MLC_RCL_D01_Rice Lake And Mille Lacs Islands Wilderness Study Report

Proposed

Rice Lake and Mille Lacs Islands

Wilderness Areas

WILDERNESS STUDY REPORT

~~Rice Lake National Wildlife Refuge~~ Mille Lacs

~~and~~

~~Mille Lacs Reservation~~

Aitkin and Mille Lacs Counties

Minnesota

United States Department of the Interior

Fish and Wildlife Service

Bureau of Sport Fisheries and Wildlife

PREFACE

The Bureau of Sport Fisheries and Wildlife, Department of the Interior, proposes that a 1,400 acre tract and a six-acre island in Rice Lake National Wildlife Refuge and two small boulder islands totaling about six-tenths acre in Mille Lacs Lake be designated as wilderness units within the National Wilderness Preservation System.

Rice Lake National Wildlife Refuge is located in east-central Minnesota in Aitkin County, seven miles south of the village of McGregor. Lands encompassed by the refuge are typical of the great, flat bog country laced with glacial moraines so characteristic of northern Minnesota. The refuge contains 20,296 acres. Also administered by Rice Lake Refuge are two small boulder islands in the south end of Mille Lacs Lake, about fifteen miles to the southwest in Mille Lacs County.

The primary purpose of the refuge is to aid flyway waterfowl management in support of the Migratory Bird Treaty Act. This includes development and maintenance of habitat for breeding ducks and geese and for resting and feeding waterfowl during the fall and early spring months of migration.

The wilderness proposal consists of 1,400 acres of bog and lowland timber habitat in the southwest corner of the refuge. Rice Lake Island, generally gravelly with a few trees and other vegetation, is also recom-

mended for wilderness along with Spirit and Hennepin Islands. They are basically boulder heaps in Mille Lacs Lake that serve as resting sites for common terns. Very small, they total about 6 acres.

The remaining approximately 19,000 acres of the refuge are excluded from this proposal for a variety of reasons. Essentially they have been altered by man's activity so as to deprive them of true wilderness character, or they will need to be managable or developable in the future to meet wildlife management objectives on Rice Lake Refuge.

About 6,000 acres of controlled marsh and water will be required to achieve wildlife management goals of: production of 6,000 ducks and 500 geese and peak migration use of 80,000 ducks and 10,000 geese.

To obtain this acreage of controlled aquatic habitat, the present Rice Lake (about 3,800 acres) and Rice River Pools (about 1,900 acres) along with minor areas should be improved so that they are capable of producing sufficient waterfowl foods to provide for the above goals.

About 200 acres of cropland will be needed to satisfy waterfowl management objectives. Approximately 850 acres of permanent grass adjacent to water areas will be required for waterfowl nesting habitat. Some 5,000 acres of timberland will be maintained and managed to provide habitat for wildlife including waterfowl.

With the above areas managed and developed to meet wildlife and public use objectives, the islands and 1400 acre tract of this proposal can be devoted to wilderness status without impairment of other values and goals.

INTRODUCTION

Located in east-central Minnesota, Rice Lake National Wildlife Refuge was authorized by Executive Order 7221 dated October 31, 1935. Legislation providing for the establishment of the refuge includes the Migratory Bird Treaty Act, the Migratory Bird Conservation Act and the Migratory Bird Hunting Stamp Act. During the period 1937-1938 the U. S. Resettlement Administration acquired 7786 acres of land which was transferred to the Bureau of Biological Survey for development as a national wildlife refuge. Subsequent acquisitions have enlarged the refuge to its present size of 20,296.6 acres.

Official Acreage

(Annual Report of Lands Under Control of the Bureau of Sport Fisheries and Wildlife as of June 30, 1972)

Acquired by Other Federal Agency	Purchased Acres	Meandered Acres	Total Acreage
10,026.2	6,489.3	3,781.1	20,296.6

Also administered out of the Rice Lake Refuge headquarters are the Mille Lacs Islands, Spirit and Hennepin islands. These two islets comprise less than one acre combined and are located in the southern portion of Mille Lacs Lake in Mille Lacs County, about 25 miles south-southwest of Rice Lake. They are merely boulder heaps in the lake and serve as nesting sites for common terns.

Spirit Island was set aside by Executive Order 2199 on May 14, 1915. It was to be 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 islets were to constitute a "preserve and breeding ground for native birds."

The refuge is located in flat, timbered bog country. Its dominant geographical feature is 3800 acre Rice Lake for which the refuge is named. About 25% pf the refuge is timbered on both uplands and lowland bog terrain. Overall, about 50% of the refuge is in lakes and streams and wetland habitat, approximately 10% is in roads, pasture, crops, etc. The general terrain is not conducive to extensive agriculture and farming success in the past was generally poor due to rocky soil and lack of fertilizers and soil amendments. The principle use of lands now within the refuge has been for timber production with limited hay being harvested from meadows.

Rice Lake National Wildlife Refuge's principle objectives are waterfowl production and maintenance. The area is of particular importance to the ring-necked duck since about 25% of the continental harvest of this species occurs in Minnesota and Rice Lake supports one of the largest concentrations of these ducks inthe State. Secondary goals relate to the welfare of other migratory birds and upland species of wildlife, and to appropriate public use of the refuge's resources. The following outlines the refuge's objectives as found in the master plan.

MANAGEMENT OBJECTIVES

Rice Lake Refuge has certain specific and unique physical characteristics. Therefore it must pursue and establish certain fundamental objectives of its own giving due consideration to the overall objectives of the Bureau of Sport Fisheries and Wildlife and the Mississippi Flyway Plan.

In looking to the future, the needs that Rice Lake can fulfill are essentially the same as present needs; therefore, immediate and long-range objectives are similar, except as noted below, and need not be considered separately. These objectives in order of priority are as follows:

1. Provide waterfowl habitat for the purpose of providing a greater opportunity for public enjoyment of waterfowl. A goal of having the capability to provide for a fall population of about 80,000 ducks and 10,000 geese during the month of October is reasonable because:
   a. Rice Lake Refuge is a traditional waterfowl migration stopover, especially for the diving duck species--ring-neck, lesser scaup, redheads and canvasbacks. Its value as a sanctuary for diving ducks, especially ring-necks, during the State waterfowl season is unmeasurable, but believed by Federal and State waterfowl biologists to be highly significant.
   b. The habitat of the refuge should have this capability to somewhat mitigate habitat losses that have occurred elsewhere in Minnesota. The waterfowl foods produced here will add to the total available food resources of these birds and contribute to their survival.
   c. To provide quality hunting in the immediate vicinity of the refuge, it is felt that these numbers are necessary to sustain a reasonable harvest.
   d. By maintaining migration habitat in this area we are furthering a distribution of waterfowl in the flyway that large numbers of people can benefit from and enjoy through wildlife-oriented recreation. Rice Lake Refuge with moderately large waterfowl concentrations is suitably located to accomplish this by offering opportunity to study, observe and photograph wildlife.
   e. The improved production of wild rice on Rice Lake will be the main tool in providing additional waterfowl migration

habitat. The ~~increased~~ rice yield will also be beneficial to rice-harvesting Indians. Nesting and brood habitat for a variety of bird species will also be improved, mainly by development of small water areas.

2. Provide as near optimum conditions for waterfowl production as is economically and biologically feasible. This objective has high priority because:

a. Waterfowl production is the Bureau's highest management priority that applies to Rice Lake Refuge, and the Bureau has a goal to produce an average of one million ducks annually on managed refuges.

b. By providing as favorable conditions as economically feasible, it is anticipated that Rice Lake Refuge can produce at least one duck per acre of marsh or 6,000 ducks produced annually. This is nearly twice the highest production of 3,860 ducklings in 1956.

c. Ducks produced at Rice Lake are species in high public demand, particularly for hunting. The principal nesting species are mallards, wood ducks, blue-winged teal and black ducks, all of which rank high in the hunter's bag in the Mississippi Flyway.

d. The prime objectives of duck production can be pursued with little or no effect on other essential functions of the refuge. The management of suitable impoundments to provide brood habitat will result in the production of food and cover for transient waterfowl.

3. Provide for optimum wildlife-oriented recreational opportunities as is compatible with habitat conditions and management considerations necessary to achieve other primary functions.

a. The refuge as a historical Indian ricing area can be Minnesota's center for preserving and interpreting the story of wild rice and its relationship to wildlife and man, especially to the Indians of earlier days.

b. The refuge is about 120 miles from one of the upper midwest's largest metropolitan areas with a population over 2 million people, many who have real and potential interest in natural resource conservation.

c. Access to the refuge, via highway 65, is excellent, offering an easy opportunity for a day's visit by inhabitants of one of the midwest's largest urban areas.

d. The refuge has much to offer the public in way of wildlife variety including waterfowl concentrations, deer, a variety of migratory birds, other resident wildlife species, and interesting wild lands.

e. With careful planning, environmental education and wildlife-oriented public use can be expanded without conflict with wildlife.

4. Provide optimum hunting opportunity on refuge lands consistent with higher objectives. Hunting shall be allowed for ruffed grouse, woodcock, rabbits, squirrels and deer. Quality can be encouraged by hunter control on given areas. This refuge objective is necessary and feasible because:

a. High quality harvest habitat is in demand, and the refuge can, through development and hunter control, offer such habitat.

b. Because the refuge will be managed to benefit waterfowl to achieve higher goals, other wildlife species will also benefit. These resident species will periodically increase in number and should be utilized by the public through high quality hunting programs.

5. Develop and manage habitat for a variety of migratory bird species that will provide public enjoyment. Biologically and economically, it is possible to insure a resident population of marsh and water birds, gulls, terns, song birds, and upland game birds in locations where they can be easily seen by the visiting public.

6. Develop and manage habitat for rare and endangered species such as the bald eagle and unique and peripheral species such as the osprey. The welfare of these species is in the national interest. The refuge can assist by providing sanctuary and the proper habitat to enhance survival in this area.

7. Provide suitable habitat for the perpetuation of a breeding flock of giant Canada geese on Rice Lake Refuge. Although production of Canada geese in the U. S. is not a high Bureau priority, resident flocks are considered valuable because they:

a. Enhance the esthetic and educational aspects of a refuge visit.

b. Provide some local hunting opportunity in an area where the sport of goose shooting is virtually unknown.

c. Act as a supply source for the maintenance of a nesting goose flock on lands and waters outside the refuge. Local residents are quite proud of this nesting goose flock.

8. It will be the responsibility of Rice Lake Refuge to preserve and enhance, to the extent feasible, the natural beauty of all its ecosystems.

Rice Lake National Wildlife Refuge was selected for a wilderness study area because it meets the minimum criteria designated in the Wilderness Act, namely it has the three roadless islands, one in Rice Lake and two in Mille Lacs Lake. In addition, although there is no roadless tract of at least 5000 contiguous acres, it does have an area of several hundred acres that is roadless and otherwise undeveloped and is substantially free of the imprint of man. It is this southwest corner of the refuge which has been examined and found to be of a suitable nature for proposal for inclusion in the National Wilderness Preservation System along with the three islands. The proposed tract would place in the system a significant and representative acreage of the northern bog country that characterizes vast areas of Minnesota and Canada.

This study was undertaken between February and July of 1973. Some field reconnaissance was done, however this was quite limited. Most data assembled in this study was already available in various refuge documents. A file search utilized refuge narrative reports, timber management plan, master plan, various leaflets, and was supplemented by specific data requested from the refuge manager of Rice Lake. Aerial photos and topographic maps were used extensively as well as general sources on the geology, climate, vegetative cover and population of Minnesota. No problems were encountered in the study.

OBJECTIVES

The Wilderness Act of Septembrt 3, 1964 (public Las 88-577), requires the Secretary of the Interior to review every roadless area of 5,000 contiguous acres or more and every roadless island within the National Wildlife Refuge System and, within ten years after the effective date of the Act, report to the President of the United States his recommendations as to the suitability or nonsuitability of each such area or island as wilderness. In defining wilderness, the Act permits the review of roadless areas of less than 5,000 acres that are of suffisient size to make preservation and use in an unimpaired condition practical.

The Rice Lake National Wildlife Refuge contains potential wilderness resources that meet the basic criteria contained in the Wilderness Act for detailed study to determine suitability or nonsuitability as wilderness.

The principal objective of investigations was to evaluate, at the direction of the Secretary of the Interior, the suitability or nonsuitability of the Rice Lake National Wildlife Refuge, or a portion of the refuge, for inclusion in the National Wilderness Preservation System.

In addition, field studies were designed to:

1. Clearly delineate and describe those areas within the refuge that were found to be suitable for consideration as wilderness.
2. Clearly delineate and describe those areas within

the refuge that were found to be nonsuitable for consideration as wilderness.

3. Determine whether classifying all or part of the refuge as wilderness would conflict with the purposes for which it was established and is administered as a unit of the National Wildlife Refuge System.

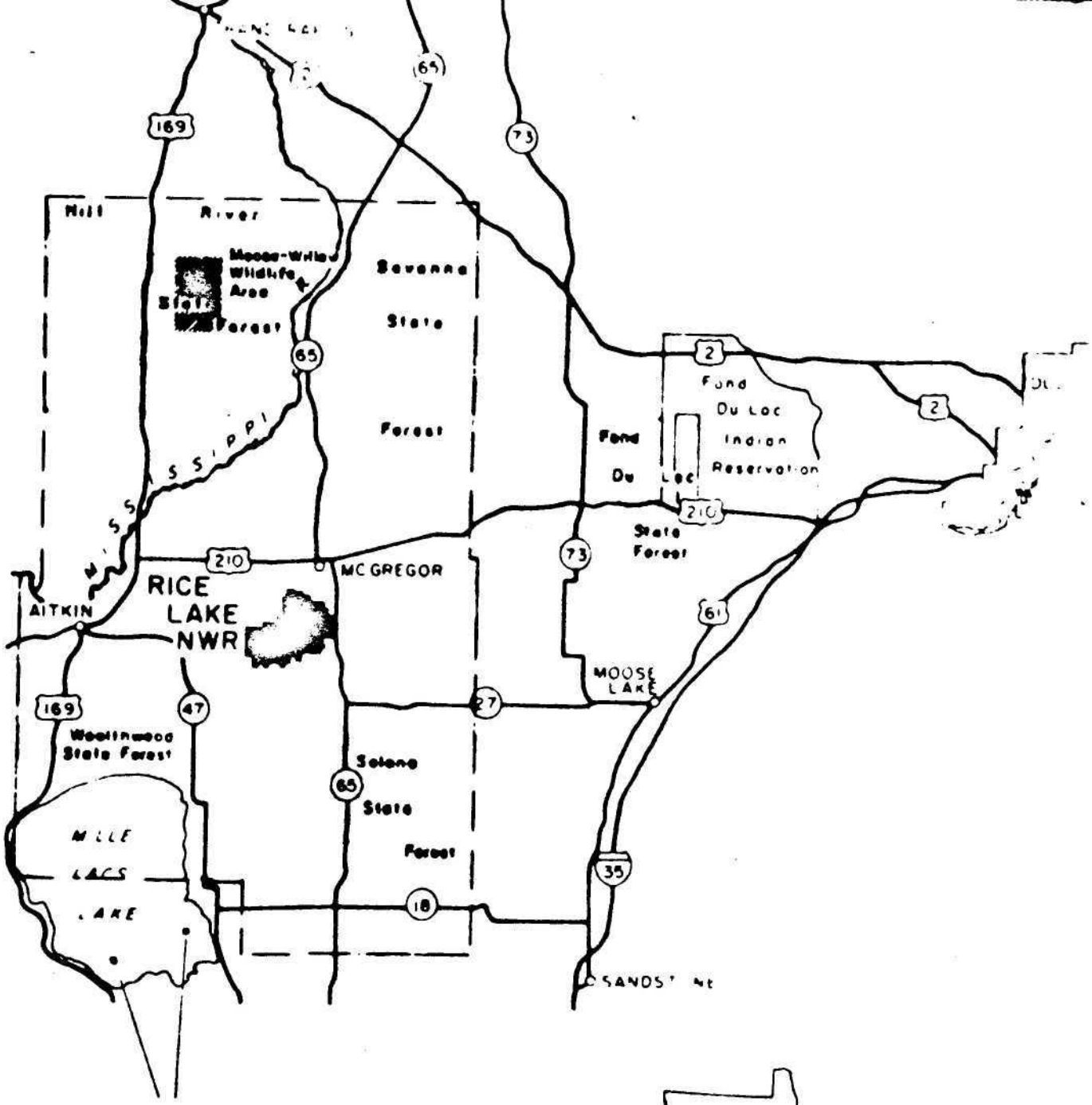
4. Determine what conflicts or benefits there might be if all or part of the refuge were classified as wilderness by the Congress of the United States.

5. Develop wilderness boundaries which can be (a) identified on the ground, (b) legally described, and (c) surveyed.

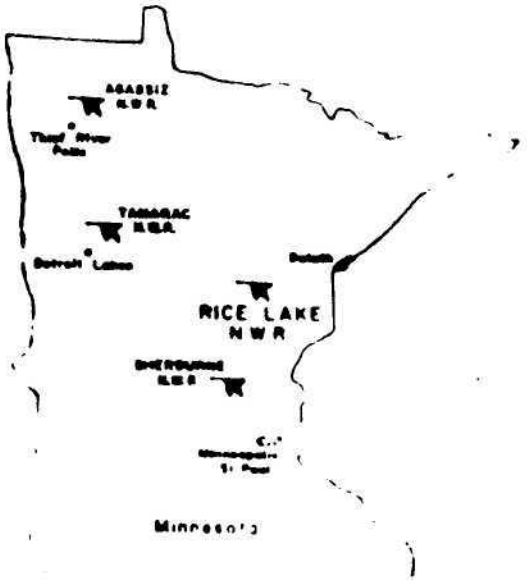
LOCATION

Rice Lake National Wildlife Refuge is centrally located in Aitkin County in east-central Minnesota. It is about 60 miles west of Duluth on Lake Superior, and about 125 miles north of the Twin Cities. About 25 miles to the east is Interstate Highway 35 which connects Duluth and the Twin Cities. The nearest town of any size is McGregor which is seven miles north of refuge headquarters. Aitkin, the county seat, is approximately 20 miles west of the refuge.

The wilderness study area and proposal are identical and (besides the islands in Mille Lacs and Rice lakes) occupies the southwest corner of the refuge. This tract is roadless and otherwise undeveloped and free of man's imprint. It is now de facto wilderness and can be devoted to wilderness designation without impairment of other refuge goals and programs.



Mille Lacs Islands



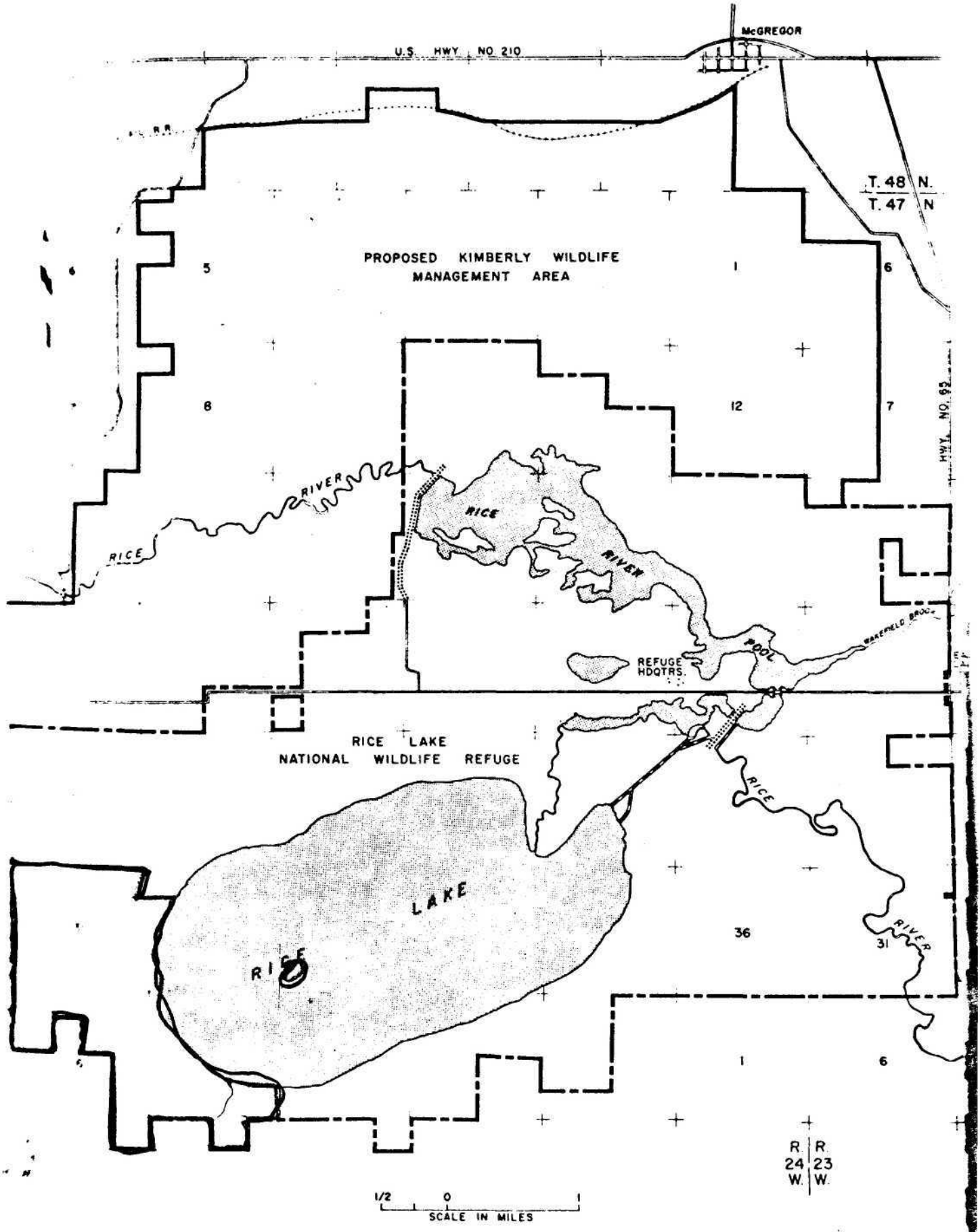


Figure 3 RICE LAKE REFUGE AND PROPOSED STATE AREA

INVENTORIES

The forest management plan for Rice Lake National Wildlife Refuge was completed in 1969. The entire refuge is divided into ten compartments. An intensive inventory of each compartment gives the amount of commercial timber volume for each forest type by acreage, species, age and size classes. Volumes are estimated for board feet and cords.

