

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: 10-10 1947

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REMARKS:

LOWER SOURIS NARRATIVE REPORT

MAY - AUGUST 1947

Return to: \_\_\_\_\_

LOWER SOURIS NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

For

MAY, JUNE, JULY, AUGUST, 1947

United States Department of the Interior

Fish and Wildlife Service

Upham, North Dakota

## PERSONNEL

Cordia J. Henry.....Refuge Manager  
Merrill C. Hammond.....Biologist  
Carl E. Pospichal.....Refuge Manager  
(Trainee)  
Lowell J. Harrison.....Refuge Clerk  
Robert W. Arrowsmith.....Refuge Mechanic  
Thomas W. Lawson.....Maintenance Man  
Roy E. Hiller.....Maintenance Man \*  
Alvin Brandt.....Laborer-Patrolman  
-----  
Edward G. Wellein.....Biologist-Pilot

\*Resigned effective end of August.

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## I. GENERAL.

### A. Weather Conditions.

<u>Month</u>	<u>Precip.</u>	<u>Normal</u>	<u>Max.Temp.</u>	<u>Min.Temp.</u>
May	1.19	2.18	78	15
June	5.64	3.36	80	26
July	.78	2.49	96	37
August	4.23	1.97	98	42
Total	11.84	10.00	Ext. 98	15

Precipitation during the months of May and July was below normal, but was considerably above normal during June and August. Precipitation during the corresponding period in 1946 was 7.41 inches; in 1945, 8.74 inches. The months of May and June were exceptionally cold, resulting in delayed migration and nesting of most species. July and August were hot but not very windy. The summer as a whole was more agreeable than that of 1946. Crops were fair to good, and with the current high prices has brought additional prosperity to the state.

### B. Water Conditions.

This has probably been the most favorable year in the history of the refuge as far as water and marsh conditions are concerned. The spring runoff was heavy, and a good flow continued through the refuge during the entire summer. The water was relatively clear and there was much less than the usual quantity of algae. Vegetation flourished and the marsh appeared healthier than ever before. To date, there has been much less botulism than in 1945 or 1946. Most of the surplus water from Lake Darling has already been passed through the refuge.

At the present time (as of September 1, 1947) all units are approximately at the approved water levels, and there is an estimated 300 second-feet running through the refuge.

It is extremely interesting to contrast the present levels with those of reports written seven to ten years ago. In those days we spoke of unit levels as lacking so many feet of being full.

### C. Fires.

None.



2

(Parts 1 & 2)  
(By M. C. Hammond)

II. WILDLIFE.

A. Migratory Birds.

1. Population and Behavior.

Spring migration was well along at the beginning of May. From the waterfowl count made April 24 we estimated a population of 36,000 ducks (and coots). A census on April 24, 25, and 26, 1946, gave an estimated population of 29,400 ducks (and coots). These counts were both made while migration was in progress and do not represent the population of local nesting birds.

In 1947 migration peaks, followed shortly by relatively stable populations were reached on the dates given in the following table in this section of North Dakota. Other chronological data are included.

Waterfowl Chronology--1947  
North-Central N. Dak.<sup>1</sup>

<u>Species</u>	<u>Arrival Date</u>	<u>Migration Peak</u>	<u>First Nesting</u>	<u>Last Broods Hatched</u>	<u>Male flocking &amp; pre-moult movement</u>
Pintail	Mar. 27	May 2-10	Apr. 28	July 23	May 23-June 20
Mallard	Mar. 25	May 2	May 9	Aug. 12	May 23-June 30
Bluewing	Apr. 19	May 6-20	May 17	July 31	June 6-July 11
Gadwall	Apr. 18	May 7-12	May 26	Aug. 23	July 6, 13-?
Shoveller	Apr. 2	May 6-21	May 21	July 31	June 7-July 11
Widgeon	Apr. 7	May 2-10	June 7	Aug. 8	June 20-July 6
Greenwing	Apr. 5	May 2-7	May 29 <sup>2</sup>	June 28 <sup>2</sup>	--
Redhead	Apr. 8	Apr. 21?	May 28	Aug. 12	--
Canvasback	Apr. 4	Apr. 21?	May 9	Aug. 9	--
Scaup	Apr. 2	Apr. 18-30	June 23 <sup>2</sup>	July 23 <sup>2</sup>	--
Ruddy	Apr. 18	Apr. 30?	June 9	Sept. 6	--
Can. goose	Mar. 27	April	Apr. 26		--

1. Based on observations at Lower Souris, Upper Souris, Des Lacs, Lostwood. Arrival dates from Lower Souris records.
2. Only one brood recorded.

The waterfowl population dropped off considerably during several days of southeast wind prior to May 12. From comparisons of certain shoreline counts made between April 25 and May 26 it is believed the resident populations was about 21,500 birds on the refuge by the end of May. The movement of male pintails and mallards began by May 23.

There is no time when the refuge waterfowl population is static, but the nearest approach to a stationary population falls immediately after the principal migration peak, this year the period between May 20 to 30. Nesting success for the season probably did not exceed 30%.

*Waterfowl data  
has been furnished  
Research  
RES.*

The extent of re-nesting and fate of re-nesting attempts is unknown. It is a factor that must be considered, however. In the absence of information on this we will estimate that one-half of the first failures re-nested but also suffered up to a 70% loss, adding 15% to the total success or an eventual 45% for each breeding pair.

The total production may then be estimated as follows:

21,500 ducks	
<u>40% females (Lincoln's banding studies)</u>	
8,600 females	
<u>10% non breeders (estimate)</u>	
860	
8,600	
<u>- 860</u>	
7,740 breeding females	
<u>45% hatch</u>	
3,480 broods	
<u>7.4 average brood size</u>	
25,700 young produced	

It was estimated that 36,000 young were produced in 1946.

