trailer Unit: New gears were secured for the rear end of the tractor and installed, which will increase the speed of the unit about 10 miles per hour from a former top of 30 to 40. Then too, with increased speed putting the tires under additional heat and strain all wheels were taken to a commercial shop and two inch inserts put in them to make wide based rims. According to tire manufacturers, tire life can be prolonged considerably for tires used on wide base rims, due to a decrease in the amount of flexing of the sidewalls that occurs on narrow base rims. The unit was also changed over to summer greases and lubricants, and surprisingly large job when done in the manner prescribed.

Maintenance Items

1. All dikes mowed once and 320 dike twice.

2. 36 miles of patrol road mowed once with about 11 of the above given a second cutting.

3. Received new Dodge 3 cu. yd. dump truck. Driven from factory by Refuge Machanic Arrowsmith, by way of Crab Orchard to pick up tools and furniture, Horicon to pick up Kentucky trailer, and Tamarac to pick up Masonite wallboard.

4. Cut 1936 Diamond T. stake truck in two, removed two feet of frame and welded it back together to make a tractor out of it to be used with the semi received from Horicon. Installed fifth wheel, and hydro-vac brake system.

5. Overhauled the complete braking and electrical system of the Kentucky trailer, and built a 3 foot box on it for use in hauling grain or other materials as necessary. This unit will give us a good light unit, especially for loads up to ten or twelve tons. In hauling grain from other refuges for use here in depredations control it will replace two of the smaller stake trucks.

6. Preventive maintenance checks and 5000 miles inspections as needed on vehicles.

7. Put dragline boom and laggings on Hanson for use with new 3/8 cu. yd. dragline bucket received this quarter.

8. Miscellaneous work on buildings and structures, mowing headquarters lawn, and grading entrance roads.

B. Plantings

Aquatic and Marsh Plants

None

Cultivated Crops

4,000 pounds of Japanese millet were sown on exposed flats in Units 320 and 326, with 2,370 pounds in 320 and 1,630 pounds in 326. 118 acres were covered in 320 Unit in strips and patches varying from 1/2 to 20 acres in size. In 326 Unit 81 acres were planted as above varying in size from 1/6 to 5 acres. The total acreage was 118 and 81 in Units 320 and 326 respectively and the application was at the rate of 20 pounds per acre. The planting was done by use of the seeder in the N-754 aircraft, most of the operation being at an elevation of 15 feet when actually applying the seed. The sowing was done on June 29.

In following the progress of the millet seeding operation from June 29 to August 30, it appears at this date that there hope that the millet will head-out or mature before a killing frost, which can come at any time within the next week.

The millet stands at an average 29 inches in height with no indication of fruiting bodies on any of the numerous stands. It is very obvious that the seeding took place too late for the crop to mature in North Dakota. This was caused due to unavoidable high water which could not be reduced in order to expose the mud flats for aerial seeding until June 29. Considerable acreage could have been planted earlier, as gauge records show. This was discussed during a field inspection June 26, 27 + 28. R.E.G.

No chemical analysis of the soil has been made but there is little doubt that wild millet will produce seed on this area since small amounts on unit 326 seeded last fall are fully mature at this date. On many patches seeded by air the growth was dense indicating that the area was too heavily seeded for maximum seed production. It did not, however, appear to effect the growth since plants crowded in the center of the strip were as tall and as fully developed as those less crowded on the outside of the strip. Aquatics such as Eleocris and Scirpus growing in competition with the millet appeared to have little or no effect on its growth.

The farm crops started out the growing season in good shape and predictions of a bumper crop, the second highest in the history of North Dakota, were being made before the dry spell during the month of July. With only .91 inches of rain in July and temperatures in the high 80's and 90's the crop went downhill some, although it has picked up considerably during the month of August. In some locations locally the crops of barley are good but do not appear to quite come up to the best of last year. There are some very good stands of hard wheat showing up, and the durum is not far behind. The corn crop has not done as good as expected, as there has been too much cool wet weather and cool nights to favor corn as required. The corn crop on the refuge is small as usual as most farmers do not like to raise it to feed the blackbirds.

Other than blackbirds, crop pests and diseases have not been of any import in this section. There were no grasshoppers to speak of, nor were the aphids in evidence. Stem rust was not common, in fact very little was in evidence. There was a little smut in the barley, but not enough to bother. The farmers in the vicinity of Lower Souris are becoming more and more sold on the use of weed killers, and many more rigs were in evidence this summer. The main weeds controlled in the grain fields with 2,4-D were wild mustard, Canadian and sow thistle, and some farmers have started to wage war on the leafy spurge.

Summer fallowing, too, is becoming more and more widespread, and the benefits of the practice are not hard to discern. This had been a good summer for fallow land as there has not been much high wind to cause wind erosion. It has not been too good for controlling quack grass, except for the month of July, as there has been too much cool weather.

Harvesting weather started out good, and it looked from the start as though it would be a fine period. After about two weeks had gone by, and swathing was well underway, the rains started, and it has been a constant period of damp, wet weather, with just a few days now and then to permit combining. In the vicinity of Souris, N. Dak. some 10 miles east of the refuge a heavy rain unofficially estimated at 7 inches, inundated many fields, formed potholes and flooded several fields of standing grain and swathed fields. Needless to say, the ducks are making "hay while the sun shines" in those flooded fields and it is pretty much of an impossibility to keep them out of fields in that condition completely. One farmer there, who has 40 acres of standing barley flooded, has admitted that he cannot hope to combine the crop and is not averse to letting the ducks harvest it. This removes a trouble spot, but there are many other spots that are in need of considerable attention.

The first refuge field was swathed on July 24th, the barley on A-12 at Boundary Creek being the crop. This was also the first field combined, this being done on July 31st. Harvesting has not progressed as speedily as hoped for, and a survey made by Hammond on August 29th (both on and off the refuge) showed the following relative to the progress of harvesting:

	From State Highway #5 South	From State Highway #5 North
Harvested	12%	11%
Swathed	66%	60%
Standing	22%	29%

IV. ECONOMIC USE OF REFUGE

A. Grazing

The grazing demand remains high, and we could have cattle busting out the fences if enough pasture was available. With the present beef situation, there are none of our former permittees letting go of any pastures, and we have had many more inquiries for pasture than in the past year. The pastures are in good condition, though they did get a little dry during July. At the end of the period they had recovered well following the generous rainfall, and there will have to be no reduction of AUM's in any of the pastures.

B. Haying

We were able to fill all the demands for hay this year through close attention to several of the larger units, and could if there is more demand after harvesting manage to fill a few requests for a small tonnage. A memorandum was sent to all haying permittees last winter asking that they report any meadow that they would be unable to cut. This plus checking of several of the units resulted in more available hay, that was gladly received by applicants.

On the meadows on either side of the river above 320 unit the high water in late spring had caused considerable algae growth, "moss" to the permittees) that interfered considerably with the cutting operations. This also had a delaying effect on the drying out of the meadow, so that many a rig became stuck in places that normally were dry. The high water also caused a large amount of foxtail to come in, and where there is any amount of it, permittees are waiting until later to cut the hay. There is quite a bit of hay uncut, and it is surprising that so much is cut after grain harvest, frequently after frosts have occurred.

V. INVESTIGATION & RESEARCH

These are in addition to those set up in 1946 REG

1. Marsh Transects

In an effort to gather practical information to be used in marsh management a number of transects running east and west across the Souris River on units 341 and 357 were set up this season. These transects which will be run each year will yield information in three main categories; effect of water manipulation on marshy aquatic vegetation, seed production and utilization as well as plant succession. The seed production and utilization is of primary importance during this period because of an acute depredations problem which seriously effects the refuge from a public relations standpoint.

This growth on mud flats which were to have been seeded to millet per instruction to Field in approving water use plan for 1957 season. REB

Since the reduction of water levels in connection with the water management plan a keen interest has developed regarding the effect of reducing the water levels on the above mentioned units. At this time the transects are incomplete but lower water levels have produced large stands of Alesma and Sagettaria which was being utilized at the time of observation. Further observation disclosed an absence of sago seed at the southern end of Unit 357 with a noticeable increase in seed on the three species of pondweed toward the north end of unit 357. As yet no cause has been determined for the lack of pondweed seed which is general over the entire refuge.

2. Leafy Spurge Control

Funds were provided for the purchase of 225 pounds of 2,4-D salt for the purpose of initiating control of leafy spurge on an area taking in most of Haying Unit H-15 and part of Agricultural Unit A-24. Leafy spurge had taken over 200 acres of these two units and was spreading out of the refuge into private land.

A more complete report is to be submitted soon, but some of the highlights of the operation are included here.

Operations started on May 23, then a rainy spell hit plus high winds so that we were unable to start again until June 11 and then ran steadily until June 20th, finishing 176 acres, travelling 63.3 miles and using 3003 gallons of 2,4-D mixture at the rate of 1.5# per 25 gallons of water or 1 to 1.5# acid equivalent per acre.

One area very heavily infested was a blowout and so rough that our ground equipment could not get through due to unseen holes, drops, etc. This patch was burned first, and then when we could see the ground were able to drive over it for treatment, said treatment being given after the plants came back from the burn. This burn was made on May 24th when the spurge had reached maximum growth, and the fire was fed by accumulated dead grasses and spurge stems. The spraying on this piece was done on July 11, covering 23 acres 1.7# per acre of 2,4-D.

Another piece on H-11 where there were small patches were treated on June 22 and covered 13 acres total of small patches using 17.2 gallons per acre of solution.

The spraying was done with a 21 foot, 3 section boom, using the fire pump and tank (Panama). The unit was made up here at the refuge and worked very well, except that the boom was at a stationary height, and in some stands, the plants were high enough so that some of them did not receive any treatment. Plans have been made now to put a stand on the Jeep so that the boom can be raised from its present position as desired.

Leafy spurge is a very tough plant to control by any method, and the best information available states that it may take 3 years of 2 sprayings a year to control it. Only enough salt was available this year for one spraying but it is hoped that we can start two sprayings annually in 1952.

An attempt was made to do some mechanical control by mowing an extremely dense stand in Grazing Unit G-10, but our mower broke down and we were unable to make more than a start. Further work along this line of attack is to be made next year.

VI. PUBLIC RELATIONS

A. Recreational Use

Recreational use as usual was confined to fishing, picnicking at the Meddaugh Recreational Area, and visits to headquarters to climb the tower and view the birds.

B. Refuge Visitors

Date	Name	Address	Purpose
5-3	Leonard Dahl	Weather Bureau	Check instruments & Records
5-7	Rod Brevig, U.S.G.M.A.-Pilot Brandt Hjelle, N.D. Fish & Game Dept.		Stopped in while flying state waterfowl transects
5-11	Claude Alexander	DesLacs Refuge	Equipment transfer
5-15	R. W. Dougall	Regional Office	Engineering inspection
5/18	Fred Cunningham Elmer Richwalski	Upper Souris Refuge	Equipment transfer
5-24	Mr. Irv. Dietrich	Fargo	Arr. for 4-H trip
5-28	Mrs. M. Nice & Daughter, Chicago, Ill.		Bird trip
6-11	H.Jensen & J.Foote	N.D.G.M.A.'s	Banding
6-22	M.T. Solon	BLM, Billings, Mont.	Land status
26-27-28	Messrs.Griffith, Gillett & Rollings	Wash. & R.O.	Refuge inspection
7-1	Mr. & Mrs.M.S.McIlroy, Cornell U.Ithaca,		N.Y. Bird trip
7-17,8-31	H.Jensen & J. Foote	N.D.G.M.A.'s	Banding & Depredations

Refuge Visitors, continued

Date	Name	Address	Purpose
7-26	Mr. Robert Corey	Minot, N. Dak.	Trip over refuge for newspaper story
8-8	Stan Harris	Pilot-Alaska	Service stop with N-757 on way to Alaska
8-11	Mr. & Mrs. Henry	Bremerton, Wash.	visit
8-15	Claude Alexander	GMA	Depredations
8-27/28/29	Ron Balham	U. of Mo.	Refuge visit

C. Refuge Participation

R. M. Glahn attended the Game Conference in Bismarck on August 25, at which meeting regulations for the coming season were determined.

VII. OTHER ITEMS

Howard Huenecke was detailed as Acting Manager of the DesLacs Refuge on July 16.

T. W. Lawson was detailed in late August to Lake Ardoch Refuge to supervise sandblasting and painting of the water control structure gates.

Mr. &. Mrs. Alvin Brandt proudly announce the arrival of son David on June 26th.

Mr. &. Mrs. Don Gray also do likewise for a son, Terrence Michael, on August 26.

The fathers are bearing up well under the ordeal of passing out cigars and bragging.

Respectfully Submitted:

Donald V. Gray

Donald V. Gray
Refuge Manager

Approved:

_____

3-1750
Form NR-1
(Nov. 1945)

WATERFOWL

Refuge Lower Souris Months of May 1 to August 31 1951

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I. Swans:									
Whistling swan									
II. Geese:									
Canada goose			303	8-28			55 nests	193	303
Cackling goose									
Brant									
White-fronted goose									
Snow goose									
Blue goose									
III. Ducks:									
Mallard			90,000	8-28			40	2,300	110,000
Black duck			300	July			1	8	300
Gadwall			15,000	August			204	3,600	20,000
Baldpate			12,000	"			21	1,500	15,000
Pintail			60,000	8-28			33	1,500	75,000
Green-winged teal			1,000	August					1,000
Blue-winged teal			35,000	August			226	8,700	45,000
Cinnamon teal									
Wood duck			10	July			3	15	25
Red head			7,000	August			62	3,000	7,000
Ring-necked duck									
Canvas-back			3,000	August			34	2,000	5,000
Scaup			4,000	May			8	200	6,000
Golden-eye									
Buffle-head									
Ruddy duck			1,500	August			52	1,100	1,500
Shoveller			8,000	August			35	2,100	10,000
Merganser							1	12	25
IV. Coot:			65,000	8-28				20,000	75,000

(over)

SUMMARIES

Total Production:

Geese 193

Ducks 16,000

Coots 20,000

Total waterfowl usage during period 371,153

Peak waterfowl numbers 302,100

Areas used by concentrations 357, 341, 332, 326 & 321 units

Principal nesting areas this season 332, 326, 320 artificial islands and shoreline

Reported by Refuge Personnel

INSTRUCTIONS

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

(2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.

