

RICE LAKE NATIONAL WILDLIFE REFUGE

McGregor, Minnesota

(including Mille Lacs and Sandstone)

ANNUAL NARRATIVE REPORT

Calendar Year 1988

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

REVIEW AND APPROVALS

RICE LAKE NATIONAL WILDLIFE REFUGE

McGregor, Minnesota

ANNUAL NARRATIVE REPORT

Calendar Year 1988

  
\_\_\_\_\_  
Refuge Manager

3/10/89  
Date

  
\_\_\_\_\_  
Wildlife Associate Manager

3/17/89  
Date

  
\_\_\_\_\_  
Regional Office Approval

3/20/89  
Date



5/87 DEH

Two examples of the delicate beauty of the northern swamp/bog community. Yellow Lady's Slipper Cypripedium calceolus above, and Showy Lady's Slipper Cypripedium reginae below.



7/80 LAT

## INTRODUCTION

The Rice Lake National Wildlife Refuge, located in Aitkin County, in east-central Minnesota, was established in 1935 to provide habitat for migratory birds, primarily waterfowl. Rice Lake itself accounts for about one-quarter of the refuges 18,104 acres. Several smaller lakes are included within the refuge, and an impoundment on the Rice River has been developed for waterfowl use.

Abundant natural foods, particularly wild rice and wild celery, have attracted wildlife to the area for centuries. The refuge is especially noted for its fall concentrations of ring-necked ducks, which often number over 50,000 birds. Other important migrants include mallards, canvasbacks and Canada geese. Although used mainly as a migration stop, sizable numbers of birds, particularly blue-winged teal, mallards, wood ducks and "giant" Canada geese, remain to nest during the summer months.

The mixture of lakes, marshes, forestlands, grasslands and croplands provides for a wide variety of other migrant and resident wildlife species. Most notable of these are white-tailed deer, black bear, otter, beaver, sandhill crane, bald eagle, grouse (ruffed and sharptail) numerous wading and diving birds, raptors and nearly all other species associated with the bogs and forests of northern Minnesota, including an occasional moose or gray wolf.

Refuge history centers around Rice Lake and its large beds of wild rice. Woodland Indians lived in the area as early as 1000 B.C. as evidenced by numerous earthen burial mounds on the refuge. Sioux Indians later occupied the area and were eventually replaced by Chippewas in the late 1700's. This group continues to harvest a portion of the wild rice crop from the refuge each year, under terms of a cooperative agreement, and also maintains an active cemetery on the refuge. Logging of red and white pine was an important activity at the turn of the century, and logging, agriculture and tourism remain primary industries. Current research on the potential of peatlands as a future energy source could have far-reaching effects in the area should an economically-feasible process be developed.

Following initial land purchases, using NIR Wildlife Refuges Funds (also known as the \$6 Million Fund) and Duck Stamp Funds, early development of the refuge was accomplished using Civilian Conservation Corps labor (Camp BS-3, Co. 2705). Major developments today include roads, dikes, headquarters buildings, two major water control structures (one for Rice Lake, the second for the Rice River impoundment), limited public use facilities and associated support equipment. Major facility improvements were last accomplished during the BLHP program of the late 1970's.

The small (.5 acre) Mille Lacs N.W.R. comprised of two boulder islands in Mille Lacs Lake, and the Sandstone Unit (2,045 acres in Pine County, Minnesota) of the Rice Lake National Wildlife Refuge are also administered from the Rice Lake Office. These unstaffed areas are covered in separate sections following this report. Refuge headquarters for the three is located seven miles south of McGregor (population 400), on the Rice Lake National Wildlife Refuge.

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MILLE LACS NATIONAL WILDLIFE REFUGE (Summary in back)

SANDSTONE UNIT (Summary in back)

#### A. HIGHLIGHTS

The drought of 1988 resulted in below objective water levels in Rice Lake and the Rice River and all but dried other refuge wetlands. On the positive side, stable water levels in Rice Lake contributed to good wild rice production. Fire danger was high during most of the spring and summer.

Rice Lake staff joined the legions of the Service working on the various programs of the 1985 Food Security Act.

A spring season refuge open house event was initiated in addition to our on going fall open house.

Nineteen wetlands were restored on Rice Lake and Sandstone Units.

A visitor parking area was completed at Rice Landing, complimenting the observation tower constructed in 1987.

Waterfowl benefited from abundant wild rice production and good (relative to the rest of the region) fall water conditions. Fall waterfowl use peaked near 100,000 ducks and geese including 67,000 ring-necked ducks, 19,000 mallards and 3,000 Canada geese.

A grassland rehabilitation program was initiated. Two small old field areas were tilled and reseeded with switchgrass.

#### B. CLIMATIC CONDITIONS

1988 will be remembered for some time as the "drought year;" very warm and dry. Although the area actually received more precipitation in 1988 (22.97 inches) than in 1987 (17.77 inches), the two "below-normal" years piggy-backed to create extremely dry conditions. Twenty-eight inches of annual precipitation is average. The second noteworthy condition was the unusually hot summer. In an area where any temperature over 80 degrees F is termed "hot," the twenty-three days of 90+ degrees, including several days over 100 degrees, were stifling to say the least.

## 1988 WEATHER SUMMARY

	Temperature F		Precipitation		Snow (inches)
	Max.	Min.	(Inches)	Snowfall	On Ground (end)
Jan.	39	-30	.92	12.0	12.0
Feb.	45	-35	.06	1.5	12.0
March	50	-6	2.19	2.75	T
April	74	9	.19		
May	89	30	2.44		
June	94	38	2.19		
July	102	42	2.82		
Aug.	96	40	4.04		
Sept.	80	28	3.77		
Oct.	75	10	.48		
Nov.	55	-1	3.08	26.50	13.0
Dec.	46	-23	.79	10.00	
1988	102	-35	22.97	52.75	

C. LAND ACQUISITION1. Fee Title

No land was purchased during the year. During December a land acquisition plan was submitted, as requested, to Realty identifying nine inholdings for purchase. The nine parcels have been identified in previous submissions. None were offered for sale during the year.

2. Easements

Provisions of the Food Security Act of 1985 (Farm Bill) bring the possibility of conditioned land use conservation easement management via FmHA procedure. This is a new concept for most refuges.

Twelve FmHA inventory properties were reviewed during 1988 for possible fee title transfer or easement. No areas were recommended for easement or fee acquisition.

Rice Lake NWR was assigned responsibility for a ten county Management District, including: Aitkin, Carlton, Cook, Crow Wing, Itasca, Lake and St. Louis in Minnesota and Ashland, Bayfield and Douglas Counties in Wisconsin.

3. Other

Nothing to report.

#### D. LAND ACQUISITION

##### 1. Master Plan

The station Master Plan was completed in 1978. No changes were made to the Master Plan during the year. Various specific Management Plans are updated as needed.

##### 2. Management Plan

Parts I and II of the Refuge Management Plan for the Sandstone Unit of Rice Lake NWR were completed and approved during the year. Parts I and II for Sandstone complimented similar documents for the main unit completed in 1985. Future management plans will address the main (Rice Lake) unit and Sandstone in the same document.

The Search and Rescue Plan was submitted 1/21/88, approved 2/08/88. The Disease Prevention and Control Contingency Plan was submitted 3/21/88, approved 4/13/88.

Plan revisions scheduled for 1989 include: Hunting Plan and Cropland Plan.

##### 3. Public Participation

A public meeting was held 4/27 at the Fireside Supper Club to receive comments on the proposed refuge trapping program. Four people attended the meeting including the area MN DNR Conservation Officer. Those that did attend supported the proposed trapping plan.

Refuge staff met with members of the local Ricing Committee (Mille Lacs Band, Chippewa) to negotiate terms for a new ricing agreement. The previous five year agreement expired following the 1987 ricing season. Although the meeting was cordial, no progress was made toward reaching a new agreement. Most of the barriers to a new agreement seemed to be differences between the local (East Lake area) band members and the Mille Lacs band government. There has been a standing controversy regarding autonomy of the local group. Ricing continued during the 1988 harvest under mutual observance of provisions of the expired five year agreement.

##### 4. Compliance with Environmental and Cultural Resources Mandates

Environmental Assessments and accompanying Findings of No Significant Impact were completed concerning the following projects:

- Rice Landing Parking Area
- Sandstone Wetland Restorations and Deer Creek Control
- Furbearer Trapping Program

Declarations of Categorical Exclusion were prepared and approved for the following projects:

- Construction of earth ditch plugs for wetland restoration on Rice Lake Unit.
- Construction of a two way radio tower at headquarters.

Plans for all of the above projects were reviewed by the Regional Historian and State Historic Preservation Officer.

The Environmental Assessment for Sandstone wetland restoration was subject to a 30-day public review/comment period. A copy of the EA was sent to the Sandstone Federal Correctional Institution for review. All Sandstone Unit permittees were sent letters describing the proposed project. No comments were received.

The presence of prehistoric manmade mounds have long indicated the potential of the Mandy Lake and Headquarters Ridge area as an important cultural site. Our desire to learn about and interpret this part of refuge history and the increasing potential for impacts by facilities construction prompted the letting of a contract to conduct an intensive inventory of the Headquarters Ridge (also known as Indian Point) to locate significant archeological resources. The successful bidder was the Institute for Minnesota Archeology, Eldon Johnson, Executive Director, Minneapolis. Field work, including systematic shallow excavation and mapping of mound locations was completed in October and early November. Preliminary results indicate a large area of significant cultural materials dating from historic Ojibwa to early woodland culture, a span of 2000-3000 years. It appears likely that at least a portion of the surveyed area will be nominated to the National Register of Historic Places.

#### 5. Research and Investigations

Studies by refuge personnel included the annual survey of Gulls and Terns on the Mille Lacs National Wildlife Refuge.

#### 6. Other

Nothing to report.

E. ADMINISTRATION1. Personnel

The permanent staffing pattern remained identical to last year, with five permanent employees, two of which are full-time. The Maintenance Worker and Biological Aid are subject-to-furlough for three months during winter and the Clerk/Typist was increased from three to four days a week beginning in October.

We were able to hire one temporary Tractor Operator again this year to assist with the maintenance program. A Green Thumb enrollee, a Minnesota Summer Youth Program position and an enrollee under the JTPA program with the Mille Lacs Band of Chippewa Indians rounded out our work force, with occasional volunteer assistance.

Green Thumb enrollee Don Evans spent his third season providing valuable assistance to the Maintenance Worker. Under a "special agreement" with Minnesota Green Thumb, Don works at Rice Lake from May through October and completes his year working for the McGregor School System. Another "special agreement" with the Mille Lacs Band of Chippewa Indians allowed Richard Merrill to join our staff under JTPA. Richard served as a Biological Aid, helping out in the Maintenance and Biological programs, working 24 hours per week. Brenda Tolin began the summer providing clerical assistance under the Summer Youth Program, but quit after two weeks for personal reasons. Her replacement Jessica Halverson did an outstanding job in the same capacity



Lindell, Young, Francis, Huhta, Funk

Personnel

1.	John R. Lindell.....	Refuge Manager, GS-11	EOD	11/22/87	PFT
2.	John W. Francis..	Asst. Refuge Manager, GS-09	EOD	5/06/79	PFT
3.	Brian L. Funk.....	Biological Aid, GS-04	EOD	10/08/87	PS
4.	Dean A. Huhta.....	Maintenance Worker, WG-07	EOD	7/08/84	PS
5.	Sharon A. Young.....	Clerk/Typist, GS-04	EOD	1/28/79	PPT



Green Thumb enrollee Don Evans with coyote pup.



Temporary Tractor Operator - Alfred Maki

The following table presents a summary of the staffing level at Rice Lake in recent years.

Table 1. Personnel Summary, FY 82-89

	Permanent			Temporary
	Full-Time	Part-Time	Seasonal	
FY 89	2	1	2	1 (plus 1 YCC Staff)
FY 88	2	1	2	1
FY 87	2	1	1	1 (plus 1 YCC Staff)
FY 86	2	1	1	1 (plus 1 YCC Staff)
FY 85	2	1	1	1 (plus 1 YCC Staff)
FY 84	2	1	1	3 (plus 1 YCC Staff)
FY 83	2	1	1	2
FY 82	2	1	1	0

With a staffing level such as this, Rice Lake continues to get the job done only through dedication and extra effort. In 1989 we must again scratch for "free" help, but in an area of very high unemployment and low incomes, that gets to be a gruelling battle.

## 2. Youth Programs

Rice Lake was not allocated YCC funds in 1988. We have, in the past, derived substantial benefit from YCC in terms of work accomplished and local public relations. Because of declining YCC funds, the Regional Office initiated a rotating YCC program system. Rice Lake will share a program with one or more other refuges and host a 3-5 enrollee program every second or third year, dependant on funds available.

## 3. Other Manpower Programs

Employees under both the Department of Labor "Green Thumb" program and the Minnesota Summer Youth Program were provided worksites and supervision on the refuge during the year. Also a "Natural Resources Trainee" was provided by the Mille Lacs Band of Chippewa Indians under the JTPA program. All these people were a tremendous asset to the refuge.

## 4. Volunteer Program

We suffered a set-back in our volunteer hours in 1988, with only 150 hours donated. This was down from a "high" of 350 hours in 1987. A successful and impressive volunteer program continues to be a difficult task, at best, in an economically depressed area.

## 5. Funding

FY 88 funding totalled \$197,327. This is approximately \$12,800 above FY 87 funding. Although this would appear to be a positive trend, over \$26,700 was supplemental fire funds, reflecting salary and equipment costs for wildfire suppression and standby. Other specific funding included \$18,700 core (1262) maintenance (formerly small AARM) and \$5,000 flexible (1262) maintenance for Sandstone Unit wetland restoration. The regional office also reimbursed \$11,500; cost of refuge managers move.

After picking through this special add-on and that targeted funding, base O&M funding was approximately \$142,000. That funding level supports a minimal custodial program.

Table 2. O&M Funding Summary, FY 83-88

FY	1260 or equivalent	8610 (Qtrs)	1210 (YCC)	Other	Total
88	\$165,800	\$2,300		\$29,227 (1)	\$197,327
87	179,000	2,000	\$3,500		184,500
86	130,200	2,500	8,400		141,100
85	132,750	3,000	16,000		151,750
84	131,700	2,000	13,650		147,350
83	136,000				136,000

(1) Includes \$26,727 fire funds and \$2,500 farm bill supplemental.

## 6. Safety

No lost time accidents were incurred by FWS or cooperative employment program personnel. The station and station personnel received a Region 3 safety award for an accident free year.

With few exceptions, safety programs were conducted monthly. All station personnel participated. Safety topics included:

January	-	Safety Supervision
March	-	Fire Extinguishers
April	-	Fire Fighting Equipment
June	-	Summer Storms/Safety Policy
July	-	Heavy Equipment Operation/Water Safety
September	-	Airboat Safety
October	-	Fire Prevention
November	-	Defensive Driving
December	-	Winter Driving

Safety improvements or additions for 1988 included:

1. Fire extinguisher replacements.
2. Replaced old emergency fire shelter tents.
3. Installed two-way radio console and telephone in shop.
4. Transfer of three-wheeled ATV.
5. Installed grass rake on airboat and raised passenger seat.
6. Purchased high band radio/shared frequency agreements for enforcement and fire suppression cooperation.

#### 7. Technical Assistance

We continued our cooperative agreement with the Long Lake Conservation Center (LLCC), a county-funded environmental learning facility about twenty miles from the refuge. Free loan of equipment as well as technical assistance is provided when appropriate, and the Refuge Manager serves as a member of the LLCC Advisory Board which meets annually to review the program and provide direction.

Costs to the refuge in support of this facility are minimal and the benefits to the 5,000 plus students who attend the Center annually are well worth our efforts.

Assistance is provided to the Brainerd and Staples Area Vocational - Technical Institute (AVTI), particularly its Natural Resources Department, and to federal, state, and local agencies as requested.

The refuge was involved in a consultation capacity with various Department of Agriculture agencies (ASCS, SCS, FmHA) in carrying out various facets of the Food Security Act of 1985 (Farm Bill). Our primary areas of involvement concerned the Conservation Reserve Program (CRP) and FmHA inventory lands.

We also provided assistance to Savanna Portage State Park regarding wetland restoration projects.

#### 8. Other

Nothing to report.

F. HABITAT MANAGEMENT1. General

The main management efforts include water level management to provide natural foods and cover for migratory birds, croplands management to provide food for Canada geese and resident wildlife, grasslands management to provide browse and nesting habitat, and forest management to provide browse for deer, open areas for ruffed grouse, cavities for wood ducks and others, and old-age stands for still other species. Various methods including force-account, permits, cooperative agreements and contracts are used in carrying out these programs.

2. Wetlands

The two major refuge water impoundments, Rice Lake and the Rice River Pool, are managed to provide optimum conditions for waterfowl. Rice Lake a large, shallow natural lake is managed for maximum growth of wild rice and other aquatic vegetation. The Rice River Pool, which feeds and/or drains Rice Lake, must be carefully regulated to achieve maximum benefits from Rice Lake, as well as provide optimum conditions for nesting waterfowl, growth and availability of moist soil plants, and fall migration habitat in the Pool itself.

Water levels in most other smaller lakes and impoundments are governed by natural conditions and have little effect on either Rice Lake or the Rice River Pool.

Throughout most of the growing season Rice Lake remained below the objective water level (Graph 1). This was the second successive dry year, with about 15 inches of precipitation from April through September. The average amount of rainfall for the 1975-86 period is 20.5 inches. Water management for Rice Lake consisted of holding back available water early in the season. On a positive note, with little water level fluctuation, growth of wild rice was excellent.

