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A Management Plan for
Lake Bronson
State Park

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Prepared by the
Minnesota Department of Natural Resources

Credits

This plan was prepared for the citizens of the state of Minnesota under the aegis of the Outdoor Recreation Act of 1975 by a multi-disciplinary team of Department of Natural Resources employees.

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All the cost estimates in this plan are based on 1976 dollars.

The appendices to this management plan are available upon request from:
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Purpose of Plan

MANAGEMENT AND DEVELOPMENT PHILOSOPHY

Minnesota is blessed with an abundance of high quality resources and, even more importantly, with leaders who have the wisdom and foresight to protect these resources. As a result, Minnesota today has one of the finest state recreation systems in the country. The Department of Natural Resources, with the assistance of concerned lawmakers, conservation and recreation groups, and private citizens, intends to do its utmost to provide planning that will be responsive to the needs of this generation while protecting the birthright of the next.

The management and development philosophy for the Minnesota state park system consists of two major objectives. The first is the protection of the natural resources within the recreation system. Without this protection, a resource can be destroyed in an alarmingly short period of time. Thus, protection benefits not only future generations, but present-day users as well. The second objective is maximizing the recreation opportunities available to the user, both in terms of quality and variety. It is the DNR's position that every citizen should share in the beauty and recreational opportunities of Minnesota's natural resources as well as the responsibility for maintaining and preserving them.

Obviously, there are going to be situations where use and preservation conflict. Every attempt will be made to reconcile these conflicts by the use of responsible management and development techniques. When this is not possible, however, the primary concern must be preservation of the resource. Allowing our resources to deteriorate would not only jeopardize high quality recreation for this generation but for future generations as well. To maintain a high quality recreational experience, it may be necessary to limit the number of people using a unit at a given time or to restrict certain activities within that unit. When this occurs, an attempt will be made to provide these activities at a nearby unit that has a higher tolerance to use.

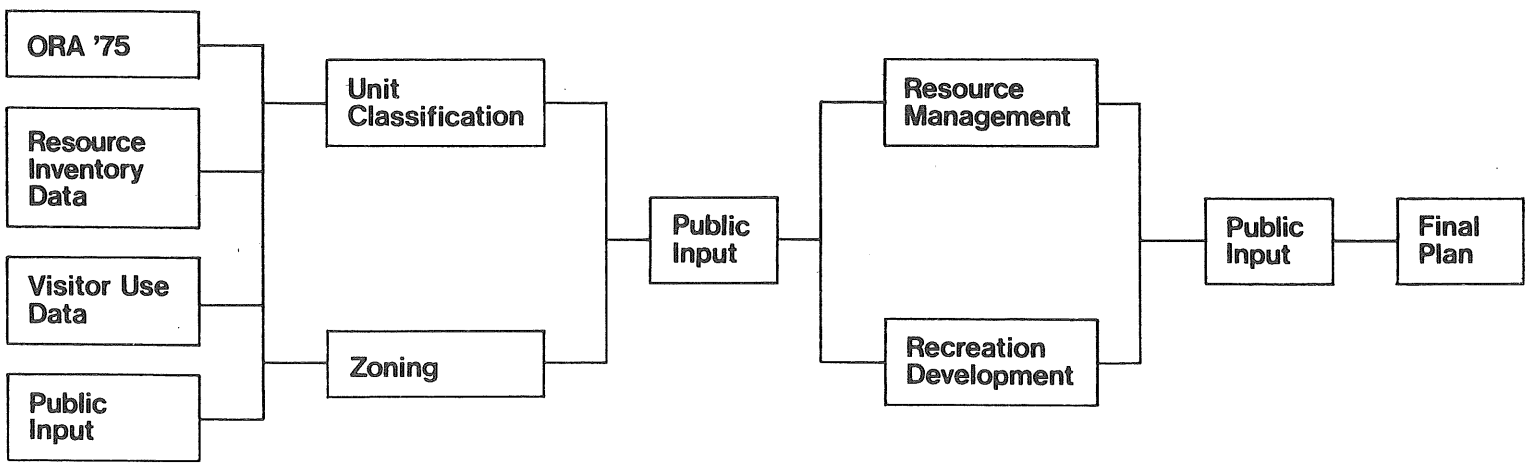
In planning management and development of the various units, the DNR will consider probable future impacts which would affect each unit. In spite of this, unforeseen circumstances are bound to occur. Therefore, each plan should be reviewed periodically to see that it is still relevant in light of current conditions. While a plan can and should be modified if conditions change, nothing should be done that would be detrimental to the objectives set forth in this philosophy.

OUTDOOR RECREATION ACT REVIEW

The Outdoor Recreation Act of 1975 (ORA '75) was enacted by the Minnesota Legislature to "preserve an accurate representation of Minnesota's natural and historical heritage" and to "provide an adequate supply of scenic, accessible, and usable lands and waters to accommodate the outdoor recreation needs of Minnesota's citizens." In an effort to improve long-range planning for the state recreation system, the legislature has directed that management and development plans be prepared for each unit in the system.

ORA '75 also redefined certain recreation unit classifications. For example, the state park classification was divided into recreational state parks and natural state parks. As a part of the overall planning process, the classification of each unit will be reviewed to insure that it is consistent with the resources in that unit. These plans will be used as a guide for developing management policies and planning recreation facilities in each unit. The ORA '75 also states that after August 1, 1977, no development funding will be permitted for any unit until a management and development plan has been completed and reviewed for that unit. By authorizing this planning program, the legislature has taken a significant step toward building a state recreation system in which every Minnesotan can take great pride.

Planning Process Diagram



Summary of Plan

SETTING

Lake Bronson, located in the extreme northwestern corner of Minnesota in Kittson County, is on the edge of the Red River Valley-Lake Plain Landscape Region. Containing 13 different ecological communities, the park is an important natural remnant of this now largely agricultural part of the state. Existing recreational opportunities include: swimming and boating on the man-made lake, picnicking, camping, and trail activities.

CLASSIFICATION

Lake Bronson State Park has been recommended for classification as a recreational state park.

GOAL

The management goals for Lake Bronson, consistent with its recommended classification as a recreational state park, will be to (a) provide water-oriented recreation in an area without suitable recreational water resources, and to (b) provide compatible land-based recreational activities in a predominantly agricultural area.

OBJECTIVES

To provide recreational activities while protecting ecologically sensitive areas of the park through zoning

To decrease the quantity of algal bloom in Lake Bronson

To reduce the rate at which the impoundment is silting in

To ensure the safety of Lake Bronson Dam

To provide recreational fishing consistent with the demand and the biological potential of the lake

To stabilize the eroding river banks and the sand dunes area

To restore and perpetuate the prairie-aspen-oak brushland mixture which characterized the area at the time of settlement by Europeans

To maintain a wildlife population characteristic of an agricultural/pioneer hardwood/brush biome complex based on the species richness concept of managing for an optimum number of different wildlife species

To identify, preserve, and interpret historical and archaeological sites within the park which are of statewide significance

To develop roads which provide a visually interesting entry experiences to the park and its facilities

To provide information to park visitors that will enrich the visitor experience to the park

To maintain and improve existing picnic facilities, with expansion as demand dictates

To maintain and modify existing campgrounds to provide high quality, socially-oriented tent, camper, and trailer camping opportunities

To facilitate a high level of swimming, fishing, boating, and waterskiing within the limits of safety and resource capacity

To develop winter and summer trails through significant park environments and to design these trails to enhance visitor sensitivity and enjoyment

To provide facilities which will ensure effective and efficient management of the park

RESOURCE INVENTORY AND MANAGEMENT

Water Resources

Lake Bronson periodically experiences excessive algal blooms. Sedimentation in the upper portion of the lake is reducing its water storage capacity and reducing its recreational effectiveness. A study to determine the hydrological and economic effects of a dam blowout is recommended. A minor impoundment is suggested upstream from the upper reaches of Lake Bronson to purify incoming water and reduce silt load.

Fisheries

Black bullhead and perch are the most common fish in the lake, however, northern pike fishing is also good. The lake has a high recreational fishery potential because of its location in a generally lakeless area. However, fast water turnover resulting from a large watershed feeding a small reservoir somewhat limits the management potential.

Soils

Soils within the park have some development limitations because of surface texture and erosion susceptibility. Stabilization of the eroding banks near the pioneer cemetery is recommended. Gabbion baskets are suggested for the downstream side of the dam to reduce erosion during high water periods. The sand dune area is being disturbed by motorcyclists and may require protection by fencing.

Vegetation

Thirteen ecological communities have been identified within the park. Predominant communities include old fields, bottomland hardwoods, and pioneer hardwoods. Prairie and oak savanna restoration has been recommended for several vegetation management units. Prairie sod may be salvaged from a proposed county road reconstruction project near the park.

Wildlife

The park serves as a wintering area for moose. Since overbrowsing is evident, especially on the oaks, oak regeneration will be attempted to provide additional browse. The development of a second impoundment to reduce the nutrient and silt load entering Lake Bronson will also be of considerable benefit to wetland wildlife.

Cultural/Historical

Historic sites within the park will be protected from future loss. Additional testing will be done in the park to locate other sites of archaeological significance. These sites will be marked and appropriately interpreted.

RECREATION MANAGEMENT

The following are highlights of proposed developments to further accommodate recreational activities at Lake Bronson.

Proposed Developments

Reroute the entrance road behind the water/observation tower and pave existing roads as necessary.

Develop a new parking area for the proposed hike-in campsites.

Develop orientation displays in major use areas and in the contact station which will include detailed maps and photographs of the park.

Develop a combination interpretive and trail center in day-use areas.

Expand picnic facilities and add a group picnic area.

Rehabilitate and upgrade the existing picnic area sanitation building, picnic shelter, and mess hall in the Scout area.

Selectively remove campsites to achieve a minimum of 60-foot spacing and establish vegetation between campsites to ensure some campsite privacy.

Develop 6 to 10 hike-in campsites along the river in east end of park.

Develop one fish cleaning shelter in each campground.

Develop a fishing deck at the dam.

Investigate the feasibility of developing interim groupings of boat docks for private cabin owners' use.

Expand the park trail system around the lake and along the river to include two bridges across the river. Trails should be hard surfaced for bicycling and soil protection.

Pave major paths to accommodate handicapped persons.

