J. CLARK SALYER
NATIONAL WILDLIFE REFUGE

Upham, North Dakota

ANNUAL NARRATIVE REPORT

Calendar Year 1984

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLFIE REFUGE SYSTEM

REVIEW AND APPROVALS

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Refuge Manager — Date — Refuge Supervisor Review — Date

Regional Office Approval — Date

Introduction

The J. Clark Salyer National Wildlife Refuge is located along the Souris River in Bottineau and McHenry Counties of north-central North Dakota. The refuge was established by Executive Order Number 7170 on September 4, 1935, under the Migratory Bird Conservation Act (45 Stat. 1222), as a refuge and breeding ground for migratory birds. The nearest town is Upham, North Dakota, located about three miles from refuge headquarters. The 58,700-acre refuge extends from Canada southward for approximately 45 miles. Included within the refuge are 36,000 acres of upland habitat composed of native and introduced grasslands, thick woodlands, shrub thickets, and uplands. The northern portion is basically confined to the river valley with a narrow band of adjacent upland habitat. The southern portion of the refuge contains about 16,000 acres of native prairie interspersed with aspen and brush covered sandhills and 4,200 acres of wooded river bottom.

Wetland habitats include some of the most outstanding deep and shallow marshes in the Central Flyway which wind along miles of river bends and oxbows north to the Canadian border. Five dikes with water control structures have restored 21,000 acres of open water, marsh and wet meadow habitat for waterfowl production and migration use.

While the primary objective of the refuge is waterfowl production, the area has one of the Nation's most diverse and abundant bird populations. More than 250 species have been noted, ranging from sharptailed grouse on their dancing grounds in spring; Swainson's hawks in great numbers in fall - - a wide variety of waterbirds, including five species of nesting grebes; and relatively rare small birds such as Sprague's pipits and Baird's and LeConte's sparrows.

More than 125 species nest on the refuge, some in great numbers - - up to 17,000 Franklin's gulls and colonies of hundreds of double-crested cormorants, great blue herons and black-crowned night herons. In an average year about 17,000 ducklings are produced, including the following species: pintail, mallard, gadwall, green-winged teal, blue-winged teal, American wigeon, northern shoveler, black duck, wood duck, redhead, ring-necked duck, canvasback, lesser scaup, and hooded merganser.

White pelicans use the refuge all summer, while thousands of sandhill cranes, whistling swans and snow geese utilize the refuge as a feeding and resting area during migration.

The entire refuge lies within an area which was once Glacial Lake Souris. The surrounding area is also lake bottom which consists of extremely flat topography interspersed with a high density of temporary wetlands. These are important for waterfowl production and natural flood storage which improves water quality in the Souris River. Unfortunately a substantial portion of these wetlands have been drained.

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J. OTHER ITEMS

A. Highlights

Field work was competed for an MS study of waterfowl nesting on selected islands in Pool 320 (Section D.5.).

An analysis of vegetation on drawdown areas in Pool 357 was conducted in August 1984 (Section D.5.).

Dry weather in 1984 impacted regulation of flows to Canada and pool management (Section F.2.).

High water level management in 1982 and 1983 impacted cattails in Pools 320 and 326 (Section F.2).

Continued emphasis was placed on expansion of our giant Canada goose flock through construction of new nest baskets and live-trapping and transplanting young goslings (Section G.16. and I.1.).

Duck production was estimated at 16,164, up 57 percent from 1983 (Section G.3.).

Major construction included final completion of a rehab project on all radial-arm gates, construction of a new low-flow at Pool 357 and one new sub-impoundment (Section I. 1. and 2.).

A mitigation plan for impacts related to the Lake Darling Project was developed this year (Section J.1.).

B. Climatic Conditions

A refuge weather station was maintained during 1984 as an official weather record for the National Oceanic and Atmospheric Administration.

Except for the month of December, the winter of 1983-84 was generally mild with light precipitation. Coldest temperature of the year was -34^{o}F on January 20. Total snowfall for the winter was 26.7 inches. Greatest snow depth on the ground was 7 inches, with an average depth of 6 inches for most of the winter. Highest water content measured for snow on the ground was 1.06 inches on February 13.

Due to light precipitation during winter and dry soil conditions in the fall of 1983, prospects for good runoff volumes were poor. By February 23 mild weather reduced the snow cover to one inch and little runoff occurred.

The mild weather however was a definite asset for most of the winter maintenance projects, especially the work on the water control structures. Construction of new goose structures had to be postponed until March when several weeks of sub-zero temperatures finally froze the pools adequately enough for heavy equipment.

On March 20 warmer weather began melting the remaining snowpack. By March 23 all snow was gone and only a light runoff occurred. A general bird migration began at the same time with the peak for waterfowl occurring the first week of April. Ice went out of refuge pools on April 12 after two days of steady rain and wind.

It appeared that spring was well on its way until April 26 and 27 when a major snowstorm struck the area. Blizzard conditions were widespread and wind gusts of 90 mph in Bottineau damaged trees and buildings. At refuge headquarters winds were only 50 mph and little damage occurred. One foot of snow fell during the storm.

Generally severe spring snowstorms such as this cause extensive bird mortality. However, when the storm broke on the 28th no widespread losses were observed. Some coots were found frozen to death around farm buildings in the Turtle Mountains. Although we did not find any dead mountain bluebirds after the storm on the refuge, no nesting pairs were observed this summer in their traditional areas. It is possible this species suffered considerable mortality from the storm. However, tree swallows were observed after the storm, which was a surprise since this species seems to be affected the easiest from unseasonably cold weather. Some Canada geese deserted their nests during the storm but renested and brought off broods later in June.

Tree swallows attempting to weather the April 26-27 blizzard at Salyer. Heavy losses of swallows and mountain bluebirds were reported in the Turtle Mountains just north of the refuge. 4/85, GAE

As a result of this snowstorm and rainfall earlier in the month moisture conditions improved dramatically. Total precipitation for January through April was 5.43 inches or 83 percent above normal. Over 4 inches of the moisture was from the month of April alone.

Tributary runoff into the Souris from both North Dakota and Saskatchewan however was not high. This was due to much of the moisture being adsorbed by the dry soil and also because upper portions of the Souris watershed did not experience the heavy precipitation the lower portion did. As a result flows were adequate for recharging refuge pools but not enough to flood refuge hay meadows and raise the water levels in the numerous small wetlands to levels that would last throughout the nesting season.

A North Dakota "Top Soil" storm . . . now you see the other side of the road . . . 5/84, FGG

Now you don't. 5/84, FGG.

During the month of May, high winds and light precipitation rapidly dried the topsoil. Severe soil erosion from the strong winds occurred on private land around the refuge. The strong and unpredicatable winds also hampered the prescribed burning program. The last frost of the spring was 26°F on May 26.

In June less wind and substantial rainfall ended the soil erosion problem. Soil moisture conditions were generally adequate for crops and native grass seedings throughout most of the month but many smaller wetlands were drying up.

Precipitation during July and August was very light with drought conditions prevailing except in localized areas where severe storms occurred. One of these severe storms struck the headquarters area on July 30 with high winds and golf ball size hail. The crop damage that occurred was appreciated by ducks, geese, and cranes later in the year.

There was a total of 23 days in July and August when temperatures reached or exceeded 90°F. The highest temperature of the year was 102°F on August 26.

The hot dry weather aided another outbreak of botulism on the refuge and also increased the grasshopper problem in the northern part of the refuge. Yields of small grain crops were surprisingly good, apparently due to adequate subsoil moisture from the spring.

By the end of August most small wetlands on and off the refuge were dry. Refuge pools were low as a result of the drought but still held fair amounts of water. As a result high numbers of duck moved into the refuge pools with the largest concentrations noted in 357 pool.

Total precipitation for the months of May through August was 4.49 inches, compared to the normal of 10.13 inches.

Cooler weather and substantial rainfall improved moisture conditions in September. First frost of the fall was 31°F on September 4. Another frost occurred on September 23 with a temperature of 27°F. Killing freeze was on September 26 with a low of 20°. Also, a trace of snow fell on this same date.

Heavy precipitation in October and November dramatically improved moisture conditions. Total precipitation for October was nearly four inches or four times the normal. Five inches of heavy snow fell on October 16 and melted by October 22. On October 27 two more inches of snow fell as the result of an artic cold front moving through the state that also forced most waterfowl south. On October 28 all water areas had frozen after the temperature dropped to 3°F.

In November one inch to a trace of snow covered the ground for most of the month. On November 26 seven inches of wet snow fell. The snow was preceeded by nearly an inch of rain which helped saturate the partially frozen ground. This gave good runoff prospects for 1985.

Snow depth in December increased from five inches on the 1st to nine inches on the 31st. Later in the month extensive soil erosion occurred from high winds blowing snow across large areas of unprotected soil on private lands surrounding the refuge.

Total precipitation for September through December was 7.06 inches or 2.33 inches above normal. Total snowfall for 1984 was 59.8 inches. Total precipitation for 1984 was 16.98 inches which is slightly above the normal of 16.61 inches.

C. Land Acquisition

2. Easements

This section is covered in the J. Clark Salyer WMD station.

D. Planning

5. Research and Investigations

a. Waterfowl Nesting on Selected Islands

During the year, field work was completed for an MS study titled "Waterfowl Nesting on Selected Islands in North Dakota". The study was undertaken by Allen Aufforth, Wildlife Instructor, NDSU, Bottineau, North Dakota on four islands in Pool 320 of Salyer NWR. Following is an abstract of this study as taken from the first draft copy of the thesis.

> "Waterfowl nesting use on islands, predation of these nests, and vegetative associations of nest sites were studied during 1983 and 1984. Nest searches were intensive and essentially 100 percent of the nests were found using a rope with attached aluminum cans assembly. Nesting waterfowl primarily selected cool season, introduced grasses, such as smooth brome, and stands of rank, dense forbs, such as tall nettle and Canada thistle. Smooth brome, in 1984, provided nesting sites for 48 percent of all the nesting waterfowl. Nettle/thistle communities were only used by gadwall as nesting sites. Forty-one percent of the nesting gadwalls, in 1984, selected the nettle/thistle sites. Eight duck species nested on the islands each year of the study period. Blue-winged teal and gadwall were the two most abundant nesting species both years. Blue-winged teal and gadwall comprised 39.5 and 38.6 percent, respectively, of the nests found during 1983 and 1984. Nest success for 1983 and 1984 was 58 percent. Nest densities averaged 7.0 and 12.5 nests per acre for 1983 and 1984, respectively. Predation by mammalian and avian predators was a factor in nest loss. Major predators were mink and ring-billed gulls. Predation was not as significant on the islands as I had previously suspected. Predator control may be a viable way to increase nest success."

b. Drawdown Vegetation Study - Pool 357

During 1984 Pool 357 was held in drawdown status exposing large mudflats which subsequently grew up to dense stands of annual and perennial plants. In July and August of 1984 plant species and composition on specific drawdown areas were identified and quantitatively measured by the Daubenmier sampling method. Final computer printouts of basal cover and relative basal cover will be completed in the near future.

The six dominant plant species found were as follows:

1. Polygonum lapathifolium (willow-leaved smartweed)
2. Chenopodium album (lamb's quarter)
3. Polygonum persicaria (lady's thumb)
4. Rumex mexicanus (willow-leaved dock)
5. Atriplex patula (saltbush)
6. Chenopodium spp. (goosefoot) (species identification will be verified by the curator of the herbarium at NDSU-Fargo.

The dramatic increase in waterfowl populations which occurs upon reflooding impoundments after one year of drawdown is attributed to increases in both invertebrate and vegetative foods. Plans for Pool 357 during the coming year include reflooding with shallow water to stimulate an abundant invertebrate population which is essential as a protein source for laying females.

Drawdown of Pool 357 and exposed large mud flats. 3/84, GAE.

Regrowth on the mud flats of smartweed, lamb's quarter, lady's thumb, dock, satbush and goosefoot was excellent. 8/84, GAE.

E. ADMINISTRATION

1. Personnel

Assistant Refuge Manager Tedd Gutzke transferred to Des Lacs NWR at Kenmare, North Dakota on July 8, 1984. Bill West from Tetlin NWR at Tok, Alaska replaced Tedd as Refuge Manager Trainee on October 14, 1984.

Front Row from left to right: Berg (30, Opdahl (7), Zeretzke (10), Latendresse (11), and Eslinger (6). Back Row from left to right: Badke (8), Giese (2), West (5), Walls (1), and Benson (9). Gutzke (4) not pictured.

1. Darold T. Walls, Refuge Manager, GS-12, PFT
2. Fred G. Giese, Assistant Refuge Manager, GS-11, PFT
3. William J. Berg, Wetlands Manager, GS-9, PFT
4. Theodore W. Gutzke, Assistant Refuge Manager, GS-9, PFT, Transferred 7/8/84
5. William L. West, Refuge Manager Trainee, GS-5, PFT, EOD 10/14/84
6. Gary A. Eslinger, Biological Technician, GS-7, PFT
7. Wanda L. Opdahl, Refuge Assistant, GS-6, PFT
8. Raymond F. Badke, Automotive Mechanic, WG-10, PFT
9. Hamilton S. Benson, Maintenance Worker, WG-7, CS, 4/29/84-12/23/84
10. Edwin C. Zeretzke, Motor Vehicle Operator, WG-7, CS, 1/1/84-3/18/84 and 4/29/84-12/31/84
11. Leo J. Latendresse, Engineer Equipment Operator, WG-8, CS, 3/18/84-12/23/84

Front row from left to right: Grabow (2) and Henry (5). Back Row from left to right: Siekaniec (4), Peterson (1) and Freund (3).

1. Jay F. Peterson, Biolgoical Technician, GS-5, 5/29-12/31/84
2. Mike L. Grabow, Biological Aid, GS-3, 5/14-9/12/84
3. Timothy J. Freund, Biological Aid, GS-3, 5/29-9/15/84
4. Gregory E. Siekaniec, Biological Aid, GS-4, 6/11-9/25/84
5. Deborah Henry, Clerk-Typist (Stay-in-School), GW-2, 5/8-12/31/84

Both the refuge and WMD are included in the following personnel figures.

Year	Permanent Full-Time	Permanent Part-Time	Temporary	Total FTE
1984	7	3	5	10.72
1983	7	3	5	10.70
1982	7	3	0	9.10
1981	6	4	2	9.94
1980	6	4	3	8.94

2. Youth Programs

A total of 10 YCC enrollees were on-board for 8 weeks during the summer; they were supervised by a Biological Aid. This form of supervision worked out well as it provided the constant supervision that the YCC's need. The Biological Aid's salary ($2,528.40) was not charged to 1520; however, we again recommended that funds be made available to hire supervisors from 1520 monies.

YCC enrollees front row from left to right: Judy Arnason, Leslee Lashman, Carla Arneson, Stacie Thorson and Laurie Olson. Back row from left to right: Jonathan Lee, Keith Erdman, Mitchell Bethke, Johnny Clark and Wayne Sand. 8/84, GES

During 1984 many projects were completed; a few of the most noteworthy were as follows:

(a) Construction of a new observation tower for public viewing of 326 Marsh.

(b) Remodeled Quarters 38 ("Barn") for the summer help.

(c) Assisted Mr. David Blockstein in his Doctoral study of the mourning dove.