Each forest stand was checked and classified according to species, size, age and density site. All data is tabulated on 5 x 8 key sort cards with each card representing 160 acres. This inventory was completed in 1968. From this the timber acreage in the wilderness proposal was derived as it is essentially identically with compartments 6 and 8 of the timber management plan.

Regular counts or estimates are made of waterfowl, furbearers and big and upland game. Other forms of wildlife are not regularly counted but simply recorded as observed, for example: birds of prey, shore birds, small mammals and reptiles and amphibians. A count is made of the number of active nest in the heron rookery on Rice River, wood duck nest boxes are checked, counts are made weekly of waterfowl on Rice Lake and Rice River during migrations. Sharp-tailed grouse activity on the dancing grounds is tallied and deer are censused regularly along the refuge fields and roads where they tend to concentrate and by aerial counts of the yarding areas during winter. Brood counts of ducks and geese are made in late spring and early summer. As can be seen, the refuge's wildlife populations are subject to a variey of kinds of inventories.

Moose, bear, coyotes, etc., are recorded as encountered or when sign is observed. Bear activity, for example, in the refuge oak trees is particularly evident in the limbs broken as the animals climb for the acorns in the fall. House counts are made of muskrats and lodge counts of beaver. Canada goose nest sites are mapped and checked annually both on and off the refuge. Ruffed grouse drumming activity leads to location of drumming logs and this serves as an index of the spring population. These birds are also noted budding in birch and aspen and hazel and as they seek grit along refuge trails.

Observations of migrating shore birds and birds of prey are regularly recorded. The former group is especially in evidence on exposed mud flats along the shore of Rice Lake and the Rice River when water levels are down. In general, the various forms of wildlife have favored haunts on the refuge where they concentrate and can be censused more or less easily. Even mink and otter tend to frequent the water edges of the river and lake. ~~All in all, wildlife inventorying on this refuge is not the problem that it is on some refuges where major numbers of the species frequent inaccessible areas not easily counted.~~

Visitors to the refuge enter on the main road from Highway 65 on the east boundary. This road leads past refuge headquarters and the public fishing are and wildlife observation area are within sight of the office. The primary use of the refuge is for wildlife observation. A large part of this occurs on conducted tours. The next major use is fishing and this is concentrated around the bridge on the main entrance road. People launch boats there to fish a short distance up- or downstream. Picnicking affords another fairly large category of

use and is confined to the picnic area developed just off the main road west of headquarters.

Hunting is the other significant activity on the refuge, for deer and grouse in designated areas. No waterfowl hunting is permitted on the refuge. Constant daily patrolling during the seasons set by Minnesota contacts most hunter and affords car counts at the parking lots that must be used by refuge hunters. A fairly complete census of all such use is ~~therefore got quite~~ collected readily. Hunting is ~~about~~ the ~~only~~ main public use ~~to speak of~~ occuring in the area proposed for wilderness, ~~and very little even of this goes on~~.

HISTORY

Rice Lake with its extensive wild rice beds provided much of the staple food supply of early Indian tribes. When the first white men explored the Upper Mississippi in the mid-17th century, most of it was held by bands of Dakota or Sioux Indians. About the middle of the 18th century the Chippewa, who had been pressing gradually westward from the Lake Superior region, drove the Sioux southward and westward and occupied the territory.

One of the principal Indian village sites in the Upper Mississippi region was on the north shore of Rice Lake where earth mounds, now covered with trees, date its use back to prehistoric times. Each fall the Indians would gather here to harvest and prepare the grain for storage to last them until the next ricing season. Good crops provided "good times" - poor crops often meant starvation.

Some of the Indians who occasionally work or harvest wild rice on the refuge were born on the site of the present refuge headquarters known as Indian Point. Many of the old sugar maples along the ridge of the point still bear prominent scars from the days when the Indians slashed the trunks for sap to make maple sugar. The sugar bush provided maple syrup and sugar while flocks of migrating waterfowl, big game and fish were other staple food crops to the early residents.

Explorers, fur traders and missionaries began visiting the Upper Mississippi region in the 1660's. Fur trade prospered until about 1855. Aitkin County was named after William Aitkin, a Scottish fur trader who operated in the area until 1851.

Railroads opened the region to settlement for logging in the 1870's. Iron ore mining on the nearby Cuyuna Range accelerated area development and brought a rail line through the center of the present-day refuge. The railroad grade was widened by the CCC in 1938 and used as an access road to the camp and refuge headquarters. Now abandoned, this railroad bed forms the major entrance road into the refuge. The Indian mounds area lies on both sides of this road to the west of the headquarters complex and east of the north boundary of the wilderness proposal.

WILDERNESS STUDY AREA

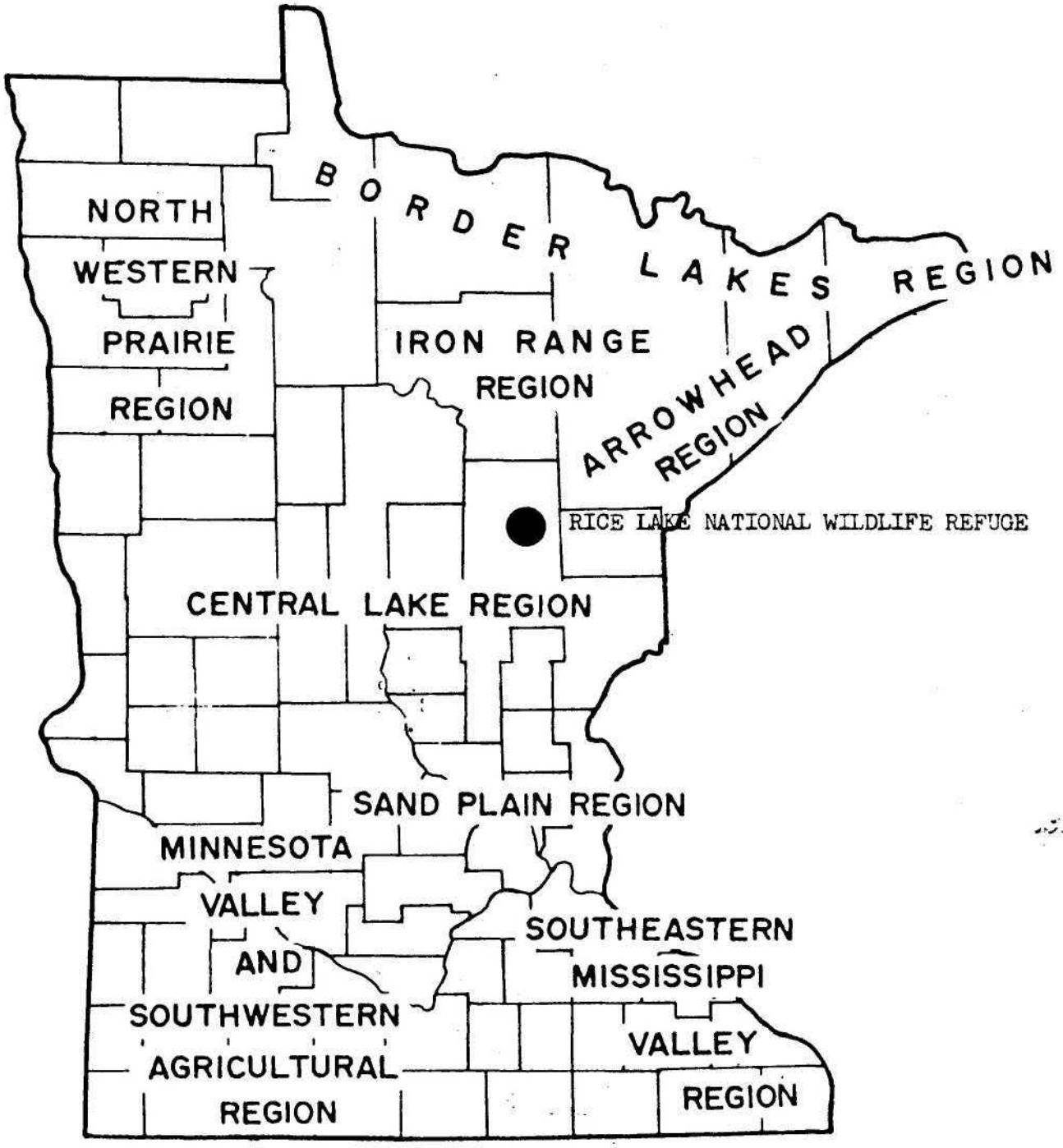
Rice Lake Refuge lies in the northeast part of Minnesota's central lake region. The landscape in this part of the State is heavily stipled with lakes. Surface features of the land are due to the action of ice sheets of the most recent glaciation and some post-glacial erosion. Basically it is termed a morainic topography, that is, a series of moraines or hills of varying height and extent that were left by the retreat of the melting ice. Though the land surface is irregular, there are relatively level expanses between hills and ridges and relief is not too great.

The refuge's ~~20,296~~ 18,056 acres are contained within a maximum east-west width of seven miles, and a north-south span of six and one-quarter miles. Elevations on the refuge range from 1221 at Mandy Lake to 1279 feet above msl about three miles west of the headquarters. However, about 11,000 acres are in lakes, river, bog and other wetlands, all of which lie below 1230 feet above msl. Only about 1000 acres are higher than 1250 feet.

The wilderness proposal ranges from 1225 feet on the shore of Rice Lake to 1240 feet on the southwest boundary. Only about 200 acres are above 1230 feet. Rice Lake Island is only slightly elevated above the lake surface and the boulder islands rise a ~~mere~~ 15 several feet above Mille Lacs Lake, the surface of which is 1251 feet above msl. mean sea level (msl).

GEOGRAPHIC DIVISIONS

OF MINNESOTA



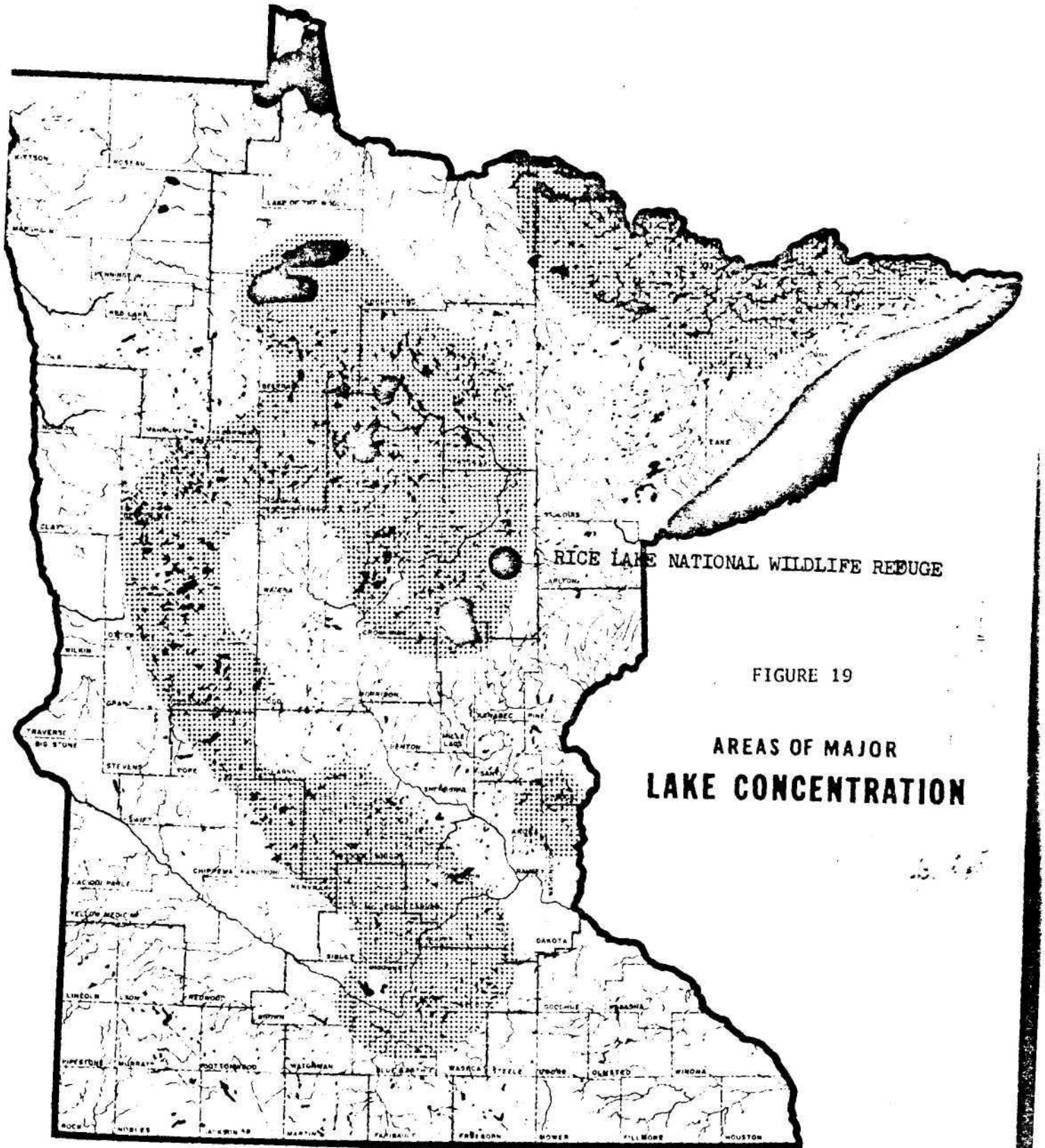


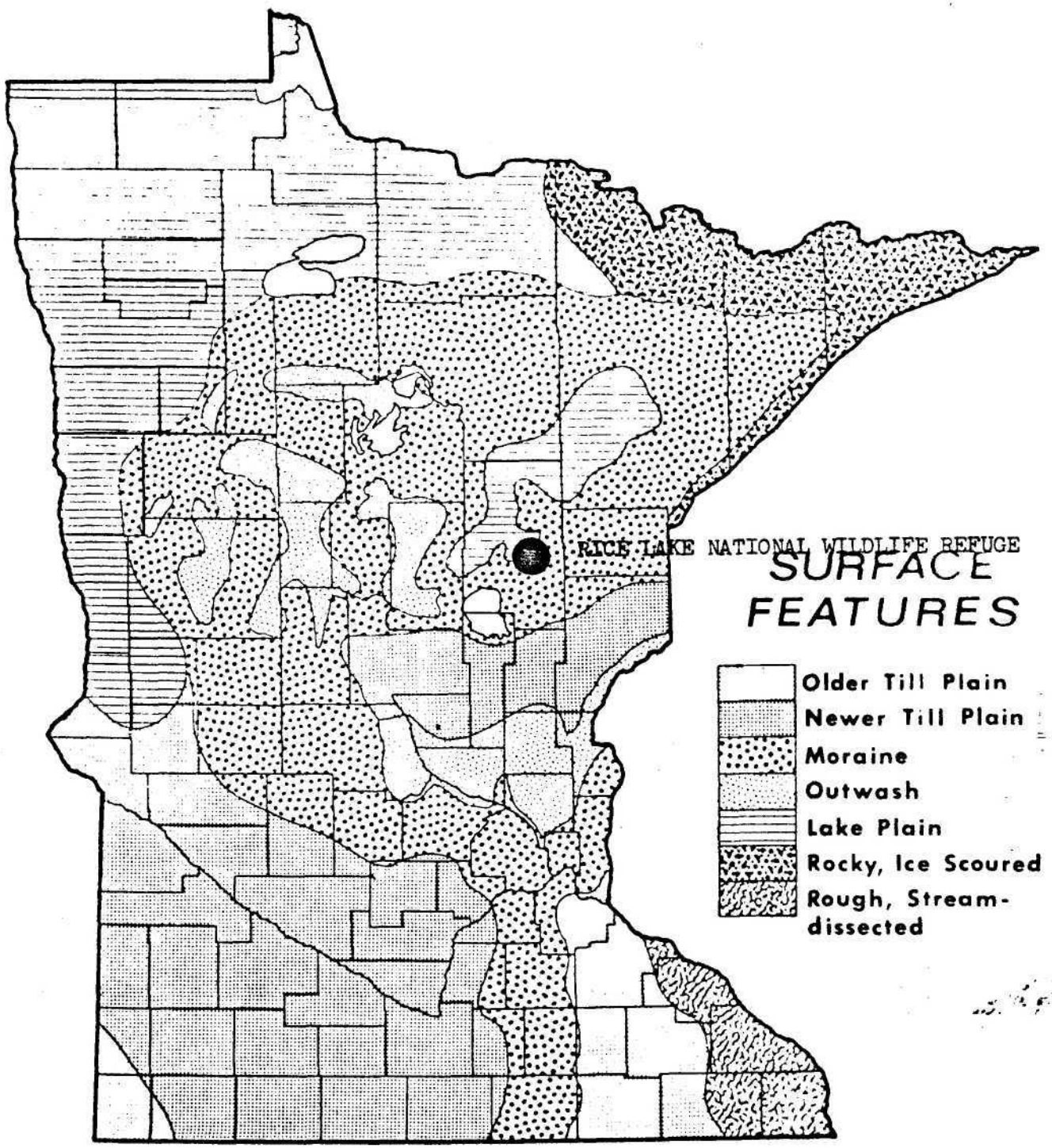
FIGURE 19

AREAS OF MAJOR
LAKE CONCENTRATION

The dominant geographical feature of the refuge is 3,800 acre Rice Lake. This is a shallow lake and a typical example of succession from open water to bog. On the east and west ends the muskeg is inexorably encroaching on the water as organic debris accumulates in the shallow basin. A glance at the topographic maps of the area shows the striking difference between Rice Lake and Dam and Portage lakes to the west of the refuge about a mile and three miles respectively.

These two lakes, though much smaller in area than Rice Lake, are deep, at least thirty and fifteen feet respectively. They also lie five feet lower than Rice Lake at their surface elevations. All indications are that their formation was due to a different source than Rice Lake. The latter appears to be a shallow depression on a glacial lake plain, possibly an extension of Glacial Lake Aitkin which reached from central Aitkin County up into southwestern St. Louis County.

The difference in lake elevations is obviously due to the high ridge about a half mile to the west of the refuge boundary. This is likely a feature resulting from the edge of the advancing ice and may mark the separation of "till plain" to the west from the lake plain surface to the east. In other words, Rice Lake has perhaps formed on what was at one time the bottom of a glacial lake formed by melt water impounded at the ice front by the moraines to the southwest. Dam and Portage lakes seem to be examples of "kettle lakes" (so-called from a supposed resemblance to a partially filled kettle of water) that formed in depressions on the surface of drift deposits to the west of the lake.



SOURCE: "A Reconnaissance Atlas of Minnesota," Dr. John Borchert, University of Minnesota, 1958.

The proposal consists of the encroaching bog west of Rice Lake which continues outside of the refuge to the high ridge mentioned, and higher ground of the glacial moraine that slopes gently upward to the south of the refuge. Thus, it is possible that the proposal straddles the margin of a glacial lake plain and the moraine that formed the south shore of the lake. If such is the case, this is then an area of unusual interest geologically.

This entire area lies within the great Mille Lacs Moraine to the southwest which is responsible for the creation of the lake in which Spirit and Hennepin islands lie. Mille Lacs Lake is a classic example of a third type of lake formation, a moraine-dammed lake.

Other physical features of the refuge are also of interest. About one-half mile east of Rice Lake a mile and a half long ridge juts straight northward into the refuge from the moraine uplands to the south. This ridge rises to a peak of over 1275 feet above msl and is only a half mile wide at its widest. The presence of gravel pits on the ridge indicate its probable identity as an esker, a deposit formed by a "subglacial stream flowing in an ice tunnel."

This esker effectively separates Rice Lake from the Rice River and its flowage in the southeastern corner of the refuge. A dike between the main east-west road and the north tip of the ridge now completes the separation of the lake and river. Rice River is shunted on to the north around another ridge, the high ground running east and west on which the road and headquarters complex is located.