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

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

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

MIGRATORY BIRDS
(Other than waterfowl)

Refuge Lower Souris Months of May 1 to August 31 1951

(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:										
Nolboell's Grebe	Common									
Horned Grebe	But few records made. No change in numbers from 1950									
Earned Grebe	Common									
Western Grebe	Common, slight increase over 1950									
P. B. Grebe	Common									
White Pelican	500, drop of 150 from 1950									
Gt. Blue Heron	Status unchanged, nested in usual numbers in 320 unit									
Bl. Cr. Nite Heron	Common. No nesting on refuge. Rookery located in N & NW of Upham on O'Brien farm									
American Bittern	Common									
Virginia Rail	Common - slight reduction in numbers									
Sora Rail	Abundant									
II. Shorebirds, Gulls and Terns:										
Wilson's Snipe	One seen on 332 dike in late August									
Marbled godwit	More favorable feeding areas on refuge drew more birds for feeding.									
Avocet	More seen on refuge than for past several years. No increase in nesting									
Upland Plover	No change from 1950									
Ring-billed gull	Common early in period									
Franklin's gull	Colony in 326 disturbed and abandoned. 332 colony same as in past years.									
Common tern	Some colonies in 320 unit on islands									
Black tern	Very common - many young produced									

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Common nesters in headquarters area. Numbers same as last year.				
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk	Several seen on refuge but not common				
Horned owl					
Magpie					
Raven					
Crow	Beginning to flock in late August, but fewer than in 1950				
Marsh Hawk	Appeared to have increased in numbers				
Swainson's Hawk	Observation made in late July and early August. Not common				
Prairie falcon	Scarce, one taken at Boundary Creek feeding field				

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 number of the species using the refuge during the period concerned.

Interior—Duplicating Section, Washington, D. C. 82362

Form NR-2

UPLAND GAME BIRDS

1613

Refuge Lower Souris Months of May 1 to August 31, 1951

(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.
Ringneck Pheasant									200	
Hungarian Partridge									100	
Sharptailed grouse									600	
Prairie Chicken									-	None seen during period

* Very few observations of broods and/or adults.

No change for the better from 1950

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

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

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Lower Souris Months of May through August, 1951

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period *	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Wheat	2904	2287	5191			4691		500		500	
Barley	1195	1185	2380			1880		500		500	
Mixed	788	97	885			885					

*Received during period not complete - current grain harvest still in progress.

(8) Indicate shipping or collection points Arrowwood, DesLacs, and Lostwood Refuges. Slade records not complete

(9) Grain is stored at Refuge granaries

(10) Remarks

*See instructions on back.

16—61482-1

NR-8a

REFUGE GRAIN REPORT

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

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

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

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

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

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

(8) Nearest railroad station for shipping and receiving.

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

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

16—61482-1 U. S. GOVERNMENT PRINTING OFFICE

North Dakota Outdoors

OFFICIAL PUBLICATION OF THE STATE GAME AND FISH DEPARTMENT UNDER THE SUPERVISION OF H. R. MORGAN, GAME AND FISH COMMISSIONER

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Entered as second class matter December 12, 1945 at the post office at Grand Forks, under the act of March 3, 1879.

VOL. XIV AUGUST, 1951 NO. 2

HOW TO SUBSCRIBE

NORTH DAKOTA OUTDOORS is published each month at a yearly subscription rate of fifty cents or five cents a single copy. CLUB RATES at forty cents per year are available to sportsmen's organizations presenting 25 or more subscriptions in a single year. REMITTANCES must be made by check or money order, payable to "State Game & Fish Dept." Cash is forwarded at sender's risk. Stamps are not accepted. CHANGES OF ADDRESS should be reported directly to this office or to the local post office, four weeks in advance of the next issue. Send both your old and new address. Your post office will not forward your copies unless forwarding postage is provided by you, and the Department cannot replace those not delivered through your failure to notify in advance. PERMISSION TO REPRINT any of the material appearing in North Dakota Outdoors is granted to all newspapers, provided proper credit is given.

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Cover Descriptions

The whitetail buck portrayed in two colors on our front cover is the work of Charles E. Schafer, nationally known wildlife artist, and is used through the courtesy of the Michigan Department of Conservation. The picture is protected by copyright and may not be reproduced without written permission of the Michigan Department of Conservation.

The back cover, a poem by Mr. Martinson, illustrated by Wilfred Baska, is dedicated to the Missouri River, and man's attempts to harness its flow. Copies of this illustrated poem can be obtained by writing to the Western Printing Company in Bismarck.

National Wildlife Refuges in N. D.

by Albert M. Day, Director, U. S. Fish and Wildlife Service

ONLY a few short years ago the northern Great Plains experienced the severest drouth in the memory of the oldest residents. Marshes and ponds became dust bowls. Thousands of acres of grainland were left to the weeds and grasshoppers. Ranges were abandoned for lack of water. It was during this period of a major economic catastrophe that the national wildlife refuge program was born. The conservation of meager runoff during the lean years was provided for by the construction of low water dams in stream beds. The plight of waterfowl was critical in the Great Plains region, as well as over much of the Continent, as a result of impoverished nesting grounds and extremely limited feeding habitat, especially along the migration routes.

Following a blueprint drawn up several years previously, a national plan of restoration and development was initiated in 1934, when funds were made available. The immediate objective was restoring former breeding grounds and providing essential feeding areas needed to accommodate the millions of waterfowl passing through North Dakota and other sections of the Great Plains region during the fall and spring migrations. The same improvements would, of course, aid in meeting the critical needs of local waterfowl and benefit other wildlife as well.

During the six years that followed, impoundments aggregating 72,300 surface acres were completed, thus providing for storing water during years of favorable rainfall as the pendulum in the weather cycle swung toward the other extreme. The abundant water supplies of recent years have largely erased the scars of the previous drought. Instead of a critical shortage, there is an excess of water in some areas. Waterfowl, as well as other wildlife populations, have spread out over many thousands of acres where favorable food and cover conditions now occur. The permanent water areas developed by the Fish and Wildlife Service continue to serve an important function in a national program of waterfowl management and, at the same time, represent an investment in conservation insurance for subsequent drought cycles, which the weather records have shown to be of a recurring nature.

Actually, the water impoundments represent far more than an investment in the future of waterfowl management. The permanent marshes dedicated to the protection of native wildlife support a healthy nucleus of game birds and fur animals which figure prominently in public recreation. During the severe winter weather pheasants, as well as other wildlife, seek the protection of the marshes and brush covered coulees, but fan out over the countryside in the spring of the year to repopulate ranges where they are able to exist at other seasons.

The refuges are also a factor in local economy. The buffer lands bordering the marshes and impoundments are kept in productive use for growing grain, grazing, and hay cutting, all in accordance with sound principles of land management in line with primary objectives of wildlife conservation. The returns from the land use program have been substantial, and the portion of the receipts allocated by law to the countries from which the revenue was derived has added several thousand dollars to local school and road funds.

Do the permanent marshes and impoundments have any relation to ground water levels? The geologists say "yes." They also point out that there has been a serious loss of ground water in many locations as a result of the drainage ditches. The production of grain, of course, is tied in directly with ground water levels. Increased cultivation in North Dakota has made added demands on ground water supplies. The water areas maintained by the Fish and Wildlife service are not, of course, of such size as to have a direct influence over a large acreage, but locally they play a definite role in maintaining ground water levels, and in that respect represent social and economic values beyond those contemplated in attempting to safeguard the future of waterfowl.

Memory is a fickle thing. Some who were very complimentary of the waterfowl development program during the 1930's view the abundance of water in the Great Plains region today, and doubts arise in their minds as to the current, as well as future, importance of large-scale projects, such as the Lower Souris National Wildlife Refuge. The grain farmer is troubled by recurrent crop depredations and wonders whether the abandoning of the refuge program would minimize his problem.

As long as the farmers and ducks are competing for marshlands upon which the birds must rely for food from midsummer until late fall as the migrants move southward to their wintering grounds, there is a serious depredation potential. The ducks cannot pack a lunch for their long flight south, and in seeking daily rations are bound to resort to grainfields if their former natural feeding grounds are denied them. Depredations have occurred over a long period of years, dating far back beyond the establishment of the first waterfowl refuge in the Great Plains region. The problem will continue to exist as long as there are ducks. And do not overlook the blackbird, which, perhaps because of its smaller size, escapes much deserved blame.

By study and experience an effective program of depredation control has been carried out in the Lower Souris areas. This last season the refuge marshes and grainfields, manipulated specifically to attract and hold waterfowl during the critical harvest period, resulted in an estimated saving of 80,000 bushels of grain, which the local waterfowl concentrations would have consumed had these feeding areas been denied them. Similar results were obtained on other refuge areas in the grain districts. Further investigation may indicate more effective methods of controlling depredations, though the success of new techniques will be governed by the availability of sufficient natural habitat for confining the birds, whether in the northern Great Plains or elsewhere along the migration route.

The duck hunter interested in the perpetuation of his sport wants to know the productive potential of the large marshes and their relative importance as contrasted with small ponds and marshes scattered across the country and not under any plan of management for wildlife. Perhaps the analysis of the Lower Souris Refuge will help answer these questions. For example, during a time of drought, such as the one experienced in the early and mid-thirties, the larger water areas, particularly those with a reasonable expectancy of some water storage (as on the streams) will necessarily support a large portion of the waterfowl in the State. In 1936 and 1937 some 8,000 acres of water area on the Lower Souris National Wildlife Refuge unquestionably produced more birds than were raised on well over a million acres of land in the surrounding area, and supplied the essential habitat requirements for nearly a million ducks as the temporary pothole nesting ground in the vicinity dried up.

In the event of a future recurrence of such conditions, relatively few water bodies may well mean the difference between the survival and loss of the waterfowl population in the State.

The productive capacities of the waterfowl refuges in time of even normal or

wet years will be important from the standpoint of some species. The status of the redhead, a marsh nester, has been in a precarious position for some years. The breeding population of redheads at the Lower Souris Refuge, some 1,500 to 2,000 pairs in recent years, has been found to exceed that found on 2,000 square miles of private land in North Dakota. his species unquestionably needs some closed areas, call them refuges or something else, if it is to remain a significant part of the Continent's waterfowl.

For example, using the 1949 waterfowl breeding surveys of the State Game and Fish Department as a basis, the Lower Souris Refuge affords nesting habitat for waterfowl comparable to that found on about 700 square miles of surrounding area. Due to the island character of the nesting habitat, where predation is reduced to a minimum, the actual production that year was a crop of young birds equal to that found on nearly 1,000 square miles of surrounding area.

The Lower Souris National Wildlife Refuge has played a major role in rebuilding the deer herd in the upper river valley. Under the pressure of expanding agriculture there was little opportunity for the deer to exist in any numbers except in areas specifically set aside for wildlife. In the wooded breaks along the river and the sand hills at the south end of the refuge, the deer have made a strong recovery, and in the past seven years hunters took over 2,300 deer on the Souris Refuge, where less than 100 head were present in 1935. The rehabilitated wildlife habitat within the Souris Refuge boundaries is an oasis for pheasants and other upland game birds, and during the critical winter months large numbers make extensive use of the food and cover so essential to the protection of a basic breeding stock.

There is a rich population of fur bearers supported by the refuge marshes, including one of the largest concentrations of beaver in the Great Plains.

Recreational opportunities in the general area have been increased considerably as a result of the refuge program, and provisions have been made for picnicking, boating, fishing, and swimming to meet the growing demands of local communities, as well as of residents of cities within reasonable travel distance. Some of the recreational opportunities now provided were available to a very limited degree heretofore or did not exist at all. It is the policy of the Fish and Wildlife Service to permit the maximum possible use of refuge lands compatible with the primary objective of wildlife management.

The refuge has had some stabilizing influence on local economy, as farming and grazing are conducted on the refuge under permit in about the same degree as prevailed prior to the rehabilitation of the marshes and the development of permanent pool areas. Agriculture and grazing are effective and economical wildlife management tools, and the present pattern of land use, which is based upon wildlife management objectives, will be continued. The Fish and Wildlife Service is sincerely interested in the application of sound land management practices and continues to explore new means of increasing the general level of productivity of the marshes, as well as the fields and meadows in the buffer zone, which are essential to the overall success of the project.



A brood of gadwalls just out of the shells. Gadwalls are among the most abundant nesters on the Lower Souris National Wildlife Refuge. This brood of ducklings will find excellent food and cover conditions here. Of over 600 broods under observation, the average number per brood was 7.2. In 1949 the Lower Souris Refuge added 54,600 new ducks to the flyways.

Lower Souris, as well as other refuges, has been directly responsible for holding a shooting population of ducks and geese in the general area throughout the hunting season, just as these areas have been instrumental in sustaining local populations of resident game, such as the deer and fur bearers.

The most effective approach to the problem of decreased waterfowl habitat on the Continent has been the restoration of former nesting and feeding grounds of the creation of new ones.

(Continued on Page 14)



Each Spring snow geese and blue geese concentrate in immense numbers on the Lower Souris National Wildlife Refuge during their northward migration. Here, as many as 45,000 rest and feed before continuing their journey to the Arctic nesting grounds.

North Dakotans Ag

PROCLAMATION

of Norman Brunsdale, Governor of North Dakota

Relating to the times and places where antelope may be taken and the means of procuring a license for the taking, transporting and possessing of antelope in North Dakota.