(d) Constructed a float depicting 49 years of wildlife management on the refuge for parades in the Bottineau Centennial and the North Dakota State Fair. The YCC float won the Chamber of Commerce award at the North Dakota State Fair.

(e) Assisted the City of Upham in cleaning up the city park, installing playground equipment and cleaning and waxing all emergency vehicles.

(f) The enrollees participated in wildlife management and wetland ecology discussions, construction of wood duck and bluebird nesting boxes, construction of holding pens for Canada geese, botulism patrol and an environmental education day at the cabin on Willow Lake WPA.

Safety training was provided on the first day of employment and periodically during the summer.

The YCC's at Salyer combined their talents to construct a float representing the refuge. 6/84, FGG

The float was entered in the parades at the Bottineau County Fair and North Dakota State Fair in Minot. The Minot Chamber of Commerce Award was their prize. 6/84, GES.

YCC's completed a visitor information station as one of many projects. 7/84, GES.

4. Volunteer Programs

During the year a total of 70 volunteers worked on the refuge, contributing 592 hours of service. The majority of the volunteer hours were utilized during our waterfowl banding operations. Most of these volunteers were from North Dakota State University at Bottineau, majoring in wildlife science. Hence the "hands on" work with waterfowl banding fit well into their schedule, and with a banding quota of 4,000 mallards their help was gratefully accepted.

Also 1,000 rose bushes were planted by volunteers on four islands in Pool 326, and one volunteer replaced the V-8 engine in a refuge pickup.

5. Funding

A schedule of funding for the refuge and WMD over the past five years is as follows:

Funding	FY-80	FY-81	FY-82	FY-83	FY-84
1210	224,500	241,000	257,000	308,000	
1220			13,000	11,500	
1240	10,000	10,000	8,000	12,000	
1260					380,000
6860					3,000
6810	11,000	14,000		3,500	
O&M	245,500	265,000	278,000	335,000	383,000
BLHP	99,000	184,000			
Fire				28,225	
6410				125,000	
6450				140,000	
1994					10,700
2821				127,000	107,000
TOTAL	344,500	449,000	278,000	755,225	500,700

6. Safety

Four accidents occurred during the year, none of which resulted in lost time. One employee injured his leg when he stumbled against the tongue of a trailer. Another injured his head when he slipped on the ice, striking his head on the running board of a dump truck. A YCC enrollee cut his head when he bumped into a fence post. Also the YCC supervisor received lacerations to his fingers when a piece of wood "kicked back" from the table saw.

Safety meetings were held each month. Use of personal protective equipment, potential safety hazards in various jobs and safety precautions to be taken while operating various types of equipment were the main topics.

7. Technical Assistance

The following types of assistance and/or services were provided to other agencies during the year:

North Dakota Game and Fish - assisted with emergency feeding of deer and upland birds and in law enforcement activities during the hunting seasons.

Soil Conservation Service - provided technical information concerning native grass seedings and grazing on the refuge.

City of Upham - provided emergency snow removal.

8. Other Items

Bottineau County received $21,822 and McHenry County received $31,649 in Revenue Sharing payments for fiscal year 1984. The payments represent approximately 77 percent of full entitlement and were $2,508 and $5,642, respectively, less than last year's payments of $24,330 and $37,291.

F. Habitat Management

2. Wetlands

Average snow pack and above average April precipitation resulted in 41,460 acre-feet of inflow to refuge pools during May. Drought conditions developed shortly thereafter and the required 20 cfs outflow to Canada resulted in extremely low water conditions on the refuge by late summer. Only 4,636 acre-feet of storage was recorded 1 September and conditions did not improve by freeze-up.

Total measured inflow on the Souris River at Bantry, ND during the calendar year was approximately 94,900 acre-feet or 55 percent of the 47-year average of 171,000 acre-feet. Flow was not measured on most tributaries during 1984 because gauging stations were discontinued in 1982 due to lack of funding. Measured inflow at Willow Creek was 18,220 acre-feet. Total measured inflow at both sites was 113,121 acre-feet.

Total outflow for 1984 was approximately 128,030 acre-feet. The peak release for the year was 1,100 cfs on 30 May. Total outflow was 14,909 acre-feet more than total measured inflow.

All refuge pools were in drawdown by 1 September and freeze-up occurred on 27-28 October. Accurate elevations could not be determined because the water was below gauges, primarily in the river channel with the rest of the pools dry.

Rubble Masonry Unit

This 500-acre impoundment is managed with a Rubble Masonary Dam (#1) which backs water in the Souris River until levels are high enough to move through a channel into the unit. A second dam (#2) downstream prevent water from reentering the river. Dams 1 and 2 were left partially open throughout the year. Stop logs were placed in the upstream end of this unit in mid-June to achieve optimum water depth of about two feet.

320 Pool

This 4,300-acre impoundment is located on the Souris River 320 miles downstream from the point where the river leaves Canada and enters the United States. Average depth is 2.3 feet.

1984 began with 320 at level 1414.0 (empty) and all three gates removed for repair. A peak level of 1426.7 occurred on May 15. A high summer operating level was maintained between 1424 and 1425 for control of emergent vegetation. Lack of precipitation and evaporation dropped the pool to 1421.0 or 1,000 acre-feet by 1 September. Gates were opened in mid-November to empty the pool, thus preventing gate damage and reducing winter maintenance. Freeze-up occurred on 28 October with water confined primarily to the river channel.

326 Pool

This 3,800-acre impoundment is located on the Souris River 326 miles downstream from the Canadian border. Average depth is 1.6 feet.

The pool was at level 1410.0 (empty) with all gates removed on 1 January. Three rehabilitated gates were replaced in mid-March. Water levels varied from 1420.5 to 1421.0 during the summer and dropped to 1418.4 by 1 September. Pool storage was 543 acre-feet or nearly dry on this date.

332 Pool

This 3,100-acre unit is located on the Souris River 332 miles downstream from the Canadian border and 25 miles upstream from the point where the Souris River reenters Canada. Average depth is 1.7 feet.

The pool had a water elevation of 1408.0 (empty) on 1 January. It was maintained at a normal level between 1417.0 to 1418.0 during the summer. The pool was nearly dry by fall due to drought and evaporation. Water elevation was 1415.0 on 1 September with about 2,000 acre-feet of storage.

341 Pool

This 3,300-acre impoundment is located on the Souris River 341 miles downstream from the Canadian border and 16 miles upstream from the point where the river reenters Canada. Average depth is 1.5 feet.

The year began with 341 at level 1407.0. This pool was maintained at 1416.5 to 1417.0 during the summer, or one to two feet above the normal operating level of 1415.0, to control cattail. During September the pool dropped to 1413.5 to allow optimum levels for waterfowl banding. The pool was later drained and freeze-up occurred on 28 October.

357 Pool

Dam 357 is located 1.5 miles from the Canadian border where the Souris River reenters Canada. The dam backs 6,800 acres of water at an average depth of 2.7 feet.

Pool elevation on 1 January was 1406.0. Water levels during the summer ranged from 1408.0 to 1410.0 despite our attempt to dry out the pool while contractors installed a new low-flow in the dike. Required flows to Canada were regulated by use of the gates on Pool 341. The pool was empty by mid-July and was dry at freeze-up on 28 October.

Emergent Vegetation

Encroachment of cattail and other emergent vegetation on refuge marshes has been dramatic over the years. Management activities to deal with this encroachment have included drawdowns, burning, and cutting. Much of the scientific literature indicates that cattail might be controlled by high water levels. Through operation of Pools 320 and 326 at 1 to 2 feet above normal operating levels during 1982 and 1983 we were able to set

back and kill vast acreages of cattail. This was not visually apparent until the summer of 1984. This management practice is part of our overall long-range water management plan at Salyer.

Vast acreages of cattails were killed by surcharging Pool 320 . . . . 8/84, GES

. . . and Pool 326 with high water in 1982 and 1983. 8/84, GES.

4. Croplands

A total of 1,045 acres was farmed by 10 cooperators during 1984. This was a reduction of about 20 acres from 1983. Small grain was seeded as cover crop on 161 acres planted to DNC. A total of 884 acres was in the regular farming program (70 percent permittee, 30 percent refuge).

Refuge personnel seeded 20 acres of native grass in 1984.

Two hundred and sixty-three acres of summer fallow was allowed this year, of which most was infested by leafy spurge. Hopefully, by fallowing and using chemicals, we can achieve some degree of spurge control in these fields.

1984 Grain Production Average

Crops	Acres Planted	Est. Bu. Produced	Refuge Share	Est. Ave. Yield/Ac.	Unharvested Acres
Barley	249	6,118	1,878	32	7.5**
Wheat	202	4,667	277	24	15***
Oats	143	1,450	0	10	0
Flax	18	0	0	0	0
Rye	15	0	0	0	5***
Corn	49	40 Ton sil.	0	0	25***
Foodplot	15	0	0	0	15***
Fallow	288	0	0	0	0
DNC	161*	0	0	0	0
Millet	14	0	0	0	14***
	993	12,295	2,155	66	66

*DNC was not included in total acres; cover crops were included in total acres.
**Swath - left in the field or baled for waterfowl, upland game birds and deer to feed on.
***Left unharvested and standing.

Approximately 2,000 bushels of barley were used at three waterfowl banding sites during 1984. About 1,500 bushels of grain were fed to resident wildlife at the winter feeding stations during 1984.

5. Grasslands

Robel survey data was collected on tracts of native and introduced grasses and dense nesting cover. Mean visual observation values per stand range from 1.56 dm to 3.11 dm and averaged 2.05 dm. Height values ranged from 5.9 dm to 14 dm and averaged 7.09 dm. The data showed that most of the older tracts (5-7 years) of DNC should be rejuvenated.

Establishment of native grass is an important management tool on J. Clark Salyer NWR. Very little maintenance is needed, other than burning every five to six years. Also, warm season natives are not susceptible to the

2,4-D that we use on leafy spurge, which allows us to spray it without elimination of legumes such as those found in our DNC mix. One tract of about 20 acres was reseeded to switch grass because of winter kill during 1983.

The refuge and the Soil Conservation Service have been working together to determine which variety of warm season natives grasses would be adapted to northern North Dakota. The project study will be completed during 1985 and the data will be put forth in a formal publication.

6. Other Habitats

Dense nesting cover was planted on 161 acres as indicated in Section F-4. Old DNC cover was plowed under as a green manure crop.

7. Grazing

The rest-rotational grazing system on J. Clark Salyer was implemented in 1976 under a 4-year lottery drawing, replacing the previous program of annual, recurring use by the same permittees.

All units have now been converted to spring grazing, which is more advantageous than summer or fall grazing, because it puts more pressure on the cool season grasses such as Kentucky blue and smooth brome.

A total of 3,065 acres in 7 of the regular units were grazed and 6,758 acres in 19 of the regular units were rested in 1984.

Grazing fees on the refuge are based on the percent of change in USDA reported price for cows and calves sold each fall. The fee was $6.95 per AUM. Grazing use totalled 1,720.69 AUM's, and refuge grazing receipts were $11,958.79.

8. Haying

The meandering Souris River, bordered with bottomland hardwoods and interspersed with wet meadows and old oxbow marshes, is prime waterfowl habitat. Haying is used on J. Clark Salyer to keep woody species such as willows from invading wet meadows. Regular hay permits were issued for a 4-year period (1984-1987) by a lottery drawing. The 25 hay permittees are allowed to cut one-half of the assigned units in alternating years. During 1984 some 2,236.12 tons of hay were harvested on our regular units. Revenue to the government was $12,139.80.

9. Fire Management

Fire has always been important to the prairie ecosystem. Wildlife not adapted to all aspects of the environment are not found in the ecosystem or remain only for a short time. Wildlife that remain in the prairie ecosystem have adapted to fire. Therefore, fire is a very important management tool used on the refuge.

Favorable weather conditions allowed the burning of 2,580 acres. Our primary objectives in burning are to promote greater species diversity, to enhance both growth and vigor of native plants, to control introduced cool season grasses, and to control cattails.

Putting down a wetline . . . 4/84, GAE.

setting a headfire . . . 4/84, GAE.

. . . for a native grass prescribed burn . . . 4/85, GAE.

. . . which is over in five minutes. 4/85, GAE.

10. Pest Control

Because leafy spurge is classified by North Dakota law as a primary noxious weed, the refuge has legal obligation to attempt some measure of control over this plant.

Early efforts to control spurge utilizing 2,4-D were ineffective, and we started using Tordon 22K as the primary means of control. Tordon is effective if applied at the right time, rate and under proper weather conditions. However, we are now using a tank mix of 2,4-D and Tordon 22K which gives us about 88 percent control for about $25.00 per acre.

The cost of chemical control for leafy spurge is horrendous. During 1984 approximately $13,089 (chemical - $8,691, labor - $3,798, gas - $600) was expended to control spurge on the refuge.

11. Water Rights

Representatives from the USFWS met with the Eaton Irrigation Board to determine the amount of flow that had passed Eaton Dam and how many acre feet they were entitled to receive. In addition to local runoff Eaton requested 2,000 acre-feet to fill their units. The release was made from the Upper Souris NWR in April 1984.

13. WPA Easements

This section is covered in the J. Clark Salyer WMD narrative.

G. Wildlife

2. Endangered and/or Threatened Species

Bald eagles were observed throughout the refuge in small numbers during the spring and fall migration. Fall drying of the refuge pools concentrated fish in small pockets and made muskrats vulnerable to eagles. Bald eagles exploited these food sources. The peak population of five birds on 29 October was down 65 percent from recent years. The early freeze-up moved waterfowl south before the bald eagle population reached traditional numbers.

No peregrine falcons were observed in 1984.

3. Waterfowl

a. Ducks

Duck use recorded during 1984 was 11,711,900 use-days, a seven percent increase over the 1983 level of 10,950,150. Duck numbers peaked in late August with an estimated 132,000 birds. Of this amount 60,000 were mallards.

It's springtime and I'm doing O.K. for boyfriends . . . but what's this ugly coot and that drake bluebill up to? 4/84, GAE.

Nest dragging operations were conducted on refuge winter wheat fields to determine duck nest density. 6/84, FGG.

b. Duck Production

Duck production for 1984 was an estimated 16,164, a 57 percent increase from the 1983 level of 10,266. The increase may have been related to lower pool levels and more stable water conditions in 1984 rather than the sustained high flows received in 1982 and 1983. A similar increase occurred when 1976 production was only 4,633, which increased to 11,718 in 1977. As is well known, 1976 was a flood year. Although census bias and other unknown factors can influence the count it is a good index of annual production at Salyer NWR.

Refuge pools were at or below normal operating levels during both segments of the summer brood survey (17 July, 13 August). The lower water levels also make for better counting conditions since broods are not as widely dispersed.

One hundred and five wood duck boxes located along oxbow lakes and along the Souris River were checked for 1984 production. Hooded mergansers have dominated the use of these boxes in recent years. Hooded mergansers utilized 69 of the 105 available nest boxes and 33 nests were successful. This year was the first time that no successful wood duck nests were documented. Only one wood duck egg was noted and it was in a merganser dump nest of 20 eggs. Wood duck broods were still observed in 1984. Apparently, wood duck production is limited to natural cavities only. We believe the mergansers are out competing wood ducks for use of the boxes at Salyer. However, it is not clear why 36 nests were not utilized by either species.