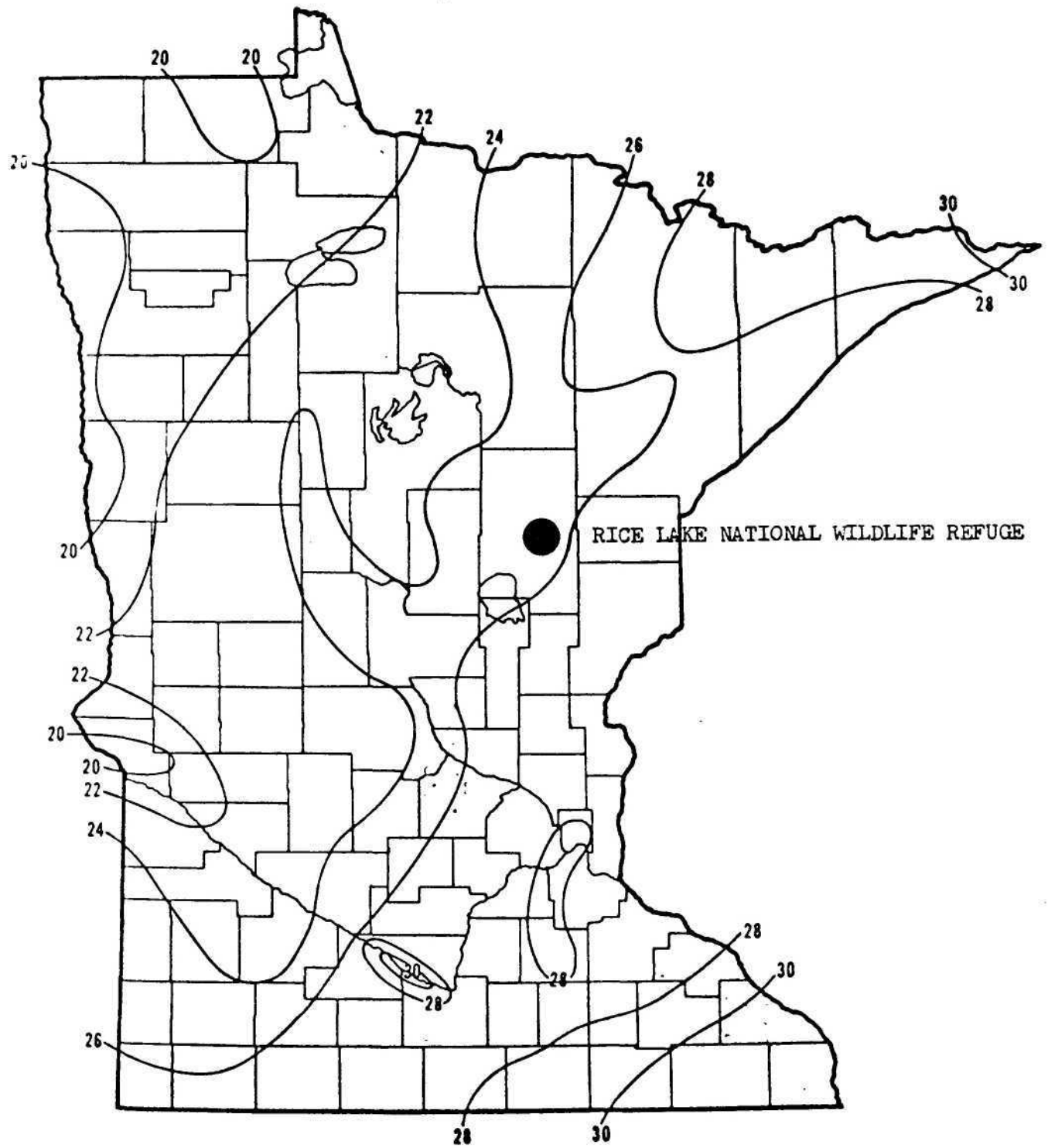
This ridge system, extending into the refuge from the west, forms the north side of the basin that Rice Lake and its associated bog occupy. The highest point on the refuge is a knoll on this ridge about one mile north of the west end of the lake. Rice River swings to the northwest around the east end of this ridge to leave the refuge at its north end on its way to the Mississippi River. Extensive bog and marsh border the rifer on both sides both within the refuge and beyond its boundary.

The east end of the refuge slopes gradually upward to the east and is ~~essentially~~ a part of the moraine topography to the south and east of the refuge. Wakefield Brook, a tributary of Rice River joins the latter within the refuge north of the main road flowing southwestward from the east boundary of the refuge.

This situation of ridges and hills separated by basins and lakes and rivers with associated bog is ~~a fine example~~ typical of the glacially formed topography of northern Minnesota. Various kinds of deposition processes of the most recent advance of the glaciers are typified here.

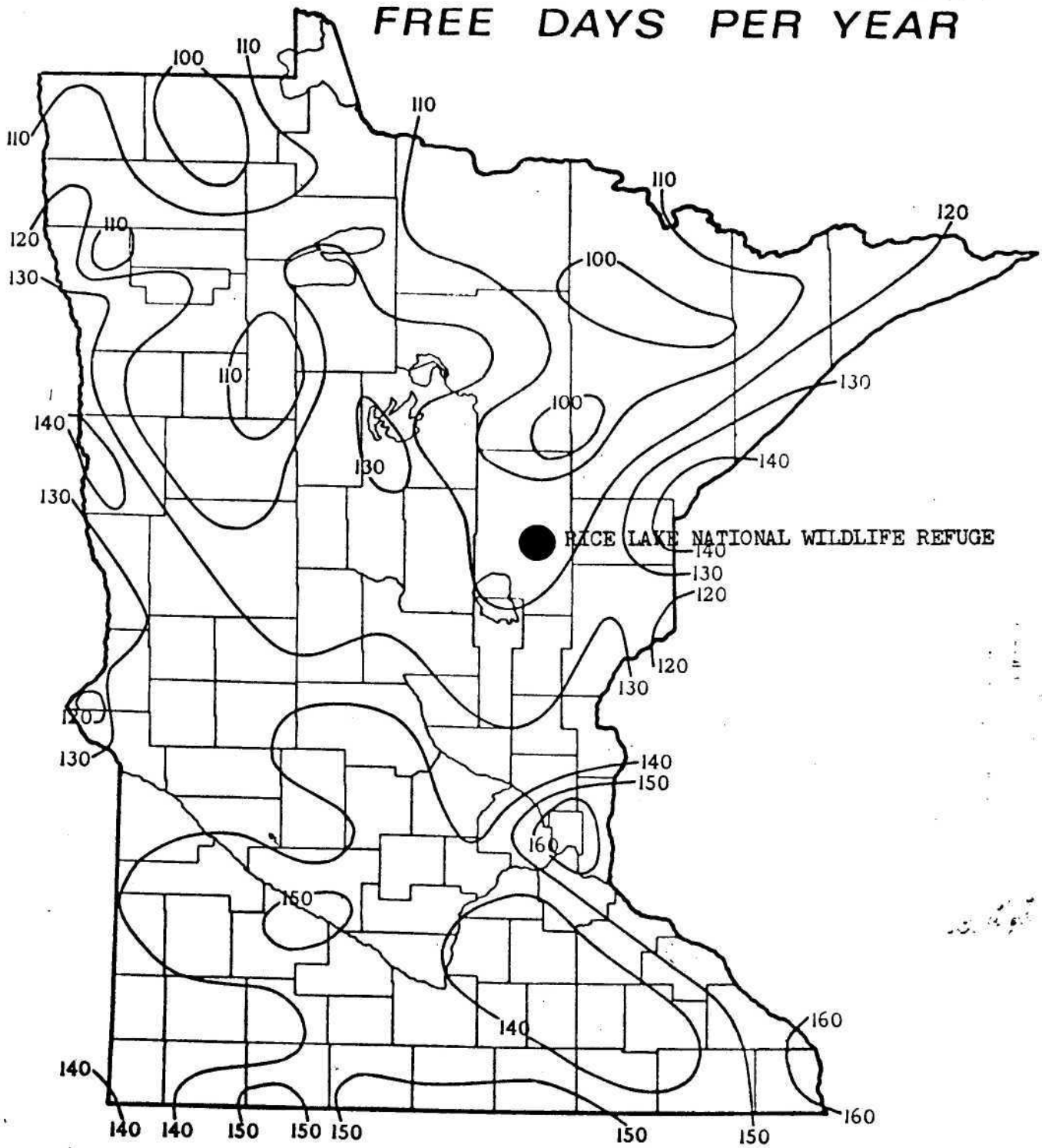
Weather records show great variation with temperature extremes from -50 to 100 degrees. Winters are long and cold. Frosts can be expected almost any month on the lowlands with the possible exception of June and July. These two months are also the wettest with nearly 13.5 inches of rain recorded during a recent July. The average is closer to 4.5 inches. Snowfall of up to 90 inches has been recorded but the average is about 50 inches. Average annual precipitation totals about 27 inches.

AVERAGE ANNUAL PRECIPITATION (in inches)



SOURCE: "A Reconnaissance Atlas of Minnesota,"
Dr. John Borchert, University of Minnesota, 1958.

AVERAGE NUMBER FROST FREE DAYS PER YEAR



SOURCE: U. S. Weather Bureau

Peat covers much of the bog area and varies generally from two to six feet in depth. The vegetation on these organic lowlands is largely sphagnum moss, Labrador tea, bog laurel, leatherleaf, cranberry, sedges, bluejoint and wire grasses and small trees of willow, bog birch, tamarack and black ash.

Upland mineral soils support a variety of timber types, depending largely upon whether they are well or poorly drained. Excessively drained loamy soils underlie oaks, red and jack pines. Quaking aspen is the most common tree species on the refuge but several stands of hard maple and other mixed hardwoods occur on the higher ground. Balsam fir, white spruce white cedar, American elm and soft maple are also common among many others. A few old growth white pines, missed during the heyday of the logging of Minnesota's pineries, remain on scattered sites, ~~in the bogs~~.

Refuge grasslands are generally former farms and as such contain a mixture of native and exotic grasses and forbs. Brome, bluegrass, quack and other grasses and white clover as well as goldenrod and wild roses are common.

The remaining approximately 19,000 acres of the refuge are excluded from this proposal for a variety of reasons. Essentially they have been altered by man's activity so as to deprive them of ~~true~~ wilderness character, or they will need to be managable or developable in the future to meet wildlife management objectives on Rice Lake Refuge.

The water level of Rice Lake is manipulated by a small control structure at its east end. Water level control is imperative for proper development of wild rice which in turn is of great importance not only to waterfowl in the fall migration but to Minnesota Indians as well.

The Rice River Pool is an artificial impoundment and is also required if management objectives are to be sustained. Besides these two major bodies of water, four smaller pools have been impounded to form additional water area with associated wetland habitat.

A program of still smaller pothole development has been initiated, principally in the area to the north of the wilderness proposal and between the Rice River Pool and the north boundary. These dug or dammed small water areas are readily accepted by Canada geese for nesting and rearing. The resulting dispersion of nest sites (often on islands mounded up in the potholes) helps make the goose population less susceptible to nest predators like the raccoon. This is crucial to the success of an increase in the breeding population of these giant Canada geese, an objective of Rice Lake Refuge. It also benefits duck production goals which in general call for doubling current production.

The pothole development program requires large tracts to allow proper dispersal of the impoundments to make nesting security effective. The utilization of the two separated portions of the refuge will provide this requirement in different habitats lending additional variety for different species of waterfowl. These nesting ponds will nicely

complement the refuge's larger bodies of water in its comprehensive waterfowl maintenance and production programs.

The area north of Rice Lake, as well as part of the east end of the refuge, have scattered crop lands and grazing and haying fields. Crops contribute significantly to goose use especially and support waterfowl maintenance goals. Grazing and haying maintain openings and grassland habitat important to the sharp-tailed grouse, a species whose range in Minnesota has greatly diminished. Deer also make extensive use of these areas and crops and of course are easily seen in these places by visitors. Coyotes are occasionally observed in these locations which are about the only places that are open enough for these "brush wolves" to be chanced upon and seen.

Finally, the refuge's timber management plan which supports wildlife management goals, must draw upon the balance of the commercial forest acreage to be effective. Devotion of larger acreages of timber to wilderness would seriously hamper timber management. Especially for deer and ruffed grouse periodic cutting of timber is essential. The approximately 400 acres of timber in the proposal represents less than 10% of the refuge total and can be "afforded" for wilderness preservation.

Thus it became apparent as a result of the proposal study that the road system, impoundments, pothole development, cropping and timber management programs rendered the balance of Rice Lake Refuge unsuitable for wilderness consideration.

In summary then, the proposal consists of the following. The proposal of 1400 acres is located in the southwest corner of the refuge in one of the most secluded areas. The west and south boundaries of this tract are identical with the refuge boundary and are separated from any roads by nearly a miles of essentially similar habitat outside of the refuge. The east side of the unit proposed is the west shore of Rice Lake. The north boundary of the proposal follows the section line between sections 30 and 31 from the west boundary of the refuge to the road that gives access to the refuge fields west of the headquarters. Only at this point and for a distance of less than one-half mile is the proposal bounded by a road.

Of the unit, 390 acres are in timber of some commercial value of which about 190 are lowland hardwoods composed of ash and elm and another 120 acres are in aspen. The great majority of the area is comprised of wet bog with no areas of open water.

The species of wildlife indigenous to the refuge at large are found in the proposal with the added fact that the refuge's only active nest of the bald eagle is within the unit. Public use within the proposal is very low due to its remote location and absence of access.

Spirit and Hennepin islands in Mille Lacs Lake are .24 and .33 acres respectively. Mere boulder heaps, most of the sand and other small particle material, has been washed out by wave action. They are nearly barren of vegetation and are major nesting sites for common terns.

Rice Lake Island is about 6.27 acres in size and comprised of sand, gravel & boulders a few feet rising only slightly out of the water. It is vegetated including trees & dense brush.

RESOURCES

Wildlife

Rice Lake National Wildlife Refuge has as its top priority the maintenance and production of waterfowl. The following tables are selected from recent Annual Narrative Reports of the refuge to indicate Rice Lake's contribution to these goals. Twenty-seven species of ducks, geese and swans frequent Rice Lake Refuge during migration. Canada geese and fourteen species of ducks breed here. About 4,500,000 waterfowl use days have been provided by the refuge in recent years. About 150 geese and nearly 2000 ducks are produced on the refuge each year.

The main species present in migration are the mallard, baldpate, and green-winged and blue-winged teals among the puddle ducks, and ring-necked ducks and scaup among the divers. These six species account for about 75% of the total duck use on the refuge. Number one during the fall, in terms of both peak number and use days, is the ring-necked duck. Rice Lake is one of the most important fall stop-over points in Minnesota for this duck. The significance of this can be realized when it is noted that Minnesota alone in recent years has accounted for about 25% of the continental harvest of the "ring-neck." ("Distribution of the Duck Harvest in Canada and the United States 1967-69".)

The next most important duck here is the mallard which is also numerous in the spring, in contrast to the ring-neck, though it is about on a par in

RICE LAKE
SEASONAL WATERFOWL POPULATIONS

		SWANS			GEESE			DUCKS		
		USE DAYS		PEAK NO.	USE DAYS		PEAK NO.	USE DAYS		PEAK NO.
1971	January - April		231	30	12,	131	560	147,	490	13, 810
	May - August				43,	470	400	697,	130	11, 100
	September - December	4,	480	300	143,	850	5, 150	3, 740	450	103, 260
1970	January - April		70	10	10,	157	500	75,	068	6, 350
	May - August				38,	101	400	768,	800	15, 950
	September - December	2,	800	250	133,	210	6, 350	3, 557	120	84, 110
1969	January - April		210	10	9,	548	500	129,	920	8, 750
	May - August				33,	250	400	604,	298	9, 350
	September - December	3,	640	250	74,	970	3, 000	3, 245,	900	86, 840

RICE LAKE
1971 SPRING-FALL
DUCK POPULATIONS

	JANUARY - APRIL USE DAYS	PEAK NO.	SEPTEMBER-DECEMBER USE DAYS	PEAK NO.
Mallard	23, 520	2, 000	952, 000	25, 000
Black Duck	2, 170	200	49, 000	1, 500
Baldpate	28, 700	2, 500	548, 000	20, 000
Pintail	7, 000	500	56, 000	2, 000
Green-winged Teal	13, 300	1, 500	226, 100	7, 000
Blue-winged Teal	18, 900	2, 000	332, 850	15, 000
Shoveler	3, 710	300	7, 000	200
Wood Duck	5, 320	400	106, 400	2, 500
Ringed-necked Duck	10, 570	1, 000	1, 162, 000	55, 000
Scaup	23, 170	3, 000	207, 830	15, 000
Goldeneye	2, 450	200	3, 360	100
Bufflehead	2, 870	300	2, 730	100
Hooded Merganser	5, 320	500	26, 950	500
Common Merganser	490	50	- -	-
Redhead	-	-	34, 930	1, 500
Canvasback	-	-	19, 530	1, 000
Ruddy	-	-	5, 670	300

RICE LAKE
FALL WATERFOWL POPULATIONS

	1971		1970		1969	
	USE DAYS	PEAK NO.	USE DAYS	PEAK NO.	USE DAYS	PEAK NO.
Mallard	952,000	25,000	1,088,500	25,000	805,000	20,000
Baldpate	548,000	20,000	345,450	15,000	241,150	10,000
Green-winged Teal	226,100	7,000	158,900	6,000	170,800	6,000
Blue-winged Teal	332,850	15,000	157,850	5,000	150,500	5,000
Ring-necked Duck	1,162,000	55,000	1,284,500	40,000	1,475,600	50,000
Scaup	207,830	15,000	184,730	5,000	99,400	5,000

RICE LAKE
WATERFOWL PRODUCTION

	1971	1970	1969
Canada Geese	150	150	150
Mallard	250	270	250
Black Duck	20	20	15
Baldpate	400	400	300
Pintail	20	10	-
Green-winged Teal	150	200	150
Blue-winged Teal	400	300	320
Shoveler	20	10	10
Wood Duck	350	400	350
Redhead	10	10	-
Ringnecked Duck	80	50	30
Canvasback	10	10	10
Scaup	10	10	10
Goldeneye	10	10	10
Hooded Merganser	150	150	150

that season with baldpate and scaup in most years. Other species that make at least fair use of the refuge are the pintail, wood duck and hooded merganser, and in the fall redheads and canvasbacks.

Major nesting duck species are baldpate, blue-winged teal, and wood ducks, closely followed by mallards, green-winged teal and hooded mergansers. These birds find their finest nesting on the refuge in the grasslands, the margins of Rice Lake and the developed pothole areas. The continuation of this last mentioned program should increase significantly duck production as well as goose production on the refuge.

Traditionally Canada geese did not nest in this part of Minnesota. In an effort to increase the population of the giant race of this species, and to establish a nesting population in Minnesota, Rice Lake was selected to attempt this, using a captive flock. An indigenous nesting population has successfully been achieved. In the spring the birds move into Rice Lake on arrival from the south, and then disperce outside of the refuge as well as within the boundaries. In the fall, they stage on the Lake again prior to departing south. Probably at least half of the production of giant Canadas in the area occurs off the refuge as a direct result of the refuge's initial work. This program has provided area residents with a great deal of satisfaction, and those "privileged" to have been selected by the birds for rearing their young are most protective of the geese.

Other Wildlife

Shorebirds, that group of long-distance fliers, and the allied gulls and terns, frequent the refuge during migrations each year. Of the 23 species of these migrants only the killdeer, woodcock, snipe and spotted sandpiper are common nesting summer residents on the refuge. Common terns nest in good numbers, some years as many as 500 pairs on Hennepin Island alone and nearly 100 more on Spirit Island.

Over two dozen species of hawks and owls are also found on the refuge, including both species of North American eagles. While the golden is only an occasional visitor some winters, the bald eagle nests on the refuge. The lone nest here of our national emblem is located in the wilderness proposal. During fall and spring migrations bald eagles make extensive use of the refuge with up to forty present at one time in recent years. An occasional migrant visitor is the endangered peregrine falcon. All three of the ascipiters are found here as is the osprey whose exact population status nationally remains officially "undetermined."

Of the owls the barred and great horned are common year-around residents. Screech owls are also residents and occasional sightings of saw-whet owls are noted. During winter snowy owls are seen occasionally, and in rare instances the hawk owl provides a special attraction for birders from near and far. With the role in the scheme of nature of the

birds of prey becoming better understood and appreciated in recent times, Rice Lake Refuge provides a vantage point for their observation for those so inclined.

Water and marsh birds add to the variety of life's forms at Rice Lake. Seventeen species including loon, grebes, herons, bitterns, pelican, cormorant, rails, coot and the greater sandhill crane are included in this group. This species, with the timber wolf, is the hallmark of the northern wilderness. A great blue heron rookery existed for many years on Rice Lake Island. As recently as 1967 it produced 150 young. However, the following year it was ~~evidently~~ raided by raccoons and the island has been abandoned since then. The rookery is now located along the Rice River where about 30 to 40 nests are located and produce in the neighborhood of 75 young annually.

Although a whooping crane was observed on the refuge some years ago and the refuge is ~~on~~ on the ~~northern~~ the ~~migration~~ migration route, it is considered accidental here today. However, its smaller relative the greater sandhill has a ~~probable~~ single nest each year on the refuge. The wild calling of the birds is heard each summer and they are seen occasionally in the marsh on the north margin of Rice Lake.

The other major group of birds, the perching birds or "song" birds is richly represented on the refuge. Fourteen different kinds of warblers can be observed here, a major attraction for birders. The finch-sparrow association is represented by close to thirty species. Especially

All waterfowl are absent during the winter. The spring migration, which begins in mid-March and reaches its peak in late April, is less spectacular than the fall flight in October. While mallards are most numerous, many thousands of ring-necked ducks stop to feed on the refuge. Since satisfactory conditions have been developed, cormorants and great blue herons are abundant throughout the summer.