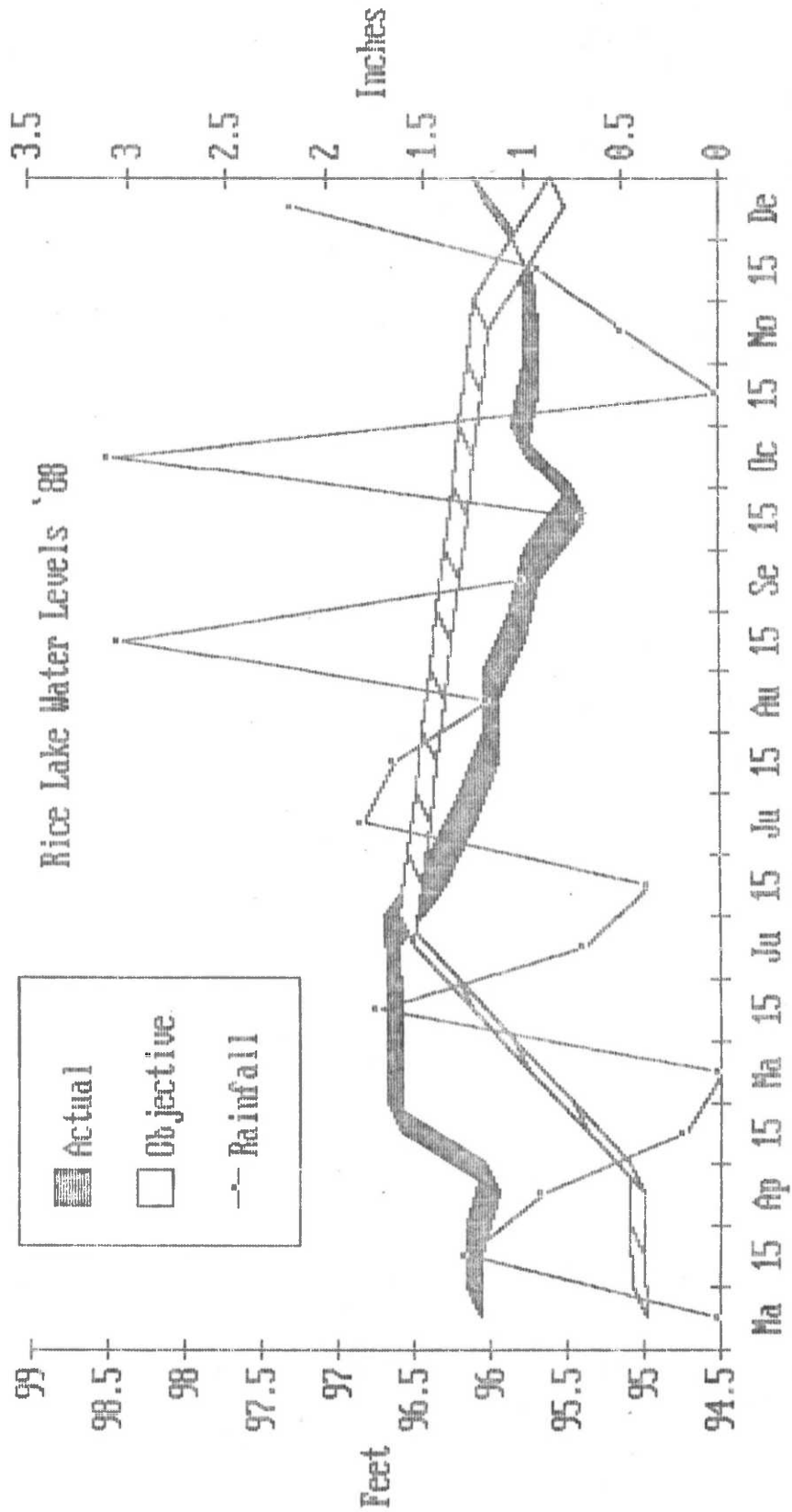
Water management in the Rice River Pool was also affected by dry conditions. Although the pool levels remained below the objective levels for much of the year, differences were not as drastic as in Rice Lake (Graph 2). Although low water levels were very similar to 1987 and provided excellent growth conditions for general aquatic and moist soil vegetation, fall waterfowl use was primarily limited to Rice Lake.

Several small wetlands, mostly drained for farming before FWS ownership, were restored or improved on both Rice Lake and the Sandstone Unit. Dry conditions provided ideal working conditions for equipment. Results of the effort will not be evident until next spring. A total of 7 wetlands on Rice Lake and 12 wetlands on the Sandstone Unit were restored.

Off-refuge, four wetlands on private lands were restored as part of Farm Bill activities. Two of the wetlands were enrolled in the Conservation Reserve Program (CRP) and two were on private lands adjacent to CRP acreage.

Graph 1

1988 Water Levels in Rice Lake Compared with the Management Objective and Monthly Rainfall.







Maintenance Worker Huhta begins a wetland restoration on CRP acreage in St. Louis County... 8/8/88 JWF



...It wasn't long before the landowner's family reunion left the house and took their places to watch Dean work. 8/8/88 JWF

### 3. Forests

No Special Use Permits for timber removal were issued in 1988. One firewood-type sale consisting of mainly black ash has been established by Area Forester Cy Brock, but the commercial firewood market in the area was almost nonexistent this year. No loggers contacted were interested and no replies were received following a Timber Sale Announcement mailed to area loggers. The major timber demand is for aspen pulpwood and hardwood sawlogs.

Area Forester Brock made one visit to the Sandstone Unit on 11/2/88.

### 4. Croplands

The cropland rotation schedule, as modified in 1984, provides for 199 acres of cropland to be managed, on a cooperative basis, in three groups of four fields of approximately the same size. Within each group, one field would be seeded to a legume with a nurse crop of oats or barley. One half the grain crop would be left as the refuge share, with half of that left standing and the remainder lightly dragged to promote re-sprouting. The remaining three fields in each group would each be idle for three years and the legume crop harvested as hay.

With the second successive dry year, tillage and planting of refuge croplands were accomplished early. Fields A-2, A-5 and A-8 were seeded to oats and clover, but continued dry weather resulted in a stunted and unharvestable oat crop. Legumes in the remaining croplands yielded an average of only 0.63 ton per acre.

Utilization of unharvested grain was mainly by sharp-tailed grouse, sandhill cranes and deer. Waterfowl concentrated most of their efforts in the excellent wild rice crop on Rice Lake.

### 5. Grasslands

Grasslands are primarily managed by haying to retard willow and aspen growth. Low ground and wet conditions in this area of Minnesota produce extremely rapid woody growth, especially willow, which has limited wildlife value when found in solid stands. Existing grasslands, would virtually disappear without some form of treatment.

Two refuge grassland areas (3 acres and 8 acres) were tilled and seeded to switchgrass, North Dakota origin, in an effort to restore some cover value to the areas. In 1989, these areas will be burned and treated with herbicide to control competing grasses and broadleaf vegetation. Depending on how the seedlings develop, other grassland areas may be re-seeded on an annual schedule.

Of the 1200 acres of refuge grassland, 200 acres are within the cropland rotation system and 100 acres are managed as a grazing unit. The remaining grassland is rotated so that only one-half of the available acreage is harvested as hay each year, leaving the remainder for cover.

## 6. Other Habitats

Nothing to report.

## 7. Grazing

The 100 acre grazing unit was managed, as in the past, with a stocking rate of 15 AUM's for 5 1/2 months, for a total of 82.5 AUM's. Grazing on this unit continues only until the retirement of its one and only permittee.

## 8. Haying

Due to the lack of precipitation and ground moisture, hay yield was minimal. Four permittees harvested 264 tons of grass hay from 444 acres for an average yield of 0.6 tons per acre, nearly half the normal yield of 1.1 tons per acre.

All hayland covered by permits on the Sandstone Unit was cut by three permittees. A total harvest of 157 tons was taken from 240 acres for a yield of 0.65 tons per acre; well below the normal of 1.4 tons per acre.

## 9. Fire Management

No prescribed burning was performed on Rice Lake, primarily in response to DNR request due to extremely dry conditions.

Refuge staff responded on two wildfire during the year, one off-refuge at DNR request and one on the refuge with DNR assistance. The off-refuge fire occurred on April 19, about eight miles south of the refuge in an area of open bog and proceeded into spruce bog. By the time our assistance was requested and four personnel and our J-5 Bombardier arrived, most of the fire was out.

The second wildfire was reported on the refuge along Highway 65 on July 26. The fire was small (about 2.5 acres) and was apparently the result of a lightning strike several days before. A refuge crew of two and DNR crew of three responded, each with a Bombardier. The DNR also requested assistance from a contracted light helicopter equipped with a water bucket. Although the fire was suppressed in less than an hour, the helicopter crashed while refilling the bucket from a neighboring farmer's livestock pond. The pilot walked away from the crash, but the helicopter went home as a smaller package on the back of a truck.

## 10. Pest-Control

Canada thistle was mowed along roadsides, water control structures, on the spoil bank of the Rice Lake outlet ditch and other areas where needed.

An ongoing search for purple loosestrife continued in 1988. Although none was found on the refuge, it has been observed in Aitkin County.

11. Water Rights

The 1981 Narrative Report provides a summary of the water rights situation at this station. No action of note occurred during the year.

12. Wilderness and Special Areas

No action was taken on the proposed 1400 acre wilderness area on the southwest side of Rice Lake during 1988.

13. WPA Easement Monitoring

Nothing to report.



DNR-contracted helicopter crashed in neighboring farmer's stock pond while attempting to refill water bucket during refuge wildfire.

G. WILDLIFE1. Wildlife Diversity

Land management practices at Rice Lake are designed to attract a variety of species. Water level manipulation, grassland rotation, small grain rest/rotation and alternating small clearcuts and selective cuts in timberlands are planned to accomplish a major objective, but are also designed to create a diversity of habitat types.

2. Endangered and/or Threatened Species

Two pairs of Bald eagles returned to the refuge in mid-March. The pair on the south trail built a new nest about 100 yards east of the trail, but failed to produce young. Their original nest was damaged by wind and snow over the winter. The pair on the southwest side of Rice Lake produced one young.

Spring migration peaked at 27 eagles in early April. Fall migration peaked at 37 eagles in late October.

3. Waterfowl

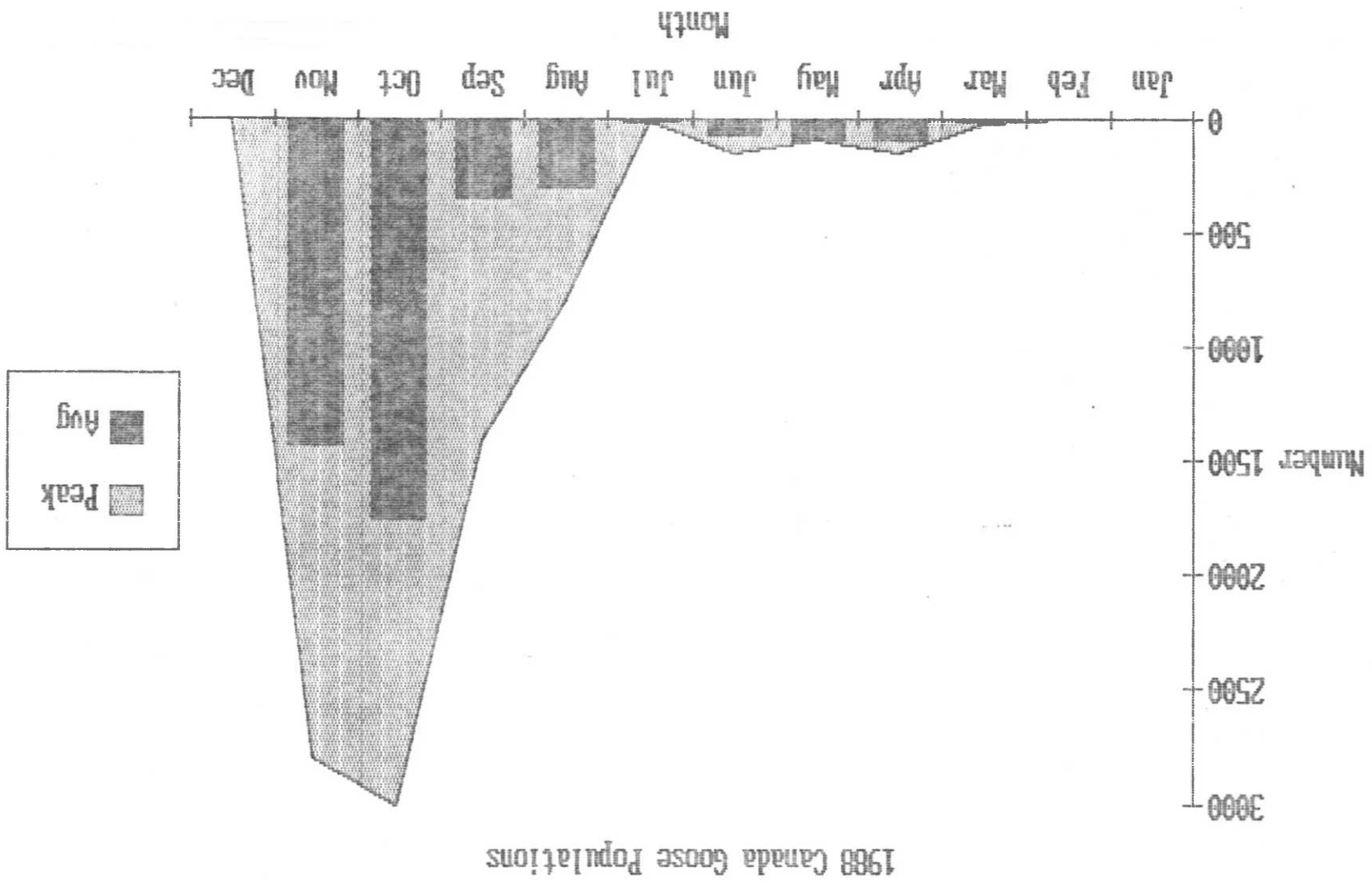
All water areas were ice-free by April 14. Waterfowl began arriving on the refuge the last week in March. Peak populations during the period included: 150 Canada geese, 200 mallards, 75 blue-winged teal, 20 black ducks, 25 green-winged teal, 20 American wigeon, 25 shovelers, 75 wood ducks, 5 redheads, 870 ring-necked ducks, 5 lesser scaup and 200 bufflehead.

The first brood of Canada geese was seen on May 11. A breeding population of 36 birds produced 50 young. This is a decrease over last year (about 75 young produced) and below average overall between 1983-1987 (average 70 young produced).

Although drought conditions did dry up some wetlands, duck production here was not dramatically effected. Production was as follows: Mallard 75 young produced (108 5 yr avg), blue-winged teal 105 (88 avg), American wigeon 60 (60 avg), wood duck 150 (110 avg), ring-necked duck 20 (40 avg), and hooded merganser 15 (20 avg). The first duck brood was a mallard brood seen in late May.

Peak waterfowl populations during fall migration included: 5,500 coots, 250 tundra swans, 3,000 Canada geese, 19,000 mallards, 1,500 black ducks, 200 pintails, 200 green-winged teal, 400 wood ducks, 900 blue-winged teal, 1,000 gadwall, 300 American wigeon, 67,000 ring-necked ducks, 1,000 lesser scaup and 100 common goldeneye. Population levels throughout the year are shown in Figures 1 and 2. Waterfowl use of the refuge came to an end when water areas froze on November 21.

Figure 1



### 1988 Duck Populations

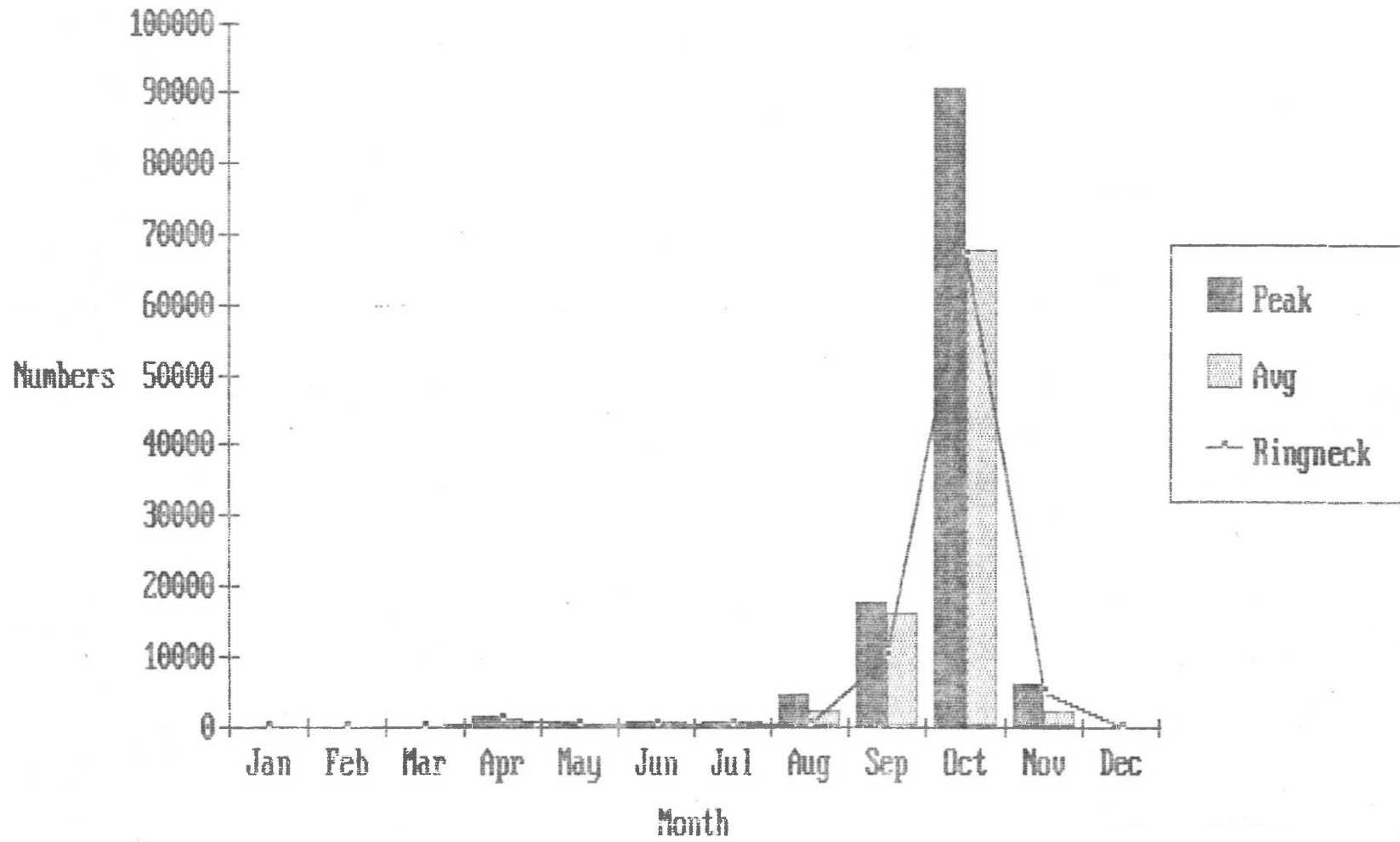


Figure 2

#### 4. Marsh and Water Birds

Three pairs of Greater Sandhill Cranes nested on the refuge this year. At least two pair successfully fledged one chick each.