Hooded mergansers are the most common user of duck boxes at Salyer. This merganser dump nest contained 30 eggs - count them. 12/85, WLW.

Duck nest boxes are checked during the coldest winter months when travel on the river is safest and easiest. 12/84, WLW.

During December, while refilling the nest material, the remains of four freshly killed saw-whet owls were discovered in three nest boxes. Our best estimate of the predator was either northern goshawk or boreal owl. No other predacious birds that use Salyer in the winter are small enough to enter nest boxes.

c. Geese

The first spring migrants, consisting of 25 giant Canada geese, arrived on 29 February. The spring peak goose population occurred on 12 April when over 150,000 snow, 1,000 white-fronted and 1,000 Canada geese were recorded.

Fall migration of geese was first noted during early September. The numbers continued to increase until 23 October when a peak of 100,000 snows and 6,000 Canadas were observed.

Extremely dry conditions from May through September prompted farmers to hold off normal fall plowing. This left plenty of waste grain for consumption by geese.

Low water in Pool 326 was inviting to snows and blues. 10/84, FGG.

Hayed area in Pool 332 also attracted geese. 10/84, FGG.

An Arctic-like cold front pushed all migrants southward on 27 October. When the four day storm and cold was over there were five inches of snow on the ground, the entire marsh and river were frozen, and the temperature on 1 November was -5°F. Needless to say even the hardy giant Canada geese were gone by this relatively early date.

Waterfowl use on mudflats in Pool 332 was excellent. 9/84, GAE.

d. Canada Goose Production

Canada goose production was estimated at 665 for 1984, up 22 percent from 1983. Most of the production occurred in nesting structures and on islands. The addition in 1983 and 1984 of 60 nesting structures in the wet meadows of the southern portion of the refuge has helped to increase the production. During the first year a third of the new structures were utilized. This helped to compensate for the large number of structures in Pools 320 and 326 which had fallen from ice and water flows or were leaning to the extent they could not be used. Several of these structures were rebuilt in 1984 (See Section I. 1.)

Placement of telephone poles for giant Canada goose nesting structures. Elaborate but necessary on the river marshes. 2.84, TWS.

Elevated nesting structures are highly successful for increasing giant Canada goose populations at Salyer. We now have 195. 12/84, WLW.

e. Swans

Spring migration of tundra swans was first noted on 2 April. Peak population was 250 on 22 April. Fall migration noted the first swans on 14 September. Their numbers peaked at 1,000 on 3 October.

f. American Coot

The refuge breeding population of 10,000 American coots produced an estimated 15,000 offspring during 1984. The population was most abundant in Pools 320 and 326. A peak population of 30,000 was reached in late September during migration.

4. Marsh and Water Birds

Eared grebes are the most abundant marsh and waterbird on the refuge with an estimated 20,000 breeding individuals. Other common breeders include black-crowned night heron, double-creasted cormorant and pied-billed grebe. White pelicans utilize the refuge frequently for feeding but nest at nearby Willow Lake Easement Refuge.

5. Shorebirds, Gulls, Terns and Allied Species

Franklin's gull colonies are active in Pools 320 and 326 with up to 12,000 birds utilizing the refuge. Lesser numbers of black, common and Forster's terns are also common. Generally, because of lower water levels and exposed mud flats, shorebird use was higher in the fall. Also observations indicated that most shorebirds stayed longer than normal with sightings occurring into late October.

A pair of long-eared owls nested in an American elm tree near one of the refuge housing units. 6/84, GAE.

Young long-eared owls were two-thirds grown by June 24.
6/84, GAE.

6. Raptors

Golden and bald eagles were occasionally seen throughout the year with peak numbers occurring in the fall. Raptors known to nest on the refuge include red-tailed hawk, northern harrier, Swainson's hawk, American kestrel, short-eared, long eared, burrowing and great-horned owls. 1984 wintering species included snowy, saw-whet, and great-horned owls, golden eagles, and northern goshawks.

7. Other Migratory Birds

The refuge is rich in bird life with the eastern and western North American avifaunas coming together in this region. Over 290 species have been recorded on the refuge. These include the numerous wood warblers, LeConte's sparrow, Sprague's pipit and mountain bluebird to name a few.

This winter was a big year for northern finches at refuge bird feeders. Pine grosbeaks were 9 to 5 visitors most days. 12/84, GAE.

Forty-three nest boxes were constructed and erected by YCC enrollees in June 1984. These nests were erected to provide nest sites for mountain bluebirds in the sandhills area of the refuge. Since boxes were not erected until June we were not anticipating high use the first year. Surprisingly, 41 (95 percent) were used for nesting but not by mountain bluebirds. Tree swallows used 35, house wrens used 3 boxes and, to our surprise, eastern bluebirds used 4. One box was successful for tree swallows and for eastern bluebirds. Although eastern bluebirds have nested at Salyer, casual observations over the past 8-10 years had indicated they were only migrant visitors. Conversely, mountain bluebird nests were expected because they nest more commonly in the Turtle Mountains of North Dakota, 25 miles northeast of Salyer. We hope to find both species using boxes in 1985.

The tree swallow is very common nester at Salyer. . . 80 percent of our bluebird boxes were occupied by tree swallows. 5/84, GAE

Eastern bluebirds were welcome tenants of boxes installed by YCC's in 1983. 5/84, GAE.

8. Game Mammals

The refuge white-tailed deer population is probably at a maximum for our habitat. Hunting pressure is always light on the northern pools (341 and 357) and a growing deer population has resulted. The 1984 North Dakota winter took a toll on this segment of Salyer's deer herd. An aerial count of the refuge found approximately 1300 deer. Two hundred plus were within a 5-square mile area at the north border of the refuge. At least 15 deer perished in this crowded region, due to harsh weather and wild dogs. At this writing we expect further losses before spring thaw. Supplemental feeding of these deer helped reduce the fears of farmers bordering the refuge who sustained moderate to heavy deer damage to their hay supplies. We hope to modify refuge deer hunting regulations in order to reduce the number of wintering deer.

White-tails at refuge headquarters on winter rye, part of the total refuge population estimated at 1300 animals. 11/84, FGG.

10. Other Resident Wildlife

a. Resident Birds

1. Sharp-tailed Grouse

Sharp-tailed grouse were censused between 16 April and 20 April on traditional dancing grounds. A total of 133 males were sighted. This was a 37 percent decrease from the 1983 level. Eight of the 27 refuge dancing grounds were not counted in 1984, as we were unable to find the birds or the grounds were flooded. Average males per ground (6.7) was similar to 1983. Thus, populations were most likely stable

and the census was not complete enough to make an accurate count. Grouse hunting was still good on the refuge with a majority of hunters bagging their limits on opening day.

2. Ring-necked Pheasants

A restocking program was initiated in 1977. Pheasant populations were up with fairly good production. During the fall hunting season, the hunter success rate was good, based on verbal reports of hunters that stopped by our main office.

3. Gray Partridge

Although no official census was taken on gray partridge, their numbers appeared to be stable or slightly increasing over the 1983 levels. Covey's of 10-20 were seen frequently along roadside areas.

4. Turkeys

A stocking program to introduce Eastern wild turkeys on the refuge was undertaken in 1980 and 1981. This is a joint venture between the Service and the North Dakota Game and Fish Department. The species has adapted very well to the hardwood river bottoms and wooded sandhill areas of the refuge. Numerous broods were observed during the summer of 1984.

Spring gobblers along the Souris River in May 1984. 5/84, GAE.

Limited spring gobbler seasons were held in April 1983 and 1984. Thirty permits were issued by the North Dakota Game and Fish Department for the refuge. A total of 17 gobblers were harvested in 1984. The winter turkey population was estimated at about 200 birds.

b. Other Mammals

Porcupine, red and fox squirrels, cottontail rabbits, white-tailed jackrabbits, snowshoe hares and various small mammals are common on the refuge. A few sightings of moose and elk were reported during the year.

11. Fishery Resources

Northern pike populations remained at good levels as was evidenced by constant good catches at various public fishing locations. Bullheads also remained stable while walleye numbers continue to be low.

12. Wildlife Propagation and Stocking

A total of 75 pheasants were released at various locations on the refuge. This joint effort between the refuge and the North Dakota Game and Fish Department has been continued since 1977.

15. Animal Control

Barley was distributed at several locations on the refuge to minimize deer and waterfowl depredations on nearby cropland.

16. Marking and Banding

The 1984 preseason banding quota was set at 4,000 mallards, 1,000 of each age and sex plus any incidentals. Following is a summary of our 1984 banding accomplishments.

Species	Adult Male	Adult Female	Immature Male	Immature Female	Total
Mallard	987	611	443	405	2446
Northern Pintail	151	205	55	89	500
American Wigeon	4	7	1	17	29
Green-winged Teal	2	8	14	7	31
Wood Duck	17			1	18
Black Duck	4		1		1
Gadwall			2		2
Blue-winged Teal			1		1
Total					3028

The giant Canada goose flock at Salyer has grown to an estimated 700 individuals. Although band returns have been received from western Nebraska, very little is known about overall migration patterns or if any summer molt migrations take place. Past efforts to use drive traps and rocket nets to capture these birds have met with little success.

During 1984 one hundred and forty-two Canada geese were captured and banded on the three southern refuge pools. Ninety-three of the birds were transplanted to three WPA's in groups of 2-3 adults and 25-30 young birds. Two airboats equipped with generators and a battery of night lights were used to capture the geese.

17. Disease Prevention and Control

Due to historical botulism outbreaks in Pools 320 and 326, weekly patrols by airboat were conducted in July and August. A botulism outbreak was noted in late July and continued through most of August. Eight hundred and forty-seven birds were picked up on Pools 320 and 326. Runoff in the Souris River had ceased entirely and our pools were gradually being lowered due to high temperatures, evapo/transpiration and a provision of 20 cfs flow of water to Manitoba to meet our International obligations. Upper Souris NWR began a 2,000 acre-feet release at a rate of 100 cfs to assist in maintaining habitat conditions and improve the situation. Type C botulism was confirmed by the National Wildlife Health Laboratory in four birds on 13 August. Daily, and later bi-daily, patrols were established with dead and dying birds removed from Pool 320 as well as Pool 326. By the end of August temperatures became more moderate and bird losses finally ceased. The final mortalities included numerous waterfowl, coot, eared grebe, shore birds, and white pelicans. A quick response to the first signs of the disease probably kept mortalities to a minimum.

H. Public Use

4. Interpretive Foot Trails

Guided and unguided tours of the sandhills walk area were popular with 1984 visitors. This area is open to the public and consists of an aspen community in rolling hills. Various native grasses, forbs, prickly-pear and ball cacti can be observed in this area of the refuge. Giant Canada geese now nest in the bottom areas near the sandhills and provide an added dimension to spring bird watching on this trail.

The refuge has one of the largest forested areas in the state of North Dakota . . . from dense wooded river bottom hardwood to aspen communities in rolling sandhills. 7/85, GAE.

5. Interpretive Tour Routes

The refuge canoe route is listed as a component of the National Trails System. The route extends 13 miles beginning at the Johnson Bridge and winding through the wooded river bottom of the Souris River, ending at Dam 1, with an alternative 5 1/2 mile stop at the Thompson Well site. A special tour of the route by boat was conducted for 21 young people from the local community. New mile marker signs for this route were installed by the Youth Conservation Corps.

There are two auto tour routes available to the visitor. One is the Scenic Trail, a 22-mile auto trail beginning at refuge headquarters traveling through Pool 326 and winding through the southern portion of the refuge. This route, along with the brochure "Scenic Trail Guide" helps explain wildlife management programs at J. Clark Salyer and describes marshlands, wooded river bottoms, and aspen covered sandhills observed along the route.

This route is our most popular self tour attraction. It gets especially heavy use during spring and fall migrations. It is also the primary access road for the majority of those people who deer hunt on the refuge.

Another tour route is the 5-mile Grassland Trail north of refuge headquarters. It passes through prairie grasslands and travels along the river marsh of Pool 341. Along this trail the visitor can view many of the native grasses and flowers that once flourished in the prairie

regions. Additionally, numerous species of grassland birds inhabit this area and are sought by birdwatchers visiting the refuge.

During 1984 portions of the Grassland Trail were prescribed burned to encourage the native grass and forb species and depress introduced cool season grasses such as smooth brome and Kentucky bluegrass.

6. Interpretive Exhibits/Demonstrations

Refuge personnel joined with Upper Souris NWR personnel to present a program on outdoor recreation opportunities at the Minot Air Force Base. Fishing, tour routes, birdwatching, hunting and related regulations were discussed.

The YCC's combined their talents to construct a float depicting 49 years of wildlife management. The float was shown in two parades, the Bottineau County Fair in Bottineau and the North Dakota State Fair in Minot. They won the State Fair Chamber of Commerce award for their efforts.

Refuge personnel operated a booth at the State Fair in Minot.

7. Other Interpretive Programs

Various groups visited the refuge in 1984. Classes from area schools, as well as biology students from the Bottineau Branch of North Dakota State University (NDSU-BB), toured the refuge on several occasions. NDSU-BB biology students assisted refuge personnel with the waterfowl banding program in September.

Reporters from a Minot television station and the Bottineau paper accompanied refuge personnel during night lighting and capture of giant Canada geese. Two television spots and a news article resulted. Other media interviews focused on public use activities and management programs on the refuge. A 1/2-hour TV special also featured both Upper Souris and J. Clark Salyer NWR's. Additionally, several off-refuge programs were given on the topics of habitat and wildlife management, career opportunities and the value of prairie wetlands.

The duck trapping and banding program is always a popular project with refuge visitors. Thirty individuals from the North Dakota Association of Interpretive Naturalists participated in one morning of banding followed by a 3-hour tour. Twelve Greenwings from the Minot Ducks Unlimited Chapter participated in banding mallards one cold wet morning in September. A banding techniques session was also conducted for the students of NDSU-BB.

Handicapped individuals from San Haven came to J. Clark Salyer in July to enjoy a day of fishing.

A state required hunter safety course was presented by personnel in cooperation with the North Dakota Game and Fish Department. A course was also presented to refuge turkey hunter permittees on species and sex identification, hunting techniques and refuge regulations.

Disabled individuals from San Haven Rest Home enjoyed a day of fishing at Salyer in July. 7/84, FGG.

Ducks Unlimited "Green Wings" spend a cold, wet day in September helping refuge staff band mallards. 9/84, GAE.

Refuge staff conducted a hunter safety course for local youth. 4/84, GAE.

As part of the course students were introduced to shotgun safety and trapshooting. 4/84, GAE.

8. Hunting

a. Waterfowl

Waterfowl hunting is the most popular public use activity at Salyer (4000-6000 visits per year). Waterfowl hunting is permitted along the refuge boundary where 15 retrieval zones have been established as well as nine designated public hunting areas. These areas provide good hunting opportunities but become overcrowded during the first week of the season. "Firing lines" consisting of 30 to 40 hunters are not uncommon along the boundary. Waterfowl soon locate these areas and avoid them or leave the refuge at a higher altitude. Waterfowl hunting attracts many people to the refuge and surrounding area in the fall. Most were not disappointed, as hunter success was high and hunting conditions were tolerable.

b. Upland Game

Nine designated public hunting areas are open to upland game hunting on the refuge during the regular state season. In addition the southern portion of the refuge, south of the Upham-Willow City Road, was open to sharp-tailed grouse, ring-necked pheasant, Hungarian partridge and wild turkey hunting.

c. Deer

The entire refuge, with the exception of the headquarters area, is open to deer hunting. Four hundred permits are issued for the first 2 1/2 days of the season. The remaining seven days of the season are open to anyone possessing a valid permit for State Unit IIIA4. All permits are computer selected by the North Dakota Game and Fish Department.