Whereas practical game management requires that approximately one thousand (1,000) antelope be harvested in certain areas of North Dakota, and in order to relieve crop depredations resulting to farmers and ranchers, and

By virtue of the authority vested in me as Governor of the State of North Dakota, under the provisions of Chapter 20-08 of the North Dakota Revised Code of 1943, and in pursuance of the recommendations of the Game and Fish Commissioner on the taking and possession of antelope, I hereby Order and Proclaim:

FIRST: *Season.* The season for the taking of antelope shall be from *12:00 o'clock noon, Mountain Standard Time, September 22, 1951,* until sunset of that day and continue from sunrise until sunset of each day *until sunset of September 24, following.*

SECOND: *Bag.* One antelope of any age or sex may be taken, possessed and transported by the holder of a license which shall be issued as the result of having the names of applicants drawn at a public drawing.

THIRD: *Tagging.* Licensee shall have license on his person at all times while engaged in hunting or pursuing antelope. The carcass tag which is attached to and is a part of the license must remain attached to the license until the licensee has reduced his antelope to possession. Licensee must attach tag furnished on license immediately upon killing antelope and must attach metal locking seal *around leg bone and under tendon of leg* before transporting animal in any manner.

FOURTH: *Licenses.* Licenses will be issued and selected by public drawing for specified areas only, such as Unit Number 1, Unit Number 2, or Unit Number 3, which will be indicated on license and may not be used on any other unit. Antelope license to cost $5.00, and will be available to *North Dakota residents only* (excluding regularly employed Game and Fish Personnel) whose names have been drawn. Nonresidents of North Dakota shall not participate.

FIFTH: *Manner of Taking Antelope.* The use of full metal jacketed or altered projectiles shall be illegal ammunition for the taking of antelope during the 1951 open season. The use of shotguns in the hunting, pursuing or shooting of antelope shall be prohibited. Any automatic or semi-automatic *military* rifle shall be illegal. It shall be unlawful for any person to hunt, pursue, shoot or kill antelope with a rifle which discharges a projectile the diameter of which is less than twenty-two one hundredths of an inch or to use a cartridge which measures less than one and three-fourths inches in length, overall, with bullet unaltered and seated in the usual manner.

Antelope shall not be pursued, molested, shot at, or killed while in the waters of any lake or stream in the State of North Dakota.

The use of aircraft for the purpose of aiding or assisting in the hunting, killing, taking, concentrating, spotting, chasing, driving, or disturbing of antelope shall be prohibited. It shall be unlawful to drive, chase, or pursue with the aid of, or shoot at antelope from a motor vehicle, a horse or other animal.

All persons shall wear red caps while hunting antelope.

SIXTH: *Area.* Unit Number One. The open season area comprising and to be known as *Unit Number 1* shall consist of those parts of McKenzie and Golden Valley Counties lying within an area bordered by the North Dakota-Montana State Line and starting at its junction with State Highway Number 61, running easterly to its junction with State Highway Number 16, thence easterly on State Highway Number 16, and a continuing county roadway to its junction with the roadway known as the Rawson Redwing-Little Missouri River, thence southerly on the latter mentioned road to the Littel Missouri River, thence southwesterly along the west bank of the Little Missouri River to its junction with Beaver Creek, thence south-westerly along the west bank of Beaver Creek to its junction with the North Dakota-Montana State Line. Unit Number Two. The open season area comprising and to be known as *Unit Number 2* shall consist of those parts of Golden Valley, Slope and Bowman Counties lying within an area bordered by the North Dakota-Montana State Line, and starting at the northwest corner of Township 136, Range 106 on said State Line proceeding due east twelve miles to the Northwest corner of Slope County, thence due east along the North Slope County Line to its junction with U. S. Highway Number 85, thence south and westerly on U. S. Highway Number 85 to the City of Bowman, thence west and northerly on U. S. Highway Number 12 to its junction with the North Dakota-Montana-State Line. Unit

On September 22, 1951, North Dakota hunters will hunt antelope legally for the first time since the 1800's. Photo by L. Cadieux, New Rockford.



Antler Development

By HENRY J. McKIRDY
District Warden
Gladstone, N. D.

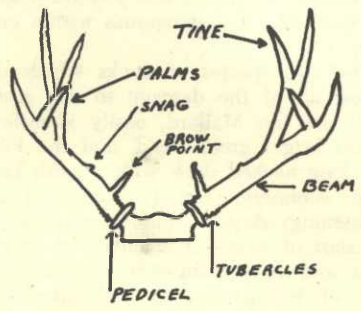
Antlers are usually considered the exclusive property of the male deer, but at times a female will be found with a small set. Antlers are shed and re-grown each year. Let's begin with the moment the antler falls off, usually in January or February. Bleeding begins from the pedicel, which clots very rapidly. Skin, which contains veins, nerves and hair, forms over the blood clot. The burr or warty substance forms first, this is caused by the overflow of blood.

The antler establishes its full diameter first and then begins to elongate. Antlers are supplied by two streams of blood, the stream which runs up through the pedicel and a second stream which feeds the velvet. The animal is very sensitive during the time of antler development.

The beam, or main stem, grows until it flattens, then bification takes place, which forms tines. The blood vessels eventually are filled in and closed, beginning at the top. After the antlers take on their solid form, the outer skin, or velvet, becomes very itchy, and the buck will rub his antlers against branches until all the velvet is removed and the antler becomes shiny. This whole process of growing antlers takes approximately 100 to 120 days.

A first year animal will usually produce a single beam or spike, with more tines being added along with each years set of antlers. The age can be guessed from the number of tines, but this is not accurate due to possible malformation of the antlers which may be caused by: 1. Injury to the antler during growth, 2. Injury to the animal itself, which usually causes malformation on the same side of the animal that was injured, or 3. Poor growth because of poor food.

If the animal is castrated, there is an abnormal growth of antlers, showing that testicles produce a hormone needed for antler development. If the animal is harmed in this way during the time his antlers are covered by the velvet, the antlers will rot and fall off within thirty days. A castrated fawn will not produce antlers.



TERMINOLOGY OF THE ANTLER

Pedicel – Cylindrical elongation from frontal skull bone to form a base for supporting the antler.
Beam—Main stem of the antler.
Tine—A large branch extending from the beam.
Snag—Very small branches or stubs.
Palms—Flattened portion of beam or tine.
Burr-Coronet—Irregular enlargement at the base of the main beam.
Warts ,Knobs, Tubercles—Warty eminences on lower portion of the beam.
Spike—A straight beam without branching.
Knobber—A short spike with a swelling on the end.
Hummel—A buck that is bald, without antlers.
Brow Point—First branch of the antlers, just above the pedicel.

NATIONAL WILDLIFE REFUGES

(Continued from Page 5)

Within the last year some easement refuge lands developed by the Federal Government during the drought peeriod were released to the North Dakota Fish and Game Department for multiple purpose wildlife management. In some instances the State found it possible to add to the size of the original project and thus expand the opportunities for waterfowl and other wildlife through the development of additional habitat. The Fish and Wildlife Service welcomes the State's able assistance in providing additional nesting and feeding habitat for waterfowl in North Dakota.

Educational programs of the State Fish and Game Department, the National Wildlife Federation, the Izaak Walton League, and other conservation agencies have had a very beneficial effect in focusing public attention on the long-time value of water areas managed specifically for waterfowl. However, from a national standpoint, there is still a critical need for the dedication of more marsh and water areas to the conservation of wildlife resources. It is therefore important that all conservation groups give their active support to the development of permanent marshes and impoundments on public and private lands wherever it is determined that a contribution can be made toward meeting the requirements of waterfowl and other wildlife and where such water development can be integrated in a land utilization program in a manner beneficial to the property owner and the general economy and well-being of local communities.

The national wildlife refuge system is not the final answer to the numerous and intrticate problems of waterfowl management, nor would a combination of Federal and State owned and operated management areas solve the problems for all time. The exercise of foresight and wisdom in the administration of privately controlled water fowl areas has been and will continue to be an important element in a national program. The Fish and Wildlife Service and the State Conservation Department cannot ignore their obligations to the public for developing and maintaining wildlife management units at strategic locations as insurance against the future. These projects, which represent a public trust, must be administered for public benefit and not subordinated to the wishes of special interest minority groups.

"FRECKLE NOSE"

(Continued from Page 11)

Soil Conservation Service, the 4-H Clubs, the Future Farmers of America, the county agents and the Game, Forestation and Parks Commission. (Your Game and Fish Commissioner, H. R. "Bud" Morgan, and his staff, recognize the importance of conservation education and this field.—A.C.F.) . . . These programs presented by specialists in these various fields are most successful. . . . *Their value would be substantially increased if they were the end product of a continued unit program in a rural school, rather than merely a one-shot inoculation.* A poignant part related to this continued conservation school program is the fact that *Speck, and others like him, can unquestionably sell the program faster to his farmer father than could any field man or any agency.*

It is only with the unbiased unity and cooperation of all governmental and state conservation and education agencies and institutions, when completely familiar with each other's categories and related problems and possibilities, that the average farmer may become acquainted with the unified picture of sound conservation activity. More important yet, *Speck and his pals may become so endowed while still attending the little country school that they will not have to wait until they reach adulthood to assimilate such conservation procedures as did their fathers.* Instead, they will be so fully equipped by graduation time that such conservation procedures will be mere routine in their work of making America more productive, as well as a better place in which they can raise their offspring. A place with less problems and more interests for freckled noses such as Speck.

DUCK DEPREDATION

(Continued from Page 13)

fore the ducks do. After they start feeding on your grain, it may be too late.

Keep a close vigil at daybreak and dusk to determine when and if waterfowl are going to feed in the field in question. It is extremely difficult to get them out of a field after they have fed there for a few days.

A couple of hours effort exerted daily for two or three days when ducks first start to feed in a field may well mean the difference between harvesting all of your crop or only part of it.

After your grain is all up, remove the frightening dvices and let the ducks feed there on the stubble. It may help your neighbor avoid loss if he has not completed harvesting operations.

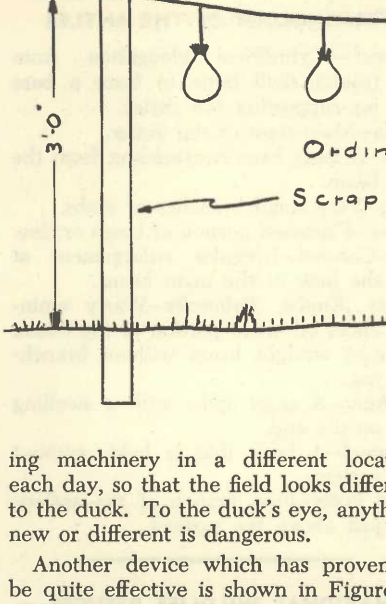
Duck Deprec

THE sight of a big flock of mallards against the early morning sky is one that has gladdened the hearts of hunters ever since the early pioneer days. That same flock of mallards appears in an entirely different light to the farmer whose swathed grain is still in the field. To the farmer, the duck may appear as a great danger to his livelihood. Ducks feeding on swathed grain can do great damage. For every bushel of grain the ducks eat, they knock off or tramp down four bushels more. Because of their highly gregarious nature, ducks feed in huge flocks, and the farmer whose field they choose for a dinner table is apt to be in for a pretty big loss.

What can be done about it? How can we keep the ducks from destroying the crops, without destroying the ducks that mean so much to sportsmen all along the central flyway from Saskatchewan to Mexico? There are several methods which have proven effective and which will be discussed here.

First of all, your duck control operations must start *before* the ducks have gotten accustomed to feeding in your fields. Once they have fed there for a few days they become bold about it, and it is hard to change their habits. If you start keeping the ducks off your fields before they get used to feeding in your fields, the job is relatively simple.

One of the oldest and still one of the best methods is the use of a scarecrow. Scarecrows should be as realistically constructed as possible. Ducks are pretty quick to recognize the rough imitation and lose fear of it in a hurry. If your scarecrow looks just like a man, ducks will shy away from it. The scarecrows should be moved regularly, so that the

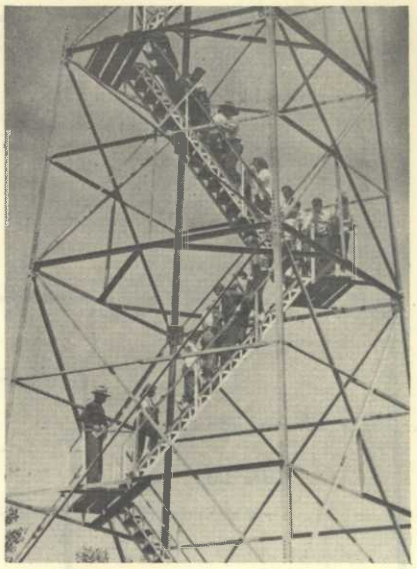


ing machinery in a different loca each day, so that the field looks diffe to the duck. To the duck's eye, anyth new or different is dangerous.

Another device which has proven be quite effective is shown in Figur The upright and cross arm may be c structed of ordinary scrap lumber. Sw els of the ball bearing type are prefer however, ordinary swivels will do, either case they require lubrication quently. The flashing tin or sheet alu num should be cut in pieces two square. The swivels and metal pi may be hung with ordinary baling w If trouble with ducks feeding at nigh experienced, a truck flare should placed beneath the flasher. The squ of tin or sheet aluminum revolving the suspended swivel serves as a flas when it moves in the wind. It has h

Metigoshe 4-H Camp

Delegates from all over the state met at Lake Metigoshe during the middle of June to attend the annual encampment of the 4-H. Conservation education was the main theme of the encampment, with Don Grey, Manager of the Lower Souris Wildlife Refuge, Dr. O. A. Stevens, Botanist of NDAC, Col. Dana Wright, and many others giving worthwhile instruction to the group. Part of the time was taken up by a tour of the Lower Souris Refuge, where the 4-H'ers learned much about the importance of the refuge to the nation's duckhunters, how a refuge is run, what species of waterfowl use the refuge and something of the problems of the management of such a big refuge.



