Central Office

J. CLARK SALYER NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT - Calendar Year 1970

United States Department of the Interior
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
Upham, North Dakota 58789

NARRATIVE REPORT

J. CLARK SALYER NATIONAL WILDLIFE REFUGE

For

Calendar Year 1970

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF SPORT FISHERIES AND WILDLIFE

FISH AND WILDLIFE SERVICE

UPHAM, NORTH DAKOTA 58789

REFUGE PERSONNEL

Robert C. Fields	Refuge Manager
Gerald H. Updike (transferred July 14, 1970)	Refuge Manager
Charles S. Peck (E.O.D. September 25, 1970)	Refuge Manager
James W. Heinecke (E.O.D. August 30, 1970)	Refuge Manager
Rodney J. King	Refuge Manager
Wilfred J. Hill	Administrative Assistant
Raymond F. Badke	Maintenanceman
Alvin Brandt	Maintenanceman
Donald R. Goodman	Maintenanceman

TEMPORARY EMPLOYEES

James M. Stensos (06/01 - 09/11/70)	Laborer
Alan R. Carli (06/11 - 09/11/70)	Laborer
Leifur Benedicktson (04/20 - 10/20/70)	Laborer
Floyd J. Kitzman (04/20 - 11/28/70)	Laborer
Leo J. Latendresse (06/08 - 11/27/70)	Laborer
Edwin C. Zeretzke (04/20 - 11/28/70)	Laborer

C O N T E N T S

I. GENERAL

A. Weather Conditions

	Precipitation			Max.	Min.
	Month	Normal	Snowfall	Temp.	Temp.
January	.38"	0.46"	7.7"	32	-35
February	.37	0.46	5.0	42	-42
March	.77	0.78	10.8	46	-20
April	3.02	1.25	22.5	76	3
May	2.04	2.21	T	91	24
June	2.26	3.49	0	91	41
July	3.25	2.41	0	97	41
August	.52	2.05	0	98	37
September	1.28	1.37	0	96	18
October	.57	0.91	2.5	86	7
November	.24	0.60	6.2	58	-12
December	.51	0.45	10.2	37	-34
Annual Totals	15.21"	16.44"	64.9" Extremes	98	-42

The above weather data was obtained from records of the official weather station located at refuge headquarters which is maintained by Administrative Assistant Bud Hill.

January — Temperatures were about normal. Winds were at a minimum and snowfall light. Snow depth at end of month measured seven inches.

February — Weather conditions were generally above normal. The low temperature of the year occurred on February3, a -42° reading. Snow on ground February 28 was four inches.

March — Weather conditions were fairly warm with thawing days and freezing nights. Above normal precipitation was received, mostly in form of snow. No strong March winds occurred.

April — General spring melting occurred first week of April with local runoff light. A high of 76° was reached on April 8. Winds up to 60 mph were reported on April 7 and 8. During the period April 12 - 22, 22.5 inches of snow fell with a moisture content of 2.22". On the 28th and 29th .80 inches of precipitation, in the form of rain, helped melt the snow which fell earlier in the month.

May — This month temperatures were generally above normal. On the 11th a trace of snow fell. A high of 91° was recorded on May 18. Moisture conditions were very good.

June — It was cool and wet during the month. A high of 94° was recorded on June 9th.

July — Temperatures were generally quite favorable for growing crops, warm days and cool evenings. Moisture conditions continued to be adequate.

August — Hot and dry most of the month. Only .52 precipitation was recorded during the entire month and of this amount .37" fell on the 29th. With the absence of moisture and high temperatures harvest progressed rapidly.

September — Fall weather conditions were generally warm and dry. Small amounts of precipitation falling occasionally.

October — Conditions are still warm and dry. A 7° temperature reading was recorded on October 10. The first snow fell on 10/29, 2.5" with a moisture content of .30". With warm temperatures the following day the snow had all melted.

November — Mild and dry. A 5" snowfall occurred on November 22. From this date on a blanket of snow covered the ground.

December — Weather conditions were about normal. Quite frequently during the period snow was drifing across the prairies. Snow on the ground measured six inches at end of the month.

B. Habitat Conditions

1. Water

Refuge pool storage at the beginning of the year was 26,970 acre feet. This figure is almost exactly our planned carry over capacity.

Water flowed all winter in the Souris River. At the beginning of the year the Bantry gauge showed a flow of 65 cfs. Flow was maintained at approximately this level until late March when it dropped off to about 30 cfs for a week. It then began to pick up and continued up with the spring runoff.

Flow at the Westhope gauge from pool 357 was maintained at approximately 90 cfs through January, dropped to 60 cfs in February, 43 cfs in March.

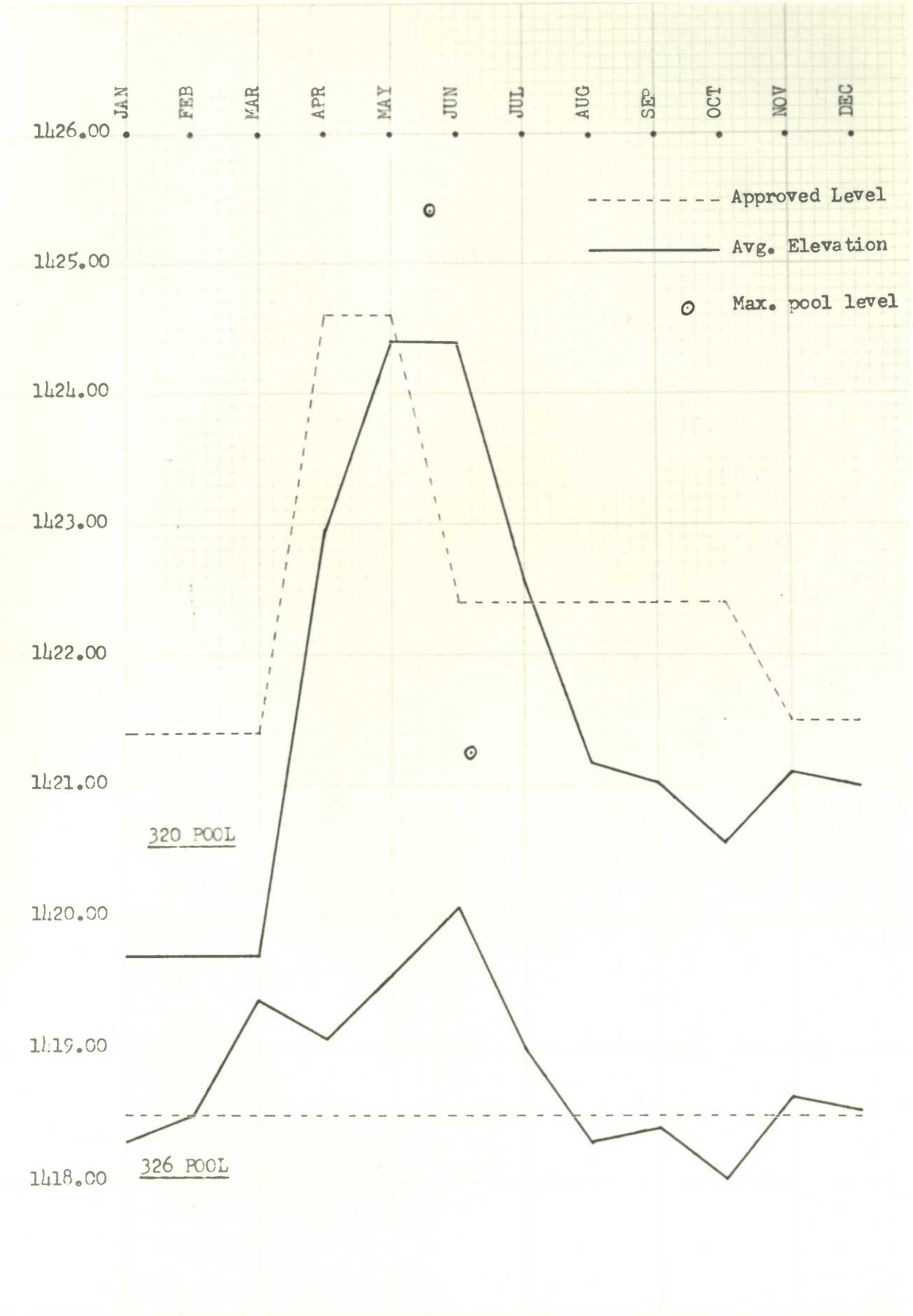
Our spring runoff was not projected to be excessive but abundant precipitation in the Souris basin in April changed that picture completely. For the second year in a row we experienced spring flood conditions. Peak levels were below the record setting 1969 flood and approximately a month later. The following chart illustrates the differences in peak flows and dates of flow in 1969 and 1970.

Pool	Approved Level	1969 Peak	Date	1970 Peak	Date
320	1424.70	1425.90	05/03	1425.40	05/22-26
326	1418.50	1422.15	04/22	1421.25	05/25-6/05
332	1417.00	1421.92	04/18	1419.70	05/29-6/08
341	1415.70	1420.20	04/18	1417.40	05/31-6/08
357	1412.75	1419.50	04/18	1415.30	06/02-6/08

Total refuge outflow measured at the Westhope gauge was 450,937 acre feet compared with 643,852 acre feet in 1969. This was the second highest water year in the history of the refuge.

Pool levels did not recede to near-normal levels until mid-July. Adequate water was available the remainder of the year to keep pools at or near desired levels.

Willow Creek sustained a flow until late August. Deep River flows ceased in early August with Boundary Creek drying up in June. Flows from these three gauged flows into the refuge was 59,000 acre feet as compared to 192,464 acre feet in the record-setting year of 1969. There was a greater proportion of our total flow from the Souris River above the refuge in 1970 than in 1969. This year the three main tributaries coming into the refuge accounted for only 14% of our total flow as compared to 30% in 1969.


JAN
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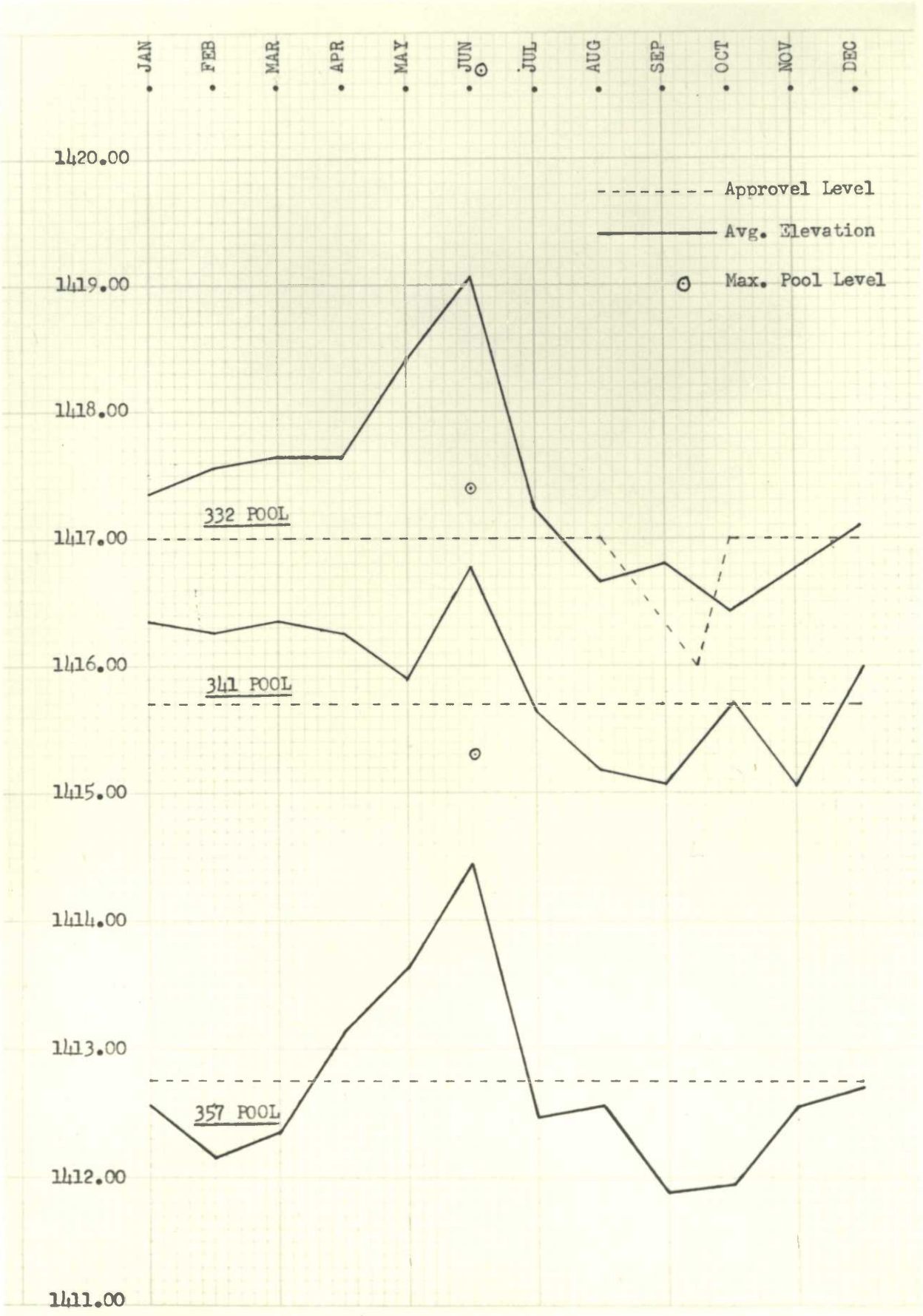
Approved Level
Avg. Elevation
Max. pool level
320 POOL
326 POOL

Figure 1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Approvel Level
Avg. Elevation
Max. Pool Level
332 POOL
341 POOL
357 POOL

Figure 2

Low inflow period at the Bantry gauge on the Souris was mid-October. Flows from Lake Darling had been closed off earlier to facilitate repair of sewage mains in Minot. At the end of the year the Bantry gauge showed a flow of 58 cfs in the Souris River.

At no time did we have difficulty meeting our committment of 20 cfs to Canada between June 1 and October 31. Flows were reduced to 20 cfs in early September through the loflo structure. On November 13 the radial gates were opened to flow approximately 25-30 cfs and the loflo structure closed. Some errors in openings were made and flow decreased drastically to a measured flow of only 1.8 cfs at the USGS gauge house 1/2 mile below 357 structure.

Water conditions in wetlands in this area were fair to good at spring break-up time. Snows and rains in April and early May aided favorably also. Dry weather during summer quickly deteriorated the water condition. Fall precipitation was not adequate to recharge many wetland basins. Going into the winter the general water situation in wetlands could only be described as fair.

Fishery Services personnel from Bismarck conducted water quality analysis at two sites on the refuge on February 3-4 and April 22. In 1969 there was no dissolved oxygen present at either sampling station (structures 320 and 357). The 1970 samples showed 3.5 and 2.45 ppm D.O. at the two sites respectively on February 3. Also there was no measurable hydrogen sulfide in the 1970 sample compared with over 5 ppm at 320 in 1969. Listed below is the analysis as reported from 326 and 357 structures on February 2-3.

Pollutant	326	357
Dissolved Oxygen	3.5 ppm	2.45 ppm
Hydrogen Sulfide	0.0 ppm	0.0 ppm
Total Dissolved Solids	490 + ppm	920 + ppm
Hardness	359 ppm	615 ppm
pH	7.1	7.2
Total Alkalinity	325 ppm	598 ppm
Ortho Phosphate	1.39 ppm	1.9 ppm
Meta Phosphate	0.06 ppm	0.5 ppm
Total Phosphate	1.45 ppm	2.4 ppm
Oxygen Demand Index (??)	150 ppm	25 ppm
Transmitance	98%	93%
Units Color	45	50
Turbidity	20 JTU	15 JTU
Ammonium Nitrogen	0.85 ppm	1.7 ppm
Nitrate Nitrogen	0.00 ppm	0.0 ppm
Nitrite Nitrogen	0.005 ppm	0.01 ppm
Anionic Detergents	0.03 ppm	0.05 ppm

A report of the study of Souris River water quality conducted by the Federal Water Quality Administration in the spring and fall of 1969 has still not been prepared. This report will hopefully contain factual information regarding sources and levels of pollution in the river in North Dakota. Preliminary information received in personal contacts by various people with the FWQA biologist who conducted the field investigation phase of the study indicates refuges will be exonerated in the matter of their contribution to pollution of the river. There still appears in the local (Minot) press statements by agencies such as the North Dakota Public Health Service and the Souris-Red-Rainy Commission that ducks are a major source of pollution in the river. We are hopeful the FWQA report will be issued soon.

Velva, North Dakota put its sewage lagoon into operation this past year. This eliminated the last major source of raw sewage on the Souris. Other sources of pollution still exist and need to be further identified. One area of concern to us is the quality of effluent that will be released from these sewage lagoons into the river. Of particular concern is the City of Minot operation. At this writing we are not certain that adequate, enforceable water quality standards exist in North Dakota to assure an acceptable product being released from sewage lagoons into the Souris River. This is of concern to us in that we are the ultimate recipients of any pollutants injected into the system above us.

2. Food and Cover

No shortages of wildlife food or cover were evident again this year. Precipitation was adequate and growing conditions favorable. The only major exception was the problem imposed on mink, muskrat and beaver by the high flood levels for the second year in a row.

Winter snow conditions never did get severe enough to cause a problem with upland birds or deer. Grouse made heavy use of standing grain in unit D-18. Trapping of grouse was done near here. It is also near an old established dance ground and excellent native cover.

No pheasant season was held in 1969 in North Dakota. Consequently we had a maximum carryover of ringnecks. Adequate cover is available in the marsh, shelterbelt and upland areas for these birds.

Phragmites and cattail stands were further thinned in some areas by high water levels again this year. For the second year in a row there was very little fruiting of cattails in nearly all the refuge marsh areas.

II. WILDLIFE

A. Migratory Birds

Whistling Swans

On April 9 the first swans returned to the prairies and soon after numbers built up to 100. By May 10 the spring population peaked at 400 and by the 23rd all were gone from the refuge area.

Again, as in 1969, collared and color marked swans were seen in the vicinity of the refuge. On May 4 and 9 a yellow dyed swan with a black neck collar was sighted about two miles west of the refuge. Information was sent to the people at John Hopkins University who are currently undertaking the color marking of whistling swans in Maryland. It was found this swan was marked and banded as an adult male at Blackwater National Wildlife Refuge, near Cambridge, Maryland on March 1, 1970.

This was one of several sightings near the refuge over the last two years. It seems to be quite evident that the "Whistlers" from Maryland are migrating through this area.

One swan was seen in 332 pool on July 13. It was thought this bird was a cripple from some spring "goose" shooting. On July 20 a swan (thought to be the same as above) was seen about six miles south of the previous sighting in 332 pool. A cripple would have had difficulty moving this far over two dikes and a highway plus the marsh.

September 21 found the first swan migrants returning to the refuge for their fall visit. Peak fall populations reached 1,215 on November 3.

There were at least three swans found shot on the refuge during the 1970 waterfowl season. A few other rumors came in from hunters that swans were being shot at. We were able to catch up to only one "swan shooter" this fall.

The last swans were noted on November 20 --- heading south on a strong north wind.

Geese

Canadas

First spring migrants appeared on March 6, when a pair of large Canada geese showed up just south of headquarters. The "big" Canadas are always the first to break the long silence of winter. After the Canadas arrive other spring migrants are soon to follow.

Such was not the case in 1970. After 50 geese had arrived a snowstorm and -20° temperatures hit our area and by March 10 all geese had returned south to parts unknown. By March 22 they were back 200 strong.

Peak Canada goose populations reached 1,500 by May 9. About 450 geese stayed throughout the summer. The resident breeding flock was about 250.

Twenty new pole-type nesting platforms were placed in pool 332 during February. This pool has originally had very little goose nesting. A few tubs had been placed on islands, but have suffered high predation. It is hoped that the nesting can be encouraged here in the future.

The new nesting platforms consisting of a single pole driven into the marsh and topped with the fiberglass tubs continued to be a success. Of the 66 new platforms, 37 (56%) were used by geese. Out of 37 nests 32 (86%) were successful.