Shoreline counts between May 23-26 gave the following relative abundance of resident species. Ruddy ducks were not counted on the study areas but were assigned a value slightly greater than that of redheads on the basis of comparative numbers of broods observed. Greenwings were uncommon, only one brood being observed.

Relative Abundance of Waterfowl - Lower Souris Refuge

	May 23-26	June 7-10		
<u>Species</u>	<u>1947</u>	<u>1946</u>	<u>1938*</u>	<u>1940*</u>
Blue-wing	35%	29.4	19	39
Mallard	2	15.1	16	10
Shoveller	4	12.0	12	8
Redhead	4	10.7	6	1
Gadwall	29	10.5	12	17
Pintail	13	10.0	22	16
Ruddy	5	6.6	1	.4
Widgeon	5	2.4	8	6.5
Canvasback	1	1.6	1	.4
Scaup	1	1.0	.5	0
Greenwing	1 (or less)	.3	1.6	1.1

\*From nesting studies.

The reduction in population from 1946 seems to have been limited mostly to mallards, shovellers, and redheads. The proportion reduction in mallards is not as great as it appears. The 1946 figures were undoubtedly high. On Lower Souris, Upper Souris, and Des Lacs there is no doubt that many of the mallard broods seen during the summer were hatched near ponds and sloughs off the refuge but made their way to the larger refuge water bodies during the course of the summer. The gadwall and blue-wing population would appear to be at least equal to that of 1946, or possibly higher.

A total of 200 brood counts were made on the refuge averaging 7.2 class I young, 7.6 class II, and 8.1 class III. The increase in size of older broods is probably due partly to inadequate sampling and partly to combination of broods.

Summary Brood Counts--1947

Species	Class I			Class II			Class III		
	: No.		:	: No.		:	: No.		:
	:Counts	Birds		:Counts	Birds		:Counts	Birds	
Mallard	6 ✓	46 ✓	7.7 ✓	8 ✓	60 ✓	7.5 ✓	4 ✓	39 ✓	9.75 ✓
Pintail	4 ✓	34 ✓	8.5 ✓	4 ✓	39 ✓	9.75 ✓	6 ✓	52 ✓	8.7 ✓
Blue-wing	8 ✓	65 ✓	8.1 ✓	10 ✓	95 ✓	9.5 ✓	3 ✓	21 ✓	7.0 ✓
Shoveller	2 ✓	15 ✓	7.5 ✓	1 ✓	9 ✓	9.0 ✓	0	0	-
Gadwall	25 ✓	193 ✓	7.7 ✓	13 ✓	110 ✓	8.5 ✓	0	0	-
Widgeon	2 ✓	13 ✓	6.5 ✓	1 ✓	10 ✓	10.0 ✓	0	0	-
Green-wing	1 ✓	4 ✓	4.0 ✓	-	-	-	-	-	-
Redhead	29 ✓	216 ✓	7.45 ✓	7 ✓	45 ✓	6.4 ✓	-	-	-
Canvasback	8 ✓	53 ✓	7.0 ✓	8 ✓	42 ✓	5.25 ✓	2 ✓	9 ✓	4.5 ✓
Ruddy	38 ✓	245 ✓	6.45 ✓	6 ✓	32 ✓	5.3 ✓	-	-	-
Unid.	3 ✓	19 ✓	6.3 ✓	1 ✓	6 ✓	6.0 ✓	-	-	-
Total	126	903	7.17	59	448	7.59	15	121	8.07

Total all classes:    Counts.... 200  
                              Birds.... 1472  
                              Ave..... 7.36



From the waterfowl census August 25, 1947, we estimated a total population of about 150,000 ducks on the refuge; deducting 47,000 young and resident adults leaves 103,000 ducks which had moved into the refuge during the summer. Part of these undoubtedly were the first waves of fall migrants. Bluewing migration was already in evidence on that date.

During the original development of the refuge a number of islands were constructed by dragline. From time to time the value of the islands has been questioned, that is, with relationship to their cost of construction. Recently, however, their use by nesting Canada geese has fully justified their cost. Furthermore, they have been used by terns, ducks, cormorants, shorebirds, and gulls.

On the 25th of June the refuge manager played "hookey" from the red tape, farmers, etc. and spent the day looking over some of the man-made islands in the 320 unit. On the second island visited a spectacular nesting concentration was discovered. The north end of the island had hundreds of common tern nests and duck nests were everywhere. Strangely there were almost no ducks except gadwall. It was surprising how many nests almost overflowed with eggs; many with 17 or 18, and of two shades of color.

On June 30th Henry and Hammond returned to the island described above in order to attempt a total count of the nests. We used two ropes, started at one end of the island and kept moving the ropes ahead and counted the nests in the strips between the ropes. Of the ducks we were able to make a reasonably accurate count, although occasionally a nest would leave us in doubt as to whether it was a 1946 or a 1947 nest.

160 duck nests were counted; approximately 106 of these were active gadwall nests; other active nests included: pintail 1 or 2, mallard 1, shoveller 1, and canvasback 1. The balance were hatched, deserted, destroyed, or unidentified.

On June 30 we also attempted to count the tern nests, but with poor success due to the fact that many young were already long out of the nest--the weeds were full of young. We determined that there were more than 250 tern nests. There were also 2 gull nests--the first refuge nesting record for the ring-billed gull; there were also 6 red-winged blackbird nests.

The island is approximately one-half acre in area; the nesting cover was a mixture of weeds with the Canada thistle usually dominant.