No inspection of Lower Souris Refuge would be complete without a climb up the big tower.



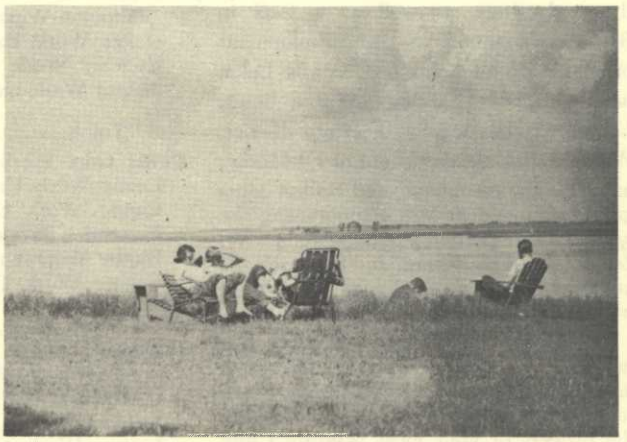
art of the group from the State camp of the 4-H at Lake Metigoshe.



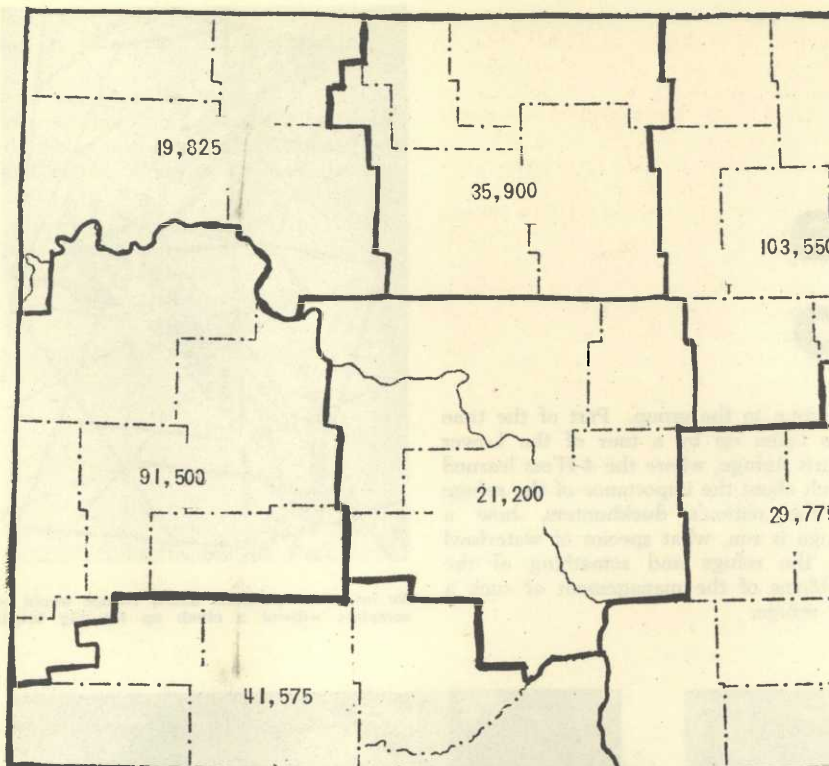
4-H'ers stop to face the camera during trip through Lower Souris Refuge.



The group listens to Don Grey, U. S. Fish and Wildlife Service, explain facts behind the operation of the big refuge.



Tired out after trip across refuge in hot sun, 4-H'ers relax alongside duck breeding ponds on Lower Souris.



445,650 New Tree

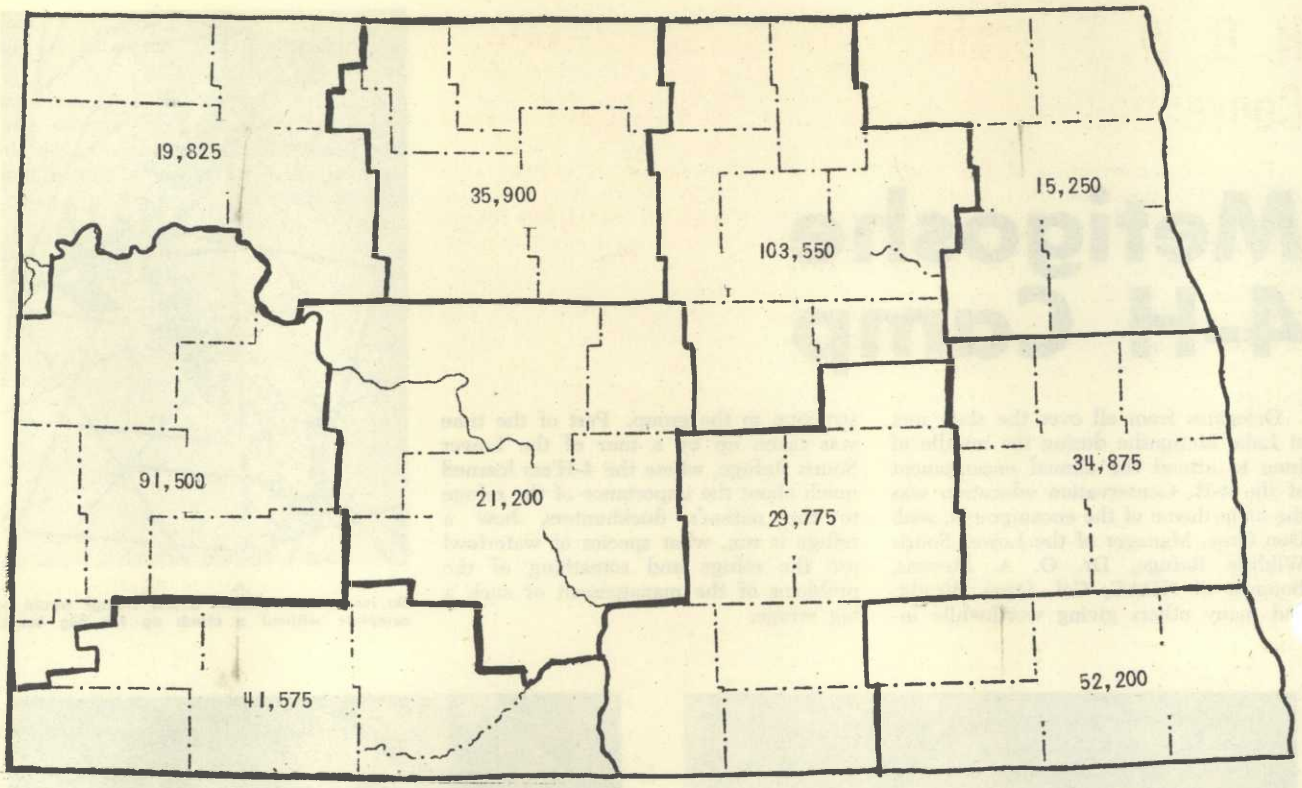
The tree planting program, sponsored by the State Game and Fish Department and the Soil Conservation Service, is getting into full production. 1951 plantings totalled just under half a million new trees and shrubs, providing new homes and more food for North Dakota wildlife. It is intended to expand the program even further in the years to come. At present, the Department has

Minot Work Group

Velva Work Unit	12,(
Towner Work Unit	10,5
Minot (East) Work Unit	5,7
Minot (Midland) Work Unit	7,7
Total	35,9

Fargo Work Group

Fargo Work Unit	
Valley City Work Unit	10,5
Mayville Work Unit	18,8
Hillsboro Work Unit	5,(



445,650 New Trees - 1951

The tree planting program, sponsored by the State Game and Fish Department and the Soil Conservation Service, is getting into full production. 1951 plantings totalled just under half a million new trees and shrubs, providing new homes and more food for North Dakota wildlife. It is intended to expand the program even further in the years to come. At present, the Department has four biologists stationed at various points in the state to help in the planning of these plantings, as well as a staff in Bismarck assigned to this development program. Keith Schreiner, Devils Lake, has the Northeast district; Wilbur Boldt, Jamestown, has the Southeastern district. William Hickling works out of Dickinson, handling the southwest, and Robert Morgan is stationed in Minot supervising the northwestern portion of the state. O. W. Zetter, headquartering in Bismarck, is in general overall charge of field work with this tree planting program.

For further information regarding this program, contact any one of the men listed above, your local Soil Conservation representative, your local Game Warden, the officers of your local Wildlife Club, or write direct to the State Game and Fish Department in Bismarck, N. D.

Minot Work Group

Velva Work Unit	12,000
Towner Work Unit	10,375
Minot (East) Work Unit	5,750
Minot (Midland) Work Unit	7,775
Total	35,900

Fargo Work Group

Fargo Work Unit	150
Valley City Work Unit	10,250
Mayville Work Unit	18,875
Hillsboro Work Unit	5,600
Total	34,875

Wahpeton Work Group

Wahpeton Work Unit	3,050
Oakes Work Unit	24,500
Edgeley Work Unit	23,450
Milnor Work Unit	1,200
Total	52,200

Devils Lake Work Group

Leeds Work Unit	32,025
Cando Work Unit	35,350
Fessenden Work Unit	14,500
Rugby Work Unit	20,875
Rolette Work Unit	800
Total	103,550

Jamestown Work Group

Jamestown Work Unit	19,275
Carrington Work Unit	2,725
Steele (Kidder Co. Work Unit	6,575
Linton Work Unit	1,200
Total	29,775

Park River Work Group

Park River Work Unit	7,550
Lakota Work Unit	7,700
Total	15,250

Bismarck Work Group

Bismarck Work Unit	6,400
Mandan Work Unit	1,550
New Salem Work Unit	1,100
Washburn Work Unit	2,25[illegible]
Garrison Work Unit	8,0[illegible]
Hazen Work Unit	1,875
Total	21,200

Williston Work Group

Crosby Work Unit	3,625
Bowbells Work Unit	9,350
Stanley Work Unit	3,250
Van Hook Work Unit	3,600
Total	19,825

Dickinson Work Group

Watford City Work Unit	1,200
Killdeer Work Unit	56,900
Beach Work Unit	56,900
Dickinson Work Unit	30,000
Total	91,500

New England Work Group

New England Work Unit	36,575
Mott Work Unit	5,000
Total	41,575
GRAND TOTAL	445,650



"Goldie" the partial albino hen gadwall returned to the same haunts for the 5th successive year. She has engageg in nesting activity each year, was observed with a brood in 1949.



Flushing bar. Tin cans containing pebbles suspended from beam. Used in mowing for leafy spurge control.





N-754 after being run into by another aircraft in a taxiing accident at Towner, N.D. airport (DVG)





A July 4 catch at the Freeman Bridge Fishing Area (Northern Pike)



A portion of 40 cars, July 4 at the Freeman Bridge Fishing Area



Pintail stubble nest moved over into plowing.
This a successful nest on a farm off the
Refuge





Smoke from burning stubble field before plowing, a common practice on many farms.



Close-up of above after burning and before plowing.



Loading plane for millet seeding.



Wood duck habitat, Souris River bottoms.

ROUTING SLIP BRANCH OF WILDLIFE REFUGES DATE: MAY 28 1951

MR. SALYER _____

MR. KRUMMES _____

MR. DUMONT _____

MISS BAUM _____

SECTION OF HABITAT IMPROVEMENT:

~~MR. GRIFFITH~~ REG

DR. BOURN _____

SECTION OF OPERATIONS:

MR. BALL _____

MR. REGAN _____

~~DR. MERLEY~~ Len

SECTION OF LAND MANAGEMENT:

~~MR. ACKERKNECHT~~ _____

_____

STENOGRAPHERS:

_____ _____

_____ _____

_____ _____

NARATIVE REPORT

REFUGE: LOWER SOURIS

PERIOD: JANUARY-APRIL, 1951

LOWER SOURIS NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

For

JANUARY, FEBRUARY, MARCH, APRIL, 1951

United States Department of the Interior

Fish and Wildlife Service

Upham, North Dakota

P E R S O N N E L

Donald V. Gray.....Refuge Manager

Raymond M. Glahn.....Pilot-Biologist

Howard S. Huenecke.....Ass't.Refuge Manager

Sigfred A. Nygard.....Refuge Clark

Robert W. Arrowsmith.....Refuge Mechanic

Thomas W. Lawson.....Maintenance Man

Alvin Brandt.....Maintenance Man

Palmer J. Lunde.....Maintenance Man

Merrill C. Hammond..... Wildlife Management Biologist

I. GENERAL

A. Weather Conditions

Month	Snow	Precip.		Temperature Max.	Min.
January	3.0	0.39		35	-42
February	9.8	0.74		36	-36
March	6.6	0.61		45*	-30
April	5.3	1.22		76	14
Total	24.7	2.96	Ext.	76	-42

*Maximum thermometer broken March 17 - 24.

All readings taken at refuge headquarters.

Totals of weather measurements for the same period during the past five years are shown for comparison:

Year	Snow	Precip.		Temperatures Max.	Min.
1947	33.0	3.92	Extreme	87	-35
1948	40.4	6.26	"	73	-35
1949	37.1	3.16	"	88	-45
1950	34.8	2.21	"	70	-42
1951	24.7	2.96	"	76	-42

The total snowfall for the 1950-51 winter period was 35.7 inches which is the least amount since 1947. It did exceed the average, however, which is 31.1 inches. The end of April saw but very few drifts remaining and those only in very sheltered places.

The breakup, while slower than in 1949 was not as late as 1950 when it was reported "....Aerial flights over the entire length of the marsh near the 30th of April disclosed that north of headquarters about 10% of the marsh was open...."".....15% of 326 unit at headquarters was open by the end of April...." The ice finally went out of 326 unit in 1950 on May 14, and this year on May 2. A flight by Hammond and Glahn on April 25 showed the units as follows with the degree of open water: 320 - 100%; 326 - 50%; 332 - 75%; 341 - 50%; and 357 - 10%. It was fortunate for us that this much ice remained as on April 27 and 28 high winds from the SE could have caused considerable damage to dikes and road crossings with the high water present.