Following is the total nesting use for 1970:
(In parenthesis are numbers of nests and eggs)

New Platforms		Fate of Nests - %			Fate of Eggs - %			
Pool #	% Used	Hatched	Deserted	Destroyed	Hatched	Not Hatched	Deserted	Destroyed
320	50 (10/20)	80 (8)	20 (2)	0	85 (40)	15 (7)	(20)	0
326	84 (22/26)	91 (20)	9 (2)	0	83 (96)	17 (19)	(9)	0
332	25 (5/20)	80 (4)	20 (1)	0	68 (15)	32 (7)	(6)	0
Totals	56% (37/66)	86 (32)	14 (5)	0	82 (151)	18 (33)	(35)	0
Old Platforms								
320	88 (7/8)	57 (4)	43 (3)	0	95 (20)	5 (1)	(28)	0
326	67 (4/6)	25 (1)	75 (3)	0	100 (4)	0	(12)	0
332	100 (2/2)	0	100 (2)	0	0	0	(7)	0
Total	81 (13/16)	38 (5)	62 (8)	0	96 (24)	4 (1)	(47)	0
Island Platforms								
320	71 (5/7)	80 (4)	20 (1)	0	90 (18)	10 (2)	(5)	0
Platforms Sub Total:	62 (55/89)	75 (41)	25 (14)	0	84 (193)	16 (36)	(87)	0
Island Ground Nests								
320	(23)	78 (18)	18 (4)	4 (1)	80 (79)	20 (19)	(20)	(5)
Platform sub-total	(55)	75 (41)	25 (14)	0	84 (193)	16 (36)	(87)	0
GRAND TOTAL	78	75 (59)	23 (18)	2 (1)	62 (272)	13 (55)	24 (107)	1 (5)

In addition 11 duck nests were found on platforms. Seven of these (all mallards) were on the same platform with an occupied goose nest.

Total production was down from 1969 by about 60 goslings. It is believed that this may have been caused by the delay in the high water during spring. When geese began nesting in 1969 many of the old lower nesting platforms were already under water from high flood stages. In 1970 a delay in the spring flood caught many geese nesting on low platforms and islands. When the high water covered and threatened many nests they were readily abandoned. Eventually we hope to replace all of the old platforms with the higher more stable pole-type platform.

A valiant effort was made to band the large Canada geese during summer, but alas all failed. The major cause was uncooperative geese! Conditions and movements of geese were similar to the successful 1969 goose drives. Delay in the spring runoff prevented the river from being low at the crucial time of the drives. Our lead nets could not withstand the current in the river so would not remain erect to turn the geese into the trap. In future years we should continue to locate geese by spotting them with an airplane just prior to setting nets. This at least eliminates trying to guess if the geese are in the river. The ideal place for putting in nets is on a shallow area in the river just behind a sharp bend in the river. Surprise seemed to be a big factor in the successful 1969 drives. If the geese had time to concentrate on a lead net stretching out into the river they were much harder to force ahead of the boats. If the birds gave full attention to the boats behind them and then, as rounding a bend in the river, were confronted with a net they were much"easier" to force along the lead and into the "pot".

Lesser Canada geese populations continue to build-up on the refuge. Peak spring numbers were about 3 ,500 on May 9. These geese remained until May 16. First fall migrants arrived August 15 and peak numbers occurred in mid-October at about 5,000. Again this year sightings of collared Canada geese were noted. Most of the collared "lessers" are being banded on the McConnell River, Northwest Territories. One goose with a red collar was spotted in Pool 320 on October 22 and again October 29. From all indications (except for right size) this was supposed to be a giant Canada banded in Manitoba.

There were five bands returned from 1969 refuge banded geese. Four of these birds were shot on the North Platte River in Nebraska. This area seems to be where the major harvest on our resident flock is taking place.

White-fronted Geese

The "specklebelly" returned to the prairies on April 5. Peak spring populations were reached in mid-May at 3,000. Thousands more were found northeast of the refuge in flooded grain fields. These shallow sheet water and type I potholes seem to be very important to migrating geese in spring. Some of these water areas will no longer be with us in 1971. Construction of the Boundary Creek Watershed Development project will drain these essential water areas. Most biologists feel that a very essential part of the ecology and biology of waterfowl is found in these temporary potholes. There is something important that attracts these birds to the area year after year. When the potholes are dry the geese do not spend much time in this area during spring. The only ones to know the real answer are the geese and after the potholes are gone, so also may the geese.

White-fronts returned in fall on September 10. Birds rapidly increased until the peak of 21,000 on September 30. During this time many hunters had been checking and "glomming" the goose flights, but on the night of October 1 about 18,000 white-fronts moved south on a strong north wind. When geese season opened on October 3 there were about 400 disappointed goose hunters in the area.

Small flights moved through the area during the rest of October, but never reached over 5,000 birds at any one time. On November 3 there were 140 still on the refuge and a few days later all were gone.

Many mornings were spent counting and aging white-fronts prior to goose season. With the high population it was relatively easy to find a place where the birds were going out of the refuge low enough to make counts. From the count of 61 family groups the average number of juveniles with two adults was 4.14. Of a total 1,190 birds observed 46.5 per cent were immatures. Following are some comparative figures of previous years:

Year	Ave. Size Family Group	Number Young/Adult	Per Cent Productivity*
1970	4.14	0.87	
1969		-	
1968	3.0	0.30	
1967		-	
1966	3.14	1.06	44.5
1965		0.56	
1964		0.30	16.0
1963		0.59	37.6
1962		0.39	15.9
1961		0.23	17.2
1960		1.39	65.0

*Productivity figures from Hammond's annual reports

1970 was one of the best productive years for artic geese; our 46.5% young compared similarly with the 45% young found on the wintering grounds in Louisiana and Texas. Young per family was 2.8 on the wintering grounds.

During early June the North Dakota National Guard spent a four day bivouac on the refuge. One heavy equipment division built two gravel loafing sites on the west side of 341 pool. This was an effort to get white-fronted geese up on the loafing sites to cannon-net them for banding.

In previous years when white-fronts were successfully banded pools were drawn very low to expose mud flats and then baited to cannon net sites. This year it was decided to attract birds to dry loafing sites by keeping the 341 pool about .5 foot higher than usual. This in a sense worked. Lesser Canada geese began to use the loafing sites in mid-September and soon after the more wary white-fronts began to loaf on the edge. Soon after the birds began to use the sites regularly two cannon nets were placed on the southern most site. The birds would use the site only on very sunny and windy days when they did not care to be in the rough water.

Due to poor communications with the National Guard lieutenant in charge of operations, and the fact that we did not look over their shoulder every minute, the loafing site had been put farther north than we wanted. Many birds would loaf about one-half mile south of the site. This was eliminated by driving a pickup truck from the south on a ridge north toward the birds. The only successful shot was made when we forced about 5,000 birds to fly north into the bay adjacent to the site. By mid-afternoon we had about 100 lesser Canadas and white-fronts on the front edge of the site. The one and only cannon shot netted 20 lessers and 7 white-fronts.

We are planning to increase the loafing sites and place them in areas used more by the geese.

Snows and Blues

The first snows and blues arrived with the white-fronts on April 5. Peak numbers were reached at 6,000 for about three weeks during May. Most of these birds, like the white-fronts, found the shallow potholes and flooded fields much more attractive than the still frozen refuge marshes. Populations to the northeast of the refuge exceeded 40,000 white geese.

The first fall migrants appeared on September 21. By October 31, refuge numbers peaked at about 15,000. Between the refuge and Lords Lake refuge located 30 miles to the northeast an estimated 75,000 snows and blues "covered" the area. Numbers seem to increase every year and so do law enforcement problems. Again this year about 19,000 snows and

blues were on the Lords Lake refuge. And again many hunters flocked to "sky bust" at the geese as they left on their morning flight to grain fields. Violations continued to mount with hunters going into the closed refuge to retrieve geese and chasing geese with vehicles.

Ross' Geese

This year Ross' geese made another appearance on the refuge. These little geese are usually found on the refuge, but in very few numbers. When thousands of snows leave the refuge on morning feeding flights it is difficult to pick out a few small Ross'. On October 30, 10 Ross' were seen going out of 326 pool. Hunters report that at least three "mallard size snow geese were killed" on the west side of the 357 unit, north of Westhope.

Also, this year a biologist for the Manitoba Department of Mines and Natural Resources had reports that hunters were seeing and shooting Ross' geese coming across the border from the refuge into Canada. Many biologists believe that this goose is expanding its range eastward.

During September managers Fields and King travelled to Kindersley, Saskatchewan to participate in the banding of white-front geese in that area. During the stay we observed probably 85% of the world's population of these beautiful little geese. It is encouraging to know that a few are expanding their range this direction. A good indication that the population is growing.

Following is 30 years data of peak numbers of all geese that used the refuge during the months of September, October and November.

GOOSE POPULATIONS

Year	SEPTEMBER Snow Blue	SEPTEMBER Canada Large	SEPTEMBER Canada Small	SEPTEMBER White-front	OCTOBER Snow Blue	OCTOBER Canada Large	OCTOBER Canada Small	OCTOBER White-front	NOVEMBER Snow Blue	NOVEMBER Canada Large	NOVEMBER Canada Small	NOVEMBER White-front
1940	-	Very few		Uncommon	8	Very few		Uncommon	-	Very few		Uncommon
1941	-	Very few		Fairly good	-	Very few		Fair	-	Very few		Uncommon
1942	-	Very few		10	-	500		30	-	500		Uncommon
1943	-	1,500		10	-	1,500		1,000	-	1,500		Uncommon
1944	-	1,000		50	-	2,000		2,000	-	500		800
1945	-	1,000		1,000	50	1,000		8,000	-	1,000	80	500
1946	30	400		500	30	600		7,000	30	100		400
1947	-	1,500		500	100	1,500		8,500	50	50		500
1948	10	500		80	10	1,600		4,000	0	60		50
1949	10	400		20	10	1,600		15,000	0	50		100
1950	0	400		200	400	400		2,500	10	300		100
1951	15	900		4,000	30	500		10	0	40		0
1952	15	400		6,500	10	500		5,000	0	150		10
1953	0	500		1,800	0	500		6,200	0	450		950
1954	0	300		50	20	500		10,000	0	450		200
1955	0	600		500	200	1,300		8,400	0	300		0
1956	0	300		7,700	50	800		8,500	0	200		0
1957	100	500	50	10,000	100	400	50	10,000	0	70		10
1958	10	400		8,000	50	700		8,000	50	300		1,500
1959	0	700		6,500	0	700		15,000	0	225		0
1960	0	450		1,700	10	600		14,000	0	350		50
1961	100	325		13,000	400 Ross	700		11,500	0	70		0
1962	10	200		8,600	400 (4)	470		21,500	0	300	800	7,000
1963	10	200		22,000	250	3,500		23,000	300	2,200		700
1964	0	400		14,000	100	1,100		19,500	70	400		800
1965	30	600		18,000	30	2,000		12,000	0	1,000		0
1966	1,000	600		10,000	2,000	2,000		18,000	0	600		500
1967	1,000	600		21,000	5,000	2,000		18,000	4,000	800		0
1968	100	600		20,000	5,000 (1)	2,400		12,000	8,500	2,000		4,000
1969	100	1,000		11,000	18,000 (1)	3,000		4,500	10,000	2,500		1,500
1970	0	500	4,000	21,000	15,000 (10)	500	4,000	7,000	7,000	300	3,000	100

() indicate numbers of Ross' geese observed on the refuge.

Ducks

The first duck to appear was a drake pintail on April 2. Common mergansers were also seen on this date. Mallards soon were to follow along with common goldeneye, lesser scaup, green-winged teal and shovelers.

About 30,000 ducks were counted by late April. Most of the pools were still iced over at this time, however 320 pool had been kept low during fall of 1969 to protect the damaged dike. The lower water had encouraged smartweed and eleocharis to grow in tremendous amounts on almost all mudflats in the pool. Waterfowl were attracted to the flats by the thousands. When spring runoff flooded the vegetation to about 6" the table was set for the ducks.

Breeding population was probably between 20 - 30,000 with peak numbers throughout the summer at 50,000. During the summer thousands of waterfowl moved to the refuge for moulting. Mallards were mainly in 326 and 332 pools while about 5,000 moulting redheads were found in pools 341 and 357.

Duck production was calculated at 21,984. Greatest production came in 326 and 332 pools where 43% of the total was found. Two hundred forty-two broods were observed on the two brood runs. Thirty five percent were blue-winged teal and 24 percent were gadwall. Total production was about 7,000 lower than 1969 and 2,000 below 1968. It is believed that the low production stemmed from cool wet weather at peak hatching period and unstable high water levels.

During June personnel from the Northern Prairie Research Center at Jamestown "borrowed" 254 gadwall eggs from 22 clutches on Gadwall island in 320 pool. The eggs were hatched at NPWRC. Crex Meadow in Wisconsin received 124 ducklings while Pennsylvania got the remainder. It is hoped that these areas can keep the ducks going with the hardy stock from North Dakota. Maybe someday they will have ducks of their own.

Fall buildup started in mid-August to September. Peak numbers were 100,000 on August 31. Mallards took the top spot with 55,000 on August 31 and 70,000 during late September. Peak numbers were about 30,000 below the 1969 fall flights and 75,000 below the high of 1968.

Major feeding areas were about 10 - 15 miles northeast of headquarters out of 326 and 332 pools. During mid-September while hunting deer with bow in the south end of the refuge manager King observed 9 - 10,000 birds returning from the southeast to 320 pool just at dusk. The ducks were very low and evidently had been feeding somewhere southeast of the refuge.

The ducks disappeared on the tail of strong north winds and 0° temperatures. About 20 mallards stayed on the open water at the 357 structure until December 5. After this the prairie was silent of whistling duck wings and babbling geese.

1. Duck Box Survey

The annual survey of 40 metal duck boxes was made on July 7-8. The boxes were erected in 1969 and had four ducks nesting that year. This year results were as follows:

Use	Number	Percent
Hooded Merganser*	16	40.0
Wood Duck	1	2.5
Long-eared Owl	1	2.5
Not used	22	55.0
Total Available	40	100.0

*Two bufflehead eggs were found in one hooded merganser clutch of four eggs.

We feel that use and acceptance to the boxes has been excellent for the two years. The nest with two bufflehead eggs had a full clutch in 1969. The same nest was used in 1970, but evidently some conflict existed over which species was going to do the housekeeping.

The long-eared owl had five young in the nest and suffice it to say she was discouraged from using it in 1971.

Six other boxes contained nest bowls which indicates birds are inspecting other boxes. At the time of the survey six clutches had already hatched.

2. Blue-winged Teal Banding

The banding quota for 1970 was 400 compared to a 200 quota last year. However, last year there was such a large concentration of blue-wings that over 800 were banded. Such was not the case in 1970. Allan Carli, one of the our summer students, took over the challenge of banding the quota. His persistant efforts enabled us to band the 400 in about two weeks. Ninety one teal were netted by night-lighting with the air boat. Night-lighting was usually undertaken between 11 p.m. and 2 a.m. Many more could have been caught because it was relatively easy to catch the birds once they were located.

Of the 800 blue-winged teal banded in 1969, we had 22 direct returns. The following map shows the distribution of returns in the western hemisphere. The longest return was from a bird banded on August 11 and shot on October 20, 5,000 miles away (straight line) near Lima, Peru. On a more realistic flight pattern following the Mississippi River, Central America, and the west coast of South America would have been over 6,500 miles. This would be averaging over 90 miles a day. The east coast returns are very interesting, none-the-less show a distinct migration pattern.

Mourning Doves

This year no banding quota from the Bird Banding Laboratory was given to the refuge. The North Dakota Game and Fish Department has undertaken all dove banding in the state. The refuge offered to band 200 doves in 1970 to continue the dove nesting study. A total of 175 doves were banded of which 97 were immatures and adults, and 78 were nestlings.

Jim Stensos undertook the conservation aid duties and conducted the dove study. Jim's devotion and hard work were an attribute to the study this year. From Jim's report it was determined that the headquarters area dove population during the week July 28 through August 3 was calculated at 220. Following are past years information on dove population in refuge headquarters area during the same period.

1970 - 220
1969 - 181
1968 - 207

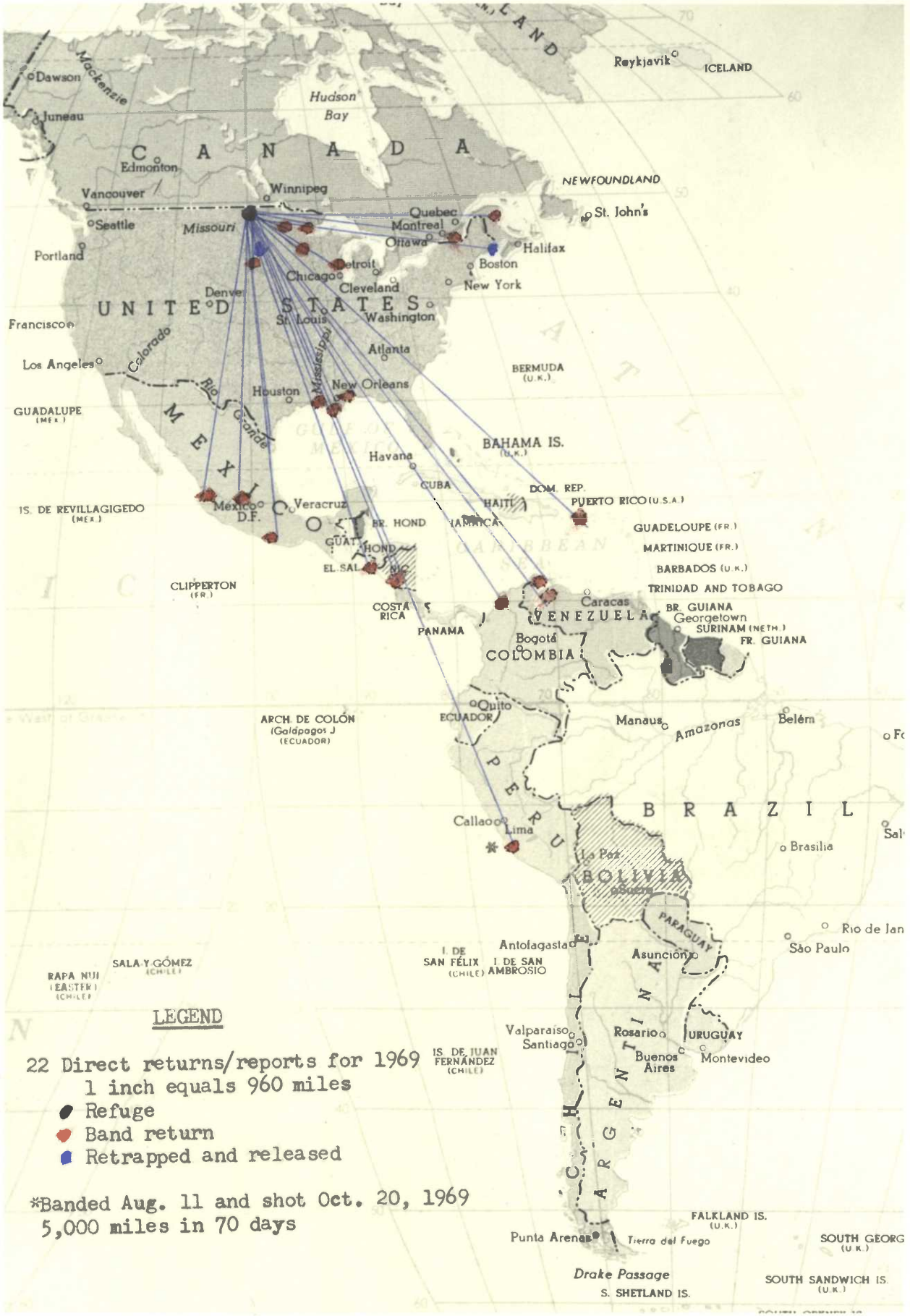
Populations are determined by using the Lincoln Index.