The island was again visited on August 1 by Hammond and Harrison. There were about 250 ducks around the island--mostly gadwalls with a large number of flappers, both adult and Class II young. No Class I young seen but a female acted as if she had young concealed on the edge of the island. (Survey made without ropes).

1. Total nests recorded (terminated)	90
2. Hatched nests	83
3. Percent hatched	92%
4. No. deserted & fate unknown (2)	7
5. Percent deserted & fate unknown	8%
6. Average clutch (June 30 visit)	10.5
7. Total eggs (6xl)	945
8. Total eggs infertile or dead embryos	150
9. Total eggs deserted	38
10. Total eggs hatched	757
11. Percent of eggs hatched	80%
12. Average hatch per nest (90 nests)	8.6

From above figures--total of 160 nests (June 30):  $160 \times 10.5$  (ave. clutch)  $\times 80\%$  (eggs hatched) equals 1,344 total number of young hatched.

12. Hatched nests	83
13. Deserted and fate unknown	7
14. Active	<u>11</u>
Total	101

Percent still active August 1 - 11%

Infertile eggs and dead embryos--  $\frac{150}{945} = 16\%$ , this normally runs 4.8% (1938-1939-1940 nest studies). It is probable that faulty incubation resulting from large (double?) sets and possibly some mistakes and confusion on part of the females due to close proximity of nests caused the high egg mortality.

The clutch size, 10.5, was higher than the six year average (1935-1940) of 9.23 as a result of more than one hen laying in the same nest. Ten eggs was the highest frequency class, however, and it is very possible that the true normal clutch is higher than nest studies generally indicate, due to predators reducing the size of observed clutches.

The 11% nests still active on August 1 would indicate only a slight tendency toward lateness in the gadwalls nesting season. In 1937, 11% of the nests studied were still active July 24-30, and in 1938, 7.5% for the same period. This would mean a possible delay of only one week in the nesting period for the species.

Of 160 nests found June 30 only 5 were definitely identified as species other than gadwall (1 canvasback, 2 pintail, 1 shoveller, 1 mallard). It is probable that at least 150 (nearly 95%) of the total nests were gadwall.



We were not able to get an accurate count of the total young Canada geese raised this year. The late summer total in 1946 was 90 birds. This year the total was about 130 birds. Either the 1946 kill was low and there was an excellent hatch in 1947, or some non-residents were attracted to the marsh over the summer.

Cormorants and great blue herons nested again in the dead elm trees and the east end of the nearest artificial island in 320 unit. There were also a few nests in the 357 unit at the same locations as in 1946.

Pelicans were again abundant, probably in numbers slightly greater than during 1946 when 3,000 birds were counted.

As a result of higher water levels, shore birds were not so common as in 1946.

## 2. Food and Cover.

There has generally been little change observed since 1946. Exceptions are some excellent stands of softstem bulrush which appeared in upper 357 unit, a good increase in emergents in 341 unit, and a slight increase in the amount of emergent vegetation in 326 unit. These increases we attribute to the period of low water in late July, August, and September in these units. Exposing the flats to high temperatures and increased light must have increased germination and aided the spread of plants already established. There was generally a great deal less algae, and a corresponding increase in submerged aquatic vegetation.

The wild rice stand at Dam 1 produced an excellent crop of seed. For the first time in several years a few patches of rice were seen at the "Sandhills slough".

Seed production of Carex, hardstem bulrush, and possibly other emergent food plants was apparently lower than during previous years, possibly due to the hard frost on May 27-28.

## 3. Duck Depredations.

Inasmuch as much activity under the duck depredations control program was conducted after September 1, this work will be reported on more fully in the next narrative.

The program this year has been handled by Game Management personnel under the general supervision in the field of Harry A. Jensen, Game Management Agent. Other personnel assisting were Agent-Pilot Roy Ferguson who flew Service aircraft NC708 on duck depredations patrols, and Agents Floyd Davis, Charles Horner, Stephen Creech, and Harry Maltby.

The services of two of our wage employees were utilized in mowing the refuge grain fields; one of these men has subsequently been employed in hauling surplus grains from the Lostwood, Des Lacs, and Upper Souris Refuges, and from our sharecrop fields to the granaries and feeding stations. Refuge personnel were also made available and assisted as required, in hauling and feeding grain, participating in duck herding both from the air and on the ground. Mr. Wellein and Service aircraft NC720 were also called on occasionally to assist in the flying of duck depredations patrols.

Duck depredations complaints have been fewer than those received last year and actual damage considerably less. This has been due to more extensive farming by the refuge with refuge personnel, and supplemental feeding making more feed available to the ducks away from privately owned fields; fair harvest weather which enabled the farmers to get their crops in, although rain has delayed the harvest somewhat in general; and intensive herding of ducks both from the air and on the ground by more personnel.

#### 4. Botulism.

Cool weather delayed the outbreak this year until the week of July 17 to 24 in 326 unit. There was an acceleration of the outbreak between August 1 and 5 associated with high temperatures and a die-off of crustaceans (Cladocera). Although subsequent aerial observations disclosed no noticeable loss after that date, the discovery of two sick birds on September 13 and 1 dead mallard on September 15 indicated that light losses had undoubtedly been occurring during all of August and the first half of September.

Losses were apparently confined to 326 unit in the vicinity of the gull colony. Coverage was not as thorough as in 1946 and the total loss is difficult to estimate. In 1946 we estimated that 1900 ducks and 6400 other birds (mostly gulls) died in 326 unit. Although losses at any one time were not so noticeable it is likely that the total duck loss here in 1947 was possibly 2500 birds. The refuge total was 4100 for all units in 1946.

