REVIEW AND APPROVALS

RICE LAKE NATIONAL WILDLIFE REFUGE

McGregor, Minnesota

ANNUAL NARRATIVE REPORT

Fiscal Year 1997

6-16-99

Refuge Manager Date

GARD, Refuges and Wildlife/Geo-3

6/28/99

Regional Office Approval Date

INTRODUCTION

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 refuge's 18,281 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 90,000 birds. Other important migrants include mallards, canvasbacks and Canada geese. Although used mainly as a migration stop, wood ducks, mallards, ringnecks, teal 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, songbirds, raptors and nearly all other species associated with the bogs and forests of northern Minnesota, including an occasional moose and 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 and 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 on 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 and shop buildings, two major water control structures (one for Rice Lake and the second for the Rice River impoundment), limited public use facilities and associated support equipment. Major facility improvements were accomplished during the BLHP program in the late 1970's and with MMS funds in the mid-1990'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, MN) of Rice Lake N.W.R. are also administered from the Rice Lake Office, McGregor, MN.

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RICE LAKE NATIONAL WILDLIFE REFUGE
(including the Sandstone Unit)

Highlights

Rice Lake (the lake) was **officially designated an Important Bird Area** (IBA) by the American Bird Conservancy in 1997. An IBA is a site which provides essential habitat for one or more species of breeding or non-breeding birds which congregate or concentrate in certain habitat areas or types for all or part of the year. IBA's do not address dispersed species such as warblers. The American Bird Conservancy uses specific population and habitat criteria to designate these sites. The American Bird Conservancy administers the global and national IBA's while the National Audubon Society administers the state level IBA's. Currently, there are no state level IBA's in Minnesota. There is no statutory designation within an IBA, therefore it does not effect or restrict land management activities (ie. timber harvest, prescribed burning, etc.). The program is an effort to focus attention on areas which have significant value for bird conservation. It is likely that Rice Lake was selected on the basis of the large concentration of waterfowl, primarily ring-necked ducks, on the lake in the fall. Mille Lacs NWR was also nominated by Refuge staff but was rejected based on the American Bird Conservancy's criteria.

Climate

FY 1997 Weather Summary

	Temperature		**Precipitation**	**Snow**	
	Max	Min	(inches)	Snowfall	On Ground
Oct.	76	10	3.45	T	T
Nov.	55	- 8	3.61	12.5	8.5
Dec.	33	- 24	1.25	15.0	14.5
Jan.	36	- 35	2.36	24.5	26.0
Feb.	46	- 14	0.70	11.5	30.0
Mar.	56	- 12	1.37	13.0	20.0
Apr.	65	2	0.50		
May	83	27	1.75		
Jun.	92	45	4.66		
Jul.	89	44	6.41		
Aug	87	43	2.06		
Sep.	84	36	2.06		
1997	***92***	***-35***	***30.18***	***76.5***	

1. Monitoring and Studies

a. Surveys and Censuses

For the second year in a row no **eaglets** were produced on the refuge. The nest on the southwest side of Rice Lake was active but produced no young. A pair of adult eagles was seen on several occassions near the South Trail nest, however no nest attempt was made by the pair. The bald eagle nest near the Sandstone Unit was active and produced two eaglets.

An **osprey nesting platform** was erected on private land next to Wilkins Lake in Aitkin County through a cooperative effort between the FWS, Mille Lacs Electric Cooperative, and a private landowner (Jon Sampson). Last year, a pair of osprey had attempted to nest on the old pole that was leaning severely. Rice Lake Refuge staff built the platform, Mille Lacs Electric replaced the old leaning pole with a new pole and the platform, and the osprey successful nested this year.

Osprey nesting platform constructed by Refuge staff
and erected by Mille Lacs Electric Co.

Fall (1996) waterfowl numbers peaked in late October at 56,000 birds, including 40,000 ring-necks, and 14,000 mallards. At the same time, DNR waterfowl biologist Jeff Lawrence, reported 100,000 ring-necks on Nett Lake and 125,000 ring-necks on Drumbeater Lake. Both of these lakes are to the north of Rice Lake, but within 100 miles. To our knowledge these birds never set down on Rice Lake. Lawrence also reported low numbers of mallards this fall throughout north-central Minnesota. During the **fall of 1997, waterfowl numbers** had started to build slightly, with many early migrating species peaking by the end of October, such as blue-winged teal (2300) and wood duck (1000). A Canada goose/domestic goose cross, 28 snow geese, and approximately 40 Richardsons' Canada geese were also observed during fall (1997) surveys.

Canada geese were again the first waterfowl to return in the spring, arriving on March 10. All waters were ice free by April 21. Other early spring arrivals include great blue herons, tundra

swans, mallards, kestrels, and robins.

Waterfowl breeding pair counts for Rice Lake increased from 272 pairs last year to 337 pairs this year. Mallards, wood ducks, blue-winged teal, and ring-necked ducks comprised the bulk of the total (Fig. 1). Mallard pairs appear to be well above the average and blue-winged teal pairs have increased from last year. Wigeon and ring-necked duck pairs have increased slightly, however Canada goose and wood duck pairs have declined. Breeding pair counts on the Sandstone Unit included: Canada goose - 5 pairs, blue-winged teal - 5 pairs, and mallard - 4 pairs.

Waterfowl Production for the Rice Lake and Sandstone Units are presented in Table 1 and 2 respectively.

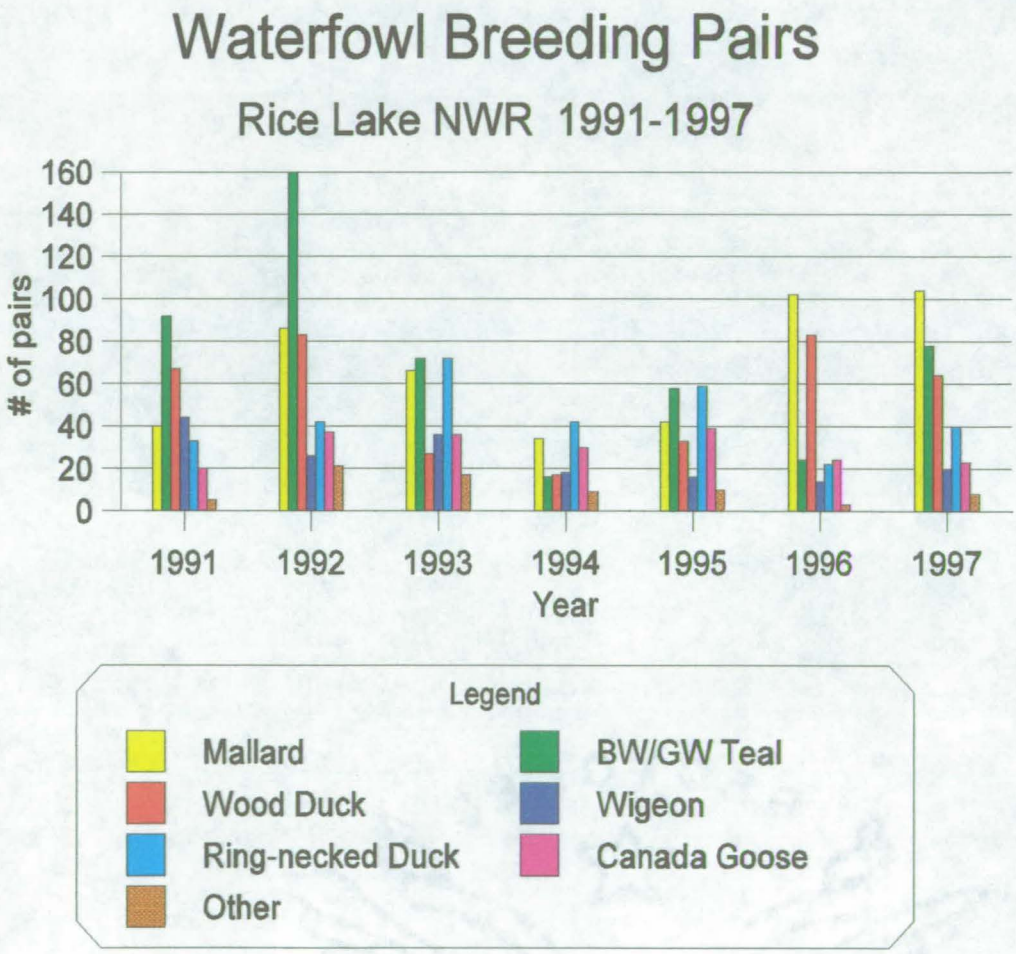


Figure 1. Waterfowl Breeding Pairs on Rice Lake NWR (1991-1997).

Table 1. Waterfowl Production at Rice Lake NWR, 1991-1997.

SPECIES	1980-90 Avg.	91	92	93	94	95	96	97
Canada Goose	64	50	70	10	42	20	20	32
Mallard	110	92	80	30	92	74	152	156
Black Duck	7	0	5	0	0	0	0	0
Pintail	2	20	0	0	0	0	0	0
GW Teal	23	0	14	10	0	5	12	0
BW Teal	90	95	60	90	30	122	20	48
Wigeon	70	20	40	80	26	14	152	0
Wood Duck	100	87	220	60	70	87	47	117
Ring-necked Duck	35	130	40	80	70	106	100	120
Hooded Merg.	20	13	27	17	0	10	23	20
TOTALS	521	507	556	377	330	438	464	493

Table 2. Waterfowl Production on the Sandstone Unit of Rice Lake NWR, 1994-1997.

SPECIES	1994	1995	1996	1997
Canada Goose	30	5	20	26
Mallard	70	54	102	72
Wood Duck	50	84	40	34
Hooded Merg.	17	0	13	0
GW Teal	8	0	13	0
BW Teal	16	8	26	20
TOTALS	191	151	214	152

The **great blue heron rookery** on the south end of the refuge was checked, but no activity or nesting herons were observed.

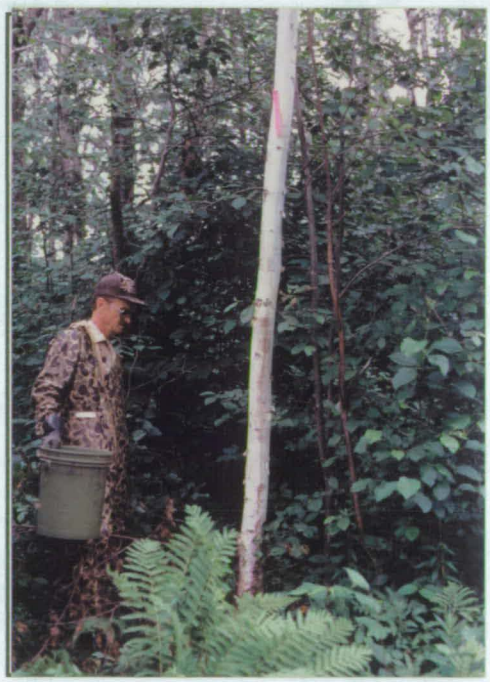
Several routes of a **marshbird survey** were completed and several species were heard including yellow rails, sora rails, American bitterns, and green herons. The survey will be expanded next year to include more routes and survey points.

Refuge personnel assisted the MN DNR in the state-wide annual **loon surveys** by surveying four lakes near Aitkin, MN. These surveys aid the MN DNR in determining the population status and estimating annual production of common loons in Minnesota.

Four **National woodcock singing ground survey** routes were completed during May. Our traditional route which is adjacent to the refuge was down four birds from last year's count of nine. Overall, woodcock appear to be declining along these routes, which would generally agree with the long-term decline reported nationally.

White-tailed deer continued to struggle through yet another tough winter. The winter severity index for the 1996-97 winter was 134, which is classified as a moderate to severe winter. This index is derived from a system of measurement that integrates temperature and snow depth. This is the second consecutive winter with this type of condition. Much deer mortality was noted after both last winter and this winter. The refusal of the MN DNR to initiate a winter feeding program has recently sparked some controversy among deer advocates in Minnesota, but there has been very little public comment toward deer management on the Refuge. Results of the **1996 deer harvest** are reported in Section 7 and are also found in the 1996 annual narrative.

A **bull moose** was observed in the cropfields area in late September (1997). Moose sightings in the past have been rare for Rice Lake.



DNR Area Wildlife Manager Dave Dickey placed two tetracycline laced bear baits on the Refuge to estimate the population in Minnesota and assist in establishing future harvest quotas.

The annual **muskrat** house and **beaver** lodge surveys were not conducted in the fall of 1996.

Three spring drumming count surveys of **ruffed grouse** were conducted on the Refuge in May 1997. The count remained about the same as last year. A total of 55 males were heard, or 1.1 grouse/stop. Ruffed grouse drumming trends for the Refuge are noted in Figure 2. The number of males heard on one route on the Sandstone Unit increased from three to nine males (up 200%). The drums/stop for the Sandstone Unit were 0.46, 0.23, and 0.69 for 1995, 1996, and 1997 respectively. The Minnesota DNR survey results for the zone surrounding the Rice Lake and Sandstone Units was 2.3 drums/stop.

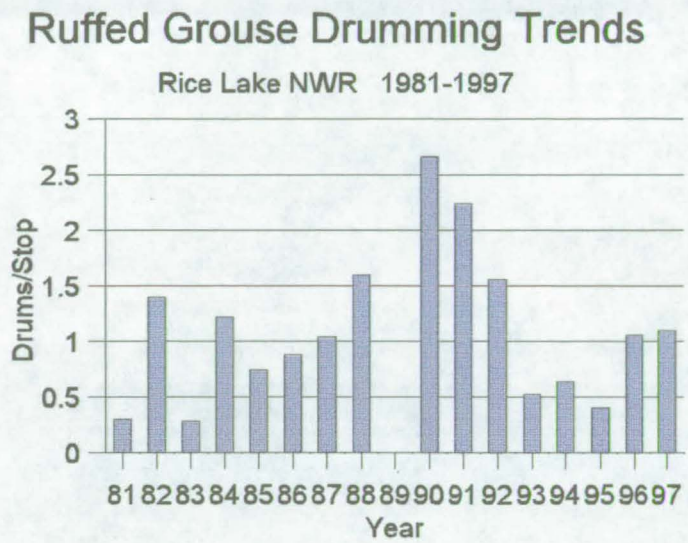


Figure 2. Ruffed Grouse Drumming Trends for Rice Lake NWR (81-97).