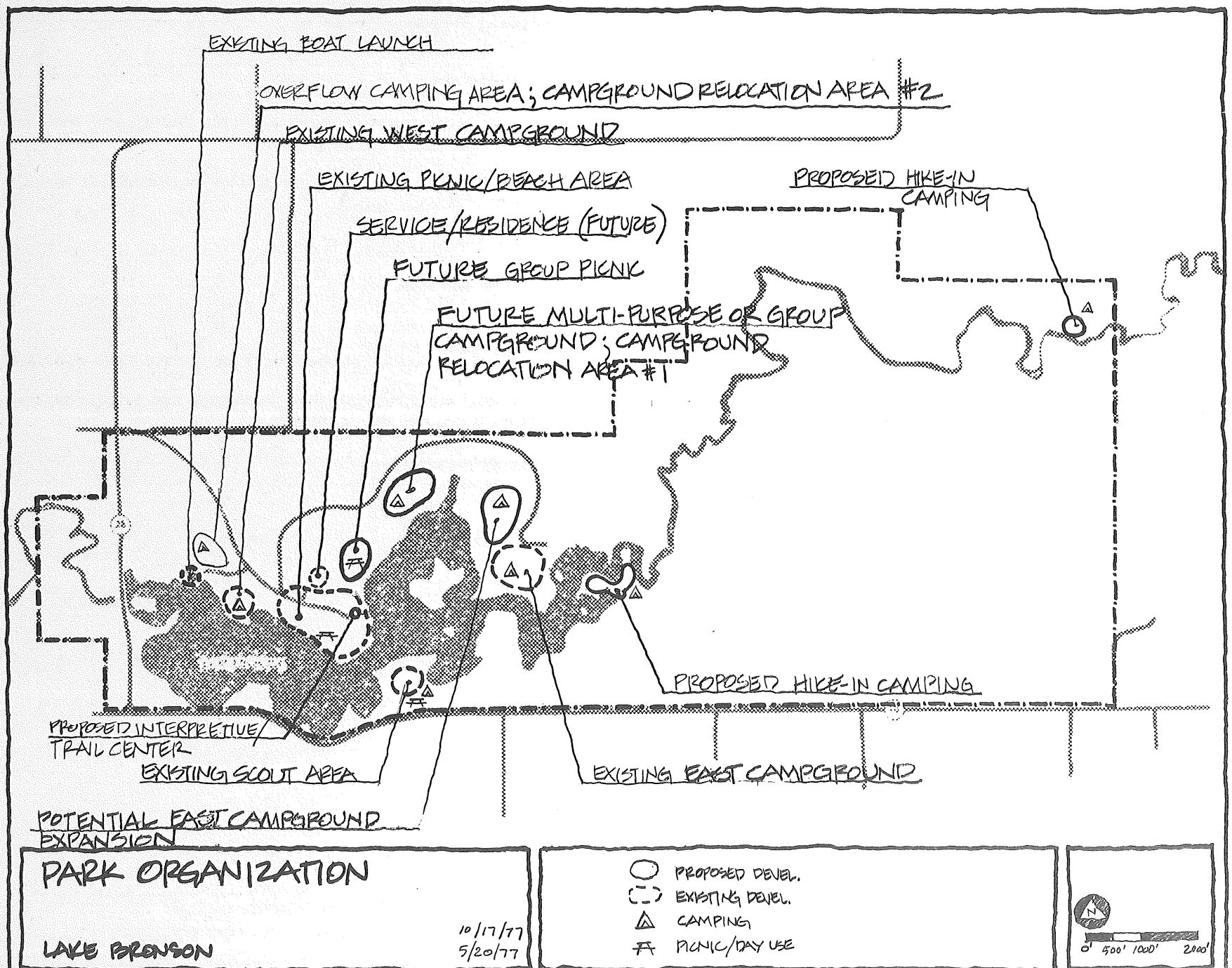
FACILITY INVENTORY

	Present	Proposed
Acreage	2,938	2,938
Campsites		
Primitive Group Camp	1	1
Individual	152	160
Picnic Tables	151	201
Trails	6 miles	17.3 miles

ACQUISITION AND BOUNDARY CHANGES

Forty-five percent of the land within the statutory boundaries is privately owned, including several parcels critical to the organized development of the park. Agricultural land totaling 640 acres in the northern part of the park is recommended for deletion from the park boundaries, to be replaced by 640 acres to the south which is more suitable for recreation and wildlife habitat.

NOTE: This boundary modification recommendation was passed by the 1977 Minnesota State Legislature.


EXISTING BOAT LAUNCH
OVERFLOW CAMPING AREA; CAMPGROUND RELOCATION AREA #2
EXISTING WEST CAMPGROUND
EXISTING PICNIC/BEACH AREA
PROPOSED HIKE-IN CAMPING
SERVICE/RESIDENCE (FUTURE)
FUTURE GROUP PICNIC
FUTURE MULTI-PURPOSE OR GROUP CAMPGROUND; CAMPGROUND RELOCATION AREA #1
PROPOSED HIKE-IN CAMPING
PROPOSED INTERPRETIVE/ TRAIL CENTER
EXISTING SCOUT AREA
EXISTING EAST CAMPGROUND
POTENTIAL EAST CAMPGROUND EXPANSION
PARK ORGANIZATION
LAKE BRONSON
10/17/77
5/20/77
PROPOSED DEVEL.
EXISTING DEVEL.
CAMPING
PICNIC/DAY USE
N
0' 500' 1000' 2000'

INTRODUCTION

Lake Bronson State Park, located in the flat landscape of the Red River Valley, is dependent on differences in vegetation and the water bodies for visual interest and diversity. Farming, the predominant prior land use, continues today on private land within the park boundaries. Although some acquired farmland has been taken over by brush, much has remained open. Some of these areas have scattered oaks and native prairie species, creating a semblance of oak savanna. These open areas offer visual relief from the dense aspen-birch woods which occupy so much of the park.

Other major environments are created by bottomland hardwoods in the river valley and the relatively open land below the dam which is surrounded by small bluffs. The main focus of the park, however, is the South Branch/Two Rivers and the artificial lake. The largely undeveloped shoreline is a major visual asset. A current problem exists in the lake because significant algal growth has created aesthetically undesirable water quality.

The majority of the existing park development is oriented toward the lake and has a manicured appearance, with extensive mowed areas and no understory. Some campsites in the old campground are very closely spaced and lack of inter-site vegetative screening. This situation is better in the east campground because of wider spaced campsites and more trees. A combination hiking and self-guiding interpretive trail provides high quality lakeside hiking.

Buildings and paved areas with little screening in the area of the manager's residence presents a built up appearance as well as privacy problems for the park manager. A combination water and lookout tower offers an additional visual dimension to the park experience. The dam that creates Lake Bronson serves more as a point of interest than as an undesirable visual impact because the view of the dam is softened by roadside trees.

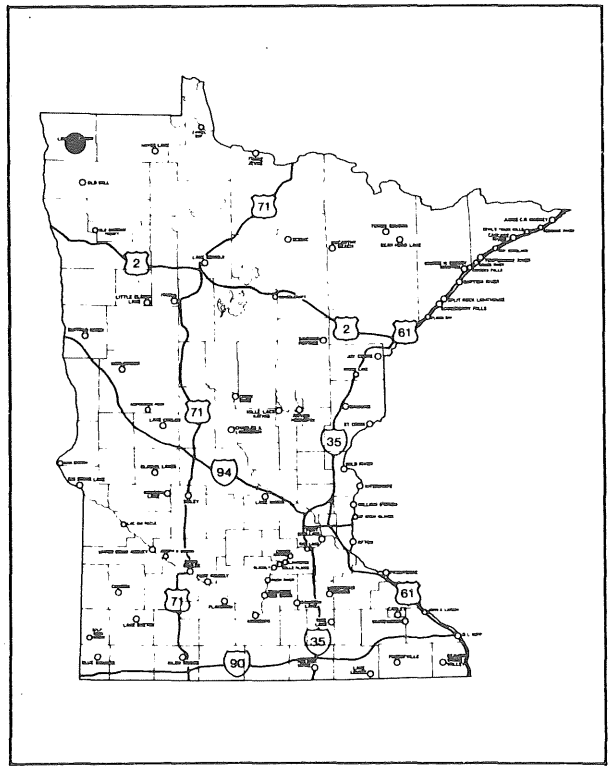
Additional visual impacts on the park environment include some private cabins and church camps within the statutory boundaries. Extensive clearing around these buildings and the adjacent lake shore make them highly visible from park roads, trails, and the lake. Private docks on otherwise undeveloped shoreline also create a negative visual impact which is contrary to a desirable park experience.

GEOGRAPHIC PERSPECTIVE

Lake Bronson State Park is located in northwestern Minnesota in Kittson County, 17 miles northwest of Karlstad on the South Branch/Two Rivers.

Kittson County State Aid Highway (CSAH) 28 from Lake Bronson provides major access to the park. Kittson CSAH 10 parallels most of the south boundary of the park. Major highways serving the general area include Trunk Highways (T H) 59, 11, and 175.

Land descriptions, ownership, and proximity to population centers are presented in the maps and tables below.