The following bird list contains 212 species based upon observations since 1939. Those marked with a #, normally transient visitors, may remain during the summer in limited numbers. The list, using species names, is in accordance with the Fifth (1957) A.O.U. Check-list. Status and abundance symbols are defined as follows:

Status	Abundance
PR - Permanent Resident	a - abundant
SR - Summer Resident	c - common
WV - Winter Visitor	u - uncommon
SV - Summer Visitor	o - occasional
TV - Transient Visitor	r - rare
AV - Accidental Visitor	

Common Loon		SR-c	Redhead		TV-c
Red-necked Grebe		TV-c	Ring-necked Duck	#	TV-
Horned Grebe		TV-c	Canvasback		TV-c
Eared Grebe		TV-o	Greater Scaup		TV-o
Pied-billed Grebe		SR-c	Lesser Scaup		TV-a
White Pelican		TV-o	Common Goldeneye		TV-u
Double-crested Cormorant		SR-a	Bufflehead		TV-u
Great Blue Heron		SR-a	White-winged Scoter		TV-o
Green Heron		TV-c	Ruddy Duck		TV-u
Common Egret		TV-u	Hooded Merganser		SR-u
Black-crowned Night Heron		TV-c	Common Merganser		TV-u
Least Bittern		SR-r	Red-breasted Merganser		TV-c
American Bittern		SR-c	Turkey Vulture		TV-c
Whistling Swan	#	TV-c	Goshawk		PR-u
Canada Goose		SR-a	Sharp-shinned Hawk		SR-u
White-fronted Goose		TV-u	Cooper's Hawk		SR-u
Snow Goose		TV-c	Red-tailed Hawk		SR-c
Blue Goose		TV-u	Harlan's Hawk		TV-o
Mallard		SR-a	Red-shouldered Hawk		TV-o
Black Duck		SR-a	Broad-winged Hawk		SR-c
Gadwall		TV-c	Swainson's Hawk		TV-o
Pintail		SR-c	Rough-legged Hawk		WV-c
Green-winged Teal	#	TV-c	Golden Eagle		WV-o
Blue-winged Teal		SR-a	Bald Eagle		SR-c
Cinnamon Teal		TV-o	Marsh Hawk		SR-a
American Widgeon		SR-a	Osprey		SR-o
Shoveler		TV-u	Peregrine Falcon		TV-c
Wood Duck		SR-c	Pigeon Hawk		TV-

Sparrow Hawk	SR-c
Spruce Grouse	PR-r
Ruffed Grouse	PR-a
Greater Prairie Chicken	SR-r
Sharp-tailed Grouse	PR-c
Ring-necked Pheasant	PR-u
Whooping Crane	AV
Sandhill Crane	SR-u
Virginia Rail	SR-u
Sora	SR-a
American Coot	SR-c
Killdeer	SR-a
Black-bellied Plover	TV-c
American Woodcock	SR-c
Common Snipe	SR-a
Upland Plover	TV-a
Spotted Sandpiper	SR-c
Solitary Sandpiper	TV-c
Greater Yellowlegs	TV-c
Lesser Yellowlegs	TV-c
Pectoral Sandpiper	TV-c
Dowitcher (species?)	TV-c
Stilt Sandpiper	TV-c
Semipalmated Sandpiper	TV-u
Sanderling	TV-u
Wilson's Phalarope	TV-u
Northern Phalarope	TV-u
Herring Gull	SV-c
Ring-billed Gull	TV-u
Franklin's Gull	SV-u
Forster's Tern	SV-a
Common Tern	SV-c
Caspian Tern	SV-a
Black Tern	SR-c
Mourning Dove	SR-c
Yellow-billed Cuckoo	SR-o
Black-billed Cuckoo	SR-u
Screech Owl	PR-c
Great Horned Owl	WV-c
Snowy Owl	WV-o
Hawk Owl	SR-u
Barred Owl	AV
Great Gray Owl	SR-u
Long-eared Owl	SR-c
Short-eared Owl	WV-c
Saw-whet Owl	SR-u
Whip-poor-will	SR-c
Common Nighthawk	SV-c
Chimney Swift	SR-c
Ruby-throated Hummingbird	SR-c
Belted Kingfisher	SR-a
Yellow-shafted Flicker	

Pileated Woodpecker	PR-c
Red-headed Woodpecker	SR-c
Yellow-bellied Sapsucker	SR-a
Hairy Woodpecker	WV-c
Downy Woodpecker	PR-a
Black-backed Three-toed Woodpecker	WV-u
Eastern Kingbird	SR-c
Western Kingbird	TV-o
Great Crested Flycatcher	SR-a
Eastern Phoebe	SR-a
Least Flycatcher	SR-c
Eastern Wood Pewee	SR-c
Olive-sided Flycatcher	SR-u
Horned Lark	TV-c
Tree Swallow	SR-c
Bank Swallow	SR-a
Barn Swallow	SR-c
Cliff Swallow	SR-a
Purple Martin	SR-c
Gray Jay	TV-u
Blue Jay	PR-c
Black-billed Magpie	TV-u
Common Raven	WV-c
Common Crow	SR-a
Black-capped Chickadee	PR-a
White-breasted Nuthatch	PR-a
Red-breasted Nuthatch	TV-u
Brown Creeper	TV-c
House Wren	SR-c
Short-billed Marsh Wren	SR-a
Mockingbird	TV-r
Catbird	SR-c
Brown Thrasher	SR-c
Robin	SR-a
Wood Thrush	SR-u
Hermit Thrush	SR-c
Olive-backed Thrush	SR-u
Veery	SR-c
Eastern Bluebird	SR-c
Mountain Bluebird	TV-r
Golden-crowned Kinglet	TV-c
Water Pipit	TV-u
Bohemian Waxwing	TV-o
Cedar Waxwing	SR-c
Northern Shrike	WV-c
Loggerhead Shrike	SR-u
Starling	PR-c
Red-eyed Vireo	SR-c
Warbling Vireo	TV-c
Black-and-white Warbler	TV-c
Tennessee Warbler	TV-c
Orange-crowned Warbler	TV-c

Nashville Warbler	TV-c	Evening Grosbeak	WV-
Yellow Warbler	SR-a	Purple Finch	TV-c
Myrtle Warbler	TV-a	Pine Grosbeak	WV-c
Blackburnian Warbler	SR-u	Common Redpoll	WV-c
Chestnut-sided Warbler	SR-u	Pine Siskin	PR-u
Blackpoll Warbler	TV-c	American Goldfinch	SR-a
Palm Warbler	TV-c	White-winged Crossbill	AV
Ovenbird	SR-a	Rufous-sided Towhee	TV-u
Yellowthroat	SR-c	Savannah Sparrow	SR-c
Wilson's Warbler	TV-c	Vesper Sparrow	SR-c
American Redstart	TV-c	Slate-colored Junco	TV-a
House Sparrow	PR-c	Oregon Junco	TV-r
Bobolink	SR-c	Tree Sparrow	TV-c
Eastern Meadowlark	SR-c	Chipping Sparrow	SR-c
Western Meadowlark	SR-u	Clay-colored Sparrow	SR-c
Yellow-headed Blackbird	SR-c	Field Sparrow	SR-c
Redwinged Blackbird	SR-a	Harris' Sparrow	TV-c
Baltimore Oriole	SR-c	White-crowned Sparrow	SR-c
Rusty Blackbird	TV-u	White-throated Sparrow	SR-c
Brewer's Blackbird	TV-c	Fox Sparrow	TV-c
Common Grackle	TV-c	Lincoln's Sparrow	TV-c
Brown-headed Cowbird	SR-c	Swamp Sparrow	SR-c
Scarlet Tanager	SR-c	Song Sparrow	SR-a
Cardinal	TV-u	Lapland Longspur	TV-c
Rose-breasted Grosbeak	SR-c	Chestnut-collared Longspur	TV-u
Indigo Bunting	SR-u	Snow Bunting	WV-

NOTES

RL-157-R-2
March 1964

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

INT.DUP.,D.C.64-43123

interesting are the winter birds such as the pine and evening grosbeaks, crossbills, redpoll and snow buntings. These are sometimes joined by magpies, three-toed woodpeckers, ravens, Bohemian waxwings and northern shrikes, ~~to make winter prime time for birding at Rice Lake~~.

Uplands species of birds and large and small mammals, generally those forms referred to as "resident species" form another broad grouping of wildlife that prosper on Rice Lake. Grouse are plentiful here, the varied habitats occupied by different species. Ruffed grouse are the common bird of the deciduous and mixed conifer-deciduous areas. In the brush areas associated with fields a few sharp-tails exist. This species is greatly reduced in numbers and range over most of the State. Rare at best or perhaps gone now altogether are the prairie chicks and spruce grouse.

For refuge visitors one of the major attractions of the refuge is the deer herd. About 100 to 150 white-tails reside on the refuge during periods of greatest use. During winter many move off to yarding areas in cedar swamps in the surrounding vicinity. The deer make heavy use of refuge fields and crops adjacent to the roads, and much of the visitor use is specifically to observe deer.

A few black bear are residents of Rice Lake. These animals are wild enough so that they tend to avoid humans and do not pose any visitor problem.

Perhaps up to ten or so are present on the refuge at times. Their feeding activity on acorns is noted each fall in the broken limbs of the ~~refuge~~ our oaks.

A pair or two of moose usually frequent the refuge but are often poached when they venture outside. ~~An occasional moose wanders through the refuge. Probably no more than two are even on the premises.~~ A small population of coyotes includes the refuge within their territory and are heard or seen ~~now and then~~ occasionally. The refuge provides a protected haven for these animals that are sometimes subject to snowmobile harrassment ~~in this area~~ in the district. The coyote's larger cousin, the timber wolf, also makes an infrequent appearance at Rice Lake. This species is classified as "threatened" in the 1973 edition of Threatened Wildlife of the United States, USDI.

It is the combination of these species, deer, moose, bear, coyote and wolf that lends such an air of wildness and naturalness to Rice Lake. Few indeed are those places today where the diminished ranges of these wild ones yet overlap, where men can know at least the chance of sight or sound of one or all of them.

Added to these larger mammals of Rice Lake are the smaller habitants of wild lands such as porcupine, fox and bobcat. Furbearers are common here like muskrat and the beaver whose dams provide water areas for birds and other animals. Mink hunt the river banks and lake shores providing glimpses now and then for fishermen and other refuge visitors.

And a family of otters may thrill a lurky visitor regardless of his station in life. Other small mammals are noted in the mammal list, many of these likely provide a buffer between the refuge's waterfowl and predators.

Reptiles and Amphibians include several frog species, toads, turtles and snakes. Their presence here speaks of the natural ecosystems that are still largely intact on the refuge.

Northern pike and bullheads predominate in the fish populations. Rice Lake serves as a natural rearing pond, ~~one of~~ the best in Minnesota, for northern pike which enter from the river in the spring. Salvage operations provide up to 175, 000 young northerns per year for stocking other Minnesota lakes. Other fish in refuge waters include yellow perch, buffalo, dogfish and eelpout.

So far as the proposed wilderness tract is concerned, most of what has been discussed concerning the refuge at large applies here as well. With no open water area within the proposal the only use by water birds would be some nesting and overflights. Most of the mammals would at least traverse the tract on occasion. The bald eagle has noted nests within the tract, and common terns nest on the Mille Lacs islands.

MAMMAL LIST

A - Abundant
C - Common
O - Occasional
P - Present
N - None known, hypothetical for county

*Star-nosed mole (Condylura cristata) : swamps, bogs and wet meadows
C

Cinereous shrew (Sorex cinereus) : heavy grassy cover of uplands
C

Richardson shrew (Sorex arcticus) : spruce and tamarack bogs and wet meadows
P

Water shrew (Sorex palustris) : found only near water
N

*Pigmy shrew (Microsorex hoyi) : prefers moist habitat
A

*Short-tailed shrew (Blarina brevicauda) : most common in wooded areas
A

*Little brown bat (Myotis lucifugus) : A

Big brown bat (Eptesicus fuscus) : N

Silver-haired bat (Lasionycteris noctivagans) : rare, in vicinity of water in wooded areas
O

Red Bat (Lasiurus borealis) : partial to hardwoods and areas with considerable water
P

White-tailed jack rabbit (Lepus townsendii) : open prairie
N

*Snowshoe rabbit (Lepus americanus) : coniferous forest
C

Cottontail rabbit (Sylvilagus floridanus) : broken deciduous forest and brush country
N

*Woodchuck (Marmota monax) : edges of clearings
C

*Striped ground squirrel (Citellus tridecemlineatus): open area and pasture
A

*Franklin's ground squirrel (Citellus franklinii) : brushy fields
C

Least chipmunk (Eutamias minimus) : coniferous forest
A

*Eastern chipmunk (Tamias striatus) : brushlands and mixed hardwoods
A

*Red squirrel (Tamiasciurus hudsonicus) : prefers conifers
A

*Gray squirrel (Sciurus carolinensis) : large blocks of mature, ungrazed hardwoods
A

*Fox squirrel (Sciurus niger) : hardwoods, smaller woodlots
O

Southern flying squirrel (Glaucomys volans) : mature hardwoods
N

*Northern flying squirrel (Glaucomys sabrinus) : prefers conifers
C

*Beaver (Castor canadensis) : common resident
C

*White-footed mouse (Peromyscus maniculatus) : conifer forest
C

*White-footed mouse (Peromyscus leucopus) : deciduous forest
P

Bog lemming (Synaptomys cooperi) : low damp bogs or meadows, particularly those with sphagnum
N

*Red-backed vole (Clethrionomys gapperi) : damp forest floors of deciduous woods or conifer swamps
C

*Meadow mouse (Microtus pennsylvanicus) : moist grass cover fields or swamp edges
A

*Muskrat (Ondatra zibethica) : common resident
C

*Meadow jumping mouse (Zapus hudsonius) : prefers low meadows
O

*Porcupine (Erethizon dorsatum) : common resident
A

*Black bear (Ursus americanus) : common resident
C

*Raccoon (Procyon lotor) : common resident
C

Short-tailed weasel (Mustela erminea) : woodlands usually
C

*Long-tailed weasel (Mustela frenata) : brushy areas along water courses
C

Least weasel (Mustela rixosa) : high marshes and damp meadows
C

*Mink (Mustela vison) : common resident
C

*Otter (Lutra canadensis) : common resident
C

*Striped skunk (Mephitis mephitis) : common resident
C

*Badger (Taxidea taxus) : occasional resident
C

*Red fox (Vulpes fulva) : common resident
C

Gray fox (Urocyon cinereoargenteus) ~~uncommon~~ P

*Coyote (Canis latrans) : ~~uncommon~~ common resident
C

*Timber wolf (Canis lupus) : rare transient
P

Canada lynx (Lynx canadensis) : P

*Bobcat (Lynx rufus) : ~~occasional~~ resident
C

*White-tailed deer (Odocoileus virginianus) : common resident
C

*Moose (Alces alces) : ~~occasional~~ resident, lives on refuge
O

*Verified on the refuge in recent years either by sightings or sign.

Species possibly present at time of White Man's advent into Minnesota but extirpated since then

Pine marten (Martes americana)	N
Fisher (Martes pennanti)	N
Elk (Cervus canadensis)	N
Woodland caribou (Rangifer tarandus)	N

This list with the habitat notations was prepared from "The Mammals of Minnesota, Harvey L. Gunderson and James R. Beer, 1953, University of Minnesota Press.

Hypothetical List of Amphibians and Reptiles of Rice Lake Refuge

Mud puppy (Necturus maculosus):	N
Common Newt (Triturus viridecsens):	N
Red-backed salamander (Plethodon cinereus):	N
Tiger salamander (Ambystoma tigrinum):	N
*Spotted salamander (Ambystoma maculatum):	A
Jefferson's salamander (Ambystoma jeffersonianum):	P
*American toad (Bubo americanus):	A
*Swamp tree frog (Pseudacris nigrita):	C
*Spring peeper (Hyla crucifer):	C
*Common tree frog (Hyla versicolor):	C
*Mink frog (Rana septentrionalis):	C
*Leopard frog (Rana pipiens):	A
Wood frog (Rana cantibnigensis):	C
Green frog (Rana clamitans):	O
Black-banded skink (Eumeces septentrionalis):	N
*Red-bellied snake (Storeria occipitomaculata):	C
Bull snake (Pituophis sayi):	N
*Common garter snake (Thamnophis sirtalis):	C
*Smooth green snake (Opheodrys vernalis):	C
*Snapping turtle (Chelydra serpentina):	C
*Painted turtle (Chrysemys bellii):	C

*Verified on the refuge in recent years

Prepared from Reptiles and Amphibians of Minnesota, W. J. Breckenridge, 1944, University of Minnesota Press.

Water

Ground Water

Ground water occurs most abundantly in the glacial drift. Water is available in variable quantities depending on the source and distribution of the drift and size and thickness of enclosed sand and gravel deposits or lenses.

Inasmuch as the porosity and permeability of the glacial drift is generally high the total storage and annual changes in storage of ground water are probably large. Although the geological conditions are generally favorable for recharge, much of the ground water in transit to the streams is lost by evaporation and transpiration. In response to recharge during the spring breakup, natural ground water levels usually reach a maximum during April or early May and then decline with only minor reversals until January or February

Watershed and Streams

The watershed of the Rice River above the control gate covers an area of approximately 155 square miles. Rice Lake and its drainage area account for 27 square miles of this total. Most of the river drainage area is swampy, heavily timbered, has flat land slopes and is capable of storing large amounts of water. Natural storage in the upstream marshes tempers the stream flow on the river so that changes in stage are generally gradual. The storage contributes toward a fairly uniform low-water flow, especially during the fall and winter months.

Drainage ditches in the headwaters have a tendancy to reduce the effects of swamp storage on the stream flow however; and this is particularly noticeable after heavy rainfalls following prolonged wet periods when the swamps are filled. Under such conditions the river stage rises rapidly at the refuge. Major runoff occurs from snow melt, as expected, and secondary peaks occur after rainfall in May and June.

No stream flow records are available for the Rice River, and only one discharge measurement has been made. Gage height records, however, have been obtained at the refuge for both the lake and the river since 1943. An average of the nearest gaging stations on similar watersheds indicates that maximum runoff rates appear to be in the range of 5 to 7 cfs per square mile. This indicates the flood discharges at the refuge would be about 800 to 1100 cfs. Bureau personnel in the spring of 1965 computed the flow at about 1500 cfs at the Kimberly bridge.

Since no stream flow records are available for the Rice River, it is difficult to determine the average annual yield from that portion of the watershed supplying the refuge. Recent information indicates the average annual runoff in the vicinity of the refuge is about $5\frac{1}{2}$ inches. The average annual yield for the 155 square mile drainage area then would be approximately 45,000 acre-feet.

Using an average annual evaporation rate of 26 inches, assuming transpiration losses at 50 percent of the evaporation, and rainfall at 26 inches, the net average annual water requirement for the pools would be about 13 inches or about 6,100 acre-feet at the operating level. This is only about 13 percent of the anticipated average yield. Even though transpiration losses cannot be estimated with any degree of accuracy, it is obvious that the total water supply of the Rice River will greatly exceed the refuge requirements. The problem of course arises with the attempt to raise water levels in the fall when runoff is low.

The refuge natural lakes range in size from about 3200 acre Rice Lake down to Twin Lakes that together have less than forty acres. Mandy Lake is the next largest with about 100 acres. The dam on Rice River has created an impoundment of about 1900 acres. Additional water area has been provided in small scattered potholes and ponds either by blocking drainage, or by scraping shallow excavations that allow water to seep into the depressions.

Various wetland and water habitats are represented in the total water acreages: Rice Lake and its associated marsh, 5000 acres; Rice River Pool and associated marsh, 2700 acres; Rice River and tributaries, 450 acres of water and marsh; ponds, potholes and ditches 1100 acres; Many and Twin Lakes 200 acres of marsh and water; total water and "wetland" habitat 9500. These acres comprise the principle waterfowl areas of the refuge, uplands and crops add about another 1100 acres that are closely associated with these water resources.