#### 5. Lead Poison.

None.

#### B. Upland Game Birds.

At this time of the year it is difficult to accurately measure or appraise the upland game bird population. It can be stated, however, that they are at a very low level. Prairie chicken and Hungarian partridge are rarely seen, and only a pitiful remnant remains of the hordes of pheasants we had before the war. Sharptailed grouse are scarce but appear to be increasing slightly. Food and cover conditions are very good.



### C. Big Game Animals.

The deer situation was fully covered in my letter of March 24 and in Hammond's deer browse survey report. From our limited observations the 1947 fawn crop appears to have been the best on record and it is believed that the deer population has reached an all-time high.

During a series of meetings in Bismarck on August 27 and 28, plans and ideas for the coming season were summarized and submitted to the State Game and Fish Commissioner for approval and appropriate action. To date everything appears to be progressing very satisfactorily.

It has already been announced in an official proclamation that hunting will be permitted on the refuge as recommended in our original plan. About 700 deer are to be removed. Season is to be the period from November 21 to November 25, inclusive, except that we have the privilege of extending the season "for an additional five day period or so much thereof as is necessary under such regulations as shall be agreed upon by the United States Fish and Wildlife Service and the State Game and Fish Commissioner to remove 700 deer from the Lower Souris National Wildlife Refuge".

### D. Fur Animals and Predators.

Beaver: The beaver have responded very well to protection and improved habitat as provided by the refuge. Trapping was first started in 1942 and since then a total of 640 beaver have been taken in the six trapping seasons (122, 25, 101, 210, 117, and 65). There is still a good population in the wooded riverbottom in the south end of the refuge, but there are almost none left in the marsh units. The present low prices plus the relatively low catch this past season have prompted us to recommend a closed season for this coming winter.

Muskrat: It is very difficult to make much more than a guess at the muskrat population. In the 332 unit and in parts of the 326 and 341 units there are fairly good numbers of 'rats, but the scarcity of emergent vegetation keeps them down over most of the rest of the refuge. It appears that we never will have a 'rat population that rivals that of the southern marshes due to the character of the marsh plus the severity of the winters. Much of the marsh is shallow with a rather firm clay bottom. Only in those areas having plenty of channels and borrow pits can the rats winter successfully. The catch by season since trapping was first started in the season 1939-40 is as follows: 206, 2064, 780, 1590, 2852, 2707, 5050, and 2194. Dr. James W. Johnston, Jr., Assistant Professor of Zoology from Fargo spent the entire summer studying the muskrat on this marsh (working for Federal Aid Division).

Raccoon: The raccoon population appears to have reached a peak in 1946. Large numbers died during the winter and spring of "dog and cat" pneumonia. It appears that there are still plenty of coons left, but nothing approaching the excessive population of last fall. It is difficult to interest trappers in taking them due to the low prices plus the tedious and greasy task of preparing the pelts.

Badger: Badgers on the refuge have continued to increase to the point where they are considered a pest. True they are valuable in removing rodents, but in doing so create countless pitfalls which cause no end of trouble. Especially aggravating is their habit of digging up roads and dikes.

Skunk: There is still a high skunk population, and nest destruction by these "varmints" again appeared to be very high. Under present fur prices, a satisfactory removal by permittee trappers appears impossible. Even more impossible is any opportunity to do predator control work with refuge personnel due to the overwhelming work load.

Mink: During the winter 1945-46, mink hit a very low population level with only 29 being taken. In the following season the catch increased to 151. This indicates that they are on the upgrade but still cannot be considered numerous.

Weasel: The weasel population increased considerably since the end of the war. But there has been a surprising change--in previous years the long-tailed weasel was by far the most abundant, but last season most of the "ermine" were Bonaparte's. The weasels as a whole apparently are not in the class of the skunk or the raccoon as a destroyer of waterfowl.

Red Fox: It is surprising how long the fox population has remained at a high level. There has been very little change for a number of years.

Coyote: Never abundant the coyotes remain about the same.

#### E. Predaceous Birds.

The population of hawks and owls remains low. The more beneficial the bird, the scarcer it appears to be. Now there is only a sprinkling of Swainson's hawks where a few years ago there were thousands.

#### F. Fish.

We have had almost no opportunity to find out anything about our fish population. Fishing success by the public has been almost

nil. A haul with a 75 foot net below Dam 1 netted two wall-eyed pike about nine inches long. Thousands of pelicans and cormorants would probably indicate the presence of some fish.

Five thousand fingerling small mouthed black bass were planted at Dam 1 (half above and half below) on September 9, 1947.



### III. REFUGE DEVELOPMENT AND MAINTENANCE.

#### A. Physical Development.

Dams: The worst job this summer from the standpoint of manpower was the cleaning and painting of radial gates in the refuge dams. Rubber seals and cables were replaced at the same time. The gates of dams 320 and 332 were completed and 341 will be finished in September. Work on the gate painting was started on May 26 and continued through the period, using an average of two men.

Airplane Hangar: The all-metal Butler hangar was constructed during the period. This included also a complete concrete floor and ramp, and gives us an excellent housing unit for the airplane.

Farming: In mid-May we completed the farming of approximately 650 acres of refuge lands. The crops planted were durum wheat and barley.

Duck Depredations: Included the mowing of grain fields and the spreading of thousands of bushels of grain to hold the birds in choice feeding spots on the refuge. Much of this grain is hauled in from other refuges.

Barracks Apartment: Due to the pressure of other work it was impossible to complete painting, and construct coal storage and garage space for this building. The old roofing was removed and new (red) roofing put on.