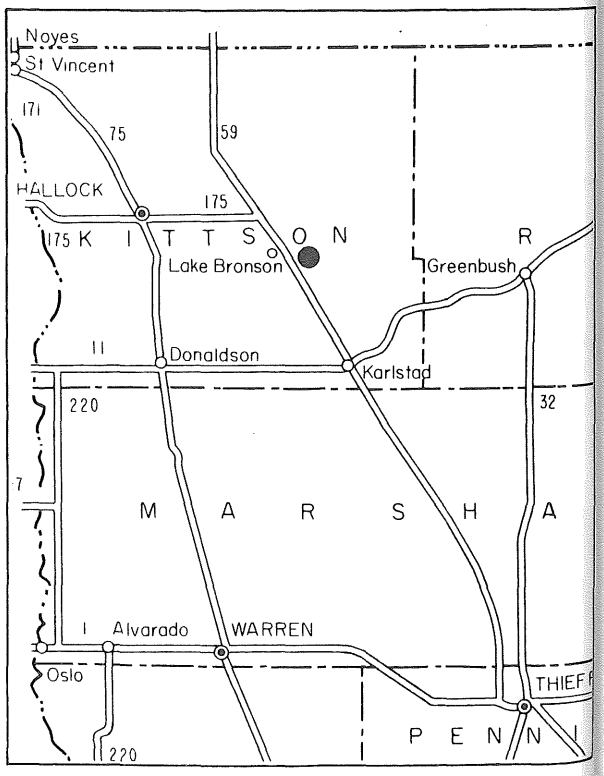


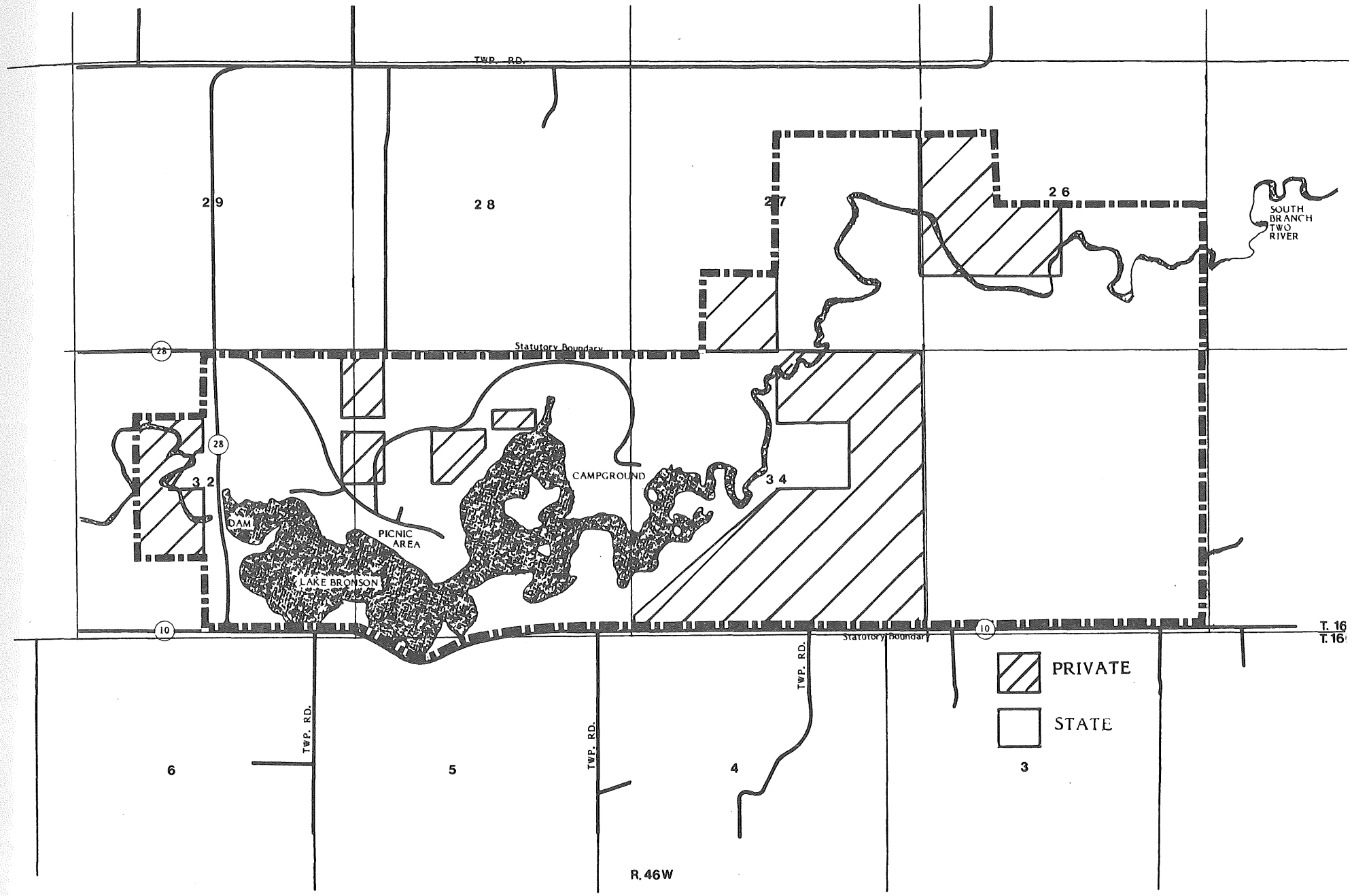
Legal Description

Township	Range	All or Part of Sections
160N	46W	5
161N	46W	26,27,32,33,34

Land Ownership

Controlled By	Approximate Acres	Percent
State	1,654	55
Private	1,329	45
Approximate Total Acres	2,983	100




TWP. RD.
29
28
27
26
SOUTH BRANCH TWO RIVER
Statutory Boundary
28
28
32
34
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
10
10
Statutory Boundary
T. 16
T. 16
TWP. RD.
TWP. RD.
TWP. RD.
PRIVATE
STATE
6
5
4
3
R. 46W

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Marschner, F. J., 1930. The original vegetation of Minnesota. North Central Forest Experiment Station Map.

Minnesota State Planning Agency, 1975. Minnesota population projections. Office of the State Demographer. St. Paul.

Minnesota State Planning Agency, 1974. 1974 Pocket data book. Development Planning Division: St. Paul.

Department of Economic Development, 1975. The economic distribution of tourist/travel expenditures in Minnesota by regions and counties. Department of Economic Development: St. Paul.

State Planning Agency and Center for Urban and Regional Affairs,1973. Wall map series: Population distribution, 1970. State Planning Agency and Center for Urban Affairs: St. Paul.

REGIONAL PERSPECTIVE

Lake Bronson State Park is located on the edge of the Red River Valley - Lake Plain Landscape Region. This nearly flat plain was the bottom of glacial Lake Agassiz, which once covered about 6,000 square miles. The valley slopes gently westward toward the Red River. The clay and silty soils were originally covered by prairie grasses, with occasional tree-lined river valleys interspersed throughout the region. The eastern edge of the region is marked by a series of sand ridges which were beach lines at the different major levels of Lake Agassiz. Presettlement vegetation of the beach ridges in the Lake Bronson area included either open oak or aspen. The present vegetation in the uncultivated areas is predominantly oak and aspen on the uplands and ash and elm along the river bottoms.

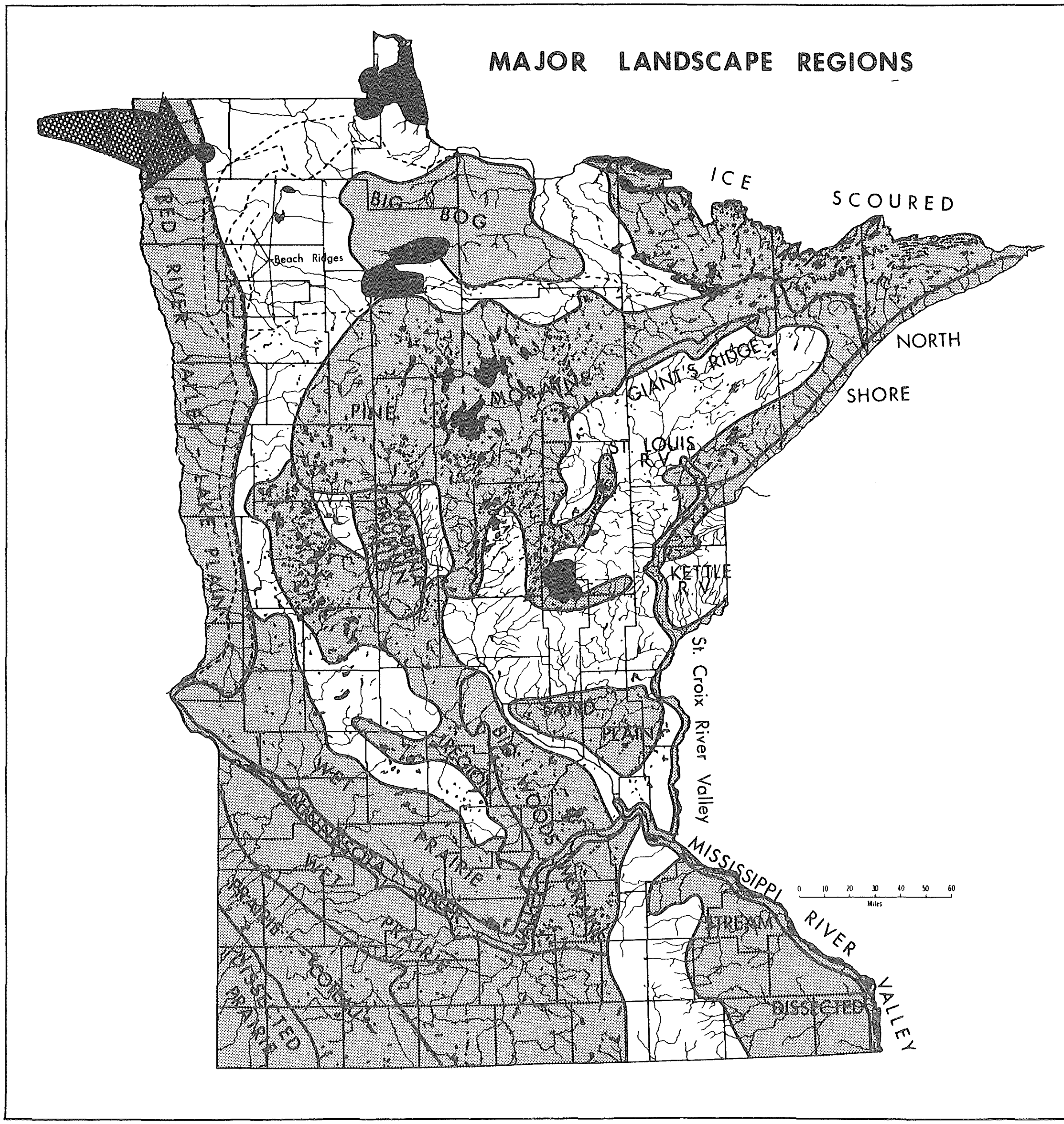
The predominant land use in Kittson and Roseau counties is agricultural (53%) with forest a distant second (25%). Marshes and open water cover approximately 12%. The 1975 population estimate for these two counties was 19,100, up from 18,500 in the 1970 census. Hallock, the principal town in the region, is approximately 15 miles from the park and had a 1970 population of 1,500.

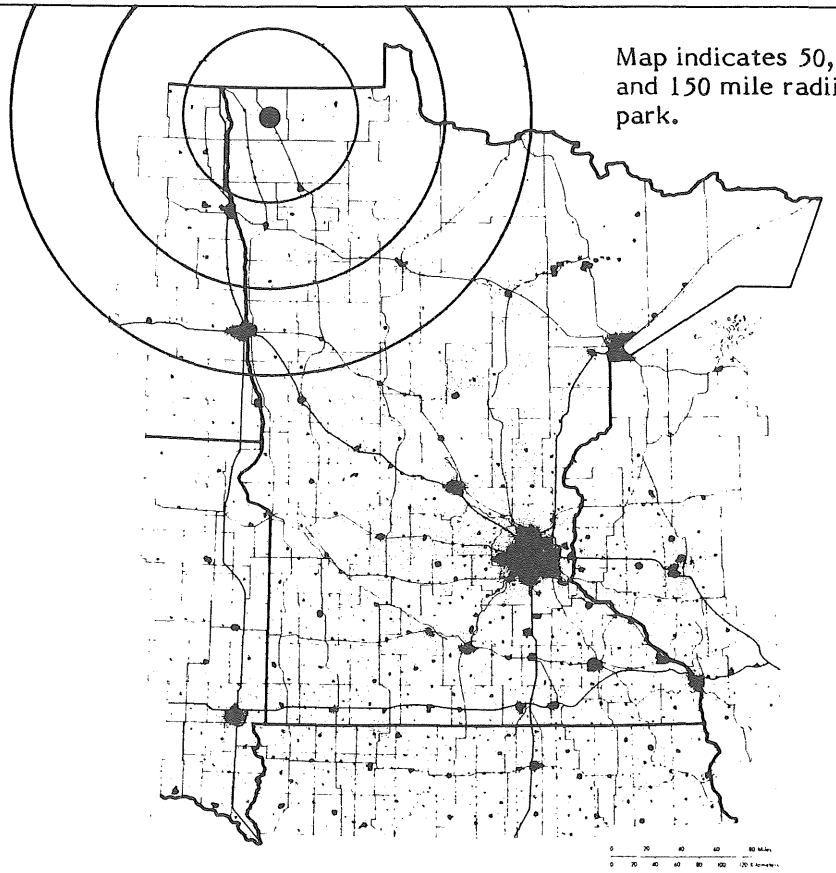
The recreational potential of the region is moderate. Because the predominant land use is agricultural and because relatively few lakes exist in the area, there are few tourist attractions. The few existing recreational units within the area are heavily used by local and regional residents. Many Canadians spend three-day vacations in the region, especially at Lake Bronson State Park.