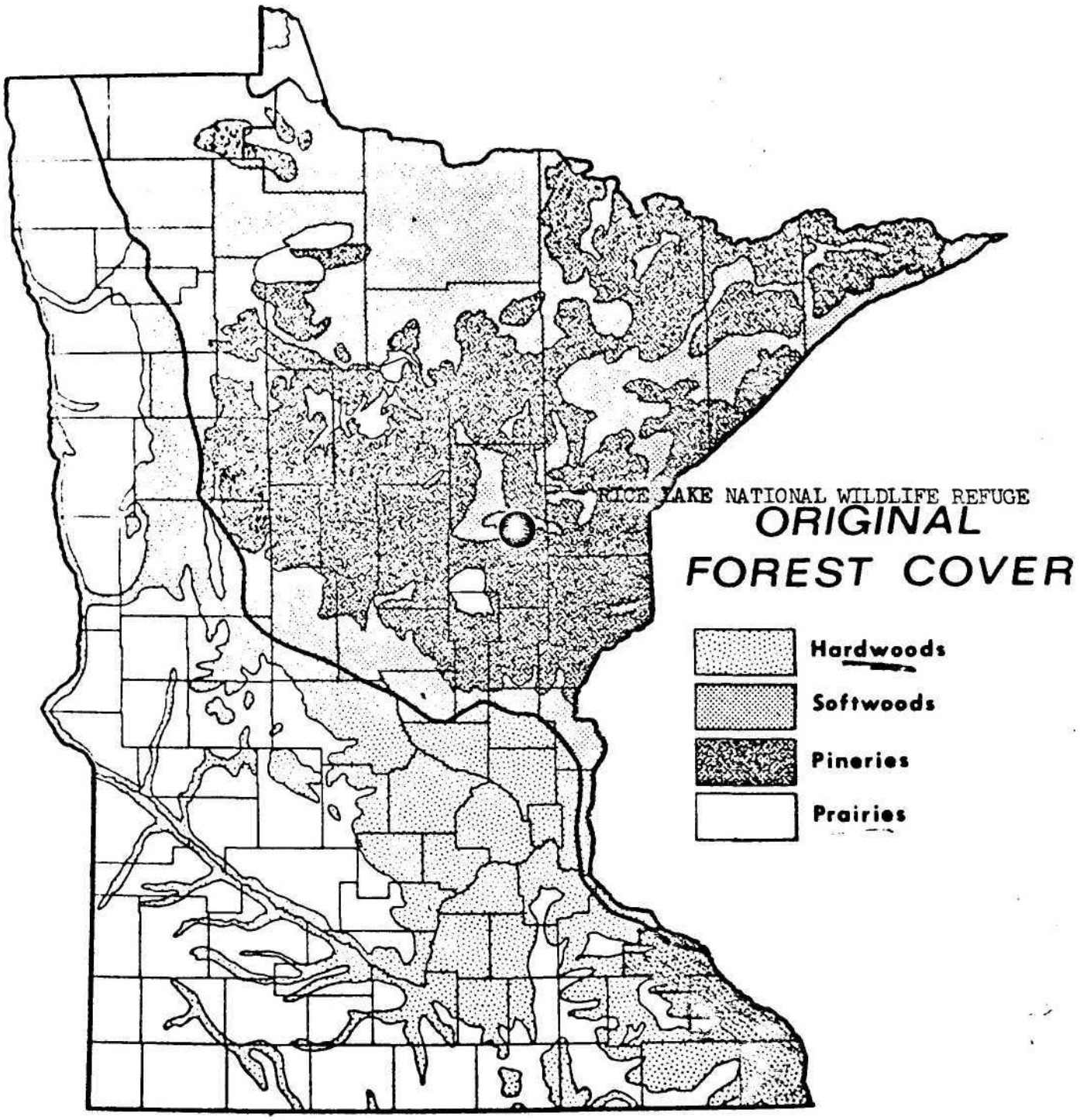
The wilderness proposal will have no effect on water resources. No lakes, streams or ponds exist within the proposed boundaries. The tract is bounded on the east by Rice Lake, but since wilderness designation here will simply preserve the status quo no change on the Lake will occur if Congress approves this proposal.

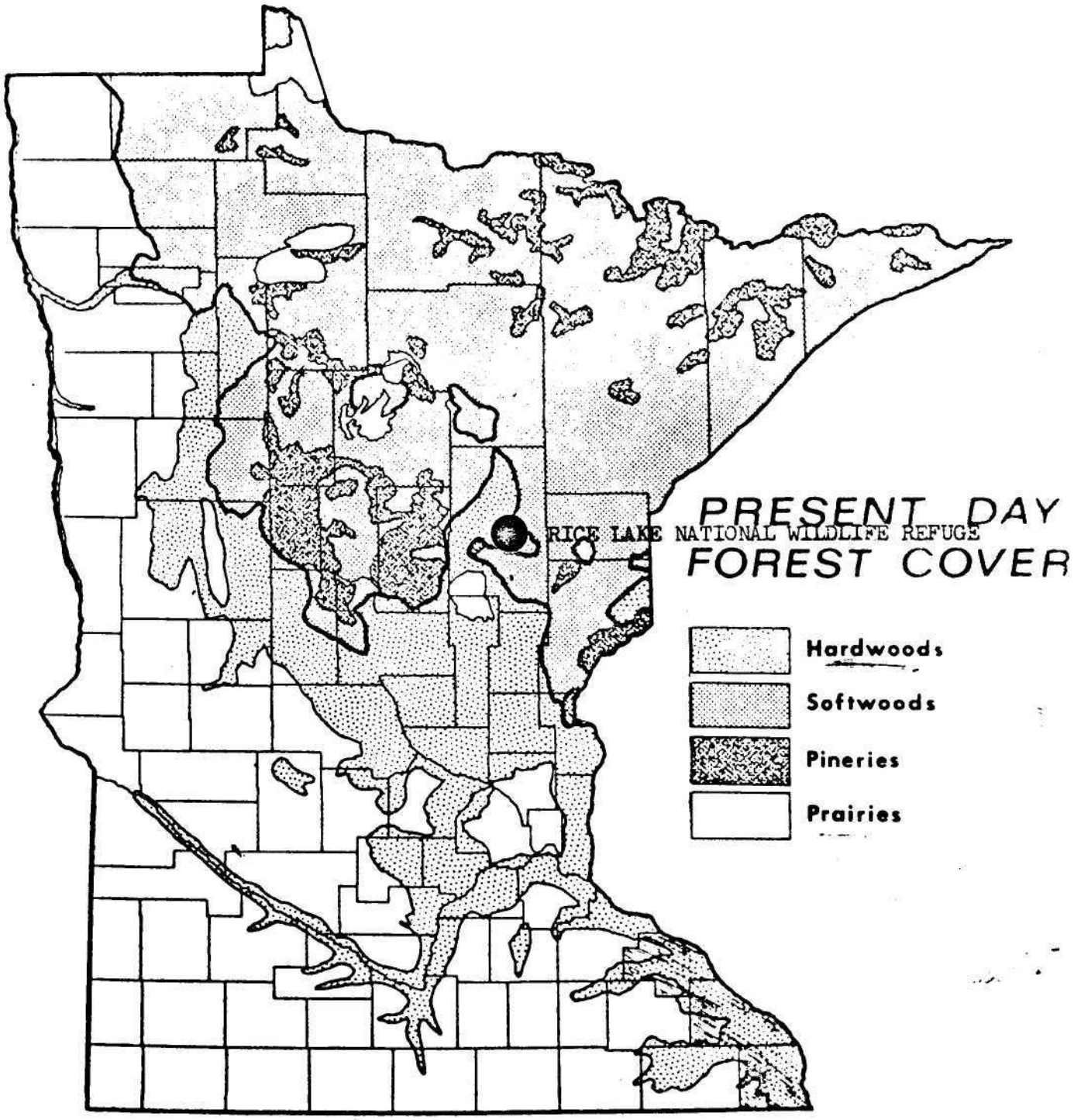
VEGETATION

Rice Lake Refuge lies within the original range of the northern conifer forest, in Minnesota in particular the great pine forests. As these magnificent forests were logged off and the areas burned over and put into agriculture, the vegetational communities were drastically altered. In general, the pine was drastically reduced to a small fraction of its original area. The southern margin of the softwood region shifted northward with the consequent northward invasion of hardwoods.

Broad categories of vegetation would be uplands, lowlands, bog, marsh, aquatic and grasslands and crops. The accompanying lists give common plant species for the first three zones and for the edges between habitat types. Bogs differ from marsh in having a ~~tendency to have more~~ woody vegetation. Of marsh and aquatics, important species include wild rice, wild celery, pondweeds, duckweeds, saggittaria, pickerel weed cattail, and roundstem bulrushes.

The first of these, the wild rice, is ~~probably the most~~ all important plant for waterfowl at Rice Lake. This species provides both food and cover for ducks, geese and other birds. So important is the rice, not only to wildlife but to Indians as well, that the lake level is manipulated to try to produce the optimum rice crop in as many years as possible.


RICE LAKE NATIONAL WILDLIFE REFUGE
ORIGINAL
FOREST COVER
Hardwoods
Softwoods
Pineries
Prairies


PRESENT DAY
FOREST COVER
RICE LAKE NATIONAL WILDLIFE REFUGE
Hardwoods
Softwoods
Pineries
Prairies

Common Plant Species in the Rice Lake Wilderness Proposal

Upland

Trees

Trembling aspen	Populus tremuloides
Bigtooth aspen	Populus grandidentata
Balm-of-Gilead(Balsam poplar)	Populus balsamifera
White birch	Betula papyrifera
Northern red oak	Quercus borealis
Bur oak	Quercus macrocarpa
Balsam fir	Abies balsamea
Basswood	Tilea americana

Shrubs

Speckled alder	Alnus incara
Beaked hazel	Corylus typhina
Raspberry	Rubus strigosas
Panicle dogwood	Cornus candidissima
Prickly ash	Zanthoxylum americanum

Herbs

Goldenrod	Solidago canadensis
Yarrow	Achillea millefolium
Milkweed	Asclepias syriaca
Largeleaf aster	Aster macrophyllus
Stinging nettle	Urtica dioica
Bloodroot	Sanguinaria canadensis
Hepatica	Hepatica americana

Grasses

Quackgrass	Agropyron repens
Kentucky blue	Poa pratenses
Smooth brome	Bromus inermis
Timothy	Phleum pratense
Red clover	Trifolium pratense

Lowla

Tre

Fraxinus nigra
cedar — Thuja occidentalis
Ulmus americana
Betula papyrifera
Larix laricina

Sha

ood — Cornus stolonifera
Rhus toxicodendron
Betula pumila
Salix discolor
erry — Viburnum trilobum
Ilex verticillata

Her

Solidago canadensis
Eupatorium maculatum
Heraculum maximum
Phragmites communis
Typha latifolia
Urtica dioica

Cra

Fluminea festucacea
Carex sp.
Carex sp.
Sphagnum sp.

Bog

Trees

Tamarack	Larix laricina
Black spruce	Picea mariana
Speckled alder	Alnus incana

Shrubs

Willow (Hoary)	Salix candida
Bog birch	Betula pumila
Leatherleaf	Chamaedaphne calyculata
Labrador tea	Ledum groenlandicum
Swamp laurel	Kalmia polifolia
Hard hack	Spirea tomentosa
Lowbush cranberry	Vaccinium oxycoccos

Herbs

Turk's cap lilly	Lilium superbum
Swamp milkweek	Asclepia incarnata
Sphagnum moss	Sphagnum sp.
Joe-pye weed	Eupatorium maculatum
Ironweed	Veronnia fasciculata
Pitcher plant	Sarracenia purpurea

Grasses

Cottongrass	Eriophobum virginicum
Wiregrass	Carex sp.

Edges

Trees

Tamarack	Larix laricina
Black spruce	Picea mariana
American elm	Ulmus americana
Black ash	Fraxiuus nigra
White birch	Betula papyrifera

Shrubs

Beaked hazel	Corylus rostrata
Poison ivy	Rhus toxicodendron
Wild raspberry	Rubus strigosas
High bush cranberry	Viburnum trilobum
Thimbleberry	Rubus occidentalis
Hoary willow	Salix candida

Herbs

Cow parsnip	Heracleum maximum
Jow-pye weed	Eupatorium maculatum
Yarrow	Achillea millefolium
Goldenrod	Solidago canadensis
Swamp milkweed	Asclepias incarnata

Grasses

Wire grass	Carex sp.
White top grass	Fluminea festucacea
Sedges	Carex sp.

During the Indians' harvest of the crop, done by the time-honored hand-flail method over canoes, ~~a major part~~ several of the seed falls into the water to re-seed the beds. Additionally, the government receives 8% of the harvest. This is used also to re-seed Rice Lake or other refuges~~waters~~, or in a few instances some may be donated to the State to seed non-refuge waters such as in the adjacent Kinberly Marsh State Wildlife Management Area. The amount of rice harvest depends on a variety of factors besides amount of rice actually produced. Weather conditions and water level at harvest time besides the pickers' efficiency are involved.

The forest types have been classified for the timber management plan. They follow with approximate acreages and wildlife values.

Upland hardwoods: 1200 acres; sugar maple, brasswood, northern red oak, American elm, white birch, and aspen; all ages and sizes are represented; major use is by nesting wood ducks; areas with understory are heavily used by ruffed grouse, deer and squirrels; oaks are used by bear in the fall feeding on acorns.

Aspen : 1200 acres; composition is make up of quacking and big-toothed aspens both in pure stands and in mixture with upland hardwoods and balsam fir; extensively used by ruffed grouse (feeding on buds) and deer.

Lowland hardwoods: 1100 acres; composed of green ash, black ash and American elm: wildlife use is somewhat similar to upland hardwoods.

Oak: 600 acres; northern red oad predominates, some white and burr oaks are also present; most production is very important and supplements deer, squirrel and bear food; cavities are used by wood ducks and mergansers and smaller mammals for nesting; grouse and ducks also feed on the acorns

Spruce - Fir: 300 acres; higher sites have mostly balsam fir with some white spruce and aspen; lower sites are mostly in black spruce with a little tamarack and white cedar; these areas are important winter cover for most upland and big game; balsam-aspen mixture provides much of the better ruffed grouse habitat.

Tamarack: 300 acres; occurs primarily in pure stands with an occasional black spruce or white cedar; about 100 acres have been designated as a natural area; little wildlife use.

White Cedar: 50 acres; managed as a wintering area for deer; condition is excellent providing a large amount of browse.

Red and White Pine: 10 acres; removal of these species was almost complete in the heyday of logging prior to the refuge's establishment. Only one "island" of pine of any extent occurs north of the headquarters; its value is aesthetic and historic and will be preserved; the few big trees offer potential eagle nest sites.

Refuge grasslands are generally former farms and as such contain a variety of native and exotic grasses and forbs. Brome, bluegrass, quack and other grasses and white clover, goldenrod and wild roses are common.

Aspen is ulitized by beaver and the eagle nest is also located in an aspen. Bobcats use the cedar swamps during the winter, and hasel and birch are important to ruffed and sharp-tailed grouse for food. Alder thickets receive what little use by woodcock that the refuge gets.

The general succession on lowlands runs from open water through marsh, open bog, to closed bog heavily grown with black spruce. On uplands white spruce, balsam fir and sugar maple tend to become the climax species due to their shade tolerance. Openings tend to quickly revert to brush and the aspen, birch, oaks and pines are generally of intermediate stage in succession. Thus, due to the climate and soils, vegetation moves to a forest climax if uninterrupted. Openings, whether aquatic or terrestrial are unable to maintain themselves. Furthermore, species that provide the best foods for wildlife, and some cover - especially for breeding - tend to be intermediate in succession and cannot maintain themselves.

To recap quickly, oaks are important to numerous mammals including deer, bear, squirrels, and raccoon for mast or cavities for dens. Wood

ducks also nest in them as well as feeding on acorns. Aspen and birch are used heavily for budding by feeding grouse. During early growth, these stands are quite open and provide excellent deer, grouse habitat until they mature. Basswood and elm are also cavity prone and desired for wildlife objectives. Openings provide brush, grasses and forbs used by many species of wildlife. Grasslands are essential to waterfowl nesting.

Thus, the effect of wilderness designnation will be to prohibit management practices favorable to plant species and communities most beneficial to wildlife. Essentially this means prohibition of timber harvest, stand improvement, soil preparation to achieve pine reproduction, etc. It is for this reason that a layer portion of the refuge's timber acreage cannot be devoted to wilderness status.

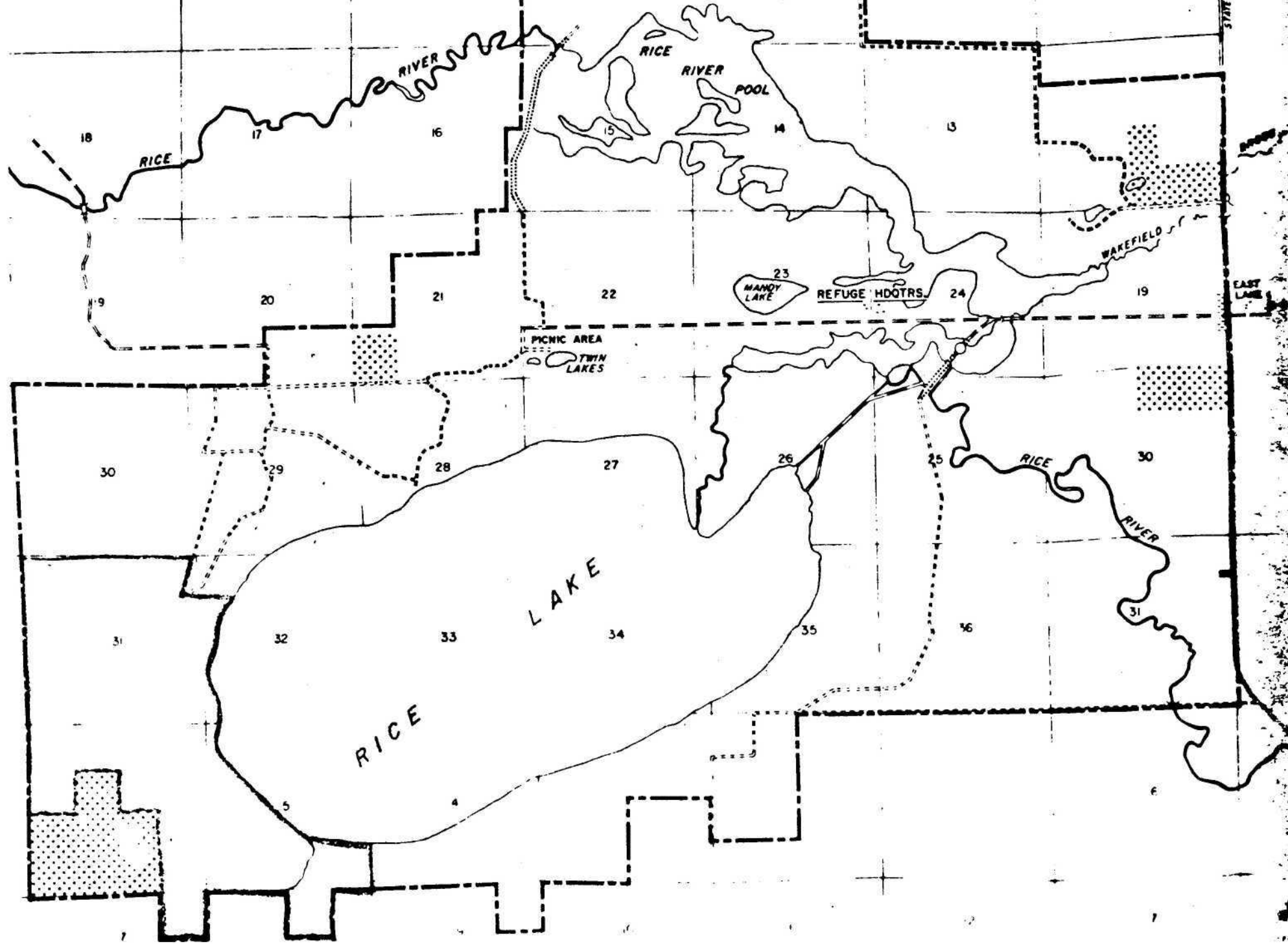
With conferral of wilderness designation the bog portion of the proposed tract would likely be eventually heavily forested with black spruce, the lowlands part to the south will probably develop into densely forested white spruce and balsam fir. Higher parts would perhaps have at least some sugar maple. This area then would have possible value for wintering cover for wildlife but have little else to attract most species of layer mammals and game birds. ~~This~~ could of course quickly be altered by natural phenomenon such as insect, disease or fire

LAND STATUS

The refuge was authorized by Executive Order 7221 dated October 31, 1935. Legislation providing for the establishment of the refuge includes the Migratory Bird Treaty Act, the Migratory Bird Conservation Act, and the Migratory Bird Hunting Stamp Act. During the period 1937-1938, the U. S. Resettlement Administration acquired 7786 acres of land which was transferred to the Bureas of Biological Survey for development as a national wildlife refuge.

Goals of the refuge are to provide for all forms of wildlife with emphasis on migratory waterfowl, to provide a wildlife-oriented recreation program, and to promote better understanding and appreciation of wildlife, its conservation and its benefit to man. The refuge as a historical Indian ricing area can be Minnesota's center for preserving and interpreting the story of wild rice and its relationship to wildlife and man, especially to the Indians of earlier days.

Within section 6 of the proposal, there are 280 acres (shown on the accompanying map in stipling) that are within the proposed acquisition boundary of the refuge. Since this tract is adjacent to the wilderness proposal, if it were acquired and if Congress confers wilderness status on the proposal, these 280 acres would be placed into the wilderness at the time of purchase.


RICE
RIVER
RICE
RIVER
POOL
RICE
RIVER
WAKEFIELD
MANOY LAKE
REFUGE HDQTRS.
PICNIC AREA
TWIN LAKES
RICE
RIVER
RICE LAKE
EAST LAKE
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GRAZING

Farming in the vicinity of Rice Lake is gradually phasing out as older farmers retire. Many farms are now being bought up for recreational property by people from urban areas and towns. The demand for grazing has diminished on the refuge and only one permit has been in effect for the last couple of years. In 1971 there was a total of 15 animals for 75 AUMs on the lone permit. The permit area is in the southeast quarter of section 20 T 47 N, R 24 W. Revenue for this amounted to $1.00/ AUM or $75.00 total. There is no conflict with other refuge objectives and this limited grazing serves to control brush.