Sharp-tailed grouse continue to be absent from their dancing grounds at the cropfields area of the Rice Lake Unit, however they are occasionally seen on the refuge. These birds may be utilizing the Kimberly WMA which is adjacent the north boundary of the refuge. Six males were observed on the dancing grounds of the Sandstone Unit. Results of the sharp-tailed grouse dancing ground surveys are illustrated in Fig. 3. According to Minnesota DNR surveys, the east-central zone, which includes both Sandstone and Rice Lake, averaged 7.5 males per lek (dancing ground).

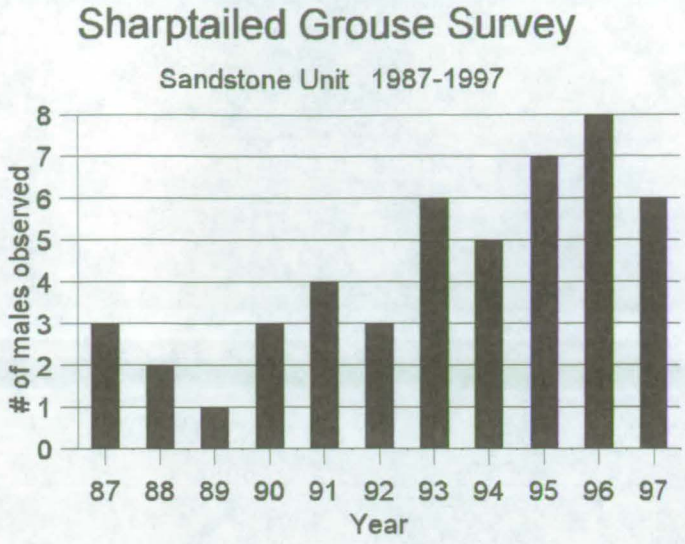


Figure 3. Sharptailed Grouse observed on the Sandstone Unit lek (1987-1997).

A **frog and toad survey** was completed for the second consecutive year on both Rice Lake and Sandstone Units. Six species were detected on Rice Lake including wood frogs, chorus frogs, spring peepers, and leopard frogs eastern gray tree frogs, and American toads. Eight species were detected on the Sandstone Unit including wood frogs, chorus frogs, spring peepers, leopard frogs, eastern gray tree frogs, green frogs, bullfrogs, and American toads.

Many refuge visitors were greeted at the headquarters by this beautiful Luna Moth.

The Refuge **Fisheries Management Plan** which was generated by the Ashland Fisheries Resource Office (FRO) was reviewed by the RO and the decision was made that the Refuge should write the plan with input from the Ashland FRO, rather than the Ashland FRO writing it with input from the Refuge. To date, the plan is still in the revision state.

The Minnesota DNR Fisheries personnel began **trapping fish** on November 5, 1996 at the Rice Lake control structure for stocking in state waters. Further reference to this trapping effort was noted in last year's (1996) narrative.

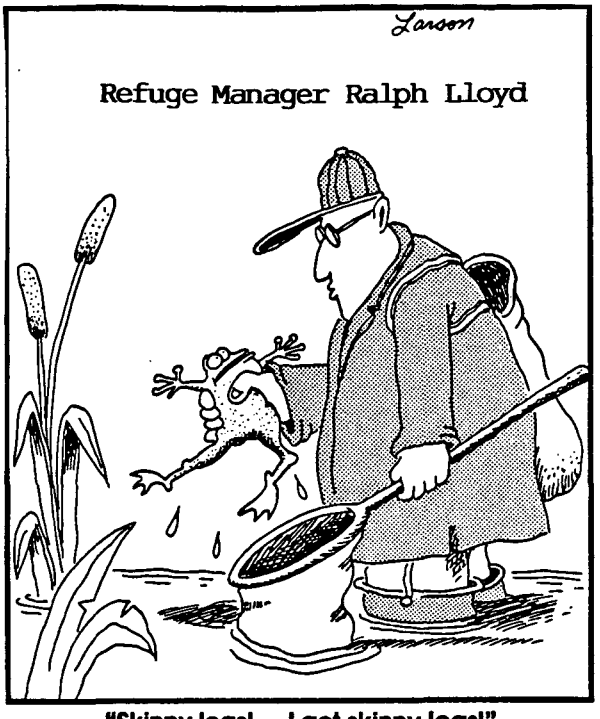
A few dead fish were noted in Mandy Lake during the spring of 1997, but there was no evidence of a large-scale winter-kill like last year.

Refuge staff continued to make progress with **forest inventory** efforts this year. Nearly half the Refuge has been inventoried to date.

b. Studies and Investigations

Refuge staff and volunteers participated in an effort to monitor **deformities in frogs and toads** on refuges in Region 3. The issue of deformed frogs and toads has risen to the surface recently and Region 3 is gathering baseline data to determine the extent of the problem. No clear evidence is available on the cause of the deformities, but many are speculating that contaminants and pollutants may be a major factor. A total of 212 frogs were collected and examined on Rice Lake NWR, including 2 leopard frogs, 59 chorus frogs, 24 wood frogs, 66 gray tree frogs, and 66 spring peepers. No deformities were noted, but 1 wood frog and four chorus frogs were missing a foot or a part of a foot. Based on the results, there are no plans at this time to further investigate this issue on the Refuge.

Refuge Manager Lloyd and volunteer Kathy Stofferahn attempt to capture frogs as part of a frog deformities investigation.



"Skinny legs! ... I got skinny legs!"

A final report of the nongame point count surveys was produced during the fall of 1996. More detail on this study can be found in the 1996 annual narrative.

Lynn Gerdes, a contract botanist with the Minnesota County Biological Survey, searched for various ferns on and in the near vicinity of the refuge. Lynn located several species of **rare ferns** including the threatened triangle moonwort (Botrychium lanceolatum), (B. metricariifolium), and (B. virginianum). He also located (B. rugulosum) and (B. simplex) in the near vicinity of the refuge, which he suspected to be present on the refuge also.

2. Habitat Restoration

a. Wetland Restoration: On-Refuge

Nothing to Report

b. Upland Restoration: On Refuge

The Refuge received 500 red maple and black ash tree seedlings from the National Tree Trust, through the City of McGregor, for planting on the recently acquired Olson Tract. This tract lies adjacent the main entrance of the Refuge. Most of these seedlings arrived with moldy roots, and are unlikely to survive. The Refuge purchased an additional 500 bur oak and 500 white spruce seedlings from the Willow River State Nursery, Willow River, Minnesota.

The Aitkin County Kinship Group assisted with tree planting on the recently acquired Olson Tract.

c. Wetland Restoration: Off-Refuge

A five acre wetland restoration was completed on the Robert Bourman property in Itasca County.

d. Upland Restoration: Off-Refuge

A "Greenshores" project in conjunction with the Aitkin County Soil and Water Conservation District is covered in detail in Sections 5a and 5c.

3. Habitat Management

a. Manage Water Levels

The two major refuge water impoundments, Rice Lake and the Rice River Pool, are managed to provide favorable food and habitat conditions for waterfowl and other wetland wildlife. Rice Lake, a large, shallow natural lake, is managed for the production of wild rice and other aquatic vegetation. Wild rice production requires fairly stable water levels throughout the growing season (early May - late September). Sufficient water depth must also be maintained in Rice Lake to allow access for American Indian harvesting of wild rice. The Rice River Pool, which feeds and/or drains Rice Lake, is regulated to achieve benefits for Rice Lake, as well as provide favorable conditions for growth and availability of moist soil plants, nesting waterfowl, and fall migration habitat within the pool itself.

Rice Lake was ice free by April 21. Objective and actual water levels for Rice Lake during the 1997 spring/summer seasons are depicted in Figure 4. Heavy snowfall during the 96-97 winter produced a large amount of spring runoff early in April when snow and ice began to melt. The actual water level was lowered close to the objective level by May 20. Evaporation and lack of precipitation dropped the water level below objective by June 10. Precipitation in late June rose the water level slightly above the objective and remained fairly stable throughout the entire summer (or growing season), thus the lake produced a good crop of wild rice this year.

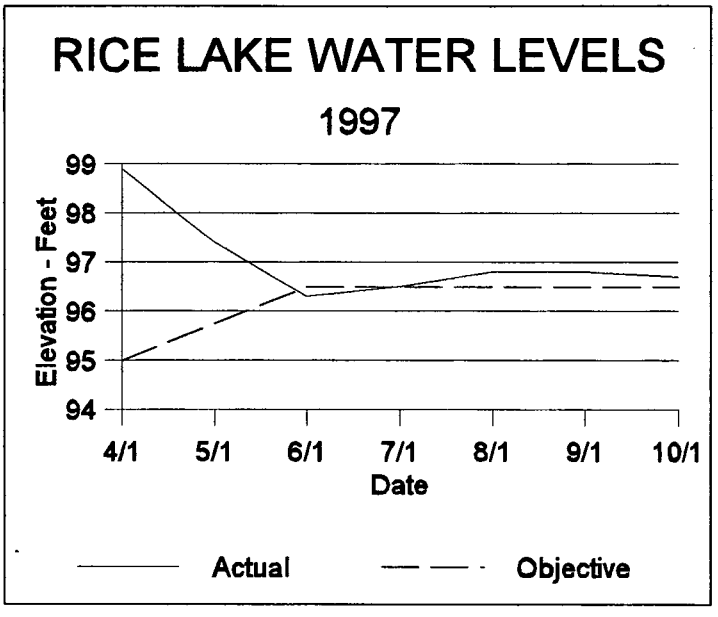


Figure 4. Objective and actual water levels for Rice Lake (1997).

The Rice River was free of ice on April 10. Objective and actual water levels for the Rice River for 1997 are shown in Figure 5. Normal spring run-off raised the water level of the Rice River well above the objective level in early April, but was lowered close to objective by May 1. Heavy precipitation in late June and throughout July caused the river to rise about two feet above of the objective level. Normally this river would be at a much lower level during this same time period to promote the production of moist soil plants and other aquatics. The water level in the river was again lowered close to objective, but the draw-down was too fast and much too late to promote moist soil plant production. From mid-August to early October the water level remained slightly below objective level (the latter part of this period was a re-flooding phase). The water control structure on the Rice River was completely opened for the winter on November 4.

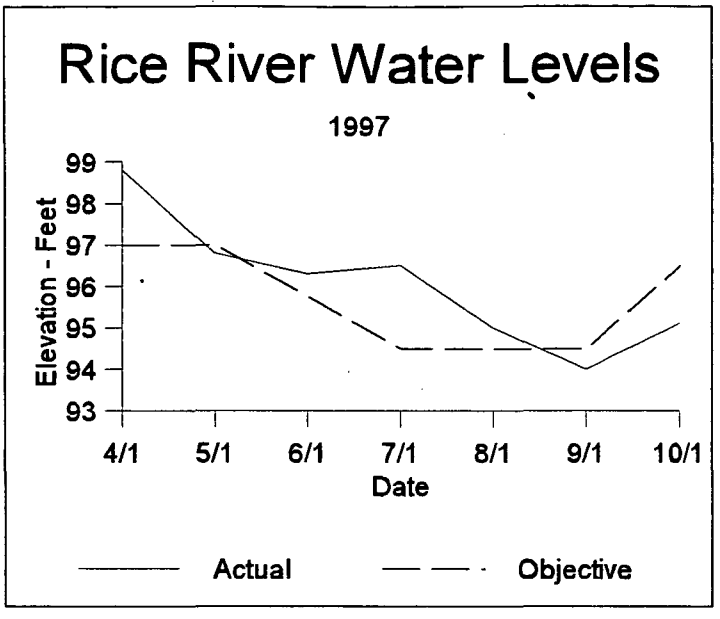


Figure 5. Objective and actual water levels for the Rice River (1997).

All small managed pools in the Refuge including the West Pool, Hilltop Pool, Rice Lake Pool, Beaver Pool, and North Pool held water throughout the year. Water levels in these impoundments are controlled by concrete risers with stop-logs which are closed in the spring and opened over the winter. A beaver leveler which was installed in Beaver Pool continued to serve its purpose well throughout the year by preventing flooding of the South Trail Road.

b. Manage Moist Soil Units

Nothing to report.

c. Graze/Mow/Hay

In October, approximately 60 acres of brush and small trees were mowed within various burn units using the Region's hydro-axe. Lack of frozen (solid) ground prevented access to many of the targeted areas and reduced the total amount of brush which could be mowed.

A total of 407 acres on Rice Lake and 92 on the Sandstone Unit were cut for hay by 5 permittees, yielding 421 and 169 tons of wild grass hay, respectively. Almost all hay harvested at Rice Lake and Sandstone is harvested on a rotational basis with one-half harvested each year and one-half left unharvested to increase grass cover.

d. Farming

In the 1997 crop year, 50 acres were seeded, according to schedule, to a mixture of oats and

legume. Due to very wet conditions in June and July, yield of oats was very poor resulting in harvest of hay only.

e. Forest Cutting

All timber harvest plans for the Refuge have been temporarily postponed until all forest inventory has been completed, so sound biological management decisions can be made for the future. As mentioned earlier, approximately one-half the inventory process has been completed to date.