The Great Blue Heron rookery in the Kimberly Marsh Wildlife Management Area adjacent to the refuge was found to be abandoned last year and was not surveyed this year.

#### 5. Shorebirds, Gulls, Terns and Allied Species

For the second consecutive year, low water provided apparently good shorebird habitat but sightings were few. Some of the species recorded were: American Woodcock, Semipalmated Plover, Common Snipe, Least Sandpiper, Greater Yellowlegs, and Wilson's Phalarope.

One woodcock singing ground survey was run in Aitkin County as part of the National Woodcock Singing Ground Survey. Three refuge woodcock routes were run again in 1988. Numbers declined for the sixth consecutive year and were the lowest since 1981.

#### 6. Raptors

Rough-legged hawks were abundant throughout the winter and into the spring.

#### 7. Other Migratory Birds

Nothing to report.

#### 8. Game Mammals

White-tailed deer appeared to come through the winter in good condition. 29% of the recorded fawn sightings were twins. This figure was an increase from 1987 (22%).

The deer kill in Aitkin County during the 1988 Minnesota firearms season was the highest on record.

The refuge hosted its tenth annual either-sex deer hunt. Details are presented in section H.8.

Black Bear numbers appear to be stable. Sightings were common throughout spring, summer and fall. The third year of participation in the DNR's Bear Food Abundance Survey showed common bear foods to be scarce on the refuge, with the exception of pincherries and acorns. A nuisance permit was issued by the DNR to William Kangas, an adjacent landowner for crop depredation. One bear was taken.

No Moose were sighted on the refuge in 1988. Several sightings were reported in the area.

Snowshoe Hare numbers remain low.

Cottontail Rabbit numbers remain low, but observations increased in 1988 over the past several years.

Gray Squirrels continue to be abundant.

Muskrat population estimates declined from a high of 1,800 in 1987 to 810 in 1988.

#### 9. Marine Mammals

Nothing to report.

#### 10. Other Resident Wildlife

Ruffed Grouse population continues to increase as it nears the top of its 20-year cycle according to DNR reports.

Sharptail Grouse numbers remain stable at 100-150 birds. The dancing grounds located at the west cropfields continues to be our only known perennial grounds. For several years the refuge has been surveyed to locate other established dancing grounds. Although none have been found, individual birds or small groups have been seen or heard in other areas during the breeding season.

#### 11. Fisheries Resources

The 1988 winter fish removal effort by Minnesota DNR Fisheries personnel to remove northern pike and yellow perch for relocation to other lakes within the County and State began in November and was finished before Christmas. State demand for the fish has been steadily decreasing over the past several years and primary emphasis has shifted from pike to perch. The final figures on fish removal are as follows: 4,335 yellow perch (1,413 lbs.) and 650 northern pike (995 lbs.).

Stocking of largemouth bass fingerlings in Mandy Lake was initially conducted in 1986 to provide an alternate predator on the bullhead population. An assessment was conducted in 1988 and determined that the initial stocking failed to survive. A second stocking of 1,100 6-inch largemouth, was done this year with hopes of better survival.

Public fishing pressure this year was moderate in the spring and light most of the summer. Speculation is that low water and high temperatures drove off either the fish or the people or both. Spring spearing pressure was also light due to the absence of a buffalofish spawning run.

#### 12. Wildlife Propagation and Stocking

As indicated previously, largemouth bass were stocked into Mandy Lake. We anticipate that Fisheries Assistance will evaluate the stocking effort in 1989.

13. Surplus Animal Disposal

Nothing to report.

14. Scientific Collections

Nothing to report.

15. Animal Control

The refuge trapping program, initiated in 1988, was designed to incorporate nuisance animal control as one of its objectives.

16. Marking and Banding

Rice Lake had no banding quota in 1988. As part of the Canada Goose EPP Project, the refuge again attempted to obtain as many neck collar observations as possible. As in 1987, the bumper wild rice crop kept birds concentrated on Rice Lake and nearly impossible to approach. Bait was placed in several locations, but the geese showed no interest. Only 11 observations were recorded.

17. Disease Prevention and Control

Nothing to report.

H. PUBLIC USE1. General

Common activities on the refuge include wildlife viewing, fishing, hunting and general outdoors enjoyment. In addition to regular seasonal activities, special openings are held to encourage visitors to learn more about the refuge and its purpose.

The tenth annual Fall Auto Tour Open House was held in October with reasonably good weather and fall colors, and was well attended. In addition, the first annual Spring Open House was hosted in April and was well received, although it didn't bring out as many visitors as in the fall. As ruffed grouse populations continue to increase, so does the interest in hunting, although hunter enthusiasm was cut short this year with 26 inches of snow in November. Interest in deer hunting and trapping remained high this year, and, as usual, birders and other wildlife enthusiasts frequented the refuge.

The main refuge road was closed again for the winter due to limited use and the staff time required to keep roads plowed. This was the fifth year for closure of the Main Road from Headquarters west.

Informational panels were received and placed on the Kiosk built in 1987 near Highway 65.

Initial planning was begun for an extended auto tour route to include the new Rice Lake observation platform and the cropfields area. We hope that some construction can begin in 1989.

In summary, a total of 9,918 visits were recorded for the year, accounting for 19,270 activity hours of wildlife-oriented public use. These figures are substantially lower than in recent year, due in part to decreased visitation related to the extremely hot dry year and because the process of determining visitation changed this year. Wildlife viewing and fishing continued to be the most popular activities. Seven news releases were issued, four personal appearances made and 557 inquiries handled.

## 2. Outdoor Classrooms -- Students

We continued our program with the McGregor 6th grades for the tenth year. Monthly programs were presented at the school by refuge personnel, and the classes visit the refuge at least once during the year. This program continues to work well and is our main thrust in this area. Assistance is provided to others as requested.

## 3. Outdoor Classrooms - Teachers

Nothing to report.

## 4. Interpretive Foot Trails

Nothing to report.

## 5. Interpretive Tour Routes

The Fall Auto Tour/Open House has, in its 10-years of existence, become one of our most popular events. This year the Open House was held October 8-16, and 2,000 visitors took advantage of the nine-day event to observe fall migration, watch deer and generally enjoy a fall outing.

In its first year, a Spring Open House was hosted April 23-29, and attracted 375 visitors. It was conducted similar to the fall event and will hopefully be continued and gain in popularity.

The initial planning for an expanded interpretive auto tour route was begun this year. The route was established and will be nearly identical to that used for the fall and spring auto tours. Outdoor Recreation Planner Ed Moyer (Minnesota Valley NWR) spent a week on the refuge talking with refuge personnel, evaluating the area, and developing an interpretive scheme and layout. His initial attempt using "succession" as his theme was rejected by refuge staff with preference for a theme centered around the human cultural resources of the area. Our hopes are to begin road improvements and open the tour route on a limited basis in 1989.



Attendees of the ABA convention in Duluth converged on Rice Lake for a day of birding. 10/8/88 JRL

#### 6. Interpretive Exhibits/Demonstrations

Nothing to Report

#### 7. Other-Interpretive Programs

During 1988, refuge programs were presented to McGregor Sixth grades, University of Minnesota Geography Class, Natural Resources students from Staples AVTI (Fond du Lac), and to the DNR Advanced Hunter Education Program in Floodwood.

Guided tours were given to McGregor Sixth grades, McGregor Pre-school, Duluth Camera Club, McGregor Tiger Cubs, Aitkin High School Ornithology Class.

The Heart of Earth School (Fond du Lac) participated in a self-guided tour of the refuge and observations of ricing activity. Other groups taking self-guided tours included: "Wings" Birding Tour, Northwoods Audubon Center and a group attending the American Birding Association convention in Duluth.

#### 8. Hunting

The Refuge's tenth annual limited-permit either-sex deer hunt was held November 12-14. Student volunteers from Brainerd AVTI checked hunters in and out at the East Lake entrance gate and served as official "Deer Registration Station" at DNR request. One additional volunteer, Pauline Hanson, worked the afternoon and evening of one hunt day patrolling refuge roads and providing information and assistance to hunters.

One hundred permits were issued and 99 hunters actually participated in the hunt. Forty-six deer were taken during the three-day hunt and no major enforcement problems were encountered. Several hunters reported seeing a wounded black bear on the second day, but attempts to locate the animal by refuge staff were fruitless. A total of 219 visits and 2,098 activity hours were recorded. A more detailed report of the hunt is available in refuge files.

Small Game hunting continues to show an increase in popularity with an increase in ruffed grouse population. Hunting pressure remained high into November when 26 inches of snowfall nearly eliminated that activity. Although road access to the hunting area remained good through the end of the year, snowmobiling must have taken precedence over snowshoeing for grouse.

#### 9. Fishing

Areas open to fishing from May through November include Mandy Lake, Twin Lakes and the designated section of the Rice River above and below the entrance road bridge. All three areas are open to non-motorized boats, although such use is rare. Most prefer the social benefits of fishing from the bridge. Fishing pressure was drastically reduced in 1988, with only about 2,900 visits recorded for the season. A total of 6,350 visits were made in 1987, and the normal for the past several years has been 5,500-6,000. The unusually high summer temperatures and low water levels probably drove both fish and fishermen to seek other areas and activities.

#### 10. Trapping

A Recreational Trapping Program was initiated in 1988 following approval of the station Furbearer Management Plan and annual Trapping Proposal. The refuge was divided into five trapping units and trappers were selected from applicants by public drawing. Selected target species for the first year at least were muskrat, mink, beaver, raccoon and skunk. This selection was based on a number of factors including: commercial demand, population status, nuisance problems and waterfowl depredation. A public meeting was held in McGregor in April and the drawing was conducted in September. A total of 12 applications were received and five trappers selected. The trapping season, however, was not highly successful. Raccoon opened on October 21 and muskrat, mink and beaver on October 29. The State firearms deer season (Nov. 5-20) interrupted trapping activity and most water areas were frozen over enough to make travel impossible on November 21. Two of the permittees never set a trap and the remaining three became disgusted and quit. A final tally on harvest for the short time period was as follows: 279 muskrats, 8 mink, 23 beaver, 25 raccoons and 10 skunks.

### 11. Wildlife Observations

As in past years, wildlife observation was dominated by local residents or "week-enders" out for a drive or specifically looking for deer. Audubon and other groups utilize refuge facilities for birding, and special openings during the year always attract a good crowd. Winter activities are generally limited to a few cross-country skiers or snow-shoers.

### 12. Other Wildlife Oriented Recreation

1987 was the final year of operation under the terms of a 5-year Wild Rice Harvest Agreement with the Mille Lacs Band of Chippewa Indians in 1983. At the end of that year, a letter was sent to the Chief Executive of the Mille Lacs Band offering a five-year continuation of the existing agreement, but no reply was received. The Band and members of the East Lake Ricing Committee were notified several times that a negotiation meeting was desirable before the start of the 1988 ricing season. A meeting was scheduled and held at Refuge Headquarters on August 16, 1988, but no agreement was finalized. In the interim, the rice harvest was to continue under terms of the expired agreement until a new one could be formulated.

As in 1987, dry conditions and low water levels produced excellent stands of wild rice, but poor harvest conditions. Poor prices (.30-.50 cents per pound) coupled with poor conditions kept ricing enthusiasm very low. Initially, about 20 canoes were out during the first week, although it was rare to see more than 1-4 canoes on the lake following that.

### 13. Camping

Nothing to report.

### 14. Picnicking

Use of the Twin Lakes Picnic Area remains low to moderate, although local residents use the area on summer evenings and week-ends. Individuals and groups on the refuge for refuge-oriented activities remain the primary users.

### 15. Off-Road Vehicling

Nothing to report. ORV's are not allowed on the refuge.

### 16. Other Non-Wildlife Oriented Recreation

Nothing to report.

## 17. Law Enforcement

Refuge staff with Service enforcement authority are Manager Lindell and Assistant Manager Francis.

Law enforcement problems are generally few and far between, but we experienced problems with late night parties and vandalism during June. An information display, sign and bench were removed and parts used as firewood during June. Small bits of a note found at the scene led to a Sheri Settergrin, granddaughter of refuge neighbor, permittee and gate key loser, Bill Berg. Lacking conclusive evidence of involvement or an admission, no charges were filed. However the problems ceased after interviewing Ms. Settergrin.

A rotating schedule of weekend and night patrols was established this year. A number of factors prompted the initiation of patrols. In the past there was the subtle expectation that "on refuge families" would keep an eye on things. Today fewer people are living in refuge housing, or if they do are less inclined to be bound by the refuge agenda while off duty; correctly so. The result was that certain people were developing an "open range" attitude about the refuge. The incidents of vandalism reinforced the decision. No other major problems occurred; in part we believe, because enough of the right people saw us when they didn't expect to.

The amount of off-refuge waterfowl enforcement was expanded somewhat this year. Lindell and Francis assisted State CO Lhotka on the opening day of goose season. Cases made included possession of toxic shot, no federal stamp and unplugged gun; which were handled through state courts.

Lindell and Francis worked the subsequent duck season opener. Cases encountered are listed on the following page.

Two groups were apprehended hunting in a portion of the refuge closed to hunting, including a group of Hmong. The Twin Cities has a large Hmong community and it has been difficult for these traditional hunters to learn and adapt to American culture and laws. The Minnesota DNR has developed a liaison office with the Hmong community to improve communication and education.

Below is a summary of 1988 violations. All subjects paid collateral or were found guilty, unless noted otherwise.

<u>Violation</u>	<u>#-Individuals</u>
Hunt in closed area of refuge.	9
Possession of lead shot while hunting waterfowl.	3
Shotgun capable of holding more than 3 shells (1 found not guilty).	3
Possess over daily limit waterfowl.	1

Lindell and Francis attended 40-hour law enforcement refresher training at Ft. McCoy, Wisconsin in March.

In May Lindell attended firearms instructor training at FLETC west, Marana, Arizona. Lindell and Manager Bob Stratton, Mark Twain NWR become the first refuge firearms instructors in Region 3. Lindell and Stratton assisted by instructor Special Agents requalified many refuge officers for the fall requalification.

#### 18. Cooperating Associations

Nothing to report.

#### 19. Concessions

Nothing to report.

### J. EQUIPMENT AND FACILITIES

#### 1. New Construction

Interpretive panels for the Introductory Kiosk constructed in 1987 were received from the Regional Sign Shop and installed to finally complete the project.

The parking area near the Rice Landing observation platform was completed during the year.

## 2. Rehabilitation

Overhead doors in the six-stall storage building and the storage portion of the shop building were replaced with new fiberglass doors. Olson Construction of McGregor did the installation and adjustment.

Quarters 68, which was occupied by Bio-Aid Brian Funk during the latter part of the year, was painted inside and carpet installed in the living room and bedroom.

A small storage shed behind Quarters 2 was sold and removed by the purchaser.



Entrance Road Kiosk with Interpretive Panels in place.

### 3. Major Maintenance

The J-5 Bombardier, our principal off-road fire suppression vehicle, has a major overhaul of the entire drive train including tracks and wheels, with excess fire suppression money. This work, in conjunction with the partial engine overhaul performed in 1987, should provide us with a fairly dependable fire vehicle until a replacement can be obtained.

Ammala Construction of McGregor picked up our old D-6 Caterpillar for installation of a new "pony" starter engine. We have had to "pull-start" this unit for the past year, which has been less than convenient. The work should be completed early in CY 89.

The remainder of our "Boundary" and "Area Closed" signs were replaced with the newest version during the year. Extremely dry conditions allowed access to some normally very wet areas.

Roadsides and dikes were mowed with tractor-mounted sickle or rotary mowers.

Most fire trails were cleared of fallen trees and mowed with a tractor-mounted rotary mower.

### 4. Equipment Utilization and Replacement

A new Chevrolet Suburban 4x4 was received to replace our 1977 model.

A new arc-welder and chop saw were purchased to replace their ancient counterparts which was badly worn and approaching safety hazard stage.

### 5. Communication Systems

A telephone and refuge radio unit were installed in the shop.

Multi-frequency high band mobile radios were purchased and installed in the two primary law enforcement vehicles. The radios were the beginning of planned total conversion to high band for the refuge. The additional frequencies provide communication with other local law enforcement and fire control agencies and greatly increase the safety factor of each job.