Boating opportunities in the two counties are limited. The vast openness and flatness of the area is not conducive to activities such as hiking, snowshoeing, or cross-country skiing. However, numerous scattered woodlots among the agricultural fields provide excellent habitat for deer and moose. Moose harvests have been permitted periodically in the past few years.

Data compiled by the Department of Economic Development indicates that Roseau and Kittson counties derived $3,910,000 from tourism related expenditures in 1974. This sum only represents approximately 4% of the total gross sales within the counties.

In the future, the region will probably decline in overall attractiveness since agricultural acreage is being expanded at the expense of woodlots and wetlands. Furthermore, an energy crisis combined with the remoteness and unattractiveness of the area would probably cause a decline in the number of tourists from outside the region, although regional and international recreational demands would continue to be served by the park.


MAJOR LANDSCAPE REGIONS
BIG BOG
Beach Ridges
ICE SCOURED
NORTH SHORE
GIANT'S RIDGE
MORAINE
PINE
ST. LOUIS R.V.
KETTLE R.V.
RED RIVER VALLEY - LAKE PLAIN
St. Croix River Valley
SAND PLAIN
BIG WOODS
WET PRAIRIE
MINNESOTA RIVER
MISSISSIPPI RIVER VALLEY
STREAM DISSECTED
DISSECTED PRAIRIE
Miles



Map indicates 50, 100, and 150 mile radii from park.

Proximity to Population Centers

Center	Distance	Travel Time	Approximate Population
Karlstad	17 miles	15 minutes	700
Winnipeg, Manitoba	87 miles	90 minutes	246,000
Grand Forks	100 miles	90 minutes	60,000
Fargo-Moorhead	158 miles	3 hours	132,120
Roseau and Marshall counties	40 miles	50 minutes	16,000
Twin Cities	340 miles	8 hours	1,905,000

CLIMATE

Lake Bronson State Park, in the extreme northwest corner of Minnesota, experiences the state's coldest winter weather (see tables below). Although nearby Hallock reported 92 inches of snow in 1950, it generally has the least precipitation in the state. While the winters are rather severe, summers are warm and pleasant, similar to the rest of the state. This serves to emphasize the attractiveness of Lake Bronson for summer rather than winter recreation.

	Lake Bronson State Park	Statewide Range	
Temperature Variations			
Average number of days/year below 0°F	68	30	70
Average number of days/year above 90°F	10	5	25
Mean January minimum temperature	-10°	-10°	6°
Mean January maximum temperature	12°	10°	26°
Mean July minimum temperature	56°	50°	62°
Mean July maximum temperature	81°	72°	86°
Precipitation			
Annual average snowfall	40"	40"	70"
Annual average total precipitation	20"	19"	32"

GEOLOGIC HISTORY

Glacial Development

The landscape of Lake Bronson State Park, located within the Red River Valley/Lake Plain Region, was formed by the forces of Glacial Lake Agassiz. Wave action and deposition of sand and silt in the lake basin created essentially flat topography, devoid of natural lakes. The general flatness of the terrain is interrupted by gravel ridges, or beach lines, which formed at the edge of the lake when waves hit the shallow bottom and tossed sand and gravel on land.

As the glacial meltwater drained away, the lake receded in five major stages, leaving a series of five beach lines. An exaggerated profile through the old lake basin and beach lines reveals a terraced effect, with the outer edge of each terrace marked by a gravel beach line. A typical beach form is a gentle rise to the top of the beach, with a slight depression immediately behind. The last stage of Lake Agassiz left the McCauleyville Beach, which passes through Lake Bronson State Park.

Streams currently draining this region flow sluggishly, except when passing over the beach lines, where rapids may still exist. These rapids may have eroded notches in the beaches and over time migrated upstream. Such is the case with the South Branch/Two River at Lake Bronson State Park where a forty-foot dam, built in the approximate location of the eroded notch, has flooded the stream channel to form Lake Bronson.

Bedrock Geology

Below the Lake Agassiz deposits are tills from earlier glaciers, Cretaceous sand and shale, Paleozoic sedimentary rocks, and, far below the surface, Precambrian metasedimentary rocks and granites.

Mineral Potential

Lake Bronson State Park has a low potential for metallic mineral occurrence.

Geologic reliability: Fair

Possible minerals of economic value: Uranium, copper

Sources

Harris, J. Merle 1956. Lake Bronson, Old Mill, Old Crossing Treaty. Conservation Volunteer, Vol. 19, no. 113.

Meineke, David G. 1976. Memo: Major Metals for the Mineral Potential of State Parks. DNR Mineral Division. January 27.

PARK HISTORY

Lake Bronson State Park came into being in a roundabout way. During the Great Depression of the 1930's, the northwestern area of the state around the towns of Bronson and Hallock were faced with a serious drought which caused many wells to dry up. Large salt deposits prevented deeper wells, so an artificial reservoir seemed to be the only solution to the water problem. The reservoir also created a recreational lake for this generally lakeless region. Also, this reservoir was expected to alleviate spring flooding problems.

J. E. Dishington, Kittson County engineer, had long advocated the construction of a dam on the South Branch/Two Rivers to create such a reservoir near the town of Bronson.

The local communities could not afford the cost of such a project, especially during this economic crisis. Therefore, the creation of the Works Progress Administration (WPA) was especially timely. When the program was established in Minnesota, the communities of Bronson and Hallock, through a resolution by the Kittson County board, began a 1½ year process to secure funds for the dam project.

Since the local communities could not even afford the local share ($225,000) of the estimated $900,000 project cost, money was solicited under the leadership of O. T. Danielson and Clifford Bouvette, mayors of Bronson and Hallock respectively, from the Minnesota State Executive Council and the WPA. However, competition for funds was keen, and the officials of these organizations "...felt they did not have funds enough to sponsor projects needed to head off starvation in heavily populated areas and at the same time sponsor this Lake Bronson dam."

Local leaders persevered to carry the project through a series of such stalemates. The final impasse in obtaining funds in March of 1936 was resolved only when Clifford Bouvette used his political friendships with Governor Floyd B. Olson and Mr. Adolph Bremer, St. Paul banker and president of Schmidt Brewing Company who had a personal aquaintance with President Roosevelt, to personally request funding from the president. One and a half years of this intricate politicking resulted in an executive order by Franklin D. Roosevelt. Construction was underway within a week after the executive order was issued.

Considerable difficulty was experienced in building the dam because quicksand over 100 feet deep was discovered. Finally, engineer Clifford Holland, designer of the New York City car tunnel which bears his name, was hired. He devised a system by which the weight of the dam forced water up and out of the quicksand through 6-inch pipes, thus solidifying the soil base enough to support the weight of the structure. These pipes can be seen today in the spillway wall, and to date have kept the dam from sinking. This structure was given widespread publicity in professional journals as an engineering landmark.

As the new lake filled, expert stone masons employed by the WPA built a picnic shelter and combination water and observation tower. Construction of parking lots and picnic tables followed. When the entire job was completed, it was turned over by the federal government to the County Board of Commissioners in a large, formal ceremony.

In 1937, Clifford Bouvette was elected to the state legislature and introduced a bill to transfer the responsibility of maintaining the dam and adjacent park from the county to the state by designating it a state park. The bill passed and Lake Bronson State Park was born. Further developments included: paving the entrance road in 1949, construction of the manager's residence, campground, and boat launch area between 1953 and 1959, and the addition of a second campground starting in 1967.

Lake Bronson has attracted substantial numbers of swimmers, fishermen, and related users, largely from within a 100-mile radius, with a large segment coming from Winnipeg. Local Red Cross swimming and lifeguard programs are conducted here and area schools are making increasing use of the park for environmental education. Use projections for the year 2000 (done in 1968) had already been surpassed by 1973, as the number of visitors between 1968 to 1973 had tripled.

The town of Lake Bronson depends upon the economic activity generated by the park. Continuing community pride has resulted in a strong involvement by the local park advisory committee to make Lake Bronson State Park a viable recreational resource for the area.

Sources

The History of Lake Bronson State Park

Borneman, A. D. 1949. History of Lake Bronson Dam. Souvenir Program Minnesota Territorial Centennial Pageant Lake Bronson State Park. (A centennial project directed by Mr. and Mrs. Harold Searls of the Minnesota Historical Society.)

Interviews with and memos by LaMonte Gross, Park Manager

Interview with John Martin, Past Assistant Director of Parks and Recreation

OFF-SITE RELATIONSHIPS

The park is moderately buffered from off-site development, although active farmland in the northern portion allows views outside the park. Traffic noise from the gravel road, which passes adjacent to the southernmost bay of Lake Bronson, is not too noticeable in the park. Also, CSAH 28 passes over the dam, separating an 80-acre tract (unacquired) from the rest of the park.

Lake Bronson State Park is a visual asset to the surrounding area as a wooded oasis in an expanding, modern, agri-business region. The park is visible along nearly five miles of county and township roads which partially encircle the park.

ACCESS CORRIDOR

Access is via CSAH 28, a paved, high speed road with a wide, cleared right-of-way which leads two miles from the town of Lake Bronson to the park.

INTRODUCTION

In accordance with the Outdoor Recreation Act of 1975, the park planning staff has reviewed the classification of each park under study this biennium. After the park resource inventory was completed for each unit, the planning staff determined the following:

A. Which of the eleven classifications from ORA '75 was most appropriate for the unit
B. Whether sub-units should be considered to deal with special areas within the unit (scientific and natural areas or other sub-units authorized in ORA '75)
C. Whether administration of the unit should be reassigned to other governmental bodies (other state agencies, county, or local governments)

Each park has been recommended for classification according to its resources and as such will be managed and developed according to the nature of those resources and their ability to tolerate visitor use.

Objectives:

To establish a statewide recreation system that will meet the recreational needs of our society

To determine the most suitable management for a given park based on its natural resources and recreational potential

RECOMMENDED CLASSIFICATION

Lake Bronson State Park is recommended for classification as a recreational state park.

ALTERNATIVES CONSIDERED

Natural State Park - Although the park possesses some significant amenities such as aspen and oak forests, sand dunes, and beds of creeping juniper, the fact that Lake Bronson is an artificial impoundment and is the major feature which attracts visitors weighed most heavily in recommending that the unit be classified as a recreational state park.

Regional Park - The park is in an area with little open water. It has a tremendous recreational attraction from beyond the 50-mile local area. It draws a large amount of visitors, both day-use and overnight, from Winnipeg (87 miles) and North Dakota. This has both international and interstate implications which preclude regional jurisdiction. This is especially true when one considers that the annual visitor count approaches 1/4 million. Even though the attraction can be considered regional if taken in the context of 100 miles as a local area, the heavy demand from non-resident users makes operation on a state park level essential.