The transfer of Biological Technician Lapp left the Refuge with no trained personnel to write Forest Stewardship plans. Much consideration was given to contracting private consultants to write the plans, but this idea has yet been approved.

f. Prescribed Burning

Three units totaling 1500 acres were burned using prescribed fire during May of 1997. The major objective for all three units was to top kill woody vegetation (primarily alder and willow brush) and reduce the litter cover. All prescribed burning was done in marsh and grass/brushland management units as described in the Refuge Landscape Plan. The ultimate goal of most prescribed fire on the Refuge is to perpetuate marsh, bog, and grass/brush habitats.

Units burned on the Refuge included R2, R12, and R14. Unit R2 burned with excellent results. By postponing the burn until late May, much of the willow had began to "leaf-out", which resulted in excellent "top-kill". The Unit was approximately 1340 acres and was the largest prescribed burn on the Refuge to date. Small parts of this unit (84 acres on the east side and 52 acres on the west side) have been burned in the past, but a larger burn of this caliber comes closer to mimicking historical wildfires and also accomplishes landscape objectives on a larger scale. Two complaints were received following this burn concerning the destruction of bird nests and wildflowers. These concerns were addressed immediately by the Refuge Manager and were also followed up with a news release in the local newspaper. Approximately 115 acres in Unit R12 also burned with good results. This unit was burned for the first time and much of the brush that had began to encroach was severely set back. During the earlier years following Refuge establishment, much of this unit had been maintained in open grassland habitat by grazing and mowing. Forty-five acres in Unit R14 burned with similar results as R12 , except a small one acre spot fire was quickly noticed and extinguished on the east side of this burn unit. All proposed burns were conducted and their objectives were accomplished.

Prescribe burn unit 2 - Postburn illustrating excellent "top-kill" of brush.

Discussion of prescribe burning portions of the North Bog were initiated among Refuge personnel. This area has not burned since the Refuge was established in 193?. A fire of this magnitude would require a RXB2 Burn Boss. FMO Swanson from Sherburne NWR is qualified but he suggested Forestry Tech. King completed necessary coursework toward this position. Refuge staff will continue to pursue this issue.

Two small electric water tanks (14 gal.) were purchased for carrying on the two Refuge ATV's for use as additional fire equipment. These two pieces of equipment provide easier and quicker transport of water during fire suppression.

Forestry Technician King was detailed to Balcones Canyonlands NWR for presuppression work from February 23 to March 15 and the Laurential District of the Superior National Forest from June 1 to June 6.

Biologist Brininger completed basic fire fighter training (S130/S190) in April and burn monitoring (RX80) in July. The Refuge hopes to establish a burn monitoring plan in the near future.

Forestry Technician King completed S-231 (Engine Boss) training in November 1996.

g. Control Pest Plants

Roundup was the only herbicide used in 1997. It was minimally used around the new Refuge Headquarters to kill weeds for landscaping purposes. It was also used in public parking areas for aesthetic purposes. Canada thistle was mowed along roadsides and near water control structures during routine maintenance. Thistle does not appear to be a problem in any other areas.

4. Fish and Wildlife Management

a. Bird Banding

Nothing to report.

b. Disease Monitoring and Treatment

Nothing to report.

c. Reintroductions

The Refuge in cooperation with local DNR fisheries personnel stocked Mandy Lake with 200 northern pike (avg. 0.97 lbs./fish) in December 1996. These fish were fin-clipped (left pectoral) to determine if they are able to move between Mandy Lake and the Rice River. If this movement is not documented, stocking may be needed to maintain a recreational fishing resource in Mandy Lake. Last year's results were inconclusive due to the winter-kill. A few dead fish were noted this spring ('97), but there was no evidence of a large-scale winter-kill. DNR Fisheries personnel checked dissolved oxygen in Mandy Lake in early February. Dissolved oxygen levels were 8.8 ppm immediately under the ice, 4.2 ppm three feet under the ice, and 0.2 ppm at ten feet under the ice. The maximum water depth in Mandy Lake is 16 feet deep.

d. Provide Nest Structures

The Refuge continues to maintain a small wood duck nest box program (13 nest boxes total). Three boxes were successfully used by wood ducks and 1 by a hooded merganser.

Four mallard cylinders, on restored wetlands of the Sandstone Unit, were checked for use. It was determined that none of these structures were used during the 1997 breeding season.

Two floating nest platforms for common loons on the Refuge were monitored in 1997. Both platforms were active this spring. A pair of loons on Mandy Lake produced 2 chicks, while the pair on Twin Lake abandoned the nest late in incubation. This is the third consecutive year of nest abandonment at this site.

Twenty-one bluebird boxes were monitored this year. Three boxes were used by tree swallows and one by a bluebird.

e. Predator and Exotic Control

Due to depredation on domestic turkeys, APHIS trapper Bill Paul trapped two adult female gray wolves and two yearling females on the Hanson farm two miles south of the Refuge. One of the adult females was lactating and the other adult female was dry but had pups in the past. All four wolves were destroyed. This is the second consecutive year that APHIS trappers were needed at

the Hanson farm.

Refuge personnel deployed ten gypsy moth traps during the summer. These traps were collected in September and sent to the USDA Forest Service in St. Paul for analysis. One male gypsy moth was discovered in a trap set at the Refuge Headquarters along highway 65. The Minnesota state gypsy moth coordinator intends to conduct an intensive monitoring effort in a ten square mile area around this capture point in 1998.

5. Coordination Activities

a. Interagency Coordination

Rice Lake staff actively participated with the following agencies dealing with resource and customer concerns:

1. Big Sandy Area Lakes Watershed Management Project
2. Aitkin County Water Planning Task Force
3. McGregor Area Chamber of Commerce
4. Aitkin County Forest Advisory Committee
5. Aitkin County Soil and Water Conservation District
6. Central Lakes College Natural Resources Advisory Committee
7. DNR Fire Warden (permits)
8. Aitkin Area DNR Ecosystem Team (invitee)
9. Aitkin County InteragencyLaw Enforcement meetings
10. Savanna Portage State Park Comprehensive Planning Committee
11. Aitkin County Conservation Review Group
12. Cooperative agreement with DNR Forestry for fire suppression activities

b. Tribal Coordination

Mushkooub, a member of the local Ojibwe community, informed the refuge in April that we would be given 72 hours notice before fish spearing began. Our assumption was that the notice referred to the 1837 Treaty issue, but the ceded territory included in the Treaty only includes the Sandstone Unit, not the main refuge. A call several days later informed us that the spearing issue was on hold.

Refuge Manager Lloyd attended a meeting with Sherburne Manager Blair, ARW Fuller and Refuge Operations Chief Hultman to discuss hunting and fishing rights contained in the 1837 Treaty that would concern refuge lands. Questions from the meeting were submitted to the Solicitor's Office for opinion.

In April, an informal request was made by members of the local Ojibwe community to build a ceremonial dance hall on the refuge, citing Executive Order 13007 (r.e. Indian Sacred Sites). The request was made again in July. Refuge Manager Lloyd informally denied the request, but said he

would accept a formal and detailed written request and submit it through proper channels. The request was made informally again, this time through the ARW's office, and informally denied.

Same members requested, under Executive Order 13007, use of the "Headquarters Hill" for drum ceremonies, or pow-wows. A check with Refuge Operations in the RO confirmed that we would honor the request, with conditions, even though it was not made by a Congressionally recognized Tribe. A Compatibility Determination was completed, and a Letter of Authorization and Special Use Permit prepared. Ceremonies were held in May and June, and another in September, with only minor problems encountered.

Tent erected for drumming ceremonies.

Prior to the 1997 hunting season, questions arose concerning Tribal hunting within the Sandstone Unit. The primary concern was for public safety, that no firearms hunting should accur in the Unit since it is only open to public archery hunting. In consultation with the Mille Lacs Band Commissioner of Natural Resources, it was decided that the Band would cooperate and not allow rifle hunting on the Unit.

The wild rice harvest on Rice Lake began on September 9. More ricers participated in the 1997 harvest than for several years. Mushkooub, ricing committee Chair, provided the refuge a copy of their ricing regulations, along with a self-designed Special Use Permit. Committee member Dale Greene told us that approximately 23,000 pounds of rice were harvested. A strong storm on September 18, knocked the remaining rice from the heads, ending the harvest.

c. Private Land Activities

The refuge, in cooperation with the Aitkin County Soil and Water Conservation District, completed several "Greenshores" projects. Partners for Wildlife funds were used to purchase fencing and pasture pumps to exclude livestock from water areas. Projects were completed on two farms, protecting 0.75 miles of shoreline and five acres of upland habitat on Luoma Lake. A

third project protected 0.25 miles of lakeshore on Pickeral Lake and a fourth, when completed, will protect Mississippi River shoreline.

Pasture pump and fencing supplied by the Refuge for the Greenshores program used to exclude livestock from wetlands and other riparian areas.

d. Oil & Gas Activities

Nothing to report

e. Cooperative/Friends Activities

Nothing to report

6. Resource Protection

a. Law Enforcement

Law enforcement patrols on the refuge were conducted approximately one day every other week-end from Memorial Day through the hunting seasons in an effort to show an enforcement presence and to document public use activities.
ROS Francis spent the week-end of July 23-24, assisting Minnesota Valley NWR with enforcement activities and also volunteered for a week-end detail at Walnut Creek NWR to work security during a dedication visit by Vice President Gore.

During the year, four acts of vandalism and one deer poaching went unsolved.

In addition, the following violations were recorded:

Violation	Number	Action
1. Vehicle speed	2	Verbal Warning
2. In refuge after hours	2	Verbal Warning
3. Vehicle off designated roadway	1	NOV
4. Uncased bow in vehicle	1	given to State
5. Possession lead shot hunting waterfowl	2	NOV/Verb Warn
6. Unsigned Duck Stamp	1	NOV
7. Driving Wrong Way	2	Verbal Warning
8. Access State land through refuge for hunting	1	Verbal Warning
9. Hunt deer with a firearm during archery only	1	NOV
10. Hunt deer from back of pickup	1	Verbal Warning

b. Wildfire Preparedness

A cooperative agreement is maintained with the Minnesota DNR-Division of Forestry for the sharing of resources for wildfire suppression on or near the refuge.

c. Manage Permits and Economic Uses

The East Lake Ricing Committee administered and managed the Native American wild rice harvest (see Section 5.b.)

Special Use Permits were issued to five individuals for hay harvest on Rice Lake and the Sandstone Unit.

Cooperative Farming Agreements were issued to two individuals.

A Special Use Permit was issued to Mark Demenge for vehicle access through refuge lands to a State timber sale.

A Special Use Permit was issued to the Mille Lacs Band of Ojibwe (Youth Services) to tap maple trees as an educational demonstration.

A Special Use Permit was issued to the McGregor Boy Scout Troop for an overnight campout and merit badge hike.

Special Use Permits were issued on three occasions for the holding of Drum Ceremonies on the refuge under Executive Order 13007 (Access to sacred sites). See Section 5.b.

d. Contaminant Investigation and Cleanup

Nothing to report

e. Manage Water Rights

Nothing to report

f. Manage Cultural Resources

Nothing to report

g. Federal Facility Compliance Act

Nothing to report

h. Land Acquisition

Nothing to report

i. Wilderness and Natural Areas

Nothing to report

j. Threats and Conflicts

Nothing to report

7. Public Education and Recreation

a. Provide Visitor Services

In an effort to provide better customer service, refuge staff took turns staffing the office on Saturdays from mid-May through October. Since this effort replaced a normal staff day, we will evaluate the benefits gained versus a workday lost. Approximately 1400 visitors came into the headquarters during the year, with over 16,000 visitors on the refuge.

Ten thousand copies of the new format Refuge Bird List were received in January.

With the relocation of the Headquarters out to Highway 65, and the refuge being mentioned in several birding publications as a desirable birding location, visitation has increased over 50 percent in the past two years. Much of this increase has been birders.

Bob Carpenter, a writer for Wild Bird magazine, visited Rice Lake in May while gathering information for an article on birding in Aitkin County. The trip was sponsored by the Aitkin Area Chamber of Commerce and he was accompanied by local birding expert Warren Nelson, Biologist Brininger and Jeff Howard, a representative from Russell and Herder Advertising. An article (found in the back of this narrative) on Aitkin County birding and Rice Lake NWR was later published by the Wild Bird magazine in Sept. 1997.

In an attempt to attract visitors during the winter and get them out of their cars, we groom several miles of our hiking trails for cross-country skiing. KKIN Radio in Aitkin included our trails in their weekly report of ski conditions.

An Refuge Open House for Fall Migration and National Wildlife Refuge Week was held October 5-20. A news release was issued, staff worked in the office week-ends and the holiday and the west gate was opened to increase visitor access. Nearly 1400 visitors used the refuge during this event.

The refuge was open to archery deer hunting, small game hunting and woodcock and snipe according to State regulations and seasons. Non-toxic shot was required to hunt small game on the refuge. Compliance with this new regulation was excellent.

Due to a reduced deer population state-wide, the Minnesota Department of Natural Resources requested we reduce the number of antlerless permits for our Special Area Hunt to fifty (originally 100) for the 1996 fall deer firearms hunt. In order to provide a hunting experience for as many as possible, and since we have staff time dedicated to the hunt anyway, we issued 50 "bucks-only" permits through the refuge office. The application process was issued through a news release. The Refuge 1996 fall deer hunt was held from November 16 - 24. A total of 16 deer were taken

during the nine day hunt, including six bucks, four does, and six fawns. Only one doe was harvested by archery, that we know of. Archery hunters are not required to register their deer at the Refuge.

Bob Kangas proudly poses with an 8-point buck which he harvested on the Refuge during the 1996 firearms deer season.

Refuge neighbor, Buck Shuroff displays a 17 lb northern pike which he caught on the Refuge.