## 6. Computer Systems

1988 was the first full year of the computer age at Rice Lake. Considerable time and effort were expended in training and familiarization with the IBM 8560 and associated devices. Region standard software was installed on hard disk including: WordPerfect 5.0, MS Chart and Multi Plan, ProComm Communications Utility and RBase for DOS. Regionally developed utilities were also installed and used including: auto menu, property inventory, and financial tracking data bases. We developed and used interim budget utility while a Regional package was being developed. New computer furniture was purchased to accommodate our hardware.

Training included basic introduction to MS-DOS and intro to WordPerfect. Clerk/Typist Young was TDY in the Regional Office to get hands on training and assist refuge support staff.

Upgrading from WordPerfect 4.2 to 5.0 caused a few problems which continue to plague us. WP 5.0 printer drive bugs do not permit full multi page document printing on our NEC 3550 spinwriter. We must go through a series of command gyrations for each page to be printed; not good for narratives or management plans. Regional support staff has been sympathetic and helpful, but WordPerfect needs to correct this programming problem.

Overall we made considerable progress; moving from a state of feeling a bit overwhelmed, to daily business as usual use of our system.

## 7. Energy Conservation

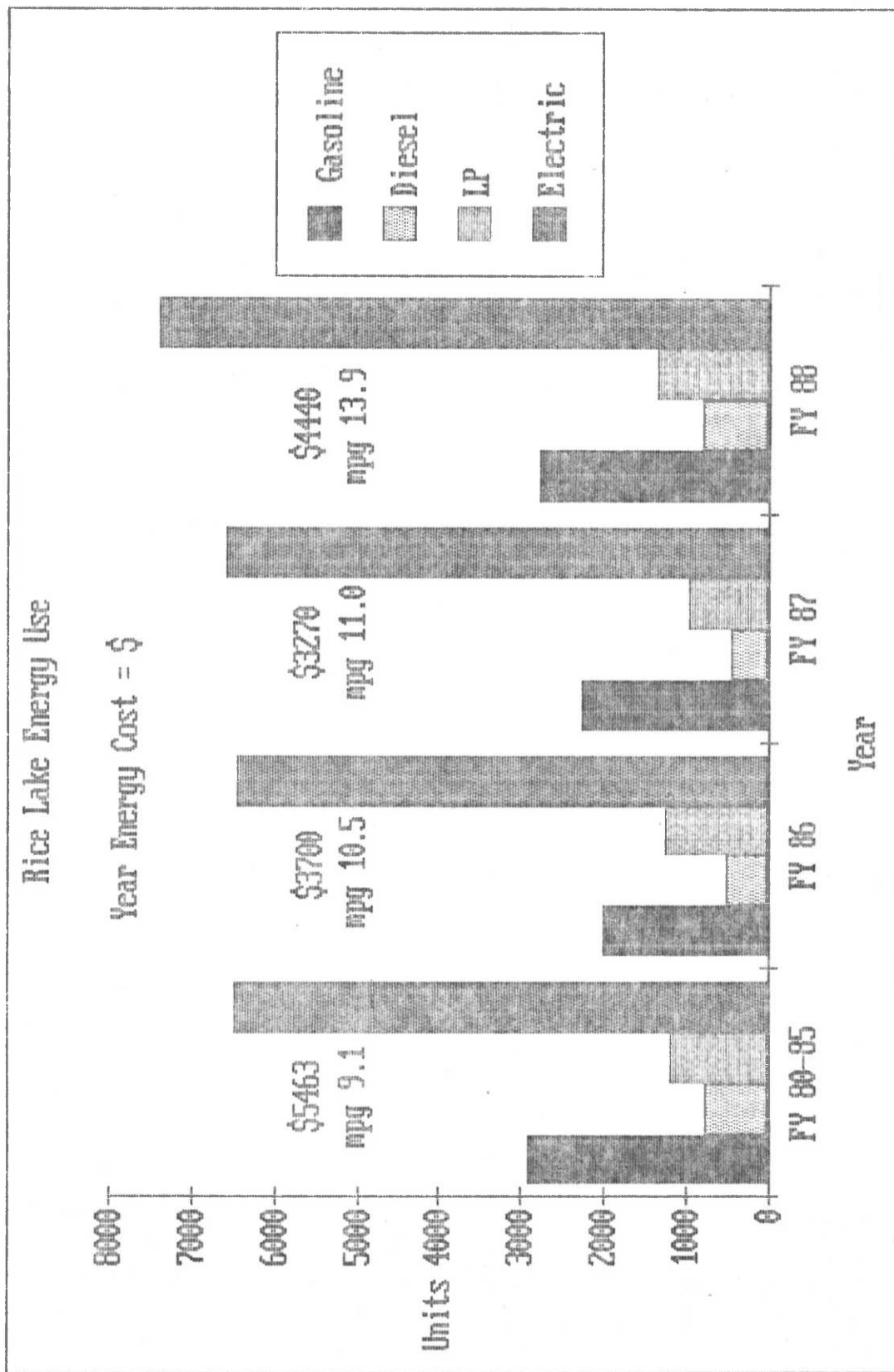
No major energy conservation improvements were made to refuge facilities in 1988. Energy use at Rice Lake was increased somewhat in FY 88 over the previous two years, but not significantly over the FY 80-85 average (Graph 3). The increase shown in gasoline and diesel consumption might be attributed to Farm Bill activities and electric increase to the installation of computer and security systems.

## 8. Other

Nothing to report.

Graph 3

Energy Use at Rice Lake in FY 88 showed a slight increase over the previous two years but not much over the FY 80-85 average.



## J. OTHER ITEMS

### 1. Cooperative Programs

The refuge continued the long standing cooperation with Long Lake Conservation Center. The refuge supplies various equipment items on long term loan. The Center provides environmental education to thousands of school children each year.

The refuge provides tours or outdoor classroom experience for Natural Resource programs at Brainerd and Staples Area Vocational-Technical Institutes. Students from Brainerd AVTI assisted with administration of the refuge controlled deer hunt.

The Mille Lacs Band of Chippewa Indians provided a natural resources trainee, selected and paid by the Band, via JTPA. The refuge provided the position and supervision for on the job experience.

Manager Lindell served on the Aitkin County Water Planning Committee, a community cooperative effort sponsored by the County Soil and Water Conservation District.

Coordination with ASCS, SCS, FmHA, Minnesota DNR and others was an ongoing aspect of administering refuge (FWS) responsibilities of the Food Security Act.

Lindell provided technical assistance to Savanna Portage State Park concerning potential wetland restoration.

### 2. Other Economic Uses

LaVonne Randa paid \$58.00 for a small wood frame shed, property number 107, which was declared surplus and offered for bid sale.

### 3. Items of Interest

Revenue sharing checks for 1987 revenues were issued to Aitkin County, \$6,334.00, and Pine County, \$1,319.00. Refuge revenues and the supplemental appropriation provided payment for 58% of the full entitled amount.

Three employees, Francis, Huhta and Young received Special Achievement and cash Awards for exceeding performance standards.

All permanent employees also received Special Achievement Awards for the excellent safety record at Rice Lake NWR.

Noteworthy training, visits or meetings not discussed elsewhere include:

- February Lindell and Francis met with John Sullivan, Warden of Sandstone Federal Correctional Institution which is neighbor to our Sandstone Unit.
- March Lindell, Francis, Huhta and Funk completed annual Pesticide Applicators Refresher Training.  
  
Lindell spent a week in St. Paul assisting with case preparations and testifying in the Clayton Drake easement drainage trial. The court found in favor of the U.S. and ordered restoration of drained wetlands.
- April Refuge Supervisor (RF-1) John Ellis and RO staff Jay Hamernick and Jan Eldridge visited for orientation.  
  
Lindell met with staff aids to U.S. Congressmen Oberstar at his Duluth and Brainerd offices.
- May Tom Worthington, John Dobrovolny and Mike Marxen (RO-refuges support services) visited to evaluate the public use program and proposed construction including shop building replacement.
- July Lindell met with Don Wedll of Mille Lacs Band Chippewa concerning ricing and other natural resource issues.  
  
Maintenance Worker Huhta assisted Minnesota Valley NWR with CRP wetland restorations.  
  
Dave Gustafson RO-CGS conducted a Procurement Management Review and found all in order.  
  
KARE Channel 11 Twin Cities visited the Refuge for a story on the effects of the drought on wild rice production.
- August Local ricing committee meeting.  
  
Lindell attended (RF-1) Project Leaders meeting at Thief River Falls, MN hosted by Agassiz NWR.

- August           A reporter with Business Week discussed wild rice production for a related article that was subsequently published in this popular national business news magazine.
- September       Clerk/Typist Young worked one day a week at Sherburne NWR for several weeks, on loan while the secretary at Sherburne was on extended sick leave.
- October          Deb Southworth provided station staff with computer assistance.
- November        Cal Gale, Cy Brock visited refuge to do some preliminary forest type mapping.  
  
Clerk/Typist Young was detailed to the RO-refuges for one week.
- December        Lindell/Francis went to St. Cloud for Farm Bill Coordination meeting.

#### 4. Credits

The following personnel contributed to the completion of this report:

Lindell - Sections A, C, D, E5-8, H17-19, J and K.

Francis - Sections B, E1-4, F, G11-17, H1-16, I, Other.

Funk - G1-10.

Young - remainder of tables, maps and staff page, typing and compilation.

Rice Lake National Wildlife Refuge, McGregor, Minnesota, CY 1988.

#### K. FEEDBACK

All in all it has been a year of positives. Principal among the various reasons for our collective euphoria has been the many good things resulting from the current agricultural legislation. Quoting one source, "I never would have believed that we would be restoring wetlands on private property." Good for us. Good for the ducks.

Dare I, at this relative high point in the work of the Fish and Wildlife Service take a glance into the next valley and wonder how we will approach it. The reaction to taking land out of food and fiber production has already started; stirred by the drought of 1987-1988, world anxiety concerning the greenhouse effect, and the wish of the U.S. farmer to be psychologically (feeding a hungry world) and financially successful again.

Recently a high level administrator with the past administration voiced opposition to the land retirement policies of the 1985 Food Security Act. Regardless of the current thinking of that official or the policies of the present administration, we should remember that national policy may be more influenced by the growl of the world stomach than the quack of a duck. The odds would not appear to favor the rosy trend we have enjoyed the past year.

Obviously we are a small agency, often relegated to near the end of the wagging tail, but let's not be overwhelmed by our past position.

A few thoughts on these matters:

- increase our will and ability for strategic planning. Goals and objectives are influenced by different administrations, but we as an agency must plan and prepare to act at least 20 years out, based on our best scientific expertise.
- move beyond ducks. Charges of heresy may follow, but there are, and will be, environmental questions that transcend focused species management. Waterfowl have been a primary basis in the development of national refuges and I am not suggesting abandonment of our old friends. But there are broader areas with larger gains to be realized with our limited financial resources.
- broaden our constituency. This goes hand in hand with the move beyond ducks. Appreciators of waterfowl, hunters primarily, have been loyal and successful in their support. But our nation is changing, an increasing majority of people do not hunt and an increasing number do not support or are opposed to hunting. At the same time there is increasing concern over environmental and natural resource issues. The question is, can we facilitate a broad base public support.

- increase our political astuteness. This is a touchy subject in the world in which we, the public employee, work. Government agencies have been lobbying for eons. We have all seen it done well. The Fish and Wildlife Service (we) must develop the ability to ethically, credibly and successfully influence people and legislators to implement sound programs.
- develop and implement innovative, flexible programs. There has been some movement in this direction in some of our habitat management programs. We need to expand on that, not only to solve biological problems, but organizational problems as well.
- develop our people. As an agency we attract and employ people with many talents, but we try to take a free ride on the talents and knowledge with which people arrive. Too often I have heard the argument that we can't afford to train. Most of the business community and a growing number of government agencies would argue that you can't afford not to. Obviously training is only one aspect of good management. Our agency must improve its ability to encourage excellence and support the well being of employees.

I'll step down at this point. No ideas here that haven't been said before, but deserve saying again. Discussion is invited.

## MILLE LACS NATIONAL WILDLIFE REFUGE

Mille Lacs National Wildlife Refuge is comprised of two small islands in Mille Lacs Lake located in Mille Lacs County. They lie about 30 air miles southwest of Rice Lake Refuge headquarters. Spirit Island contains .24 acres of jumbled rock located approximately three miles offshore in the southwest corner of Mille Lacs Lake. Hennepin Island, .33 acres in size is quite flat with both large boulders and a coarse gravel-type beach, depending on the current water level. It lies approximately four miles northwest of Isle, Minnesota.

Spirit Island was set aside by Executive Order 2199 on May 14, 1915, and was originally known as Mille Lacs Reservation. On Oct. 13, 1920, the reservation was enlarged by the addition of Hennepin Island under Executive Order 3340. The two islands, which were to constitute a "preserve and breeding ground for native birds," are now known as the Mille Lacs National Wildlife Refuge.

Surveys of nesting gulls and terns was conducted on both islands on June 2, and July 16. Although 1987 and 1988 were extremely dry years, water levels around the islands did not appear much below average, although the shoreline of Mille Lacs Lake showed a tremendous amount of exposed mudflats. The lower water exposed more of the gravel beach area on one end of Hennepin Island and resulted in an increase in common tern nesting. This trend has become apparent over the years. For the most part, gull nests remain among the boulders. It has also become apparent that several survey trips are necessary to derive a true picture of nesting activity, since active tern nests were discovered on a third trip made on August 16. The following table illustrates nesting survey results from 1977-1988.

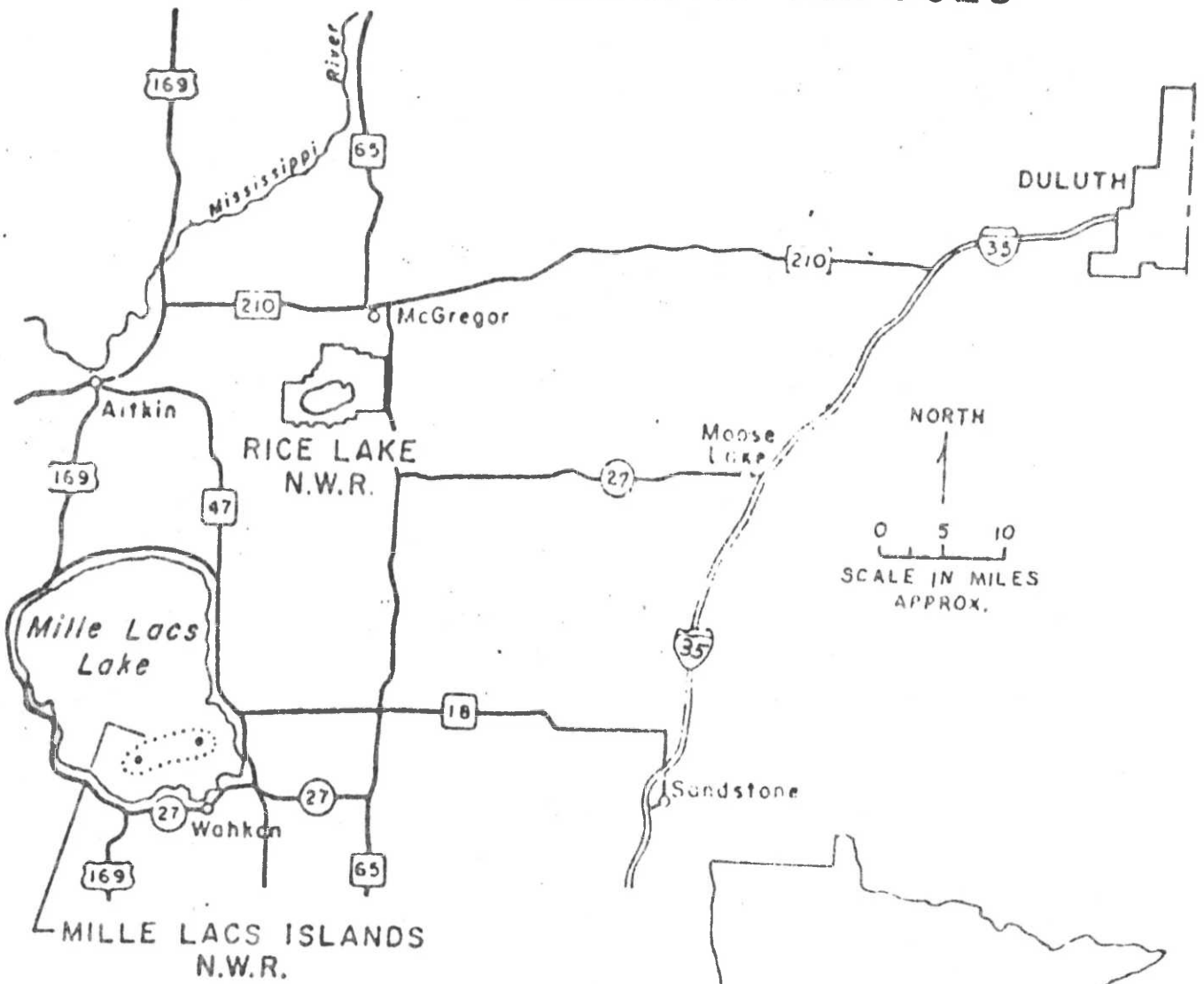


Hennepin Island (1/2 of Mille Lacs NWR) showing gravel beach where Common Terns nest.