CRITERIA

The Outdoor Recreation Act of 1975 requires that a unit substantially satisfy the following criteria to qualify as a Recreational State Park:

Contains natural or artificial resources which provide outstanding outdoor recreational opportunities that will attract visitors from beyond the local area.

Contains resources which permit intensive recreational use by large numbers of people.

May be located in areas which have serious deficiencies in public outdoor recreational facilities, provided that recreational state parks should not be provided in lieu of municipal, county, or regional facilities.

DISCUSSION

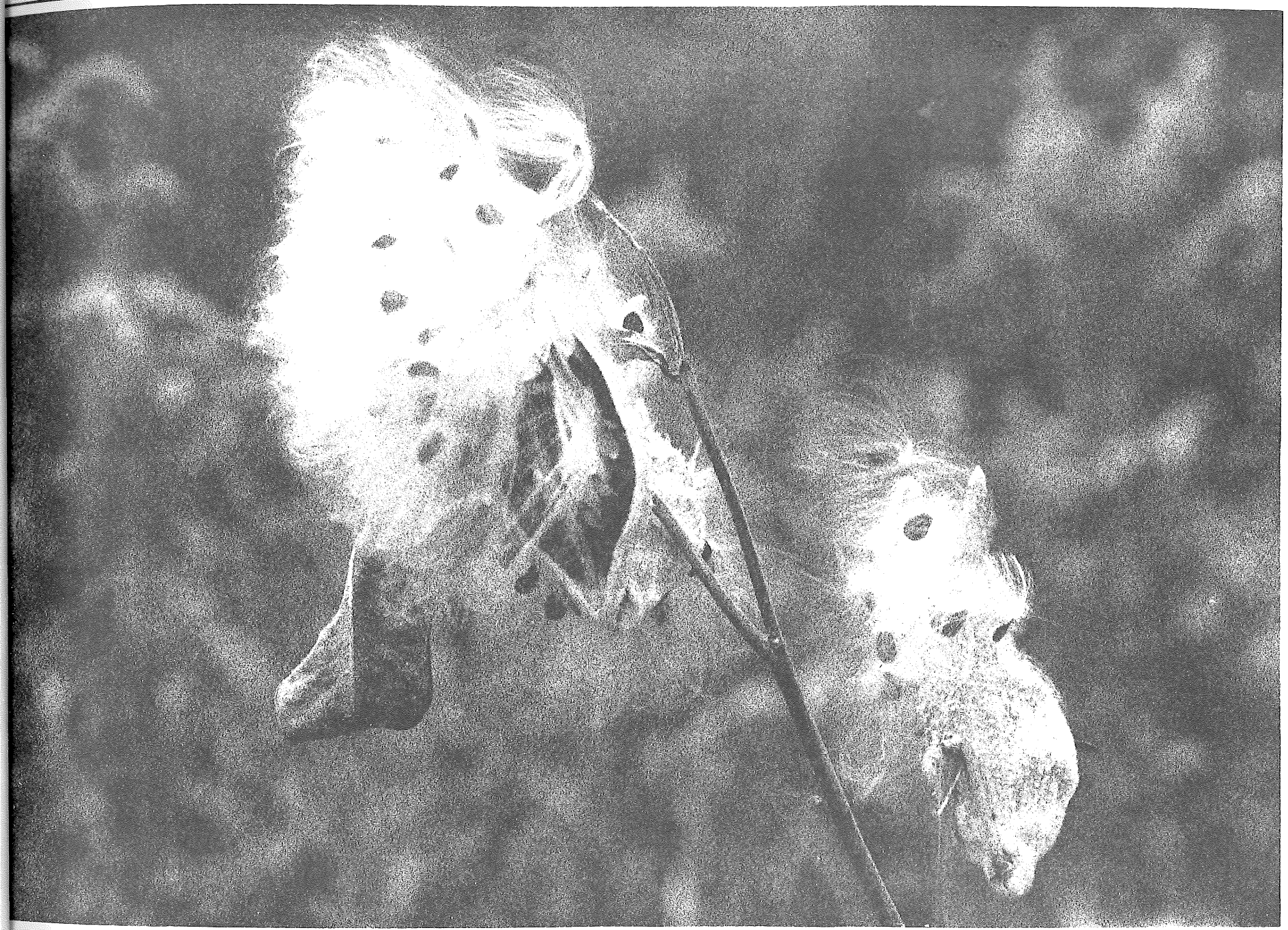
The artificial impoundment created by the Lake Bronson dam draws visitors regularly from as far as Winnipeg, Manitoba. Swimming, boating, canoeing, fishing, and water skiing are presently permitted uses on Lake Bronson, an area with virtually no large recreational bodies of water.

Over 221,000 people visited Lake Bronson State Park in 1975. Many, if not most, of these people were attracted to the unit by the lake. Many people may use the beach without adversely affecting it. Other uses, such as boating, have greater space requirements and may have to be more rigidly controlled in the future. Snowmobiling, camping, hiking, and picnicking can easily be accommodated at present use levels, but some facility expansion will be needed to meet future demands.

Some deficiencies in public outdoor recreational facilities do occur in the region and the projections indicate that these deficiencies will continue through 1990. Notable among these are shortages in swimming, camping, and picnicking facilities.

PARK GOAL

The goal for Lake Bronson State Park is to provide the people of Minnesota with a broad selection of water-related recreational opportunities in a reasonably natural setting.



Resource Management

INTRODUCTION

Optimal management of Minnesota's state park system requires a multi-disciplinary approach to each park's unique resource content. All determinations in this plan are based upon:

an initial inventory of the park's soils, waters, vegetation, wildlife, fisheries, and historical/cultural sites

a careful examination of the interdependence of these systems and their relationships to larger systems, within and outside of the park boundaries

a critical, site-specific zoning of all park areas according to natural and cultural resources and values

an assessment of the park's recreational potential consistent with its classification and zoning

ZONING

Introduction

Before the specific management of an area within a park can be considered, a zoning concept must be established to evaluate the management alternatives within the park. General management strategies can then be determined and expressed by zoning the park for its prime management objectives.

Objectives:

To establish a zoning system which formally recognizes the various features of a park

To identify those areas suitable for specific uses

To establish management policies which provide recreation while protecting the park resources

Management Zoning

A land classification system utilizing six major management zones was adopted which will permit effective, economical management of the park's resources, centralize legitimate park development and use, and protect delicate resources within the park.

Land Classification Zones

To aid in understanding the final zoning concept map, each of the six potential zones have been defined with a description of their prime management objectives. All six management zones may not necessarily be found in each park.

The final zoning map (page **31**) is a composite of all potential zones that shows where management decisions have been made to eliminate conflicts between individual zones. This final zoning map will guide the recreation and resource management decision-making process.

Ecological Protection Zone - The ecological protection zone includes areas having ecological communities which are either sensitive to certain uses, require special management or protection and/or have significant value for research. Areas having unique or endangered wildlife habitat or vegetative communities are included in this zone. Management will be directed toward perpetuating these ecological values. Development will be restricted to interpretive facilities or trails which do not disturb these values. All forms of access may be prohibited when necessary. In certain instances, small structures may be necessary to orient use and protect habitat.

Outstanding Natural Feature Zone - The outstanding natural feature zone includes areas which are geologically or biologically of statewide significance. These features often are the park's principal resource attractions and will be managed to provide for visitor enjoyment without impairing their quality. Development of restricted forms of recreation facilities may be necessary to allow for enjoyment and interpretation. All development must be compatible to the features of the site to protect its natural character. Resource management will be restricted to restoring the resources and perpetuating their natural characteristics.

Primitive Zone - The primitive zone includes extensive areas of land and water remote from high density use areas and major development within the park and removed from the external influences of civilization. Development will be restricted to non-riding trails, primitive walk-in campsites and appropriate interpretive facilities. Resource management will be directed toward restoring and perpetuating the natural environment and the aesthetic character of that environment.

General Environment Zone - This zone includes areas which may be very scenic but, contain no identified outstanding natural, historical or cultural features. In addition, the resources in this zone must tolerate moderate use. Properly managed, this zone will unite the other zones into a cohesive unit.

Historical and Cultural Zone - The historical and cultural zone includes those sites which help to illustrate the historical and archeological heritage of the area that should be presented or restored. Activities should emphasize the interpretive values of the site. Recreation development will be restricted to activities such as non-riding trails, small picnic areas, interpretive facilities and parking. In some instances, extensive improvements may be necessary to protect the qualities of the site while providing for the use, enjoyment, and interpretation of the significant features. Activities and improvements should be limited to those which will not detrimentally affect the preservation and restoration of these sites and should be reviewed with the Minnesota Historical Society. All historical or cultural sites should be surrounded by sufficient natural buffers to minimize encroachment from other activities. Natural resource management activities should maintain and perpetuate historical and cultural values while insuring regeneration of native or historically compatible plant and animal species.

Development Zone - The development zone includes lands and waters where major park development and intensive use, both existing and proposed, has or will substantially alter the environment. This zone will be managed to provide and maintain the level of development necessary to serve the needs of relatively large numbers of visitors and of park administration. Park roads extending beyond this zone may be included in appropriate natural or historic zones through which they pass. Resource management will be directed toward improving the recreation capabilities and characteristics of the environment. However, native vegetation should not be extensively replaced solely for aesthetic reasons.

Non-Conforming Uses - The non-conforming uses identified on the map, page **31**, are developed private inholdings within the heart of the park. They include a number of summer cabins and two church camps. These are recommended for acquisition on a willing seller basis in the Boundary Modifications Section, p. **141.**

Potential Ecological Protection Zone - Several areas within the park have creeping juniper beds which are found only in northwestern and southeastern Minnesota. This plant, believed to be a prostrate variety of red cedar, is especially vulnerable to fire because of its shallow root system. The park also serves as a wintering area for moose. (See map, page **27.**)