Results of the 1996-1997 trapping season yielded a total harvest of 39 beaver, 48 muskrats, 9 raccoon and 5 mink. A total of four trappers applied for the five trapping units.

Lloyd, Francis, Young and Brininger attended a meeting for local resource agencies involved in public use. Those in attendance discussed their public use programs and facilities and distributed samples of brochures, and agreed to try to meet annually.

Landscape and general maintenance around the new headquarters continued this year. Maintenance worker Huhta poured a concrete base and installed the new flagpole, completed siding of the headquarters garage, and erected the radio tower and antenna at the new headquarters. An additional telephone line was installed to provide the shop with a direct line and new phone number. Refuge staff continued improved the headquarters landscape with tree, brush, and flower planting according to the headquarters landscape plan.

Maintenance worker Huhta siding the new headquarters garage.

My kite's higher than your kite!!

Installing radio tower and antenna at the new headquarters (or trying to coax the Biologist down after a difficult day in the office).

Maintenance worker Huhta directed the construction of a new "Romtec" restroom at the Rice River bridge. The old "run-down" restroom was removed prior to construction of the new restroom.

The new "Romtec" restroom after completion.

Refuge staff picked up litter along two miles of Highway 65 adjacent to the Refuge under MNDOT's Adopt-a-Highway program.

Three hundred cubic yards of class V gravel were "spot" spread at several locations along the wildlife drive.

A portion of the newly acquired Katchmazinski tract boundary was cleared with the dozer.

MacFarland Construction completed the roofing and siding of quarters 2.

Several projects were completed on the Sandstone Unit this year including the leveling and painting of the kiosk, installation of the new entrance sign, installation of a gate at the south parking lot and the clearing of trees and brush on the north/south road.

b. Outreach

Refuge Manager Lloyd met with Legislative Aides from Congressman Oberstar's office and representatives from Senators Grams and Wellstone's offices.

Lloyd attended meetings throughout the year with: Aitkin County Water Planning Task Force, McGregor Area Chamber of Commerce, Mississippi Headwaters/Tallgrass Ecosystem, Aitkin County Soil and Water Conservation District, Aitkin County Forest Advisory Committee, Aitkin Area DNR Ecosystem Team and Big Sandy Area Lakes Watershed Management Project.

Lloyd gave general refuge programs to the Tamarack Senior's Club and to a group of seniors at the Covenant Pines Bible Camp.

Francis participated in the Aitkin County Conservation Review Group, Central Lakes College Natural Resources Advisory Committee, Aitkin County Law Enforcement Agencies Committee, the local EnviroThon competition

Rice Lake NWR staffed information and display booths at the Aitkin County Rivers and Lakes Fair, Aitkin County Fair and McGregor Wild Rice Days.

Aitkin County Fair booth staffed by Biologist Brininger and Refuge volunteers Cecilia Brininger and Zoe Paterson.

Wild Rice Days booth staffed by Biologist Brininger and Refuge volunteers Patti Lloyd and Cecilia Brininger.

J. F. Walker of the East Lake Rangers with his daughter Gabe in the Wild Rice Days parade.

Lloyd and Francis participated in the multi-agency Aitkin/McGregor Pathways to Fishing program, the Aitkin/McGregor Take-a-Kid-Fishing Day, Kinship Fishing Day on the Refuge, and McGregor "Woodworking for Wildlife".

This is what it's all about! Take-A-Kid Fishing Day.

Monthly programs were given to the McGregor Sixth Grade throughout the school year. This was the eighteenth year for this program. Lloyd, Francis, Brininger and Young all participated in various programs.

Biologist Brininger gave general refuge programs to Aitkin Kiwanis and and Mille Lacs Kathio State Park.

Young represented the Service at a Career Day at McGregor High School.

8. Planning and Administration

a. Comprehensive Management Planning

Nothing to Report

b. General Administration

Annual Work Plans for FY's 97, 98 and 99 were submitted to the Regional Office. Mission, Goals and Objectives for Rice Lake NWR, including Mille Lacs NWR were developed and submitted to the Regional Office.

Paperwork was initiated to transfer Wayne Brininger from a Coop Student position (Agassiz NWR) to a Wildlife Biologist GS-7/9 at Rice Lake.

A review of the FY 97 budget revealed that we have almost no 1261 funds beyond fixed costs and salaries. Our only discretionary funds are in 1262 and a minor amount for Private Lands.

Five Year Annual O&M Funding History					
Funding Code	FY-93	FY-94	FY-95	FY-96	FY-97
1121	$5,000	-	$5,000	$3,000	$9,000
1230	2,000	800	-	3,700	1,000
1261	147,251	147,445	155,710	259,945	286,870
1262	187,580	129,122	156,830	25,000	18,750
9110/9251	27,115	30,900	43,160	35,570	20,163
1221	-	-	1,000	1,000	-

Rice Lake also received $300 from RO/Fisheries to offset Take a Kid Fishing expenses.

The annual station safety inspection was completed.

Wildlife Biologist Wayne Brininger's first day was January 2.

Maintenance Worker Maki and Forestry Technician King returned during the month from furlough status.

The 1997 Revenue Sharing checks in the amount of $15,975 (72.4% of total) and $3,098 were delivered to Aitkin County to Pine County respectively.

AEOA summer employee Kathy Stofferahn began work as a clerical aide and will work 32/hrs a week for eight weeks.

Zoe Paterson began volunteer service on the 26th. She is a zoology student at the University of Aberdeen in England. Zoe assisted Biologist Brininger with wildlife surveys, helped monitor the Mille Lacs tern colony and developed a refuge wildflower list. Zoe volunteered through August 18th.

A Youth in Natural Resources crew, (1 leader/5 youth) associated with Minnesota Conservation Corps Fond du Lac Reservation, spent a week removing fence from the former grazing unit.

Front: C. Brininger, P. Lloyd, Z. Paterson,
S. Young, A. Maki, W. Brininger
Back: K. Stofferahn, J. Francis, D. King, R. Lloyd,
D. Huhta

Personnel

1. Ralph O. Lloyd.... Refuge Manager, GS-12 EOD 08/09/92 PFT
2. John W. Francis..Refuge Ops Spec., GS-11 EOD 05/06/79 PFT
3. Wayne L. Brininger...Biologist....., GS-07 EOD 12/22/96 PFT
4. Sharon A.. Young.....Admin. Tech.., GS-07 EOD 01/18/79 PFT
5. Dean A. Huhta.Maintenance Worker, WG-08 EOD 07/08/84 PFT
6. Alfred L. Maki.Maintenance Worker, WG-06 EOD 04/19/92 PPT
7. Duane L. King...Forestry Tech....., GS-05 EOD 10/02/92 PPT

1. Ceceilia Brininger.....Volunteer....., 01/01/97 - 09/31/97
2. Kathy Stofferahn....Clerical Aide....., 06/18/97 - 08/22/97
3. Patricia Lloyd.....Volunteer....., 01/01/97 - 09/31/97
4. Zoe Paterson.....Volunteer....., 06/26/97 - 08/18/97
   (University of Aberdeen - England)

Feedback

Nothing to report

MILLE LACS NATIONAL WILDLIFE REFUGE

Mille Lacs National Wildlife Refuge is the smallest refuge in the nation. It 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 course gravel-type beach which varies in size depending on the current water level. Hennepin Island 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 October 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.

Mille Lacs NWR holds one of only four common tern breeding colonies in Minnesota. The common tern is currently designated a species of special concern under the Minnesota endangered species law and is proposed for listing as Threatened in the near future. Under Federal listing the common tern (Great Lakes population) is currently not listed, but is considered a species of management concern with national significance.

A project to increase common tern production at Mille Lacs NWR was initiated in 1993 with the assistance of Mille Lacs Band of Chippewa DNR biologists. The project includes installing a gull exclosure grid over the gravel beach portion of Hennepin Island during the nesting season. The grid acts as a barrier to ring-billed gulls which compete for nest sites with terns, but the grid lines are spaced to allow terns access to the beach. Former Biological Technician Chris Lapp co-authored a publication "Success and Failure of Ring-billed Gull Deterrents at Common Tern and Piping Plover Colonies in Minnesota" in Colonial Waterbirds 19(2):242-247 (publication can also be found in the appendix of this narrative.

The gull deterrent grid system was partially set up on May 13 and completed on May 23. Weekly trips were made to Hennepin and Spirit Islands to monitor the breeding success of the common terns. A total of 20 trips were made to the island during the 1997 nesting season. Common terns were first observed on Hennepin Island on May 23 and the first tern nests were established on May 31. Many of these terns nests were initiated on the southern spit of Hennepin Island. Heavy winds and wave action in early June destroyed most of the nests on the spit. Many of the terns then initiated second nests on slightly higher ground and under the grid system. More of these nests were successful and yielded some productivity. Those terns that continued to nest on the spit repeatedly had their nests destroyed by wave action.

Nesting data for the Mille Lacs NWR in 1997 is listed in Table 1. Despite some minor problems, the productivity (fledging rate) continued to increase this year. Productivity of common terns on Hennepin Island since the project was initiated is illustrated in Table 2. The productivity is still well below the 1.1 fledglings/pair that is necessary to maintain a population, but the gradual

increase in the number of fledglings and the overall productivity and is encouraging.

Table 1. Results of the nesting data for Mille Lacs NWR, 1997.

Island	Number of Nesting Pairs		# of Common Terns Fledged
	Common Terns	Ring-billed Gulls*	
Hennepin**	111	137	52
Spirit	5	182	0

* Ring-billed gull productivity was not monitored, however all gull eggs were removed from under the grid system.

**Twelve common terns and one ring-billed gull were fatalities due to grid entanglements.

Table 2. Productivity of common terns on Hennepin Island, Mille Lacs NWR, 1993*-1997.

Year	**# of tern pairs**	**# of tern fledglings**	**Fledglings/pair**
1993	104	8	0.08
1994	82	12	0.14
1995	95	19	0.20
1996	125	49	0.39
1997	111	52	0.47

* Grid system was established in 1993 and resulted in closer monitoring of the nesting colony.

Several problems were encountered with the grid system this year. Ice spars which were used during the winter to mark buoy anchor locations were missing. It is likely that large sheets of ice carried the ice spars to different locations on the lake. It is recommended that ice spars no longer be used and that all buoy equipment, including anchors, chains, and buoys be removed from the lake each winter. Some of the gravel substrate that was added in February 1996 had started to eroded or "wash-away" from the island. This problem was partially solved by placing terrace boards in the areas of the island in which the gravel was "sluffing or washing-away". Future efforts to reduce this erosion problem will be emphasized in the future. An high number of entanglements (13 common terns and 1 ring-billed gull) in the grid lines still posed a problem this year. The grid lines were initially spaced too close together when they were put up this year. The spacing was properly adjusted two weeks later and an effort was made to tighten up the grid lines to reduce entanglements. Despite some mortality, we acquired valuable information from some of

these entanglements. Three of the entangled common terns were banded with metal leg bands. Two of these birds were banded in 1989 and one in 1984. The bird banded in 1984 banded near Whipholt, MN (probably from the Pipe Island or Pelican Island colony on Leech Lake). Of the birds banded in 1989, both were banded on Mille Lacs Lake (one from Spirit Island and one from Hennepin Island based on the banding records. The bird banded on Leech Lake provides some insight on the dispersal of common terns from Minnesota colonies. Leech Lake lies approximately 75 air miles northwest of Mille Lacs NWR. Dispersal of common terns from Minnesota colonies, movements between colonies in Minnesota, and banding records were major topics of discussion at the annual Minnesota common tern working group meeting hosted this year by the Leech Lake band of Chippewa at Cass Lake. Currently Francie Cuthbert from the University of Minnesota is working on a status report for the common tern in the Great Lakes Region. She also intends to collaborate the banding records to examine the movement patterns and dispersal of common terns in Minnesota.

Sandstone Unit

Rice Lake
National Wildlife Refuge

The Sandstone Unit of Rice Lake National Wildlife Refuge is located in Pine County in east-central Minnesota about 2 miles southeast of the town of Sandstone. The unit is about 40 air-miles southeast of the main Rice Lake Unit, which is located south of McGregor, Minnesota. The Sandstone Unit was initially acquired by the United States in 1932 for the purpose of establishing a federal prison. In 1969, the Department of Justice declared a portion of the original acquisition surplus to their needs, and on February 18, 1970 the area was transferred to the Department of Interior (Fish and Wildlife Service) "for use in carrying out the national migratory bird management program." The unit encompasses 2,045 acres including upland forest, grassland, forested wetland, shallow marshes, bogs and riverine wetlands.

A majority of the Sandstone Unit is forested upland. Predominant woodland vegetation includes sugar maple, basswood, aspen, paper birch, red and white pine, and several oak species. Most of the remaining area is grassland, which is cut for hay to maintain an early successional stage. Primary old field vegetation includes goldenrod, asters and milkweed. The unit has about 160 acres of wetlands, mainly in small 1-12 acre basins.

Surface geology is glacially influenced. Bedrock is overlain by glacial till of varying depth. Bedrock is exposed along the Kettle River bluffs and canyon that occupies the western portion of the Sandstone Unit. Topography is primarily flat to rolling, with the exception of the relatively deep (80-120 ft.) canyon carved by the Kettle River.