Opening day of refuge deer season was a successful start for this group of hunters. 11/84, WJB.

During 1984 hunter activity was greatest during the first few days of the season and then declined rapidly thereafter. An estimated 600 hunters harvested 300 deer for a hunter success rate of 50 percent.

9. Fishing

Public fishing is permitted at 13 locations from spring through fall and designated waters are open to winter ice fishing. Fishing pressure was above the 1983 levels of 1,470 visits to 1,850 in 1984.

10. Trapping

Two trapping permits were issued for taking furbearers on the refuge. The permits included a clause designating striped skunk as a reward species. After a trapper had harvested ten skunks he would receive a rebate of $5.00 for each additional skunk taken. The total rebate was then substracted from their trapping fee of $300.00. This technique was initiated in 1983 in an attempt to increase the number of striped skunk harvested and hopefully reduce predation by this species on nesting ducks.

Of the two trappers issued permits for the refuge, neither trapped the entire season, neither harvested ten skunks and both will be replaced in 1985.

Below is a summary of the 1984 trapping season.

Species	Number Trapped
Badger	0
Beaver	8
Coyote	0
Fox	6
Mink	17
Muskrat	123
Raccoon	15
Skunk	12
Weasel	3

11. Wildlife Observation

A total of 4,448 visitors were recorded at the refuge during 1984, a slight decrease from the 1983 level of 4,496. Our greatest wildlife observation use occurs in early fall when large concentrations of snow geese and other waterfowl can be found on the refuge.

14. Picnicking

The refuge receives only light picnicking use, primarily at three sites, the sandhills fire tower, the old Thompson well, and at headquarters.

17. Law Enforcement

A total of 30 violations were prosecuted through the Federal Magistrate Court in Minot, North Dakota. Fines collected amounted to $1,450.00, an average of about $48.00 per offense. Three warnings were given during 1984.

Type and number of violations are listed below:

Fishing without a license - 3
Fishing in violation of state law (over limit) - 1
Hunting without a duck stamp - 1
Taking migratory game bird in excess of daily limit - 1
Unplugged gun - 2
Taking non-game bird in closed season - 2
Tagging violations - 3
Hunting with a loaded gun in a motor vehicle - 3
Hunting without Federal deer permit - 1
Illegal entry (retrieval of waterfowl in closed area) - 4
Violation of state law (hunting without small game or general game stamp) - 4
Hunting without fluorescent orange - 1

I. Equipment and Facilities

1. New Construction

A 72" and two 36" sluice gates were installed along North Dakota Highway 14 to create a subimpoundment. Basically these screw gates will permit independent management of the subimpoundment, rather than management dependent on the main pools as previously existed.

For example, the subimpoundment area could be kept dry while the main pools are at normal (full) operating level. This would allow control of vegetation, moist soil food plantings or even small grain farming that could be flooded in late summer to attract waterfowl and help alleviate crop depredation problems.

In addition, a 36-inch CMP stop-log structure was installed in the south end of 326 dike for an inlet source to the new subunit. Approximately 200 acre-feet of water would be contained in this subunit.

Twenty-nine new goose nesting structures were erected in 1984. To combat the forces of nature (ice heave and river flows), holes were drilled with an auger truck and telephone poles were installed eight feet into the marsh bottom. This may be a time consuming procedure and rather expensive, but it is the only way to insure a nest structure that can withstand North Dakota's frigid weather and deep frost lines (six-seven feet). Nineteen old goose nesting structures were rehabilitated using these same methods. There are now 195 goose nesting structures on Salyer NWR.

2. Rehabilitation

During 1983 nine of our fifteen radial gates were rehabilitated. The remaining six gates were repaired this year. Total cost of this work was about $85,655. It should be noted that the original contract was for about $55,000; however, after the gates were removed from the five refuge pools, the damage was more extensive than previously thought.

The old low-flow concrete structure at Dam 357 was rehabilitated by the installation of a concrete outlet structure for two existing 24-inch concrete pipes, the installation of two steel slide gates and two cast iron slide gates. The upgrading of this structure will allow us to meet our treaty commitment to Canada.

A new low-flow structure at Pool 357 was completed by contract for water releases to Canada during the summer months. 10/84, FGG.

The old tile shingles were removed from the 3-stall garage, old office, service building and the barn (bunkhouse). A new roof of double coverage T-lock asphalt type shingles replaced the old.

3. Major Maintenance

The refuge had about $52,000 in ARMM's money for FY 1984. The following is a list of ARMM's projects and other major maintenance projects for 1984.

a. Graveled headquarters and portions of scenic trail roads and stockpiled gravel for future needs.

b. Sprayed noxious weeds.

c. Interior and exterior fence repairs.

d. Mowed refuge trails.

e. Repaired and replaced nesting materials in goose nesting structures, wood duck and bluebird boxes.

f. Installed rebuilt motor in 1976 Chevrolet pickup and overhauled the transfer case.

g. Installed new hydraulic pump on 8630 tractor.

h. Gave a valve job and installed a new windshield and cable on the Garwood motor crane.

i. Rehabilitation of nesting structures (See Section I.1.).

j. Rehabilitation of dike road.

k. Installed ROPS on D-7, HD-6, and International 506 tractor.

l. Repaired clutch, brakes and steering and installed fuel heater on the Case payloader.

m. Repaired trailer brakes and installed fuel heater on White semi-truck.

Maintenance of a recurring nature included: winter snow removal, periodic sewer flushing, general vehicle and building maintenance, sign maintenance, lawn care and trash pickup at public fishing areas. Also patrol and tour roads were bladed, as needed, to maintain them in good condition.

4. Equipment Utilization and Replacement

Side boxes for the two refuge fire trucks were built and installed by a local contractor. These will enable the flappers, drip torches, wetting agent and torch fuel to be stored properly at all times.

Following is a list of other new equipment purchased to replace old equipment:

a. Woods 15-foot rotary mower
b. Truax native grass drill
c. Wheel hay rake
d. Gilbarco floor hoist

Automotive Mechanic Ray Badke stands by the new floor hoist installed by refuge staff in December 1984. 12/84, FGG.

Our new Digital Rainbow 100 Computer is a real indispenable piece of equipment. Word processing and record keeping improved tremedously in 1984. 12/84, GAE.

7. Energy Conservation

An energy audit of the headquarters complex was performed by EMC Engineers. During 1985 we will be collecting wind speed data using a recording anemometer.

J. OTHER ITEMS

1. Cooperative Programs

During the year refuge personnel attended numerous meetings to provide input into a mitigation plan for the Lake Darling Project. The Lake Darling Project is a flood control project resulting from a 1980 agreement hammered out between local proponents and opponents of the onerous Burlington Dam. The project consists of an approximately 4-foot raise of the Lake Darling design pool at Upper Souris NWR; levee improvements at Velva, Sawyer, and at six subdivision areas between Burlington and Minot; flood proofing of rural residences; modifications of refuge dams in the Upper Souris and the J. Clark Salyer National Wildlife Refuges; road and railroad relocations in the reservoir; mitigation measures; compensation to Canada for altered return flows; and protection measures for flooding from Gassman Coulee. The project is located on the Souris River in Ward, Renville, McHenry, and Bottineau Counties in northwestern North Dakota. Total estimated project cost is $64,899,000.

The Lake Darling project is the second phase of the total flood control plan for the Souris Valley in North Dakota. The channel modification in Minot was authorized in the summer of 1970 and completed in 1979. The Burlington Dam project was authorized as the second phase of the flood control plan. However, because of the controversial nature of the Burlington Dam project, a scaled down project was pursued by local interests. The resulting action was the authorization to raise the dam at Lake Darling by approximately 4 feet and to implement upstream and downstream flood control measures. Velva has been separated from the rest of the Lake Darling project and while construction proceeds with that feature, using traditional cost-sharing policies, the Corps will continue planning studies on the remaining portion of the project.

The general design memorandum was completed in June 1983. The FY-1984 funding allotment of $1 million was used to complete the Lake Darling site-specific EIS, a mitigation report, a hydraulic model study of the feature, a cultural resource design memo, and a supplement to the general design memo addressing downstream rural impacts. Also, work was initiated on design memos for reservoir levees and levees between Burlington and Minot. A task force for the International Joint Commission is currently evaluating the project impacts in Canada. The FY-1985 funding allocation includes funds for initiation of construction in the Velva feature. Traditional cost sharing is being applied to the Velva feature and a decision on cost sharing for the remaining project features will be made later.

When the current project was authorized, the need for a joint board representing the counties affected by the project to serve as a local sponsor was identified. On June 6, 1983, the representatives of the water resource districts from Ward, Renville, McHenry, and Bottineau Counties and the Oak Creek drainage area agreed to become members of a Souris River Joint Board for Flood Control, which would serve as local sponsor for the project. A local cooperation agreement for the Velva feature was signed on November 20, 1984.

Fish and wildlife features required to offset adverse impacts of project operation will be limited to structural measures designed to increase management capabilities at Upper Souris and Salyer NWR's. This is based on an earlier agreement between FWS and the Corp and does not necessarily represent the best biological decisions for Salyer NWR. These measures, as well as other proposed operational features at Salyer NWR are as follows:

a. Raise dams 326, 332, and 341. The purpose of the dam raises would be to increase management capabilities primarily to control cattail by periodic flooding with high water.

b. Construct a low-flow conduit through dam 320 to provide better circulation of water through the pool.

c. Construct 20 potholes in the wet-meadow areas south of pool 320.

d. An analysis of the potential for carp migration into the Souris River loop indicated that the probability of carp reaching suitable overwintering habitat was quite low. The analysis also indicated that the project would cause only a minimal increase in that probability. As the result of a December 6, 1984 meeting between the St. Paul District Engineer and the Fish and Wildlife Service, it was agreed that the Corps would include the carp control structure. It was suggested that the Corps seek non-reimbursable funding for the structure and if that failed, the Corps and FWS would share the cost 50/50. This structure would consist of a high-flow/high velocity channel and a low-flow electric weir at dam 357.

e. Provide one heated gate and actuator for each of the five dams.

f. Raise portions of the scenic trail and other service roads.

g. Improvements to boat and canoe launch and exit sites.

A mitigation report and draft EIS is due in May 1985 with the final EIS due in October 1985. Pending the future availability of funds, work is scheduled to begin on the dam in June 1985 and on other refuge features in September 1986.

2. Other Economic Uses

During the past year the refuge has received an increasing number of oil and gas exploration requests. All seismic activities during 1984 were required to lay seismograph cable by foot or stay within the road right-of-way. Four special use permits were issued for seismic exploration across refuge lands at $50.00 for each permit.

4. Credits

William West wrote Sections F.2., G., and H. Fred Giese wrote Sections E. 2.,4., 6., 7., and 8., F., H.17., I., and J.2. Gary Eslinger wrote Section B. Darold Walls wrote the Introduction, A., D.5., E.1. and 5., J. 1. and 4., K, and edited the report. Wanda Opdahl typed and assembled the report.

K. Feedback

What to write about this year . . . there really isn't too much to say that won't make a lot of people mad . . . so I guess I won't write about the politics of our system that we deal with now . . . how it has reached a much lower level in the FWS . . . how we haven't bought a wetland in North Dakota for years . . . how we can't even restore a drained WPA . . . (Holsten Slough WPA) . . . the first one purchased in the Salyer District . . . a WPA drained by the SCS and most recently we've given that to Ducks Unlimited as a project so that they can restore it and take care of our problem for us. We needed help from upstairs . . . from a big stick . . . but it didn't come. No, I won't write about that because everybody knows about those things anyway.

And I won't write about the paperwork . . . the paper blizzard that runs a close parallel to herpes. There seems to be no cure for it and it never seems to get any better. Seriously, folks, we need to do something about it but I won't write about that either. Everybody knows about it, no one likes it and we'll keep talking about it.

And so I scratch my head a little more and I decide that, yeah, we have other problems here at Salyer. A big refuge, complicated, involved, nearly 60,000 acres total. We've got manpower limitations . . . established our first WPA in 1962. We now have 114 units consisting of more that 20,000 acres in 5 counties; 7 large easement refuges, wetland easements scattered all over the 5 counties, thousands of acres of wetland easements to protect that we fly every year. Since the establishment of our first WPA we moved one new body into Salyer, namely a wetlands manager. He hasn't even seen all of the WPA's, no one else has either . . . never will. We have never added additional permanent staff since that time for either the refuge or the WMD . . . and everybody knows the wetlands manager needs an assistant. We did convert one full-time maintenance position into a bio-tech position to assist in the district's work and as a result of that we now hire more temporary

employees to assist with maintenance work. Washington even recognizes our need . . . gave us $35,000 recently which included money for 1 FTE but only for a temporary. But everybody knows all about that anyway, so I won't write about that.

And I won't write about the fact that our maintenance crew here ranges from one 30-year employee ready to retire, all the way up to one individual who is 69 years old, also ready to retire, or the fact that we only have one permanent full-time maintenance position, 3 career-seasonals, again all at or above age 60. We should be doing something about that, should put people on to train under them and have them ready to go when they retire within 2-3 years. An upcoming problem which will face the new manager at Salyer.

So with all those things aside, and all the other things that we all know about, I'll just transfer to Tamarac on August 4 of this year . . . probably go fishing, probably have a good time, probably keep myself out of trouble like I always have. And in so doing probably the only thing in the feedback that I have to say this year is thanks to a very dedicated staff at Salyer, we still have this ole place glued together, we are still going down the road together, we're still producing a lot of ducks and doing a lot of good things. Only because of good dedicated refuge people . . . and with that, and in reflecting, . . . if you're going to be an ecologist you've got to stir things up a little. So I'll transfer to Tamarac and, perhaps, just go fishing . . . goodbye and farewell to a darn good crew!

DOUBLE-CRESTED CORMORANT COLONY

OTHER WILDLIFE

Although waterfowl concentrations of spring, summer and fall are spectacular, the attention of bird observers is also directed to other birdlife making use of the vast and varied habitat. Salyer Refuge is in the geographical zone which separates eastern and western species and, therefore, hosts birds from both areas.

Many species of shorebirds and grebes, the white pelican, sandhill crane, lark bunting, longspurs, and the sparrows—including Baird's and LeConte's, are among the list that take summer residence on the refuge. A double-crested cormorant colony is located in the southern portion of the refuge.

The management of upland areas for waterfowl nesting habitat and food production also has benefitted upland game birds. The sharptailed grouse, which has been declining in many areas outside the refuge, has responded favorably. Ring-necked pheasants

FUR HARVEST

are able to cope with the rigorous North Dakota winters and produce young in the upland management areas. Coveys of gray partridge are also occupants of the uplands.