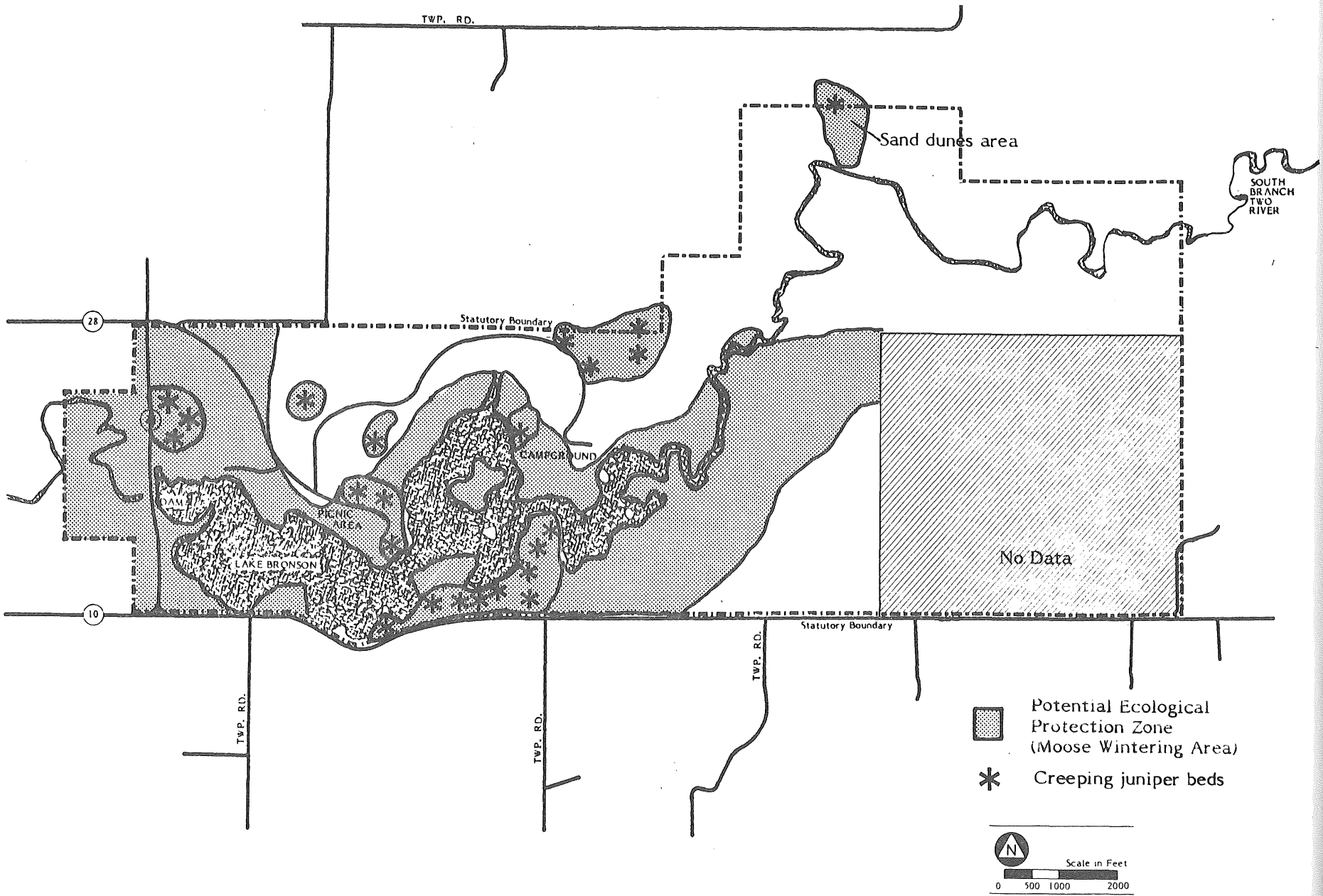
Potential Outstanding Natural Feature Zone - No areas within Lake Bronson State Park have been identified which meet the criteria of this zone.

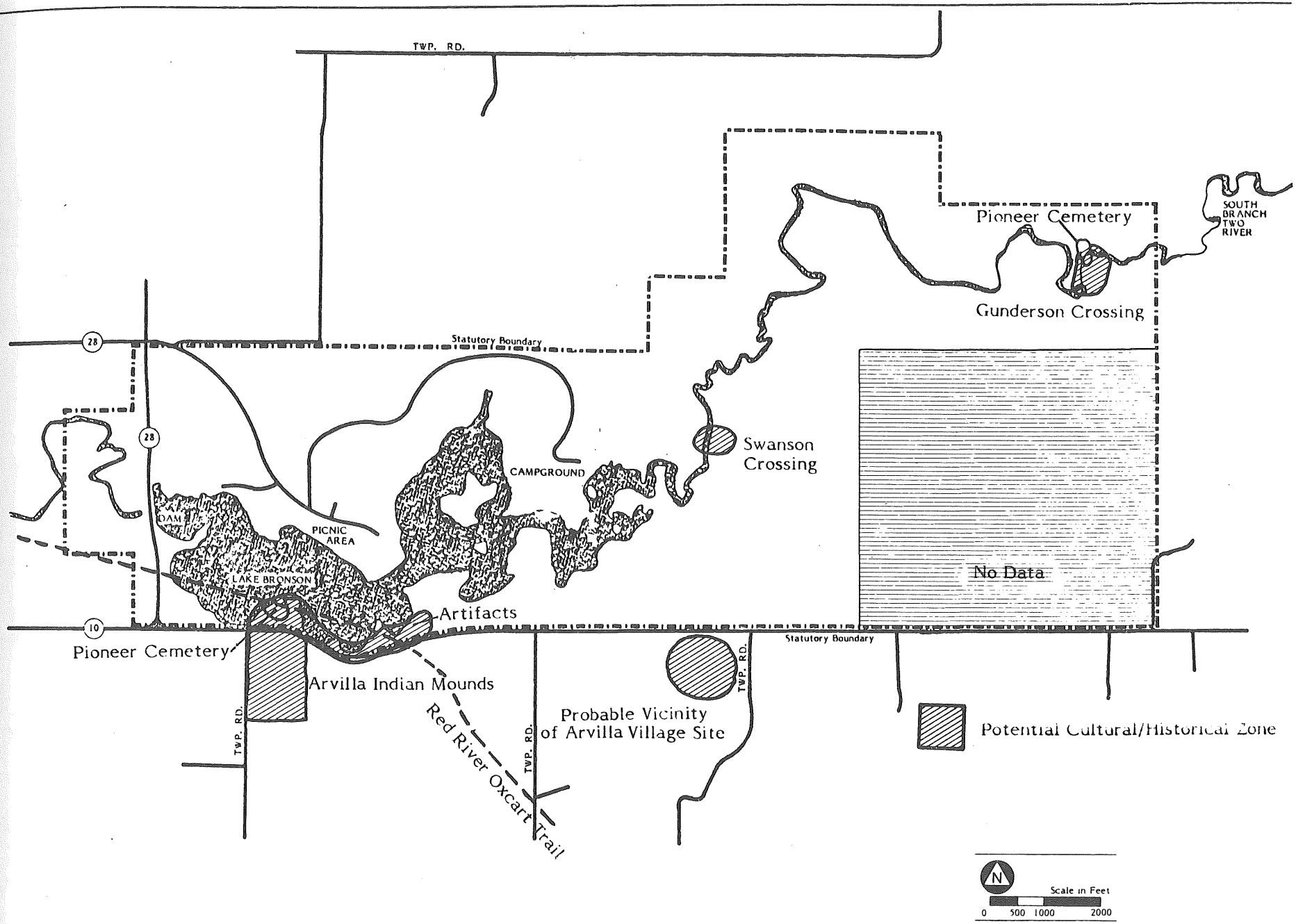
Potential Primitive Zone - No areas within Lake Bronson State Park meet the criteria of this zone.

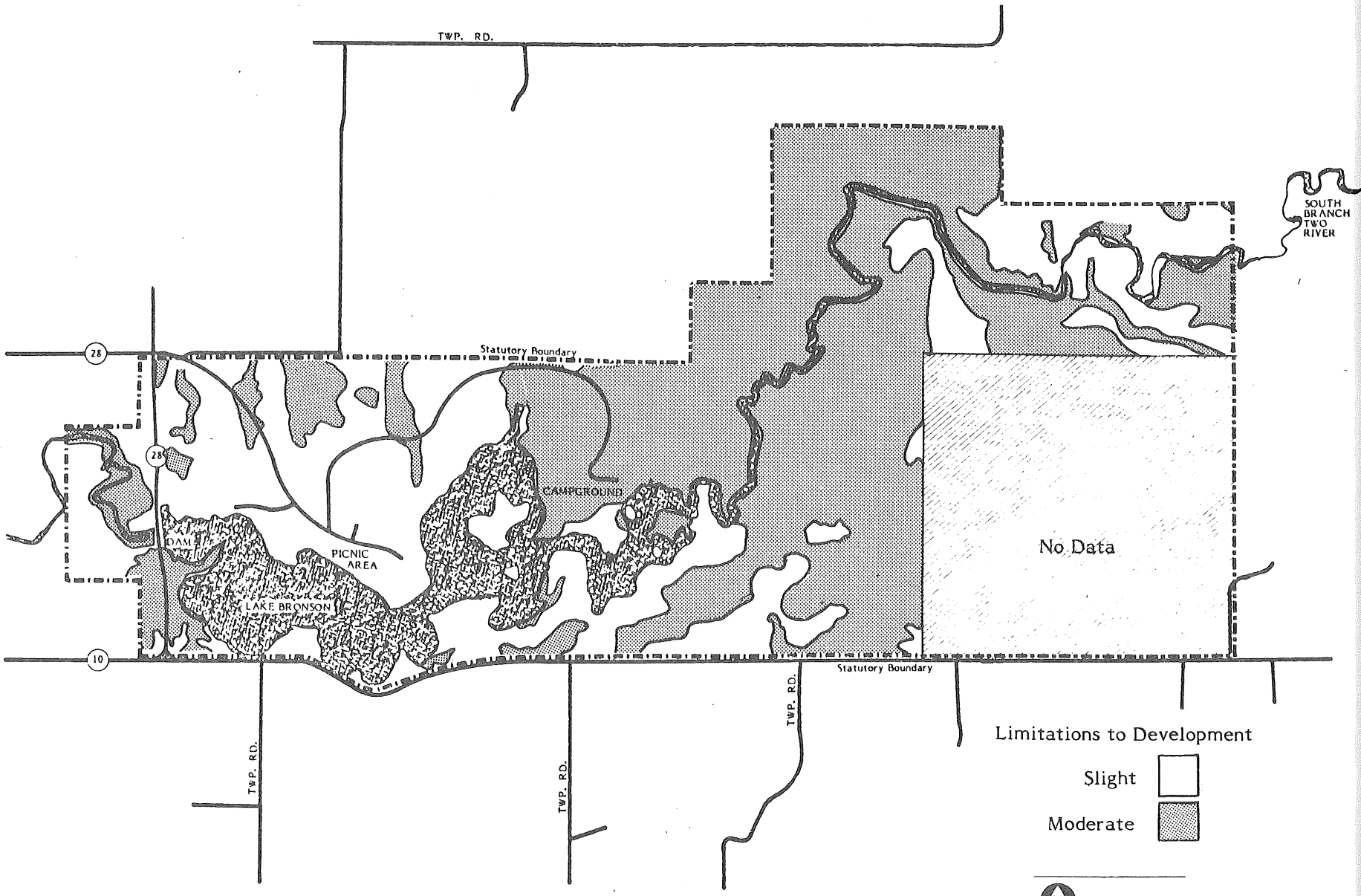
Potential General Environment Zone - The majority of the park falls into this zone. Although the natural resources of the park are good, they are not exceptionally outstanding or unique. The resources are durable and can provide an excellent outdoor recreational experience. (See map, page **31.**)

Potential Historical and Cultural Zone - Several sites of historical and archaeological significance occur within and adjacent to the park. Two pioneer cemeteries are situated within the park. Swanson and Gunderson crossings are two river fords of local historical significance. Artifacts have been discovered along the south shore of Lake Bronson. The historic Red River oxcart trail passed through a portion of the park. The locations of the Arvilla Indian mounds (outside the statutory boundary of the park) has recently been placed on the National Register of Historic Sites. The probable location of the Arvilla village site is also outside the park but near the park boundary. (See map, page **28.**)