Stensos made an effort to locate all dove nests in and around refuge headquarters. Of 72 nests found, 48 (66%) were successful. A total of 78 nestlings were hatched for an average of 1.6 young per nest. 1969 nesting success was 65% and 1968 was 72%. Nests in the thicker, more protective shelterbelts had the highest success. There were ten renests and one dove using an artificial basket successfully raised three broods in a spruce tree adjacent to the refuge office.

Tree species with the highest nesting use were boxelder (Acer negundo); and juniper.

Water and Marsh Birds

On April 7 ring-billed and herring gulls were seen in 320. Franklin gulls showed up on April 13, peaking at about 6,000. Again this year there were three breeding colonies; two located in 326 and one in 320 pool.



LEGEND

22 Direct returns/reports for 1969
1 inch equals 960 miles

- Refuge
- Band return
- Retrapped and released

*Banded Aug. 11 and shot Oct. 20, 1969
5,000 miles in 70 days

White pelicans reached a new population peak this year when 2,500 were still here in July. For the first time to our knowledge nests with eggs were found on the refuge. No birds were seen incubating and all nests were either abandoned or destroyed.

Other marsh birds of interest were the 20-30 breeding pairs of cormorants northwest of dike 320 and a nesting pair of great blue herons. For the second year in a row a cattle egret (first record in 1969) returned to the refuge. The bird was seen on June 3, only one day later and in same area as 1969.

One least bittern was seen in pool 326 on August 5. This is another rare species for our area.

B. Upland Game Birds

Game birds had a generally good winter. It was not until late winter that this country experienced any blizzard condition that may have had some effect on the upland game birds. During March, 11 inches of snow fell and in April 22 inches of the white stuff fell. Although these storms were quite late in winter there was no freezing rain that could have the detrimental effects possible on upland game bird populations.

Pheasants

During February a pheasant sex ratio count was conducted and 75 roosters to 90 hens were counted. There was no 1969 hunting season on pheasants and this may account for the high rooster population.

A pheasant call count was made on the refuge during late May. Two routes are established on the refuge for a complete representative sample. Route "A" is in the southern end of the refuge and better pheasant habitat. Route "B" is located in the northern part of the refuge and generally shows a lower number of pheasants occupying the poorer quality habitat. Following is data gathered from annual pheasant call counts:

	Route "A" Calls	Route "B" Calls	Total Calls
1970	68	41	109
1969	Not surveyed due to flooded roads		
1968	17	13	30
1967	31	41	72
1966	26	23	49
1965	32	Not run	32
1964	70	40	110
1963	38	24	62
1962	21	41	62
1961	39	5	44
1960	15	0	15

Sharp-tailed Grouse

Total number of grouse counted this spring was the highest in four years. This increase in population has been noted not only in the number of grouse per ground, but in new dance grounds located. Two new dance grounds were located adjacent to 341 pool. One of the new grounds (7 birds) has never been noted before. Grazing was stopped on this unit in 1967. The second new ground (18 birds) was found to have grouse on it in 1959. The unit was grazed until 1964 and checked annually from 1960. This year was the first time grouse were found there since 1959, just six years after grazing was stopped. The grouse may be trying to tell us something.

Grouse study blocks were set up in 1967 and since have been checked annually. Following are results of the four years of data:

	1967	1968	1969	1970
Grounds counted	14	21	10	22
Males counted	99	181	72	183
Ave. per ground	7.1	13.9	7.2	8.3
Grounds not counted	0	0	9*	0
Total for blocks counted	99	181	72	183

*Nine grounds not counted because of high water.

A total of 70 grouse were banded on the refuge this year. Sixty of the grouse were trapped with cannon nets, the largest catch being 22. The birds were baited under one 40'x60' cannon net with mixed barley and wheat for bait. Ten birds were caught in small funnel traps. The cannon nets are preferred as they require less checking and give better results. Following is a breakdown of birds caught:

Immatures		Adults	
Male	Female	Male	Female
10	29	7	13

Eleven females of unknown age were also caught in mid-March when age is questionable.

Eight birds were retrapped from 1969 trapping season.

One bird trapped in 1970 was shot seven miles northeast of Towner, N. Dak., during the fall hunting season. This bird was trapped on January 25, 1970 and shot 19 air miles southeast of where trapped.

Hungarian Partridge

Partridge were seen quite frequently during spring and early summer. After this very few were seen. Production was thought to be lower than last year as only three broods were seen on the refuge. "Huns" have showed up quite readily in the last two months and certain areas with abundance of stubble, shelterbelts, and "wasteland". Where ever there is an abundance of small pigweed along roadsides the partridge will be burrowed down in the snow scratching for seeds.

During late December a total of 12 coveys and 107 birds were counted on the refuge. Many of the birds were found at grain bins feeding on waste grain.

C. Big Game Animals

In mid-February the North Dakota Game and Fish Department made the annual aerial survey. Fifty per cent of the total refuge area was flown and 446 white-tailed deer counted. The State projected total was 892 animals. This was the highest number of deer counted since the surveys were started in 1949.

Four checks of browse conditions were made in the south end of the refuge. In no area was there evidence of any over-browse condition. Many areas of willow, red osier and quaken aspen had numerous small twigs untouched. It is felt that deer came out of winter in excellent condition.

Following are population counts done on the refuge since 1953. All were aerial surveys done by the North Dakota Game and Fish Department.

Year Jan. or Feb.	Actual # Counted	Population Estimate	Percent Of Refuge Flown
1970	446	892	50
1969	368	587	70
1967	?	572	50
1965	442	680	70
1962	179	224	80
1960	160	352	55
1955	119	160	80
1953	32	60	50

These population estimates are taken on winter counts so do not reflect the annual increment to the herd; only what is left after hunting season. In the 1940's there were more deer killed during the hunting season than left to over-winter. The refuge was subject to different hunting pressures than at present. For further information see Section VI. D. on Hunting.

Moose

It was reported by one of our trappers that a cow moose was sighted in the spring and again this fall in the south end of the refuge. This will be further investigated in the coming year.

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

Beaver

Beaver continue to increase in the south end of the refuge. There are large houses this year where smaller ones existed in 1969. The larger houses would probably indicate a pair and family of pups or yearling beaver from the preceding season. Many houses are showing up on old oxbows. This may be from two high water years that rejuvenated old oxbows. When water levels fall during a dry summer much of the water leaves these oxbows and makes them less attractive to beaver, muskrats, and ducks.

No beaver house count was made this fall. During 1970, 29 beaver were trapped by two trappers. Twenty seven of the beaver were trapped during spring of 1970.

Beaver had built a partial dam on the ford in the river below 357 dam. The dam was removed in early spring and the beaver cooperated by not rebuilding this fall.

Muskrat

Spring of 1970 saw muskrat populations low. When high water came in May many 'rats were forced out of the houses and it was felt that the population would again suffer a set-back. By fall there were few muskrat houses noticed in the pools. A closed muskrat season was established to encourage the 'rats to come back. On January 4, 1971 a refuge muskrat house count was made and 975 houses were counted.

This count was 710 houses over the 1969 count. It was felt that the closed season helped build the population. We feel that there is still plenty of room for increase in population and look forward to letting the 'rats open up the marsh.

Mink

This furbearer is our most talked about - money-wise. The mink populations seemed average (whatever that is) for 1970. A total of 161 were trapped this fall compared to 219 trapped in 1969. This animal was seen occasionally throughout the year. During July an adult and 6 young were seen about 3 miles southeast of refuge headquarters.

Weasel

Weasel were not seen in the abundance of 1969, but 25 were trapped this fall. Occasionally these little fellows were seen hunting in fields south of headquarters.

The most common weasel is the short-tailed and past records show that rarely a least weasel has been sighted.

Raccoon

Trapping was lower on these animals as only 32 were caught compared to 52 in 1969. Raccoons were seen quite often during spring breakup and occasionally this fall.

Skunk

A total of 39 skunks were trapped which is the same as 1969. The skunk population may be about stable if trapping is any indication. Skunks may be a problem on a few of the islands. Some type of control should continue to be undertaken in pools 320 and 326. On the mid-May goose nest check 4 skunks were seen on two islands in 320. One of these islands had the only destroyed goose nest of the season.

Coyote

This canine seems to be increasing. During a waterfowl count in September two coyotes were seen running together two miles south of pool 320.

Coyotes were heard in October, and on December 10 a coyote was seen one-half mile southwest of Johnson bridge. Ten days later a coyote was trapped (unintentionally) by a refuge trapper near the same area.

Since then two sets of tracks have been seen near Johnson bridge. A rancher on the east side of the river in the south end of the refuge has reported seeing more coyote sign this past summer and fall than in the past 15 years. Surprisingly the rancher was very happy to see the coyote coming back.

We hope to encourage the increase of coyotes on the refuge by eliminating some of the areas now open to trapping. Although no trapper is permitted to trap coyotes this may stop "accidental" catches.

Fox

An effort to study the red fox was undertaken by NPWRC personnel. On June 16-18 six active fox dens were dug out in an attempt to find the use of waterfowl by fox. The number of waterfowl at the individual den complexes were: 5,6,8,13,35 and 67. Following is the species and number breakdown of the dens:

	Female	Male	Unknown	Total
Blue-winged teal	61	3	3	67
Pintail	12	6	0	18
Gadwall	12	2	1	15
Mallard	6	3	5	14
Shoveler	8	1	2	11
Green-winged teal	2	1	1	4
Widgeon	2	1	0	3
Coot	-	-	2	2
Total	103	17	14	134

In addition to the waterfowl, 13 jackrabbits, 6 hen pheasants, 1 hungarian partridge, 1 sharp-tailed grouse and a wide variety of small birds and mammals were also found at the dens.

Following is an explanation of these findings by Alan Sargeant, biologist at NPWRC.

"All of the ducks were dabblers and 86 percent were hens. The sex ratio and the absence of diving ducks is similar to our findings from other areas. The dabbling duck species composition undoubtedly reflects, in part, the time the dens were visited. The dens containing 5 and 13 waterfowl were only partially dug whereas the other four complexes were completely excavated.

It is difficult to know how to interpret these data in terms of waterfowl losses on J. Clark Salyer. We do, however, have sufficient data to know that the number of birds found at dens is only part of the total number of birds foxes utilize during the denning season and that most foxes use a succession of different dens to rear their pups. We also know that the food composition at dens is a reflection of the abundance of available prey species. The 67 ducks is the greatest number of waterfowl we have found at any den. Nineteen of these birds were identified from the surface food remains and the remainder were located underground in the den. At the den with 35 ducks, 23 were identified from the surface remains. Last year you sent in remains of 42 ducks that were found on the surface at a den. Thus, it appears the utilization of seemingly large numbers of ducks by foxes, the refuge is not unusual.

Foxes are a territorial species and the data we have from both Sand Lake Refuge and Arrowwood Refuge show fox families spacing themselves at about two mile intervals along both sides of the refuge bordering the Jim River. Also there appears to be a high probability that the foxes will den on the refuge because of the land use and topography. Todd felt that this same situation existed on J. Clark Salyer. The foxes, however, should not be considered exclusively as refuge foxes since much private land is undoubtedly included in their territories."

Along with the den surveys eight red fox pups were tagged during the operations. They were tagged with metal buttons placed in both ears and a 2-inch plastic streamer attached to the buttons. Of the eight pups tagged three were trapped during the regular fall trapping season.

In one stretch of refuge, four miles long and three miles wide, one trapper caught a total of 30 foxes (3 of these were tagged). Over one-half (16) of these 30 were trapped during the first three weeks of the 9-week season. Normal red fox populations are about one fox per three square miles. A recent survey in North Dakota found a family of foxes every eight square miles. This was considered a low population.

When 30 red fox are trapped in 12 square miles there is something that must be attracting them to the area. Our explanation is that fox populations are somewhat high this year and although the foxes are well spaced as to territories, when one fox is trapped there is always another to take its place. The attraction to the area could be the high population of rodents found in the refuge marsh. This seems to hold true in other areas of similar habitat. Some of the highest red fox densities are found in the quality pothole country of Rolette and northern Renville counties.

The three tagged foxes trapped were no more than seven miles from the original den. This would indicate an abundance of habitat for red fox on the refuge. Other foxes tagged in the state have shown movements from 10 to 90 miles. This little red fellow is becoming more interesting every year - not only in their association to waterfowl, but also their movements in and out of the refuge.

Bobcat

It was reported by one trapper that bobcat tracks were seen in the south end of the refuge. In 1968 tracks were also seen in the same area.

Snow-shoe Rabbit

The "white bunny" continues to increase in the sandhills portion of the refuge. Populations seemed quite high in 1969, but this winter showed another increase in browse use and number of rabbit tracks. This may also be the reason for increase in the number of predators found on the refuge.

E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies

Four bald eagles and three golden eagles were seen on the refuge during 1970. One adult bald eagle was seen throughout January and February.

Snowy and great horned owls were found in fair numbers (five of each) throughout late winter. Much of their time is spent hunting the rabbit infested sandhills.

Crows descended on the area about the end of March when 400 were counted in the shelterbelt just southeast of headquarters. The crows are seen making morning and evening flights over the same patterns every day. In morning the birds fly south and by evening they are coming back from the west.

F. Other Birds

Following are dates of spring migrants:

Date	Species
1/26/70	Golden eagle
2/02	Snowy owl
3/06	Canada goose
3/08	Crow
3/11	Red-winged blackbird
3/17	Marsh hawk
	Meadowlark
3/18	Blue jay
3/21	Mountain bluebird
3/22	Bald eagle
3/23	Red-tailed hawk
4/02	Pintail
	Common merganser
4/04	Mallard
4/05	White-fronted goose
4/06	Snow and blue geese
4/07	Common goldeneye
	Lesser scaup
	Ring-billed gull
	Herring gull
	Robin
	Baldpate
	Slate-colored junco
4/08	Killdeer
	Green-winged teal
	Shoveler
	Mourning dove
	Sandhill cranes
4/09	Whistling swans
	Sparrow hawk
	Tree sparrow
	Hooded merganser
	Great blue heron
	Redhead duck
	Ring-neck duck
4/10	Gadwall
	Lesser yellowlegs
	Coot
	Canvasback
	Cormorant
4/11	Yellow-bellied sapsucker
	Yellow-shafted flicker
	Blue-winged teal
4/12	Bufflehead
	Oregon junco
4/13	Franklin gull
	Belted kingfisher
4/16	Greater yellowlegs
	Fox sparrow
4/18	Black-crowned night heron
	American avocet
4/20	Ruddy
4/21	Perregrine falcon
	Common grackles
4/23	White pelican
4/24	Eared grebe
	Yellow-headed blackbird
4/25	Tree swallow
	Marbled godwit
	Mourning dove
	Dowitchers
4/26	Pied-billed grebe
4/27	Wilson's snipe
4/28	Willet
	Osprey
	Barn swallow
	Myrtle warbler
	White-throated sparrow
	Horned grebe
	Common tern

Date	Species	Date	Species
4/30	Wilson phalarope	5/11	Gray-cheeked thrush
	Snow bunting		House wren
5/01	Hudsonian godwits		Rose-breasted grosbeak
	Vesper sparrow		Rufous-sided towhee
	White-crowned sparrow		Clay-colored sparrow
	Swainson's thrush		Chipping sparrow
	Western grebe	5/12	Brown thrasher
5/02	Common loon		Oven bird
5/03	American bittern		American redstart
5/05	Wood duck		Magnolia warbler
	Bobolink	5/13	Yellowthroat warbler
	Red-necked grebe	5/16	Eastern kingbird
	Sprague's pipit	5/18	Baltimore oriole
	Chestnut-collared longspur	5/19	Loggerhead shrike
5/06	Cowbird		Long-billed marsh wren
	Black tern	5/20	Wilson's warbler
	Solitary sandpiper		Pine Siskins
	Semi-palmated plover		Catbird
	Orange-crowned warbler		Blackpoll warbler
	Western kingbird	5/21	Tennessee warbler
	Yellow warbler		Chestnut-sided warbler
	Lapland longspur		Eastern phoebe
	Upland plover	5/22	Lark bunting
5/07	Harris sparrow		Virginia rail
	Sora Rail	5/25	Common nighthawk
5/08	Northern waterthrush	5/26	Yellow-throated vireo
	Palm warbler	6/02	Ruby-throated hummingbird
	Black and white warbler	6/03	Cattle egret
	Black throated green warbler	6/04	Common egret
5/09	Ruby-crowned kinglet	6/13	Dickcissel
	Bank swallow	6/18	Common loon
5/11	Lincoln sparrow	8/05	Least bittern

G. Fish

Water conditions remained close to excellent throughout the year. This was brought about by the installation of sewage lagoons in Towner and Velva.

Fishing began to pick up in early May, despite high water. Many 2-lb. northern pike were caught along Highway #14 on the refuge. By July fishing began to taper off, but a few dedicated fishermen stuck with it and a few 4 pounders were taken in August.

Fishing season was closed from September 15 to December 15 except at the Freeman bridge area where fishermen continued to be successful.

From December 15 to the end of the year fishing had to be termed excellent. By December 31, there were 8 fish houses on the ice. Best fishing was at Freeman bridge and 326 dike.

There continues to be about 60 cfs flowing through the refuge. This is encouraging in that the water is very good quality and fish are expected to have a good survival rate over winter.

H. Reptiles

No exceptional observations were made on this form of wildlife this year. Garter snakes appeared at their normal levels. There was one observation of a hog-nosed snake at the Freeman bridge this fall.

Snapping turtles have not been observed since the die off noted in the spring of 1969.

I. Disease

There was no major disease noted on the refuge. Botulism seemed very low for the second year in a row. The 320 pool was kept low and a small stop-log structure was opened on the west end of the dike. This encouraged circulation of water through the pool during summer.

A four point buck (still in velvet) was found dead in the sandhills. It was not noted until late fall and could have died from epizootic hemmoragic disease as no other marks were evidenced as cause of death.

J. Rare and Endangered Species

American Peregrine Falcon

Falcons were seen twice this year. Once on April 21 and again on August 25. On each occasion it was one bird. Usually seen only as a streak as it went from the edge of a grove to the interior in several quick wing beats. Falcons are usually seen within 1/2 mile of headquarters and indicate their seclusive habits where they can escape to a grove of trees when spotted.

American Osprey

One bird was seen on the river at Nelson bridge. An osprey is observed every two or three years in spring. This bird was seen April 28.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Buildings

Quarters 29 : Installed new sink and toilet in bathroom, painted one bedroom.

Quarters 31 : Painted exterior of house and garage; installed new sump pump and water lines in basement; repaired ceilings in two bedrooms.

Quarters 32-1: Painted entire interior of quarters; cut open in kitchen/living room wall; installed new combination screen/storm door; installed new sump pump.

Quarters 40 : Painted hallway and one bedroom; constructed storage shelves in garage; installed sliding shower door and new kitchen sink faucets.

Quarters 61 : Finished remodeling bathroom including new fixtures, painting, counter/cabinets and floor. Painted exterior of house; installed new screen/storm door and outside porch door; replaced all eave troughs; constructed storage shelves in garage.

Quarters 38 : Installed sliding shower door.

New humidifiers were installed in all quarters and the office.

Poured concrete floor and ramp in three-stall garage (bldg. #26).
Removed old cinder block pump house from headquarters yard (bldg. #33).
Enlarged wash ramp at east end of shop to 20' x 24'.
Enclosed corn crib with sheet metal and fiberglass light panels for sign storage.
Removed old sidewalk between quarters 29 and 31.
Installed ventilators in oil storage building.
Installed manhole on water line at Quarters 32.
Painted exterior and roof of Willow Lake cabin.

Fencing and Posting

Fenced old cemetary plot in NW¼ Sec. 12, T 163N, R 80W.
Renovated 20 miles of refuge boundary fence including construction and installation of four wire gates.
Posted Lords Lake Easement Refuge with new refuge signs.

Roads and Dikes

Most activities other than routine maintenance of roads and roadsides was concerned with flood damage repairs. Work done included:

Repaired two washouts in Scenic Trail.
Installed four culverts in Scenic Trail road.
Installed culvert at 341 control structure entrance road.
Installed culverts in LaPorte Coulee crossing and made emergency rock spillway.
Raised road into 326 structure (3/8 mile) and gravelled.