"Simengaard" House: The Simengaard house was moved to headquarters and placed over the basement of Quarters #3, previously destroyed by fire. One bedroom was painted during rainy weather, but no other work was possible.

Dam 357: Work was started on the construction of buttresses behind the spillway, but raising water levels put a stop to the job. Eight were completed.

Operation Dams: More than the usual amount of time was required for checking dams and adjusting gate openings. A heavy flow of water continued through the refuge during the entire period.

Economic Uses: The demand for hay and pasture was greater than at any time since the great drought. Office work was often greatly hindered by the necessity of talking with farmers.

Mechanical: The refuge mechanic did a fine job in keeping equipment in operating condition. One of his best accomplishments was



the building of a sedan delivery by consolidating the best parts of two vehicles; an old Ford "60" sedan delivery from Upper Mississippi, and the Ford coach wrecked here last summer.

One Dodge dump truck was completely overhauled, as was the Continental irrigation pump motor.

The Pontiac sedan transferred from the Regional Office received a "medium" overhaul job which included honing of the cylinder walls, new rings, etc.

The old rims were cut off one of the Farmall tractors and new wide base rims welded on. New tires were installed.

Additional work was done on the Wisconsin motor and Gorman-Rupp pump, and the unit installed on the fire truck. Shortages of certain pipe fittings are holding up completion of this unit.

A new dead axle and one track were installed on the Cletrac.

Many minor repairs were made on all of the vehicles, a borrowed concrete mixer, farm tractors, plows, drill, mowers, etc.

The war has been over two years and we are still far behind. A great deal of work remains to be done on the dams, all of the buildings need paint, fences are in poor condition, and the boundary markers are worse, and so it goes. Patrolling is just a memory.

#### B. Plantings.

1. Cultivated Crops: Approximately 650 acres of barley and durum wheat.

#### C. Collections.

None.

#### D. Receipt of Seed, etc.

None.

#### IV. ECONOMIC USES.

##### A. Grazing.

Grazing demand in 1947 was about the same as in 1946. Pasture conditions varied from fair in May and late July to excellent in late August. Mr. Hammond, refuge biologist, conducted a limited research program on four refuges (Lower Souris, Upper Souris, Des Lacs, and Lostwood) in order to accurately measure the effect of grazing on wildlife. His report will follow later. If at all possible these studies should be conducted again in 1948, on a larger scale.

##### B. Haying.

The demand for hay in 1947 was even greater than last year, and the big hay meadows in the south end of the refuge have been cleaned off better than at any time since 1936.

##### C. Fur Harvest.

In the last report a resume of the fur harvest was given but at that time we lacked information on the prices received. The following tabulation completes trapping records for the past season.

<u>Species</u>	<u>Number</u>	<u>Price</u>	<u>Average Price</u>	
			<u>1947</u>	<u>1946</u>
Beaver	38	723.61	19.04	40.92
Muskrat	1100	1008.04	.92	1.87
Mink	75	1531.87	20.42	30.42
Raccoon	52	160.55	3.09	2.63
Ermine	46	56.81	1.24	1.38
Badger	17	36.34	2.14	.71
Coyote	3	9.12	3.04	5.23
Skunk	131	211.00	1.61	2.04
		<u>\$3737.34</u>		

During the previous winter the total income from furs was \$8,331.28 or a decrease in 1947 of 45%. The decrease in prices hit us twice, first in less effort by the trappers, and second in a smaller price for those furs secured.

## V. INVESTIGATION AND RESEARCH. (Hammond)

### A. Nesting-grazing Studies.

Field studies of relationships between waterfowl nesting and grazing were carried on at Lower Souris, Upper Souris, Des Lacs, and Lostwood Refuges. There was only a very low nesting population on pastures at Upper Souris and Des Lacs. After making preliminary surveys of shoreline breeding pairs with the assistance of the refuge managers at the latter two refuges, the remainder of the season was spent at Lower Souris and Lostwood.

Tentatively, the seasons work did not disclose any direct detrimental affect of moderate grazing on either nest density or the fate of nests (a special report will be submitted later).

The shoreline surveys indicated the approximate nesting populations and also were a good index to the migratory status of each species.

### B. Sex Ratio.

Sex ratio counts were made for the Division of Wildlife Research and waterfowl specimen material saved for lead poisoning studies.

## SUMMARY OF USE OF AIRCRAFT STATIONED AT LOWER SOURIS REFUGE.

(by E.G. Wellein)

### A. Aerial Counts on Waterfowl.

Central North Dakota. This year was the second successive year in which a waterfowl strip count was made in North Dakota. The count was conducted in the same manner as the one last year and over precisely the same routes. The five routes run are located within the area from Devils Lake on the east to Minot on the west, and from Williston on the south to Lower Souris on the north. In 1946 the count was conducted from May 6 through May 12; this year it was made somewhat later--May 18 through 20. It is believed, however, that because of later migration this year and a later spring in general this resulted in little difference in dates for the two years from a phenological standpoint.

Because of the experience obtained last year in setting up and standardizing the procedure it was possible to conduct the survey in much less time this year than was required in 1946. Almost a week was used last year in this count; the time required this year was about  $2\frac{1}{2}$  days.



A strip  $1/8$  of a mile wide was covered on each side of the plane. The pilot counted all ducks by species on the left side; the observer on the right. The plane was flown at an altitude of 100 feet and at an airspeed of 70 m.p.h. Fairly consistent identification is possible at this speed, distance, and altitude.

All observations were reduced to a per square mile basis to facilitate comparison. In four miles of flying one square mile was covered. It is not only possible to compare this data year to year but to compare it with data obtained by different methods in different areas--provided this data is reduced to a unit area basis.