GULL AND TERN NESTING SURVEY RESULTS - MILLE LACS NWR

Survey Date	Hennepin Island				Spirit Island				Total Mille Lacs Count			
	Ring-billed Gulls		Common Terns		Ring-billed Gulls		Common Terns		Ring-billed Gulls		Common Terns	
	Adults	(Nests)	Adults	(Nests)	Adults	(Nests)	Adults	(Nests)	Adults	(Nests)	Adults	(Nests)
5/12/77	300	(89)	20	(0)	450	(85)	2	(0)	750	(174)	22	(0)
6/02/78	550	(190)	165	(51)	450	(164)	70	(20)	1000	(354)	235	(71)
6/04/79	400	(134)	30	(12)	500	(184)	35	(14)	900	(318)	65	(26)
5/22/80	400	(187)	20	(0)	500	(250)	25	(0)	900	(437)	45	(0)
5/27/81	500	(193)	50	(39)	500	(208)	30	(10)	1000	(401)	80	(49)
5/28/82	400	(196)	0	(0)	500	(181)	8	(3)	900	(377)	8	(3)
6/01/83	400	(201)	20	(0)	350	(250)	40	(6)	750	(451)	60	(6)
6/04/84	500	(180)	60	(16)	300	(170)	60	(15)	800	(350)	120	(31)
5/29/85	400	(160)	20	(2)	270	(238)	50	(17)	670	(398)	70	(19)
6/04/86	250	(136)	50	(20)	400	(235)	25	(7)	650	(371)	75	(27)
5/26/87	120	(81)	30	(2)	250	(181)	20	(3)	370	(262)	50	(5)
6/16/87	200	(30)	125	(42)	500	(95)	100	(48)	700	(125)	225	(90)
6/02/88	200	(107)	170	(69)	300	(177)	15	(3)	500	(284)	185	(72)
7/16/88	75	(60)	175	(78)	395	(97)	10	(4)	470	(157)	185	(82)

# RICE LAKE & MILLE LACS ISLANDS NATIONAL WILDLIFE REFUGES



LOCATION MAP



MINNESOTA

## SANDSTONE UNIT

of

### Rice Lake National Wildlife Refuge

The Sandstone Unit is located in Pine County, Minnesota, southeast of the town of Sandstone, 40 air miles southeast of Rice Lake. The 2,240 acre area was transferred to the FWS by the Department of Justice (Sandstone Federal Correctional Institution) in 1970. The area consists mainly of wooded uplands with areas of open hayland and river bottom (Kettle River) habitat. It supports good population of ruffed grouse, white-tailed deer and a limited number of waterfowl.

Public Use is limited to fishing by boat on the Kettle River. Poor access and distance from Rice Lake preclude any other activities.

Because of minimal allotted funding and manpower, little is done beyond the "custodial" level of management and enforcement.

Hay permittees harvested 157 tons of grass hay from 240 acres. The haying program is directed toward maintaining openings in the timber areas, and providing green browse for resident wildlife.

A land exchange that occurred in 1986 and provided the town of Sandstone with 195 acres for settling ponds as part of their wastewater treatment facility expansion, still shows no signs of development.

In 1984, the Sandstone Federal Correctional Institution requested "emergency use" of the Fire Lane Road and the River Road on the Unit and agreed to repair washouts on each road in return. The washouts were partially repaired in 1985, finished early in 1986, and washed out again during the year. To date, the two roads have not been re-repaired nor has the prison requested renewal of the Special Use Permit covering their use of these roads.

In 1984, the Minnesota Air National Guard requested use of refuge lands for C-130 airdrop exercises and was issued a Special Use Permit, which was renewed each year through FY87. Although we learned of several low-level flights over the area, we are aware of no actual airdrops being made since 1985.

Identification of restorable wetlands on the Unit began in 1987. During 1988, a total of 12 small wetlands were restored. Several more are possible and a larger-scale project to impound a portion of Deer Creek has been submitted in proposal form to Ducks Unlimited for funding consideration.

Service Area Forester Cy Brock and Regional Forester Cal Gale visited the Sandstone Unit during November. They completed a cruise of the unit, including general type map and estimated standing timber by area. This work was the preliminary field review needed to prepare a timber management plan for the unit.

The north and east boundaries of Sandstone were posted during 1988. The northeast portion was newly posted to reflect new boundaries resulting from the trade of the 195 acres to the City of Sandstone. Refuge signs were removed from the former boundary. New boundary signs were placed along the revised boundary per a previous survey. Boundary signs were replaced as needed along the remainder of the east boundary.



Aerial view of the Sandstone Unit showing grasslands and woodland. Foreground is private land and Sandstone Prison is in upper right.



Aerial view of wooded portion of Sandstone Unit and Kettle River.

# RICE LAKE NATIONAL WILDLIFE REFUGE (Sandstone Division)

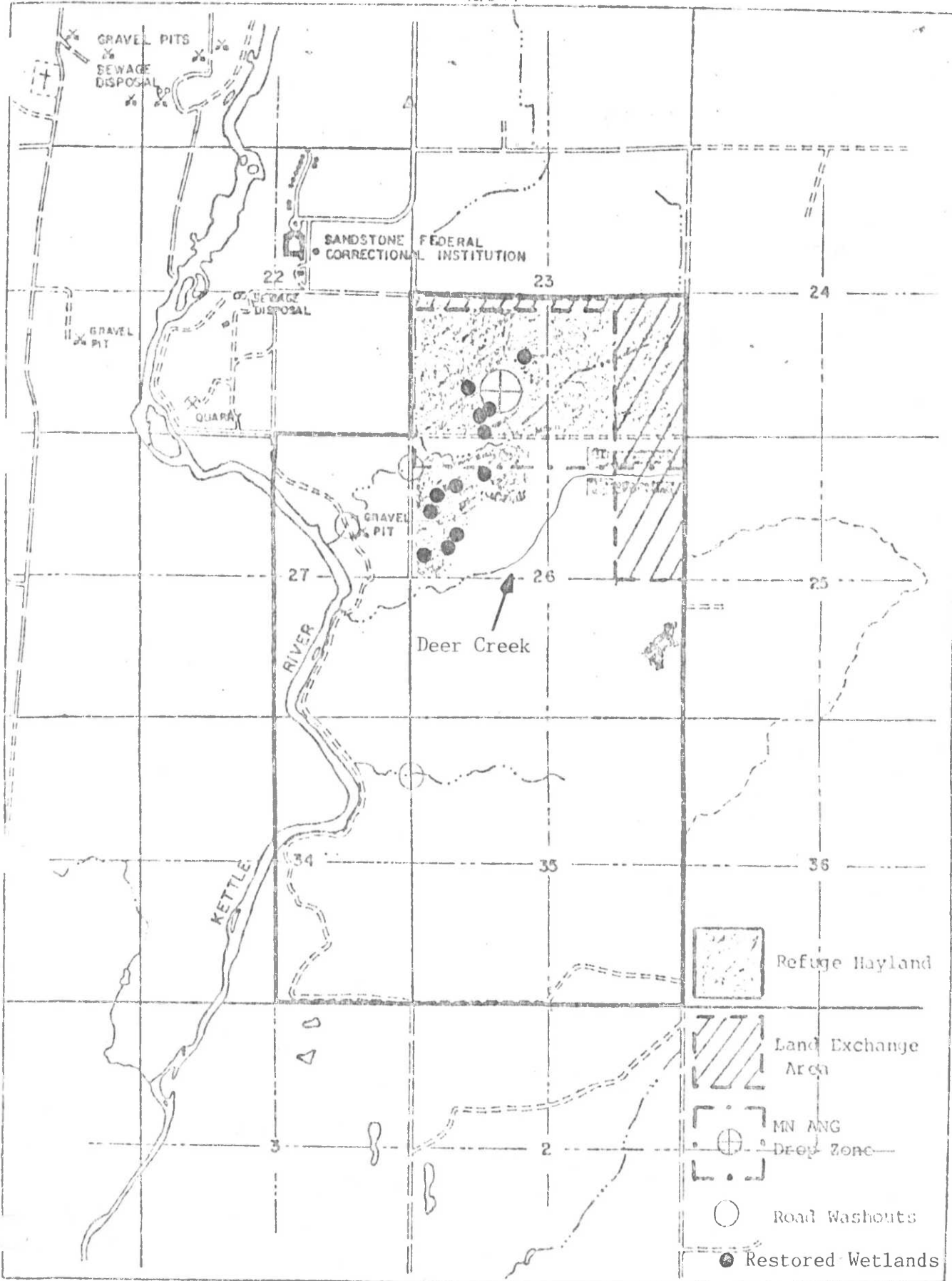
PINE COUNTY, MINNESOTA

UNITED STATES  
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE  
DEPARTMENT OF SPORT FISHES AND WILDLIFE

R.20W.

4.



R. 20 W.

COMPILED IN THE DIVISION OF ENGINEERING  
FROM SURVEYS BY THE B. L. M.

FOURTH PRINCIPAL MERIDIAN

Scale 0 20 40 60 CHAINS

TOWNSHIP  
DIAGRAM

MEAN  
DECLINATION  
1980

SD.MIN.100-404

**Rice Lake  
National Wildlife  
Refuge  
Minnesota**



# Rice Lake National Wildlife Refuge

## Water Is the Key to Wildlife

Abundant natural food, particularly wild rice, has attracted man and wildlife to Rice Lake for centuries. Thousands of migrating waterfowl feed and rest on the lake and the surrounding marshes and bogs.

Chippewa Indians continue to harvest wild rice from the lake. Resident animal populations flourish.

Water is the key to the area's productivity. Rainfall and snowmelt, held behind glacial moraines on a flat glacial plain, trap sediment and rotting vegetation. Year after year, the muck gets deeper and vegetation grows more abundant.

Except for the small harvest of plants and animals that is removed and a small amount of nutrient washed down the river, Rice Lake Refuge is predominantly an "energy collector." The sun's energy, in the form of decaying plants and animals, accumulates and is stored in the bogs and marshes.

## Rice Lake

Rice Lake National Wildlife Refuge is located in Aitkin County in east-central Minnesota, about 7 miles south of the community of McGregor. It was established in 1935 to preserve its valuable habitat for waterfowl, a dwindling resource in the 1930's.

The refuge continues its important waterfowl management role today. Its variety of wildlands, wildlife and human history also makes it a fine place to visit, study and enjoy the outdoors.

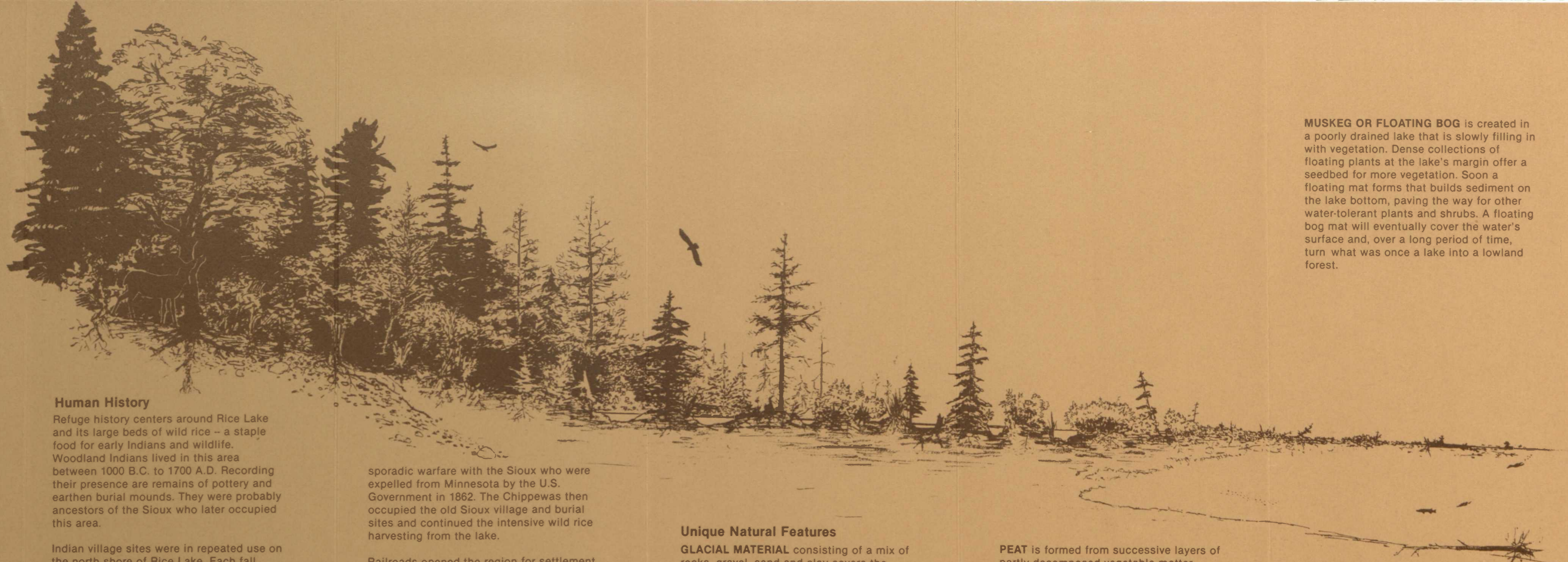


### A Landscape Shaped by Water

The dominant refuge surface features were formed by glaciers over 10,000 years ago. A system of moraines or glacial ridges, in the shape of a huge horseshoe, surrounds the area on three sides with the open end to the northeast. One set of ridges has formed Rice Lake itself. The Rice River bisects and drains the refuge, flowing from the southeast corner to the northwest, and ultimately empties into the Mississippi River 20 miles west of the refuge.

The land's natural water drainage toward the south has been blocked by the moraines. This wet area is slowly filling in with sediment and vegetation, becoming a floating or muskeg-like bog -- a natural haven for wildlife. Refuge bog lands are flat expanses of poorly-drained organic soils, known as peat. They support a dense, spongy mixture of flowering plants, grasses, low shrubs and small stands of black spruce, balsam fir and tamarac. Shallow lakes with marshy shorelines dot this landscape. The lakes are slowly being taken over by the encroaching bog.

Scattered islands and glacial ridges rise above the surrounding bog and are covered with timber and other upland plants. The refuge lies within the transition zone between the coniferous forests of northern Minnesota and the deciduous hardwood forests typical of the southern portion of the state. Quaking aspen is the most common tree species, but several stands of hard maple, red oak and other mixed hardwoods occur on higher ground. Balsam fir, white pine, white cedar, American elm and soft maple are also common.



### Human History

Refuge history centers around Rice Lake and its large beds of wild rice -- a staple food for early Indians and wildlife. Woodland Indians lived in this area between 1000 B.C. to 1700 A.D. Recording their presence are remains of pottery and earthen burial mounds. They were probably ancestors of the Sioux who later occupied this area.

Indian village sites were in repeated use on the north shore of Rice Lake. Each fall Indians would gather here to harvest and prepare grain for storage which would last until the next year's ricing season.

In the mid-1700's, Chippewa Indians moved into this region from the east. This led to

sporadic warfare with the Sioux who were expelled from Minnesota by the U.S. Government in 1862. The Chippewas then occupied the old Sioux village and burial sites and continued the intensive wild rice harvesting from the lake.

Railroads opened the region for settlement and logging of red and white pine in the 1870's. Iron ore mining on a nearby range brought a railway line through the center of what is now the refuge. This abandoned railroad bed is now used as the main entrance road into the refuge.

### Unique Natural Features

**GLACIAL MATERIAL** consisting of a mix of rocks, gravel, sand and clay covers the area's bedrock in layers ranging from 50 to 300 feet thick.

**PEAT** is formed from successive layers of partly decomposed vegetable matter, mostly sphagnum moss. The peat makes bog soil acid and tints bog waters a clear amber color.

**MUSKEG OR FLOATING BOG** is created in a poorly drained lake that is slowly filling in with vegetation. Dense collections of floating plants at the lake's margin offer a seedbed for more vegetation. Soon a floating mat forms that builds sediment on the lake bottom, paving the way for other water-tolerant plants and shrubs. A floating bog mat will eventually cover the water's surface and, over a long period of time, turn what was once a lake into a lowland forest.

### Wildlife Viewing

The main entrance road is normally open throughout the year. Late evening drives often result in sightings of deer, beaver, porcupine, ducks and many other types of wildlife. Old logging roads make excellent walking trails for observing wildlife, and they are great for winter activities such as snowshoeing or cross-country skiing.

A ¾-mile walking trail is located near Twin Lakes. It takes you through a variety of habitats -- deciduous and coniferous woods, grasslands and marsh. You have a good chance to see wildlife in this diverse area.

### Fishing

Fishing is popular at the refuge in an easily accessible area along the Rice River. The location is posted with "PUBLIC FISHING AREA" signs and FISHING LEAFLETS are available at the refuge office. The fishing season extends from May through November each year. Northern pike dominate the daily catch. Mandy Lake and Twin Lakes are also open to fishing, but success is usually well below that experienced on the river.

### Hunting

Ruffed and spruce grouse hunting is available in a specially designated area marked with "PUBLIC HUNTING AREA" signs. HUNTING LEAFLETS are available in parking lots during the hunting season and at the refuge office.