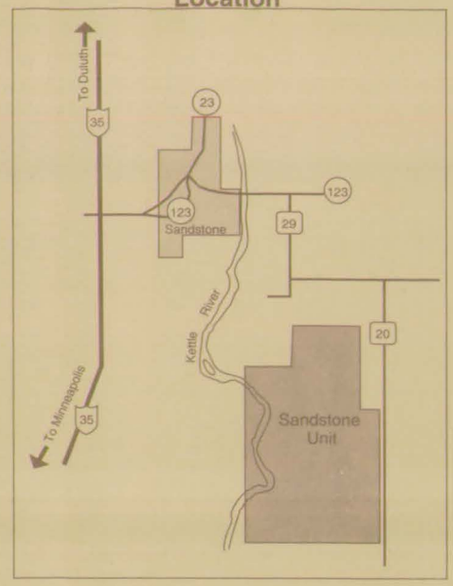
Refuge Signs
Know Their Meaning

REFUGE BOUNDARY SIGN - ENTRY FOR AUTHORIZED ACTIVITIES ONLY

AREA OPEN TO HUNTING AT SPECIFIC TIMES

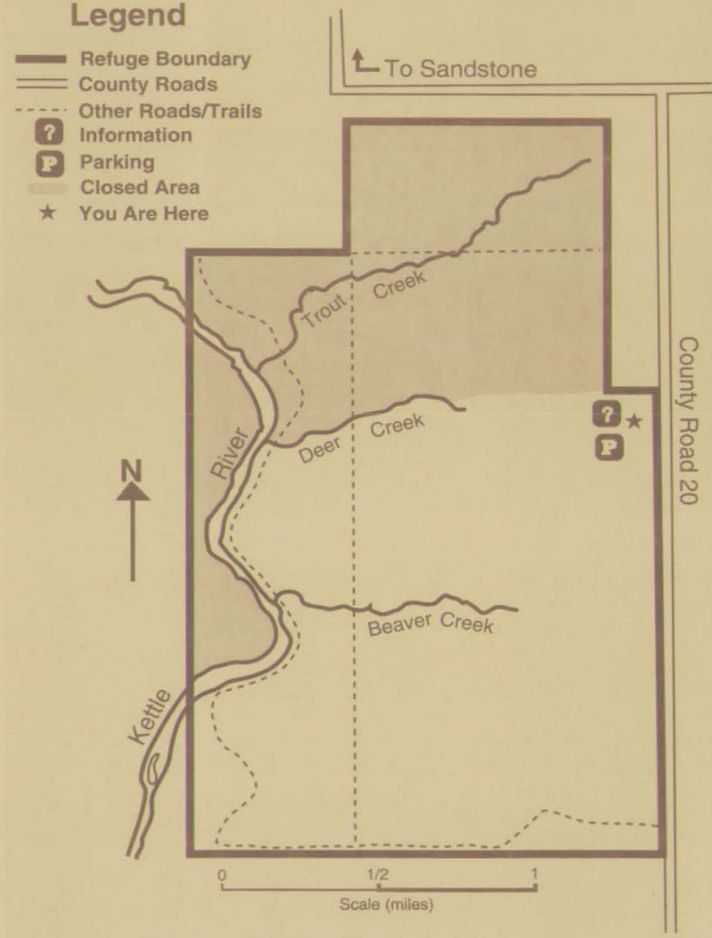
SANCTUARY AREA - OFF LIMITS TO THE PUBLIC UNLESS OTHERWISE SPECIFIED

Location



Legend

- Refuge Boundary
- County Roads
- Other Roads/Trails
- Information
- Parking
- Closed Area
- You Are Here



Activities

Wildlife Viewing
View wildlife in designated open areas. Best viewing times are early morning and evening. Deer, beaver, ruffed grouse, woodcock, wood ducks and mallards can be seen on the area. Many species of songbirds can also be seen on the unit.

Hunting
Part of the unit is open to small game and large game hunting as determined by the refuge manager. Access is from county road 20. Consult refuge headquarters for current hunting regulations.

Hiking, Snow-Shoeing, Cross-Country Skiing
Old logging trails and roads make excellent places for observing wildlife, and although trails aren't groomed, they are great for winter activities such as snow-shoeing or cross-country skiing. We encourage people to leave their vehicle and explore the Sandstone Unit. In winter, the hardy soul may be rewarded with great wildlife viewing opportunities.

Visiting the Sandstone Unit
- All uses are daylight hours only.
- Firearms are not permitted, except during designated refuge seasons.
- Do not remove or disturb any plants, animals or artifacts.
- Camping is not permitted on the refuge.
- Motorized vehicles are not permitted except in the designated parking area.
- Many areas are reserved for wildlife only. Please observe all refuge signs.

Public campgrounds are available at Banning State Park, north of Sandstone.

For information contact:
Refuge Manager
Rice Lake National Wildlife Refuge
Route 2, Box 67
McGregor, MN 55760

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

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-32540S

October 1991

Rice Lake

National Wildlife Refuge

Sandstone Unit

Minnesota

PUBLIC USE INFORMATION

Welcome to the Sandstone Unit of the Rice Lake National Wildlife Refuge. The information that follows is provided to make your visit more enjoyable.

GENERAL INFORMATION

Rice Lake Refuge, administered by the U.S. Department of Interior, Fish and Wildlife Service, was established in 1935 to provide habitat for migratory birds, mainly ducks and geese. Management practices are directed toward maintaining and improving conditions for all types of wildlife native to this area. The Sandstone Unit was acquired from Department of Justice in 1972.

PERMITTED ACTIVITIES

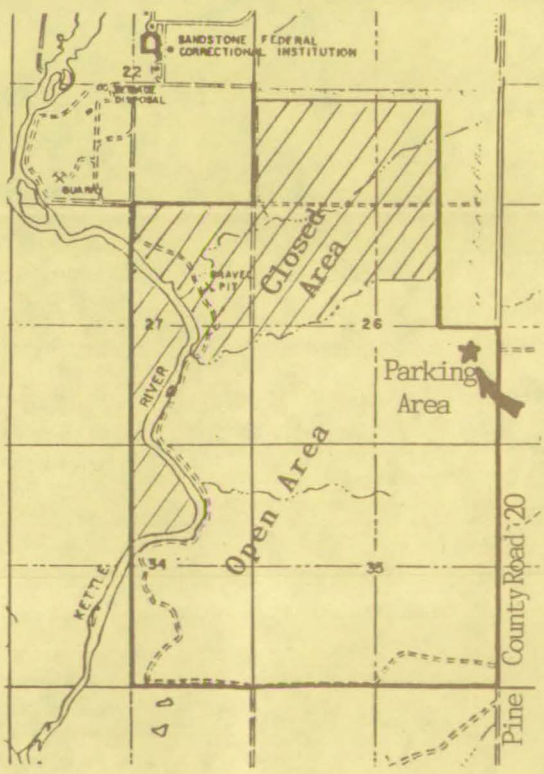
The following are the most commonly pursued recreational activities allowed:

WILDLIFE VIEWING

View wildlife in designated open areas. Best viewing times are early morning and evening. Deer, beaver, ruffed grouse, woodcock, wood ducks and mallards can be seen on the area. Many species of songbirds can also be seen on the unit.

HUNTING

Part of the unit is open to small game and archery deer hunting (see map). **Woodcock and snipe are the only migratory birds that may be hunted.** **NO WATERFOWL HUNTING IS PERMITTED**. All State hunting regulations and dates apply. Access to the unit is from the parking area along Pine County Road 20.



HIKING, SNOW-SHOEING, CROSS-COUNTRY SKIING

Old logging trails and roads make excellent places for observing wildlife, and although trails aren't groomed, they are great for winter activities such as snow-shoeing or cross-country skiing. We encourage people to leave their vehicle and explore the Sandstone Unit. In winter, the hardy soul may be rewarded with great wildlife viewing opportunities.

VISIT THE SANDSTONE UNIT

- All uses are daylight hours only.
- Firearms are not permitted, except during designated refuge seasons.
- Do not remove or disturb any plants, animals or artifacts.
- Camping is not permitted on the refuge.
- Motorized vehicles are not permitted except in the designated parking area.
- Many areas are reserved for wildlife only. Please observe all refuge signs.

Public campgrounds are available at Banning State Park, north of Sandstone.

FOR INFORMATION CONTACT:

Refuge Manager
Rice Lake National Wildlife Refuge
Route 2, Box 67
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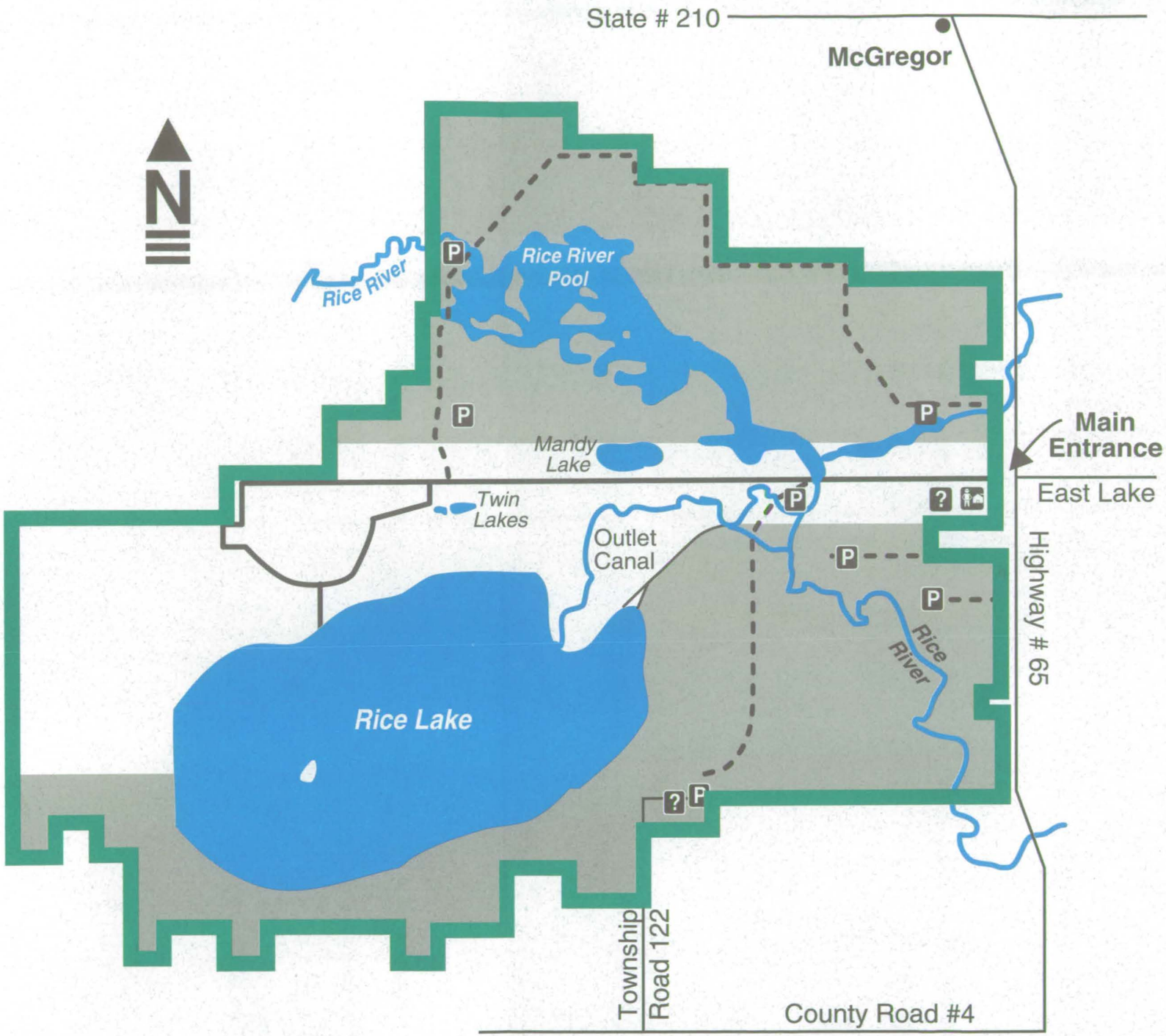
Phone: (218) 768-2402

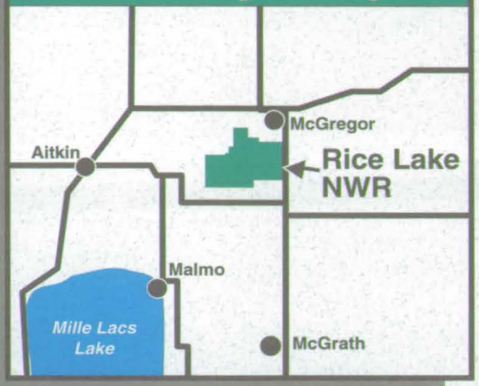
DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

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.

Welcome to Rice Lake National Wildlife Refuge!



Vicinity Map



Legend

- Refuge Boundary
- Open to Small Game & Archery Deer Hunting
- Refuge Headquarters
- Hunting Information
- Parking
- Seasonal Roads
- Refuge Wildlife Drive

Hunt Regulations

	Season Dates
Small Game	
Ruffed and Spruce Grouse	Same as Minnesota State Regulations
Cottontail Rabbit	
Snowshoe Hare	
Gray & Fox Squirrel	
Big Game	
Deer - Firearms	Limited to **Special Permit Holders** Only (See **Special Conditions** below)
Deer - Archery	Same as Minnesota State Regulations
Migratory Birds	
American Woodcock	Same as Minnesota State Regulations
Common Snipe	

No duck, goose or other migratory bird hunting is allowed on the refuge.

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.
- **Only non-toxic shot may be used or possessed for Small Game and Migratory Bird Hunting.**
- Archery Deer and Small Game Hunting is allowed in the area shown on the map and designated by signs as open to hunting.
- Deer taken by archery may be registered at any authorized Registration Station. Also, please notify the Refuge Office of any deer taken to aid in our management program.
- Firearms 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 Hunting and Trapping Regulations** phamplet, or contact the refuge office.
- Camping, overnight use and open fires are prohibited.
- Only portable stands may be used, and they must not be left overnight.
- Vehicle travel is restricted to designated roads and parking areas. Snowmobiles, ATVs and other off-road vehicles are not permitted on the refuge.
- Nearby **State Wildlife Management Areas** include the Kimberly Marsh WMA and others. *Contact the local Area Wildlife Manager (Aitkin) for information (218) 927-6915.*
- Please report all accidents and injuries to the refuge headquarters.
- The use or possession of alcoholic beverages while hunting on National Wildlife Refuges is prohibited. Have a safe hunt!