MINERALS

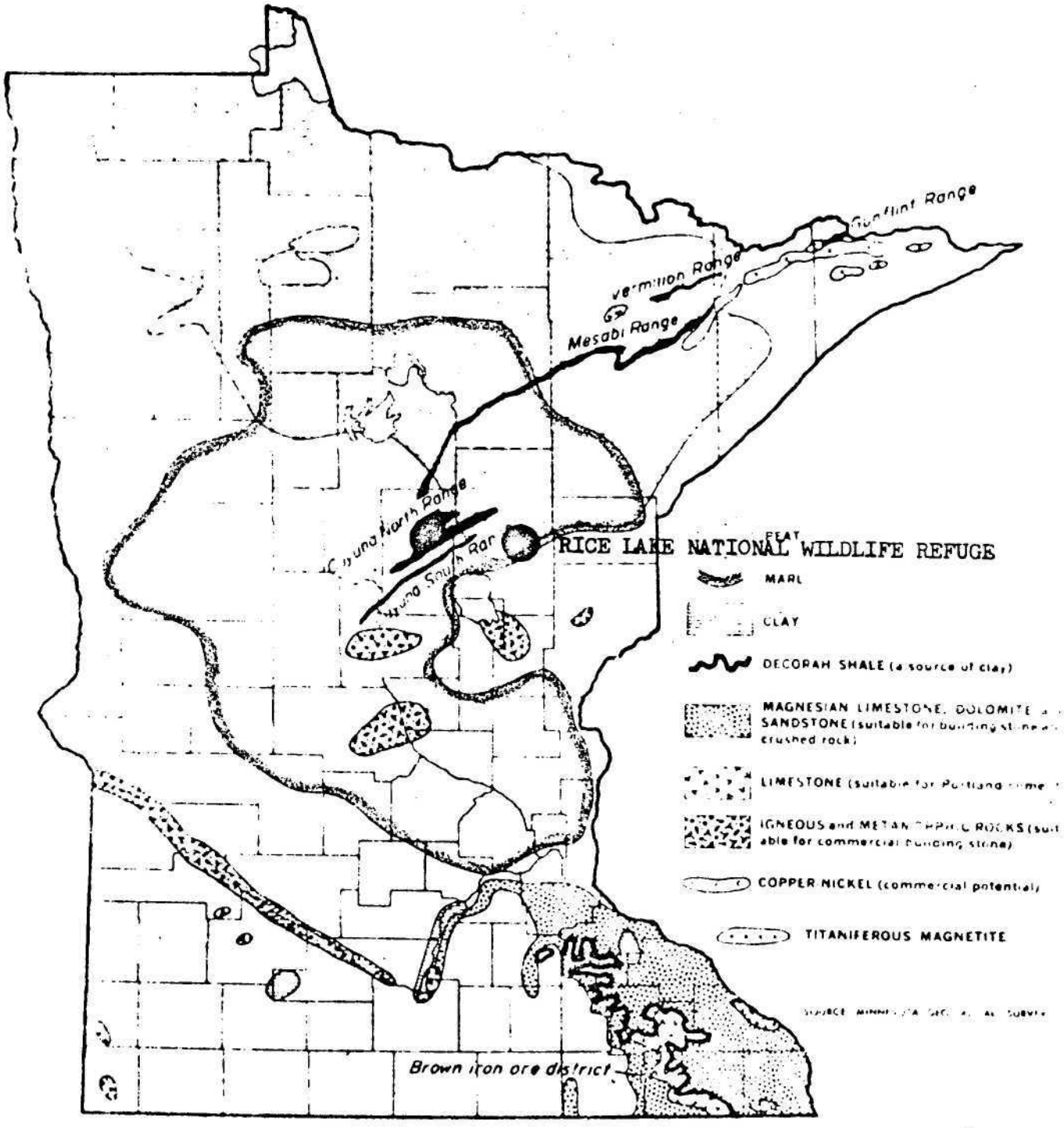
Rice Lake Refuge lies a short distance to the east of the Cuyuna Range, one of three major iron ranges in Minnesota. The Cuyuna's production has gradually been decreasing with some of the mines closing. There are no identifiable mineral deposits known to underlie the refuge according to the Bureau of Mines.

Northern Minnesota is the site of vast deposits of peat, the southern edge of which lies just below the refuge. Presumably the refuge's deposits could someday have commercial value for fuel or for gardening products, but there exist vast areas of this organic mineral that would make development of the refuge deposits unnecessary.

Central Minnesota also has great areas where marl is developing on lake bottoms and beneath peat beds in bog areas. Whether or not any marl exists on the refuge is unknown. Being ~~essentially~~ unconsolidated limestone, marl has the same use for agricultural purposes as regular limestone. Again, even if it should exist within the refuge in any volume, there are many deposits in the state that would be of greater value commercially.

Sand and gravel deposits are another possibility, but as with the other above mentioned minerals, great quantities exist throughout this part of Minnesota. There is little demand for any that might exist on the refuge.

MAJOR MINERAL AREAS



PUBLIC USE

Rice Lake currently receives about 12,000 visits per year. Nearly all of these visitors come for a variety of uses related to wildlife or termed "program" recreation. Less than a thousand visits occur for mere picnicking or other activities not related to refuge wildlife programs.

The greatest single "drawing card" of the refuge in the opportunity to view wildlife, nearly 50% of all use is for this purpose. The main entrance road skirts numerous areas where concentrations of waterfowl, and deer, and numbers of ruffed and sharp-tailed grouse can be readily seen. An observation tower close to headquarters gives visitors a fine opportunity to view geese, ~~especially~~. Otters, mink, beaver and muskrats provide visitors with many hours of viewing enjoyment along the shores of the river.

One of the major attractions of the refuge is for birding. In close proximity to the Twin Cities and the Duluth - Superior region over good roads, Rice Lake Refuge has much to offer urban residents in unusual bird-watching. During migration over 25 species of waterfowl frequent the refuge. About two dozen species of hawks and owls can be observed here as well as over twenty species of shorebirds and gulls and terns.

Winter birding is especially rewarding. Northern species that are rarely seen by most people can be located here. Both species of boreal grosbeaks can be readily found at Rice Lake most winters. Crossbills are occasionally present. Causing widespread excitement are the great gray and hawk owls that make infrequent appearances here some winters. Other "premium" species for the life-list include the common loon (Minnesota's state bird), bald eagle (our national emblem), sharptailed grouse, sandhill crane, black-bellied and upland plovers and pileated woodpecker.

After wildlife observation, fishing is the next most common activity on the refuge. In recent years up to 3700 fishing visits have been recorded. The bridge over Rice River on the entrance road was constructed to accomodate fishermen. This is tremendously appreciated, especially by the elderly and others who do not have boats. Many hours of enjoyment are thus provided to local residents who might otherwise have much less opportunity for good fishing.

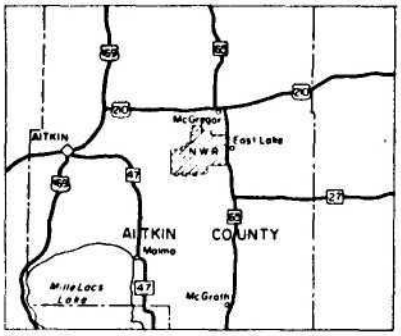
Rice Lake Refuge is open to grouse and deer hunting in accord with state seasons. In recent years Minnesota has curtailed its deer season quite a bit so that this use has decreased somewhat on the refuge. Only ruffed grouse are hunted on the refuge and with an abundance of grouse habitat in this part of the state not too many hunters seek their quarry at Rice Lake. In 1971 less than 100 grouse hunters used the refuge and only

56 deer bow hunters showed up. Minresota closed its deer gun season that year. In previous years with high deer populations as many as 500 deer gun hunts were provided here.

Other public use of significance is the conducted tour. Many groups visit the refuge each year. Annually since its inception, the Long Lake Conservation Center has utilized the refuge and its staff as a part of their educational program. Various schools make good use of Rice Lake for field trips. Its educational potential is extremely high with its proximity to the high population of the Twin Cities. Currently several hundred visits occur each year for programs and tours of the refuge. This will likely increase greatly in the future.

The following maps show the portion of the refuge open to deer and ruffed grouse hunting, and the major public use areas and facilities. About 400 pickniking visits occur each year.

RICE LAKE NATIONAL WILDLIFE REFUGE



Deer • Grouse
HUNTING MAP

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Sport Fisheries and Wildlife

COMPANY DITCH
RICE RIVER
RICE RIVER POOL
To AITKIN
To McGREGOR
65
NO. EAST LAKE
HIGHWAY
STATE
Brook
Mandy Lake
HEADQUARTERS
Wake's Old
PICNIC AREA
Twin Lakes
LOGGING DITCH
RIVER
RICE LAKE
To McGRATH

N

0 1/4 1/2 3/4 1
SCALE IN MILES

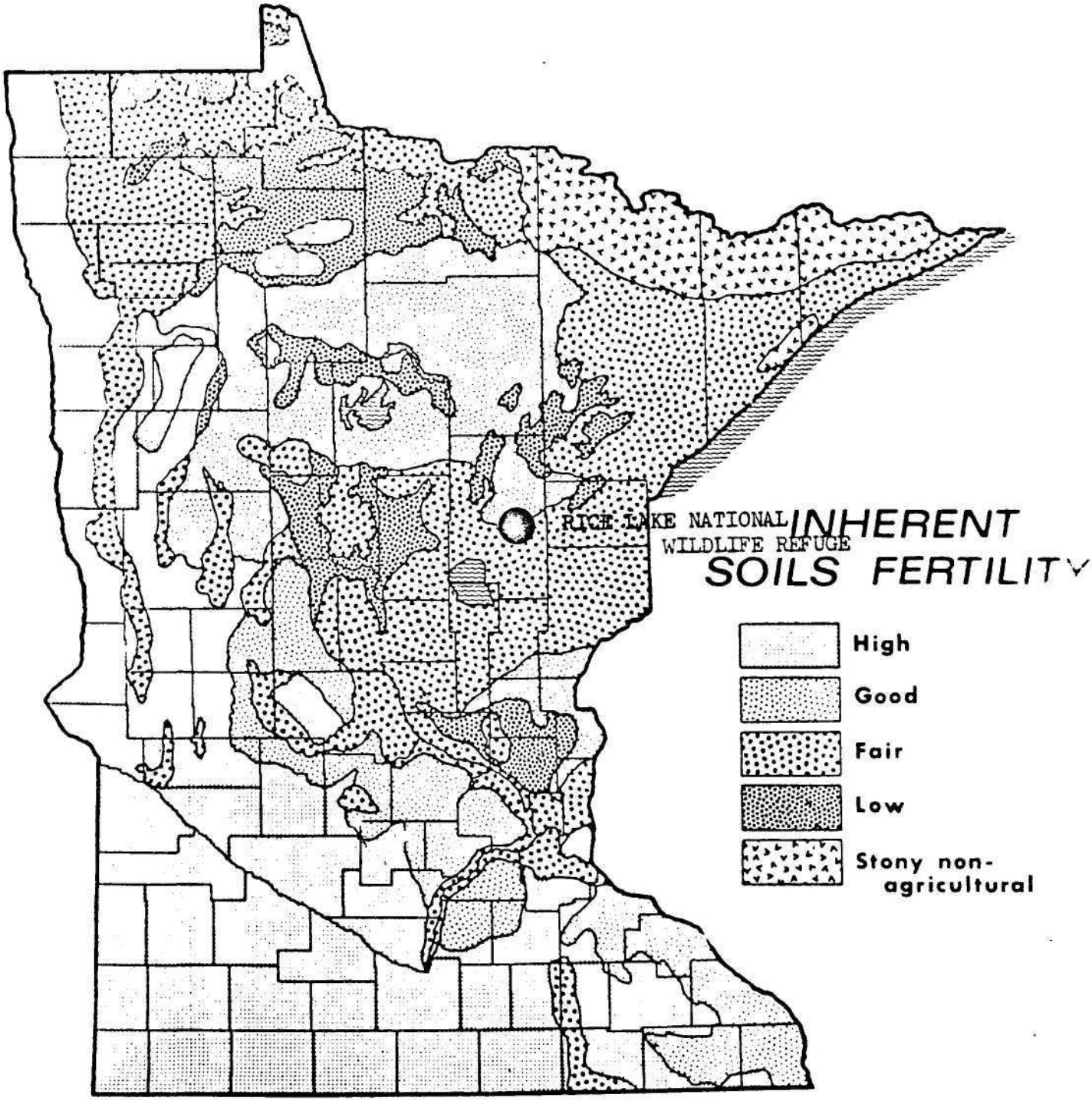
1972

LEGEND

- PARKING AREA
- AREA UNDER CULTIVATION
- GROUSE AREA
- CLOSED AREA
- OPEN TO DEER

SOILS

The ridges are complsed of sand and gravel mainly, glacial deposits. A number of different soils are common throughout the area. Generally there are three soil types that make up the major acreage of the area. A sandy clay loam to sandy loam is found on the uplands. It is moderate to well drained and suitable for most crops. Silt clay loams are found in the lower areas. They are poorly drained soils, relatively impermeable, and high in organic matter. Peat underlies much of the refuge area and varies generally from two to six feet in depth. Most common soils are unnamed. (organic, poorly drained, including sphagnafibric over sandy mineral soil) 15.34%, Nordland very fine sandy loam 14.09%, Dawson (a poorly drained opganic soil with sandy mineral soil at less than 51 inches) 10.35%, Greenwood (organic) 9.5%. unnamed silt loam 9.43%, and the balance sandy, silty or clay loams in varying small percentages.



SOURCE: "Minnesota Lands," American Forestry Association, Dana, Allison and Cunningham

MANAGEMENT

1. Water Management

About 6,000 acres of controlled marsh and water will be required to achieve wildlife management goals of: production of 6,000 ducks and 500 geese and peak migration use of 80,000 ducks and 10,000 geese.

To obtain this acreage of controlled aquatic habitat, the present Rice Lake (about 3,800 acres) and Rice River Pools (about 1,900 acres) along with minor areas should be improved so that they are capable of producing sufficient waterfowl foods to provide for the above goals.

Rice Lake, traditionally an important producer of wild rice for waterfowl and the local indians, often fails to produce an optimum crop of rice. This has been due, in part, to fluctuating water levels or too high levels during the critical germinating and growing season. To increase the frequency of an abundant wild rice crop, the following operating criteria must be met: ability to reach an average depth of 0 to 4 feet and maintain that depth for an entire growing season, ability to dewater or recharge the lake at any time at a rate of 2 feet per month, and ability to exclude all waters of the Rice River not withstanding major floods of 1 in 25 year frequency.

The optimum conditions for wild rice production are an average depth of 2.5 feet or less in the lake stabilized from May 1 through August 1. Fluctuating water levels or excessive wave action during the critical period of June and July, when the plants have submerged or floating leaves, destroys the plant. Little can be done about retarding the wave action, but improved control structures will do much to provent fluctuating water levels. Consideration should be make to straightening the river bend above the Rice Lake dike so that full force of the river bypasses the dike.

After August 1, levels may fluctuate, but preferably the level should be raised gradually .5 feet per month until October 1, so that by September 15, there is adequate water for the rice harvest and some flooding of the lake margins for better utilization by waterfowl.

After freeze-up the lake should be drawn down to provide for spring inflows of the Rice Lake watershed while the flood waters of the Rice River should be kept out of the lake. Provision should be made for improving the dirch outlet to pass excess water. This improvement will also provide adequate flushing action to remove excess vegetative debris.

The bog or marsh on the margins of Rice Lake, particularly the east end, should be improved for waterfowl production by level ditching and/or artificial potholes. ~~It is recommended that potholes and nesting structures be constructed at the rate of not more than 1 per 4 acres~~.

The Rice River Pool ~~should~~ may be subdivided into four pools of 250 acres each, if economically feasible. Each pool should have an average depth of 18". This depth should be reached by May 1, and held steady until August 1. After that date, the level may be allowed to recede naturally. The pools should be capable of being drawn down within a 20 - day period to facilitate mechanical work on the pool and to periodically aerate the pool bottom.

Preferably, the Rice River should be kept separate from the pools to prevent sudden fluctuations but, if the criteria can be met by having the river traverse the pools, this is acceptable provided the stream flow is confined to a channel below pool bottom grade when the pool is drained.

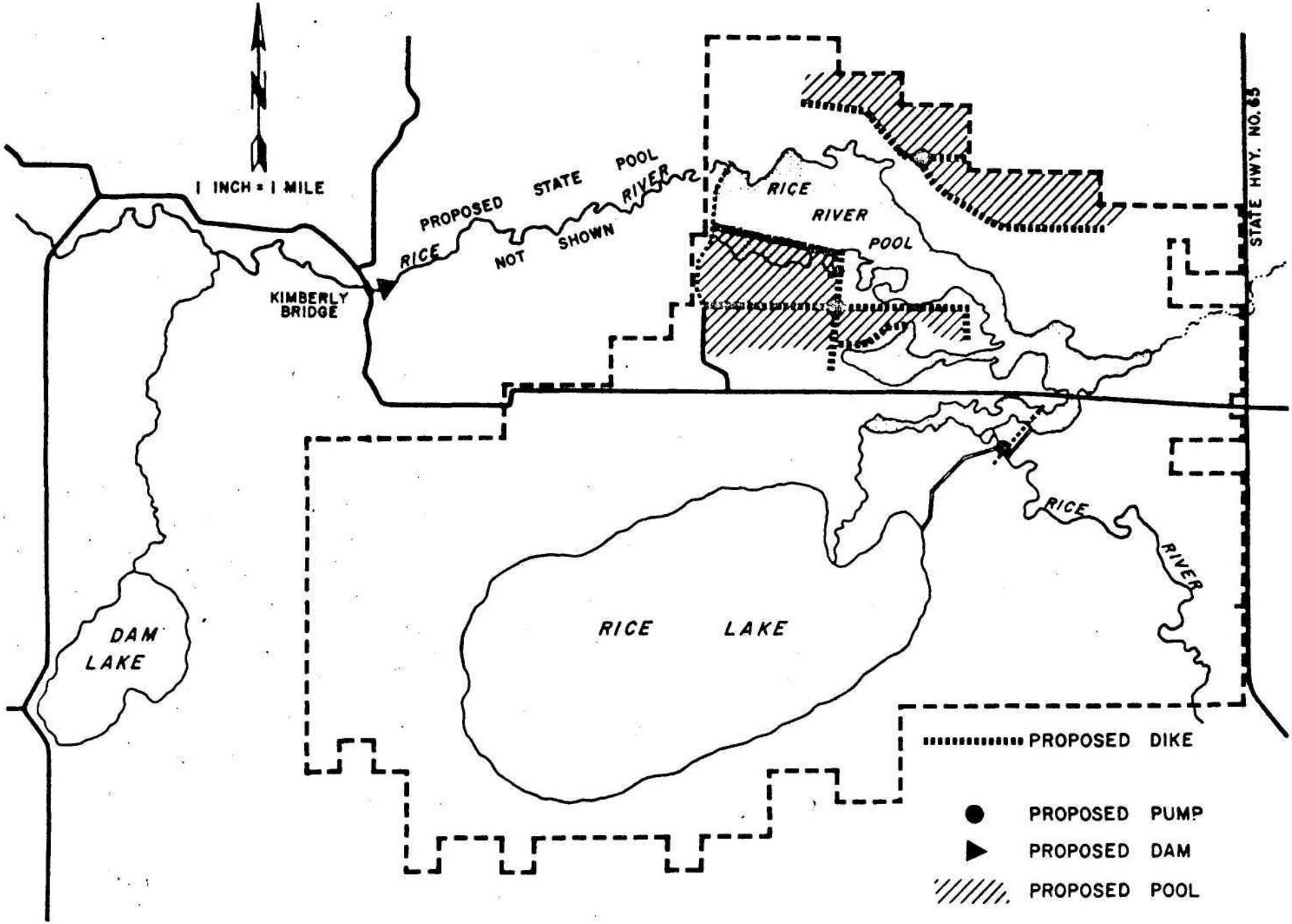
All dike slopes should be flat for easier maintenance and waterfowl nesting and resting.

These pools, if operated at the desired level, would transform the nearly unproductive bog marshes into productive duck production areas. The raised water levels will kill out the undesirable vegetation and replace it with plant species that could be used for waterfowl food and cover. The high unflooded portions of the pools will become highly desirable as waterfowl nesting sites.

Where natural islands are lacking, artificial nesting structures should be installed. If this development for the Rice River Pool is not feasible or economical, then provision should be make for improving this bog area by constructing potholes and level ditches. These would serve two purposes -- open water would be provided and the spoil from ditches and ponds would serve as nesting areas for ducks and geese.

There are natural potholes on the refuge uplands which have, through the years, filled in. The acreage of these is small, but they should be opened up so that they can be used again by waterfowl.

Several smaller impoundments of less than 100 acres should be created on the refuge to provide more attractive waterfowl nesting habitat. Depth should be an optimum of 18" and held through August 1 until the waterfowl nesting season is completed.


N
1 INCH = 1 MILE
PROPOSED STATE POOL
RICE RIVER
NOT SHOWN
KIMBERLY BRIDGE
RICE RIVER POOL
STATE HWY. NO. 85
DAM LAKE
RICE LAKE
RICE RIVER
PROPOSED DIKE
PROPOSED PUMP
PROPOSED DAM
PROPOSED POOL

2. Land Use Management

Cropland

About 200 acres of cropland will be needed to satisfy waterfowl management objectives with farming done by refuge personnel. To provide supplemental food adjacent or contiguous to impoundments to achieve use goals of 300,000 goose use days and 5,000,000 duck use days, 100 acres of green browse and 100 acres of unharvested cereal crops will be required. Maintenance of a sharp-tailed grouse population, as well as other wildlife species, will also be the objective of cropping programs.