### Ricing

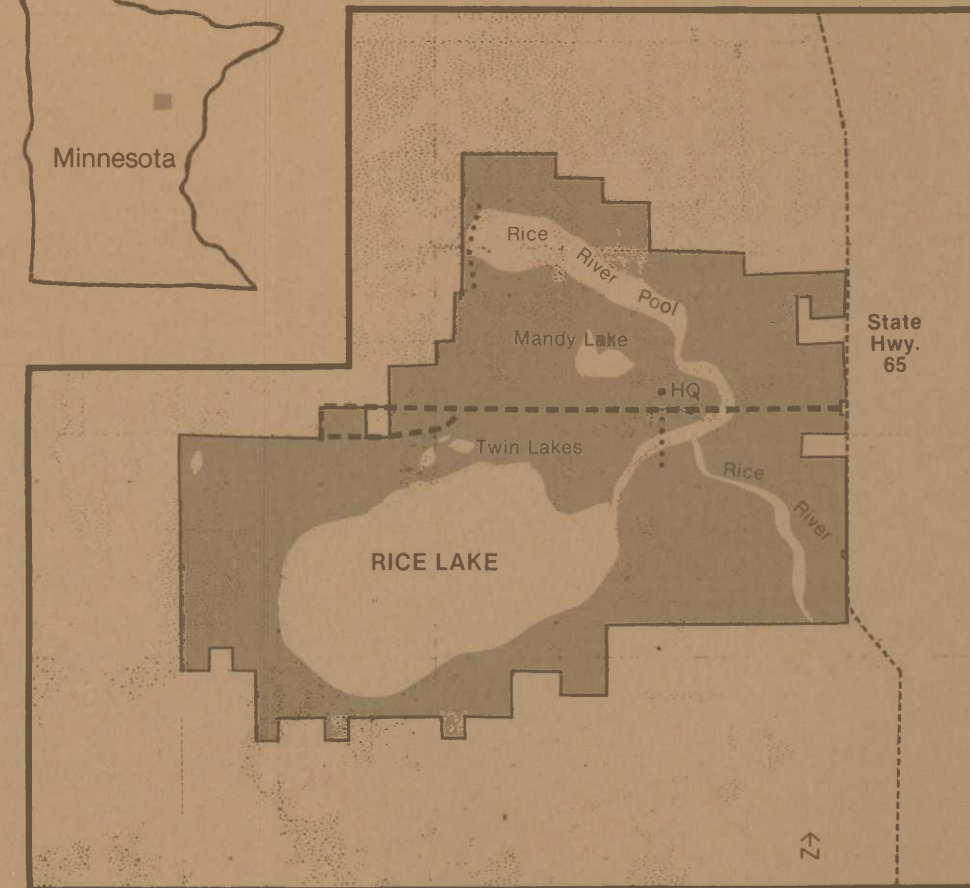
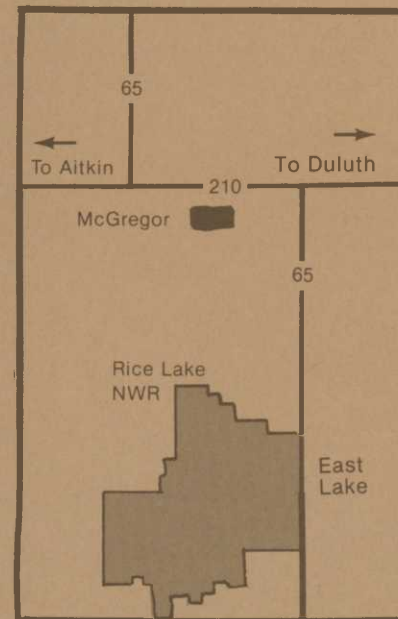
Local Chippewa Indians, under special permit, harvest a portion of the wild rice crop from Rice Lake each year. The harvest, using traditional Indian methods, usually takes place in early September.

### Visiting Rice Lake Refuge

Restrooms are provided on the refuge but no drinking water is available. A small picnic area near Twin Lakes is provided if you plan to spend some time enjoying the refuge. Camping and open fires are prohibited. Remember to keep pets on a leash. Swimming, horse-back riding, traveling by off-road vehicles or snowmobiles, or collecting of any plants, animals and artifacts also are not permitted. Refuge visitors are urged to

contact the refuge office for current information and regulations.

Motel lodging is available in McGregor. Public campgrounds are available at Savannah-Portage State Park and near Big Sandy Lake Dam, both within a 30-minute drive of the refuge. Private campgrounds are also available.



----- Main Refuge Road and West Loop Road

..... Dikes

### Wilderness Areas

Rice Lake National Wildlife Refuge administers two proposed National Wilderness Areas. A 1400-acre unit, located in the southwest part of the refuge, preserves a typical northern bog area and includes the 6-acre island in Rice Lake. The second area, Spirit and Hennepin Islands, comprises the entire area of the Mille Lacs National Wildlife Refuge. These two small boulder islands, totaling about ½-acre in size, are protected for their nesting colonies of gulls and terns.

### For information contact:

Refuge Manager  
Rice Lake National Wildlife Refuge  
Route 2  
McGregor, Minnesota 55760

Office hours are 8:00 am to 4:30 pm  
Monday through Friday.  
Phone: (218) 768-2402



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

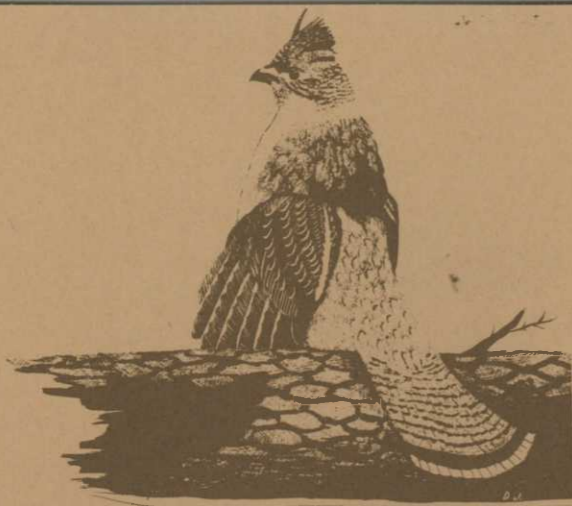


As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

RF-32540-1

MAY 1979

☆ U.S. GOVERNMENT PRINTING OFFICE: 1979-667-742



## Today's Residents — Wildlife

### Waterfowl

The refuge is managed primarily for waterfowl. Wild rice and wild celery beds in Rice Lake are especially attractive to migrating ducks and geese. Water levels of Rice Lake are manipulated to benefit wild rice production. Levels that are too high or too low at critical periods of aquatic plant growth mean poor feeding for the fall migration of swans, geese and ducks. The leaflet **WILD RICE**, available at the refuge office, explains how wild rice grows and is harvested and its importance to waterfowl and people.

Croplands with green browse and unharvested cereal crops provide food for Canada geese and snow geese. An established Canada goose flock, started at the refuge in 1958, now migrates south in the fall and returns in spring to nest on the refuge and surrounding area.

Grasslands next to water areas are maintained for waterfowl nesting sites. Wood duck production is encouraged by timber management practices which preserve cavity-prone trees for this tree-nesting species. The refuge's principal nesting species of ducks are mallard, blue-winged teal, wigeon and wood duck.

Rice Lake Refuge has an important role in the management of the ring-necked duck. About one-quarter of the continental harvest of this duck occurs in Minnesota, and Rice Lake supports one of the largest concentrations of migrating ring-necks in the state.

### Other Wildlife

A variety of habitat and the refuge's water, timber, grassland and cropland management practices result in many other wildlife species living here. Nearly two dozen species of hawks and owls frequent the area. Bald eagles are often seen during spring and fall migration, and at least one active nest is located on the refuge. Sharp-tailed and ruffed grouse are found in varying numbers. A **REFUGE BIRD LIST**, available from the refuge office, contains more information for observers of bird life. White-tailed deer and black bear are favored mammals for wildlife viewing. Smaller mammals include mink, muskrat, beaver, otter, raccoon, porcupine, skunk, badger, weasel and several species of squirrels. The **REFUGE MAMMAL LIST** includes a brief description of some of the more common mammals a visitor might see.

Reptiles and amphibians include several frog species, common toads, painted and snapping turtles, garter and green snakes and salamanders.

Rice Lake is a natural spawning area for northern pike which enter the lake from the Rice River in the spring. Other fish include yellow perch, walleye, buffalo, dogfish and eelpout.



INDIAN RICE  
MANOMIN

# WILD RICE

PSIN  
MARSH RICE  
FOLLE AVOINE

RIVER OATS

SQUAW RICE

MAD OATS

FALSE OATS

MARSH OATS

CANADIAN RICE

INDIANS OATS

BLACK RICE

WATER RICE

BLACKBIRD OATS



# WILD RICE

## INDIAN RICE

The Chippewa word for grain or berry is "min." To this, the adjective "mano" (good) is added to make "manomin" (good berry). By this name, wild rice was known to the Chippewas and to most of the early white explorers and settlers of the Upper Mississippi valley.

Through the years, 60 popular names for wild rice have been identified. The early French noted similarities between wild rice and both oats and rye and named it folle avoine (wild oats). English terms were numerous but the most commonly accepted name became wild rice.

It has been estimated that wild rice comprised 25 percent of the early woodland Sioux and Chippewa diet. When negotiating with the U.S. Government for their reservations, Indians usually wanted lakes with extensive wild rice stands. Today, Minnesota Indians have exclusive harvest rights to about 10,000 acres of wild rice stands on their own tribal territory.

## HARVESTING WILD RICE

The method of harvesting wild rice from natural stands on public waters is basically the same today as it was for early Indians. Machines are prohibited. This ensures that adequate rice will remain to reseed the lakes and that wildlife can also share in the harvest.

Ricing boats or canoes are propelled by hand with long poles. A standing boatman, or poler, maneuvers the ricing craft. A ricer sits in the front, middle or rear and alternately works each side of the boat. Rice stalks are bent over the boat with a 30-inch ricing stick and gently stroked or tapped with another stick to dislodge ripe grains.



## PROCESSING WILD RICE

Although most wild rice today is processed by machine, the basic procedures remain the same as old Indian methods.

Indians prepared it as follows:

**Curing** — Newly harvested rice was spread outdoors on birchbark or a blanket and allowed to sun-dry for a day or two.

**Parching** — Cured grain was placed in a container over a wood fire. The grain became dry, and hard after stirring for 30 to 60 minutes.

**Threshing** — Rice was then placed in animal skins, either in a dug out hole or on a flat surface. Hulls were removed by treading upon the grain or pounding with a pole.

**Winnowing** — As a final step, grain was poured from one container to another, allowing wind to blow the light chaff away.

Finished grain could be stored for long periods of time if kept cool and dry. Indians usually placed rice in animal skins and buried it until needed.

## HOW WILD RICE GROWS

Wild rice (*Zizania aquatica*) is a tall grass found growing in soft mucky soils of shallow lakes, marshes, and stream edges. It is not related to white rice cultivated in warm climates.

A wild rice plant is an annual. It produces seed grains in the fall, then the mature plant dies. Grain falls from the plant as soon as it ripens and sinks in the water. Grain lies on lake or stream bottoms throughout the winter and sprouts in late May or early June.

If water conditions are not right, grain will not sprout. The period of winter dormancy, while rice is lying in the mud, must be ended by a period of very low oxygen in cold water. This is a normal late winter condition. Renewed oxygen supply then enables the grain to sprout. When the ice melts in spring, water is churned up by wave action or current flow, dissolving more oxygen. If the spring water level is abnormally high, however, not enough oxygen reaches the rice grain and little will sprout.

Regardless of water conditions, some seed may remain dormant for as long as 10 years. This assures that the species cannot be eliminated by a single catastrophe, or by a series of crop failures.

By late June long narrow leaves are seen floating on the water surface. High water during this floating-leaf



stage can also cause rice crop failure. Tender plants are weakened or uprooted by wave action and cloudy silt-laden water can coat the leaves, obscuring light. The hazard of high water in early spring or early summer explains why some otherwise productive lakes have been barren of wild rice for as long as eight years.

Insect and plant disease are also causes of crop failure. These pests are cyclic in that they increase during years of good rice crops and decline in years of crop failure.

The stem, or seed stalk, as well as several leaves, grow out of the water by mid-July and growth continues until mid-August. Stalk length is between two and ten feet, depending on genetic variety of the rice, mud fertility and water depth.

By September, rice grains ripen downward from the top of the seed head to the base, a few seeds at a time.

## WHERE WILD RICE GROWS

Wild rice is native to the lakes, marshes and slow moving streams of northern United States and southern Canada. Its use as a gourmet food dates back to the first days of commerce between the native Indians and the French traders. Today, the supply of wild rice for the United States market comes from the harvest of Minnesota and Canadian lakes and in increasing proportions from the production of cultivated wild rice on paddies in both Minnesota and, surprisingly, California. A recent annual harvest report included the following figures:

Minnesota paddies (cultivated)	3.5 million pounds
California paddies (cultivated)	1.8 million pounds
Canada lakes (natural)	1.0 million pounds
Minnesota lakes (natural)	.4 million pounds

In Minnesota there are about 15,000 acres of naturally growing wild rice stands that are harvested in the traditional Indian methods in an average year.

During a good wild rice year when water levels and good germination favor the crop, there may be as many as 30,000 acres of wild rice growing naturally in lakes and marshes of Minnesota.

### GROWTH CONDITIONS FOR WILD RICE

Good wild rice stands are found in shallow lakes with restricted drainage that lie within the flat basins of old, sedimented glacial lakes.

Lakes that have produced wild rice for many years usually have the following characteristics:

1. They contain water shallower than four feet deep.

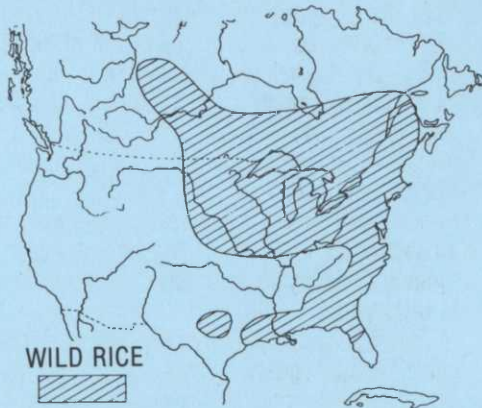
2. They are wide enough to have heavy wave action in spring or have a flow of water through them.

3. They have a bottom of soft mucky organic soil, a few inches to a few feet thick, which lies over sand or gravel.

4. Bottom soil may be acidic; however alkaline water provides greater amounts of nutrients and benefits growth.

5. Water is below 10 parts per million in sulfates.

6. The drainage area feeding the lakes is usually large and the outlet small so that there is high water in some summers. In these years high water drowns cattails and other perennial water plants that could crowd out wild rice.



7. They have water levels which normally do not rise sharply (more than 6 inches) at any time during June or July when the wild rice is in the floating-leaf stage.



### WILD RICE AND WATERFOWL

Wild rice is one of the important waterfowl foods in Minnesota. From early May to late November, ducks, geese and other water birds feed on the sprouting seeds, young shoots and ripe grains. However, waterfowl prefer the ripe grains and these are heavily fed upon in September and October.

Wild rice provides no spring protective cover for birds. However, as the plant grows out of the water in early July, it gives good escape cover for waterfowl broods and moulting adult ducks. Dense stands in the fall provide excellent cover for many water birds. Other marsh plants may provide more year around benefit to waterfowl, but during the fall migrating season wild rice is preferred when abundant and available. Wildlife biologists have noted that migrating ducks fly south much sooner during poor rice crop years.

Wildlife species that commonly feed on this plant include ducks, geese, soras, American coots, blackbirds, deer, moose, beaver and muskrats.

### MANAGING FOR WILDLIFE

Because wild rice is such a good natural food supply for waterfowl, its growth is encouraged on many national wildlife refuges. On Rice Lake, Tamarac, and Sherburne National Wildlife Refuges in Minnesota the water levels of marshes are often manipulated specifically to promote wild rice growth.

When ideal water depth is maintained, excellent rice crops have resulted. However, the crop frequently fails during years of high water conditions. Dikes and water control gates are installed to keep floodwaters from entering a marsh, provide for water intake control during dry summer months and permit the lowering of water levels in autumn.

As you visit one of these national wildlife refuges keep in mind that these are places dedicated to providing habitat, food, water, and shelter, for wildlife, particularly migratory waterfowl. Controlling water levels in lakes and marshes is just one of the ways refuge managers provide good habitat for wildlife.

DEPARTMENT OF THE INTERIOR  
U.S. Fish and Wildlife Service



September, 1987

# MAMMALS OF RICE LAKE

National Wildlife Refuge  
Minnesota



# MAMMALS OF RICE LAKE

## National Wildlife Refuge



Rice Lake National Wildlife Refuge is managed to provide nesting and resting areas for migratory waterfowl. However, many mammals also benefit from refuge water impoundments, agriculture and timber management programs.

The presence or signs of 42 mammals is known, and 36 species have been verified by actual sightings. Visitors to the refuge may see many of these animals, or at least see signs indicating their presence such as muskrat houses, beaver cuttings, burrows, tracks or droppings.

Hiking trails and gravelled roads take you to many wildlife habitats. Binoculars and a field guide with pictures will help you to correctly identify the wildlife you see. Remember, wild animals are shy and wary. If you are quiet and patient, you may be rewarded with interesting sightings.

Please stop by refuge headquarters and share your wildlife findings with the staff.

## COMMONLY SEEN MAMMALS

### MICE, VOLES AND SHREWS

These small mammals are ever present in ground litter and vegetation of woods, meadow and marsh. They seldom expose themselves to view, but can be detected by rustling sounds as they move through dry leaves, by tracks in mud, or by droppings and tunnels in the grass. Their abundant populations supply much of the food for predators.

### EASTERN CHIPMUNK

Chirps and stripes identify this small ground squirrel. The best place to find "chippie" is in open woodlands with plenty of stumps and logs. It digs burrow systems of 30 feet or more.

### RED SQUIRREL

Named for its rusty red color, this small tree squirrel is about half the size of a gray squirrel. Its shrill chatter greets every intruder that comes within its territory.

### EASTERN GRAY SQUIRREL

Most active in early morning and evening, these tree squirrels are found in hardwood forests. Their leaf nests are usually evident. Some gray squirrels are actually black in color.

### GROUND SQUIRRELS

The Franklin and the thirteen-lined ground squirrel are commonly seen dashing for their burrows; the thirteen-lined in open areas, and the Franklin in borders between grassland brush. Both squirrels have a shrill whistle. The thirteen-lined gives a high trill; the Franklin's call is remarkably clear and musical.



### WOODCHUCK

In the early morning and evening you will see this stout relative of the squirrels feeding on vegetation close to its burrow. The rest of the day "ground hog" will sun in its doorway or sleep underground.