Many interesting mammals can be found on the refuge. Albino muskrats are observed occasionally. Beaver are plentiful along parts of the river. Other native fur animals such as the mink, raccoon, weasel, and skunk can be found at home in the marshes. The higher ground, which includes the sandhills area in the southern third of the refuge, harbors such animals as the white-tailed deer, coyote, red fox, badger, porcupine and rabbit.

ECONOMIC USE

The refuge is involved with many aspects of land management. Neighboring farmers grow crops on nearly 1,700 acres. Refuge share of the crop is either left standing or harvested for wildlife feeding programs. Haying is permitted on 2,500 acres after the waterfowl nesting season. Ranchers graze 12,000 acres at light stocking rates where interference to wildlife is at a minimum.

Oil wells were first drilled on refuge lands in 1965 and today ten wells are in operation along the boundary. Fur trapping is carried out on a limited basis with mink, muskrat, red fox and raccoon being taken. Other small scale uses include wood harvest for posts and a bee colony operation.

ADMINISTRATION

J. Clark Salyer National Wildlife Refuge is administered by the U.S. Fish and Wildlife Service, Department of the Interior. Headquarters is three miles north of Upham and can be reached by turning off U.S. Highway 2 at Towner, North Dakota and proceeding 26 miles north on State Highway 14.

Inquiries should be mailed to the Refuge Manager, J. Clark Salyer National Wildlife Refuge, Upham, North Dakota 58789.

OUR NATION'S WILDLIFE

The National Wildlife Refuge System is a collection of lands and waters which was begun in 1903 when Theodore Roosevelt established tiny Pelican Island refuge in Florida. Now almost 400 National Wildlife Refuges enable you to catch a glimpse of a unique wildlife heritage, and provide you a yardstick against which you can contrast the quality of your own environment. Over 45 million acres of land and water afford opportunities conditioned only by your care and discretion for experiencing wildlife habitat of unequaled variety.

UNITED STATES DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE

RF6-62620-1 Revised 1981

J. CLARK SALYER

NATIONAL WILDLIFE REFUGE
NORTH DAKOTA

J. Clark Salyer II (1902-1966) was chief of the Division of Wildlife Refuges, U.S. Fish and Widlife Service, from 1934 until 1961. His vision and hopes of a national wildlife refuge system are reflected here.

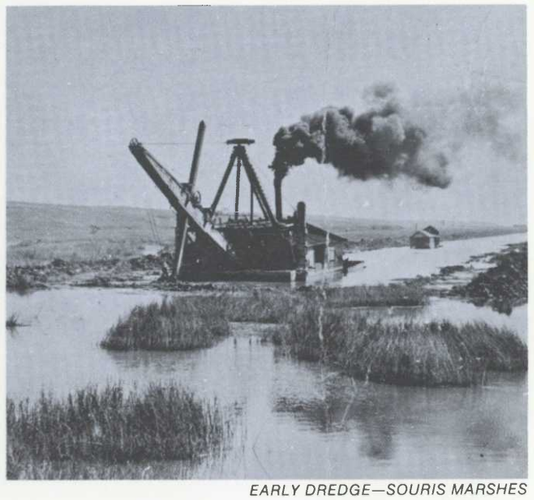
This refuge, containing 58,700 acres, was established in 1935 along the lower reaches of the Souris River. It serves as an important feeding and resting area for hundreds of thousands of waterfowl which annually migrate through the Central Flyway. The refuge also has been developed into one of the important duck production areas in the United States.

A HISTORY OF MISUSE . . .

Prior to 1900 the prairies of North Dakota abounded with buffalo, waterfowl and vast expanses of grasslands that will never be known again. Shortly after 1900 man began breaking the sod and draining valuable lowlands with expectations of fabulous crop production. The marsh areas, however, did not lend themselves to complete agricultural use and many crop failures occurred.

Finally, most farming efforts were abandoned and the land was allowed to endure Nature's whim. The drought period of the 1930's added its devastating effect, and desolation of wildlife habitat was the ultimate result. Thus, man had once again initiated and aided complete destruction of valuable waterfowl habitat with an ill-conceived plan to produce cash crops on land entirely unsuited for this purpose.

During these critical times the Federal Government stepped in to establish refuge areas for the preservation, propagation and protection of waterfowl.



EARLY DREDGE—SOURIS MARSHES

. . . THEN MARSH RESTORATION

To accomplish restoration of the marshes, a series of five low dikes were erected to create pools along the 75 miles of river included within the refuge boundary. Prior to flooding, nesting islands were constructed. Then, as the waters of the Souris River slowly inundated the valley once again, tons of aquatic plant seeds, stems, tubers, and roots were gathered from still-existing water areas many miles away and planted in these new marsh areas. Improved water conditions finally returned and large flocks of waterfowl responded to this haven for marsh-loving wildlife.

The refuge has now become a favorite spot for birds of all descriptions to stop on their migrations north and south. More than 250 species of birds have been observed since the refuge was established. Nearly 125 species have been found nesting.

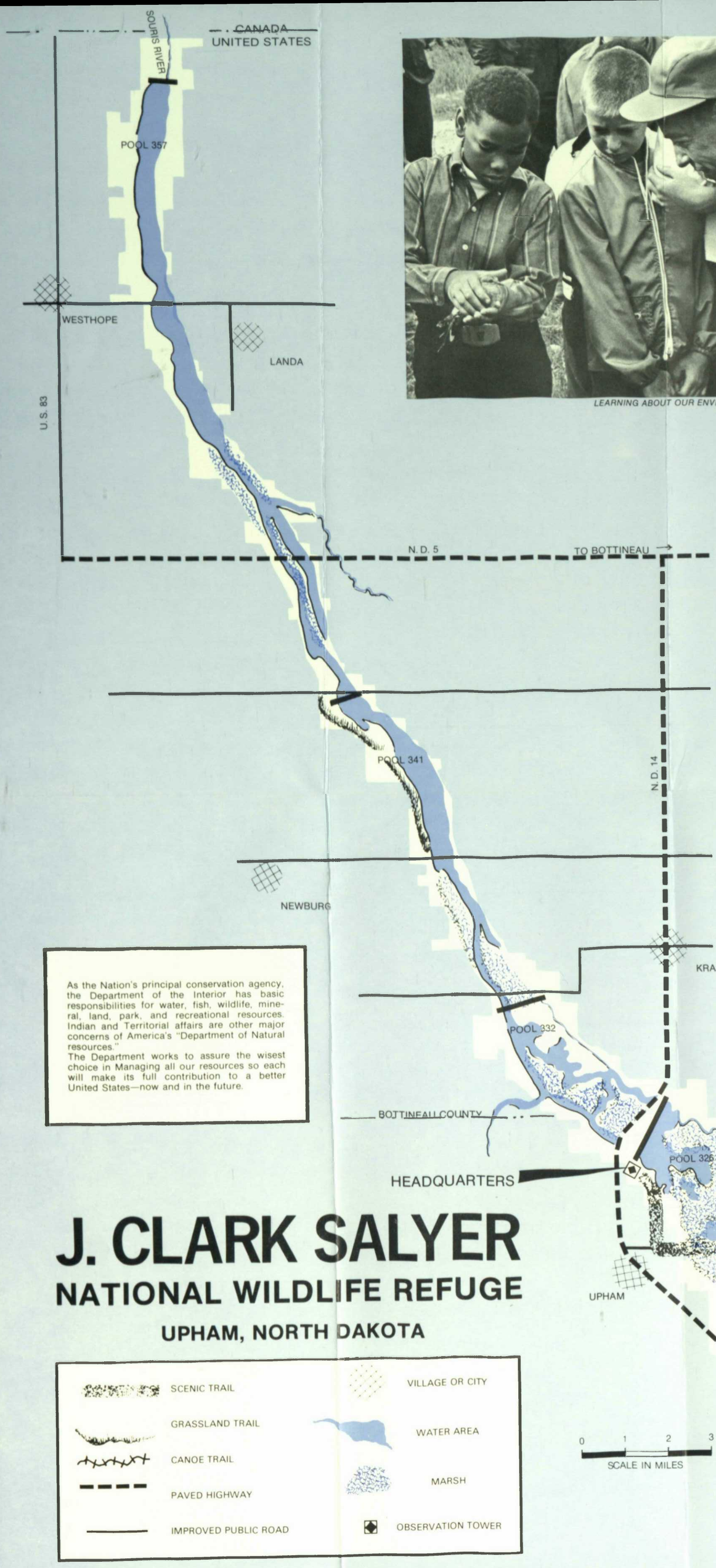
DUCKS IN SOURIS MARSH TODAY

WATERFOWL TODAY

Peak waterfowl numbers of more than 200,000 birds have occurred during the spring and fall migrations, with more than 100,000 being the normal influx. During the summer, breeding waterfowl and their young are joined by thousands of moulting adult ducks from smaller water areas as far as 100 miles away, seeking the protection of the sheltered bays during their moult. They are flightless for several weeks during this period.

Foremost among the huge waterfowl populations moving through the Central Flyway are the grain feeding ducks—the mallard and pintail. The increased production of barley and wheat, combined with occasional abnormally high fall moisture conditions, have led to harvest-time visitations by these two species causing varying degrees of crop depredation. An important aspect of refuge management is, therefore, the prevention of this damage. The principle methods used to combat this problem are crop production of suitable refuge lands to produce supplementary feed, the maintenance of feeding stations during the grain harvest period, and use of an airplane and various scare devices to drive birds from swathed grain fields surrounding the refuge.

A good example of the response of wildlife to a well planned management program is the re-establishment of the Canada goose as a breeding summer resident. History indicates that these magnificent birds were once nesters in this area but probably were eliminated during the homesteading era by overshooting. A small flock of captive birds was transferred here in 1937. Goslings which hatched from these few pairs have survived subsequent hunting seasons to return and raise young of their own. The nesting flock of wild "honkers" has gradually increased so that now from several hundred goslings are produced each year.



LEARNING ABOUT OUR ENVIRONMENT

WOODED-MEANDERING RIVER BOTTOM

FOR YOUR OUTDOOR ENJOYMENT

Scenic Trail A 22-mile auto trail beginning at headquarters and winding through the southern portion of the refuge before ending at State Highway 14 helps explain wildlife management programs and describes the marshland, wooded river bottoms and sandhills along the route. Trail is in generally good condition from early May through September.

Grassland Trail A five-mile auto trail leading north from the Newberg Road is open to the public. The trail goes through prairie grasslands and travels along the river marsh. Usually the trail is open from May 1 to September 15 — Travel not advised during wet weather.

Canoe Trail A unique 13-mile stretch of natural river bottoms rich in beauty, woodlands and wildlife. Floaters have the choice of traversing the entire length or a 5½-mile portion. An interpretive refuge leaflet is available for your use. (This trail is a designated National Recreation Trail.)

Photography and Birdwatching Many opportunities exist for interested amateur and professional people. Observation towers at headquarters and in the sandhills are open. The varied habitat attracts more than 250 species of birds and wildlife photography often is rewarding. Refuge bird lists and information on specific species are available at headquarters.

Hunting Upland game, big game and waterfowl hunting are provided in accordance with State seasons and regulations. Contact Refuge Manager for information on specific areas, yearly dates and regulations pertaining to hunting on a National Wildlife Refuge.

Fishing in Summer Fishing and boating shall be in accordance with all State laws and federal regulations. Fishing is permitted on 900 acres of refuge waters. Contact the Refuge Manager for information on the 13 open areas.

Winter Ice Fishing Ice fishing is permitted on all refuge waters between the dates of December 15 and the end of the State fishing season.

Picnicking Three picnic areas are located on the refuge.

Fires Open fires are prohibited.

Hours Refuge areas are open between 5:00 am to 10:00 pm daily.

** Contact Refuge Manager or check state proclamation for yearly dates and regulations pertaining to hunting and fishing. State license is required.*

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural resources."
The Department works to assure the wisest choice in Managing all our resources so each will make its full contribution to a better United States—now and in the future.

J. CLARK SALYER
NATIONAL WILDLIFE REFUGE
UPHAM, NORTH DAKOTA

SCENIC TRAIL
GRASSLAND TRAIL
CANOE TRAIL
PAVED HIGHWAY
IMPROVED PUBLIC ROAD
VILLAGE OR CITY
WATER AREA
MARSH
OBSERVATION TOWER

THINGS TO LOOK FOR ON YOUR TRIP

BEAVER LODGE - Large mounds of sticks and mud, located along the river bank, mark the home of a beaver. These homes, called lodges, have underwater entrances and a ready supply of winter food.

WATERFOWL - A river bottom offers the ideal habitat for wood ducks and hooded mergansers. Metal boxes, located on several tree trunks, are provided for the spring nesting of these two species. Other waterfowl can also be seen by moving quietly on the river. Look for broods of young ducks in June and July.

OLD RIVER OXBOWS - There are several old river oxbows located off the main river channel. These were formed when the river cut a new route, and isolated the old river bends from the new channel. They offer good habitat for ducks and furbearers. You may wish to explore some of the larger ones.

WHITE-TAILED DEER - River bottoms offer good habitat for deer, especially during the winter months. Deer often rest along the river banks, but will dart into the brush if disturbed. You may see one if you are quiet.

FURBEARERS - A variety of furbearing animals, including raccoon, mink, muskrat and weasel live in the river bottom area. Muskrat and mink make their homes in bank burrows. You may see a mink darting along the river bank or a muskrat feeding along the shore.

BIRDLIFE - A wide variety of birds make their homes in the river bottoms. Take along a pair of binoculars and a bird book to make your trip more enjoyable. Keep a list of the birds you see on the refuge checklist available at headquarters.

FISHING -Fishing is permitted along the canoe route. Northern pike and walleye are common species caught in the area.

For your convenience, mile markers have been placed along the route so you can pace your travel time.

GPO 846-196

HAVE AN ENJOYABLE TRIP

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

RF-6-62620-10 **Reprint July 1980**

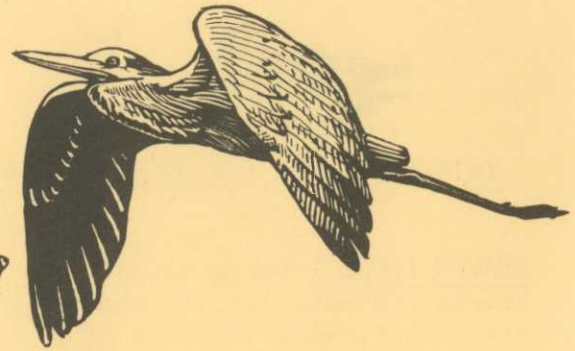
Souris River

Canoe Trail

A UNIQUE STRETCH OF NATURAL RIVER BOTTOMS RICH IN BEAUTY, WOODLANDS AND WILDLIFE

Begin at Johnson Bridge along Scenic Trail. Canoeist has choice of 5½ or 13 mile routes.

J. CLARK SALYER
NATIONAL WILDLIFE REFUGE
UPHAM, NORTH DAKOTA



TWO ROUTES ARE AVAILABLE FOR YOUR ENJOYMENT

5½ Mile Route: From Johnson Bridge to Thompson Well site. 2 miles by road back to Johnson Bridge. Allow 2-3 hours for canoe trip.