Fields seeded to grass/legume in a crop-rotation program will be mowed, or grazed to maintain their attractiveness to browsing geese. Where grazing is used, fencing will be required.

Grassland

About 850 acres of permanent grass adjacent to water areas will be required for waterfowl nesting habitat. Management objectives will be to discourage brush encroachment on grasslands to provide optimum waterfowl and upland nesting habitat. Another means of improvement will be to readjust haying practices on areas adjacent to water areas. Management methods will consist of haying, grazing and herbicidal control.

Timberland

About 5,500 acres of timberland on the refuge will be maintained and managed to provide habitat for wildlife, including waterfowl. The management objective is a sustained yield of timber products simultaneously improving wildlife conditions. Management will generally be an all-age management to encourage the increase of northern hardwoods and cedar.

Specific benefits to wildlife through timber management will be the development of an open crown canopy for the purpose of creating a better browse condition for white-tail deer. Natural seeding white spruce and balsam will be managed for ruffed grouse winter cover. Cavity prone species will be encouraged and cavity trees will be preserved to encourage wood duck nesting. Tag alder should be left in the impoundments to provide cover for waterfowl, particularly black ducks. Flooded tag alder is also used for wood duck roosts while grazed alder thickets makes good woodcock cover.

No special development is required, as harvest facilities are furnished by commercial loggers and access roads are adequate.

The Forest Management criteria were set forth in the Rice Lake Management Objectives dated May 27, 1966. These objectives are as follows:

1. Sustained yield of timber products simultanously improving wildlife habitat.

2. All age management.

3. Encourage the increase of northern hardwoods and northern white cedar.

4. Development of the open crown canopy to create a better browse condition for whitetail deer.

5. Cavity prone species will be encouraged and cavity trees preserved for wood duck nesting.

6. Balsam fir and white spruce areas will be managed for ruffed grouse and whitetail deer. (Winter cover important.)

These objectives can be reached through the following land use practices.

1. Management on upland and lowland hardwoods will be geared towards mixed uneven age stands. All ages will be represented to insure the continuous existence of natural cavities. Cavity prone species will be encouraged. These species are basswood, aspen, red oak and elm. Trees possessing safe natural cavities will be preserved. The patch cut system will be used in harvesting timber. The density of cavities can vary depending on desired or future population levels.

2. The remaining forest acreage will be managed on a "sustained yield basis." All age management will prevail, but in even aged stands. Harvesting techniques will be by clear cut, with TSI work following to insure natural regeneration. Special emphasis will be placed on establishing additional acreage of northern white cedar.

3. Timber clearing for increase waterfowl nesting. The refuge has numerous forested islands which offer little to the forestry program. It has been found that waterfowl, especially geese, prefer nesting on isolated islands. Under sound management the islands can be logged off, cleared and seeded to grass cover. Prescribed burning can then be used to curtail the encroachment of brush.

Under no circumstance should trees be planted in existing opening. The cropland and grasslands are essential to meet the needs of waterfowl management.

Other Economic Use

Fur harvest will be used as a management tool to maintain balanced populations of furbearers. No special development will be required, as the marsh development for waterfowl will enhance certain furbearer populations.

Grazing, and haying by permit will be used as a management tool to maintain nesting areas in optimum condition and to prepare grassland areas for browse feeding areas.

The attached map shows those roads open for public use. It will not be necessary to operate any motorized vehicles or equipment within the proposal, all such uses would be totally excluded. The islands would continue to be reached by motor boat.

The following detailed kinds and quantities of objectives show the refuge goals toward which management is directed.

Self-guiding foot trail: 3,750 visits, 1 hr/visit; 2 trails, 2 miles each; capacity at one time, 160 people.

Conducted foot trail: 6,375 visits, 1 hr/visit; 2 trails, 2 miles each; 240 OTU

Self-guiding auto: 23,625 visits, 1 hr/visit; 2 trails, 5 miles each; 200 OTU

Auto Route: Conducted 13,125 visits 1 hr/visit; 2 trails, 5 miles each; 200 OTU

Visitor Center: 15,000 visits, 1/2 hr/visit; 200 OTU

Exhibition Demonstration, Self-guiding: 5250 visits, 1/4 hr/visit; 9 demonstrations 180 OTU

Exhibition Demonstration, Conducted: 3200 visits 1/4 hr/visit; 9 demonstrations 180 OTU

Environmental Education: 4500 visits, 2 hr/visit; 10 sites, 300 OTU

Snipe Hunting: 100 hrs. 25 visits, 15 OTU

Ruffed grouse hunting: 350 visits, 4 hr/visit, 50 OTU

Deer gun hunting: 500 visits, 8 hrs/visit; 300 OTU

Deer bow hunting: 70 hunts, 8 hrs/visit; 5 peak

Squirrel hunting: 25 hunts, 4 hrs/visit; 5 peak

Rabbit hunting: 25 hunts, 4 hrs/visit; 5 peak

Coyote-fox hunting: 20 visits, 4 hrs/visit; 8 peak

Raccoon hunting: 120 hunts, 4 hrs/visit; 14 peak

Trapping: 180 visits, 4 hrs/visit; 230 peak

Fishing: 2100 visits, 4 hrs/visit; 230 peak

Wild Rice Harvest: 800 visits, 8 hrs/visit; 80 peak

Wildlife Observation: 14,700 visits, 1 hr/visit; 450 peak

Canoeing: 100 visits, 2 hrs/visit; 20 peak

Sightseeing: 5200 visits, 20 min./visit; 25 peak

Photography: 50 visits, 4 hrs/visit; 12 peak

Picnicking: 375 visits, 1 hr/visit; 60 peak

Research Natural Area: 1 100 acres Tamarack

Archeological Site: 1 Indian Mounds

Timber Wolf: 35 use days; 2 peak

Pelican: 35 use days; 5 peak

Cormorants: 150 use days; 10 peak

Herons and Egrets: 36,000 use days; 200 peak

Grebes: 19,000 use days; 100 peak

Loons: 1440 use days; 4 peak

Terns (Mille Lacs): 236,000 use days 2000 peak

Gulls: 13,400 use days 75 peak

Shorebirds: 180,000 use days; 1000 peak

Bald eagle: 2,250 use days; 15 peak; produce 6 young

Other raptors: 33,000 use days; 100 peak

Swan Maintenance: 4,000 use days; 100 peak

Goose Maintenance: 283,000 use days; 4500 peak; produced 250 young

Duck Maintenance: 4,000,000 use days; 80,000 peak; produced 2100 young

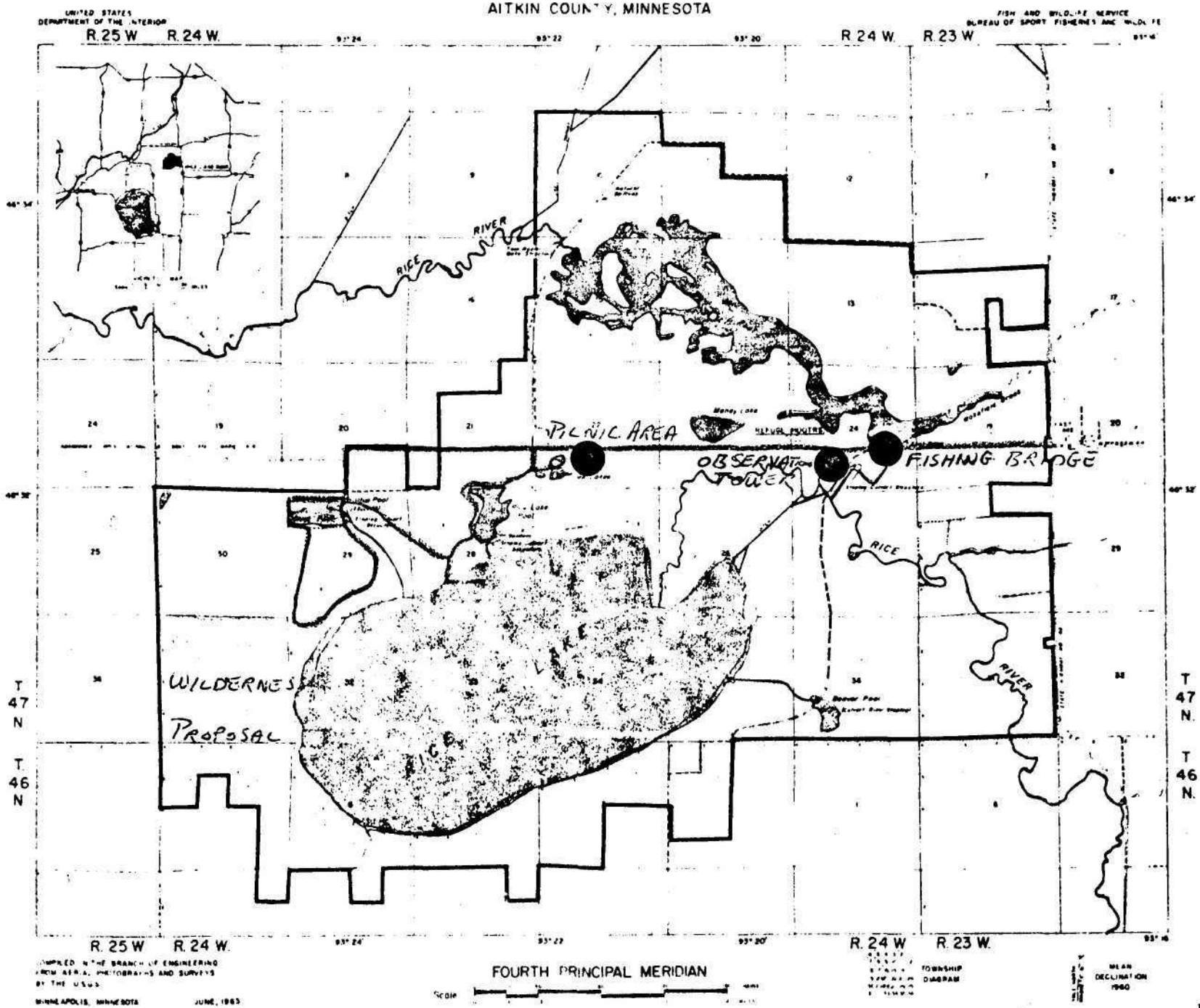
Timber: $3200; 10 year cutting cycle, sustained yield

Hay: $150; (150 acres $1/ton/acre)

Grazing: $100; (1.5 acres/AUM: 150 acres $1/AUM)

RICE LAKE NATIONAL WILDLIFE REFUGE

AITKIN COUNTY, MINNESOTA



Public Access & Facilities

DEVELOPMENT

1. Master Plan Site Layout

The proposed development has been influenced by physical limitations, existing improvements and economic considerations. Phasing of the construction has been planned to provide and maintain operable units to the maximum extent possible.

The primary need at a production refuge like Rice Lake is the improvement of nesting habitat. One method to be used will be the improvement of water control structures to better manage water levels. Another method is the construction of potholes, small watershed impoundments, and artificial nesting sites.

At Rice Lake, potholes and nesting structures can be constructed more economically than to create separate impoundments within the existing pools, and still provide an equal amount of nesting habitat. Because the acceptability by waterfowl of potholes in the wire grass at Rice Lake is unknown, a test program should be initiated, and the results analyzed before an extensive pothole construction program is undertaken.

Aside from the waterfowl facilities, the primary construction features are concerned with headquarters and recreation facilities. The headquarters facilities include an office-information building, equipment buildings, residences, necessary utilities, entrance roads and courtyard paving.

The recreational facilities will consist of two interpretive trails, two interpretive stations, an auto tour route, an improved fishing area, and a small picnic wayside area. The office-information building will have an exhibit area which will double as an auditorium.

2. Existing Improvements

Three residences are located in the headquarters area, shown on sheet 3. Two were constructed in the period 1940-1941 and have a life expectancy of 15 years. The other was constructed in 1963 and is assumed to encompass the 50 year design usefulness of newly constructed work. The estimated replacement cost of each residence is $30,000.

The service-office building is the standard concrete block type unit built in Region 3 prior to 1960. This building has a life expectancy of 30 years and an assumed replacement cost of $60,000.

Three large storage buildings are located in the headquarters. Two are frame, one is a metal quonset and all have a life expectancy of about 10 years. Replacement storage buildings will cost approximately $35,000 each. Several small storage buildings are located in the headquarters and are outdated and should be removed.

Telephone and electric service is presently provided to the headquarters area from pole lines along highway 65. The electric service is 110-220 volt, single phase.

Domestic water is provided from a well located behind the service building. The well is about 65 feet deep and yields approximately 10 gpm.

Two large pools are located on the refuge and the water levels are controlled by concrete structures. Rice Lake Pool is controlled by a 4 x 4 foot culvert with stoplogs. Rice River Pool is controlled by two 7 x 12 foot radial gates. Water levels cannot be easily manipulated due to the low channel gradient and downstream capacity. Both the radial gate structure and the small control on Rice Lake Pool will be retained. Several small watershed impoundments have been constructed on drainage ways to Rice Lake. Water levels on these are controlled by overflow spillways.

The roads are partially graveled, one way, and are used for patrolling, management, fire protection, and operation of water control structures. Many roads can be used only in fair weather. A precast concrete bridge built in 1963 is located on the entrance road. All roads will be retained.

3. Construction Features

Water Impoundments

The development plan shows the managed pool areas on the refuge near their optimum operating level.

Spring runoff from the drainage basin is usually more than sufficient to fill all pools to the desired level. Summer and fall runoff is not very dependable and a general lowering of pool levels can be expected throughout these months.

Water management in the pool areas will be used to provide maximum amounts of waterfowl food plants, to provide resting areas, to control undesirable vegetation, and to improve the habitat for waterfowl production.

The operation of Rice Lake will be pointed to the maximum production of wild rice. In the past, fluctuating water levels or too high levels during the critical germinating and growing season, often caused partial failures in the rice crop.

To increase the frequency of an abundant rice crop, the following management procedure will be followed. The lake level will be held so the maximum area has about a two foot water depth for the period May 1 through August 1. After August 1, the level will be allowed to fluctuate. The water level will be raised gradually, about $\frac{1}{2}$ foot per month, until October 1. This will provide adequate water for the rice harvest and also flood the lake margins for utilization by waterfowl. Just prior to freeze-up, the lake will be drawn down to provide storage space for the spring inflow from the lake watershed.

In the spring the desired lake level is normally lower than the river level and water cannot be released from the lake. Water release from the lake is therefore dependent on river levels and on the concentration time for peak flows on the river. To provide for the rapid release of water in the late fall and when possible in the spring before the river rises, a control structure will be built capable of passing about 9600 acre-feet in 30 days. This is equivalent to about 160 cfs.

This structure will be in addition to the 4 x 4 foot culvert now used. Maximum flow through the existing culvert is about 80 cfs with an average one-foot head. However, obtaining an average of one foot of head on the structure is difficult. It is normally less, and the water elevation desired for management is below the top of the culvert so the structure does not have full flow.

The operation of the Rice River Pool will change very little from the existing. The river will be drawn down during the winter to

allow for the drawdown of Rice Lake. As the spring runoff is nearing completion the radial gates will be closed and the river pool will be raised and held at an elevation which will promote the greatest growth of aquatics. The pool will be raised, when possible, by late summer runoff to the top of the radial gate. This rise by early fall will provide for better utilization of the area by waterfowl.

The radial gate structure is adequate in size to pass 800 cfs with a one foot head. This is assumed to be a 10 year frequency flood flow. Flow in excess of this amount will pass through an emergency spillway located to the north of the structure. The assumed 50 year frequency flood flow is 1300 cfs.

Several small watershed impoundments will be constructed on drainageways leading to Rice Lake. The pool water level will be controlled by overflow spillways similar to the existing small pools.

Water Control Features

A new water control structure will be built on Rice Lake. The structure will have three 3' x 5' reinforced concrete box culverts with a concrete headwall, and will be equipped with both slidegates and stoplogs for water management purposes. The structure will be designed to pass 160 cfs with an average head of $\frac{1}{2}$ foot as this is more in conformance with normal management operation. The invert of the structure will be at elevation 1218.6.

In early times there was only a small, natural, meandering channel across the marsh connecting Rice Lake to the river. Early logging operations around the lake necessitated the widening and straightening of the channel to provide an adequate waterway for movement of saw logs. This channel will be cleaned and enlarged to deliver the required water volume to the lake control structure.

In conjunction with the construction of the Rice Lake structure, a new river channel will be excavated about $\frac{1}{4}$ mile to the east, where the river makes a turn to the north. This channel rectification will provide for better flow conditions and prevent a direct river flow against the Rice Lake dike as now exists.

Biological Development

To improve the wiregrass areas adjacent to the pools for wildlife, a system of potholes, level ditching, and nesting structures will be

constructed. The success of this type development during the early stages will be a guide to future development in the later phases.

The potholes and nesting structures will be planned at a rate not to exceed one per four acres. Ditches will be cut from the pool to some of the potholes to provide a positive water supply. Spoil from the ditches and potholes will be piled in a scattered fashion and shaped to be used for nesting islands.

Fabricated nesting structures will be interspersed among the potholes and islands.

Natural potholes existing on the uplands, which have through the years filled in, will be re-opened for waterfowl use.

Buildings

There will be separate areas for residential, administration, and service facilities. Access to each area will be separate and distinct for privacy, safety, and to eliminate unnecessary traffic through the headquarters area.

An office-visitor information building will be constructed in the administration area.

The service area will consist of the existing service building and two new equipment storage buildings. The existing service building will be remodeled so the overhead doors will be located on the east side of the building to face the new courtyard. In addition, the heating system will be changed similar to the one at Horicon and the existing small office space will be utilized as a crew room.

The residential area will consist of three residences. Two will be newly constructed and the third will be the existing residence which was built in 1963. This residence will be moved onto a new basement foundation within the designated residential area. It must be moved from its present location to provide adequate space for the office-information building.

Roads and Trails

The present entrance road to the refuge does not present an appealing or attractive appearance to the public. Buildings, located on each

side of the entrance road, detract from the aesthetic environment of a wildlife refuge.

To eliminate the above problem a new access from the highway will be constructed. This section of entrance road will deviate from the existing road about $\frac{1}{2}$ mile west of the highway and meet the highway about one-eighth of a mile south of the existing entrance road.

The entrance road will be asphalt paved from the highway, past the headquarters, to the point where the auto tour route turns south into the woods. All roads and parking areas in the headquarters area will also be paved.

Roads to the water control structures and public hunting areas will be gravel surfaced to provide all weather travel. One-way travel is all that is required due to the low traffic volume. Parking areas for hunters will be provided.

Fair weather, one way, access trails to provide for refuge vehicle movement for farming, management and protection purposes will be laid out as required. No special development is required.

Fencing and Posting

As land acquisition proceeds, the land will be fenced and posted at standard intervals. Gates will be installed on patrol roads to prevent their unauthorized use. The existing boundary will be fenced where required to permanently define the refuge limits.

Single strand, smooth wire will be used for boundary fences. Fences of four-strand barbed wire will be erected around the refuge grazing units.

Utilities

Electric and telephone service are presently available in the headquarters area. The existing systems will be modified to change the overhead wires to underground from the entrance road to a point behind the service area. From this point the wires will be installed underground to the residences, office, and other using facilities. Three phase power is not available and converters will be required if three phase equipment is desired for the shop.

Domestic water for a portion of the headquarters will be available from the existing well. The system will be modified by providing for a larger storage-pressure tank, and connection to the new office building. A new 6-inch well and distribution system will be provided for the residential area.

Sewage disposal for all new buildings will be provided by septic tanks and drain fields. The service building will remain connected to the existing system.

A central L. P. gas system will be installed and extended to each using facility. The storage tank will be placed in a landscaped fenced enclosure near the service area where it can be readily accessible for refueling.

Recreation

Recreational demand and facilities available are both low in number in this area. The present amount of visitation to the refuge averages about 10,000 annually. It is anticipated the use will expand to about 50,000 by the year 2020 when wildlife oriented recreational facilities are constructed.

The primary recreation facility constructed will be the interpretive portion of the office building. This will consist of an exhibit area, which will also double as an auditorium, separate public restrooms, and storage facilities.

A self-guided auto tour route will be constructed starting at the wildlife interpretive center and passing through timbered and cleared areas along small marsh areas, down to the shore of Rice Lake and back to the entrance road. The road will be one way and gravel surfaced.

An interpretive station will be provided at the ricing landing area to present the wild rice program as it relates to the Indians and to the waterfowl.

Two interpretive foot trails will be constructed. One will pass through a variety of refuge habitat. Also of interest along this trail will be old Indian rice caches. The second trail will cover prehistoric mounds. A complete sign system will be provided along each trail to give an explanation to the visitor at each location of interest.

The present picnic area, although in an ideal setting, is seldom used due to its distant location from the highway. In the future it will be primarily used for group use on a reservation basis. Other times it will be open to the general public. A new picnic area-wayside will be built along the new entrance road just off the highway. A concrete vault toilet will be constructed and a well drilled to provide for water use at the wayside area. This area will then serve the people who visit the refuge and also people traveling north to the summer resort areas. By building a contact station in conjunction with the picnic area, an informative program can be presented to the people along with the location of facilities available on the refuge.