The five census routes were a fairly good sample of the waterfowl population in Central North Dakota. Six hundred and four linear miles were flown with a resulting coverage of approximately 151 square miles. Shown below is a summary of the observations on the five census routes in 1946 and 47.

Species	No. Ducks Observed		Comparative Abundance	
	<u>1946</u>	<u>1947</u>	<u>1946</u>	<u>1947</u>
Pintail	588	668	25.3	33.9
Blue-wing Teal	323	309	13.9	15.5
Shoveller	259	180	11.2	9.2
Mallard	322	274	13.9	13.9
Scaup	61	99	2.6	5.1
Baldpate	151	59	6.5	2.9
Gadwall	137	153	5.8	7.8
Redhead	15	26	.6	1.3
Canvasback	12	43	.5	2.3
Ruddy	145	33	6.2	1.7
Green-wing Teal	--	6	--	.3
Unidentified	<u>315</u>	<u>123</u>		
Total	2329	1973		

The pintail was again highest in comparative abundance followed by the blue-winged teal, mallard, and shoveller. Only two dabbling ducks showed an increase over 1946--the pintail and gadwall. Blue-winged teal, shoveller, mallard, and baldpate all showed a decrease. The overall picture was a total decrease in the waterfowl population of 19.6 percent.

Below is shown the percentage increase or decrease by routes:

Route No.	% Increase or Decrease <u>in 1947 over 1946.</u>
1	-29.2%
2	-29.8%
3	+ 7.4%
4	-13.2%
5	-31.4%



Only Route No. 3 showed an increase. The other 4 showed a decrease varying from 13.2% to 29.8%.

The number of ducks per square mile varied from a low of 8.0 to a high of 18.6 as compared to a low and high of 11.4 and 23.5 obtained in 1946.

<u>Ducks per Square Mile</u>		
<u>Route No.</u>	<u>1946</u>	<u>1947</u>
1	13.3	9.5
2	11.4	8.0
3	17.2	18.6
4	11.9	10.3
5	<u>23.5</u>	<u>16.2</u>
Average	15.4	13.1

The average number of ducks per square mile decreased from 15.4 in 1946 to 13.1 in 1947--a decrease of 2.3 ducks per square mile.

A record was kept of the flying time necessary to cover the five routes. This information is listed below:

Total cost for aircraft (\$4 per hour)	- \$37.00
Cost per linear mile	- .061
Cost per square mile	- .25
Average ground speed	- 64.5 m.p.h.
No. square miles covered per hour	- 16.3

Lower Souris Refuge Count. An aerial count on waterfowl was made in the past two years on the Lower Souris Refuge in April and again in August. The count obtained this spring was 36,000 as compared to the total count obtained in 1946 of 29,000. The fall count obtained this year by systematically flying the refuge is shown below:

<u>Unit</u>	<u>Waterfowl</u>
357	71,000
341	31,700
332	16,300
326	27,000
320 & rubble	
masonry unit	<u>31,500</u>
Total	177,500

It was estimated that approximately 15% or 26,000 of the total count consisted of coots.

This shows an increase of approximately 37,000 over last year's count of 140,000. It is not known whether this indicates a more successful nesting season than last year or represents a greater influx

of ducks into the refuge during the summer. The increase of waterfowl on the refuge this year from April 24 to August 25 was 145,000. It is impossible to say what percentage of this increase is due to reproduction and how much is due to the influx of ducks preparing to moult. Last year the increase during this period was approximately 111,000.

As an interesting sidelight the following information is offered. In the spring of 1947, 36,000 ducks were counted on the Lower Souris. At the same time an index of 13 ducks per square mile was obtained by the transect method explained previously. The area sampled was located south and east of the refuge and is a good average sample of North Dakota. This means that the Lower Souris Refuge harbored a waterfowl population equal to that found in an average 2,461 square miles of North Dakota--about 3% of the total spring duck population in North Dakota. This percentage, of course, increases during the summer as ducks move in for the moulting season.

By comparing the population of the refuge with the surrounding territory it is possible to definitely show the value of the refuge to waterfowl and demonstrate the effectiveness of sound water and marsh management.

Counts on waterfowl populations were made on the Upper Souris and Des Lacs Refuges and this information will probably be included in the narrative reports from those areas.

Botulism. Flights were made over the following refuges during June or July to check on botulism conditions.

<u>Refuge</u>	<u>No. Flights</u>	Observations--
		<u>No. sick or dead ducks</u>
Lower Souris	3	8 gulls; 10 ducks
Upper Souris	1	300 "
Des Lacs	1	None
Long Lake	1	20 (?) ducks
Lac Aux Morte	1	30 ducks
Lake Alice	1	1 gull
Lake Zahl	1	2 ducks

On the basis of a report received by Mr. Carter of a bad botulism outbreak in a lake  $\frac{1}{2}$  mile east of Alamo, North Dakota a flight was made over that area--only 4 dead ducks were observed.

It should be pointed out that all dead ducks in an area cannot be seen from an aircraft. In fact, from comparing air and ground checks of the same areas it was found that from less than one percent to fifteen percent of the dead ducks were seen, depending, of course, on the abundance of emergent vegetation. The value of the aircraft is in locating outbreaks quickly and in inaccessible areas.

In general, botulism was less severe and not nearly so widespread as last year. The most serious outbreak in this area was the one at Upper Souris.

Duck Depredations. The aircraft stationed at Lower Souris was not used extensively in duck depredations control work this fall. The plane operated by the Game Management Division was used for most of the flying. Some flights (12 to date) amounting to approximately 15 hours of flying time have been made with the refuge plane. In general, this plane was used only when one aircraft was unable to cope with the situation.