Other work included:

Removed three cattle guards from refuge trails where no longer needed.
Installed cattle guard at 357 oil field entrance.
Built new gate and cattle guard wings for sandhills tower road.
Hauled and spread 150 cubic yards of barnyard manure as mulch on trails.
Stockpiled 800 cubic yards of gravel at Boundary Creek site and 1000 yards at Johnson Bridge pit.

Public Use

Routed and painted 35 signs for scenic trail's route numbers, information signs, hunter information and general public use control.
Constructed new roof and sign on visitor information booth at headquarters.
Refinished six recognition signs and large headquarters entrance sign.
Relocated recognition sign on Highway #14 south of headquarters entrance.
Erected three recognition signs received from Regional Sign shop.
Pumped out pit toilets at 320 and 326 fishing sites.
Developed new Scenic Trail guide and numbered station system.
Put up smooth wire fences at edge of two public hunting retrieving zones.

Equipment

Rebuilt trailer for snowmobile.
Installed winch and loading ramps on lowboy trailer.
Painted D-7 tractor
Repaired damage to dragline cab.
Took delivery of new Dodge 4-WD pickup I-190178 in April.
Purchased new 7' disk for tree cultivation. Traded in riding lawn mower on new one.

Miscellaneous

Installed 20 fiberglass goose nesting tubs on single poles pile driven into 332 marsh.
Removed beaver dams above USGS Westhope gauging station and Dam I diversion.
Replaced catwalk ends at 320, 326 and 332 structures and replaced planks as needed.

Removed dead and downed trees from headquarters area.
Sandblasted and painted upstream face of all radial gates (15) with epoxy paint.
Removed old loading ramp and filled in hole at west end of 320 dike.
Removed log jams from Johnson Bridge twice.
Repaired washout on south side of Dam I.
Hauled and spread 35 loads of gravel on goose banding sites.
Installed safety bumper around gas pump in headquarters area.
Hauled 13 loads of old concrete from Upham to 326 structure for riprap.

Troops of the North Dakota National Guard conducted training exercises on the refuge during early June. A total of 600 troops were present. Work accomplished by the troops was limited because many planned projects were under water from flood waters. Work accomplished included:

Painted Sandhills Tower treads with linseed oil and painted interior of cabin.
Cleared brush and trees from alongside 5 miles of refuge trails.
Constructed two goose banding sites in pool 341.
Removed 1 mile of old fencing and took up three cattle guards.
Repaired 2 miles of refuge trail and hauled and spread 400 yards of manure as mulch on the renovated trail.

Two formal contracts were let by the Division of Engineering during the period to cover the following work:

Contracts

Contract # 14-16-0003-13,197
Flood Damage Repair to 320 and 326 Dikes
Contractor: B & G Construction, Westhope, N. Dakota
Sub-contractor: Walter Otto Construction, Upham, N. Dak.
Road surfacing, filter bed and riprap.

Item	Estd. Contract Need	Unit	Unit Price Bid	Quantity Completed	Contract Total
Common excavating	55,000	cu. yd.	.535	86,918	46,501.13
Road surfacing	5,000	tons	1.30	4630.95	6,020.24
Filter bed (326 dike)	400	tons	8.50	551.085	4,684.22
Riprap (326 dike)	800	tons	9.00	800	7,200.00
					$64,405.59

Work started on August 31 and final inspection was done January 4, 1971. Work done on filling and shaping 320 and 326 dikes was outstanding. Road surfacing was good. Filter bed and riprap work was accepted after negotiations for deductions on material placed on job which did not meet specifications. A total of 1,200 tons of riprap material was placed on 326 dike but payment was made for only 900 tons.

320 dike was shaped to an 8:1 slope upstream and 3:1 downstream with 16' top. No riprap was placed on either slope. Top was gravelled.

326 dike was reshaped on the S.W. 1000 ft. to a 6:1 upstream slope and 3:1 downstream. Downstream slope was ripraped as it is exposed to open sweep of 332 pool from prevailing northwest winds.

Contract # 14-16-003-13,234
Remodeling of sewage system at refuge headquarters; installation of new floor with drain in east end of shop.

Contractor: Morris Holen, Bantry, N. Dak.
Sub-contractor: Walter Otto, Upham, N. Dak.(sewage lines and shop floor)

Work consisted of constructing two cell lagoon system; installation of cast iron sewage pipe system where needed (1,702 lineal feet); install 7 manholes; fence lagoon; shop floor and drain. Total contract payment: $23,665.97.

B. Plantings

1. Aquatic and Marsh Plants

None.

2. Trees and Shrubs

In June, the second planting of a 12 year shelterbelt program was carried out in Unit D-11 by the Mouse River Soil Conservation District. Six shrub and tree species were planted in eight rows on the 25 acre area at a cost of $555 ($2.75 per 100 linear feet).

Survival of a similar planting made in May 1969 is good, but has required extensive cultivation and spraying to control grass and weeds. Such problems are to be expected when attempting to establish tree stands on grassland sites. Benefits of the shelterbelt planting program are being re-evaluated in view of the high cultivation costs to determine the desirability of continuing the program for the full 12 years originally planned.

The North Dakota Forest Service Nursery at Towner donated approximately 200 burr oak seedlings. These were planted in three single rows just south of the headquarters area. Weather was dry following the May planting and survival rate was poor.

3. Upland Herbaceous Plants

Seed beds have been prepared for planting of dense nesting cover on 11 small tracts of land totaling approximately 135 acres. A mixture of six pounds of tall wheat, one pound of alfalfa and one pound of sweet clover per acre will be seeded on these areas during the coming year.

4. Cultivated Crops

Yields from cultivated crops in 1970 were down considerably from the bumper harvest of 1969, but were slightly above the average of the 1966-69 period. Twenty-eight permittees produced a total of 41,693 bushels on 1692.5 acres of refuge land for an average yield of 24.63 bushels. Nearly all the refuge share of grain grown (10,986 bushels) was harvested and fed out to control duck depredations during grain harvest in the vicinity of the refuge. Six acres of cereal grain was left unharvested for utilization by upland birds during severe weather.

Following is grain harvest data for 1970 and a summary of data from 1969 along with a summary of average acreages and yields for the 1966-69 period:

			1970			
				Refuge Share		
Crop	Acreage Planted	Bushels Produced	Average Yield	Harvested	Fed in Swath	Standing
Wheat	485	9,359	19.29	1,777	-	5
Barley	994	26,594	26.75	8,689	-	250
Speltz	17.5	465	26.57	465	-	-
Triticale	9	55	6.11	55	-	-
Oats	183	5,170	28.25	-	-	-
Flax	4	50	12.50	-	-	-
	1,692.5	41,693	24.63	10,986	-	255
			1969			
	1,788	63,223	33.5	16,275	500	10
			1966 - 1969 Average			
	1,584.25	39,726.75	24.35	10,278.75	169.25	63.75

Permittees are allowed to plant flax and oats if they so desire, but since utilization of these crops by ducks is low at feeding station sites the refuge share is taken in barley or wheat.

C. Collections and Receipts

1. Seed or Other Propagules

One farming permittee harvested 15 bushels of alfalfa seed from 10 acres. The refuge share of 7.5 bushels was delivered to the headquarters granary.

2. Specimens

Sixty-three eggs representing 42 species were collected and added to the refuge egg collection that was started in 1969.

D. Control of Vegetation

During the month of June, farming permittees sprayed 500 acres of cropland with 2 lb. a.e./acre of 2,4-D LV ester for the control of broad leaved weeds. Purpose of spraying was to increase yields by reducing competition for moisture. Results were satisfactory.

On June 1, 25 acres of a new shelterbelt planting were sprayed with Simazine 80W and Simazine 4G at a rate of 4 lb. per acre to eradicate quackgrass and brome grass in the rows of trees. Spraying was carried out by the Mouse River Soil Conservation District at a cost of $52.50 to the refuge.

In mid-June a 300 acre upland grazing unit, G-33b, was sprayed with Tordon 212 (2 lb. per acre) to eliminate leafy spurge. Results of treatment cannot be properly evaluated at this time. The area will be checked in the spring of 1971 and any patches missed will be spot treated.

This unit will not be stocked for at least three years following the application of Tordon 212.

Several 40' wide strips totaling 60 acres in the marsh in and around pools 320 and 326 were sprayed aerially with 15 a.e. per acre of Dowpon for eliminating cattail and phragmites. Results indicate nearly 100% kill. Removal of the dead vegetation by burning should leave the desired open water areas. Cost per acre of this treatment is $16.50.

E. Planned Burning

In early 1970 a Prescribed Burning Plan was submitted to the Regional Office and approved. The general plan included a listing of areas suitable for prescribed burning totaling 19,300 acres; 4,800 acres upland prairie, 10,000 acres of marshlands and 4,500 acres of subirrigated meadows.

The 1970 proposals for burning totaled 48 acres in four areas. Three areas totaling 47 acres were burned. The main objective of current planned burning is to reduce densities of kentucky bluegrass in upland areas and stimulate growth of native warm season grasses.

Three basically different areas were selected for burn sites. They were: old field site dominated by kentucky bluegrass, native cool season grass site dominated by kentucky bluegrass but with green needlegrass and western wheatgrass also present as remnants throughout the site, and a cool/warm season native grass site dominated by kentucky bluegrass but with remnant warm season grasses present on suitable sites. All were dragged to locate bird nests prior to burning.

Results were about as expected on the old field site (NE¼NE¼ Sec. 34, T160N, R 78W) burned May 22. Competition from bluegrass was reduced with the resulting vigorous growth of many forbes including licorice plant, sweet clover and wild rose. Bluegrass was set back sufficiently so that it did not seed this year. Some western wheatgrass and green needle were also visible after the burn. Repeated burning at least every two years appears desirable to control bluegrass on these old cultivated sites.

On the cool season site (SW¼SE¼ Sec. 2, T 160N, R 79W) burned on June 5, bluegrass was removed and growth of all grasses appeared to have an equal chance. Western wheatgrass and green needle made good growth. Forbes responded spectacularly, especially wild buckwheat and lambsquarter. A patch of canada thistle showed increased vigor from the burn. The over-all aspect of the area was one of a thriving mixture of plants as compared to the sterile monotype bluegrass assocation adjacent to the burn area.

On the third site (NW¼NW¼ Sec. 24, T 161N, R 79W), we obtained the most spectacular results. This site was dominated by kentucky bluegrass but contained remnant plants of little bluestem on the shallower soil sites and big bluestem in the swales, along with other native warm season grasses. This late burn, June 24th, severely damaged the bluegrass and allowed spectacular response by the bluestems. The rhizominous big bluestem virtually filled every swale and suitable site in the area. Little bluestem responded well as did prairie dropseed and switchgrass where remnants were present in the burn area. Cool season grasses seemed to be effected similarily. All were set back and usually failed to produce seed. Abundant seed production was evident on the warm-season grasses. Production of forbes was stimulated and did not appear to be damaged by the late burn. They responded much better than did native cool season grasses.

Burning is a long overlooked tool of grassland (and correspondingly, wildlife) management we are attempting to apply to much of our lands. It is difficult to dramatize in words and figures the spectacular results obtained when areas heavily dominated by bluegrass are burned. The whole vegetative aspect of the area changes; it appears to spring forth with new life. Seeing is believing and doing is conversion for anyone who has not applied fire to the prairies at the right time and place.

E. Fires

None this year.

IV. RESOURCE MANAGEMENT

A. Grazing

Twenty-seven grazing operations were carried out on refuge lands during the year. A total of 3,397 AUMs were grazed on 15,393 acres for an average stocking rate of 4.5 acres per AUM compared with 3,373 AUMs from 14,241 acres and 4.2 acres per AUM in 1969. The slight increase in AUMs from 1969 to 1970 does not represent an increase in the total number of AUMs for which permits were issued but rather a case of permittees stocking to the full capacity of their permits which some were unable to do because of flooding in 1969. Refuge permits specify a maximum number of AUMs per unit which is 50 to 75% of the recommended stocking rate according to the most recent range survey.

Inspection of the units at the end of the grazing season indicates actual grazing is light to moderate throughout most of the units and that range condition is improving. No new grazing permits are being issued. As permittees go out of the livestock business, the vacated units are worked into a rest-rotation grazing system or placed in a non-grazing status. In 1970, five units were not grazed. The immediate goal is to reduce the number of grazed units to 20 and increase the number of reserve grazing units to 10. Long range plans are for little if any grazing on refuge lands.

Total revenue from grazing in 1970 was $10,120. from 3,396.98 AUMs @ $2.98 per AUM.

B. Haying

Spring flood waters inundated most meadows for the second consecutive year and rendered several unsuitable for haying. Of 43 hay permits issued, only 23 operators actually cut hay this year. Revenue from haying operations was $3,992. from 998 tons @ $4 /ton in 1969.

Overcutting of designated units was not common in 1970 and only one gross violation was noted. New aerial photos of the refuge have been obtained and actual use and cutting patterns on the meadows were mapped for the past season. These will be useful in controlling overcutting and in implementing alternate year haying rotations on the larger units. In addition, more accurate land use records can be maintained, allowing future planning of land treatment and use to be based on good historical data.

C. Fur Harvest

A spring beaver trapping season was set up during March and April. Twenty-nine beaver were removed in the southern part of the refuge.

Fall trapping season was opened on the refuge November 1. Trapping was permitted on all long-haired species except coyote. General trapping season was opened state-wide on November 15. There were eight applicants for trapping on the refuge and all were assigned a unit. By the start of the regular trapping season two had relinquished their permits to spend time on other jobs.

Trapping for muskrats was allowed on or adjacent to dikes and river banks. Marsh 'rat populations have been low for the last four years so they were given a chance to increase and make more openings in the marsh vegetation.

Conditions for trapping were only fair this year as poor snow and ice conditions prevailed into December. The mink populations may have been down because of heavy pressures in 1969, but trapping conditions were much different than in 1969.

Following are numbers trapped as compared to '68 and '69:

Species	1970	1969	1968
Mink	161	219	95
Muskrat	29	655	591
Weasel	25	39	5
Beaver	31	5	1
Raccoon	32	52	42
Red Fox	44	17	2
Badger	4	10	4
Skunk	39	39	20

Peak trapping success occurred the first and second weeks of December. At this time we received a good snowfall and a slight warming trend. This seemed to encourage animal movements.

Trapping season ended December 31. The refuge fur sale was set up for January 6, 1971. Four fur buyers were invited to refuge headquarters to give sealed bids on the six lots of furs.

Following are average prices bid on all lots for 1970 and price comparisons to 1969:

Species	1970	1969	
Mink (male)	$15.90	$24.75	
Mink (female)	5.25	8.95	
Muskrat	.93	1.14	
Weasel	.46	.47	
Beaver (med. to lg.)	5.25	4.40	(small to med.)
Raccoon	4.97	6.42	
Red Fox	11.25	11.25	
Badger	4.50	7.22	

Fur prices were somewhat lower in all animals except fox and very disappointing on mink. Although female mink are smaller than males it is still questionable about the difference of price between the two.

D. Timber Removal

None.

E. Commercial Fishing

None.

F. Other Uses

1. Oil Operations

Seven wells on the refuge and four wells outside the refuge boundary shared revenue with us during the year. A total of $18,538.63 was received. One well in Grazing Unit G-13 was abandoned in early 1970. No new leases or drilling took place on the refuge but exploration activities continue in the refuge vicinity. No major problems with the oil operations were encountered in 1970.

2. Bee Colonies

Permits for bee hives were issued to two operators. Gunter Honey, Inc. of Towner operated 70 hives @ $0.10 per hive and a local individual operated 10 hives (minimum charge of $2.50). Total revenue $9.50.

3. Gravel

In accordance with the amended Land Use Plan, permits were issued to three townships and one local county for removal of gravel from refuge pits to be used for road building in the immediate vicinity. A total of 10,430 cubic yards @ $0.10 per yard yielded receipts of $1,043.

G. Revenue Summary

Listed below is a summary of refuge income for the past four years:

Source	1967	1968	1969	1970
Hay	8,313.71	3,847.95	11,362.76	3,992.00
Grazing	8,628.97	10,196.45	8,803.27	10,120.00
Wood	39.90	5.00	2.50	-
Bees	10.80	9.00	7.00	9.50
Fur	1,034.52	1,173.33	2,382.12	840.47
Oil wells	25,000.00	19,000.00	20,000.00	18,583.63
Totals	$43,027.90	$34,231.73	$42,557.65	$33,545.60

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Depredations Control

This past year can be considered a successful one as far as depredations control is concerned. Weather conditions during harvest were generally good with only brief periods of wet conditions late in the harvest season.

The first depredations complaints were received on August 19. A total of 16 "inquiries" (as we choose to call them) were received between then and September 23. Three of these were concerning blackbirds. Thirteen of the 16 parties that called came to refuge headquarters and were given fuse rope and firecrackers to use. One exploder was loaned out for a short period of time.

Depredations feeding on the refuge commenced on August 12 and terminated September 16. A total of 14,000 bushels of mixed grain was placed out on 8 feeding sites. News releases were issued again this year to explain what we were doing and point out the Bureau is concerned about depredations control.

We have been attempting over the past few years to acquaint local farmers with devices that are available to control waterfowl depredations. We have several acetylene exploders but do not generally place them out merely upon request. They are retained to be used if a particularily bad problem area develops and to show farmers who have not used them just how they work. Our main item in depredations control is fuse rope and firecrackers. These items are provided farmers upon request along with instructions on their use.

Those farmers who use these items properly can do an effective job of controlling duck depredations. Proper and early placement of scarecrows is also a big help.

What we have managed to accomplish is to convey to area farmers that we will help them in their depredations control problems but we will not do it for them. This approach has been effective in that we get only the infrequent farmer who is "hopping mad" about the ducks and expects us to do it all. Usually when it is explained to him what we will do to help him he realizes we are concerned with his problem and are willing to help. But he also gets the message that we will not do it for him.

This approach is not in line with the Bureau approach in other areas, namely the Horicon goose problem. Our problem is evidentally not as critical as theirs so possibly this adds to the effectiveness of our approach. With only the normal refuge staff to handle depredations complaints, along with other normal duties, it would be impossible to handle all problem areas. We know there are people with problems

who do not contact our office and handle their problems in their own way. It is our feeling, however, that if we did attempt to do depredations control for any and all who ask we would receive many more calls from a much wider area. Since depredations control is not basically a Division of Refuges function we feel any efforts exerted beyond the area of influence of refuge ducks is in part accomplishing work over and above our basic responsibilities. Hence, we feel justified in setting the pace and extent of our involvement in depredations control beyond the refuge boundary.

B. Cover Width Study

Three areas were set up for the cover width study. Two areas run east-west and one area runs north-south. All areas are set up to contain three plots each 440 feet long and 165 feet, 99 feet and 33 feet wide. Each area is an old agricultural unit with alfalfa planted for cover. Following are results of 1970 dummy eggs placed in each plot:

33' Strip

Unit	EGGS Destroyed	OK
A-24	5	8
A-26	9	4
A-30	4	9
	18	21

99' Strip

Unit	Side eggs were placed in strip	EGGS Destroyed	OK
A-24	middle	12	1
A-24	west side	11	2
A-26	middle	6	7
A-26	north side	8	5
A-30	middle	3	10
A-30	south side	1	12
		41	37

165' Strip

A-24	middle	7	6
A-24	west side	10	3
A-26	middle	10	3
A-26	south side	11	2
A-30	middle	6	7
A-30	south side	2	11
		46	32

Each unit had 13 eggs placed in a strip and the wider 99' and 165' strips had two sets of eggs. All eggs were given a 21-day exposure.

Egg settings in the "narrow" 33' strip had the most comparative data where 18 of 39 eggs were destroyed. In the 99' and 165' strips more than half of the eggs were destroyed. In these wider areas where middle strips were placed 44 eggs were destroyed and 34 were okay.

It appears the only "significant data" was from the strips placed downwind from the prevailing northwest wind. Those strips placed on the north or west sides had 29 of 39 eggs destroyed. Eggs on the south side of the strips had better "survival" when only 14 of 39 were destroyed.