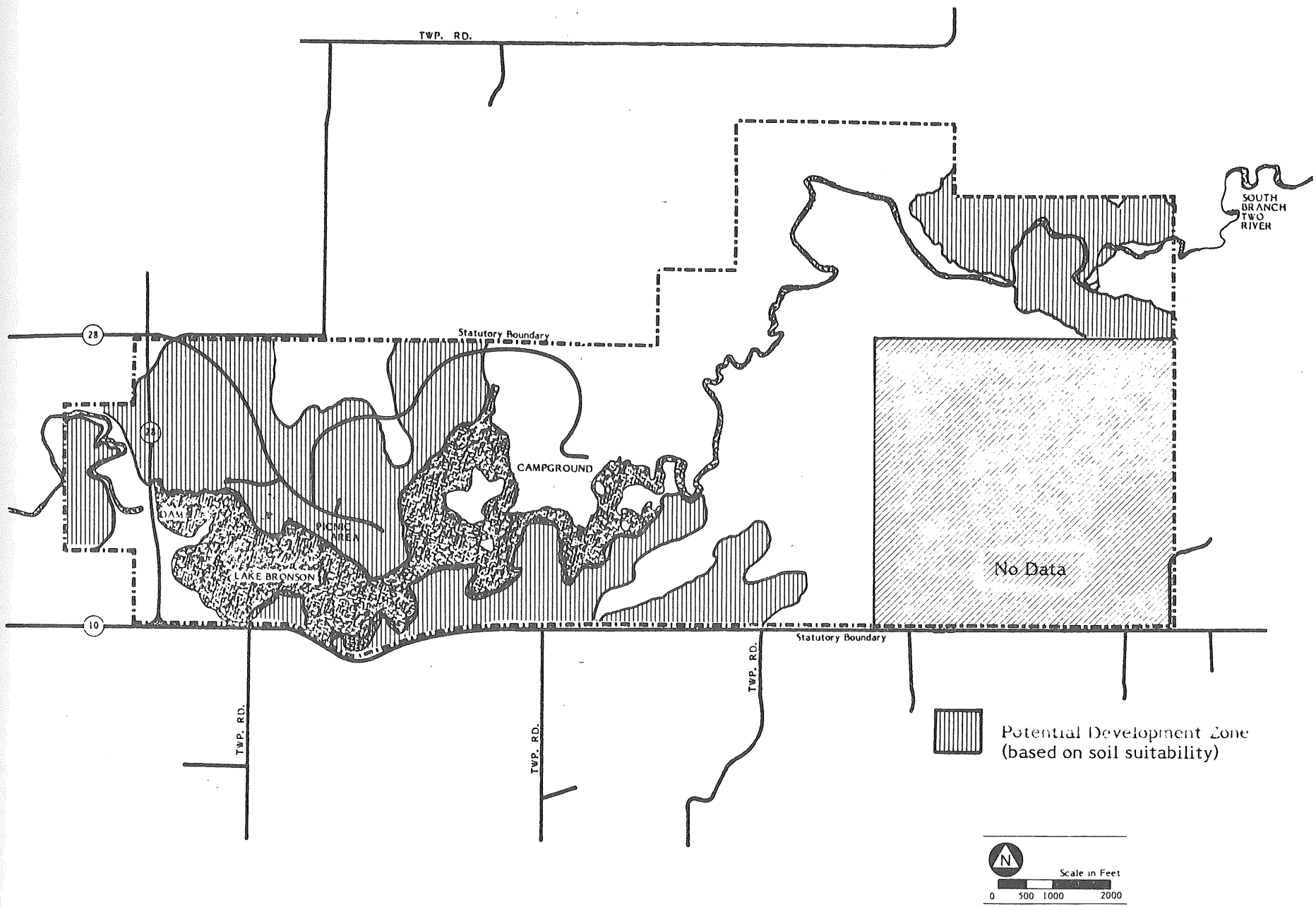
Potential Development Zone - Three separate development zones have been identified within the park boundaries. These areas have been the sites of past development in the park and will continue to provide space for the services required by the recreating public. Facilities either existing or planned include swimming beach, campground, picnic area, group camp, boat launch, visitor center, and administrative/service area. Soils in the development areas have only moderate limitations to development because of surface texture or drainage. (See map, page **29.**)

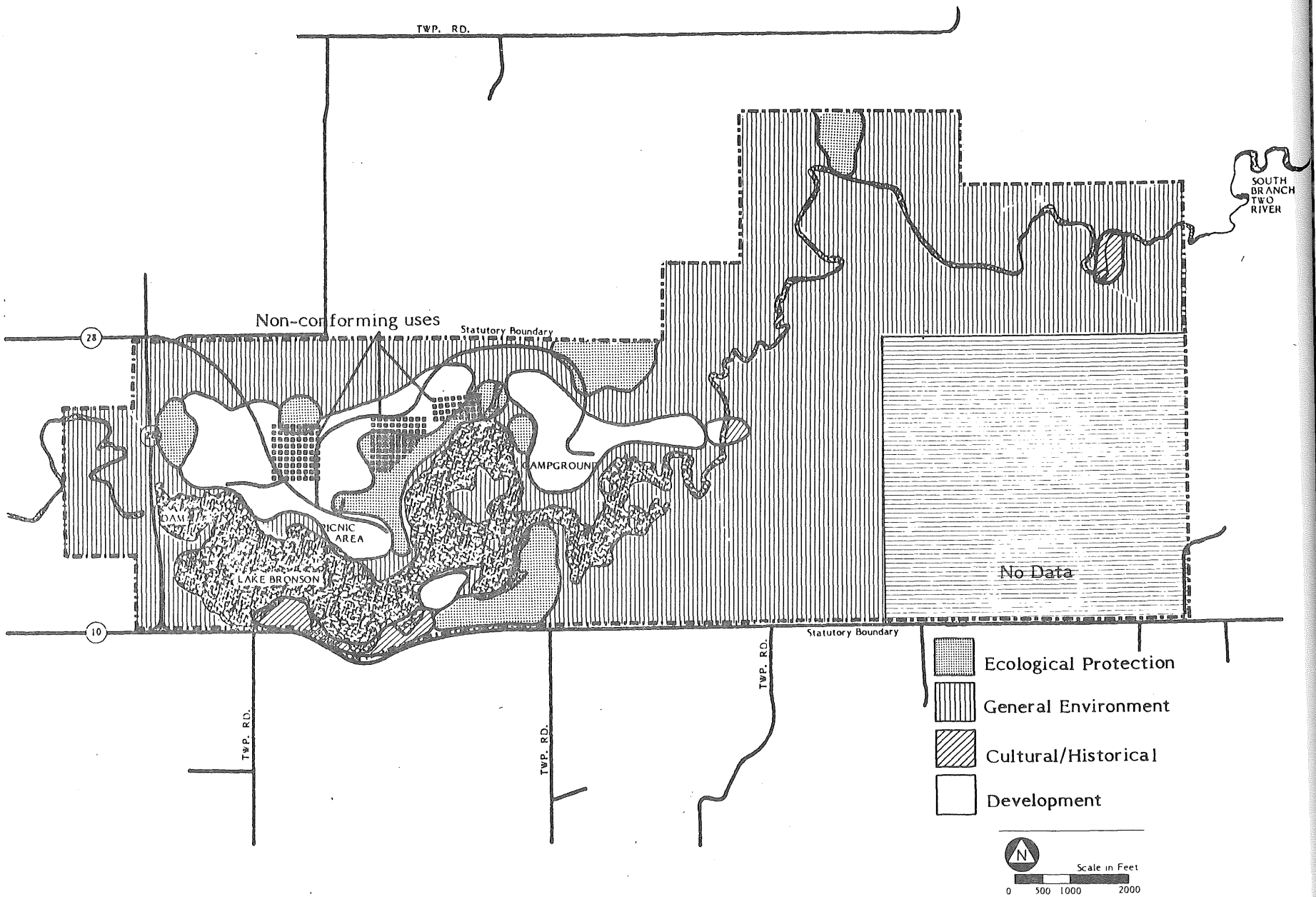

TWP. RD.
Sand dunes area
SOUTH BRANCH TWO RIVER
28
Statutory Boundary
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
No Data
10
Statutory Boundary
TWP. RD.
TWP. RD.
TWP. RD.
Potential Ecological Protection Zone (Moose Wintering Area)
Creeping juniper beds
N
Scale in Feet
0 500 1000 2000


TWP. RD.
Pioneer Cemetery
SOUTH BRANCH TWO RIVER
Gunderson Crossing
28
Statutory Boundary
28
Swanson Crossing
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
No Data
Artifacts
10
Pioneer Cemetery
Statutory Boundary
TWP. RD.
Arvilla Indian Mounds
Red River Oxcart Trail
TWP. RD.
Probable Vicinity of Arvilla Village Site
TWP. RD.
Potential Cultural/Historical Zone
N
Scale in Feet
0 500 1000 2000



See Soils Suitability Chart, page 46


TWP. RD.
SOUTH BRANCH TWO RIVER
28
Statutory Boundary
28
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
No Data
10
Statutory Boundary
TWP. RD.
TWP. RD.
TWP. RD.
Potential Development Zone
(based on soil suitability)
N
Scale in Feet
0 500 1000 2000


TWP. RD.
SOUTH BRANCH TWO RIVER
Non-conforming uses
Statutory Boundary
28
10
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
No Data
Statutory Boundary
TWP. RD.
TWP. RD.
TWP. RD.
Ecological Protection
General Environment
Cultural/Historical
Development
N
Scale in Feet
0 500 1000 2000

WATER RESOURCES

Introduction

No single element plays a more important role in the total environment and its component life support systems than water. Besides nourishing vegetation and wildlife, water provides aesthetic and recreational experiences for park users.

Inventory - Groundwater Hydrology

Lake Bronson State Park lies above a 5-mile-wide outwash channel which is probably the highest capacity aquifer in the Two Rivers Watershed. It has the potential to be developed for large amounts of water, with possible yields up to 1,000 gallons per minute (gpm).

Because groundwater levels are above lake level, the lake currently does not function as a groundwater recharge area, although it would if groundwater levels would drop sufficiently.

Available Groundwater Data

Depth to groundwater:

Piezometric contour depth varies from 0' to 20'; wells in town of Lake Bronson vary from 2.8' to 18.5'; the water level of the well in the east campground is at 22.2'.

Hardness:

Very hard, containing as much as 5 parts per million (ppm) iron and 440 ppm $CaCo_3$; total dissolved solids in vicinity of 500 ppm.

pH:

Varies from 7.5 to 9 in town of Lake Bronson.

Water volume:

Regional groundwater movement is westward at an estimated rate of 0.80 cubic feet per second (cfs) per mile of width of the aquifer. Local movement of groundwater is toward Lake Bronson.

Inventory - Surface Hydrology

Water bodies in Lake Bronson State Park consist of South Branch/Two Rivers and its impounded waters which form the artificial lake. The river upstream from the lake is navigable by small craft for at least two of the three miles within the park. Water quality is fairly good although, sediment is being deposited in the upper portion of the lake. The watershed draining to the river at the park is approximately 440 square miles.