13 Mile Route: Johnson Bridge to Dam 1. Four miles by road back to Johnson Bridge. Allow 5-7 hours for canoe trip.

	S	S	F	W
___• American Robin (Robin)	c	c	a	o
___ Hermit Thrush	u		u	
___ Swainson's Thrush	c		c	
___ Gray-cheeked Thrush	c		c	
___• Veery	u	c	u	
___• Eastern Bluebird	o	o	o	
___ Mountain Bluebird	u	r	u	
___ Townsend's Solitaire	r		r	r
___ Golden-crowned Kinglet	u		u	
___ Ruby-crowned Kinglet	u		u	
___ Water Pipit	u		u	
___• Sprague's Pipit	u	u	o	
___ Bohemian Waxwing	u		u	u
___• Cedar Waxwing	c	c	c	r
___ Northern Shrike				o
___• Loggerhead Shrike	u	u	u	
___• Starling	u	u	u	u
___• Yellow-throated Vireo	o	o	o	
___ Solitary Vireo	r	r	r	
___• Red-eyed Vireo	c	c	c	
___• Philadelphia Vireo	o	o	o	
___• Warbling Vireo	c	c	c	
___• Black-and-white-Warbler	u	o	u	
___ Tennessee Warbler	c		c	
___ Orange-crowned Warbler	c		c	
___ Nashville Warbler			r	
___• Yellow Warbler	c	c	a	
___ Magnolia Warbler	o		o	
___ Cape May Warbler	r		r	
___ Black-throated Blue Warbler	r		r	
___ Yellow-Rumped Warbler (Myrtle & Audubon's)	c		c	
___ Black-throated Green Warbler	o	o	o	
___ Blackburnian Warbler	o	o	o	
___ Chestnut-sided Warbler	o	o	o	
___ Bay-breasted Warbler	o	o	u	
___ Blackpoll Warbler	c		u	
___ Palm Warbler	o		o	
___• Ovenbird	u	o	u	
___• Northern Waterthrush	c	u	c	
___ Connecticut Warbler	r		r	
___ Mourning Warbler	u	o	u	
___ MacGillivray's Warbler	o	o	o	
___• Common Yellowthroat (Yellowthroat)	c	c	c	
___• Yellow-breasted Chat	o	o	o	
___ Wilson's Warbler	u	u	c	
___ Canada Warbler	r		o	
___• American Redstart	u	u	u	
___• House Sparrow	c	c	c	c
___• Bobolink	c	c	c	
___• Western Meadowlark	a	a	a	r
___• Yellow-headed Blackbird	a	a	a	
___• Red-winged Blackbird	a	a	a	o

	S	S	F	W
___• Orchard Oriole	o	o	o	
___• Northern Oriole (Baltimore & Bullock's)	u	u	u	
___ Rusty Blackbird	u		u	r
___• Brewer's Blackbird	u	u	u	
___• Common Grackle	c	c	c	r
___• Brown-headed Cowbird	c	c	c	
___ Western Tanager			r	
___ Scarlet Tanager	r	r		
___• Rose-breasted Grosbeak	o	r	u	
___ Black-headed Grosbeak	r			
___ Indigo Bunting	r	r		
___• Lazuli Bunting	o	o		
___• Dickcissel	r	r	r	
___ Evening Grosbeak	r		r	r
___ Purple Finch	u		u	r
___ Pine Grosbeak				o
___ Hoary Redpoll				r
___ Common Redpoll	c			c
___• Pine Siskin	c	r	c	r
___• American Goldfinch	c	c	a	r
___ Red Crossbill	r	r	r	r
___ White-winged Crossbill				r
___• Rufous-sided Towhee	u	c		
___• Lark Bunting	c	a	c	
___• Savannah Sparrow	c	a	a	
___• Grasshopper Sparrow	u	c	u	
___• Baird's Sparrow	u	c	u	
___• Le Conte's Sparrow	u	c	u	
___• Sharp-tailed Sparrow	u	c	u	
___• Vesper Sparrow	u	u	u	
___• Lark Sparrow	o	o		
___ Dark-eyed Junco (Slate-colored, Oregon & White-winged)	a		a	r
___ Tree Sparrow	a		a	r
___• Chipping Sparrow	c	u	c	
___• Clay-colored Sparrow	a	a	c	
___• Field Sparrow	o	o	o	
___ Harris' Sparrow	c		c	r
___ White-crowned Sparrow	c		c	
___ White-throated Sparrow	a		c	
___ Fox Sparrow	u		u	
___ Lincoln's Sparrow	c		c	
___ Swamp Sparrow	o		o	
___• Song Sparrow	c	c	c	
___• McCown's Longspur	r	r	r	
___ Lapland Longspur	a		a	c
___ Smith's Longspur	o		o	
___• Chestnut-Collared Longspur	c	c	u	
___ Snow Bunting	c		c	a

BIRDS THAT ARE RARELY SEEN ON THE REFUGES AND OUT OF THEIR NORMAL RANGE:

Green Heron
White Ibis
Fulvous Whistling Duck
Oldsquaw
Harlequin Duck
Surf Scoter
Common Scoter
Red-shouldered Hawk
Bobwhite
American Woodcock
Whimbrel
Knot
Black-necked Stilt
Barn Owl
Barred Owl
Whip-poor-will
Scissor-tailed Flycatcher
Winter Wren
Northern Parula
Townsend's Warbler
Hooded Warbler
Lesser Goldfinch
Henslow's Sparrow

Acknowledgments: To Dr. and Mrs. R.T. Gammell for their contribution in compiling this birdlist.

Further information about the refuges or certain species can be obtained from:

Des Lacs Refuge
Kenmare, North Dakota 58746

Lostwood Refuge
Lostwood, North Dakota 58754

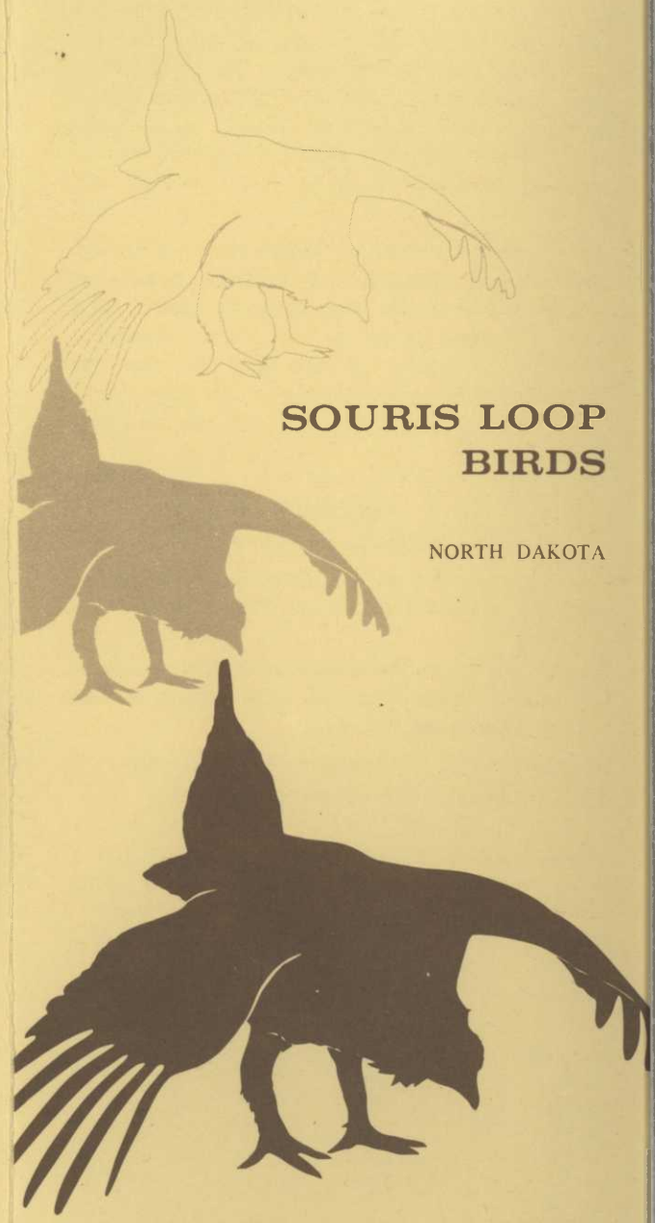
J. Clark Salyer Refuge
Upham, North Dakota 58789

Upper Souris Refuge
Foxholm, North Dakota 58738

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH & WILDLIFE SERVICE

RF–Region 6

1979
GPO 849-947



SOURIS LOOP BIRDS

NORTH DAKOTA

SOURIS LOOP BIRDS

The "Souris Loop" National Wildlife Refuges were established in 1935. They are Des Lacs (18,881 acres), Lostwood (26,747 acres), J. Clark Salyer (58,695 acres), and Upper Souris (32,092 acres). Wetlands consist of restored marshes on Des Lacs, J. Clark Salyer, and Upper Souris and potholes in the rolling hills on Lostwood. Other important wildlife habitats are remnants of the original short-grass prairie, lowland meadow, wooded sandhills, river bottoms, and coulees.

While the waterfowl concentrations of spring, summer, and fall are spectacular, bird observers are generally most interested in the five species of grebes, white pelicans, certain hawks, grouse, cranes, shorebirds, Franklin's gulls, burrowing owls, Sprague's pipits, lark buntings, longspurs, and sparrows—including Baird's and Le Conte's. About 140 species are known to nest on these refuges.

CHECKLIST
Souris Loop National Wildlife Refuges

This list contains 290 species (23 are accidental species) recorded on the refuges since 1935.

Species nesting on the refuge are indicated by a (•). The relative abundance of each species at each season is coded as follows:

S—March-May F —September-November
S—June-August W—December-February

a—abundant ..... common species, very numerous
c—common ..... certain to be seen in suitable habitat
u—uncommon ..... present, but not certain to be seen
o—occasional ..... seen only a few times during a season
r—rare ..... seen at intervals of 2 to 5 years

	S	S	F	W
___ Common Loon	r	r	r	
___• Red-necked Grebe	o	o	o	
___• Horned Grebe	u	u	u	
___• Eared Grebe	c	c	c	
___• Western Grebe	c	c	c	
___• Pied-billed Grebe	c	c	c	
___ White Pelican	c	c	c	
___• Double-crested Cormorant	u	u	u	
___• Great Blue Heron	u	u	u	
___• Little Blue Heron	u	u	u	
___• Cattle Egret	u	u	u	
___ Great Egret (Common)		r	r	
___ Snowy Egret		r	r	
___• Black-crowned Night Heron	c	c	c	
___• American Bittern	u	u	u	
___ Least Bittern	r	r	r	
___ White-faced Ibis		r	r	
___ Whistling Swan	u		c	
___• Canada Goose	c	u	c	
___ White-fronted Goose	c		c	
___ Snow Goose (Snow & Blue)	a		a	
___ Ross' Goose			r	
___• Mallard	a	c	a	
___• Black Duck	r	r	r	
___• Gadwall	a	c	a	
___• Pintail	a	c	a	
___• Green-winged Teal	u	u	u	
___• Blue-winged Teal	a	c	a	
___ Cinnamon Teal	r	r		
___ European Wigeon (European Widgeon)	r	r		
___• American Wigeon (Am. Widgeon)	c	u	c	
___• Northern Shoveler (Shoveler)	c	u	c	
___• Wood Duck	u	u	u	
___• Redhead	c	u	c	
___• Ring-necked Duck	u	o	u	
___• Canvasback	c	u	c	
___ Greater Scaup			r	
___• Lesser Scaup	c	u	c	
___ Common Goldeneye	u		u	
___ Bufflehead	u	o	u	
___• White-winged Scoter	r	r	r	
___• Ruddy Duck	c	c	c	
___• Hooded Merganser	o	o	o	
___ Common Merganser	c		u	
___ Red-breasted Merganser	u		u	
___ Turkey Vulture	r			
___ Goshawk			r	r
___• Sharp-shinned Hawk	o	o	o	
___• Cooper's Hawk	o	o	o	
___• Red-tailed Hawk	c	u	c	
___ Broad-winged Hawk	o	o	o	
___• Swainson's Hawk	c	u	c	
___ Rough-legged Hawk	o		o	o
___• Ferruginous Hawk	o	o	o	
___ Golden Eagle	o		o	o
___ Bald Eagle	o		o	
___• Marsh Hawk	c	c	c	
___ Osprey	r		r	
___ Gyrfalcon				r
___ Prairie Falcon			o	o
___ Peregrine Falcon	r		r	
___ Merlin (Pigeon Hawk)	o		o	r
___• American Kestrel (Sparrow Hawk)	u	o	u	
___ Greater Prairie Chicken (1)				
___• Sharp-tailed Grouse	c	c	c	c
___• Ring-necked Pheasant	u	u	u	u
___• Gray Partridge	c	c	c	c
___ Whooping Crane	r		r	
___ Sandhill Crane (2)	a	r	a	
___• Virginia Rail	u	c	u	
___• Sora	u	c	u	
___• American Coot	c	c	a	
___ Semipalmated Plover	u		u	
___• Piping Plover	o	o	o	
___• Killdeer	c	c	c	
___ American Golden Plover	u		r	
___ Black-bellied Plover	u		u	
___ Ruddy Turnstone	r		r	
___• Common Snipe	o	o	o	
___ Long-billed Curlew	r			
___• Upland Sandpiper (Plover)	u	c	u	
___• Spotted Sandpiper	u	c	u	
___ Solitary Sandpiper	u		u	
___• Willet	u	u	c	
___ Greater Yellowlegs	u		c	
___ Lesser Yellowlegs	c	u	c	
___ Pectoral Sandpiper	c	c	c	
___ White-rumped Sandpiper	r		r	
___ Baird's Sandpiper	u		u	
___ Least Sandpiper	c	c	a	
___ Dunlin			r	
___ Short-billed Dowitcher	r		r	
___ Long-billed Dowitcher	u	u	c	
___ Stilt Sandpiper	o		u	
___ Semipalmated Sandpiper	a	a	a	
___ Western Sandpiper	r		r	
___ Buff-breasted Sandpiper	r			
___• Marbled Godwit	u	u	c	
___ Hudsonian Godwit	r		r	
___ Sanderling	r			
___• American Avocet	c	c	c	
___• Wilson's Phalarope	c	c	c	
___ Northern Phalarope	a		a	
___ Herring Gull	r		r	
___• California Gull	u	r	u	
___• Ring-billed Gull	c	c	c	
___• Franklin's Gull	c	c	c	
___ Bonaparte's Gull	r		r	
___• Forster's Tern	c	c	c	
___• Common Tern	u	u	u	
___• Black Tern	a	c	c	
___• Rock Dove	o	o	o	o
___• Mourning Dove	c	c	a	
___ Yellow-billed Cuckoo	r			
___• Black-billed Cuckoo	o	o	o	