This is the first year the cover width study has been tried. The study is to continue until 1974. Following is the schedule to be used on the areas until 1974:

UNIT A-26 and A-30 Plot Design A_4

Year	Cover Status	Schedule
1-1970	Alfalfa (sweet clover)/grass	Dummy nest study 6/08-29
2-1971	Alfalfa (sweet clover)/grass	Natural nest survey
3-1972	Alfalfa-cut year before	Dummy nest study 6/15-7/06
4-1973	Alfalfa (sweet clover)/grass	Natural nest survey

UNIT D-23 Plot Design A_1

1-1970	Alfalfa-cut year before	Dummy nest study 6/15-7/06
2-1971	Alfalfa/grass	Natural nest survey
3-1972	Out of rotation - cannot use	
4-1973	Alfalfa/grass	Dummy nest survey 6/8-29
5-1974	Alfalfa/grass	Natural nest survey

VI. PUBLIC RELATIONS

A. Recreational Uses

Total recreational use was up 20 per cent over the previous high of 1967. Greatest increase came from the sustained good fishing throughout the year. When the scenic trail was opened in late July a news release was made to the Minot Daily News. This resulted in a steady stream of traffic for three week-ends in a row. Two or three trips a week-end were made to the information station at headquarters to keep refuge leaflets and scenic trail brochures available to the public.

Off-site programs were given to 1,776 individuals for 105 hours. Most of this was during Wildlife Week. On-site programs were given to 561 individuals for 114 hours. This was due to the increased number of students who came to the refuge for a first hand visit. Both of these categories are in a non-additive column, but consume much time. A job that we truly enjoy and is time well spent.

B. Refuge Visitors

Date	Name	Affiliation	Purpose
02/03	D. Christopherson	BSF&W, FMS, Bismarck	River quality standards
04/06	R. Wahlin	BSF&W, R.O., Mpls.	Sewage lagoon, engrg.
	B. Miller	" "	" "
	J. Ramsour	" "	" "
05/19	J. Carlsen	BSF&W, R.O., Mpls.	Present M.C.Hammond w/meritorious service award
07/30	H. Stiles	BSF&W, C.O., Wash.	Look at dike and lagoon jobs and tour of refuge
	J. Lundeen	" " "	
	D. Umbarger	" R.O., Mpls.	" "
09/03	G. Bossimeir	Manitoba Dept. Mines & Natural Resources	Tour of refuge and discuss marsh management
	B. Ransom		" "
	G. Hochbaum		" "
	K. Cohoe		" "
	M. Hammond	Upham, N.D.	" "
09/29	E. Bry	NDSG&F, Bismarck	Photography-waterfowl & banding
10/04	Mrs. T. Leach	Towner, N.D.	Courtesy call & tour of refuge
11/16	D. Campbell	SCS, Towner	Pasture utilization checks
11/18	J. Carlsen	BSF&W, R.O., Mpls.	Wetlands inspection tour

Occasional:

L. Reynoldson	GMA, Minot
E. Zahn	W.S., Velva
J. Winship	R.O., Mpls.
NDG&F personnel	Wardens and biologists
C. Wingard	R.O., Mpls.
J. Ritchey	R.O., Mpls.
Personnel	Wetlands Off., Minot
Personnel	NPWRC, Jamestown

C. Refuge Participation

01/05/70 Fields and Updike to coordination meeting in Minot.

01/07 Fields and Updike to TAP (Technical Action Panel) meeting in Bottineau.

01/09-10 Fields and Updike to N. Dak. Wildlife Society meeting in Fargo.

01/16 Fields and Updike to N. Dak. Wildlife Federation meeting in Minot.

01/20 Fields and King to NPWRC seminar at Jamestown.

02/04 Fields and Updike Bottineau County TAP committee meeting at Bottineau.

02/04 Updike to ASCS local meeting in Newburg.

02/04 Fields gave slide talk on environment to Presbyterian Church high school group in Bottineau.

02/06 Fields gave slide talk on ecology to students at School of Forestry in Bottineau.

02/16 Fields gave talk on environmental problems to Lions Club at Towner.

02/25-26 Fields, Updike and King attended briefing on Starkweather Watershed in Jamestown.

03/09 Fields and Updike attended coordination meeting at Minot.

03/16 Updike and King attended Bottineau County monthly wildlife club meeting.

Wildlife Week - 3/15-21

03/16 King gave slide talk and discussion to Granville 9th-12th grades
03/16 Updike gave slide talk and discussion to Glenburn 7 - 12th grades
03/17 King gave slide talk and discussion to Antler 1 - 12th grades
03/17 Updike gave slide talk and discussion to Kramer 1 - 8th grades
03/19 Updike gave slide talk and discussion to Upham 6 - 8th grades
03/19 King gave slide talk and discussion to Gardena 5 - 8th grades
03/20 King gave slide talk and discussion to Souris 9 - 12th grades
03/20 Updike gave slide talk and discussion to Newburg 7 - 12th grades
03/25 Fields gave slide talk and discussion to Westhope 1 - 12th grades

04/14-15 Fields, Updike and King attended burning and water facilities seminar in Jamestown.

04/22 Fields gave talk at Earth Day, Bottineau School of Forestry.

04/22 Updike gave talk at Earth Day at Towner High School.

04/23 Updike gave movie and talk to Lutheran Church group in Newburg.

04/30 Fields gave slide talk on environment to NDSF Rod and Gun Club, Bottineau.

05/02 Updike gave refuge tour to Bottineau girl scouts.

05/04 Updike, Fields and Hill attended Bureau coordination meeting at this station.

05/05 Updike gave refuge tour to Newburg biology class.

05/06 Updike gave refuge tour to Upham science club.

05/09 Fields gave refuge tour to School of Forestry, Bottineau, ornithology class.

05/09 King gave refuge tour to Willow City 8th grade.

05/13 King gave refuge tour to Karlsruhe 7th and 8th grades.

05/14 King gave refuge tour to Antler 5th thru 8th grades.

05/15 Updike gave refuge tour to Towner 7th grade.

05/16 Updike gave refuge tour to Minot State College ornithology class.

05/16 King gave refuge tour to Willow City 7th grade.

05/18 Updike gave refuge tour to Kramer grade school.

05/19 Updike gave refuge tour to Westhope biology class.

05/20 King gave refuge tour to Souris 7th grade and sophomore biology classes.

05/27 Brandt gave refuge tour to Dunseith 6th grade.

05/28 Brandt gave refuge tour to Dunseith 5th grade.

06/16 Fields gave refuge tour to Bottineau cub scouts.

06/16 Fields gave slide talk to Benson County 4-H Camp at Metigoshe.

06/22 Updike gave refuge tour to Bottineau cub scouts.

06/29-30 Updike and King gave refuge program to Boy Scouts from Metigoshe.

07/01 Fields gave film and talk at church service in Metigoshe chapel.

08/05 Fields and King gave meeting and refuge tour to Bottineau County Committee for Rural Development.

09/11 King and Stensos gave environmental education course to Towner 6th grade.

09/23 King gave film "So Little Time" and talk to Towner 6th grade.

10/04 King gave refuge tour to 6th grade teacher and Mrs. Tom Leach of Towner.

10/10 King gave refuge tour to Towner cub scouts.

10/11 Fields gave refuge tour to senior girl scouts of Bottineau.

10/15 King in discussion with Prof. Cushing and students of Bottineau School of Forestry.

10/28 Fields gave Wildlife Careers Day discussion to Bottineau County senior class students at Bottineau.

11/23 Fields gave slide talk on refuge to Upham Parent-Teachers meeting at Upham.

11/24 Fields gave talk to Bottineau High School science club.

12/07 Fields gave talk and slides on wildlife to Minot Camera Club.

12/07 Fields, Peck, Heinecke and King attended Bureau coordination meeting at Minot.

D. Hunting

1. Waterfowl

A total of 2,400 visits were recorded for waterfowl hunting during the 1970 season. An average of four hours per hunter visit was spent on the refuge. Again the typical hunt on many areas of the refuge is to lay along fence lines in wait for geese and ducks to make their morning flight out of the refuge. "Sky busting" was seen often when snow and blue goose populations were highest.

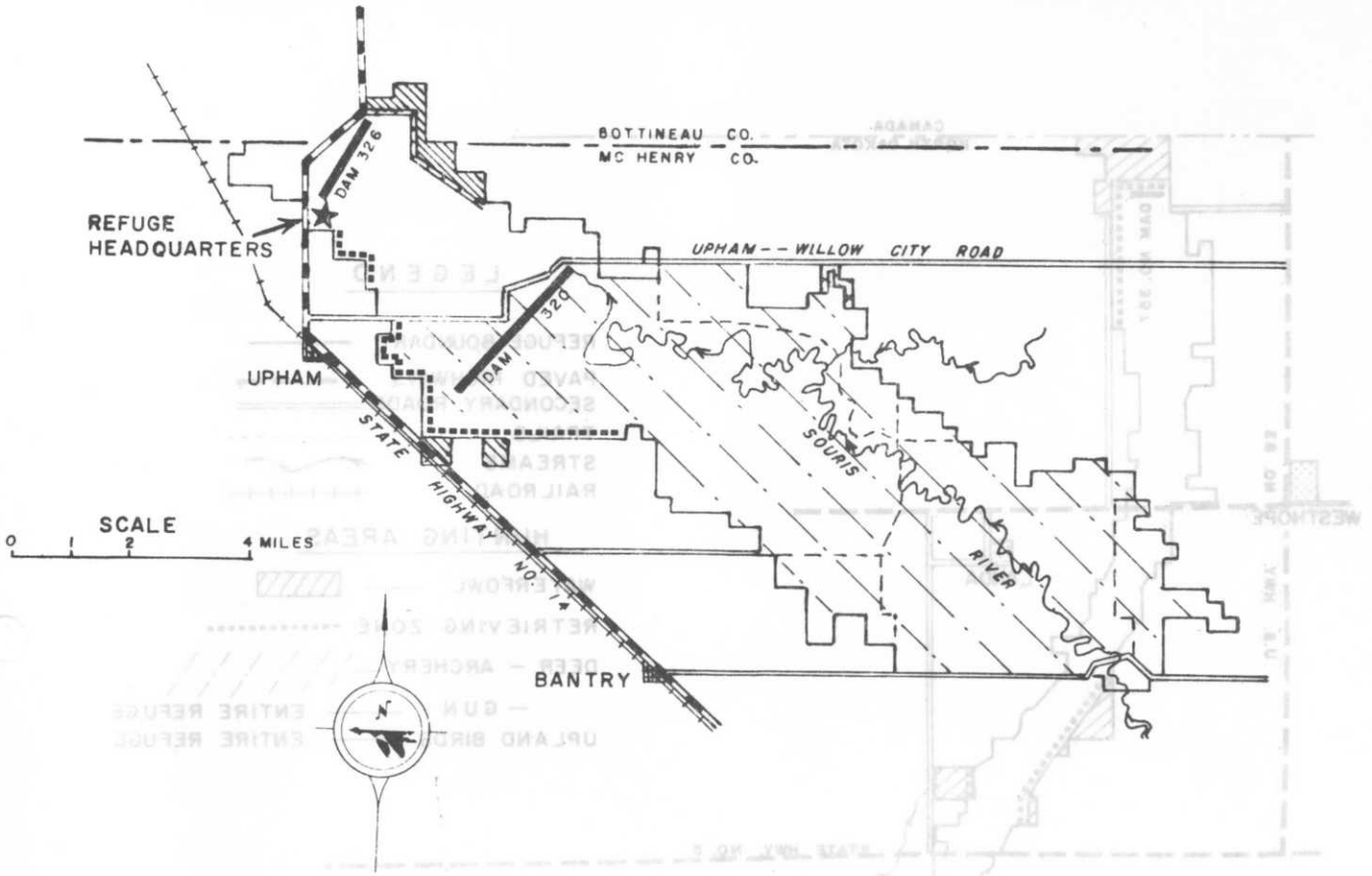
Ducks

Mallards and shovelers were the most frequently taken duck during the season. We did not experience any tremendous build-up of large flights such as in 1968 and to a limited extent in 1969. Many of the ducks found what they needed on the refuge and only in certain limited areas were there consistent morning and evening feeding flights out of the refuge. The most consistent "duck pass" was along the river north of the 357 dike. This area is historically a pass shooting area and a few hunters had very good success by using decoys and a call.

Geese

White-front and lesser canada goose numbers had a tremendous build-up by September 30. Then on October 1, a large cold front with winds up to 40 mph was too much for the geese. They took wing on the north winds and were virtually gone by opening day October 3. There were about 400 disappointed goose hunters opening morning. Many had been observing at the geese the week before and had it all planned how they were "really going to get 'em opening day".

By late October hunting picked up when the tremendous numbers of blue and snow geese moved into the area. Peak refuge numbers were about 15,000 on October 31. No studies were made to count cripples this year, but the fence line hunting and sky busting tactics took their toll. Many retrieving zones did enable hunters to pick up wounded and dead geese.



1970 SEASONS & REGULATIONS

Consult current North Dakota regulations for bag and possession limits.

DEER ARCHERY:	Aug. 28 - Nov. 1 and Nov. 16 - Dec. 13
DEER GUN:	Noon Nov. 6 - Nov. 15
DUCK:	Oct. 3 - Dec. 11
GEESE:	Oct. 3 - Dec. 16
UPLAND BIRDS:	Nov. 16 - Dec. 6

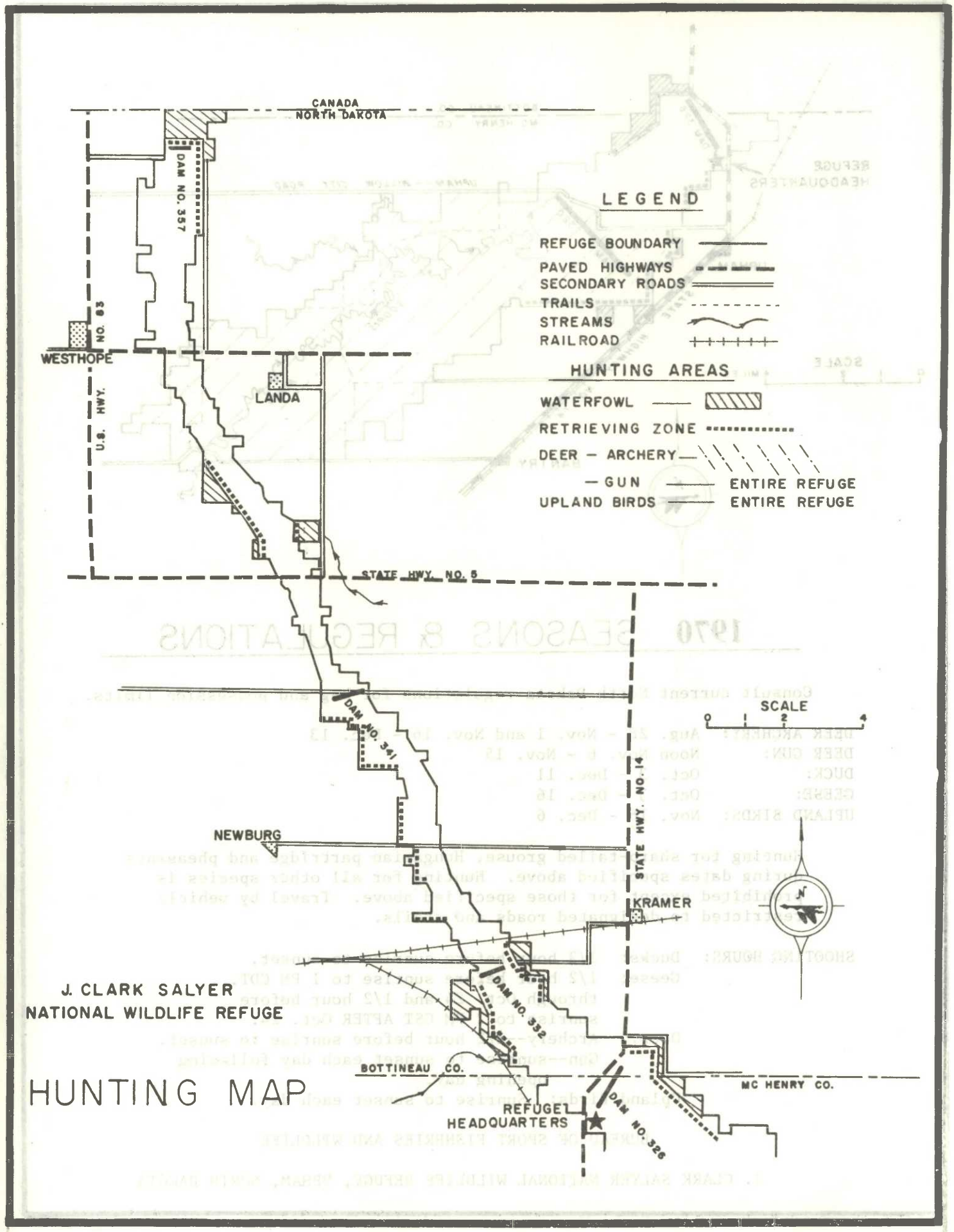
Hunting for sharp-tailed grouse, Hungarian partridge and pheasants during dates specified above. Hunting for all other species is prohibited except for those specified above. Travel by vehicle restricted to designated roads and trails.

SHOOTING HOURS:

Ducks:	1/2 hour before sunrise to sunset.
Geese:	1/2 hour before sunrise to 1 PM CDT. through Oct. 24 and 1/2 hour before sunrise to 2 PM CST AFTER Oct. 24.
Deer:	Archery--1/2 hour before sunrise to sunset. Gun--sunrise to sunset each day following opening day.
Upland Birds:	Sunrise to sunset each day.

BUREAU OF SPORT FISHERIES AND WILDLIFE

J. CLARK SALYER NATIONAL WILDLIFE REFUGE, UPHAM, NORTH DAKOTA


CANADA
NORTH DAKOTA
DAM NO. 357
U.S. HWY. NO. 83
WESTHOPE
LANDA
STATE HWY. NO. 5
DAM NO. 341
NEWBURG
STATE HWY. NO. 14
KRAMER
DAM NO. 332
BOTTINEAU CO.
MC HENRY CO.
REFUGE HEADQUARTERS
DAM NO. 326
LEGEND
REFUGE BOUNDARY
PAVED HIGHWAYS
SECONDARY ROADS
TRAILS
STREAMS
RAILROAD
HUNTING AREAS
WATERFOWL
RETRIEVING ZONE
DEER — ARCHERY
— GUN
ENTIRE REFUGE
UPLAND BIRDS
ENTIRE REFUGE
SCALE
0 1 2 4
N
J. CLARK SALYER
NATIONAL WILDLIFE REFUGE
HUNTING MAP

Again this fall there was a tremendous build-up of snow and blue geese at the Lords Lake Refuge. Although the area is only 1,900 acres, populations peak around 20,000. On October 31, 19,000 geese were counted on the area long with about 300 hunters. Again this contributed to a tremendous amount of wasted waterfowl and violations. This was discussed in 1969 and we still feel that there must be some drastic changes made in the boundary, purchase and use of the area!

2. Upland Game Birds

1970 saw another pheasant season. A spring census showed pheasants about two or three times over the 1968 population. We expected a very good pheasant season, but dry conditions by fall changed our minds. The pheasants were around, but hunting conditions were poor until the last part of the season. Most of the 330 upland game bird hunting visits were for pheasants.

A few hungarian partridge and sharp-tailed grouse were taken incidental to pheasant hunting. Hunters with dogs were most successful and would very seldom go home empty-handed.

3. Big Game

Bow

There were about 150 bow hunting visits to the refuge. Only five deer were known to have been shot on the refuge.

The early bow season is a good chance to get out for some enjoyable morning and evening hunting. A time when everything is quiet and wildlife are at their peak activity. Many bow hunters go into the field with high hopes and a strong desire. Very few hunters did not see deer every outing. Many hunters saw up to 5 to 10 deer during a visit. This alone was enough to bring the hunter back full of enthusiasm and spirit .... and plenty of energy to slap at hungry mosquitoes.