January again, as in most past years, was the coldest month of the quarter although not as cold as January, 1950. That month had 20 days when the maximum was below zero. In 1951, however, only 7 days were present with below zero maximum readings.

There was a "February thaw" the last week of February that saw temperatures get up to 34, 35 and 36, but immediately after in the first week in March we began to get what was one of the toughest months of March for several years. There were two periods of blizzard conditions, though not much snow was received. The first period, 5-10 was characterized by high winds, blowing snow and 3 inches of snow. This blocked roads that had been open all winter, and made some huge drifts out of smaller ones. The winds during these periods were quite variable with frequent changes in direction. A snowflake that that started out angular was worn round in short order being shunted to the NW, then to the SE, and back and forth ad infinitum (it seemed).

April was a pleasant month with a few periods of raw winds and snow squalls, but the temperature trend was definitely upward with the highs of 74-76 reached at the end of the month.

Precipitation for the month was normal and only .02 under the 53 year average 2.96 compared to 2.98.

B. Water Conditions.

Considerable water fluctuations was experienced all through the quarter, due to the spill from the Upper Souris Refuge through the winter months. With gates frozen in solid it was very difficult to make the adjustments to care for the flow and after each change the flashings would freeze down and ice form again in front so that in a short while we had it all to do over again.

The creeks started spring runoff about the 6th of April and ran pretty full for about 5 days before starting to taper off. Only one bridge went out on Boundary Creek, that on the grade to Landa from Highway #5. Several bridges on other streams were endangered but prompt action by highway crews in blowing ice jams saved them.

A summary of water conditions by units follows:

Rubble-massonry unit. Unit completely flooded. At the end of the month of April the flow over Dam I was 16" and over Dam II 15".

320 unit. All gates open wide, no change in opening from last fall. The highest reading to date was 1424.20, one foot higher than the highest last year.

326 unit. Center gate opened wide, outside gates 4', highest readings 1421.30 but dropping at the end of the month slowly. High winds on April 29 and 30 caused a little wash on the dike, but not of any great consequence. The structure and spillway came through the period in fine condition.

332 unit. All gates wide open, the highest reading being 1418.40 just before the end of the quarter and dropping slowly. The high reached last year was 1418.70. The dike, spillway and gate structures weathered well.

341 unit. All gates open wide, the highest reading 1416.80 dropping to 1416.68 at the end of the period. All structures in good condition.

357 unit. Center gate wide, outside gates closed with water over the spillway and 1½ foot over the two outside gates. The highest reading was 1415.64 at the end of the month and still rising slowly. The head at the spillway was about 8" at the end of April, as the water is not getting away very fast in Canada. Dike, spillway, and structure in good condition although additional rip-rap will have to be placed around downstream wing walls.

At the end of the period a crest was reported on the Souris River at Estevan, Saskatchewan, and gates were again opened at Lake Darling, Upper souris 5', so we can expect another slug of water before the end of May. The gates had been closed in the latter part of April accounting for our lowering water levels at the end of the period.

C. Fires

One fire occurred on the refuge, at the boneyard when a grass fire accidentally started by three boys caught up the red granary and burnt it completely to the ground. When discovered at 6:26 pm, April 15 a strong NW wind was blowing, carrying the smoke away from the headquarters buildings so that it had gotten too much of a start to put out even with the newly arrived fire pump. Main efforts were expended on controlling the grass fire and saving other buildings in the area. The loss included the building, a fanning mill, 70 bushels of barley, 1064 pounds of bluegrass seed, and one Fraim lock. Total value of property destroyed $1078.40.

II. WILDLIFE

A. Migratory Birds

1. Population and Behavior

The waterfowl migration got off to an exceptionally early start this year when about 200 Common Canada geese arrived at Rugby, about 60 miles southeast of headquarters, on February 24, during a week of mild weather. This early start was a false one though, as cold and snowy weather set in again and lasted until the latter part of March.

Just what happened to these "early birds" is not known. They probably went back south aways to wait for the return of mild weather.

The Common Canada geese returned to Lower Souris to stay on March 26, when 42 arrived. After that date there were several flocks that stopped at the refuge for a day or so and then moved on. By April 13 all but the resident flock had moved on. From the waterfowl census made on the 13th, it is believed that our resident flock of common Canadas numbers about 175. An aerial survey conducted on April 25 revealed that there were at least 50 breeding pairs (=100 adults); 40 nests were located. There were possibly 75 immature geese, bringing the total to approximately 175.

The large percentage of the migrant geese this year were again snow-blues. Little use of the refuge is made by these geese; the off refuge areas, especially the Kramer-Whitespur area, Newburg area, and the area around the junction of state highways 14 and 5, held the largest concentration of these birds. It was common to see flocks of up to 5000-8000 geese in these areas. The snow-blue geese were first seen on April 4, and from that date on there was a steady increase to a peak that occurred during the week April 22-28. On the refuge, the largest concentrations of snow-blue geese were seen in 341 unit. On April 25 Glahn and Hammond counted 2500 birds on this unit.

Lesser Canada, Richardson's, and white-fronted geese were also observed, but made up only a small percentage of the total goose migration.

The first pintails and mallards were observed on April 3. A fairly heavy migration occurred on that day, with an almost constant stream of small flocks passing overhead throughout the day. Between 4:30 and 5:30 p.m. on April 4, approximately 1500 ducks and 2000 geese were seen flying northwest over structure 326. Pintails and snow-blue geese were the dominating species.

The following table shows the first arrival dates of waterfowl on the Lower Souris Refuge for the years 1950 and 1951:

SPECIES	Arrival Date	
	1950	1951
Whistling swan	Apr.7	Apr.13
Canada goose	Mar.31	Mar.26
White-fronted goose	Apr.6	Apr.4
Snow-blue goose	Apr.14	Apr.4
Richardson's goose		Apr.4
Mallard	Apr.2	Apr.3
Gadwall	Apr.27	Apr.20
Baldpate	Mar.30	Apr.10

Arrival Dates continued.

SPECIES	Arrival Date 1950	1951
Pintail	Mar.30	Apr.3
Green-winged teal	Apr.15	Apr.10
Blue-winged teal	Apr.24	Apr.24
Shoveller	Mar.31	Apr.6
Redhead	Apr.21	Apr.12
Ring-necked duck		May 3
Canvasback	May 1	Apr.10
Scaup	Apr.15	Apr.10
Golden-eye	Apr.11	Apr.12
Buffle-head	Apr.28	Apr.29
Ruddy-duck	Apr.24	Apr.25
Am. Merganser	Apr.5	Apr.2

Inspection of this table reveals that nine species arrived earlier in 1951 than in 1950, eight were later, one the same, and two were not reported in 1950 .

While the data above does not show decisively that we have had an earlier migration this year, it is true that from the standpoint of population numbers, the waterfowl have arrived earlier.

Swans were present in the spring migration in about their usual numbers. The first swans, 11 of them, were seen on April 13. On April 25, 400 were counted in 320 unit.

On April 13 an aerial waterfowl census was made by Glahn and Huenecke of the refuge and immediate vicinity (from 1 to 5 miles outside). As in the past, the transect method was used, flying strips parallel to section lines. It is believed that the census made on this date is comparable to the one made on May 4 of last year (considering weather and general advance of the spring season). The following are comparative figures for these two censuses:

	May 4, 1950	Apr.13, 1951
Ducks for refuge and vicinity	4,220	10,126
Geese for refuge and vicinity	11,076	7,051
Swans for refuge and vicinity	255	11

On April 25, an aerial survey of the refuge, conducted by Glahn and Hammond, revealed the following information:

Refuge Unit	% Open water	Ducks	Swans	Snow-Blue Geese	Other Geese
320	100	1,500	400	-	100
326	50	1,000	-	-	50
332	75	1,000	-	-	30
341	50	2,000	-	2,500	1200
357	10	2.800	-	-	1000
	TOTALS	8,300	400	2,500	2,380

On off refuge areas, 31,500 snow-blue geese were observed.

Hammond reported that two-thirds of the ducks on the refuge were divers (scaup, canvasbacks and redheads); of the rest, pintails and mallards were most common. This is probably due to the fact that there is high water in all the refuge units and and abundance of water in the fields and potholes of the surrounding area (on April 13 it was estimated that 15 to 20% of the off-refuge area north of headquarters, in a strip about 20 miles wide, was under water). The divers are attracted to the refuge while the dabblers are spread out over a vast area.

As indicated above, there is an abundance of water in the fields; however, there is not as much as there has been in the previous two years. By early May, at the end of the spring run-off, the water areas were much lower and fewer in number than for several years. It is entirely possible that, as a result of the fewer potholes with water, we will have some increase in the numbers of dabblers using the refuge.

Glahn and Hammond also made a goose-nesting (Common Canada) survey on the 25th, the following shows the location and number of nests by units:

Unit	Location of Nests	Number of Nests
320	Islands	17
326	Islands	17
332	Marsh	2
341	Islands & dike	4
	Total	40

From 0 to 8 eggs were observed in the nests. From this, we can expect our first broods of Canada geese about May 25, barring accidents, of course. The above total of 40 nests is a new record for this refuge. The islands used so extensively as nesting sites are almost exclusively artificial ones. The heavy use of such islands by the geese is a strong point in favor of the maintenance of such islands and the "hoped for " construction of others. These islands are also put to heavy use by ducks (especially gadwalls) and other water and marsh birds.

On April 20, Glahn reported finding two pintail nests, each with three eggs. Apparently many of the mallards and pintails have begun nesting as the ratio of males to females observed has taken a considerable jump.

For the water and marsh birds, the following is a listing of the first arrivals: Great blue heron, 1 - 4/13; Black crowned night heron, 2 - 4/19; White pelican, 190 - 4/24; Double crested cormorant, 20 - 4/25; Eared grebe, 7 - 4/24; Holboell's grebe, 1 - 4/29; Western grebe, 3 - 5/5; American bittern, 1 - 5/5; and Sora rail, 2 - 5/5.

On the shorebirds, gulls and terns, the first arrival listing is as follows: killdeer, 2 - 4/7; semi-palmated plover, 1 - 4/9; Herring gull, 1 - 4/13; California gull, 1 - 4/13; Franklin's gull, 10 - 4/21; Warbled godwit, 2 - 4/24; and avocet, 2 - 4/27.

The first record of mourning doves was on April 12, when two were seen. As of this writing, it appears that the main part of the population is back and nesting activities have been started.

B. Upland Game Birds

The pheasants, Hungarian partridge and sharptailed grouse appear to have come through the winter in good shape despite the several blizzards that occurred in March. Only one dead pheasant (a male) was found by refuge personnel. This bird died of suffocation when ice and snow packed in his nostrils and mouth. Some winter feeding was done around headquarters and the Thompson and Skar places, but not extensively otherwise. Up to 50 pheasants stayed in the airport and headquarters area and about that number at the Thompson and Skar places. One covey of 12 Huns. fed regularly at residence 1 at headquarters, along with a few pheasants, sharptails and jackrabbits.

The pheasants have started nesting activities (and probably the other upland game birds, though not observed), and so far it appears that the season will be more successful than last year.

One prairie chicken was seen on February 12, between Dams I and II, by Al Brandt.

C. Big Game Animals

The white-tailed deer herd on the refuge came through the winter in good shape. Browse was adequate and snow did not become deep enough to seriously hinder free movement.

On February 27, an aerial census was made on the refuge to determine the size of the deer herd. 159 deer were counted; of these, all but 11 were found south of headquarters in and adjacent to the Souris River bottoms.

"The 'buck law' during the 1950 big game season apparently did not reduce the population as much as was anticipated. Animals moving into the refuge have made up to some extent the loss suffered during the open season". (From report to the Regional Office, Gray.)

The following is a summary of the deer population of the Lower Souris Refuge, 1935 - 1950, compiled from the narrative reports. This information was worked up by Huenecke during the winter months by going back through all the narrative reports and assembling all pertinent information on deer. In this process, data on other forms of wildlife were also tabulated and it is planned to include one or more of these summaries in future narrative reports.

WHITE-TAILED DEER POPULATION SUMMARY, LOWER SOURIS REFUGE, 1935 - 1951

1935 When the Lower Souris Refuge was first established, white-tailed deer were fairly common in the sandhill and river bottom areas. With the end of grazing on refuge areas, it was expected that there would be a marked increase in the population. The herd in 1935 was estimated to be about 100.

1936 Little available information for this year, apparently the status of this deer herd was about the same as for 1935.

1937 It was estimated that, by the end of this year, the herd had increased 100% over that of 1935. This increase undoubtedly was the result of influx from surrounding areas in addition to the annual increment.

1938 Again an increase of about 100% over previous year. A November census revealed an estimated 600 deer on the refuge. (Census made by CCC drive.

1939 This year too saw an increase, though not as spectacular as in the previous two years. The estimated population was 790 deer. (CCC drive census.)

1940 No information except that the estimated population was 1085. (Aerial censusing was begun this year.)

1941 During the winter of 1940-41 it was decided that the deer herd had reached what should be its maximum concentration. In January, the population was estimated at 1085 deer. It was observed that red-osier dogwood was being damaged quite heavily, while oak, ash, currants, willows, box elder, black haw and juneberry were being used extensively. Elm, chokecherry, plum and snowberry were being lightly browsed, and aspen, hawthorn and rose occasionally. Heavy use was made of standing corn, wheat and barley.

It was decided that the refuge should be opened for hunting in order to reduce the herd, and the season was set to extend from November 22 to December 19.

Apparently there was a considerable dispersal of deer out of the refuge during the summer, as a census conducted November 6 revealed a population of 750.

The 1941 deer hunt was a controlled hunt; 615 permits were issued, 504 were actually used. 393 hunters were successful, giving a hunter success of 79.3%. While 393 deer were checked out through the stations, it was estimated that at least 400 deer were killed (5 were found dead after the season.)