NOTE: Part of the **Sandstone National Wildlife Refuge**, near Sandstone, MN, is open to small and big game hunting. *Consult Refuge Headquarters for current hunting regulations.*

For more information please contact:
Rice Lake NWR
Route 2, Box 67
McGregor, MN 55760
(218) 768-2402

Hunt Regulations

Rice Lake

National Wildlife Refuge

Birds of Rice Lake

Rice Lake National Wildlife Refuge, containing over 18,000 acres, is located in the bog country of north-central Minnesota. It is an important resting and feeding area for ducks, especially ring-necked ducks, scaup and mallards.

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, brushlands, small lakes and croplands result in a variety of bird species.

Many species of waterfowl nest on the refuge, including an established Canada goose flock. 4,500-acre Rice Lake is noted for its extensive wild rice beds, an important waterfowl food. Waterfowl are best observed in September and October, and again in April and May. Of special interest are the large numbers of ring-necked and other diving ducks in the fall.

The following list contains 227 species which have been observed at Rice Lake National Wildlife Refuge. Another 15 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 Ornithologist's Union's** "*Checklist of North American Birds*," revised in 1996.

Symbol Meanings

Season
S - Spring ..... March - May
s - Summer ..... June - August
F - Fall ..... September - November
W - Winter ..... December - February

Status
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 between species indicate **Orders**
Dashed lines between species indicate **Families**

Common Name	S	s	F	W
Common Loon	u	u	u	
Pied-billed Grebe	u	u	u	
Horned Grebe	u		u	
Red-necked Grebe	o		o	
Eared Grebe	r		r	
American White Pelican	o	o	o	
Double-crested Cormorant	o	o	o	
Great Blue Heron	c	c	c	
American Bittern	u	u	u	
Green Heron	u	u	u	
Great Egret	o		o	
Least Bittern	r	r		
Black-crowned Night Heron	r		r	
Tundra Swan	c		c	
Canada Goose	c	c	a	
White-fronted Goose	r		r	
Snow Goose	u		u	
Mallard	a	c	a	
American Black Duck	u	u	c	
Gadwall	o		u	
Pintail	u	u	u	
Green-winged Teal	c	c	c	
Blue-winged Teal	c	c	c	
Cinnamon Teal	r		r	
American Wigeon	c	c	c	
Northern Shoveler	u		o	
Wood Duck	c	c	c	
Redhead	o		o	
Ring-necked Duck	a	c	a	
Canvasback	o		o	
Greater Scaup	r		r	
Lesser Scaup	c		a	
Common Goldeneye	c		u	
Bufflehead	c		c	
Ruddy Duck	r		r	
Hooded Merganser	u	u	u	
Common Merganser	u		u	
Red-breasted Merganser	u		u	
Turkey Vulture	o	o	o	
Osprey	u	u	u	
Northern Goshawk	o	o	o	o
Sharp-shinned Hawk	u	u	u	
Cooper's Hawk	u	u	u	
Red-tailed Hawk	u	u	u	
Red-shouldered Hawk	r		r	
Broad-winged Hawk	u	u	u	
Rough-legged Hawk				c
Golden Eagle	r		r	r
Bald Eagle	u	u	c	
Northern Harrier	c	a	c	
Peregrine Falcon	r		r	
Merlin	u		u	
American Kestrel	c	c	c	
Ruffed Grouse	c	c	c	c
Sharp-tailed Grouse	u	u	u	u
Virginia Rail	u	u	u	
Sora	u	u	u	
Yellow Rail	o	o		
American Coot	c	c	a	
Sandhill Crane	u		u	
Semipalmated Plover	r		r	
Killdeer	c	c	c	
Lesser Golden Plover	r		r	
Black-bellied Plover	r		r	
American Woodcock	u	c	u	
Common Snipe	u	u	u	
Upland Sandpiper	u		u	
Spotted Sandpiper	c	c	c	
Solitary Sandpiper	u		u	
Greater Yellowlegs	u		u	
Lesser Yellowlegs	u		u	
Pectoral Sandpiper	u		u	
Least Sandpiper	u		u	
Short-billed Dowitcher	u		u	
Long-billed Dowitcher	u		u	
Stilt Sandpiper	u		u	
Semipalmated Sandpiper	u		u	
Sanderling	r		r	
Wilson's Phalarope	u		u	
Red-necked Phalarope	r		r	
Herring Gull	o		o	
Ring-billed Gull	u	u	u	
Franklin's Gull	r		r	
Bonaparte's Gull	o		o	
Forster's Tern	r		r	
Common Tern	o		o	
Caspian Tern	o		o	
Black Tern		c	u	
Mourning Dove		c	u	
Yellow-billed Cuckoo	r	r	r	
Black-billed Cuckoo		u		
Eastern Screech-Owl	u	u	u	
Great Horned Owl	u	u	u	u
Snowy Owl			o	o
Northern Hawk-Owl				r
Barred Owl	u	u	u	u
Great Gray Owl				u
Short-eared Owl	u	u	u	
Northern Saw-whet Owl			r	r
Whip-poor-will	u	u	u	
Common Nighthawk	c	c	c	
Chimney Swift	c	c	c	
Ruby-throated Hummingbird	u	c	u	
Belted Kingfisher	c	c	c	
Northern Flicker	c	c	c	
Pileated Woodpecker	u	u	u	u
Red-headed Woodpecker	u	u	u	
Red-bellied Woodpecker	u	u	u	u
Yellow-bellied Sapsucker	u	u	u	
Hairy Woodpecker	c	c	c	c
Downy Woodpecker	c	c	c	c
Black-backed Woodpecker	r		r	r
Eastern Kingbird	c	a	c	
Western Kingbird	r		r	
Great Crested Flycatcher	c	c	c	
Eastern Phoebe	c	c	c	
Yellow-bellied Flycatcher	u	u	u	
Alder Flycatcher	u	u	u	
Least Flycatcher	c	c	c	
Eastern Wood-Pewee	u	u	u	
Olive-sided Flycatcher	u	u	u	
Horned Lark	c	c	c	
Tree Swallow	c	c	c	
Bank Swallow		u	u	
Northern Rough-winged Swallow		u	u	
Barn Swallow	c	c	u	
Cliff Swallow	c	c	u	
Purple Martin	u	u	u	
Gray Jay				o
Blue Jay	c	c	c	c
Black-billed Magpie	u		u	
Common Raven	c	c	c	c
American Crow	c	c	c	
Black-capped Chickadee	c	c	c	c
White-breasted Nuthatch	c	c	c	c
Red-breasted Nuthatch	o		o	
Brown creeper	u		u	
House Wren	c	c	c	
Marsh Wren	c	c	c	
Sedge Wren	c	c	c	
Northern Mockingbird	r		r	
Gray Catbird	c	c	c	
Brown Thrasher	c	c	u	
American Robin	c	c	c	
Wood Thrush	u	u	u	
Hermit Thrush	u	u	u	
Swainson's Thrush	u		u	
Veery	c	c	c	
Eastern Bluebird	c	c	c	
Ruby-crowned Kinglet	u		u	
Golden-crowned Kinglet	u		u	
Water Pipit	o		o	
Bohemian Waxwing				r
Cedar Waxwing	c	c	c	
Northern Shrike				u
European Starling	c	c	c	c
Red-eyed Vireo	c	c	c	
Warbling Vireo	u	u	u	
Philadelphia Vireo	u	r	u	
Yellow-throated Vireo	c	c	c	
Black-and-white Warbler	u	u	u	
Cape May Warbler	u	u	u	

Welcome to Rice Lake National Wildlife Refuge!

Bird List

Common Name	S	s	F	W
Golden-winged Warbler	u	u	u	
Tennessee Warbler	u		u	
Orange-crowned Warbler	u		u	
Nashville Warbler	u	u	u	
Northern Parula	o	o	o	
Yellow Warbler	c	c	c	
Yellow-rumped Warbler	c		c	
Black-throated Green Warbler	u	u	u	
Blackburnian Warbler	u	u	u	
Pine Warbler	u	u	u	
Chestnut-sided Warbler	u	u	u	
Magnolia Warbler	u		u	
Blackpoll Warbler	u		u	
Palm Warbler	u		u	
Bay-breasted Warbler	u	u	u	
Ovenbird	c	c	c	
Northern Waterthrush	o		o	
Connecticut Warbler	u	u	u	
Mourning Warbler	u	u	u	
Common Yellowthroat	c	c	c	
Wilson's Warbler	u		u	
Canada Warbler	o	o	o	
American Redstart	c	c	c	
Northern Cardinal	r	r	r	
Rose-breasted Grosbeak	c	c	c	
Indigo Bunting	c	c	c	
Eastern Towhee	u	u	u	
Henslow's Sparrow	u	c	u	
LeConte's Sparrow	c	c	u	
Savannah Sparrow	c	c	c	
Grasshopper Sparrow		r		
Vesper Sparrow	u	u	u	
Dark-eyed Junco	c		c	
American Tree Sparrow	c		c	
Chipping Sparrow	c	c	c	
Clay-colored Sparrow	c	c	u	
Field Sparrow		r		
Harris' Sparrow	u		u	
White-crowned Sparrow	u		u	
White-throated Sparrow	u	u	u	
Fox Sparrow	u		u	
Lincoln's Sparrow	u		u	
Swamp Sparrow	c	c	c	
Song Sparrow	c	c	c	
Lapland Longspur	u		u	
Snow Bunting				c
House Sparrow	c	c	c	c
Bobolink	c	c	c	
Eastern Meadowlark	u	u	u	
Western Meadowlark	o	o	o	

Common Name	S	s	F	W
Yellow-headed Blackbird	u	u	u	
Red-winged Blackbird	c	c	c	
Baltimore Oriole	c	c	c	
Rusty Blackbird	u		u	
Brewer's Blackbird	c	c	c	
Common Grackle	c	c	c	
Brown-headed Cowbird	c	c	c	
Scarlet Tanager	u	u	u	
Evening Grosbeak				u
Purple Finch	u		u	
Pine Grosbeak				r
Common Redpoll				r
Pine Siskin				o
American Goldfinch	u	c	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
- Gyrfalcon
- Greater Prairie Chicken
- Ring-necked Pheasant
- Whooping Crane
- Ruddy Turnstone
- Willet
- Ross' Goose
- Western Sandpiper
- Marbled Godwit
- Hudsonian Godwit
- Red Crossbill
- Mountain Bluebird
- White-winged Crossbill
- White-winged Scoter

We wish to thank Jo Blanich and Warren Nelson for their assistance in reviewing the bird list.

Field Notes

Date _____ No. Species_____

Time Afield _____

Observers _____

_____

Weather_____

Remarks_____

_____

_____

_____

_____

_____

_____

_____

_____

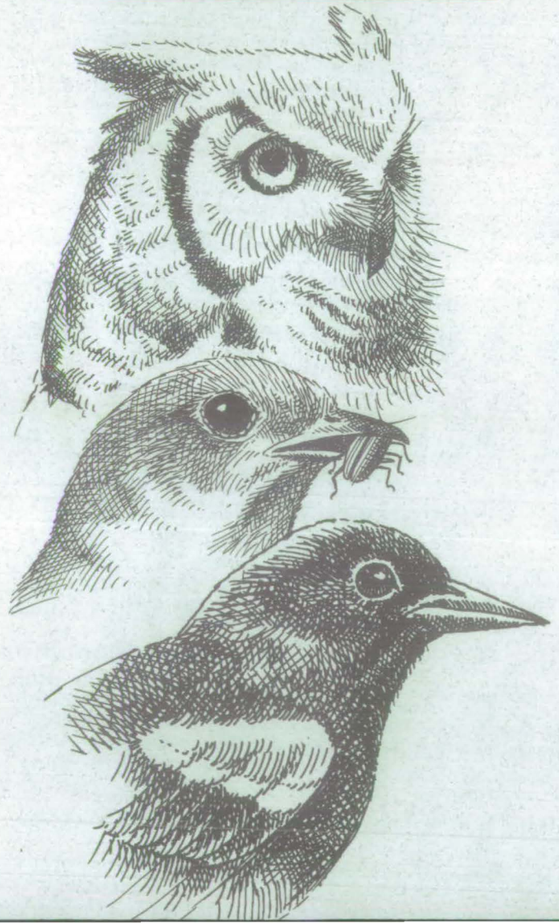
Please report unusual bird sightings to the refuge office listed below.

For more information please contact:
Rice Lake NWR
Route 2, Box 67
McGregor, MN 55760
(218) 768-2402

December 1996

Rice Lake

National Wildlife Refuge



Welcome to Rice Lake National Wildlife Refuge!