Fishing off the entrance bridge is a popular pastime for residents in the vicinity. Sanitary facilities are presently available, but do require improvement. A concrete vault toilet will be constructed for fisherman use.

Photography and observation blinds will be constructed in several selective areas where high waterfowl concentrations are likely to occur. The photographing of waterfowl is becoming more interesting to the general public and the refuge offers good opportunities during certain times of the year for this pastime.

Two types of hunter access trails will be provided. One, for vehicle travel, will utilize patrol roads. These will provide access to the refuge interior and to designated parking areas. The second type will be a walking trail and will be used for hunting upland game. These will be established by management.

Existing and planned develpments will have no effect on the wilderness proposal. The natural, undeveloped character of the wilderness tract, if so designated, would provide a perfect backdrop against which the refuge interpretive program could be portrayed.

SOCIO - ECONOMIC CONSIDERATIONS

Rice Lake Refuge was established as a part of a program for the protection of migratory birds, particularly waterfowl, in the interest of the public. In the interneving years since the refuge's establishment public interest in natural resources has broadened as is exemplified in this wilderness proposal.

The socio-economic effect of designating the three islands and 1400 acre tract as wilderness would be of no consequence. Economic activities on the refuge relate to haying, grazing, ricing, trapping and timber harvest. Formerly wire grass was utilized commercially for weaving mats, rugs, etc. It is no longer so used and there has been no harvest of this vegetation on the refuge for many years. Only timber harvesting of the preceding activities would be affected by this proposal.

Grazing and haying bring in very small amounts of revenue to the refuge, refuge objectives anticipate less than $400 annually for the two. The gradual diminishment of these practices is a trend which might be only slightly affected by refuge management with or without wilderness. With farming in the refuge vicinity gradually phasing out as older farmers retire, demand for these uses has diminished. Only one grazing permit has been in effect in recent years. Very little trapping occurs on the refuge, some years there is none. This activity occurs on the refuge as

there is need in terms of wildlife management goals and fluctuates in demand in accordance with prices. No grazing or haying has been done or ever would be within the proposal. Trapping is generally pursued along the Rice River and the associated marshes accessible from the main road.

The primary economic use of the refuge has come to be timber harvesting, since the recent inception of the timber management plan. Based on this, about $3,200 income is expected to be realized annually, assuming a ten-year cutting cycle. This was based on a total of about 5000 acres of merchantible timber. The demand for stumpage within the Rice Lake area is relatively high. There are many small operators dealing with both sawtimber and pulpwood. A pallet mill and furniture mill is located within the town of McGregor. The cities of Duluth and Cloquet are excellent pulpwood outlets and are within trucking distance.

The approximately 400 acres of timber in the proposal represents less than 10% of the total that the timber plan was based upon. What the exact reduction in income to local people would be due to wilderness status effect on logging is unknown but it would be minimal.

Ricing is the other main activity of commercial importance on the refuge. All harvesting of wild rice in Rice Lake is done by the Indians who have first rights to the harvest. A good wild rice crop can mean

an annual income of over $45,000 to the local Chippewa Indian community. Harvesting is strictly regulated to preserve the time-honored methods in their primitive state. Canoes are used and poled or paddled into the stands where wooden flails ~~whip~~ wire the grain into the canoes.

RICING

	Season	Permits	$ / lb.	lbs. harvested	Average/Boat	
1971	10 days	55	$1.18	51,085	979 lbs.	
1970	10 days	34	$1.43(high)	20,805	736 lbs.	$942
1969	10 days	56	$1.50(high)	49,462	810 lbs.	$1012
1968	11 days	58	$1.50(high)	48,198	831 lbs.	$1122
1967	10 days	46	$1.73(high)	85,695	1714 lbs.	$2819

The preceding table shows the value of the rice crop to the Indians. The average per boat is their net after the government's 8% has been removed. In general, it shows a good income for a 2 man crew for ten days work.

The wilderness proposal is unaffected by this acivity and would in turn have no bearing on the ricing. None of the lake is included in the proposal, access is on the north shore of Rice Lake, non-motorized canoes are the sole means of harvesting.

The only other activities that would be affected by the proposal would be recreational pursuits involving motorized equipment. Refuge policy

will always, as it does now, prohibit snowmobiles and other off road or all terrain type vehicles. Current refuge policy and management maps the proposed tract a virtual wilderness. Congressional designation would only change the status from de facto to de jure and make it essentially permanent.

ECOLOGICAL REVIEW

Rice Lake Refuge was established as a waterfowl refuge, both for production and migration maintenance. These remain its first priority objectives. Many other goals, particularly public use, are dependent on achievement of these and other wildlife populations objectives. The accomplishment of these goals depends upon management of water and associated marsh and upland habitat. Nesting cover and food provision are management aims. Thus it is necessary to manage, develop, manipulate, etc., the majority of the refuge to achieve established goals.

Basically, management for waterfowl and upland and big game species attempts to hold ecologic succession at some desirable stage, generally an intermediate or subclimax point on the spectrum. In wilderness, on the other hand, it is the uninterrupted (by man) natural processes of succession that are themselves of the greatest value. If this results in an ecological climax, its chief value lies in its being a natural end of natural processes. If this is of value to wildlife so much the better, yet that is a secondary consideration. Some climax types are beneficial to wildlife for different species - such as wood duck.

The wilderness study has revealed that the islands in Mille Lacs and Rice Lakes plus a 1400 acre tract qualify for wilderness designation. They are roadless and otherwise undeveloped and appear to be substantially free of the imprint of man. Furthermore, their devotion to wilderness status would not impair the Bureau's ability to achieve the

goals for which Rice Lake Refuge and Mille Lacs ~~Reservation~~ Refuge were originally established. The ecological significance of the proposal would be to preserve an area serving as a "control"against which to assess environmental effects of management on the blalnce of the refuge.

Certain species requiring remoteness and seclusion would likely benefit by wilderness designation. Examples of this would be the bald eagle in its nesting and the endangered timber wolf. Their wilderness ecology will be different from the ecological relationship, on the rest of the refuge and be an attractive and varied addition to the ecosystens of Rice Lake.

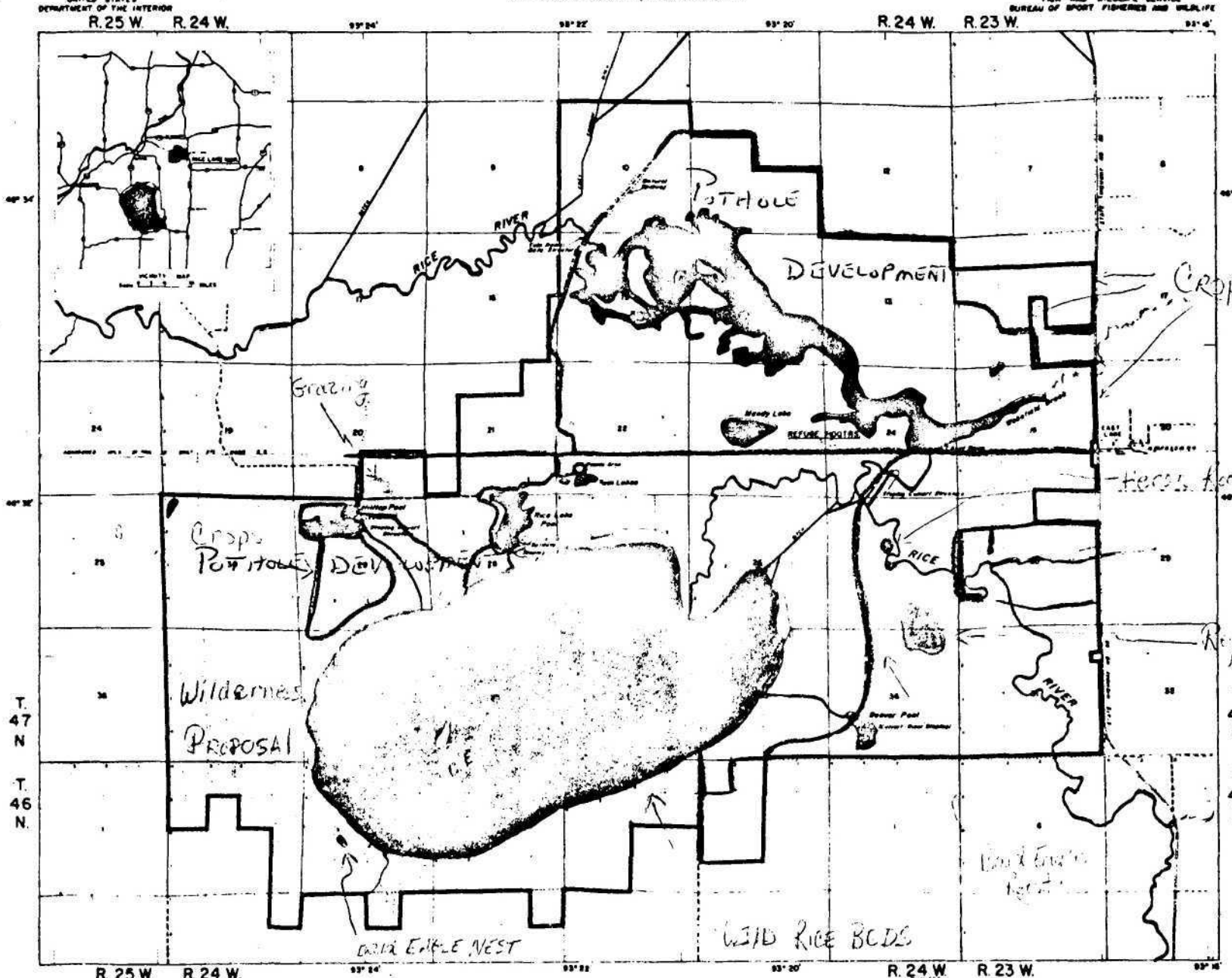
The following map shows the principle natural features and developments of Rice Lake Refuge. Timber management would be pursued on all forested lands of the refuge outside of the proposed tract (except, of course, the research natural area).

This last is the primary aspect of the ecological impact of establishing a wilderness. The timber would remain uncut and unimproved and develop to shade tolerant species like spruce, fir, and sugar maple. This would be at the expense of intermediate species such as aspen and oak that would be more desirable from a purely wildlife standpoint. Grazing, haying, cropping and pothole development will continue to be done on

other portions of the refuge. Facilities for recreation will be located in the vicinity of the main road and headquarters and where the principle wildlife attractions are concentrated.

RICE LAKE NATIONAL WILDLIFE REFUGE

AITKIN COUNTY, MINNESOTA



LAND USE & PRINCIPLE FEATURES

WILDERNESS BOUNDARY

The proposed tract encompasses all of section 31 and that portion of section 32 west of Rice Lake in T47N R24W; nine forties in section 6: the NE quarter; the E 1/2 of the SE 1/4 and the N 1/2 and SW 1/4 of the NW 1/4; the NE 1/4 of the NE 1/4 quarter of section 7 and the NW 1/4 of the NE quarter of section 8, and all of section 5 south and west of Rice Lake in T46N R24W.

The boundary is as follows. Beginning at the NW corner of section 31 T47N R24W, the line goes south 1 1/2 mile along the section line to the quarter corner between section 6 T46N, R24W and section 1 T46N R24W; thence east 1/4 mile, thence north 1/4 mile, thence east 1/4 mile, thence south 1/4 mile, thence east 1/4 mile, thence south 3/4 mile, then east 1/4 mile, thence north 1/4 mile, thence east 1/2 mile, then south 1/4 mile, then east 1/4 mile, then north 1/4, then east 1/4 mile to the southeast corner of section 5 T46N R24W. Thus far the wilderness boundary is identical with the refuge boundary.

From the last named corner the wilderness boundary goes north along the section line about 1/4 mile to the south shore of Rice Lake, then follows the shoreline around the west end of the lake for about 2.1/2 miles. The north side of the tract runs east on the section line from the beginning point (at the NW corner of section 31 T47N, R24W) for slightly over one mile to the road that loops through section 29 T47N R24W. The wilderness boundary at its intersection with this road turns south - southwest following

the west side of the road to its southernmost extremity (a distance along the road of 1/4 mile) and then goes straight east about .3 of a mile to the west shore of Rice Lake which closes the boundary of the unit. Total length of boundary is about 9 3/4 miles.

Rice Lake Island is situated in section 33 T47N R24W in west 1/2 of the SW1/4. The entire 6 and a fraction acre are proposed.

Spirit Island in Mille Lacs Lake is in section 5 T42N R26W, Hennepin Island is in section 29 T43N R25W.

SUMMARY and CONCLUSIONS

The Rice Lake Refuge wilderness proposal consists of 1,400 acres of bog and timber habitat type in the southwest corner of the refuge. A six-acre island, Rice Lake Island, which is generally gravelly with a ~~few~~ trees and other vegetation, is also recommended for wilderness.

Spirit and Hennepin Islands which, in total, comprise the Mille Lacs Refuge, are basically boulder heaps in Mille Lacs Lake. They are very small -- .6 acres -- and they also are proposed for wilderness status.

The proposal unit and the three islands meet the basic criteria of the Wilderness act. The balance of the refuge either has been or will be developed or managed so as to achieve the wildlife objectives for which the refuge was established. This will also ensure the accomplishment of other goals, principally in public use which are dependent upon wildlife values. Devotion of the proposes tract and the islands will in no way inhibit achievement of other refuge goals.

Rice Lake National Wildlife Refuge is located in east-central Minnesota in Aitkin County, seven miles south of the village of McGregor. Lands encompassed by the refuge are typical of the great, flat bog country laced with glacial moraines so characteristic of northern Minnesota. The refuge contains ~~20,296~~ 18,056 acres. Also administered by Rice Lake

Refuge are two small boulder islands in the south end of Mille Lacs Lake, about fifteen miles to the southwest in Mille Lacs county. They are ~~building~~ nesting sites for common terns.

The bog lands are characterized by flat expanses of poorly drained organic soils heavily vegetated with low shrubs and grasses and scattered small trees of spruce and fir. Shallow lakes with marshy shorelines dot this landscape, most are gradually being diminished by the encroaching bog. The refuge programs center on 3,800 acre Rice Lake with its famous beds of wild rice. Scattered islands and ridges, features of glaciation, rising above the bog are covered with timber and other upland plants.

The refuge lies within the zome of northern conifer forest, much of which in Minnesota originally consisted of pine. Railroads opened the region to settlement for logging which removed the magnificent pine forests. Today there are about eleven acres of old growth pine remaining on the refuge. Iron ore mining on the Cuyuna Range, about ~~twenty~~ fifty miles to the west, accelerated area development and brought a rail line through the center of the present - day refuge.

About 25% of the refuge is timbered on both uplands and lowland bog terrain. Overall, about 50% of the refuge is in lakes and streams and wetland habitat, approximetely 10% is in roads, pasture, crops, etc. The general terrain is not conducive to extensive agriculture and farming

success in the past was generally poor due to rocky soil and lack of fertilizers and soil amendments. The principle use of lands now within the refuge has been for timber production with limited hay being harvested from meadows.

Rice Lake National Wildlife Refuge's principle objectives are waterfowl production and maintenance. The area is of particular importance to the ring-necked duck since about 25% of the continental harvest of this species occurs in Minnesota and Rice Lake supports one of the largest concentrations of these ducks in the State. Secondary goals relate to the welfare of other migratory birds and upland species of wildlife, and to appropriate public use of the refuge's resources.

Over two dozen species of waterfowl frequent the refuge and refuge objectives call for capability to provide for a fall population of 80,000 ducks and 10,000 geese. Production goals are for 6,000 ducks and 500 Canade geese. Principal nesting species are widgeon, wood duck, mallard, blue-winged teal, green-winged teal and hooded merganser.

Over two dozen species of hawks and owls are also found on the refuge including both species of North American eagles. The bald eagle nests on the refuge, the lone nest is in the heart of the wilderness proposal, and uses the refuge extensively during migration. Up to forty of these magnificent birds have been seen on the area at one time in recent years.

An occasional migrant visitor is the endangered peregrine falcon. The osprey also utilizes the refuge. The Rice Lake bird list contains 227 species and has besides the above the following species of interest: sandhill crane, great blue heron, pileated woodpecker, common loon, sharp-tailed grouse and upland plover.

Numerous mammals find habitat to their liking on the refuge, white-tailed deer being the commonest of the larger species. However, black bear are frequently seen here as well as an occasional moose. The timber wolf, an endangered species uses the refuge on occasion. Smaller mammals include mink, muskrat, beaver, otter, raccoon, porcupine, skunk, badger, weasels and several species of squirrels.

Rice Lake Refuge is in reasonably close proximity to 1,750,000 people. The Twin Cities Metropolitan Area is about 120 miles to the south on Interstate Highway 35 and Duluth is about 60 miles to the northeast on the same Interstate. The refuge is about thirty miles west of I - 35. Total number of visitors in 1971 amounted to over 12,000.

Wildlife observation and fishing are prime activities of visitors to the refuge. Hunting for deer and ruffed grouse, birding and photography also bring a number of people to the area. Many of these use the picnic area facilities. During years of good wild rice crops many visitors are drawn to the refuge to observe the Indians in their ricing activities.

The Mille Lacs Islands are so small and so isolated in the expanses of this vast lake that they are essentially unused by the public except for a few visits by birders. The main benefit of wilderness designation of these two islets would be the further protection of nesting colonies of terns.

Rice Lake National Wildlife Refuge has been master planned. The road system is already in place providing access into the refuge to the headquarters area where there will eventually be a visitor center complex as well as the administrative center; and access to water areas and other recreational and intrepretive sites. There are no roads in the area proposed for wilderness and there will not be any as there is no need for any foreseeable reason.

In order to achieve waterfowl objectives management of water levels on Rice Lake and Rice River is essential. Water control structures are in place at both sites although the present facilities are inadequate for the task and may be replaced when funds are available. To disperse production a program of pothole excavation has been established creating small open water areas in the otherwise totally vegetated marshlands. Nesting structures are also being emplaced in the lowland vegetation. No plans exist to develop water areas or nesting structures in the area proposed for wilderness.

Administration and recreational-interpretive developments (including utilities) are in general concentrated along the east-west headquarters road that bisects the refuge. Here will be located a new administrative center. The office building overlooking Rice Lake will be designed to contain a viewing tower and an exhibit area. Interpretive foot trails in the burial mounds area are adjacent to the road as well as picnic and parking facilities. A self-guided auto tour loops off the road north of Rice Lake. Photography and observation blinds will be developed in proximity to these access facilities where concentrations of wildlife can be conveniently observed.

Besides water level control, management practices are centered on a timber management program, grazing, crop production and haying. About 5000 acres of forest is under a timber management plan to provide habitat for wildlife. Management objectives are the sustained yield of timber products and simultaneously improvement of wildlife conditions. It will generally be an all-age management to encourage the increase of northern hardwoods and northern white cedar.

About 850 acres of permanent grasslands will be required for waterfowl nesting habitat to meet production goals. The main objective will be to inhibit brush encroachment. Methods will consist of haying, grazing, herbicidal control and fire in prescribed burns. Other species that will benefit from grassland management besides the waterfowl will be

the sharp-tailed grouse and the white-tailed deer.

About 200 acres of cropland are needed to satisfy waterfowl management objectives of 300,000 goose use days and 5,000,000 duck use days. Both green browse and unharvested cereal crops are required. Sharptails and other species will also prosper under this management. None of these management programs will affect the areas proposed for wilderness.

The gradual elimination of haying and grazing on the refuge is a trend which might be only slightly affected by refuge management practices. The wilderness proposal would have no effect on these programs. Older farmers in the area are retiring and the young people are leaving the family farms. Pulp cutting and harvest of other timber are the primary industry locally although some manufacturing has moved in recently. Timber products will still be a significant factor in local economies and the refuge can contribute to this under its timber management plan from the non-wilderness portions of forest lands.

Wild rice is important in supplementing local Indian incomes through sale as a food delicacy. The market has become so large as to encourage commercial development of rice paddies and mechanical harvest. These efforts could lead to the demise of the age-old Indian process of harvesting and preparing wild rice and its loss as a native art.

Rice Lake Refuge holds the potential for the preservation of this important aspect of Indian culture in America. Effective control of water level on Rice Lake is crucial to an annual crop of wild rice. Water control developments as proposed in the master plan would assure this goal and have no influence on the wilderness proposal. Nor would the wilderness as herein proposed inhibit achievement of this goal.

The information gained in this study led to the conclusion that a 1,480 acre tract of the Rice Lake National Wildlife Refuge plus Rice Lake Island and Spirit and Hennepin Islands in Mille Lacs Lake qualified for wilderness designation. Furthermore, wilderness administration of this area will, in part, permit the Bureau to fulfill the wildlife objectives for which the refuge was acquired.

The remainder of the refuge was excluded from wilderness for a number of reasons including the fact that most of the wetland and upland habitat requires intensive management and development which is noncompatible with wilderness. These developments are essential to waterfowl which are in low supply and whose habitat is constantly being reduced, as well as to public enjoyment of the refuge's wildlife.

It is not likely that wilderness designation would have any appreciable effect on the total visitor pattern. Visitor use of the islands and area proposed for wilderness status would probably not be changed to any

extent after initial curiousity passes. These areas would be preserved for those people able to participate in appropriate uses.

Benefits accruing to the public from designation of wilderness at Rice Lake would include:

--preservation of an extensive area representative of the northern bog lands in natural condition.

--protection of this area from future developments.

--prevention of vehivle intrusion, except in emergencies involving wild fi re or public safety.