Of the 393 deer checked, 228 (58%) were bucks, 165 (42%) were does. It is interesting to note that one mule deer was shot on the refuge that season.

The season was closed after four days, when the 393 deer had been taken. A census conducted on November 26 revealed an estimated 250 deer remaining.

1942 A count in February of this year placed the herd at 610. The December count 835.

1943 The February census (made by State personnel) revealed a herd of 800 deer. Again it was noted that dogwoods were being heavily browsed. By the end of the summer the herd had increased to 1100, and plans were made to take off 450 to 550 deer the following November.

1067 permits were issued for the season which was to extend from November 26-30. Approximately 800 hunters were checked in, and 575 deer were checked out, on the first day; this ended the season

The estimated population as of December 31 was 650. According to the narrative report for that period, it was believed that the food would be no problem, and that the population had been reduced to a point where there was plenty of browse.

1944 By the end of April, the herd was estimated at 500; a decrease probably attributable to dispersal. No evidence of over-browsing was noted during the past winter. By the end of December, the herd had increased to 650, the same population as of a year ago. No information was found in the narrative reports to indicate whether there was poor reproduction this year or not; The movement of deer in and out of the refuge probably accouns for many of the differences in population size that occur.

1945 At the end of the summer of this year, the population was estimated at 735 deer. Some loss of fawns to coyotes occurred. The third open season for deer was held this year during the last five days of November to eliminate any immediate danger of over-browsing. An aerial census was conducted the day before the season opened and this herd size was estimated at 850 deer. 428 hunters applied for permits (a limit of 450 permits had previously been set), and of these, only 338 actually hunted. 317 deer were actually checked, and it was believed that 400 to 500 deer were shot that were users or potential users of the refuge. Of this 317, 165 (52%) were bucks and 152 (48%) were does; 98 were fawns or yearlings and the remainder adults.

A post-season census revealed that 368 deer were left on the refuge. At this time it was believed that, while there were "possibly a few too many" deer left, "we can take care of the herd another two years without undue damage to the vegetation." (Narrative report for Sept-December, 1945.)

By the end of December, the refuge herd had increased to 500.

1946 According to the narrative reports, the deer herd wintered well even though the snow forced practically all the deer into the river bottoms. In the May-August report it was stated that: "It is believed that the refuge can support a herd of about 700 deer without undue depletion of the winter food supply."

The estimated population at the end of December was 700 deer.

1947 By the end of April, the deer population was up to an estimated 825.

In February and March a browse survey was conducted by M. C. Hammond. The results of this survey indicated that much of the deer range had been definitely over-browsed in recent years. (Compare this with what was reported since 1943 in regards to the range condition and its carrying capacity!)

As a result of this survey, plans were made to remove 800 deer during a season to extend from November 21-25, or an additional five days if needed. The pre-season census this year revealed a population of 1350 deer.

During this season the fourth controlled hunt was conducted on the refuge. 1180 hunters checked in, 795 deer were checked out - for a hunter success of 67.3%. It was believed that at least 200 more were shot immediately outside the refuge, and probably quite a few were slipped under fences or left dead in the field.

Of the 795 deer checked, 608 were adults, 187 were fawns; 399 were does, 396 were bucks.

During this hunt P-R personnel of the North Dakota Game and Fish Department again aided in checking. Members of the Veterinary Department of the State Agricultural College were also present and collected blood samples and intestinal tracts. These were examined for parasites, arthrax, Bang's disease, etc. It was reported by Dr. Bolin (of N.D.A.C.) that he had never seen such a healthy bunch of deer. However, it was believed that one deer had Bang's disease.

A more careful analysis of the deer population statistics made this year indicated that previous estimates of annual increases (33%) had been too conservative, and that it was probably better than 60%! (At least during the years of deer increase and abundance.) Experiences of the State Game and Fish Department indicated parallel findings.

The post-season census which was conducted showed a population of 550 deer left - the removal still had not been high enough!

1948 The winter of 1947-48 was a hard one for the deer. While the deer in timbered areas wintered satisfactorily, those in the open marsh were on the verge of starvation before spring arrived in mid-April. Two deer were found, one dead and one mortally injured from their inability to jump a fence. Both were autopsied and found to be in a seriously emaciated condition, even to the extent that their bone marrow was red and jelly-like. Their stomachs were full, but contained only the remains of dead weeds. During a waterfowl census on May 4, three more dead deer were found.

The over-all food condition at this time was poor. In the open marsh the animals were existing on dead weeds (and grain when it could be found) and in the timbered river-bottoms the available browse was sadly over-utilized.

The fifth hunt in the history of the refuge was held from November 27 to 29. This was an uncontrolled hunt, with no permits issued and no regular checking stations operated. It was estimated that about 1200 hunters took part and removed approximately 600 deer. (A ten-day bow and arrow hunt from November 20-30, in which about 30 archers participated, was entirely unsuccessful.)

It was felt that for the first time an adequate removal was obtained. The kill was adequate but not excessive due to good cover in the heavy emergent marsh vegetation and the heavy snow conditions in the brush that greatly reduced visibility.

The estimated total population as of December 31 was 100. There was no information available on the pre-season population for this year.

The over-browsed areas in the river bottoms made a good recovery this year. The rabbit, beaver, and deer populations were all lower than they had been for several years, and the demand for the browse species was correspondingly lower. Also, the thorough soaking of the river bottoms during the high spring floods was beneficial to browse reproduction and growth.

1949 The winter of 1948-49 turned out to be the worst one for deer in the history of the refuge. It was fortunate that so many had been removed during the previous season. Despite an improvement in food conditions following last year's flood, the supply was inadequate and starvation losses occurred. Some loss was also attributed to the weakened condition of deer that made them easy prey for dogs and coyotes. The estimated loss on the refuge was 15 animals. In the Turtle Mountains (and other off-refuge areas) the loss of deer due to starvation was very high.

By the end of the year, food and cover conditions had improved. The estimated population at the end of December was 100 deer.

1950 The deer herd at the end of April was estimated at 147. A complete and intensive survey was made in March to determine what the browse conditions were since the deer herd was effectively reduced in 1948. This survey revealed that no serious over-browsing was being done on the reproduction of common timber species, or on preferred browse species. It also revealed that the deer range in general had made a good recovery following its over-use during the years of peak populations.

A three and one-half day deer hunt was held on the refuge from November 10-13. This season was for the taking of forked-horn bucks only - conforming with the state season for this section of the state.

An estimated 552 hunters took an estimated 75 forked-horn bucks. Again no checking stations were maintained, but all refuge personnel were on duty during the entire season, and spot checks were made at various places throughout the season. It was believed that only a very small illegal kill was made.

The estimated population at the end of December was 180 deer. Despite the small population on the refuge at the beginning of the year (147), the open season did not reduce the population excessively.

Food and cover conditions at the end of the year were good, with ample browse available. Excellent seedling crops of ash, box-elder, dogwoods, and other species were noted during this year.

1951 See section of narrative report preceding this summary.

The following table summarizes the populations, removals, number of hunters and hunter success for the years 1935-1951.

	Population			No.		
	Estimated Peak	Pre-Season Census	Post-Season Census	Deer Removed	No. Hunters	Hunter Success
1935	100	No	Season			
36	-	"	"			
37	200	"	"			
38	600	"	"			
39	790	"	"			
40	-	"	"			
41	1085	750	250	400*	504	79.3%
42	835	No	Season			
43	1100	1100	650	575*	800	71.8%
44	650	No	Season			
45	850	735	368	317*	338	90.8%
46	700	No	Season			
47	1350	1350	550	795*	1180	67.3%
48	700	?	100	600	1200	50.0%
49	130	No	Season			
50	260	260	180	75	552	13.0%
51	-	February Census-159				
		TOTALS		2762	4574	51.0%

*Controlled Hunts

The table below shows the reproductive rate (computed by M.C. Hammond) of the refuge deer herd during various intervals of the period from 1935 - 1951:

Year	Population	Period	Reproductive Rate
1935	100)	6 years	40.0%
1941	1085)		
1942	610)	2 years	34.0%
1943	1100)		
1943	650)	2 years	28.0%
1945	735)		
1945	500)	2 years	64.0%
1947	1350)		
1947	550)	2 years	13.0%
1948	700)		
1948	100)	2 years	60.0%
1950	255)		

The average reproduction rate for the 17 year period was 40.0%

The preceding information shows how the deer herd on the refuge has fluctuated during the 17-year period from 1935-1951. From 1935 to 1943 the herd increased greatly. The main factor involved was probably the improved habitat, made possible by reduced grazing in the sandhills areas and timber cutting operations in the river bottoms. From 1944 to 1946 the herd was fairly stable, and then made a tremendous increase by 1947. This was apparently a banner year in deer reproduction, not only on the refuge but throughout the state. A heavy influx of deer to the refuge also probably occurred. It was not until 1948, when the fifth refuge hunt was held, that the herd was finally reduced adequately, and the over-use of the range that had been occurring was stopped. Since 1948, the herd has been fairly stable, at a new low level.

Under the present conditions of the deer range, a herd of 200 to 400 animals is probably the maximum that can be maintained without undue damage to browse. It is felt, however, that if more intensive management practices (especially timber cutting) could be carried out a herd of 500 to 700 deer could be supported. With the decreased demand for wood by local people it is not probable that any timber cutting of consequence will be done. The deer herd on refuge will have to be closely watched in the future to prevent over-use and depletion of existing habitat.

D. Fur Animals, Predators, and Other Mammals

Beaver:

Beaver have been increasing on the refuge in the past few years. A harvest of 60 beaver had been planned and approved for this past spring season, but circumstances prevented it. To begin with, only one trapper was interested in taking beaver - all others felt there was too much work involved for the return (beaver prices have dropped). Then, this one trapper was ill for about two weeks during the season (April 1-30) and was unable to work. All in all, only 12 beaver were removed.

Beaver sign and observations have been common this spring; it will be undoubtedly necessary to try to effect a larger removal next season.

Muskrat

Our fall aerial house count, made on November 11 and 13, 1950, indicated that the muskrat population had made an increase over the previous year. While the take this year (1511) was almost twice that of last year (781), our present population is believed to be about the same as a year ago.

The weather conditions during the winter, and up until the middle of April, prevented much trapper success. The last two weeks of April (season closed April 30) were favorable though, and a fairly good take was effected.

The increased take this year was due mainly to the better coverage of trapping units 1-5, in the north end of the refuge, by trapper Ben. Clark. Clark was not with us a year ago, and the trapper who worked these units just didn't do the job. Clark trapped 1280 rats this season (out of the 1511 total), and the majority of these were taken in 357 unit. This take at 357 was especially welcome in view of the amount of damage that has occurred to 357 dike.

An inspection of the dikes this spring revealed that all dikes have some new rat runs in them that will require attention. This is a yearly occurance, of course, and will always be a problem.

Raccoon

The total number of raccoons taken is 21. The population is still fairly high, and there will undoubtedly be duck nest predation by the coons again.

Badger

Only seven badgers were removed by the permittee trappers this past season; the condition of some of our patrol roads will necessitate further control. The population is quite high, and it is unfortunate that long-haired fur-prices continue to be so low.

Skunks

Skunks are still abundant and still rank at the top of the predator list. The permittee trappers removed only 118 this past season. 23 have been killed by refuge personnel this past month, and as many more as possible will be taken as time permits.

Mink

The take of 106 mink is the highest since the season of 1946-47.

Despite this, mink are still commonly seen, and indications are that the population is still comparatively high. Two of our best trappers stated that they have seen more mink and mink sign this spring than a year ago.

Weasel

Only 13 weasel were taken this season (November 15 - February 15, as for mink,) Sight and sign observations indicate that weasels are present in about the same numbers as last year.

Red Fox and Coyote

The total number of red fox taken this past season (November 1 - April 30, the same as for badger and skunk) was 45. The permittee trappers (including one airplane hunter) accounted for 37, and predator and rodent control men shot eight.

Eight coyote were removed this season, four by predator and rodent control men, and four by the permittee plane hunters.

The fox and coyote populations are believed to be fairly low at this time and should now be no cause for complaint by the local farmers.

Rabbits

Jackrabbits and snowshoes are fairly abundant; cottontails are seen occasionally.

Porcupine

No change in status.

Small Mammals

Little to report this period. Thirteen-stripped ground squirrels are commong and Franklin and Richardson's ground squirrels have been seen occasionally.

E. Predacious Birds

Hawks

The spring hawk flight has been about average. Redtailed hawks were first seen on April 6 and were fairly common by April 10. American rough-legged hawks were first seen on April 17 and were common by the 24. The first observation of marsh hawks was made on March 28; they were common by April 10. One duck hawk was seen at Upham on January 10 by Glahn and Lawson; no observations on this

species since Sparrow hawks were seen on April 10 and had become common by April 26.

Eagles

Golden eagles were seen frequently throughout the period. On April 24, Glahn counted 24 between the Thompson Place and the Freeman Bridge (at north end of 320 unit). One Bald eagle was seen on March 23, and one on April 4.

Owls

Snowy owls were present throughout the period in about normal numbers. A total of 48 observations were made during this period. The last observation of a snowy owl was made on April 29.

Six burrowing owls have been seen after the end of the period - on May 4.

One screech owl was seen on January 31 in the old nursery house.

Short-eared owls have been abundant this spring.

Crows

The crows are present in about usual numbers.

Suggestions for Improving Narrative Reports

In going through all the narrative reports on the Lower Souris Refuge, from 1935 to the present, to summarize data on all wildlife species, a few discrepancies were noted. The following are some suggestions that may be of value to help improve future NR's, not only our own, but those of other stations as well:

1. Make sure that data given in the text of the report corresponds with that shown on the NR forms. When making general statements regarding the status of a species - whether increase, decrease, or "same as last year", be sure the estimated figure on the NR form shows the corresponding change when compared with the NR form for the same period of the previous year.