(1) Last observed in 1956
(2) Nesting recorded at J. Clark Salyer in 1973

	S	S	F	W
___• Screech Owl	o	o	o	o
___• Great Horned Owl	u	u	u	u
___ Snowy Owl	o		o	o
___• Burrowing Owl	o	o	o	
___• Long-eared Owl	o	o	o	o
___• Short-eared Owl	u	u	o	o
___ Boreal Owl				r
___ Saw-whet Owl	o	o	o	o
___• Common Nighthawk	o	o	o	
___ Chimney Swift	r			
___• Ruby-throated Hummingbird	o	o	o	
___• Belted Kingfisher	o	o	o	
___• Common Flicker (Yellow & Red Shafted)	c	c	c	
___• Red-headed Woodpecker	r	o	r	
___• Yellow-bellied Sapsucker	o	o	o	
___• Hairy Woodpecker	o	o	o	o
___• Downy Woodpecker	u	u	u	u
___• Eastern Kingbird	a	c	c	
___• Western Kingbird	a	c	c	
___• Great Crested Flycatcher	r	o	o	
___• Eastern Phoebe	r	o	o	
___• Say's Phoebe	o	o	o	
___ Yellow-bellied Flycatcher	r	r	o	
___• Willow Flycatcher	c	c	a	
___• Least Flycatcher	c	c	a	
___• Eastern Wood Pewee	r	o	o	
___ Western Wood Pewee			r	
___ Olive-sided Flycatcher	o		u	
___• Horned Lark	a	c	a	c
___ Violet-green Swallow			r	
___• Tree Swallow	c	c	a	
___• Bank Swallow	c	c	a	
___• Rough-winged Swallow	o	o	o	
___• Barn Swallow	c	c	a	
___• Cliff Swallow	a	a	a	
___• Purple Martin	c	c	c	
___• Blue Jay	o	o	o	o
___• Black-billed Magpie	u	u	u	u
___ Raven				r
___• Common Crow	c	u	c	
___• Black-capped Chickadee	c	c	c	c
___• White-breasted Nuthatch	o	o	o	o
___ Red-breasted Nuthatch	u		c	r
___ Brown Creeper	u		u	r
___• House Wren	c	c	c	
___• Long-billed Marsh Wren	c	c	c	
___• Short-billed Marsh Wren	c	c	u	
___• Rock Wren	r	r	r	
___ Mockingbird	r	r	r	
___• Gray Catbird (Catbird)	u	u	u	
___• Brown Thrasher	u	u	u	
___• Sage Thrasher	r	r	r	

J. Clark Salyer

NATIONAL WILDLIFE REFUGE

SCENIC TRAIL GUIDE

WELCOME to J. Clark Salyer National Wildlife Refuge. This refuge was established in 1935 for the preservation and propagation of migratory waterfowl and other wildlife. It is nearly 59,000 acres in size, extending along the Souris River for 50 miles from east of Bantry to the Manitoba border. Originally called Lower Souris Refuge, it was renamed in 1968 in honor of J. Clark Salyer II, head of the National Wildlife Refuge System from 1934–1961.

This is the starting point for a 22-mile tour covering marshes, wooded river bottoms and sandhills of the refuge, ending north of Bantry of Highway 14. Check your gas supply before leaving, Upham is the nearest source of gas.

The name "Souris" is French for "mouse". Before 1800, French explorers found the Indians calling the stream "the mouse river" because of the great number of mice found in the meadows now within the refuge.

TRAIL OPEN
5:00 A.M.
To
10:00 P.M.
Daily

NUMBERED SIGNS ALONG THE ROUTE INDICATE THE POINTS OF INTEREST DESCRIBED BELOW:

1 ***Nursery.*** *This tree nursery was established in 1935, and from it the Civilian Conservation Corps (C.C.C.) planted most of the trees now at headquarters. This nursery and similar planted tree groves are valuable winter habitat for pheasants, deer and small animals as well as being attractive summer nesting areas for songbirds.*

2 ***Pool 326.*** *To your left (east) is Pool 326, formed by a dam north of headquarters. The natural marsh that existed here was drained for farming in the early 1900's, but these farming operations failed. The dam impounded the water, thereby restoring the marsh. Water levels are controlled to stabilize marsh vegetation, prevent flooding of nesting areas and encourage growth of food-producing aquatic plants.*

In the marsh is a nesting colony of Franklin's Gulls. They build nests of marsh plants in shallow water and lay two or three eggs. Farmers welcome these black-headed birds because they eat great numbers of grasshoppers, grubs, insects and mice.

To your right is a typical refuge wildlife cover patch. The patch was established by seeding a Dense Nesting Cover mixture of sweetclover, alfalfa and two types of wheatgrass on a former farm unit. These patches maintain good vigor and provide excellent wildlife cover for a period of 5-10 years after establishment. Some type of manipulation is then required to rejuvenate the cover. This is sometimes done by farming the areas for a few years before reseeding. Grain from the farming operation is used to keep ducks on the refuge during harvest season, attract ducks to banding sites, and as winter food for pheasants, partridge, grouse and deer.

3 ***Marshland Wildlife.*** *Turn left on the Upham-Willow City road. To your left in 326 Pool are small platforms in open water areas. Wild Canada geese nest on these platforms, which provide security against flooding and predators such as raccoons. There are over 100 of the artificial nests in refuge marshes. Several hundred goslings are produced annually on the refuge.*

Different kinds of ducks may be seen in the road ditches ahead. Albino muskrats also have been seen along this stretch of road.

4 ***LeConte's Sparrow.*** *Here is one of the few places in the midwest where LeConte's sparrow may be found. This small bird is of interest because it is so uncommon and difficult to see. It seeks meadows with tall grassy areas such as you see here.*

5 ***Pool 320.*** *This is an approach to 320 dike and water control structure. The dike extends southwest for nearly 3 miles, creating a pool and marsh of 4,300 acres. This is a good spot to observe ducks and many other water birds. You are encouraged to walk up on the dike and look out over the marsh. The islands are used by nesting Canada geese and many ducks. Gates on the control structure may be raised or lowered to achieve desired pool water levels. PLEASE REFRAIN FROM DRIVING ON THE DIKE OR GOING NEAR THE CONTROL STRUCTURE—IT IS A DANGEROUS PLACE.*

Refuge dikes and the pools behind them are numbered (320, 326, etc.) to correspond with the number of river miles from where the Souris (Mouse) River enters North Dakota from Canada. There are 358 miles of river within the state, the last 75 being within this refuge.

Back on the main road you will cross the Freeman Bridge, named for a pioneer family in this area. Here is one of 13 public fishing areas on the refuge. You may also see diving ducks and cormorants, large black birds. Follow the main road ahead for 1½ miles and turn right at the "Scenic Trail" marker. This is a ***dry weather road*** *only. Fire danger may be high so please be careful if you smoke.*

6 ***"End of the Woods."*** *Ahead of you the timber along the river ends. This area was a crossing well travelled by Indians, fur traders and explorers, all of whom knew it as "End of the Woods." In 1852, Charles Cavelier, a customs collector, camped here for 21 days. All that time, great herds of buffalo marched steadily to the northwest. About 40 Indian families lived here. Cavelier recorded that their hunters killed more than 400 buffalo in one chase during his stay.*

Grazing units are located on both sides of the trail. Refuge neighbors have grazing privileges on 12,000 acres. Grazing by cattle is permitted early in the growing season to retard growth of grasses less valuable to wildlife, thereby encouraging growth of warm season native grasses of more value to wildlife.

7 ***Dam 2.*** *The road crosses a bridge near a low dam, called Dam #2, which floods the marsh to the left. Control of water levels is an essential part of marsh management.*

8 ***River Oxbow.*** *On your right is a river oxbow slough, a good place to see ducks. These water areas are formed when the meandering river changes its channel over the years, isolating an oxbow, or loop, in the river. This is habitat for tree-nesting ducks and their broods sometimes may be seen here. Across the slough is a round cone-shaped metal nesting box erected to attract tree-nesting ducks, such as hooded mergansers and wood ducks.*

9 ***Water Control.*** *Dam #1 crosses the river here. It was built in 1936 to divert water to the marsh on the left. The dam also maintains water levels in the river, filling old oxbows to the south. Water diverted at Dam #1 flows back into the river near Dam #2.*

10 ***Pothole Development.*** *Small ponds were dug along a creek channel here to improve the area for waterfowl nesting. These ponds simulate natural potholes in the prairies, so essential for waterfowl production.*

Ranchers cut hay in the meadows ahead of you. Haying is regulated by limiting locations and cutting dates so waterfowl and other wildlife needs have first consideration.

11 ***Willow Creek.*** *Here the woods follow Willow Creek, a name given the small stream by the Indians. Porcupine and deer are common here. Wood ducks sometimes may be seen along this wooded creek.*

12 ***Twining Expedition.*** *On September 8th and 9th, 1869, Captain W.J. Twining of the U.S. Engineers Corps camped near here. He was making a reconnaissance of northeastern North Dakota, including the Souris and Red River valleys.*

Just ahead by the spruce trees is the Thompson Place, location of a farm home before establishment of the refuge. There is a well with good drinking water and picnic tables.

13 ***Lowland Meadows.*** *Areas such as this are natural lowland meadows. In recent years, some of these areas have become overgrown with willow. Although willow is good for deer cover and food, it can become too dense. Control by infrequent mowing or burning may be needed to keep the area in its natural meadow type. In historic times, wild fire periodically swept this area, maintaining the natural ecologic communities.*

14 ***Souris River.*** *Here the trail crosses the Souris River on the Johnson Bridge. It is believed the Indians used a crossing about 100 feet to the right of the bridge. Beaver inhabit this part of the river. Look for red squirrels, wood ducks and hooded mergansers.*

15 ***Early History.*** *You are now leaving the river bottom and entering the sandhills. An early day cattle operation, the famous Stevens Ranch Company, had its headquarters located on the first sand ridge as you enter the sandhills. Texas longhorn cattle were shipped here about 1900 but were not hardy enough to withstand the cold North Dakota winters. It is said these Texas herds furnished the foundation stock for nearly all the cattle produced in this area.*

To the left about one-half mile is an Indian crossing. Two miles southeast is the Cole Ford, another famous crossing used by Sioux, Chippewa and Assiniboine Indians, fur traders, trappers, explorers and even cars in more recent years. The late historian Dana Wright said of it, "This was a well established rendezvous known to every plainsman on the northern prairies".

16 ***Sandhills.*** *These tall sand ridges were a beach of glacial Lake Souris of the last* ***ice age****, about 10,000 years ago. They were formed by wind piling the loose sand into dunes at the edge of the lake. The sandhills are home for deer, sharptailed grouse, red squirrels, snowshoe hares, many songbirds and a few coyotes.*

You may park and walk into the sandhills. The view from the sand ridges is beautiful. Note the many grasses and forbs to be found here. The blue three-petaled spiderwort and prairie wild rose, state flower of North Dakota, are common. The tiny ball cactus may be seen if you look carefully. Watch for poison ivy, a creeping plant with three leaflets, found mainly beneath trees and shrubs. TAKE CARE NOT TO BECOME LOST.

17 ***Tower and Picnic Area.*** *A side trail leads to the sandhills tower and picnic area. There is a well with good water and picnic tables. Again, watch for poison ivy. Please cooperate in keeping the picnic area clean. Waste barrels have been provided for your use. You can detour to the tower, but if you do, return to this point and continue to the Scenic Trail.*

18 ***Historic Trail.*** *Here you cross the Red River Hunters Trail, also used by Captain Twining in 1873.*

This trail comes from the Red River across the Cole Ford and goes into Canada, leaving the U.S. at the Hill of the Murdered Scout near Portal, North Dakota. This trail, on the left side of the road, appears as three tracks. They were made by horses dragging travois.

19 ***Sharp-tailed Grouse.*** *Sharp-tailed grouse have a "dancing ground" here. This dancing is done by male birds to win the attention of females during the spring mating season. During the mating season, grouse are on the area for 2-3 hours after sunrise and sometimes during late afternoon. When they are active, the grouse can be heard a mile away on calm days. Check at headquarters for best times to see these birds.*

The Scenic Trail has given you a sample of the rich history and wildlife habitats of J. Clark Salyer National Wildlife Refuge. We hope you enjoyed your stay and welcome you back in the future.

This is the last stop on the Scenic Trail. Continue west 4 miles to Highway #14. At that point, turn right 4 miles to Upham, or go left 17 miles to Towner.

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FISH AND WILDLIFE SERVICE

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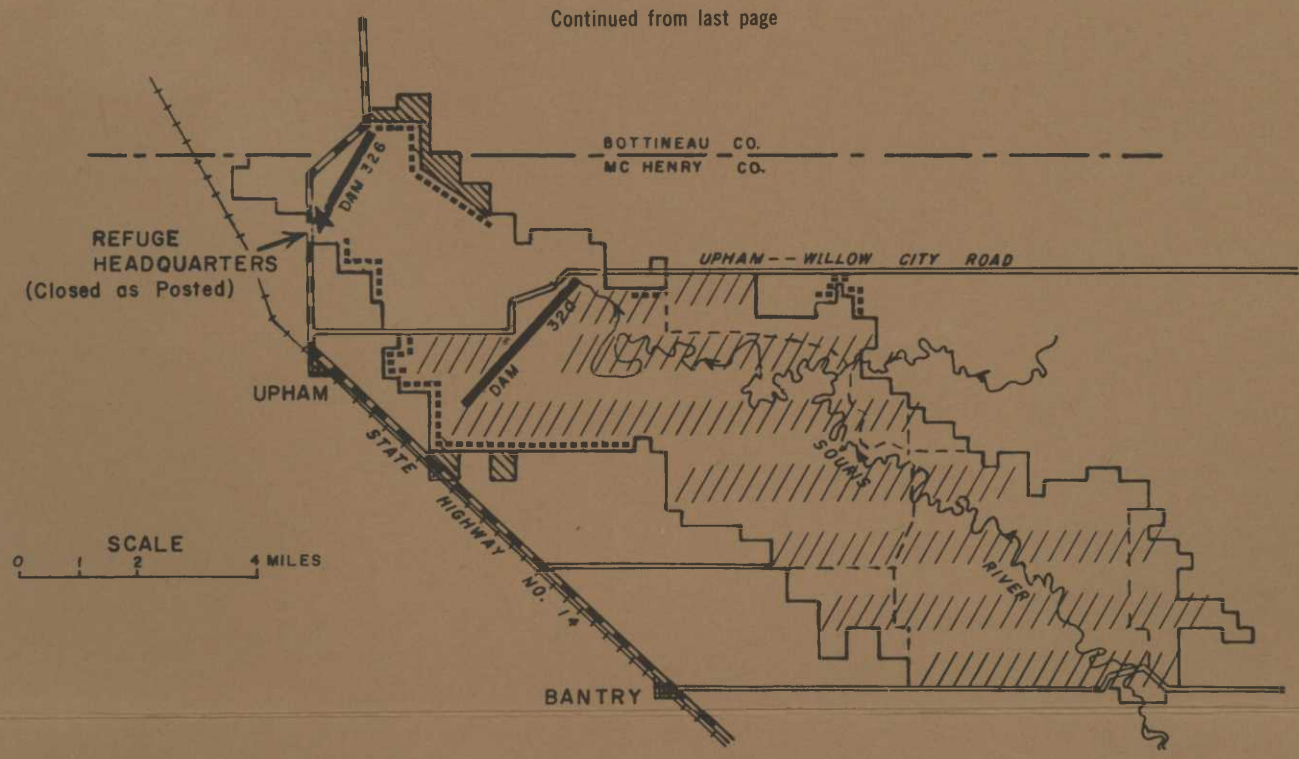
Continued from last page



waterfowl, grouse, partridge, pheasant and deer.