Seasonal P

Rice River

North Bog Road

Mandy Lake

P

P

Wildlife Drive

P CCC Camp

P

Twin Lakes

Rice Lake Pool

P

Rice Lake

Scale in Miles

0 1/4 Mi 1/2 Mi

Getting Around

- Refuge Headquarters
- Observation Tower
- Picnic Table
- P Parking
- Restrooms
- Roads *(Bicycles Permitted)*
- Marsh
- Hiking Trails *(Bicycles Prohibited)*
- Field
- Bog

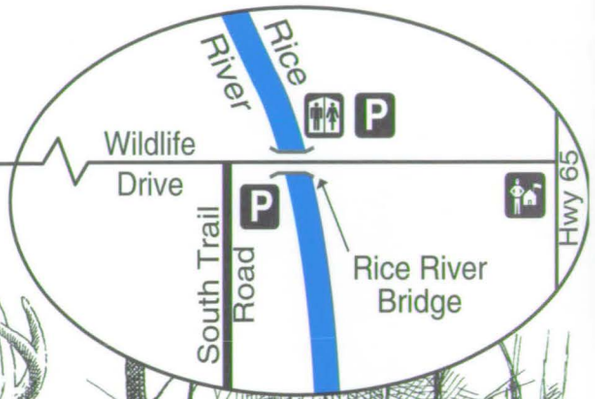
Trails & Loops

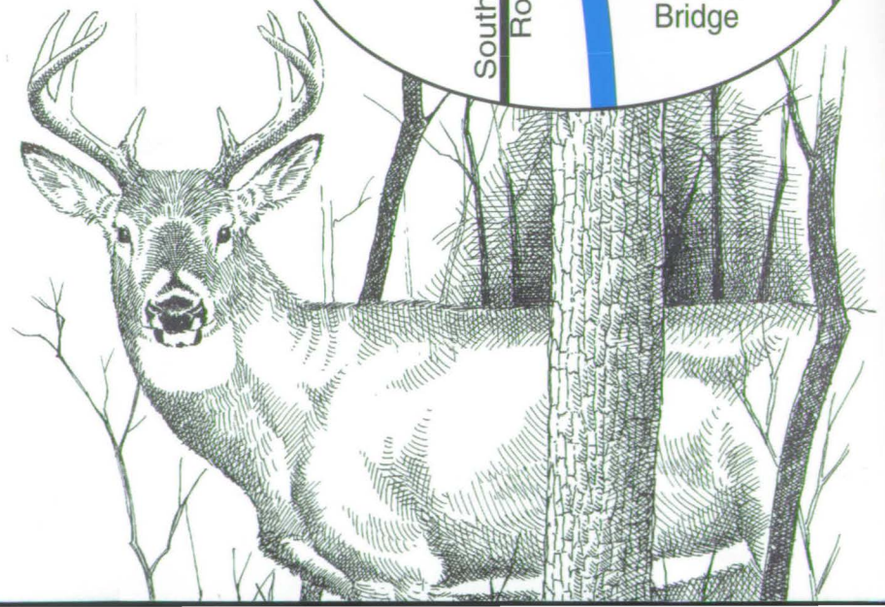
- Mandy Lake (1-1/2 Mi)
- Twin Lakes (3/4 Mi)
- CCC Camp (1 Mi)
- Rice Lake Pool (2-1/2 Mi One Way)
- North Bog (1-1/4 Mi)

Roads

- North Bog Road (7-3/4 Mi One Way)*
- South Trail Road (3-1/4 Mi One Way)*

* To Refuge Boundary





Trail Information

All hiking trails pass through a mixture of upland and lowland hardwood forest, small grasslands and marsh. Songbirds are the most abundant wildlife seen and heard on the trails. Hikers may occasionally see raccoon, owls, hawks, bald eagles, waterfowl, deer, skunks and bears.

The slope for most trails ranges from level to gently sloping. Some muddy and wet areas may be encountered.

The North Bog and South Trail Roads are open to hikers. The South Trail Road is closed at the Rice Lake water control structure during bald eagle nesting season which runs from April through July.

Viewing Wildlife

Binoculars and a field guide will improve your chances of seeing wildlife; both are available for loan at the Refuge Headquarters during office hours.

Restrooms

Restrooms are located at the:
- Refuge Headquarters (office hours),
- Rice River bridge and
- Rice Lake observation tower.

Picnic Tables

Picnic tables are located at Mandy Lake and Twin Lakes parking areas.

If you encounter a bear on the trail, remain calm, for these are black bears, the least aggressive of the bear species. You may be surprised to know that most bears fear people as much as you fear them - and will flee when they hear or see you! If you see a bear which does not leave, make some noise and give it an easy escape route. *Remember, seeing a bear is an uncommon, yet memorable, experience!*

Cross-Country Skiing

Mandy Lake, CCC Camp and North Bog Trail loops are groomed for skiing in the winter months. Parking is available at Mandy Lake.

Insects!!

Ticks are abundant from late May through early July. Mosqitoes and deer flies are abundant from June through August. Insect repellent and other precautions should be used!

Rice Lake National Wildlife Refuge
Route 2, Box 67
McGregor, MN 55760
(218) 768-2402

U.S. Fish & Wildlife Service
1 800/344 WILD

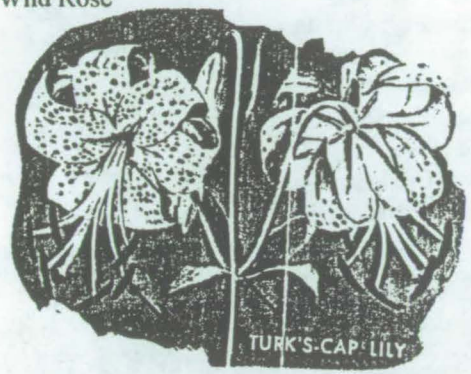
U.S. Fish & Wildlife Service

Rice Lake

National Wildlife Refuge Hiking Trails

Red /Pink /Orange Flowers

Blanket Flower
Brown Cone Flower
Columbine
Indian Paint Brush
Orange Hawksweed
Plains Coreopsis
Pointed-leaved Tick-trefoil
Purple Milkweed
Red Clover
Spotted Touch-Me-Not
Staghorn Sumac
Swamp Milkweed
Turk's cap Lily
Wild Rose



Purple /Blue Flowers

Alfalfa
Blue-eyed grass
Blue Flag Iris
Bull Thistle
Common Skullcap
Dame's rocket
Everlasting
Fireweed
Fragrant Giant Hyssop
Heal-All
Purple Fringed Orchid

Purple Giant Hyssop
Purple Pea
Rabbit's Foot Clover
Western Wild Bergamot

Green / Brown Flowers

Bur
Common Cattail
Dock
Giant Bur-reed
Green Bullrush
Narrow-leaved Cattail
Purple Meadow Rue
Water Plantail

Misc.

Bracken
Fern

Field Notes

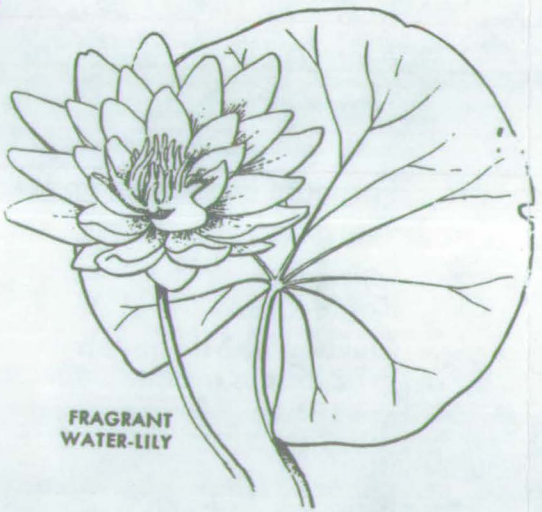
Date.....
No.species.....
Observers.....
Remarks.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

Please add unusual wildflower finds to the notice board in the refuge headquarters.

For more infomation please contact:
Rice Lake NWR
Route 2, Box 67
McGregor, MN 55760
(218) 768-2402

Designed By Zoe Paterson
Volunteer for Summer 1997
From Sheringham, England

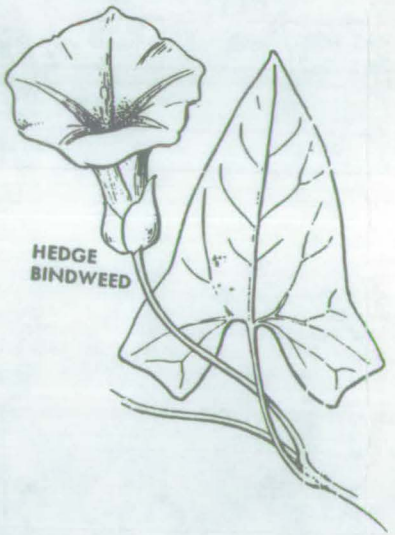
Wildflowers of Rice Lake National Wildlife Refuge



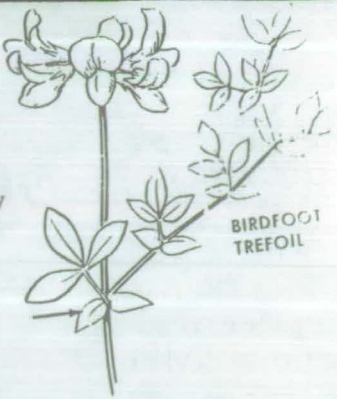
The following list contains 85 species of wildflowers that can be found during the spring and summer on Rice Lake National Wildlife Refuge. Other flowers may also be present but not so commonly seen.

White Flowers

Aliske Clover
American Spikenard
Baneberry
Bastard Toadflax
Bramble
Climbing False Buckwheat
Common Milkweed
Common Yarrow
Cow Parsnip
False Aster
False Boneset
Hedge Bindweed
Mayweed
Meadow Anemone
Meadowsweet
Nettle
Northern Bedstraw
Ox-eye Daisy
Spreading Dogbane
Sweet White Clover
Tall Meadow Rue
Water Hemlock
White Campion
White Clover



White Vervain
White Water Lily
Wild Strawberry
Wood Sorrel



Yellow Flowers

Agrimony
Bird's foot Trefoil
Bog Goldenrod
Brown-eyed Susan
Butter and Eggs
Common Mullein
Common Sow Thistle
Dandilion
Early Goldenrod
Fringed Loosestrife
Goat's Beard
Green Headed Coneflower
Hop Clover
Old-field Cinquefoil
Ox-eye
Prairie Buttercup
Prairie Coneflower
Rough Avens
Shrubby Cinquefoil
Silvery Cinquefoil
SunDrops
Tall Sunflower
Yellow Avens
Yellow Evening Primrose
Yellow Sweet Clover
Yellow Water Lily

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.

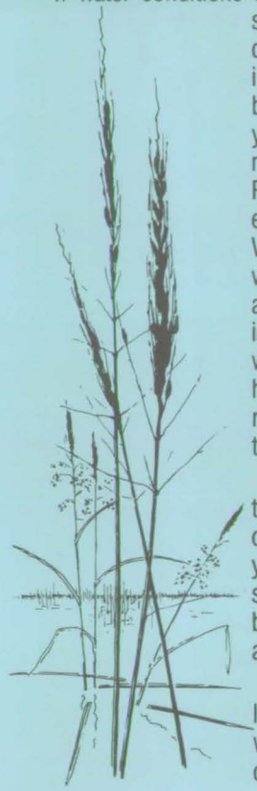
Winnowing — As a final step, grain was poured from one container to another, allowing wind to blow the light chaff away.

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 catastrophy, 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.

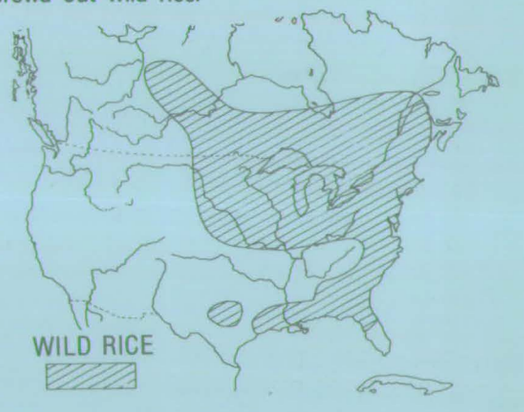
During a good wild rice year when water levels and good germination favor the crop, there may be as many as 30,000 acres of wild rice growing naturally in lakes and marshes of Minnesota.

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

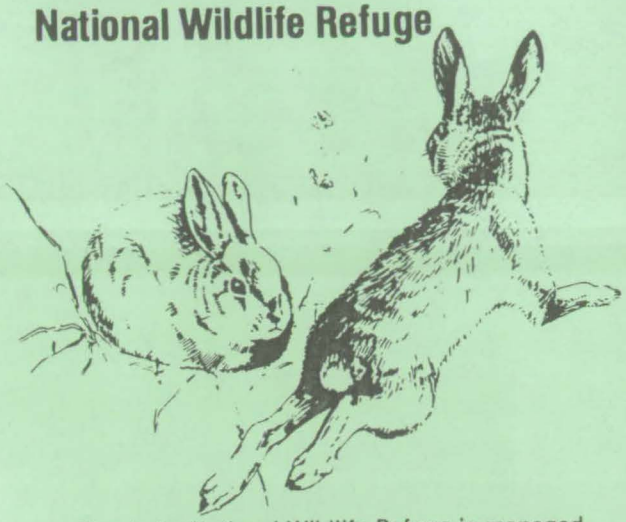
INDIAN RICE
MANOMIN

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

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

MAMMALS OF RICE LAKE

National Wildlife Refuge
Minnesota

Changing Times Changing Uses

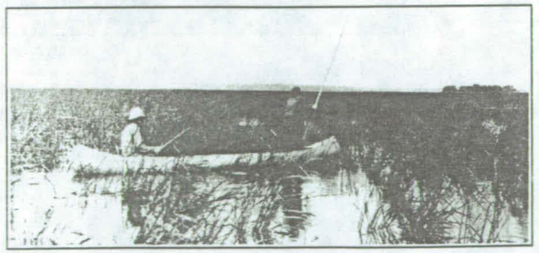
For an eon they have come here to gather what the land provided. We do not know how they named themselves, those first people to follow retreating glaciers to this place. But, they kept coming, and lived here, for generations unnumbered.

More recently, the Dakota and later, the Ojibwa Indians came and lived here. They collected wild rice from the lake, maple syrup from the forest, and the other foods and materials they needed to survive. Later, Europeans and their descendants settled here and cut timber and dug drainage ditches to convert this place to farmland.

Today, Rice Lake National Wildlife Refuge is managed for wildlife and for people who come to enjoy these wildlands.