2. Try to make each report at least as complete as previous ones have been, include the status of all species. Then, if you ever want to compile records of a species over a period of years, there won't be blank spaces in your records. If status is unknown, at least say so!

3. On form NR-4, Small Mammals, include population estimates for all furbearers and predators - not just the ones for which you had an open season and harvest. In addition, in regard to furbearers, keep as accurate harvest records as possible.

4. When compiling summarization tables on the status of various species for a period of years, try to make them complete by checking all previous reports, not just the ones for certain periods of each year.

5. In food and cover sections, try to give the status of some of the most important plant species rather than broad, general statements. Sometime you may want to check back to try to correlate vegetation changes with changes in certain wildlife species.

III. REFUGE DEVELOPMENT AND MAINTENANCE.

A. Physical Development

Only one development project was carried on during the period, that being 622-R, Move Dragline Shed. As reported in the last narrative the building had been moved and spotted above the foundation excavation. On January 9-10 a break in the weather permitted us to haul gravel for concrete and floor cushion from the pit near Willow Creek School to the building, a total of 97 cu. yds. hauled. Concrete pours were made on January 12, 19, and 31, the last date completing the wall. On February 9 the contractors lowered the building to the foundation. We were very fortunate in having good weather each time we poured and adequate precautions were taken to prevent freezing.

The other items in connection with this building was the nailing of scrap fiber board between the studdings to help hold out wintery winds and installing a new small entrance door on the side.

As soon as the weather warmed up enough to permit the floor grade was established, levelled, forms installed and a 5" wire reinforced concrete floor poured over a 3" (minimum) gravel cushion. This was a big job in itself and the personnel did a fine job in completing it.

Light and power wire has been purchased, and masonite for sealing the inside has been arranged for by the Regional Office.

Maintenance

Under this item the following tasks were completed:

1. Redecked two bridges, replaced 3 stringers and guard rails

on patrol road to Thompson Place. This job has been badly needed as the bridges were in an unsafe condition.

2. 2nd coat outside paint 60% completed on Quarters #4.

3. Linoleum laid in kitchen and bathrooms of Quarters #10-4, 11, and 6 and in bathroom and hall of Quarters #1. New linoleum laid on kitchen counters in Quarters #1, 9-4, and 11.

4. Extensive rewiring in Quarters #2 and minor electrical changes in Quarters 10-4 and 9-4.

5. Leak in water main between Quarters #1 and Office discovered, dug up and temporary repairs made pending arrival of warmer weather.

6. 3/4 mile of fencing taken down and ½ mile reset on boundary in Sec. 17 - 158 - 76.

Many hours spent on miscellaneous maintenance on tools, buildings and other features.

Equipment repair and maintenance as follows:

1. Received new Jeep pickup January 2nd.

2. Received new Panama fire pump and tank during quarter. (a very welcome arrival).

3. Rebuilt and strengthened Freeman front-end loader on Ford-Ferguson tractor. The unit demonstrated several weaknesses in usage last summer and these were corrected.

4. Assembled arc welder and although not completed is in shape to be used.

5. Preventive maintenance checks and 5000 mile inspection on four pickups, sedan delivery, three dump and two stake trucks.

6. During the quarters one 1939 Pontiac sedan and one 1939 Dodge dump truck were advertised for sale and sold.

7. Numerous miscellaneous maintenance jobs on vehicles such as body welding, fender strengthening, replace a few broken springs, brakes, etc.

Other

Safety meetings were held seven times during the quarters with all personnel on the station participating. The present series of

safety meetings is based on the "Safety Talks for Construction and Maintenance Foremen" published by the National Safety Council, a copy of which was received through channels.

B. Plantings

4. Cultivated Crops

Farmers in the vicinity were generally in the field about April 25th, the higher portion of the farm land receiving the first consideration. This is earlier by about 10 days than in 1950, but later than the average of several years.

Some difficulty is being experienced by farmers in getting durum wheat with good germination capacity. From germination tests made by several permittees the per cent was found to range considerably below average, some as low as 40%. They attribute this to early frosts, and high moisture content prevailing during the 1950 harvest season. For this reason it may be that we will have to accept more hard wheat and barley than in the past, so that we can get as high as return as possible from refuge crops for use in depredation control.

Several changes have been made in the farming units, with non-veterans being replaced by veterans in instances where the former had been contacted a year ago and was agreeable to the change. Former owners of now refuge lands still retain first priority rights.

IV ECONOMIC USES

A. Grazing

Some units will be opened to grazing June 1, the remainder July 15. To date 12 permittees have received their permits, the rest will be coming in as the opening date approaches.

B. Haying

No activity during the period except permittees hauling hay cut during the season last year.

C. Fur Harvest

A summary of the fur removal on the Lower Souris Refuge during the 1950-51 season follows:

FUR TAKE, 1950-51, BY SPECIES, TRAPPER AND TRAPPING UNIT

SPECIES	T. Counts (T-7551) Units 8 & 9	L. R. Rolfman (T-7552) Unit 10	L.Benedicktson (T-7553) Unit 7	B.Clark (T-7554) Unit 1-5	J.W.Rice (T-7555) Unit 6	TOTALS
Beaver	12					12
Muskrat	60	24	139	1280	8	1511
Raccoon	11		3	5		19
Badger		1	2	4		7
Skunk	19	1	25	73		118
Mink	52	6	22	26		106
Weasel	5		7		1	13
Fox			2	8	2	12
Coyote						

In addition to the above, 1 raccoon, 23 skunks, and 1 weasel have been taken by refuge personnel in April. 33 fox and 8 coyotes were taken by airplane hunters during the season.

FOX AND COYOTE HUNTING (AIRPLANE)

	FOX			COYOTE		
	Male	Female	Unknown	Male	Female	Unknown
E. Roles (Permit T-7556)	14	9	2	2	2	
Henderson & Bunke (Predator & Rodent Control)			8			4
TOTALS			33			8

On the following page is a summary of the fur sales by permittee trapper for which we have information at the present time:

FUR SALES BY PERMITTEE TRAPPERS, 1950-51*

TRAPPER	Beaver NO.	Beaver VALUE	Muskrat NO.	Muskrat VALUE	Raccoon NO.	Raccoon VALUE	Badger NO.	Badger VALUE	Skunk NO.	Skunk VALUE	Mink NO.	Mink VALUE	Weasel NO.	Weasel VALUE	Fox NO.	Fox VALUE	SOLD TO
			3	$5.40	1	$2.00					23	$637.00	2	$3.60			Sears
T.Counts					9	20.25											Ales Marsden
T-7551	6	$73.00	27	44.55													Minot Hide & Fur
											4	56.00					Bottineau Hide & Fur
			246	$303.65			4	$2.00	30	$15.00	13	$416.00					Dakota Hide & Fur
B.Clark					5	$7.25			44	43.75							Shubert Fur Co.
T-7554															12	$18.00	Bottineau Hide & Fur
			26	45.40													Sears
L.Benedicktson			10	10.40	3	7.00	2	0.50	22	11.00	5	$150.00	2	3.00			Minot Hide & Fur
T-7553											6	147.00					F.C.Taylor Fur Co.
TOTAL	6	$73.00	312	409.40	18	36.50	6	2.50	96	69.75	51	1406.00	4	6.60	12	18.00	
Average price per pelt		$12.17		$ 1.31		$2.03		$0.42		$0.73		$27.57		$1.65		$1.50	

* Incomplete - all furs not yet sold at this time

D. Timber Removal

Eight permits completed on wood cutting listed the following types and amounts out:

Aspen fuel wood	40 cords
Posts & Poles	14.5 cords
Fuel wood	42.2 cords

This is a little below the cut in an average year.

E. Other Uses

No permits for other uses were issued in this period.

Two sales of vehicles were made, one 1939 Pontiac Sedan sold for $265.00 and one 1939 Dodge dump truck sold for $225.00.

V. INVESTIGATION AND RESEARCH

The following is taken from "Marsh and Waterfowl Management on the Lower Souris Refuge," M. C. Hammond, March, 1951.

1. Many marshes and water areas, including Lower Souris Refuge, have undergone a period of deterioration during the high water levels occurring between 1942 and 1950. Lower Souris has had some recovery since 1946.

Waterfowl production on Lower Souris has been at a low level due to restriction of nesting to the upland areas bordering the marshes, where predation has been abnormally high, and a great reduction in the amount of suitable nesting habitat.

3. While the refuges have many important uses, waterfowl production is one of these and parts of each refuge should be managed primarily for production.

4. Summer concentrations of gathering males should be limited to certain areas where production is not an important objective. This means a reduction in the average number of birds that can be supported during July and August.

5. The program of refuge feeding during duck damage season is justified in that it results in a considerable net reduction in Statewide losses.

6. A general marsh management program designed to better meet the needs of all waterfowl using the refuge is outlined. This included:

a. A fallow or rotation plan to oxidize bottoms and permit return of nitrogen and phosphorus to a usable state. This will also aid in compacting muck bottoms.
b. Seasonal recession to stimulate pondweed growth and seed production.
c. Return of many bottom nesting islands to use as nesting habitat for dabblers.
d. An early brief spring flooding of bottoms (prior to nesting,) when possible to force predators out to the marsh margins.
e. In areas having past botulism history - a program to establish sod-forming marsh plants (Carex, whitetop) on zones through which water levels will normally fluctuate.

7. Earlier breeding population and production estimates appear to be much too high due to inclusion of non-breeding birds in the population counts.

8. Estimates of normal breeding populations during the periods 1936 to 1941 and 1948 to 1950, and of the potential for Lower Souris Refuge were, espectively, 5,300 pairs (plus divers), 4,800 pairs (partially including divers), and 10,000 pairs (including divers). The potential was computed at the rate of 31 pairs per mile of shoreline (the average for recent years). There are instances where local populations have occurred at double this rate and it is therefore conceivable that, under very favorable conditions and possibly reduction in water areas surrounding the refuge, the potential might reach 20,000 pairs.

9. Production at the base population figures given in 8 was 33,000 young hatched, 15,000 and 47,500 for 1936-41, 1948-50, and potential (with normal predation), respectively.

10. Each Lower Souris unit was discussed with regards to unit objectives, population, and production.

11. A 10-year management plan for Lower Souris Refuge is outlined, considering the major principles and objectives mentioned above. In this is included a discussion of needed island construction and repair, ditching, gravel, and willow control on nesting islands.

The following is taken from "Progress Report - Marsh Management of 326 Unit, Lower Souris Refuge," M. C. Hammond, 1950.

CONCLUSIONS FROM 5-YEAR RECORDS

1. Late summer and fall exposure of bottoms permits the rapid establishment of such marginal plants as eleocharis accicularis and Eleocharis palustris, Beckmannia, Typha, Rumox persicaroides, Alisma, and Sagittaria. The seeds of these plants presumably germinate almost immediately and plants may appear the same year (if exposed early

enough) or the following year. Flooding continuously reduces or eliminates Eleocharis accicularis, Beckmannia, and Rumex, but the others will tolerate several inches of water after initial germination and growth occurs.

Repeated fall exposure seems to favor Eleocharis palustris and bulrushes over Typha, with the bulrushes probably a climax type which might eventually take over the flats.

2. Shallow flooding of original meadow associations comprising mixtures of Poa, Spartina (and other mixed grasses), Teuerium, Canada thistle and other low bottom herbs permits Spartina to obtain dominance and soon produces tall, rank stands of little value to waterfowl.

3. Spring or early summer exposure has not been observed in this unit and the rate of re-vegetation on flats exposed continuously, except for early spring flooding, is not known. The wet soil plants (see #1) may not persist more than a year or so. Meadow weeds would probably appear within two years, but such plants as Fluminia, Carex, Polygonum muhlenvergia, and Spartina may require 5 to 10 years to eventually cover the bottoms and slough margins.

4. Cattail spreads principally by establishment of seedlings on bare wet flats (or damp flats), following removal of water. Growth of rootstalks fill in the blank areas as the seedlings mature.

Neither fall draw-downs nor continued flooding seemed to result in appreciable spread of cattails by rootstalk extension in mature beds. This must be a very slow process in this area.

5. Cattail seedlings appearing during the fall do not seem to tolerate 6 to 12 inches of water during the following growing season. Even mature plants declined slightly when covered with 12 inches or more of water during the growing season.

Seedlings and mature plants died on some higher bottoms with fall exposure and a certain amount of drying. The results of drying and winter kill are not yet full understood.

6. Pondweeds (sago and pusillus) can grow and produce seed when interspersed with Eleocharis palustris, Alisma, and Sagittaria in sparce to medium stands for at least one season. Filamentous algae in these areas reduced pondweed growth and seed production in 1950, however.

7. Redhead grass, sago, and pusillus grew well in each of the zones between 1416.5 and 1418.5 under the varying water levels occuring during the five years. Early summer water depths were mostly 6 inches to 3 feet (gauge readings 19.0 to 19.5) and flats with elevations over 18.0 were exposed in the fall of 1946, 1948, and 1949.

A combination of sunshine and drying have been demonstrated as aids to germination (Sharp, Ward M. 1939, Propagation of Potamogeton and Sagittaria from seeds. Trans. 4th N.A.W.C., 351-358).

8. Sago and pusillus will not tolerate fluctuations such as those of 1950. Increasing depths during the growing season may reduce light near the bottoms to the extent that many new seedlings and plants cannot survive. Redhead grass increased slightly in 1950, however, suggesting that the deeper levels may be more favorable.

9. Receding levels during the growing season were most favorable for pondweed growth and seed production.

10. Redhead grass may not tolerate fall and winter exposure as well as sago and pusillus. Note 1949 declines on all bottoms following low winter levels of 1948.

11. Milfoil apparently does best on bottoms exposed during the fall, but flooded continuously the following season. This plant grows much later in the fall than the pondweeds. Its growth may be favored by the removal of pondweed vegetative parts by waterfowl and the earlier death of pondweeds in the fall.