Gun

It was estimated that 175 deer were harvested during the nine and one half day season. Opening day was at noon on Friday when 450 hunters were on the refuge. A total of 218 cars were counted on opening day. Weather was dry and cool during the entire season and the lack of snow was a definite advantage to the deer.

The only refuge roads open to hunting were main county roads and the scenic trail. All approaches and hay meadow trails were closed to traffic. Also, nine signs were put at main entrances to the refuge stating regulations for hunting on the area. A minimum of violations were noted this year.

Following are results of deer checked on the refuge:

Age	Bucks	Does
Fawn	5	6
1½	17	8
2½	4	2
3½	1	3
4½	2	-
5½+	-	1
Total	29	20

This is a very small sample, but does show an indication of a "normal" deer harvest. Of the females, 1½ years and older, 64% (9) were wet does. Of 11 bucks recorded by antler growth 6 of the 1½ year olds were 3 points on each side and 5 had 4 points on each side.

From these small samples and observations by hunters the deer seem to be in excellent shape and condition. We are now beginning to ask ourselves a few puzzling questions: If we are only harvesting 150 to 200 deer every fall and browse and harvest conditions of deer indicate nothing strange why doesn't the deer population increase? In the 1940's deer harvest was around 500 to 900 annually, yet populations seemed to bounce back the next fall. At this time there were as many (if not more) hunters than now and they were able to drive virtually anywhere to pick up deer. If we are truly limiting the harvest why isn't the population increasing under seemingly ideal conditions? It is hoped that we can answer some of these questions in the future. More time will be spent in the sandhills during winter to accurately determine populations and browse conditions.

E. Violations

Date	Name	Violation	Court Action
05/14	Mike Craig	Fishing w/o license Apprehended by: King	State court, fine $25.
05/14	Wm. Rintoul, Jr.	Fishing w/o license Apprehended by: King	No plea, federal warrant issued for his arrest after failure to appear
07/26	Henry Juve	Fishing w/o license Apprehended by: King	Pending for trial date.
10/03	James L. Feldman	Over bag limit on ducks Apprehended by: King	Fined $75.

Date	Name	Violation	Court Action
10/03	Robert L. Haensel	Over bag limit on ducks Apprehended by: King	Fined $75.
10/03	Fred J. Lindberg	Attempt to take protected species (swan) Apprehended by: Fields & Peck	Fined $100.
10/15	John O. Thorson	Retrieve goose on closed refuge. Apprehended by: King	Pending for trial date
10/19	Leland S. Goodman	Failure to kill goose after reducing to possession. Apprehended by: King	Fined $75.
10/19	Herbert A. Boye	Possession of illegally taken goose Apprehended by: King	Fined $35.
10/31	Luverne E. Wilke	Hunting geese with vehicle Apprehended by: King	Fined $75.
11/07	A. A. Burkhartsmeier	Taking vehicle off closed trail - to retrieve deer Apprehended by: Fields & Peck	Fined $50.

Six juvenile cases were turned over to State Warden Geisen and handled in State court.

All cases were tried before U. S. Commissioner Knutson in Minot unless otherwise stated.

Three other waterfowl violations were observed by State Warden Geisen on Lords Lake Refuge and taken before the U. S. Commissioner.

F. Safety

Our lost-time accident record ended at 2,006 days on February 27 when a motor crane was tipped over. The crane was used to remove old cottonwoods adjacent to the refuge office. One cottonwood was too big for the operation and toppled the crane over pinning Maintenanceman Goodman's leg between the door and cab. A larger motor crane, D-7 bulldozer, a payloader and three days later our motor crane was upright.

On September 30, temporary maintenanceman Leo J. Latendresse was stepping from a pick-up truck and sprained his ankle. This resulted in four days lost before he could return to work.

The Third accident occurred when maintenanceman Alvin Brandt lacerated his hand while changing a spring on the shop overhead door during December.

Safety meetings were held monthly and current safety problems were discussed. All refuge personnel participated in the Defensive Driving refresher course when three slide talks, two movies and two discussion sessions were held during October through December.

An annual quarters and building inspection was held during spring. All personnel participated in safety efforts to prevent unnecessary injuries.

The following safety projects were completed in 1970:

Warning flasher placed on John Deere tractor
Frame and safety windshield put on TD-6 tractor
Catwalks repaired on structures 320, 326 and 332
Stair treads placed on upstairs at Quarters #31
Slow vehicle signs placed in headquarters
Identification sign for poison ivy on scenic trail
Sandhill tower stairs repainted by National Guard personnel
Thin ice signs placed at 320, 326, 332 and 341
Life buoy rings repaired and painted
Put wider wheels and reinforced bed of snowmobile trailer
Purchased two more Handyman jacks and put wider plate on bottom of jacks for better stabilization
Put in bumper guard around gasoline pumps
All permanent personnel purchased safety shoes
Purchased two sets of ear cups for protection against noise (airboat operation)

VII. ITEMS OF INTEREST

A. Items of Interest

Personnel changes this year resulted in a change in assistant managers and the assignment of another member to our staff for wetlands administration.

On July 15, Gerald Updike transferred to Necedah Refuge as Refuge Manager (Project Leader). Jerry was at this station 20 months and did an excellent job of administering land use programs, updating public use programs and contributing generally to overall refuge operations.

Replacing Updike was Charles Peck who arrived on September 25. Chuck transferred from the Charles M. Russell National Wildlife Range in Montana. He was assistant manager supervising operations on the west unit of the range, being there for 5 years. He finds it hard to believe the Bureau actually owns all our refuge and has a fence around it!

On September 1 the Wetland Management District under this office was enlarged from two to five counties. Assigned to our staff to administer this program was James Heinecke. Jim transferred from the Devils Lake Wetland Management District, bringing three years of experience at that station. Our wetlands district now encompass Renville, Bottineau, Rolette, McHenry and Pierce counties.

Fields attended a training session in environmental education at Sherburne Refuge sponsored by the Division of Refuges. The instruction was provided by personnel of the Environmental Science Center, Golden Valley, Minnesota. Accompanying Fields was Mr. Larry Bullinger, science teacher at Upham High School. The training was designed to show both manager and teacher environmental education programs and techniques applicable to refuge lands.

In September King and Fields went to the Kindersley, Saskatchewan area to observe techniques and assist Northern Prairie Wildlife Research Center biologist and Canadian Wildlife Service personnel in capturing and banding white-fronted geese. The area is a major concentration point for both white-fronts and Ross' geese. During the two days they were at Kindersley a total of 369 white-fronts and 10 Ross geese were captured and banded in two net firings.

Maintenanceman Goodman's family was increased by one with the birth on October 10 of their second son, Scott.

Merrill Hammond was presented with the Department of Interior Meritorious Service Award on May 19. Presentation was made by John Carlsen from the Regional Office. The award was made in recognition of Merrill's more than 30 years of dedicated service to the Bureau and his major contributions in the fields of waterfowl and prairie grouse management.

Following is an interesting account of a mid-air collision observed and recorded by Rod King:

Mid-air Collision of White-fronted Geese

"On the evening of September 27, 1970, I was observing geese in the 320 pool of the J. Clark Salyer National Wildlife Refuge, near Upham, North Dakota.

My observation point was on a conspicuous bare dike while standing outside of a dark green pickup truck. The evening was exceptionally calm with unrestricted visibility.

At 7:20 p.m. I was observing birds moving into fields to the southwest. One family group of white-fronted geese was seen flying in my direction. Being interested in obtaining information about age structures of these geese I trained my 7x50 binoculars on the birds. I observed the birds through the glasses at about 100 feet high and still moving directly towards me. When the birds were within 50 yards I was able to tell the age of the front two birds. The first bird was an adult. The one immediately behind and above was a juvenile. As I was observing these two birds they apparently noticed the pick-up. The adult bird (leading) suddenly flared upward and back, catching the second bird (juvenile) by surprise. As the adult went up a sharp "clap" was heard and the juvenile bird immediately plummeted to the ground. I did not notice any body contact between the birds, but recall the wings coming very close together.

I went over to the downed bird immediately and located it about 50 yards away. As I approached the bird it tried to escape, but the right wing did not move. I picked up the bird and observed the right wing to be broken and protruding from the skin at the elbow. The bone was not fractured, but had been completely seperated at the joint.

Evidently the wrist of the juvenile wing had been hit sharply as the adult flared upward causing enough pressure to seperate the bones at the joint.

Birds (pelicans, gulls) with identical breaks have been observed on the refuge before, but we have never known the exact cause of the injury. It is possible that birds found with such fractures of the wing may be from similar mid-air collisions."

Refuge personnel, especially the young children, enjoyed the presence of a young white-tailed deer last winter. The animal was picked up at Minot Air Force Base where it was being held by some people who rescured it from some chasing dogs. It appeared to have a badly damaged leg when brought to headquarters by G.M.A. Reynoldson.

In a short while the animal worked its way out of the pen and came up near the houses. It was obvious then it was a tame animal. It stayed around all winter and spring. It showed a definite fondness for children and became good friends with Fields' beagle.

All went well until flower and vegetable time in early summer. The deer was carefully hauled to a site in the Turtle Mountains "near" the International Peace Garden. Its fate is unknown but we received unconfirmed reports of an especially tame deer in the Peace Garden that seemed to show a fondness for flowers.

B. Photographs

As appended. All darkroom work was accomplished in the refuge darkroom. Photos by refuge staff. Printing is done on 8x10½ Kodabromide A-2 light weight paper.

C. Credits

Preparation of report was done as follows:

HILL : I-A and typing of report.

KING : II; IV-C; V-B; VI

PECK : III-B; C & D; IV-A & B

FIELDS : I-B; III-A, E & F; V-A; VII

SIGNATURE PAGE

Submitted by:

(Signature)

Robert C. Fields

Refuge Manager

Title

Date: February 10, 1971

Approved, Regional Office:

Date: FEB 22 1971

(Signature)

Regional Refuge Supervisor Asst

Refuge personnel and their wives, taken at the annual Christmas Party

Men: Donald Goodman, maintenanceman; Charles Peck, refuge manager (assistant); James Heinecke, refuge manager (wetlands); Rod King, refuge manager (trainee); Alvin Brandt, maintenanceman; Bud Hill, administrative assistant; Ray Badke, maintenanceman; Robert Fields, refuge manager.

Ladies: Lavonne Goodman, Mary Peck (standing), Kathy Heinecke, JoAnn King, Anne Brandt, Sue Hill, Orlene Badke and June Fields.

Cutting ice in front of structure 326 is an annual job to protect the radial gates from ice damage. Styrofoam blocks are placed over opening which has been cut. They are then covered with straw and snow for further insulation.

B453

Ice cutting can be a cold job as Rod King's face reveals. North Dakota winters are still as "good" as ever.

B450

"On a clear day you can see forever", or so it seems. This view of refuge headquarters and pool 326 in the foreground and pool 332 in the background shows the clear North Dakota air.

B487

But then there are other days---such as this one in early April in western Renville County. Blowing dust from bare farm fields is still a major problem in North Dakota.

B447

An old view of refuge headquarters found in the files, circa 1937. Pool 326 was just being filled and trees were just beginning to show in the headquarters area.

Same general view 32 years later, both views taken from the refuge tower.

Flood waters of the Souris River inundating the south end of the refuge for the second straight year. This view is looking west from the Thompson Place downriver into pool 320.

B521

Road leading to the U.S.G.S. gauging station near Westhope below Dam 357, underwater for the second time in as many years. U.S.G.S. personnel have difficulty measuring river flows when the river is this wide.

B527

Sandblasting radial gates at 320 structure. All upstream faces of all 15 radial gates were sandblasted and painted with epoxy resin paint. Flood heights required the gates to be out of water, aiding in ease of this operation.

B441

Wash ramp constructed at east end of shop. A new floor with inside drain was added to the shop under contract late in the fall.

B442

Personnel from Northern Prairie Wildlife Research Center and refuge summer biological aides digging out a fox den. Six dens were dug out on the refuge and pups tagged.

B498

Young fox being readied for ear tagging. This pup is a little larger than the crew liked to handle.

B503

Todd Eberhart, NPWRC, spreading out remains of 67 ducks taken from one den near Dam 341, with assistant manager Updike looking on. Remains are from both surface and inside den remains -- all 1970 stock.

B497

Eberhart showing what is necessary to really get with it in fox den digging. He is down attempting to locate pups in den tunnels.

B505

The lowly coot, he still abounds
We wonder what we'll do!
Just write him up with all the rest
For he's still an R.B.U.

C-98

Golden eagle which was kept at headquarters all winter in an attempt to nurse him back to health. A wing injury was apparently permanent. The bird was donated to the Minot Zoo.

C105

Blue-winged teal are still the major nesting species on the refuge. 1970 production of this species was calculated at 7,700 -- 35% of total refuge duck production.

C102

Canada goose production was 270 birds in 1970, down approximately 60 birds from 1969. Heavy snow and cold weather in mid-nesting season and flood waters late in the season were undoubtedly influencing factors.

C104

Western grebes are common refuge breeders and are very visible to refuge visitors.

A140

This red-tailed hawk has just secured his dinner in the form of a large grub from the headquarters lawn and is perched outside the manager's residence to eat it.

A138

Muskrats made a spectacular comeback from the poor reproductive year of 1969. In an effort to let the population expand, no trapping was done in marsh areas this year.

A142

Raccoons are abundant in the south portion of the refuge. Trapping is of limited success as they den up soon after the season opens.

A131

Depredations feeding resulted in nearly 14,000 bushels of mixed grain being fed out on eight sites on the refuge.

B445

Concentration of ducks taking off from Deep River feeding station. Up to 20,000 ducks utilize this one feed station at the peak of the feeding operation.

A148

Barley in refuge grain field that has been eaten by ducks while still standing. Grain in foreground is untouched while heads are virtually all gone from grain in background.

A149

Albino pintail hen in shallow wetland along Highway #14, three miles north of Kramer. She was seen with the drake for several days but never was seen witha brood in this area.

A150

Equipment working on new sewage lagoon system. Work done under formal contract by Morris Holen Construction of Bantry, N. Dak.

B480

View from tower of new lagoon system. Two lagoons should offer adequate system to meet both Federal and State water quality standards.

The Mighty Mouse (or Souris as we all call it) in one of its more peaceful moods, flowing through the south end of the refuge. This is wonderful beaver habitat.

Refuge entrance sign finished off with Bureau emblem mounted on stained piece of 3/4" plywood mounted on rock frame.

B468

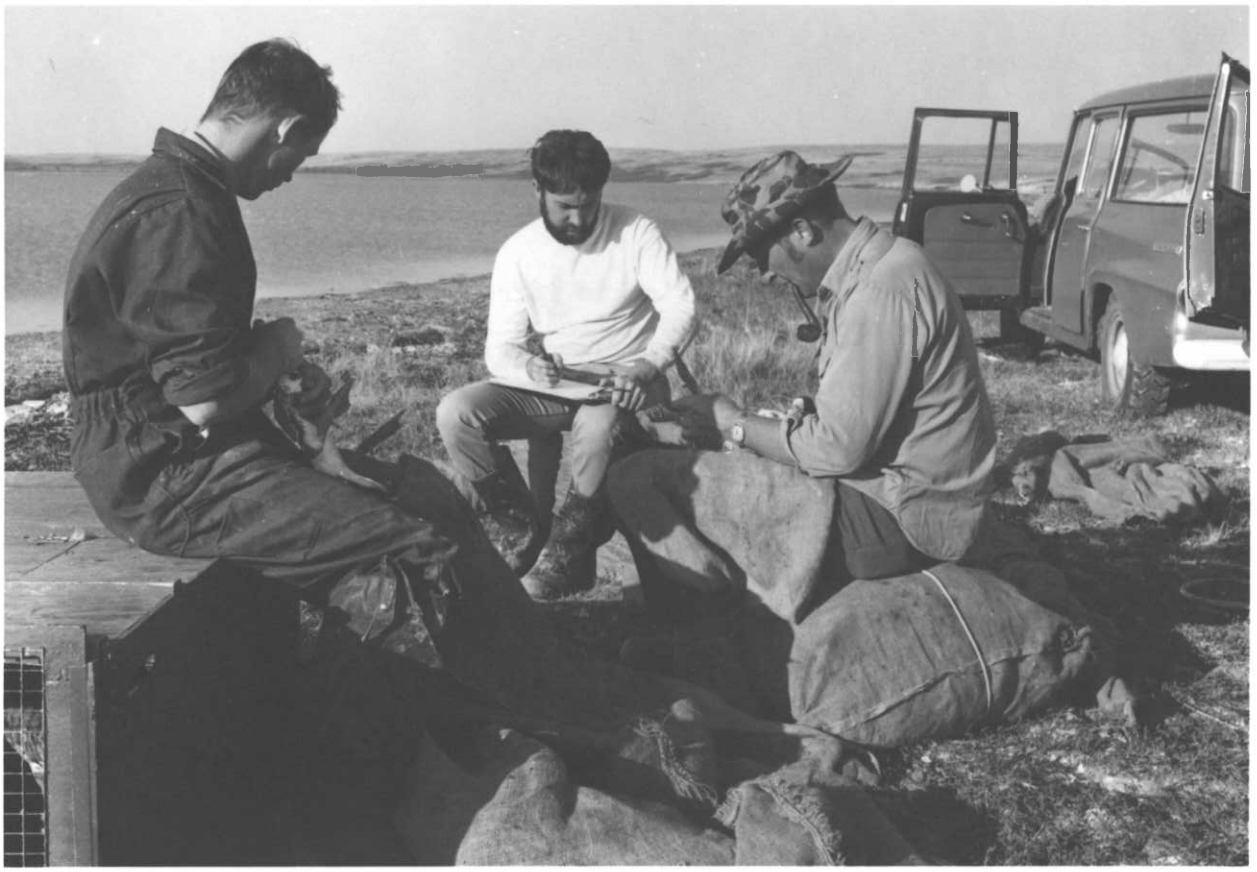

HEADQUARTERS
CLARK SALYER
NATIONAL WILDLIFE REFUGE

White-fronts and Ross geese in cannon net trap on shores of Dewar Lake, Saskatchewan. There were 247 white-fronts and 4 Ross' in this catch.

B508

Rod King, left, assisting Bert Posten, CWS, and Harvey Miller, NPWRC, in white-front banding at Dewar Lake site. Miller is truly the "pro" white-front trapper.

B511

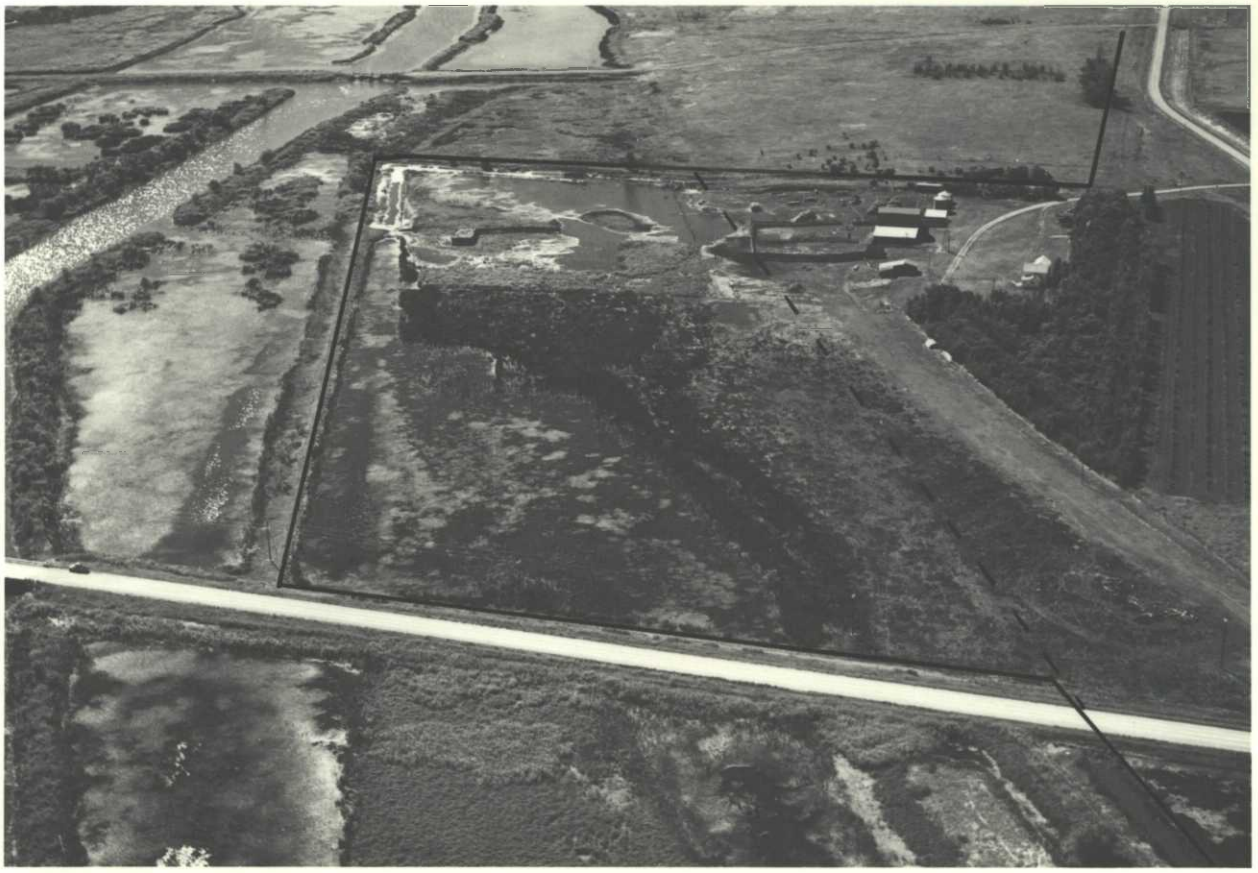


An old problem -- flooding of Jesse Nermoe farmyard. Refuge boundary is solid line; we hold a flowage easement below dotted line. An attempt is being made to negotiate a land exchange to acquire land under easement and permanently rid the Bureau of this problem area.