The use of the aircraft has proven to be extremely valuable in this work. A large area can be patrolled morning and evening and with the use of shotguns and bombs, and by herding it is possible to drive the birds from many areas during flight. It is possible to cover only a correspondingly small area by automobile during the short time that the ducks are feeding.

Aerial Photography. Unfortunately not enough time has been spent on this important phase of work, but at the present, flying time just doesn't appear to be available. Some pictures have been taken, however, of nesting study areas and of duck concentrations. The photos of the nesting study areas are to be used for cover type maps.

The K20 aerial camera which is assigned to this plane has potentialities of taking much of the time and expense out of cover type mapping. It may also take the "guess" out of the counting of large waterfowl populations. It is unfortunate that more time is not available for developing techniques for the use of the K20 aerial camera in this work.



## VI. PUBLIC RELATIONS.

### A. Recreational Uses.

Editors have written volumes upon the charms of nature, but the average public is little interested unless there are some tangible benefits. Esthetic values have little attraction for the Sunday driver. He must have a place to swim and buy hamburgers, a smooth floor and jive music, or waters from which he can take home a mess of fish. Unfortunately (?) we have none of these to offer at the present time. Lower Souris continues to draw conservationists and ornithologists, but has little attraction for the mobs of Sunday pleasure seekers.

### B. Refuge Visitors.

<u>Names</u>	<u>Addresses-Titles</u>	<u>Purpose-Date</u>
F. C. Gillett	Reg. Refuge Supervisor	Inspection 5/7 & 8
H. A. Jensen	Game Management Agent	5/8
M. Myhre	State Game Warden	5/8
F. Davis, H. Jensen	Game Mgmt. Agents	5/15 & 16, 17
Jesse Thompson	Reg. Supervisor, Game Mgmt.	5/16, 17
R. Ferguson	Agent-Pilot	"
R. W. Dougall	Civil Engr.	5/16
A. Hochbaum & A. Hawkins	Delta Waterfowl Station, Delta, Man.	5/21
R. W. Dougall		5/26
Wm. T. McKean	Fed. Aid Division	5/31
Dr. J. W. Johnston, Jr.	N. Dak. Agric. College	Muskrat study-summer
R. W. Dougall	- in on periodic visits in connection w/water management and work on Dam 357.	
John Eaton	Denbigh, N. Dak.	Water control 6/13
W. H. Kircher	The Farmer, St. Paul, Minn.	Visit 6/13
J. Thompson, H. Jensen		6/25
Robert & Allan Smith	- Flyway Biologist	7/4
John Doyle, A. J. Wright	- Buffalo, N. Y.	Bird Gazers 7/5 & 6
Dr. Wheeler	Mandan, N. Dak.	Archery hunting 7/5
David Spencer, J. Lynch	- Biologists	7/6
A. Hawkins, P. Springer, J. Anderson	of Delta Station	7/6
Roy Bach, R. Stewart	- Fed. Aid Division	7/22
A. Huey, F. Dart	Reg. Engr. & Ref. Mgr.	Water mgmt. 8/1
H. A. Jensen		Duck depred.-staying 8/9
R. Bach,		8/17
Cecil Williams	Chicago Office	Visit 8/20
E. B. Lawson	Upper Miss. Refuge	Duck depred.-staying 8/28
S. Creech	Game Mgmt. Agent	" " "
J. Thompson		" " "
R. Ferguson		" " "
R. F. Potter family	Buffalo, N. Y.	Bird gazers 8/29



<u>Names</u>	<u>Addresses-Titles</u>	<u>Purpose-Date</u>
C. Horner	Game Management Agent	Duck depred.-staying
D. H. Janzen	Regional Director	Bottineau conf. & visit 9/3-5
F. C. Gillett	" "	" "
Dr. Clarence Cottam	Director	" "
Dr. Gustav Swanson	Chicago Office	" "
W. E. Crouch	" "	" "
C. R. Gutermyth	Wash., D.C. (Wild. Mgmt. Institute)	" "
Harold Peters	Atlantic Flyway Biologist	" "
Robert Smith	Mississippi " "	" "
George Saunders	Central " "	" "
Stanley Jewett	Pacific " "	" "
A. H. Hochbaum	Delta Waterfowl Res. Station	" "
Lyle Soules	" " " "	" "
Bruce Wright	Northeastern " " (Canada)	" "
E. W. Malaher	Director, Game & Fish, Manitoba	" "
A. B. Howell	Chief Game Guardian "	" "
Arthur Hawkins	Delta Station, Manitoba	" "
John Lynch	Biologist-Delta	" "
Cecil Williams	Chicago Office	" "
E. R. Kalmbach	Denver	" "
David Spencer	Florida- Biol.-Pilot	" "
C. E. Addy	Massachusetts	" "
Richard Griffith	Chicago Office	" "
Dr. Wm. Elder	Missouri Wild. Res. Unit	" "
F. Carpenter	Ref. Mgr., Des Lacs Refuge	" "
Burns T. Carter	" " Lostwood Refuge	" "
F. S. Dart	" " Upper Souris Refuge	" "
Nelius Nelson	" " Arrowwood Refuge	" "
Paul Springer	Wisconsin	" "
Mr. Woods	Oregon	" "
Carl B. Vogen	Ref. Mgr. Long Lake Refuge	" "
Wm. T. McKean	Fed. Aid Div. - N. Dak.	" "
Mr. Hargrave	" " " "	" "
B. Hjelle	" " " "	" "
Dr. J. W. Johnston	" " " "	" "
Mr. Berner	" " " S. Dak.	" "
L. Young	Bear River	" "
Horton Jensen	" "	" "
John Steenis	Biologist	" "
Allan Smith	"	" "
Jerome Stoudt	"	" "
J. Thompson	Reg. Sup., Game Mgmt. & Agents	" "
F. C. Gillett, R. Griffith		Marsh mgmt. 9/6

C. Refuge Participation.

On August 27 and 28 the refuge manager attended the State wildlife conference in Bismarck.