HUNTING INFORMATION

[redacted]—Open on nine designated Public Hunting Areas in State seasons. **Grouse and Partridge**—Open on that portion of the refuge south of the Upham-Willow City Road during State season. **Late Pheasant, Grouse and Partridge**—Entire refuge open following the closing of deer gun season in accordance with dates set by N.D. State Fish and Game Department. **Archery Deer**—Entire refuge open with State season, except during the waterfowl hunting season when only the area south of the Upham-Willow City road will be open. **Firearm Deer**—Entire refuge open with State season; special refuge permit required first 2½ days; open to any State Unit IIIA4 permit holder thereafter.

Hunters are reminded that State law prohibits hunting within ¼ mile of an occupied building.

Refuge Hours: 5:00 a.m. to 10:00 p.m. daily. Hunting hours in accordance with all State and Federal regulations. Overnight camping prohibited.

J. CLARK SALYER NATIONAL WILDLIFE REFUGE, UPHAM, NORTH DAKOTA 58789
U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
TELEPHONE: (701) 768-2548

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GPO 837-651

January 1983

HUNTING MAP

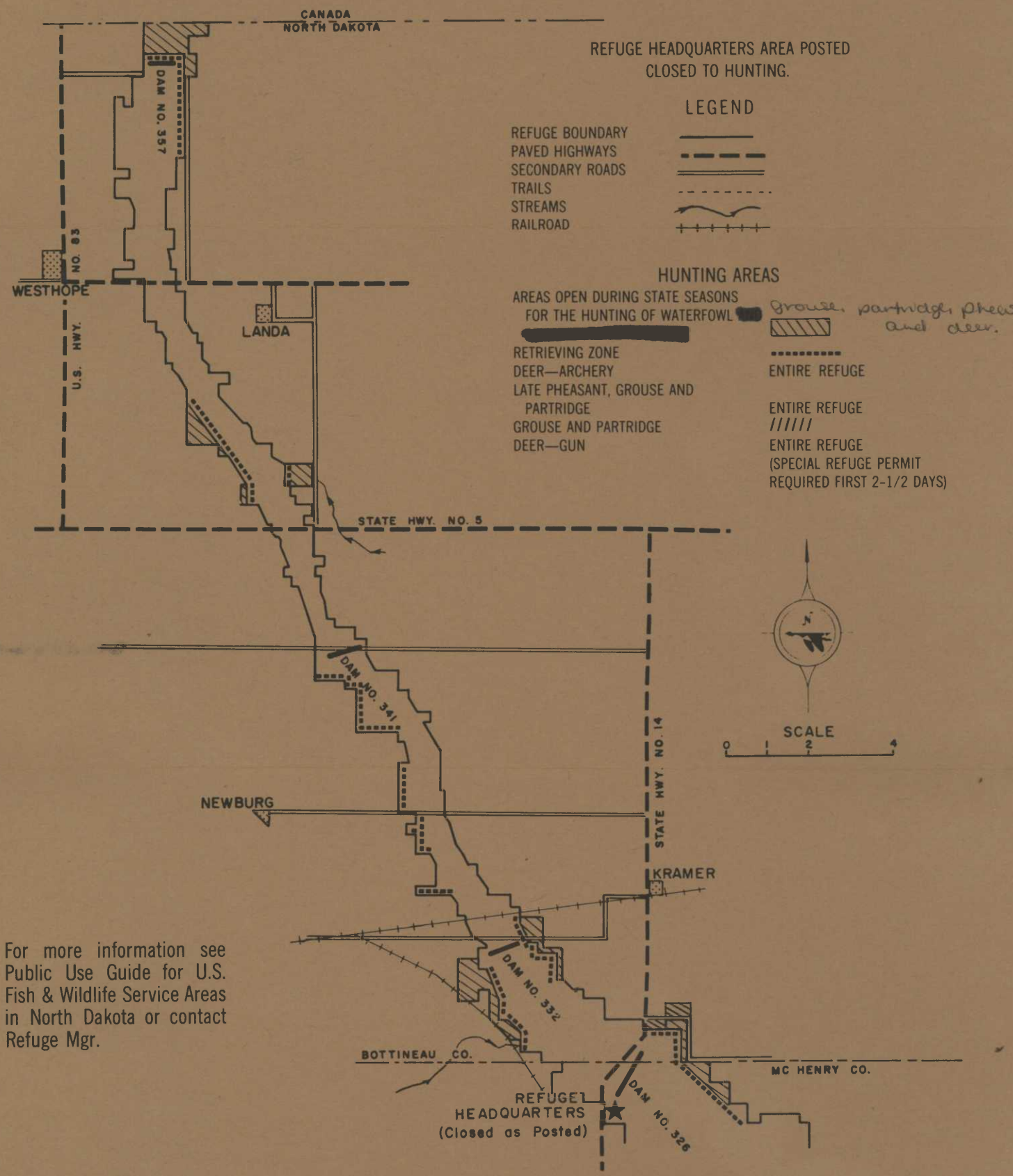
J. Clark Salyer

NATIONAL WILDLIFE REFUGE

J. Clark Salyer

NATIONAL WILDLIFE REFUGE

HUNTING MAP



REFUGE HEADQUARTERS AREA POSTED
CLOSED TO HUNTING.

LEGEND

REFUGE BOUNDARY
PAVED HIGHWAYS
SECONDARY ROADS
TRAILS
STREAMS
RAILROAD

HUNTING AREAS

AREAS OPEN DURING STATE SEASONS FOR THE HUNTING OF WATERFOWL — grouse, partridge, pheasant and deer.

RETRIEVING ZONE — ENTIRE REFUGE

DEER—ARCHERY — ENTIRE REFUGE

LATE PHEASANT, GROUSE AND PARTRIDGE — //////

GROUSE AND PARTRIDGE — ENTIRE REFUGE

DEER—GUN — (SPECIAL REFUGE PERMIT REQUIRED FIRST 2-1/2 DAYS)

For more information see Public Use Guide for U.S. Fish & Wildlife Service Areas in North Dakota or contact Refuge Mgr.

Map continued on next page

GENERAL INFORMATION

Signs stating "Public Fishing Areas" are posted at each area.

It is our desire to prevent violations rather than to prosecute violators. Please observe the following regulations:

Fishing and boating shall be in accordance with all State laws and requirements set forth by the refuge.

Boat Fishing Allowed only on Areas Designated.
Boat Fishing is closed last Friday in September.

Winter Ice Fishing—All Refuge Waters Open between the date of December 15 and the end of the State fishing season. Fishermen are cautioned to beware of thin ice, particularly near water control structures.

Refuge Hours—From 5:00 a.m. to 10:00 p.m. daily. Overnight Camping Prohibited.

Littering Prohibited.

For safety reasons, all public access to water control structures is prohibited.

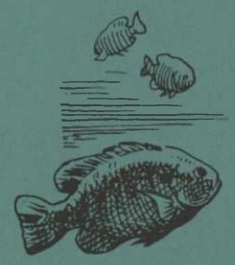
Open fires on ground or ice are prohibited.

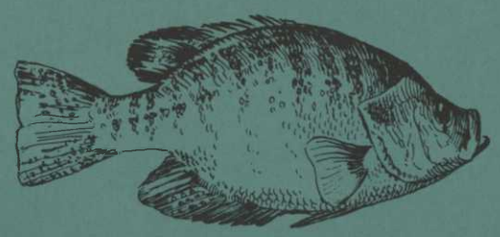
ADMINISTRATION

J. Clark Salyer National Wildlife Refuge is administered by the U.S. Fish and Wildlife Service. Headquarters is three miles north of Upham, and can be reached by turning off U.S. Highway 2 at Towner, North Dakota and proceeding 26 miles north on State Highway 14.

Inquiries should be directed to the Refuge Manager, J. Clark Salyer National Wildlife Refuge, Upham, North Dakota 58789. (Tel. (701) 768-2548).

J. Clark Salyer Refuge is one of a system of refuges administered by the U.S. Fish and Wildlife Service and dedicated to the preservation of wildlife. The financial base for this system was firmly established in 1934 through the passage of the Migratory Bird Hunting Stamp Act. This Act requires waterfowl hunters to purchase annually a migratory bird or "duck stamp." Funds collected from duck stamp sales have been used to purchase numerous refuges that provide habitats necessary to sustain a variety of wildlife for both hunters and nonhunters to enjoy.





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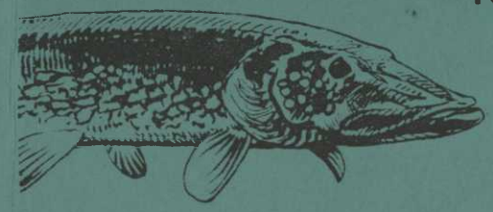
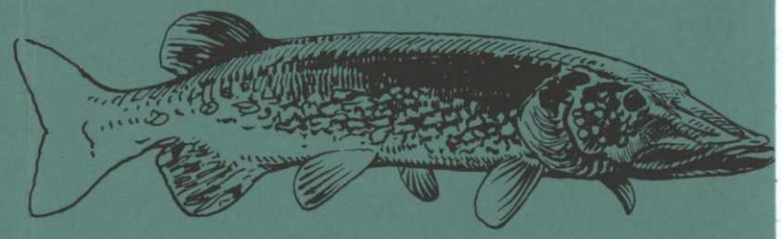
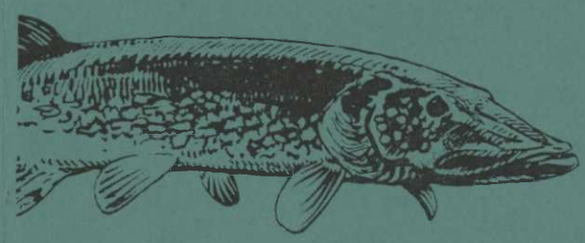
J. Clark Salyer

NATIONAL WILDLIFE REFUGE



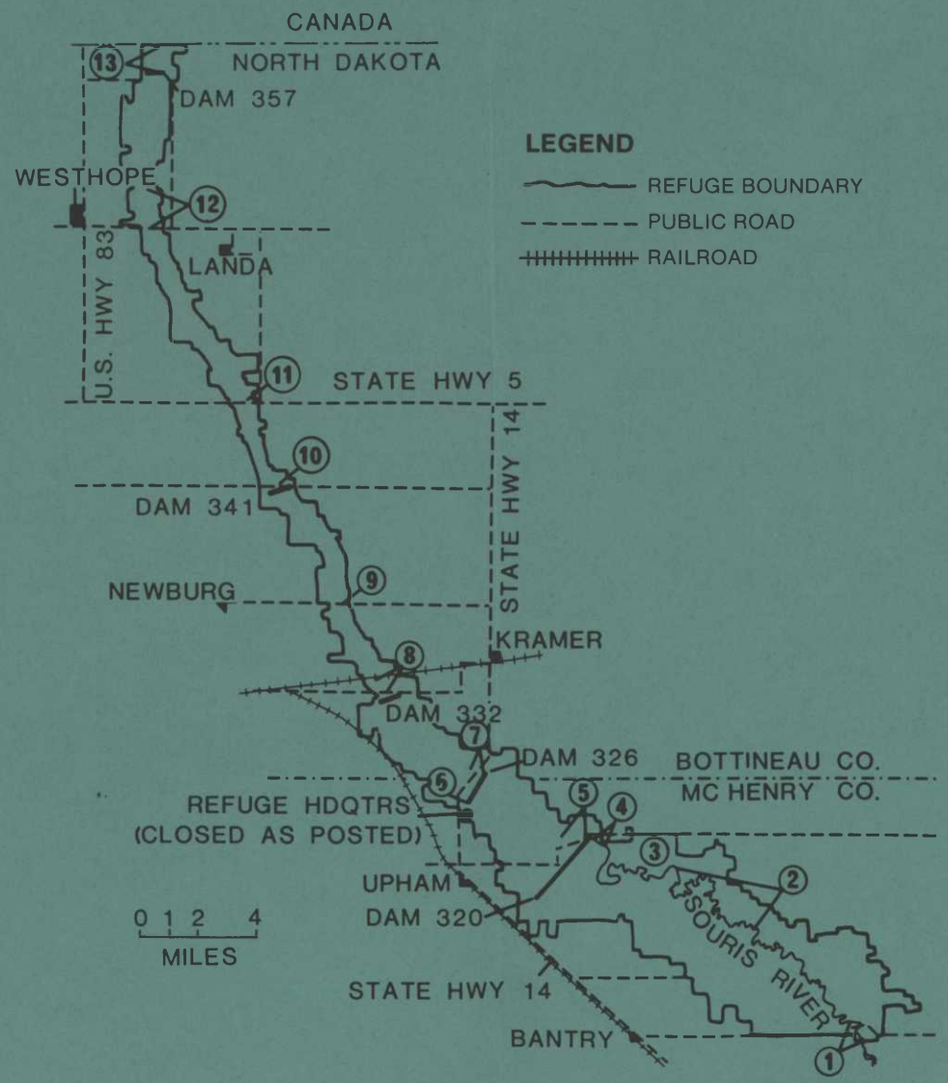




FISHING INFORMATION

PUBLIC FISHING AREAS

GENERAL LOCATIONS OF PUBLIC FISHING AREAS ARE INDICATED ON THE MAP BY NUMBERS 1-13. FOR A MORE EXACT DECRIPTION OF THE LOCATION OF EACH AREA, SEE RIGHT SIDE OF PAGE.



INFORMATION AND REGULATIONS

1. **NELSON BRIDGE.** From both banks downstream *(northwest)* ¼ mile and upstream *(south)* to refuge boundary.
2. **SOURIS RIVER—SCENIC CANOE ROUTE.** From banks or boat without motor 100 feet upstream *(east)* from Johnson Bridge and downstream *(northwest)* 13 miles to end of Canoe Route at Dam 1. Includes Sandhills Slough on the Canoe Route.
3. **DAM I.** On bank next to Scenic Trail *(north bank)* from dam downstream *(west)* 100 yards. Entry to or fishing from the dam is prohibited.
4. **ABOVE *(east)* of 320 DAM.** From bank, 300 feet east of dam for ¼ mile upstream *(southeast)*.
5. **FREEMAN BRIDGE.** From both banks or boat without motor downstream *(west)* from dam to 1½ miles downstream *(west)* from bridge.
6. **CUTBANK CULVERT ON HIGHWAY 14.** From road right-of-way for 50 feet either side of culvert.
7. **HIGHWAY 14 BRIDGE.** From both banks ¼ mile both upstream *(south)* and downstream *(north)* from bridge.
8. **RUSSELL-KRAMER ROAD.** From both banks or boat without motor, upstream *(south)* 200 feet from bridge and downstream *(north)* of bridge to Soo Line RR bridge.
9. **NEWBURG ROAD.** From road right-of-way 100 feet either side of bridge.
10. **SCHEFLO BRIDGE.** From road right-of-way 100 feet either side of bridge.
11. **HIGHWAY 5.** From road right-of-way 100 feet either side of bridge.
12. **WESTHOPE-LANDA ROAD.** From road right-of-way 150 feet either side of bridge, or from boat with motor up to 25 h.p. from road downstream *(north)* for two miles.
13. **BELOW DAM 357.** All waters on downstream *(north)* side of dam north to the Canadian border. From both banks or from a boat, with up to 25 h.p. motor.