B486

Another problem which is infrequently encountered. Identification was found on some of the material here and an attempt to prosecute is underway.

B474



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

WATERFOWL

REFUGE J. Clark Salyer

MONTHS OF January TO April 30, 1970

(1) Species	(2) Weeks of reporting period									
	1-3 1	1-10 2	1-17 3	1-24 4	1-31 5	2-7 6	2-14 7	2-21 8	2-28 9	3-7 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										50
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	25	25	25	25	25	20	20	20	20	20
Black										
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
TOTAL WATERFOWL.....	25	25	25	25	25	20	20	20	20	70
Coot:										

Int. Dup. Sec., Wash., D.C. 37944

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE **J. Clark Salyer** MONTHS OF **January** TO **April 30**, 19**70**

(1) Species	(2) Weeks of reporting period: 3-14 (11)	3-21 (12)	3-28 (13)	4-4 (14)	4-11 (15)	4-18 (16)	4-25 (17)	4-30 (18)	(3) Estimated waterfowl days use	(4) Production Broods: seen	Broods: Estimated total
Swans:											
Whistling					100	200	250	300	5,350		
Trumpeter											
Geese:											
Canada		200	250	250	250	300	800	1,000	19,350		
Cackling											
Brant											
White-fronted					150	500	700	1,700	17,950		
Snow											
Blue					1,000	3,500	4,000	5,000	84,500		
Other (Lesser Canada)					500	1,500	2,500	2,500	44,000		
Ducks: **Total Goose Use**		200	250	250	1,900	5,000	8,000	10,200	165,800		
Mallard	20	20	20	100	1,500	2,000	6,500	7,000	107,675		
Black											
Gadwall					200	500	1,500	2,000	25,400		
Baldpate					20	100	500	1,000	9,340		
Pintail				50	1,000	3,000	5,000	6,500	95,850		
Green-winged teal					20	100	200	300	3,740		
Blue-winged teal					50	100	200	1,000	7,450		
Cinnamon teal											
Shoveler					50	200	300	600	6,850		
Wood											
Redhead					50	100	200	500	4,950		
Ring-necked					20	100	100	100	2,040		
Canvasback					20	50	100	200	2,190		
Scaup					50	300	700	1,000	12,350		
Goldeneye					20	100	200	300	3,740		
Bufflehead						50	100	100	1,550		
Ruddy							20	100	640		
Other (Common merganser)				10	50	50	200	300	3,670		
Coots:					20	100	200	400	4,240		
Total Waterfowl.....	20	220	270	410	5,050	12,750	24,070	31,500	458,785		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	5,350	300	
Geese	165,800	10,200	
Ducks	287,635	21,300	
Coots	4,240	400	

SUMMARY

Principal feeding areas 320 pool

Principal nesting areas

Reported by Rodney J. King, Ass't. Refuge Manager

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

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

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

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

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

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

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

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

Interior Duplicating Section, Washington, D. C.
1953

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

WATERFOWL

REFUGE ~~J. Clark Salyer~~ MONTHS OF ~~MAY~~ TO ~~AUG. 31~~, 19 ~~70~~

(1) Species	(2) Weeks of reporting period									
	05/02-02	05/09	05/16	05/23	05/30	06/06	06/13	06/20	06/27	07/04
Swans:										
Whistling	~~350~~	~~400~~	~~400~~	~~300~~						
Trumpeter										
Geese:										
Canada										
Cackling	~~1,000~~	~~1,500~~	~~1,000~~	~~500~~	~~300~~	~~300~~	~~400~~	~~450~~	~~450~~	450
Brant										
White-fronted										
Snow } Blue } Other --Lesser Canada	~~2,000~~	~~3,500~~	~~1,500~~							
	~~6,000~~	~~6,000~~	~~6,000~~							
	~~3,000~~	~~3,500~~	~~1,500~~							
TOTAL GEESE	~~12,000~~	~~15,000~~	~~10,000~~	~~500~~	~~300~~	~~300~~	~~400~~	~~450~~	~~450~~	450
Ducks:										
Mallard	~~9,000~~	~~10,000~~	~~11,000~~	~~15,000~~	~~17,000~~	~~17,000~~	~~17,000~~	~~20,000~~	~~20,000~~	20,000
Black										
Gadwall	~~4,000~~	~~5,000~~	~~7,000~~	~~8,000~~	~~8,000~~	~~10,000~~	~~10,000~~	~~15,000~~	~~15,000~~	20,000
Baldpate	~~2,000~~	~~2,500~~	~~3,000~~	~~4,000~~	~~4,000~~	~~4,000~~	~~4,000~~	~~5,000~~	~~10,000~~	10,000
Pintail	~~8,000~~	~~10,000~~	~~10,000~~	~~10,000~~	~~10,000~~	~~12,000~~	~~12,000~~	~~13,000~~	~~13,000~~	13,000
Green-winged teal	~~1,000~~	~~1,500~~	~~2,500~~	~~2,500~~	~~2,500~~	~~2,500~~	~~3,500~~	~~3,500~~	~~3,500~~	3,500
Blue-winged teal	~~2,000~~	~~3,000~~	~~3,500~~	~~4,000~~	~~4,000~~	~~5,500~~	~~6,000~~	~~7,000~~	~~7,000~~	8,000
Cinnamon teal										
Shoveler	~~1,000~~	~~1,500~~	~~1,500~~	~~2,000~~	~~2,500~~	~~2,500~~	~~3,500~~	~~3,500~~	~~3,500~~	4,000
Wood	-	-	~~100~~	~~100~~	~~100~~	~~100~~	~~200~~	~~200~~	~~200~~	200
Redhead	~~500~~	~~700~~	~~800~~	~~1,000~~	~~500~~	~~500~~	~~500~~	~~500~~	~~1,500~~	2,500
Ring-necked	~~100~~	~~200~~	~~100~~	-	-	-	-	-	-	-
Canvasback	~~500~~	~~600~~	~~600~~	~~600~~	~~600~~	~~600~~	~~600~~	~~700~~	~~800~~	800
Scaup	~~1,500~~	~~3,500~~	~~3,000~~	~~2,000~~	~~500~~	~~500~~	~~500~~	~~500~~	~~700~~	700
Goldeneye	~~100~~	~~100~~	~~100~~	-	-	-	-	-	-	-
Bufflehead	~~200~~	~~200~~	~~200~~	-	-	-	-	-	-	-
Ruddy	~~100~~	~~200~~	~~500~~	~~600~~	~~600~~	~~600~~	~~600~~	~~700~~	~~700~~	800
Other Con.&Hd. Merg.	~~500~~	~~600~~	~~400~~	~~100~~	~~100~~	~~100~~	~~100~~	~~200~~	~~200~~	200
TOTAL DUCKS	39,700	39,800	44,300	48,900	50,400	55,900	58,500	69,800	76,100	83,700
Coot:	~~500~~	~~1,500~~	~~4,500~~	~~5,000~~	~~5,000~~	~~5,000~~	~~5,000~~	~~8,000~~	~~8,000~~	8,000

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE J. Clark Salyer MONTHS OF MAY TO AUGUST 31, 1970

(1) Species	(2) Weeks of reporting period 07/11 11	07/18 12	07/25 13	08/01 14	08/08 15	08/15 16	08/22 17	08/31 18	(3) Estimated waterfowl days use	(4) Production Broods: seen	Broods: total
Swans:											
Whistling									8,400		
Trumpeter											
Geese:											
Canada	450	500	500	500	500	500	520	600	69,160		250
Cackling											
Brant											
White-fronted									39,000		
Snow (											
Blue (									99,500		
Other Lesser Canada						100	200	500	47,600		
Ducks: TOTAL GEESE	450	500	500	500	500	600	720	1,100	255,260		
Mallard	20,000	20,000	30,000	30,000	35,000	50,000	53,760	55,000	3,212,900	6	660
Black	-	-	50	50	50	50	100	100	3,000		
Gadwall	20,000	15,000	15,000	12,000	12,000	10,000	8,000	12,000	1,446,000	67	5,280
Baldpate	10,000	10,000	8,000	5,000	5,000	5,000	2,500	3,000	675,000	22	2,420
Pintail	10,000	8,000	8,000	10,000	10,000	10,000	13,000	15,000	1,365,000	3	550
Green-winged teal	3,500	3,500	3,500	4,000	5,000	2,500	1,500	1,000	354,000	3	330
Blue-winged teal	8,000	8,000	8,500	9,000	9,000	9,000	9,500	9,000	848,000	62	7,700
Cinnamon teal	-	-	-	-	-	-	-	-	-	-	-
Shoveler	4,000	4,000	3,500	2,500	2,000	2,000	1,500	2,000	328,000	6	880
Wood	200	200	200	200	200	200	200	200	20,000	-	-
Redhead	3,500	4,000	4,500	4,000	2,000	1,500	500	1,000	209,500	23	1,760
Ring-necked	-	-	-	-	-	-	-	-	2,300	-	-
Canvasback	1,000	1,000	500	500	500	400	200	200	72,800	7	330
Scaup	700	700	700	400	400	400	300	500	109,000	6	330
Goldeneye	-	-	-	-	-	-	-	-	3,400		
Bufflehead	-	-	-	-	-	-	-	-	3,200		
Ruddy	800	800	800	800	800	800	800	800	83,700	21	1,760
Other (Hd. Merganser)	200	300	300	300	300	300	200	200	30,100	1	
TOTAL DUCKS	81,900	75,500	83,550	76,750	82,250	92,150	92,000	100,000	8,755,900	242*	22,000
Coot:	8,000	9,000	10,000	11,000	12,000	15,000	15,000	15,000	1,046,000		

*Includes 15 unknown broods

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	8,400	400	
Geese	255,240	15,000	270
Ducks	8,755,900	100,000	22,000
Coots	1,046,000	15,000	5,000

SUMMARY

Principal feeding areas Sago pondweed in pools 326, 341 and 357

Principal nesting areas Pools 326 and 332

Reported by R. J. King, Refuge Manager (trainee)

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

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

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

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

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

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

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

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

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

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

WATERFOWL

REFUGE J. Clark Salyer

MONTHS OF September 1 TO December 31 19 70

(1) Species	Weeks of reporting period (2) 09/05 1	09/12 2	09/19 3	09/26 4	10/03 5	10/10 6	10/17 7	10/24 8	10/31 9	11/07 10
Swans:										
Whistling				10	200	500	500	1,000	1,000	1,200
Trumpeter										
Geese:										
Canada	600	400	400	600	350	400	400	400	400	460
Cackling										
Brant										
White-fronted		20	7,500	18,000	21,000	2,500	1,000	500	500	140
Snow)										
Blue)				10	1,500	5,000	6,000	8,500	15,000	6,700
Other Lesser Canada	500	500	600	1,500	3,900	2,000	4,000	5,000	5,000	3,300
Ducks: Total Goose Days	1,100	920	8,500	20,110	26,750	9,700	11,400	14,400	20,500	10,600
Mallard	55,000	45,000	45,000	70,000	50,000	50,000	41,000	40,000	12,000	5,000
Black										
Gadwall	12,000	10,000	10,000	5,000	2,500	2,000	1,500	1,500	500	200
Baldpate	3,000	500	500	1,000	1,000	1,000	1,000	1,000	300	100
Pintail	15,000	10,000	10,000	5,000	5,000	2,500	1,500	1,500	500	300
Green-winged teal	1,000	100	100	100	100					
Blue-winged teal	9,000	4,000	4,000	2,000	1,000	500				
Cinnamon teal										
Shoveler	2,000	1,000	1,000	1,000	500	500	500	1,000	400	
Wood	200	100	100	100	100					
Redhead	1,000	500	1,500	1,500	1,500	1,500	1,500	1,500	500	200
Ring-necked										
Canvasback	200	200	200	500	500	500	600	500	300	100
Scaup	500	500	1,500	1,500	1,500	1,500	2,500	2,500	500	300
Goldeneye										
Bufflehead										
Ruddy	800	1,000	1,000	800	500	500	500	500		
Other H. Merganser	200	100	100							
Total Duck Days	99,900	73,000	75,000	88,500	64,200	60,500	50,600	50,000	15,000	6,200
Coot:	10,000	10,000	8,000	8,000	5,000	3,000	3,000	2,000	500	

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE J. Clark Salyer MONTHS OF September 1 TO December 31, 1970

(1) Species	(2) Weeks of reporting period: 11/14 (11)	11/21 (12)	11/28 (13)	12/05 (14)	12/12 (15)	12/19 (16)	12/26 (17)	12/27-31 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimat total
Swans:											
Whistling	900	100							37,870		
Trumpeter											
Geese:											
Canada	50								30,020		
Cackling											
Brant											
White-fronted									358,120		
Snow)	2,000	500							316,470		
Blue)											
Other Lesser Canada	500								186,600		
Ducks: Total Goose Days	2,550	500							891,210		
Mallard	1,800	430	20	20					2,796,890		
Black											
Gadwall									292,400		
Baldpate									59,800		
Pintail	50	50							329,800		
Green-winged teal									7,800		
Blue-winged teal									125,500		
Cinnamon teal											
Shoveler									51,300		
Wood									3,800		
Redhead	50								76,750		
Ring-necked											
Canvasback									24,800		
Scaup	100	20							89,440		
Goldeneye											
Bufflehead											
Ruddy									37,600		
Other M. Merganser									2,400		
Total Duck Days	2,000	500	20	20					3,898,280		
Coot:									326,500		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	37,870	1,200	
Geese	891,210	26,750	
Ducks	3,898,280	99,900	
Coots	326,500	10,000	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by Rodney J. King, Refuge Manager (trainee)

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

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

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

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

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

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

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

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

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

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge J. Clark Salyer Months of January to April 30, 1970

(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:										
Horned grebe	3	4-24-70								
Horned grebe	2	4-28								
Pied-bill grebe	1	4-26								
White pelican	5	4-23								
Double-crested Cormorant	2	4-20								
Great blue heron	1	4-09								
Blk.-crowned night heron	1	4-18								
Sandhill crane	15	4-08	150	4-22						
II. Shorebirds, Gulls and Terns:										
Killdeer	2	4-08								
Common snipe	1	4-27								
Lesser yellowlegs	1	4-20								
Greater yellowlegs	1	4-16								
Marbled godwit	2	4-25								
Ring-billed gull	20	4-07	1,500	4-15						
Franklin gull	15	4-23	6,000	4-24						
Common tern	2	4-28								
Willet	1	4-28								

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove	1	4-08	500	4-25			
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	1	1-26					
Duck hawk							
Horned owl	2	1-15	4	3-15			
Magpie	12	2-25					
Raven							
Crow	2	3-08	400	3-26			
Osprey	1	4-28					
Red-tailed hawk	1	3-23					
Bald eagle	3	1-10	3	3-22			
Marsh hawk	5	3-17	15	4-21			
Sparrow hawk	1	4-09	5	4-20			
Peregrine falcon	1	4-21					
Snowy owl	2	2-02	4	3-21			

Reported by Rodney J. King

INSTRUCTIONS

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

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

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

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

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

(6) Total: Estimated total numb ` of the species using the refu during the period concerned.

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

59317

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge J. Clark Salyer Months of MAY to AUGUST 31, 19~~5~~70

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Western Grebe	2	05/01/70	500	July						
Red-necked Grebe	1	05/05	20	05/15						
American Bittern	1	05/03	300	July						
White Pelican			2500	July						
Sandhill Crane			300	05/10						
Least Bittern	1	05/05								
Sora Rail	1	05/07	common							
Virginia Rail	1	05/22								
II. Shorebirds, Gulls and Terns:										
Black Tern	3	05/06	abundant							
Cattle Egret	1	06/03								
Common Egret	1	06/04								
Upland Plover	1	05/06	common							
Avocet	Numerous throughout period									
Hudsonian Godwit	25	05/01								

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove			500	June			
White-winged dove							
IV. Predaceous Birds:							
Golden eagle							
Duck hawk							
Horned owl	1	05/10	uncommon				
Magpie							
Raven							
Crow			500	05/15			
Red-tailed hawk			common				
Sparrow hawk			5	08/10			
Peregrine falcon	1	08/25					

Reported by Rodney J. King

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 num[illegible] of the species using the refu[illegible] during the period concerned.