12. On most bottoms it appeared that the young sage and pusillus plants produced more seed than the older plants. Heaviest seed production and an abundance of new vigorous plants were commonly found in the shallower areas, exposed, or nearly exposed, the previous late summer and fall.

13. Approximately two year peaks of growth or new plant establishment are suggested for sago and redhead grass. This may have resulted from factors associated with water levels or may be a growth character of the plants.

14. In this area aquatic surveys must be made in July or early August. Waterfowl consume seeds and remove plants in such quantities that true measurements of abundance cannot ordinarily be obtained after mid-August. Heavy use of immature seeds and flowers has been observed prior to July 13.

15. Botulism has occurred at all levels present during summer and early fall since 1945. The only hope for eventual elimination of this from 326 unit appears to be re-establishment of conditions prior to 1942.

16. That the suggestion made in the 1946 report (P.4) is still true "-the regulation of levels should be assigned to one man as his principal job during the time any movement of water is taking place-" was demonstrated again by the extreme fluctuations in 1950.

17. The general change from 1946 to 1949 was an increase in production of aquatic foods available in late summer due to re-vegetation on some flats, replacement of bladderwort and coontail with pondweeds, and increased pondweed seed production; (b) establishment of wet zone plants used considerably by ducks and geese on many bare flats; (c) some reduction in cattails due mainly to replacement by Eleocharis, bulrushes, and other border plants. There was some improvement in brood cover, but little change in the availability of usable nesting cover. It should be remembered that the changes expected were modified by the constant high levels of 1947, the extended flood of 1948 (which reduced stands of many marsh plants), and the adverse fluctuations of 1950.

18. It does not appear possible to manage the unit to provide food for large summer male concentrations and at the same time produce any appreciable number of ducks there. The reasons may be more than simple ones of availability of nesting cover, food, and territory.

VI. PUBLIC RELATIONS

A. Recreational Uses

Very little recreational use was made of the refuge during the quarter, it being one of bad weather, snow and cold. Toward the end of April some local bird watchers and other stopped on refuge crossings to watch the ducks and geese on the area. The main visitors to the refuge were local residents on business including haying, grazing, wood cutting, etc.

B. Refuge Visitors

Jan. 19, F. A. Carpenter, Ass't. Reg. Refuge Supervisor, inspection.
Jan. 26, R. W. Dougall (Minot), Reg. Office Engineer, Water regulation.
Feb. 20, Brandt Hjelle, N.D. Game & Fish, P.R., visit.
Feb. 20, Henderson & Bunke, Predator & Rodent Control, Predator control on refuge.
March 28, R. W. Dougall, Reg. Off. Engr., Water Regulation
Mar. 30, H.Jensen & A.Smith, Flyway Biologists, transfer of Air Boat.
Apr. 7, R. W. Dougall, Reg. Off. Engr., Water Regulation
April 18, H. Jensen, Foote, G.M.A.'s, Grain Hauling.
April 20, Messrs Cunningham, Buer, & Richwalski, Upper Souris Refuge, Equipment transfer
Periodic-Chas. Decker, State Warden

C. Refuge Participation

In February plans were laid, contacts made and a program arranged for showing the "Lower Souris Refuge" film, and appropriate comments thereon, to the schools in the immediate vicinity of the refuge during National Wildlife Week, March 18-24. The weatherman produced a program of his own, however, during the month of March so that we were unable to make the showing as planned.

Arrangements were then made for the week of April 16-20 and the schools as listed below shown the program:

Towner Public Schools
Willow City Public Schools
Bottineau Public Schools
Westhope Public Schools
Upham Public Schools
Kramer Public Schools
Souris Public Schools
Newburg Public Schools
Russell Public Schools
Notre Dame Academy, Willow City.

The showings were made by Glahn and Huenecke who reported the program well received at the schools and invitations to return.

On March 26 the "Lower Souris Refuge " film was shown before the Upham PTA by Gray.

On April 23, Glahn discussed the refuge and general wildlife with the biology class of the Towner, N. Dak. High School.

Hammond attended the annual Dusters & Sprayers Conference at Fargo, North Dakota on April 20-21.

On March 11-12 Glahn attended a demonstration of latest equipment for aerial seeding, spraying and fertilizing at Purdue University, Lafayette, Indiana.

On April 5th Gray, Huenecke and Glahn attended the Wildlife Clinic in Minot, North Dakota sponsored jointly by the North Dakota Wildlife Federation and the North Dakota Game and Fish Department. This was a night meeting with good weather and roads, but was quite poorly attended. Several sportsmen, however, got a lot off their chests and the Federal refuges came in for the usual full share of criticism for duck damages, and no crossing the fences, plus not allowing the refuges to be turned into speedways for boats and motors. But, with all that it was an interesting meeting, and one well handled by Federation President Dave Ritchie.

VII. OTHER ITEMS

A. Aircraft Operations

During the period the following aerial censuses were made by Mr. Glahn, utilizing the L-4 aircraft:

DATE	REFUGE	TYPE
1/16/51	Upper Souris	Big Game Census
1/25/51	Des Lacs	" " "
1/30/51	Mud Lake	" " "
2/10/51	Necedah	" " "
2/12/51	Tamarac	" " "
2/14/51	Sand Lake	" " "
2/15/51	Arrowwood	" " "
2/16/51	Long Lake	" " "
2/16/51	Slade	" " "
2/27/51	Lower Souris	" " "
3/24/51	Lostwood	" " "
4/12/51	Lower Souris	Waterfowl Census
4/23/51	Upper Souris	Big Game Census

In addition to the above the aircraft was utilized on porcupine control work at the Des Lacs Refuge on March 2, 1951

It was originally intended to make the big game census at Tamarac Refuge on February 2. During the take-off from Detroit Lakes Airport, however, the right ski struck a snow drift, piercing the crust of the snow and breaking away from the fuselage. This turned the aircraft to the right forcing most of the weight on the left ski which promptly broke away from the fuselage. The aircraft slid for approximately 35 feet on the under side of the fuselage because of a heavy covering of snow ranging from 11-16 inches in depth. None of the runways had been cleared this season and the fields' condition was similar to any open pasture in that area. All other conditions were considered excellent.

Landing gear bolts had been found to be in poor condition during the 100 hour inspection just prior to the accident and had been replaced. Upon examination these bolts were found to be in good condition.

Damage included one metal McCauly propeller, right and left hydraulic line leading from master cylinder to right and left brake. Skis, cable and shock cords attaching skis to fuselage were not damaged. No breaks of any kind were found on the fabric of the plane.

B. Personnel

Mr. A. B. Jamieson, Construction and Maintenance Foreman, was detailed here temporarily for the period February 6 through April 27. While here Art took over operations on the dragline shed and turned in a fine piece of work on it, as well as several other jobs while he was here.

Respectfully Submitted:

Donald V. Gray

Donald V. Gray
Refuge Manager

5/14/51

APPROVED:

MAY 21 1951

Acting Regional Director

WATERFOWL

Refuge Lower Souris Months of Janua ry to April 19/451

(1) Species		(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
	Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I.	Swans:									
	Whistling swan	11	4/15	750	4/19					1500
II.	Geese:									
	Canada goose	42	3/26	190	4/13					400
	Cackling goose									
	Brant									
	White-fronted goose	15	4/4							
	Snow goose)	-	4/4	2500	4/25					5000
	Blue goose)									
	Richardson's goose	150	4/4	150	4/4					200
III.	Ducks:									
	Mallard	300	4/3	1500	4/25					4000
	Black duck									
	Gadwall	2	4/20							
	Baldpate	20	4/10							
	Pintail	700	4/3	2500	4/25					7000
	Green-winged teal	8	4/10	500	4/25					1000
	Blue-winged teal	3	4/24							
	Cinnamon teal									
	Shoveller	3	4/6							
	Wood duck									
	Redhead	2	4/12	1500	4/25					3000
	Ring-necked duck	6	5/3							
	Canvas-back	1	4/10	1000	4/25					2000
	Scaup	40	4/10	3000	4/25					5000
	Golden-eye	1	4/12							
	Buffle-head	2	4/29							
	Ruddy duck	7	4/25							
	Am. Merganser	5	4/2	50	4/12					200
IV.	Coot:	7	4/24							

SUMMARIES

Total Production:

Geese_____

Ducks_____

Coots_____

Swans-----1500
Geese---- 5950
Total waterfowl usage during period Ducks----22000

Peak waterfowl numbers 15,750

Areas used by concentrations All units, but especially 320, 326, and 332 units.

Principal nesting areas this season_____

Reported by Refuge personnel

INSTRUCTIONS

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

(2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.

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

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

2338

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Lower S ouris Months of January to April 1951

(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:										
Holboell's grebe	1	4/29								
Horned grebe	14	5/4								
Eared grebe	7	4/24								
Pied-billed grebe	2	5/5								
Western grebe	3	5/5								
White pelican	190	4/24								
D. C. cormorant	20	4/25								
Gt. Blue heron	1	4/15								
Bl. crowned night heron	2	4/19								
American bittern	1	5/5								
Sora rail	2	5/5								
II. Shorebirds, Gulls and Terns:										
Killdeer	2	4/7								
Marbled godwit	2	4/24								
Avocet	2	4/27								
Willet	4	5/4								
Herring gull	1	4/15								
California gull	1	4/15								
Franklin's gull	10	4/21								
Semi-palmated plover	1	4/9								
Forster's tern	8	5/4								

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	2 4/12				
White-winged dove					
IV. Predaceous Birds:					
Golden eagle	resident				
Duck hawk					
Horned owl					
Magpie	resident				
Raven					
Crow	resident				
Snowy owl			last seen 4/29		
Marsh hawk	2 4/3				
Sparrow hawk	1 4/10				
Red-tailed hawk	1 4/6				
Rough-legged hawk	3 4/17				
Short-eared owl	2 4/16				
Burrowing owl	6 5/4				

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 number of the species using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Lower Souris Months of January to April, 194/51

(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.
Ringneck pheasant	F_1B 2960 F_2B 6945 M-G 39820 H_12 5210 A 8990 58925								400	
European partridge									300	
Sharptail grouse									600	
Prairie chicken									1	Only one seen during period.

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-4

SMALL MAMMALS

Refuge Lower Souris April 30, 1951

(1) Species	(2) Density		(3) Removals					(4) Disposition of Fur						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control	For Re-stocking	For Research	Permit Number	Trappers' Share	Refuge Share	Total Refuge Furs Shipped	Refuge Income	Furs Donated	Furs Destroyed	Total Population
Beaver				12					6	6					168
Muskrat				1511					755	755					6000
Raccoon				20	1				20	0					100
Badger				7					7	0					80
Skunk				118	23				118	0					800
Mink				106					53	53					100
Weasel				13	1				7	6					250
Fox				4	33				37	0					20
Coyote					8				8	0					10

REMARKS:

1615

Refuge personnel

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i.e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) **SPECIES:** Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan. "List of North American Recent Mammals" by G. S. Miller, Jr., a very good reference, is now out of print, although a revision is scheduled for publication in the near future.)

(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, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) **REMOVALS:** Indicate the total number under each category removed since April 30 of the previous year. Also show any removals not falling under heading listed.

(4) **DISPOSITION OF FUR:** On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market and the total income to the refuge by species, including share-trapped furs and furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) **TOTAL POPULATION:** Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specially requested.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Lower Souris Months of January thru April 1951.

(1) VARIETY	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED USE		
				TRANS-FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Wheat	2934	0	2934			30	30	2904		2904	
Barley	1285	0	1285			20	20	1195*		1195	
Mixed	803	0	803			15	15	788		788	
							TOTAL——	4887			

* 70 bushels lost in fire on 4/15/51

(8) Indicate shipping or collection points.....

(9) Grain is stored at Refuge granaries.....

(10) Remarks.....

NR-8a REFUGE GRAIN REPORT

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

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)--55 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately: Corn, wheat, proso millet, etc. Include only domestic grains; aquatic and other seeds will be listed on NR-9.

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

(4) A total of Columns 2 and 3.

(6) Column 4 less Column 5.

(7) This is a proposed breakdown by varieties of grain listed in Column 6.

(8) Nearest railroad station for shipping and receiving.

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

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

3-1759
Form NR-9

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)

Refuge Lower Souris National Wildlife Refuge Year 1951

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
		Nothing to report this period.						

Form NR-11 — TIMBER REMOVAL

Refuge Lower Souris Year 1950-51

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B.F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Joe Einarson	LS-338			10 cords fuel	.50/cd.	5.00	**	Aspen(fuel)
Theo. Lovely	LS-339			14 " "	"	7.00	"	"
Reinhold Klebe	LS-340			9 " "	2.50/cd.	22.50	"	Ash(fuel)
				2.5 " post	5.00/cd.	12.50	"	Ash & Elm (posts)
Barthi Goodman	LS-341			3 " fuel	.50/cd.	1.50	"	Aspen(fuel)
				2 " post	5.00/cd.	10.00	"	Ash & Elm(posts)
Walter Prellwitz	LS-342			14 " fuel	2.50/cd.	35.00	"	Ash(fuel)
				1 " pole	5.00/cd.	5.00	"	Ash & Elm(poles)
Percy Gibbs	LS-343			9 " fuel	.50/cd.	4.50	"	Aspen(fuel)
Walter Boye	LS-344			5 " pole	5.00/cd.	25.00	"	Ash & Elm(poles)
				13.2 " fuel	2.50/cd.	33.00	"	Ash(fuel)
Herbert Liebelt*	LS-345			4.5 " pole	2.50/cd.	22.50	"	Ash & Elm(poles)
				6 " fuel	2.50/cd.	15.00	"	Ash(fuel)
				4 " "	.50/cd.	2.00	"	Aspen(fuel)

* Has not remitted final payment.
** As marked by refuge personnel.

Total acreage cut over _____ Total income $200.50

No. of units removed B. F. _____ Method of slash disposal Scattered

Cords 40-Aspen; 42.2-Ash; 14.5-Ash & Elm.

Ties _____

_____

1622