The land retains traces of how people have used it. This 9.5 mile self-guiding tour draws your attention to the changing uses people have put to this area. The tour will take about 45 minutes, longer if you stop to hike or watch for wildlife. Follow the arrows and stop at the numbered posts.

As you travel the auto tour and learn about man's use of the area, you will often see the waterfowl, deer, grouse, bear and other wildlife that continue to be a part of Rice Lake's attraction.



1. As the last glaciers melted 10,000 years ago, they left behind poorly drained soils and basins created by chunks of melting ice. The resulting watery landscape contains a mixture of cedar swamp, tamarack bog and lakes. The ridge you are now on, between Mandy Lake before you and Rice Lake to the south, was one of the few high grounds close to the abundant wild rice crops of the lakes. A 1.5 mile long hiking trail skirts the edge of Mandy Lake, to the North Bog Road, rewarding the hiker with excellent wildlife viewing.

2. Ancient people lived and buried their dead on this ridge. Among these trees are mounds that archaeologists think were built by prehistoric people about 1,300 years ago as a cemetery. Such sites are found from northwestern Wisconsin across central Minnesota to the Red River Valley.This is the largest known concentration of linear mounds in Minnesota and Wisconsin. **All remains of peoples' use of the land on the refuge are fragile and irreplaceable. They are strictly protected by State and Federal laws.**

3. Evidence suggests the Eastern Dakota Indians occupied the Rice Lake area 300-400 years ago. Attracted by wild rice and plentiful game, the Dakota probably lived here in temporary hunting and ricing camps. Archaeologists believe their main villages were at Mille Lacs Lake, southwest of here. In Twin Lake, located down the road to your left, an ancient dugout canoe was discovered in 1969. Perhaps, the canoe was used by Indians to gather wild rice and hunt game. A short, scenic hiking trail begins at the east end of the picnic area and makes a short loop on the north side of Twin Lake.

4.The Dakota and Ojibwa people took resources from the land which were renewed each year: maple syrup, wild rice and game. But, in the late 1800's the use of the land changed dramatically. As the railroads extended westward, more European settlers moved into the area. The resources, which for centuries were used for subsistence, became commodities.

5. In 1900, a livestock ranch began operating in and around Rice Lake. Wanting to harvest Rice Lake's marsh hay with machinery, the ranchers made two unsuccessful attempts to drain the lake. The ditch they dug was too small to be effective.

6. For a few weeks in the fall, Indians centered their activities around the harvest of wild rice. They poled their canoes through dense stands of wild rice, bending the stalks over their boats, tapping the stalks with sticks, dislodging the grain into the bottom of the boats. On shore, they parched the rice over a fire, placed the grain in shallow holes in the ground, tramped out the kernels from the husk, and winnowed out the grain. They took the wild rice back to their villages where they stored it in pits for use during winter. A local band of Ojibwa still gather wild rice here each September.

Climb the observation tower for a vista of the 18,000 acre refuge. In the fall, Rice Lake holds concentrations of between 50,000 and 100,000 ring-necked ducks.

7. Loggers harvested the towering white pine and maple from the forests that surround Rice Lake. During the winter, logs were hauled to the lake and unloaded on the ice. A boom was made around the logs and when the ice melted, the log raft was towed to the lake's outlet. Lumbermen drove the logs through Rice Creek and on to the Mississippi River, 20 miles to the northwest.

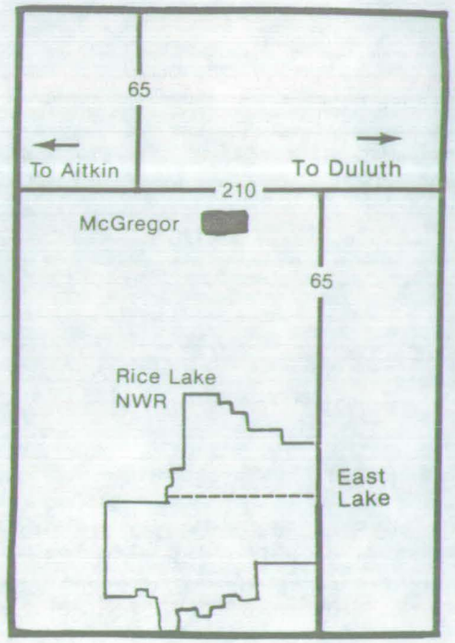
8. While many of the area's fields were cleared by early European settlers, these were cleared by the refuge staff to provide good habitat for canada geese and sharp-tailed grouse.

9. A branch of the Soo Line Railroad, known as the Cuyuna and Iron Range was constructed in 1910. This line carried ore from the iron mines of the nearby Cuyuna Range, and timber from the surrounding area to Lake Superior ports. This line was abandoned in the 1920's and a portion of the rail bed is now used as the main refuge road. You are on it now.

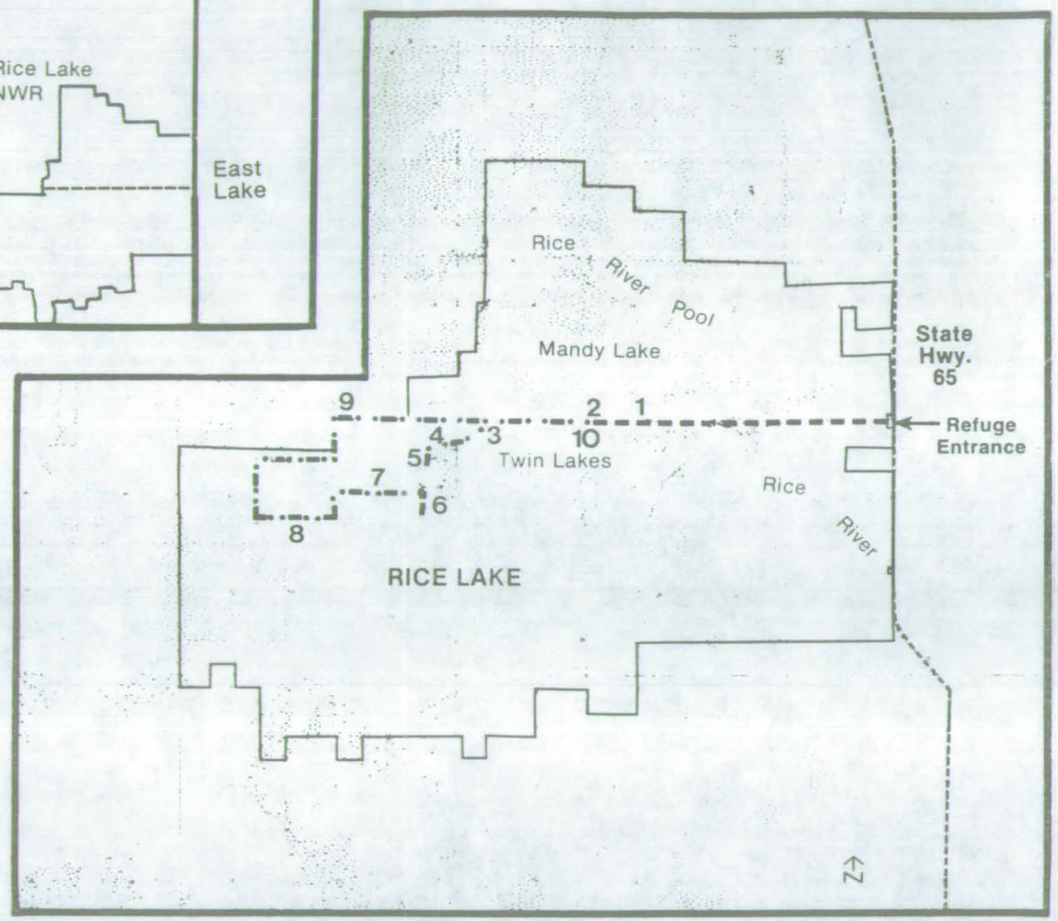
10. President Franklin Roosevelt established the Rice Lake National Wildlife Refuge in 1935. To help restore wildlife and to provide employment during the depression, the Federal Government operated a Civilian Conservation Corps camp here in the late 1930's. In the clearing to your right there were 24 camp buildings. While almost nothing is left of the camp's buildings, the product of the corpsmen's work still remains. Through their labor, water control structures were built on Rice River, providing the refuge with a lasting tool for improving wildlife habitat.

Today, the refuge is managed by the U.S. Fish and Wildlife Service, providing habitat for migrating birds and other wildlife species.

The refuge staff hopes that you have enjoyed your tour.



Main Refuge Road
and
Auto Tour Loop



TAKE PRIDE IN AMERICA

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally-owned public lands and natural and cultural resources. This includes fostering wise 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 promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in IslandTerritories under U.S. Administration.

RF-32540

May 1990

Rice Lake

National Wildlife Refuge

Auto Tour

Minnesota

FISHING MAP

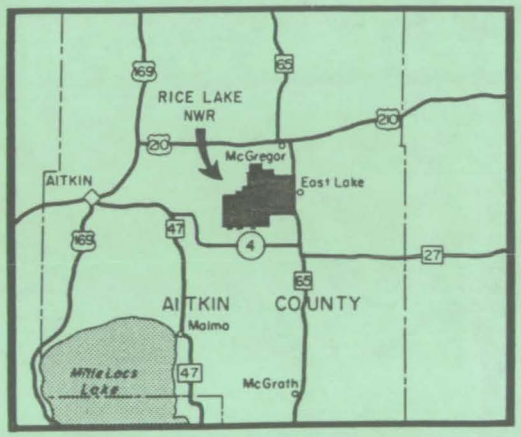
REGULATIONS ON BACK SIDE OF MAP

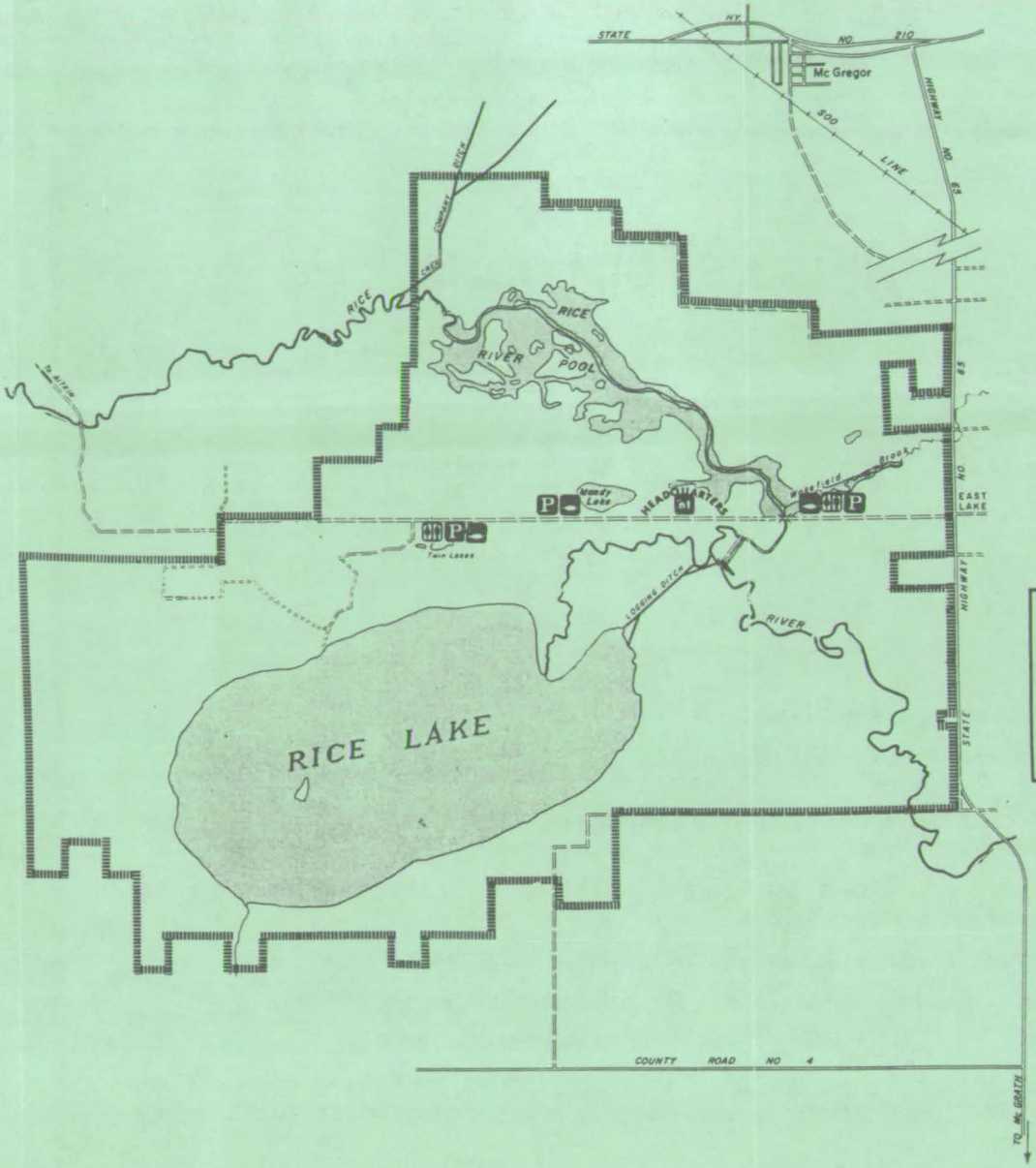
REFUGE SIGNS — KNOW THEIR MEANING

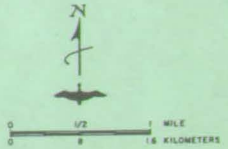
REFUGE BOUNDARY SIGN — ENTRY BY PERMISSION ONLY

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	SEASON DATES
Northern Pike Yellow Perch Bullhead Buffalo	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
Minnesota

Fishing Map And Regulations

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