### MUSKRAT

Most often seen swimming with only its head out of water, the "marsh rat" only leaves its wet habitat to migrate to new territory. Its favorite food is cattail roots and shoots, and it builds its house from cattail leaves.



### BEAVER

Suretell beaver signs are stick and mud dams across streams, large conical houses of mud and sticks at the edge of a lake and pointed stumps of trees near water.

### PORCUPINE

Clumsy and dull-witted, "Porky" feeds on buds and bark of trees. It ambles slowly across the ground and climbs still more slowly through trees following the scent of new food. Easily approached, a porcupine is well protected from most animals by its quills.

### SNOWSHOE HARE

Brown in summer and white in winter, the snowshoe hare is named for its big furry feet which enable it to "snowshoe" across deep winter snow. It is found in brushy swampland.

### STRIPED SKUNK

An adult skunk weighs about 4½ pounds. Favorite foods are insects, berries, mice, eggs and frogs. It can spray its scent up to 15 feet, but will do so only as a last resort for protection.

## MINK

Active throughout the year, usually in or near water, mink weigh up to three pounds. They are bold, tireless wanderers and will not hesitate to attack animals larger than themselves.

## WHITETAIL DEER

Deer stand about 3 feet high at the shoulder. Their coats are reddish-tan in summer and blue-gray in winter. The whitetail feeds on a wide variety of vegetation, but buds and twigs are the winter mainstay. Deer are most often seen along roads or edges of meadows in early morning or evening.

## THE OTHER MAMMALS

The rest of the mammals on Rice Lake Refuge are less commonly seen or are known from the signs or droppings they leave behind. Be alert and you may detect several of these animals. Find their names on the complete list of all refuge mammals.



## COMPLETE MAMMAL LIST

Masked Shrew (*Sorex cinereus*)  
Arctic Shrew (*Sorex arcticus*)  
Pygmy Shrew (*Microsorex hoyi*)  
Shorttail Shrew (*Blarina brevicauda*)  
Starnose Mole (*Condylura cristata*)  
Little Brown Myotis (*Myotis lucifugus*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Red Bat (*Lasiurus borealis*)  
Black Bear (*Ursus americanus*)  
Raccoon (*Procyon lotor*)  
Shorttail Weasel (*Mustela erminea*)  
Least Weasel (*Mustela rixosa*)  
Longtail Weasel (*Mustela frenata*)  
Mink (*Mustela vison*)  
River Otter (*Lutra canadensis*)  
Badger (*Taxidea taxus*)  
Striped Skunk (*Mephitis mephitis*)  
Coyote (*Canis latrans*)  
Red Fox (*Vulpes fulva*)  
Gray Fox (*Urocyon cinereoargenteus*)  
Lynx (*Lynx canadensis*)  
Bobcat (*Lynx rufus*)  
Woodchuck (*Marmota monax*)  
Thirteen-lined Ground Squirrel  
(*Citellus tridecemlineatus*)  
Franklin Ground Squirrel (*Citellus franklinii*)  
Eastern Chipmunk (*Tamias striatus*)  
Least Chipmunk (*Eutamias minimus*)  
Eastern Gray Squirrel (*Sciurus carolinensis*)  
Eastern Fox Squirrel (*Sciurus niger*)  
Red Squirrel (*Tamiasciurus hudsonicus*)  
Northern Flying Squirrel (*Glaucomys sabrinus*)  
Beaver (*Castor canadensis*)  
Deer Mouse (*Peromyscus maniculatus*)  
White-footed Mouse (*Peromyscus leucopus*)  
Boreal Redback Vole (*Clethrionomys gapperi*)  
Meadow Vole (*Microtus pennsylvanicus*)  
Muskrat (*Ondatra zibethicus*)  
Meadow Jumping Mouse (*Zapus hudsonius*)  
Porcupine (*Erethizon dorsatum*)  
Snowshoe Hare (*Lepus americanus*)  
Whitetail Deer (*Odocoileus virginianus*)  
Moose (*Alces alces*)

For more information write Refuge Manager,  
Rice Lake National Wildlife Refuge,  
Route 2, McGregor, Minnesota 55760

## DEPARTMENT OF THE INTERIOR

U.S. Fish and Wildlife Service

July 1976 RF32540-3

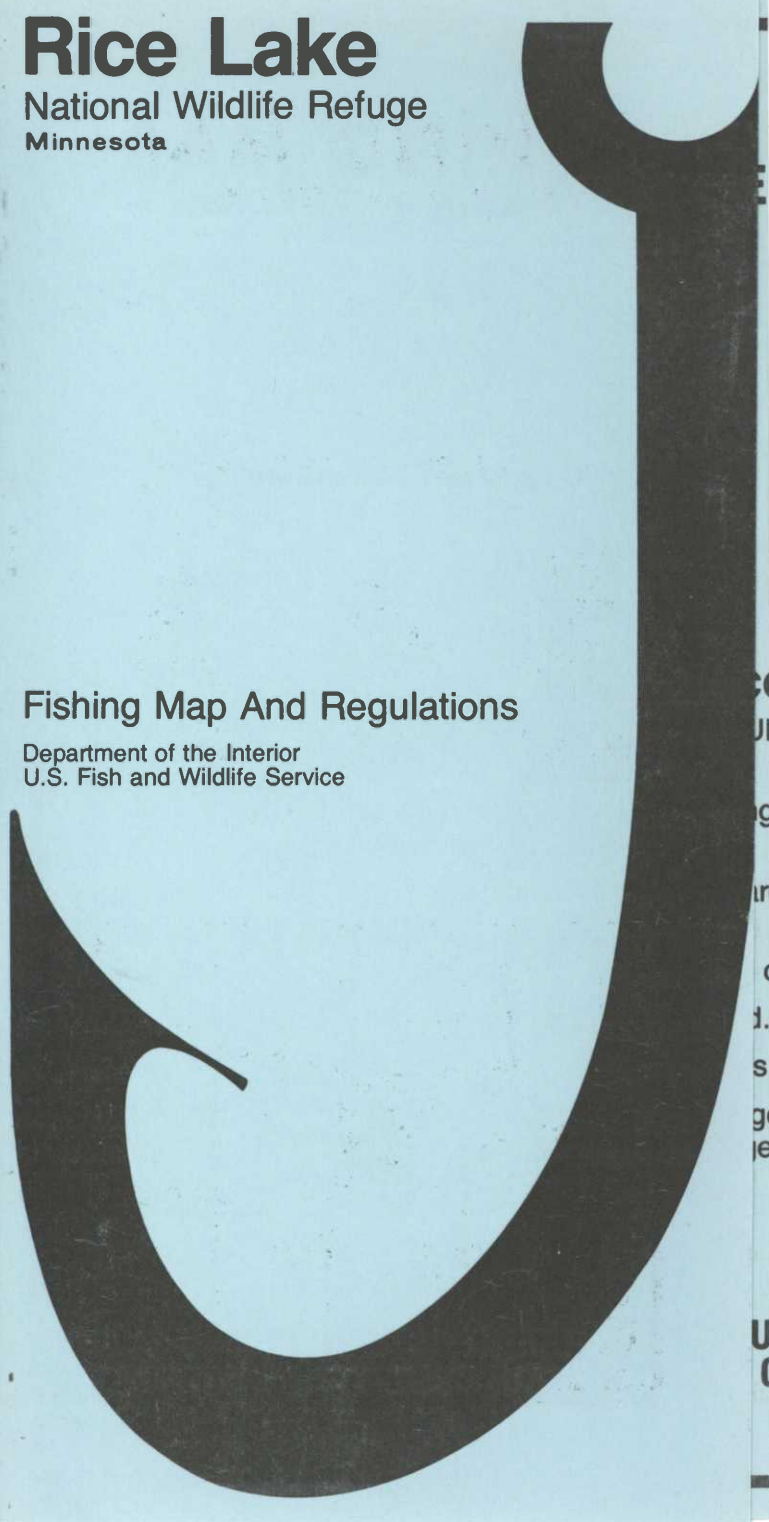


# Rice Lake

National Wildlife Refuge  
Minnesota

## Fishing Map And Regulations

Department of the Interior  
U.S. Fish and Wildlife Service



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# FISHING MAP

REGULATIONS ON BACK SIDE OF MAP

## REFUGE SIGNS — KNOW THEIR MEANING



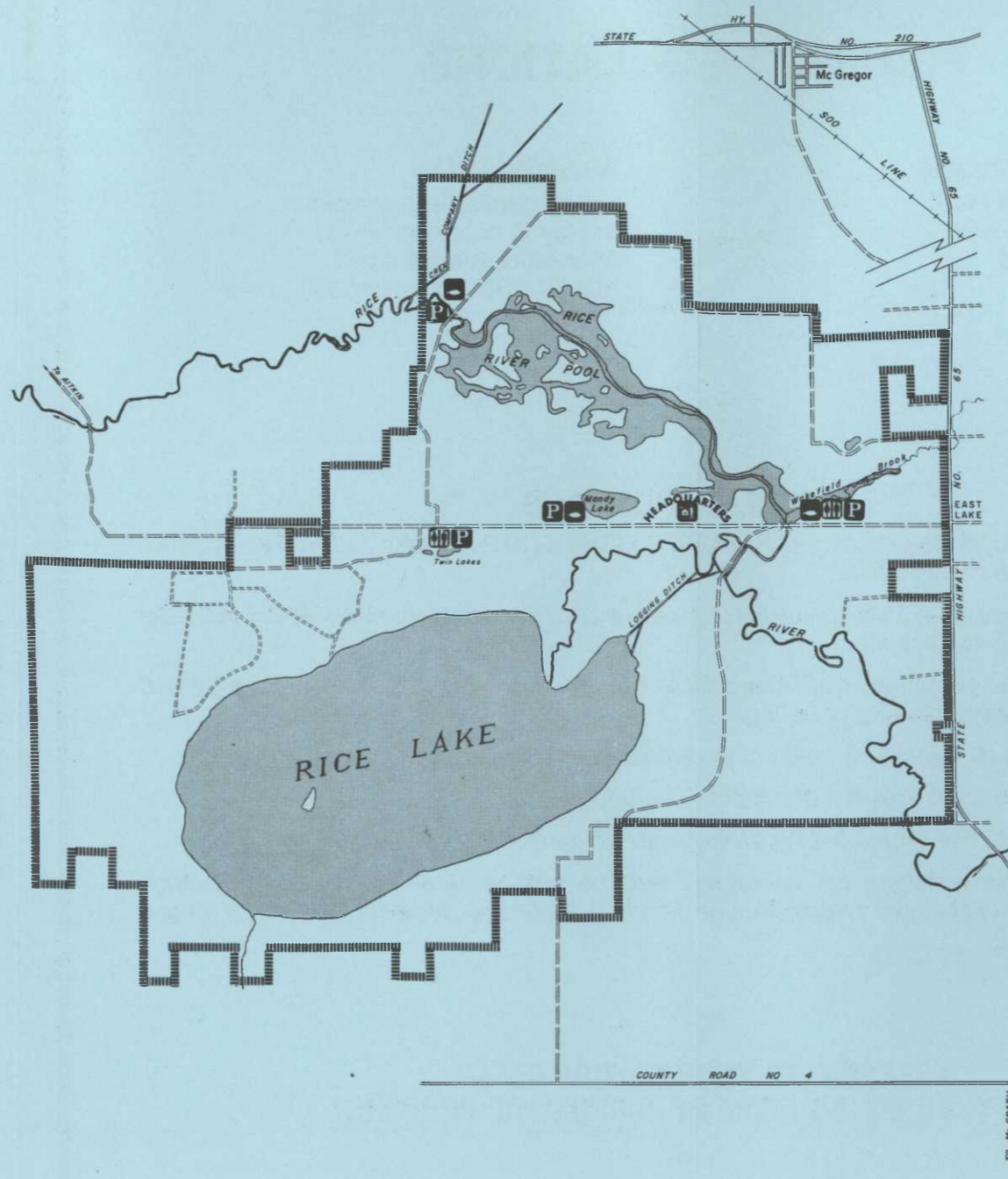
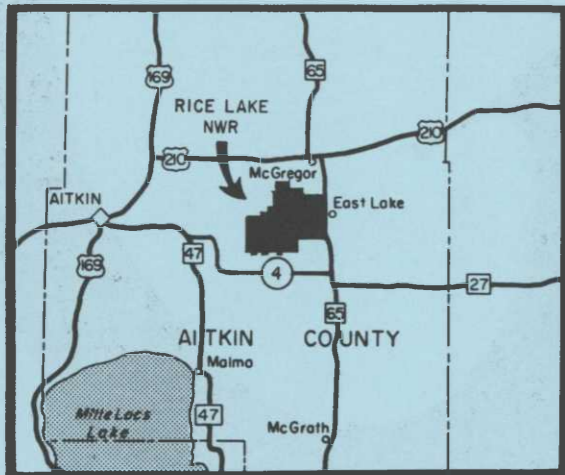
REFUGE BOUNDARY SIGN — ENTRY BY PERMISSION ONLY



AREA OPEN TO FISHING AT SPECIFIC TIMES



SANCTUARY AREA — OFF LIMITS TO THE PUBLIC UNLESS OTHERWISE SPECIFIED



LEGEND	
	REFUGE BOUNDARY
	REFUGE HEADQUARTERS
	OPEN TO FISHING
	PARKING
	RESTROOMS

# FISHING REGULATIONS

## FISH SPECIES

Northern Pike  
Yellow Perch  
Bullhead  
Buffalo

## SEASON DATES

Refuge fishing areas open  
in May in accordance with  
Minnesota season dates  
and CLOSE November 30

## SPECIAL CONDITIONS

Fishing is permitted only at areas posted with "PUBLIC FISHING AREA" signs and as delineated on the map on the reverse of this leaflet.

Fishermen must possess a valid Minnesota fishing license and fish in accordance with all applicable state and refuge fishing regulations.

Boats without motors are permitted on all fishing areas, but only up to "CLOSED" signs. Area beyond closed signs is not open to boating or fishing.

Automotive vehicles must remain on roads or in designated parking areas.

Overnight camping and open fires are prohibited. The refuge is open for day use only.

Ice fishing is prohibited. The refuge fishing areas close November 30.

All injuries or accidents occurring on the refuge must be reported immediately to the Refuge Headquarters, Rice Lake National Wildlife Refuge, Route 2, McGregor, Minnesota 55760, Phone Number 218/768-2402.

**PLEASE KEEP YOUR REFUGE CLEAN  
TAKE YOUR LITTER HOME OR DISPOSE OF PROPERLY**

# Rice Lake

NATIONAL WILDLIFE REFUGE

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## Hunting Map & Regulations

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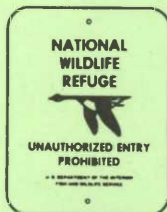


MINNESOTA

# HUNTING MAP

REGULATIONS ON BACK OF MAP

## REFUGE SIGNS — KNOW THEIR MEANING



REFUGE BOUNDARY  
SIGN — ENTRY  
FOR AUTHORIZED  
ACTIVITIES ONLY

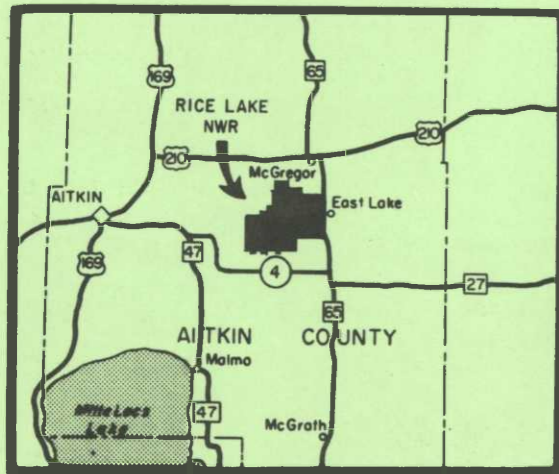


AREA OPEN TO  
HUNTING AT  
SPECIFIC TIMES

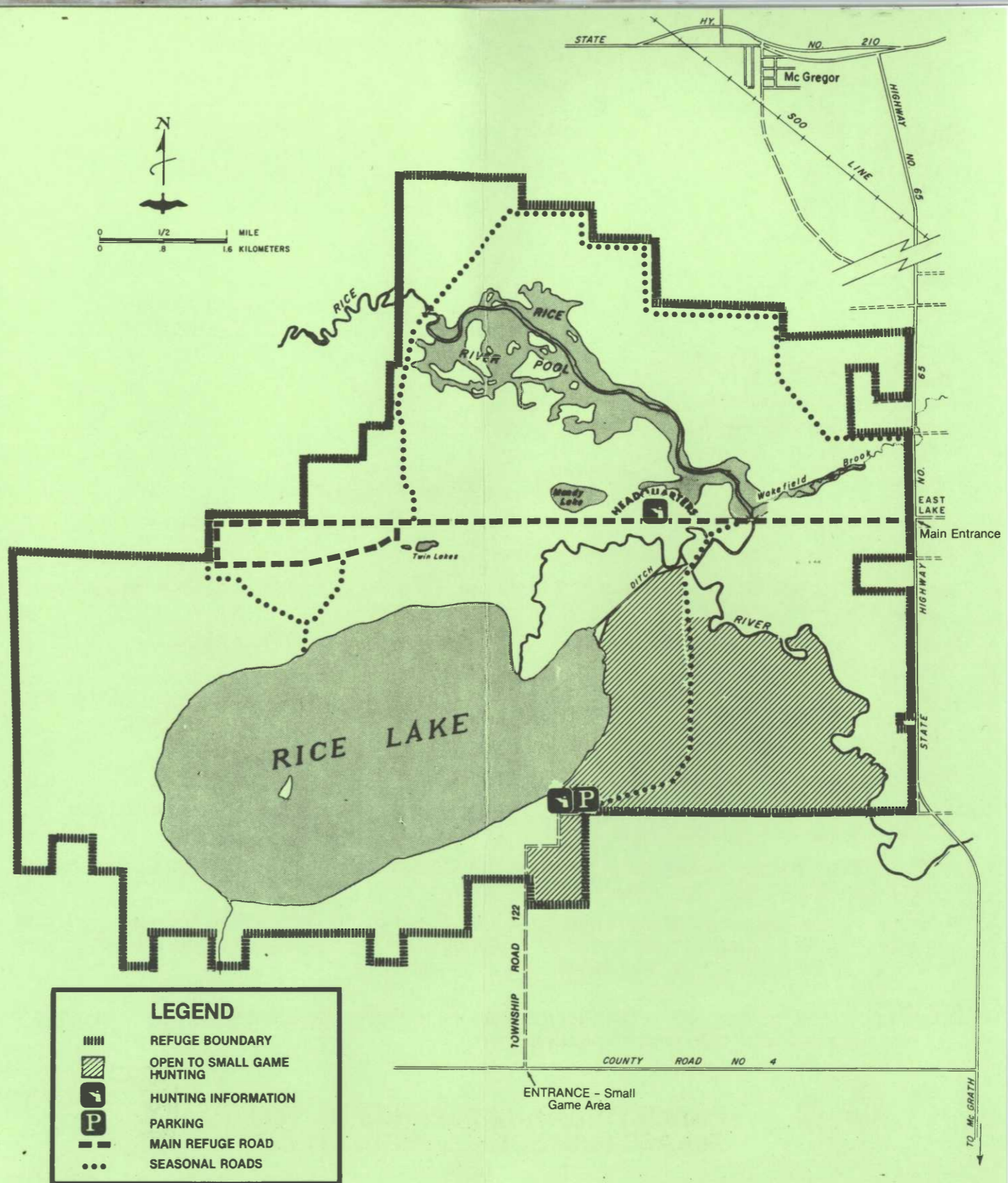
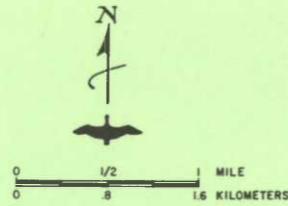