D. Fishing.

Since the big die-off during the winter of 1945-46, fishing success in refuge waters has been very poor.

VII. OTHER ITEMS.

Photographs.

Although a number of good negatives were secured during the summer we were unable to get them ready for use in this report. These pictures will be included in the next report.

Respectfully submitted,

*C. J. Henry*  
C. J. Henry  
Refuge Manager

9/30/47

APPROVED:

*S. A. Jammer*  
REGIONAL DIRECTOR  
OCT 6 1947

# WATERFOWL

Refuge Lower Souris Refuge Months of May to August 194 7

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I. <u>Swans:</u>									
Whistling swan	7	4/11	* 2500	4/17	5	5/6	—	—	12,500
II. <u>Geese:</u>									
Canada goose .....	37	3/22	* 6000	4/24			8	80	30,000
Cackling goose									
Brant									
White-fronted goose..	504	4/13	* 9000	4/24					45,000
Snow goose	} wave	4/13	* 45000	4/17	20	5/20			225,000
Blue goose		4/13			20	5/20			
III. <u>Ducks:</u>									
Mallard	4	3/25	* 2000	5/2			18	510	200,000
Black duck	2	6/1							300
Gadwall .....	2	4/18	* 8000	5/7-12			38	7450	50,000
Baldpate	2	4/7	* 2000	5/2-10			3	1280	30,000
Pintail .....	2	3/27	* 10000	5/2-10			14	3340	80,000
Green-winged teal	4	4/5	* 1500	5/2-7			1	260	15,000
Blue-winged teal	3	4/19	* 9000	5/6-20			21	9000	90,000
Cinnamon teal									
Shoveller .....	1	4/2	* 1500	5/6-21			3	1030	20,000
Wood duck									
Redhead .....	400	4/18	* 4000	4/21			36	1030	20,000
Ring-necked duck	2	4/19							50
Canvas-back .....	8	4/4	* 1000	4/21			18	260	4,000
Scaup	5	4/2	* 32000	5/1				260	200,000
Golden-eye .....	10	3/31	* 1000	4/2					50
Buffle-head	1	4/19	* 50	4/2					300
Ruddy duck	1	4/19	* 4000	4/30			44	1280	20,000
American Merganser			* 2000	4/2					10,000
IV. <u>Coots:</u>		4/20	27500	8/25				5000	40,000

\*Spring peak - fall peaks in next report.



# SUMMARIES

## Total Production:

Geese 80

Ducks 25,700

Coots 5,000

Total waterfowl usage during period 1,081,900

Peak waterfowl numbers 200,000

Areas used by concentrations All units

Principal nesting areas this season actual bottom lands.

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 RefugeMonths of May to August1947

(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. <u>Water and Marsh Birds:</u>										
Holboell's Grebe			200	August			Some			1,000
Horned Grebe			200	"			Some			1,000
Eared Grebe			3000	"			Abundant			15,000
Western Grebe			500	"			Common			2,500
Piedbilled Grebe			1000	"			Common			5,000
White Pelican			4000	"			Do not nest			20,000
Great Blue Heron			50	"			2	10	25	250
Black-crowned Night Heron			300	"			Unknown			1,500
American Bittern			1000	"			Common			5,000
Virginia Rail			1000	"			Common			5,000
Sora Rail			5000	"			Abundant			25,000
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer			200	August			Nests			1,000
Upland Plover			100	"			"			500
Spotted Sandpiper			500	"			"			2,500
Western Willet			200	"			"			1,000
Marbled Godwit			200	"			"			1,000
Avocet			4	"			Nests-very rare now			20
Wilson's Phalarope			1000	"			Nests-common			5,000
Ring-billed Gull			50	"			2 nests-first refuge record.			250
Franklin's Gull			50,000	"			2	10,000?		250,000
Forster's Tern			300	"			Nests			1,500
Common Tern			1000	"			2	400		5,000
Black Tern			5000	"			Abundant			25,000

(over)



(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					15,000
Mourning dove		3000	August		
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk	Rare				
Horned owl	Few				
Magpie	Few				
Raven					
Crow		1000	August		5,000
Marsh Hawk		50	"		250
Refuge personnel					
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 Gruiformes)  
 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.



Months of **May** to **August**, 194**7**

(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'd. Estimated Total	Percentage	Hunting For Re- stocking For Research	Estimated number using Refuge
Ringneck pheasant	P <sub>1</sub> B P <sub>2</sub> B M-Q R <sub>1</sub> -2 A	2960 6945 39820 5210 3990 58925				400
Hungarian partridge						30
Sharptailed grouse						1000
Prairie chicken						10
<p>Note: Very difficult to appraise at this time beyond fact that population is still very low.</p>						



# 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.

REFUGE GRAIN REPORT

Refuge Lower Souris Refuge

Months of May thru August 7 1944

(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	1372		1372		300		300	1072		1072	
Oats	777		777					777		777	
Barley	666	90	756		600		600	156		156	

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WASHINGTON, D.C.

- (8) Indicate shipping or collection points Des Moines Refuge.
- (9) Grain is stored at refuge granaries.
- (10) Remarks 220 acres wheat seeded; 405 acres barley. Feeding program got under way at end of period and considerable grain was hauled from other refuges; this information will be included on next grain report.



NR-8a

## REFUGEE 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.