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

59317

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge J. Clark Salyer Months of September to December 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Western grebe			200	September	4	10/15				
American bittern			150	"	2	11/02				
White pelican			300	"	10	10/23				
Sandhill Crane			400	9/28	20	10/17				
Virginia rail			30	September	1	12/22				
II. Shorebirds, Gulls and Terns:										
Franklin gull			1,500	09/10	4	11/02				

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove			600	09/15	2	11/16		
White-winged dove								
IV. Predaceous Birds:								
Golden eagle								
Duck hawk	1	11/08	2	11/20	1	12/29		
Horned owl								
Magpie			5	10/28	1	12/29		
Raven			50	11/15	10	12/31		
Crow								
Bald Eagle	1	11/10	200	10/30	3	11/15		
Marsh hawk (females)			2	11/30	1	12/26		
Peregrine falcon	1	09/01	50	09/10	3	10/30		
Snowy owl	1	11/26	3	12/10	3	12/31		

Reported by Rodney J. Ring, Refuge Manager

INSTRUCTIONS

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

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

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

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

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

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

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

59317

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge J. Clark Salyer For 12-month period ending August 31, 19[illegible]

Reported by Rodney J. Hinz Title Refuge Manager (trainee)

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
Unit 1	Crops	1,013	Ducks	6,517,696	1,400	2,650
357	Upland	4,076	Geese	100,000		
	Marsh	1,771	Swans	2,500		
	Water	1,785	Coots	175,843		
	Total	10,645	Total	6,795,039		
Unit 2	Crops	277	Ducks	2,408,792	1,300	2,350
341	Upland	2,000	Geese	350,000	10	25
	Marsh	1,769	Swans	2,500		
	Water	1,357	Coots	187,521		
	Total	5,403	Total	3,017,073		
Unit 3	Crops	556	Ducks	3,103,665	3,000	6,900
332	Upland	4,730	Geese	150,000	10	20
	Marsh	2,650	Swans	5,000		
	Water	734	Coots	119,332		
	Total	8,670	Total	3,377,997		
Unit 4	Crops	105	Ducks	1,086,283	2,000	7,000
326	Upland	2,432	Geese	300,000	80	100
	Marsh	3,900	Swans	15,275		
	Water	1,000	Coots	221,616		
	Total	7,437	Total	1,523,174		
Unit 5	Crops	208	Ducks			
Benson	Upland	47	Geese	[illegible]		
	Marsh	537	Swans			
	Water	208	Coots	[illegible]		
	Total	1,000	Total			
Unit 6	Crops	19	Ducks			
Bubble-masonry	Upland	[illegible]	Geese	[illegible]		
	Marsh	[illegible]	Swans			
	Water	136	Coots	[illegible]		
	Total	[illegible]	Total			
Unit 7	Crops	307	Ducks	2,327,748	600	3,100
320	Upland	1,037	Geese	350,000	120	120
	Marsh	1,370	Swans	[illegible]		
	Water	2,200	Coots	796,180		
	Total	5,304	Total	3,474,928		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge J. Clark Salyer For 12-month period ending August 31, 1970

Reported by Rodney J. Hirz Title Refuge Manager (Wildlife)

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage	(3) Use-days	(4) Breeding Population	(5) Production
Sandhills Unit 8	Crops	29	Ducks		
	Upland	20,693	Geese	NOT	
	Marsh	0	Swans		
	Water	309	Coots	COUNTED	
	Total	20,931	Total		
Willow Potholes Unit 8-A	Crops	0	Ducks		
	Upland	747	Geese	NOT	
	Marsh	10	Swans		
	Water	3	Coots	COUNTED	
	Total	760	Total		
Thompson Unit 8-B	Crops	0	Ducks		
	Upland	550	Geese	NOT	
	Marsh	50	Swans		
	Water	80	Coots	COUNTED	
	Total	680	Total		
TOTAL.....	Crops	2,644	Ducks	15,518,325	6,300 / 22,000
	Upland	36,036	Geese	1,101,100	220 / 250
	Marsh	12,391	Swans	35,275	
	Water	9,602	Coots	1,704,700	7,000
	Total	58,693	Total	18,402,400	
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge J. Clark Salyer Refuge Months of January to April, 1970

(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 observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant									1,000	Mild winter with good cover and food has enabled birds to do well. Good cover, also has drawn birds to refuge from adjacent crop lands
Gray partridge									100	
Sharp-tailed grouse									500	

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.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge J. Clark Salyer Months of MAY to AUGUST 31, 19 70

(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 observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant			15	400					1,000	
Gray Partridge			2	60					400	
Sharp-tailed Grouse				100					400	

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.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge J. Clark Salyer Months of September to December, 19 70

(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 observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant			10	-		50			1,100	
Gray partridge						15			450	
Sharp-tailed grouse						10			700	

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 J. Clark Salyer Calendar Year 1970

(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	Cropland 1,788 Wayland 6,153 Grassland 23,213 Marsh 11,003 Timberland 4,235 Brush 2,350 48,742		175						10			900	800	

Remarks:

Reported by Rodney J. King, Refuge Manager

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

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge J. Clark Salyer Year ending April 30, 1970

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Beaver				32				JCS-1-69	2	2				300
								1-70	10½	10½				
								2-70	3	3				
								Refuge		1				
Muskrat				661				3-69	59½	19-3/4				3,000
								4-69	41½	13-1/4				
								6-69	252	84				
								7-69	29½	9-3/4				
								8-69	114	38				
Mink				219				1-69	15	15				600
								3-69	16	16				
								4-69	9½	9-1/2				
								5-69	10½	10-1/2				
								6-69	32	32				
								7-69	14	14				
								8-69	12½	12-1/2				
Weasel				36				3-69	1½	1-1/2				300
								4-69	3½	3-1/2				
								6-69	11	11				
								7-69	2	2				

* List removals by Predator Animal Hunter

REMARKS:

Reported by Rodney J. King

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.)

(2) DENSITY: Applies particularly to those species considered in removal programs. 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, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(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, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness 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 specifically requested.

32715

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge J. Clark Salyer Year ending April 30, 1970

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Raccoon				53				JCS-1-69	5					300
								2-69	2					
								3-69	3					
								5-69	9					
								6-69	9					
								7-69	16					
								8-69	10-					
Skunk				41				1-69	3					150
								2-69	0					
								4-69	2					
								5-69	2					
								6-69	17					
								7-69	6					
								8-69	3					
Badger				21				1-69	2					60
								6-69	4					
								7-69	2					
Fox				17				1-69	6					75
								3-69	2					
								6-69	8					
								7-69	1					

* List removals by Predator Animal Hunter

REMARKS:

Reported by Rodney J. King

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.)

(2) DENSITY: Applies particularly to those species considered in removal programs. 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, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(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, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness 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 specifically requested.

32715

3-1755
Form NR-5
60701

DISEASE

Refuge J. Clark Salyer Year 19 70

Botulism

Period of outbreak none noted

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl	1	10
(b) Shorebirds	1	5
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl (one)	died 5 days later	
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) 332 pool

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

2 feet

Condition of vegetation and invertebrate life good

Remarks Low pool levels and good water flow kept water moving in pool 320, generally the area of greatest botulism threat

Lead Poisoning or other Disease

Kind of disease

Species affected

Number Affected

Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge J. Clark Salyer Year 1970

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Los
Caragana							S½SE¼, S-11, T 160N, R 79W	3'	(25 acres 20,200 linear feet in 8 rows)	670	6/70		
Russian olive								4'		650			
							Unit D-11						
Siberian elm								8'		594			
Chokecherry								3'		808			
Native plum								4'		625			
C.B. spruce								8'		620			
										3,967			
Burr oak							SE¼, S-10, T 159N, R78W	12'	2,400'		5/70		

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches 25 acres
Food strips, food patches _____
Forest plantings _____

Remarks: Shelterbelt planting in Unit D-11. This part of the 12-year planting program.
Planting was done by Mouse River Soil Conservation District at a cost of $2.75 per 100', total $555.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge J. Clark Salyer County Bottineau State North Dakota

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Barley	465	12,997	189	5,277			654	Sweet clover	194
Wheat	224	4,331	760	1,272			284		
Oats	61	1,620					61		
								Fallow Ag. Land.	419

No. of Permittees: Agricultural Operations 15 Haying Operations 0 Grazing Operations 5

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Sweet clover	54	54	*	1. Cattle	104	423.67	1,262.54	1,664
*Refuge share taken in grain				2. Other	-	-	-	-
				1. Total Refuge Acreage Under Cultivation				1,612
Hay - Wild	0	0	0	2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres 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. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge J. Clark Salyer County McHenry State North Dakota

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Barley	187	4,658	143	3,412	10	250	340	Sweet clover	49
Wheat	170	3,246	29	505	1	5/	200		
Spelts			17.5	465			17.5		
Flax	4	50					4		
Oats	122	3,550					122		
Oats	51	47 T					51		
Corn	40	121 T					40		
Triticale			9	55			9	Fallow Ag. Land.	158
Alfalfa (seed)	5	7.5 bu.	5	765			10		
Sweet clover (seed)	8*	14.0 bu.	2.75	4.5			11		

No. of Permittees: Agricultural Operations 13 Haying Operations 42 Grazing Operations 22

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	57	38	*	1. Cattle	762	2,973.31	$8,860.46	13,729
*Refuge share taken in grain				2. Other				
				1. Total Refuge Acreage Under Cultivation				1,011.5
Hay - Wild Marsh	998		$3,992.	2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres 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. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge J. Clark Salyer Months of January through December, 1970

(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
Mixed grain	9,189 (1)	381	9,570								
Barley	(2)	10,352	10,352								
Wheat	(3)	3,974	3,974								
Spelts		465	465								
Total Mixed Grain			24,361	Ducks		16,511	16,511	6,350		6,350	
				Pheasants and baiting		1,500	1,500				
Triticale	-	55	55	-	-	-	0	55	-	55	-
Tall wheatgrass	-	1,400 lb.	1,400 lb.	-	-	-	0	1,400 lb.	1,400 lb.	-	-
Alfalfa seed	-	7.5 bu.	7.5 bu.	-	-	-	0	7.5 bu.	7.5 bu.	-	-

(8) Indicate shipping or collection points

(9) Grain is stored at 250 bu. of mixed grain at 357 bins; remainder of grain at headquarters grain bins.

(10) Remarks (1)From Arrowood Refuge; (2) 1,063bu. from Audubon Refuge;(3) 2,197 bu. from Des Lacs & Upper Souris Refuges

*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

(1) Variety*	(2) Grain on hand beginning of period	(3) Received during period	(4) Total	(5) Grain disposed of: Transferred	Seeded	Fed	Total	(6) On hand end of period	(7) Proposed or suitable use*: Seed	Feed	Surplus

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: J. Clark Salyer

Proposal Number:

Reporting Year: 1970

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/1/70 thru 6/30/70*	Broad-leaved weeds	Croplands throughout refuge	500	2,4-D LV ester	1000 lbs.	2 lb.a.e./ac.	water	ground sprayer
6/1/70**	Quack and brome grass	Shelterbelt in D-9	25	Simazine 80% Simazine 4G		4 lb/ac.	water	ground sprayer
6/15-19/70	Leafy Spurge	Grazing Unit G-33b	300	Tordon 212		2 lb/ac.	water	ground sprayer
8/28/70	Cattail and phragmites	Selected strips in pool 320 & pool 326	60	Dowpon	900 lbs. a.e.	15 lbs.a.e./ac	water 10 gals of mix per acre. Wetting agent 4 pts. per 100 gals. of mix.	aerial sprayer

10. Summary of results (continue on reverse side, if necessary)

* Sprayed by cooperator farming permittees.
** Sprayed by Soil Conservation District at refuge expense
*** Excellent results obtained in 1970

35500

3-1750
Form NR-2
(Rev. March 1953)

WATERFOWL

REFUGE J. Clark Salyer

MONTHS OF September 1 TO December 31, 19 70

(1) Species	(2) Weeks of reporting period: 09/05 1	09/12 2	09/19 3	09/26 4	10/03 5	10/10 6	10/17 7	10/24 8	10/31 9	11/07 10
Swans:										
Whistling				10	200	500	500	1,000	1,000	1,200
Trumpeter										
Geese:										
Canada	600	400	400	600	350	400	400	400	400	460
Cackling										
Brant										
White-fronted		20	7,500	18,000	21,000	2,500	1,000	500	500	140
Snow)										
Blue)				10	1,500	5,000	6,000	8,500	15,000	6,700
Other Lesser Canada	500	500	600	1,500	3,900	2,000	4,000	5,000	5,000	3,300
Ducks: Total Goose Days	1,100	920	8,500	20,110	26,750	9,900	11,400	14,400	20,900	10,600
Mallard	55,000	45,000	45,000	70,000	50,000	50,000	41,000	40,000	12,000	5,000
Black										
Gadwall	12,000	10,000	10,000	5,000	2,500	2,000	1,500	1,500	500	200
Baldpate	3,000	500	500	1,000	1,000	1,000	1,000	1,000	300	100
Pintail	15,000	10,000	10,000	5,000	5,000	2,500	1,500	1,500	500	300
Green-winged teal	1,000	100	100	100	100					
Blue-winged teal	9,000	4,000	4,000	2,000	1,000	500				
Cinnamon teal										
Shoveler	2,000	1,000	1,000	1,000	500	500	500	1,000	400	
Wood	200	100	100	100	100					
Redhead	1,000	500	1,500	1,500	1,500	1,500	1,500	1,500	500	200
Ring-necked										
Canvasback	200	200	200	500	500	500	600	500	300	100
Scaup	500	500	1,500	1,500	1,500	1,500	2,500	2,500	500	300
Goldeneye										
Bufflehead										
Ruddy	800	1,000	1,000	800	500	500	500	500		
Other H. Merganser	200	100	100							
Total Duck Days	99,900	73,000	75,000	88,500	64,200	60,500	50,600	50,000	15,000	6,200
Coot:	10,000	10,000	8,000	8,000	5,000	3,000	3,000	2,000	500	

Int. Dup. Sec., Wash., D.C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE J. Clark Salyer MONTHS OF September 1 TO December 31, 1970

(1) Species	(2) Weeks of reporting period: 11/14 (11)	11/21 (12)	11/28 (13)	12/05 (14)	12/12 (15)	12/19 (16)	12/26 (17)	12/27-31 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimat total
Swans:											
Whistling	900	100							37,870		
Trumpeter											
Geese:											
Canada	50								30,020		
Cackling											
Brant											
White-fronted									358,120		
Snow)	2,000	500							316,470		
Blue)											
Other Lesser Canada	500								186,600		
Ducks: Total Goose Days	2,550	500							891,210		
Mallard	1,800	430	20	20					2,796,890		
Black											
Gadwall									292,400		
Baldpate									59,800		
Pintail	50	50							329,800		
Green-winged teal									7,800		
Blue-winged teal									125,500		
Cinnamon teal											
Shoveler									51,300		
Wood									3,800		
Redhead	50								76,750		
Ring-necked											
Canvasback									24,800		
Scaup	100	20							89,440		
Goldeneye											
Bufflehead											
Ruddy									37,600		
Other H. Merganser									2,400		
Total Duck Days	2,000	500	20	20					3,898,280		
Coot:									326,500		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	37,870	1,200	
Geese	891,210	26,750	
Ducks	3,898,280	99,900	
Coots	326,500	10,000	

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by Rodney J. King, Refuge Manager (trainee)

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

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

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

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

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

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

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

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

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

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge J. Clark Salyer Months of September to December 1970

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Western grebe			200	September	4	10/15				
American bittern			150	"	2	11/02				
White pelican			300	"	10	10/23				
Sandhill Crane			400	9/28	20	10/17				
Virginia rail			30	September	1	12/22				
II. Shorebirds, Gulls and Terns:										
Franklin gull			1,500	09/10	4	11/02				

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove			600	09/15	2	11/16		
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	11/08	2	11/20	1	12/29		
Duck hawk								
Horned owl			5	10/28	1	12/29		
Magpie			50	11/15	10	12/31		
Raven								
Crow			200	10/30	3	11/15		
Bald Eagle	1	11/10	2	11/30	1	12/26		
Marsh hawk (females)			50	09/10	3	10/30		
Peregrine falcon	1	09/01			1	09/15		
Snowy owl	1	11/26	3	12/10	3	12/31		

Reported by Rodney J. King, Refuge Manager

INSTRUCTIONS

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

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

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

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

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

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

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

59317

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge J. Clark Salyer Months of September to December, 1970

(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 observed	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant			10	-		50			1,100	
Gray partridge						15			450	
Sharp-tailed grouse						10			700	

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 J. Clark Salyer Calendar Year 1970

(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	Cropland 1,788 Hayland 6,153 Grassland 23,213 Marsh 11,003 Timberland 4,235 Brush 2,350 48,742		175						10			900	800	

Remarks:

Reported by Rodney J. King, Refuge Manager

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
60701

DISEASE

Refuge J. Clark Salyer Year 19 70

Botulism

Period of outbreak none noted

Period of heaviest losses

Losses:

	Actual Count	Estimated
(a) Waterfowl	1	10
(b) Shorebirds	1	5
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl (one)	died 5 days later	
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) 332 pool

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

2 feet

Condition of vegetation and invertebrate life good

Remarks Low pool levels and good water flow kept water moving in pool 320, generally the area of greatest botulism threat

Lead Poisoning or other Disease

Kind of disease

Species affected

Number Affected

Species	Actual Count	Estimated

Number Recovered

Number lost

Source of infection

Water conditions

Food conditions

Remarks

(1)

3-1757
Form NR-7
(Rev. June 1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge J. Clark Salyer Year 1970

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs) Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Plantings (Marsh - Aquatic - Upland) Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Los
Caragana							S½SE¼, S-11, T 160N, R 79W	3'	(25 acres 20,200 linear	670	6/70		
Russian olive								4'	feet in 8	650			
Siberian elm							Unit D-11	8'	rows)	594			
Chokecherry								3'		808			
Native plum								4'		625			
C.B. spruce								8'		620			
										3,967			
Burr oak							SE¼, S-10, T 159N, R78W	12'	2,400'		5/70		

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic
Hedgerows, cover patches 25 acres
Food strips, food patches
Forest plantings

Remarks: Shelterbelt planting in Unit D-11. This part of the 12-year planting program.
Planting was done by Mouse River Soil Conservation District at a cost of $2.75 per 100', total $555.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service · Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge **J. Clark Salyer** County **Bottineau** State **North Dakota**

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Barley	465	12,997	189	5,277			654	**Sweet clover**	194
Wheat	224	4,331	60	1,272			284		
Oats	61	1,620					61		
								Fallow Ag. Land.	419

No. of Permittees: Agricultural Operations **15** Haying Operations **0** Grazing Operations **5**

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Sweet clover	54	54	*	1. Cattle	104	423.67	1,262.54	1,664
***Refuge share taken in grain**				2. Other	-	-	-	-
				1. Total Refuge Acreage Under Cultivation				1,612
Hay - Wild	0	0	0	2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only thenumber of acres 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. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service · Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge **J. Clark Salyer** County **McHenry** State **North Dakota**

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return Harvested		Government's Share or Return Unharvested		Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./ Tons	Acres	Bu. /Tons			
Barley	187	4,658	143	3,412	10	250	340	**Sweet clover**	49
Wheat	170	3,246	29	505	1	5/	200		
Speltz			17.5	465			17.5		
Flax	4	50					4		
Oats	122	3,550					122		
Oats	51	47 T					51		
Corn	40	121 T					40		
Triticale			9	55			9	Fallow Ag. Land.	158
Alfalfa (seed)	5	7.5 bu.	5	765			10		
Sweet clover (seed)	8¼	14.0 bu.	2.75	4.5			11		

No. of Permittees: Agricultural Operations 13 Haying Operations 42 Grazing Operations 22

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	57	38	*	1. Cattle	762	2,973.31	$8,860.46	13,729
***Refuge share taken in grain**				2. Other				
				1. Total Refuge Acreage Under Cultivation				1,011.5
Hay - Wild **Marsh**	998		$3,992.	2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

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Permittee's Share - Only thenumber of acres 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. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvesed column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge J. Clark Salyer Months of January through December, 1970

(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
Mixed grain	9,189	(1) 381	9,570								
Barley		(2) 10,352	10,352								
Wheat		(3) 3,974	3,974								
Speltz		465	465								
Total Mixed Grain			24,361	Ducks		16,511	16,511	6,350		6,350	
				Pheasants and baiting		1,500	1,500				
Triticale	-	55	55	-	-	-	0	55	-	55	-
Tall wheatgrass	-	1,400 lb.	1,400 lb.	-	-	-	0	1,400 lb.	1,400 lb.	-	-
Alfalfa seed	-	7.5 bu.	7.5 bu.	-	-	-	0	7.5 bu.	7.5 bu.	-	-

(8) Indicate shipping or collection points

(9) Grain is stored at 250 bu. of mixed grain at 357 bins; remainder of grain at headquarters grain bins.

(10) Remarks (1)From Arrowwood Refuge; (2) 1,663bu. from Audubon Refuge;(3) 2,197 bu. from Des Lacs & Upper Souris Refuges

*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

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: J. Clark Salyer

Proposal Number:

Reporting Year: 1970

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/1/70 thru 6/30/70*	Broad-leaved weeds	Croplands throughout refuge	500	2,4-D LV ester	1000 lbs.	2 lb.a.e./ac.	water	ground sprayer
6/1/70**	Quack and brome grass	Shelterbelt in D-9	25	Simazine 80W Simzine 4G		4 lb/ac.	water	ground sprayer
6/15-19/70	Leafy Spurge	Grazing Unit G-33b	300	Tordon 212		2 lb/ac.	water	ground sprayer
8/28/70	Cattail and phragmites	Selected strips in pool 320 & pool 326	60	Dowpon	900 lbs. a.e.	15 lbs.a.e./ac	water 10 gals of mix per acre. Wetting agent 4 pts. per 100 gals. of mix.	aerial sprayer

10. Summary of results (continue on reverse side, if necessary)

* Sprayed by cooperator farming permittees.
** Sprayed by Soil Conservation District at refuge expense
*** Excellent results obtained in 1970

35500