SANCTUARY AREA—  
OFF LIMITS TO  
THE PUBLIC UNLESS  
OTHERWISE SPECIFIED

## LOCATION MAP



(NOT TO SCALE)



# HUNTING REGULATIONS

## SMALL GAME

Ruffed & Spruce Grouse  
Cottontail Rabbit  
Snowshoe Hare  
Gray & Fox Squirrel

## BIG GAME

Deer

## MIGRATORY BIRDS

No duck, goose, woodcock, snipe or other Migratory Bird hunting is allowed on the refuge.

## SEASON DATES

Same as Minnesota State Regulations.

Limited to Special Permit Holders only. See below.

## SPECIAL CONDITIONS

- All species not listed above are protected and may not be killed or possessed.
- All State regulations are in effect and will be enforced.
- Hunting for Small Game is allowed only in the area delineated on the map and designated by signs as open to hunting.
- Access to the Small Game Area is from the south, via Aitkin County Road No. 4. See map for details.
- Deer hunting is limited to Rice Lake Special Area Permit holders ONLY. Details on the hunt and application procedures are outlined in the annual Minnesota Big Game Hunting Regulations pamphlet, or contact the refuge office.
- Camping, overnight use and open fires are prohibited.
- Vehicle travel is restricted to designated roads and parking areas. Snowmobiles, ATV's and other off-road vehicles are not permitted on the refuge.
- Nearby State Wildlife Management Areas include the Kimberly WMA and others. Contact the local Area Wildlife Manager (Aitkin) for information.
- Additional information about the refuge can be obtained by writing to: Refuge Manager, Rice Lake National Wildlife Refuge, Route 2, Box 67, McGregor, MN., 55760; telephone 218/768-2402. Accidents or injuries should also be reported to this address.

**NOTE:** The Sandstone Unit of the Rice Lake National Wildlife Refuge located near Sandstone, Minnesota is closed to all hunting.

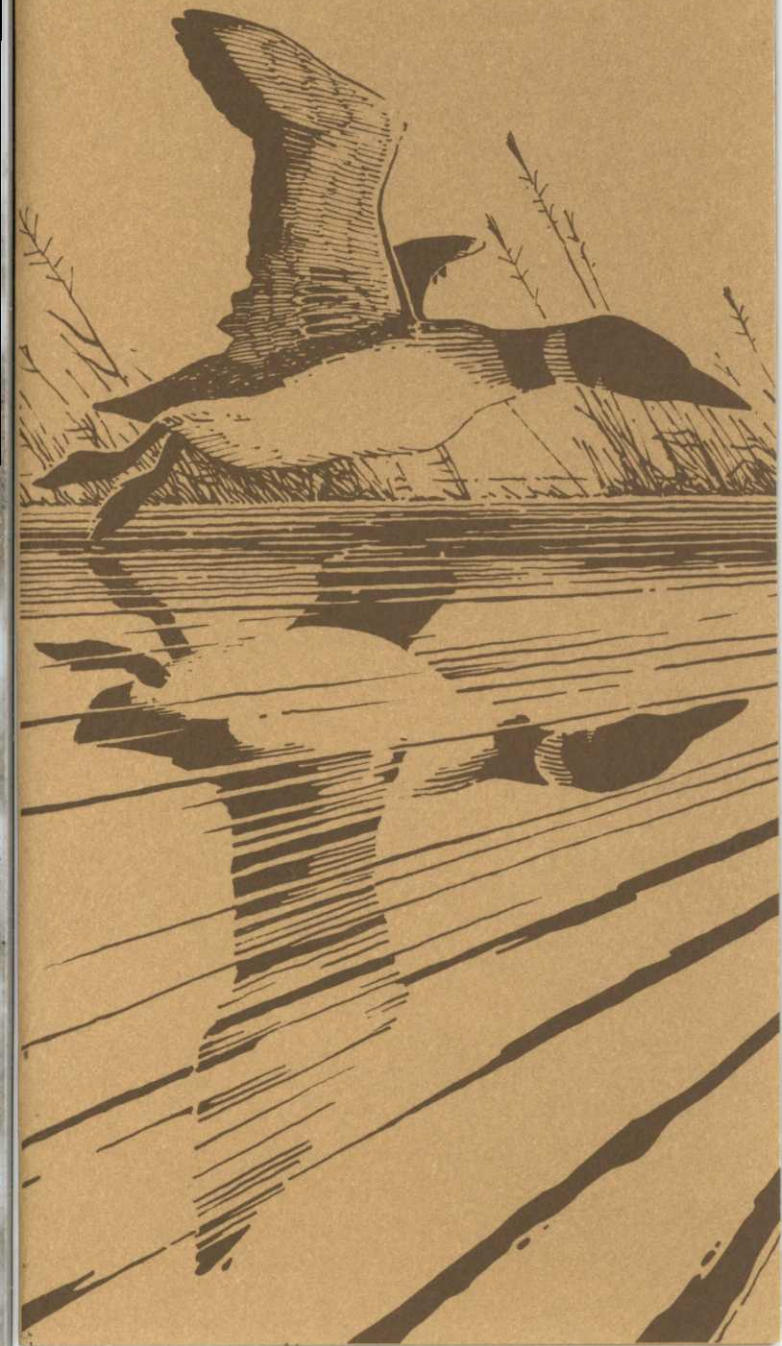


**QUALITY HUNTING DEPENDS ON YOU  
PLEASE RESPECT ALL REGULATIONS**



RF3-32540-6-9/86

**Birds of  
Rice Lake National  
Wildlife Refuge  
Minnesota**



# Birds

Rice Lake National Wildlife Refuge, containing 18,056 acres, is located in the bog country of north-central Minnesota. It is an important resting and feeding area for ducks, especially ring-necks, scaup and mallards.

Many species of waterfowl nest on the refuge, including an established Canada goose flock. The 4,500-acre Rice Lake is noted for its extensive wild rice beds, an important waterfowl food.

The refuge is located in the transition zone between the coniferous forests of northern Minnesota, and the hardwood forests of the southern part of the state. Habitat varies from open water to heavily forested uplands. Scattered grasslands, small lakes and croplands result in a variety of bird species.

Waterfowl are best observed in September and October, and again in April and May. Of special interest are sharp-tailed grouse, usually found near the refuge's cropped farm fields, and large numbers of ring-necked and other diving ducks in the fall.

The following list contains 219 species which have been observed at Rice Lake National Wildlife Refuge. Another 14 species are listed which have been seen on the refuge, but are not normally expected to be present.

The English, or common names of birds are in accordance with the American Ornithologists' Union's "checklist of North American Birds" revised in 1976. Season and abundance are coded as follows:

- PR - Permanent Resident (year-round)
- SR - Summer Resident (spring, summer, fall)
- WR - Winter Resident (fall, winter, spring)
- M - Migrant (spring and fall migration)
- WV - Winter Visitor (winter only)
- a - abundant (a common species which is very numerous)
- c - common (certain to be seen in suitable habitat-not in large numbers)
- u - uncommon (present, but not always seen)
- o - occasional (usually present, but seldom seen)
- r - rare (seen at irregular intervals)

Solid lines = Orders  
Dashed lines = Families

Common Loon	SR-u
Red-necked Grebe	M-o
Horned Grebe	M-u
Eared Grebe	M-o
Pied-billed Grebe	SR-u
White Pelican	M-o
Double-crested Cormorant	SR-o
Great Blue Heron	SR-c
Green Heron	SR-u
Great Egret	M-o
Black-crowned Night Heron	M-u
Least Bittern	SR-r
American Bittern	SR-u
Whistling Swan	M-u
Canada Goose	SR-c
White-fronted Goose	M-o
Snow Goose	M-o
Mallard	SR-a
Black Duck	SR-u
Gadwall	M-u
Pintail	SR-u
Green-winged Teal	SR-c
Blue-winged Teal	SR-c
Cinnamon Teal	M-r

Woodcock



American Wigeon	SR-c	
Northern Shoveler	M-u	
Wood Duck	SR-c	
Redhead	M-u	
Ring-necked Duck	SR-a	
Canvasback	M-u	
Greater Scaup	M-r	
Lesser Scaup	M-a	
Common Goldeneye	M-u	
Bufflehead	M-u	
White-winged Scoter	M-r	
Ruddy Duck	M-u	
Hooded Merganser	SR-u	
Common Merganser	M-u	
Red-breasted Merganser	M-u	
Turkey Vulture	SR-o	
Goshawk	PR-u	
Sharp-shinned Hawk	SR-u	
Cooper's Hawk	SR-u	
Red-tailed Hawk	SR-u	
Red-shouldered Hawk	M-r	
Broad-winged Hawk	SR-u	
Swainson's Hawk	M-o	
Rough-legged Hawk	WV-u	
Golden Eagle	WV-r	
Bald Eagle	SR-u	
Marsh Hawk	SR-c	
Osprey	SR-o	
Peregrine Falcon	M-o	
Merlin	M-u	
American Kestrel	SR-c	
Spruce Grouse	PR-r	
Ruffed Grouse	PR-c	
Sharp-tailed Grouse	PR-u	
Sandhill Crane	SR-u	
Virginia Rail	SR-u	
Sora	SR-u	
Yellow Rail	SR-o	
American Coot	SR-u	
Semipalmated Plover	M-r	
Killdeer	SR-c	
American Golden Plover	M-r	
Black-bellied Plover	M-o	
American Woodcock	SR-u	
Common Snipe	SR-u	
Upland Sandpiper	M-u	
Spotted Sandpiper	SR-c	
Solitary Sandpiper	M-u	
Greater Yellowlegs	M-u	
Lesser Yellowlegs	M-u	
Pectoral Sandpiper	M-u	
Least Sandpiper	M-r	
Short-billed Dowitcher		M-u
Long-billed Dowitcher		M-u
Stilt Sandpiper		M-u
Semipalmated Sandpiper		M-o
Sanderling		M-o
Wilson's Phalarope		M-o
Northern Phalarope		M-o
Herring Gull		M-o
Ring-billed Gull		M-u
Franklin's Gull		M-o
Bonaparte's Gull		M-o
Forster's Tern		SR-u
Common Tern		SR-u
Caspian Tern		M-u
Black Tern		SR-c
Mourning Dove		SR-u
Yellow-billed Cuckoo		SR-u
Black-billed Cuckoo		SR-u
Screech Owl		SR-u
Great Horned Owl		PR-u
Snowy Owl		WV-o
Hawk-Owl		WV-o
Barred Owl		PR-u
Long-eared Owl		SR-u
Short-eared Owl		SR-u
Saw-whet Owl		WV-u
Whip-poor-will		SR-u
Common Nighthawk		SR-c
Chimney Swift		SR-c
Ruby-throated Hummingbird		SR-u
Belted Kingfisher		SR-u
Common Flicker		SR-c
Pileated Woodpecker		PR-u
Red-headed Woodpecker		SR-u
Yellow-bellied Sapsucker		SR-u
Hairy Woodpecker		PR-u
Downy Woodpecker		PR-c
Black-backed Three-toed Woodpecker		WV-o
Eastern Kingbird		SR-u
Western Kingbird		M-o
Great Crested Flycatcher		SR-u
Eastern Phoebe		SR-c
Yellow-bellied Flycatcher		M-o
Alder Flycatcher		SR-o
Least Flycatcher		SR-u
Eastern Wood Pewee		SR-u
Olive-sided Flycatcher		SR-u
Horned Lark		M-c
Tree Swallow		SR-c
Bank Swallow		SR-u
Rough-winged Swallow		SR-o



Heron

Barn Swallow	SR-u
Cliff Swallow	SR-c
Purple Martin	SR-u
Gray Jay	WV-o
Blue Jay	PR-c
Black-billed Magpie	M-o
Common Raven	WV-u
Common Crow	SR-c
Black-capped Chickadee	PR-c
White-breasted Nuthatch	PR-u
Red-breasted Nuthatch	M-o
Brown Creeper	M-u
House Wren	SR-u
Long-billed Marsh Wren	SR-u
Short-billed Marsh Wren	SR-c
Mockingbird	M-r
Gray Catbird	SR-u
Brown Thrasher	SR-u
American Robin	SR-c
Wood Thrush	SR-u
Hermit Thrush	SR-u
Swainson's Thrush	SR-u
Veery	SR-u
Eastern Bluebird	SR-u
Golden-crowned Kinglet	M-u
Water Pipit	M-o
Bohemian Waxwing	WV-o
Cedar Waxwing	SR-u
Northern Shrike	WV-u
Loggerhead Shrike	SR-o
Starling	PR-c
Red-eyed Vireo	SR-u
Warbling Vireo	M-u
Black-and-white Warbler	M-u
Tennessee Warbler	M-u
Orange-crowned Warbler	M-u
Nashville Warbler	M-u
Northern Parula	SR-o
Yellow Warbler	SR-u
Yellow-rumped Warbler	M-u
Black-throated Green Warbler	SR-u
Blackburnian Warbler	SR-u
Chestnut-sided Warbler	SR-u
Blackpoll Warbler	M-u
Palm Warbler	M-u
Ovenbird	SR-u
Northern Waterthrush	SR-o
Connecticut Warbler	SR-o
Mourning Warbler	SR-o

Common Yellowthroat	SR-u
Wilson's Warbler	M-u
American Redstart	M-u
House Sparrow	PR-c
Bobolink	SR-c
Eastern Meadowlark	SR-u
Western Meadowlark	SR-o
Yellow-headed Blackbird	SR-u
Red-winged Blackbird	SR-c
Northern Oriole	SR-u
Rusty Blackbird	M-u
Brewer's Blackbird	SR-c
Common Grackle	SR-u
Brown-headed Cowbird	SR-u
Scarlet Tanager	SR-u
Cardinal	M-u
Rose-breasted Grosbeak	SR-u
Indigo Bunting	SR-u
Evening Grosbeak	WV-u
Purple Finch	M-u
Pine Grosbeak	WV-u
Common Redpoll	WV-u
Pine Siskin	PR-u
American Goldfinch	SR-c
Rufous-sided Towhee	SR-u
Savannah Sparrow	SR-c
Grasshopper Sparrow	SR-o
Vesper Sparrow	SR-u
Dark-eyed Junco	M-c
Tree Sparrow	M-u
Chipping Sparrow	SR-u
Clay-colored Sparrow	SR-u
Field Sparrow	SR-u
Harris' Sparrow	M-u
White-crowned Sparrow	SR-u
White-throated Sparrow	SR-u
Fox Sparrow	M-u
Lincoln's Sparrow	M-u
Swamp Sparrow	SR-u
Song Sparrow	SR-c
Lapland Longspur	M-u
Chestnut-collared Longspur	M-o
Snow Bunting	WV-c

The following birds have been seen at Rice Lake but are either no longer present, are not normally found in this area, or do not ordinarily stop here during migration.

Brant	Western Sandpiper
Gyrfalcon	Marbled Godwit
Greater Prairie Chicken	Hudsonian Godwit
Ring-necked Pheasant	Great Gray Owl
Whooping Crane	Red-bellied Woodpecker
Ruddy Turnstone	Mountain Bluebird
Willet	White-winged Crossbill

NOTES

Date \_\_\_\_\_ No. Species \_\_\_\_\_

Time Afield \_\_\_\_\_

Observers \_\_\_\_\_

Weather \_\_\_\_\_

Remarks \_\_\_\_\_

Refuge headquarters is located just off State Highway 65, south of the town of McGregor, Minnesota. Additional information can be obtained from the Refuge Manager, Rice Lake National Wildlife Refuge, McGregor, MN. 55760. Phone: (218) 768-2402

Visitors are requested to report unusual bird sightings to the refuge office at the above location.



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



RF-32540-2

May 1979