Lake and River Survey Summaries

- South Branch/Two Rivers

  Location: T161N, R46W, Sec. 34, 26, 27 (within the park)
  Width: 20'-30' (estimate)
  Depth: 1.5' or less in Sec. 26 and 27; 4' in Sec. 34
  Gradient: 0.0008 ft./ft.
  Bottom types: sand, some muck (estimate)
  Pools: 10'-12' deep in N.E. 1/4 Sec. 27
  Flowage volume: Average 93 cfs; 25 year storm = 5210 cfs; 50 year storm = 6650 cfs; 100 year storm = 8240 cfs.
  Direction of flow: West and southwest in park; generally west and northwest in region.
  Water level fluctuation: Max. 15 ft. during period of record flood at town of Lake Bronson; approximately 3 feet in average years.
  Dams: Lake Bronson Dam
  Navigability: By small watercraft through most of length within park although fallen trees necessitate portaging in upstream portions.

- Lake Bronson

  Location: T160N, R46W,Sec. 5; T161N, R46W, Sec. 32, 33, 34
  Surface area: 313 acres
  Maximum depth: 32 feet
  Water level fluctuation: 3.5 ft. during average year.

  Control structure: Lake Bronson Dam, which is state owned, was completed in 1937, and modified in 1951, 1960, and 1962 to replace stop logs with crest gates and replace the sluice gate with a gate valve. The dam consists of six 20 ft. bays, each with an ogee crest and a 10 ft. wide by 4 ft. high crest gate (2 power winches, 4 crank-operated winches). Crest elevation is 969.55 ft. Mean Sea Level Datum (MSLD 1929). There is also a 2'x2' sluiceway at upstream sill elevation of 951.25' (MSLD 1929) which is operated by a 12-inch diameter gate valve. The sluiceway is designed to augment flows at Hallock when Lake Bronson is below normal operating level. The capacity of the dam without overflowing the abutments is approximately 5,000 cfs. The bridge incorporated into the dam is 68 feet long and has a driving width of 18 feet.

Inlet: South Branch/Two Rivers. (Center Sec. 34, T161N, R46W); secondary wetland inlet in NW 1/4, Sec. 5, and T160N, R46W.
Navigability: With 16' boat (70 h.p. motor)
Percent of lakeshore controlled by park: 100%, although private cabins have been given docking permits and control is tenuous at points close to gravel road on south edge of park.
Shoreline character: Generally steep banks 6'± high; some gradual sloping areas
Water quality:

Color: Green brown (stain and algae)
Clarity: 5.0' Secchi disc.
Alkalinity: 202.5 ppm (9/25/69)
Mineral Content: pH 7.8 - 8.1 (9/23/50)

Pollutant: None apparent, although agricultural runoff within the watershed may contribute some.
Dissolved oxygen:

Surface	9.1 ppm
5 ft.	9.0 ppm
10 ft.	8.9 ppm
15 ft.	4.7 ppm
20 ft.	0.6 ppm
25 ft.	0 ppm

Water temperature:

Surface	73°F
5 ft.	73°F
10 ft.	72°F
15 ft.	70°F
20 ft.	69°F

Management

Objectives:

To decrease quantity of algal bloom in Lake Bronson

To reduce the rate at which the impoundment is silting in

To ensure the safety of Lake Bronson Dam

Introduction

The area surrounding Lake Bronson State Park is highly agricultural. Drainage ditches have been dug to speed up spring run-off and carry excess water from heavy rains off the land rapidly. These ditches empty water carrying fertilizer, organic matter, and silt into the river. All of these materials are carried in the river until quiet, non-flowing water is reached. Then the silt and sediment settle out and aquatic plants use the excess nutrients. Lake Bronson is one of these quiet areas. Because of excessive additions of nutrients and silt, Lake Bronson is gradually filling in and losing its storage capacity. Also, the water quality is poor because of excessive algal bloom during the warm summer months.

The Lake Bronson Dam poses a potentially serious threat to downstream residents and therefore requires a high priority assessment of structural stability.

● Specific Recommendations

Ensure dam safety, Site 1 (Map, page **38**).

The Lake Bronson dam is constructed to handle a normal flow volume of 5,000 cfs. During periods of peak runoff (i.e., a 100-year flood) this volume increases to 8,240 cfs. Because inflow exceeds outflow, the lake level will increase and overtop the dam. Therefore, sand bagging will be necessary to contain the water within the lake basin and to protect the dam.

Alternatives to sandbagging include the use of a sand fuse along the top of the dam on County Road 28 or a depressed section of road in the same location to serve as an emergency spillway. The emergency spillway concept has been discussed with local residents and the Kittson County engineer. The 1977 Minnesota Legislature reappropriated money to repair the dam and spillway, however, local residents are opposed to a depressed spillway because of their concerns about downstream flooding.

It is recommended that a detailed hydrological and engineering report be prepared by the Division of Waters or a suitable consultant using specially appropriated funds. The report should document the following data:

1. Structural soundness and stability of the Lake Bronson Dam
2. Expected useful life of the structure
3. Estimated replacement cost
4. Downstream effects of a spillway at 10-year, 25-year, 50-year, and 100-year flood levels including a map showing high water contours and their effects on residences, including the town of Hallock. Estimated current cost of damages should be included
5. Current flooding probability within the park, and 100-year flood level; anticipated impact on flooding within park by the proposed spillway

6. The siltation rate in Lake Bronson and present storage capacity compared to original capacity
7. Based on current siltation rates, the estimated longevity of the impoundment
8. Identification of major sources of silt and sediment load and recommendations for reducing erosion
9. Estimated effects of dam failure during 100-year flood
10. Estimated costs of dredging channel to improve boating in upper portions of the lake

Note: This study should be coordinated with the impoundment study so that solutions are compatible and non-duplicative.

Priority: High Estimated Cost. $8,000

Reduce algal bloom and sedimentation, Site 2 (Map, page **38**).

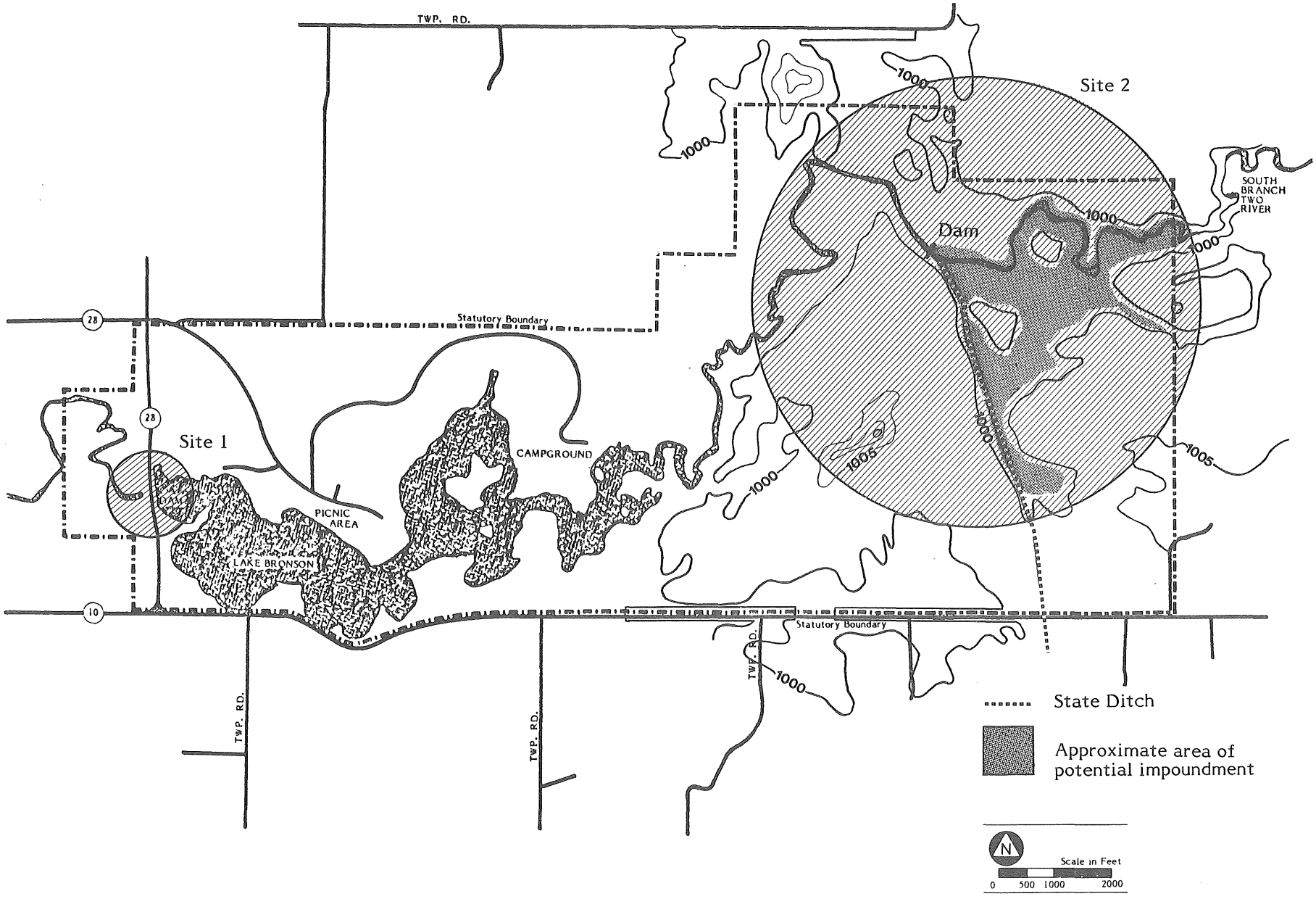
This area has the potential for providing a second minor impoundment area to trap excess nutrients and reduce the silt load on Lake Bronson. Two methods are presently apparent for solving this problem:

Alternative 1 - A series of 1-foot-high "scrubbers" might be placed in the river channel to slow the water and trap silt. Trapped silt could be periodically removed by dredging. Excess nutrients would not be removed to any appreciable extent by using this method.

Alternative 2 - An impoundment designed to bring the water level up to the 996-foot contour would be placed in the general area designated on the map, p. **38.** A marsh about 80 acres in size would be created which would tend to slow incoming water and cause the silt load to be dropped above Lake Bronson. The marsh vegetation would use the excess nutrients and result in cleaner water entering Lake Bronson. Mineralized, nutrient-laden water coming from irrigated agricultural fields would also be confined to the marsh.

The area under consideration had formerly been marsh but was drained by a ditch running through section 35. An impoundment at this location should not affect any lands outside the park which are drained by the ditch. A further benefit would be the creation of wetland habitat for waterfowl, shorebirds, and other wetland inhabitants. The pond could be periodically drawn down and excess silt removed. This draw-down would also improve wetland habitat.

Alternative 2 is preferred because of its overall beneficial value to wildlife in addition to its primary objective of removing silt, sediment, and nutrients from incoming water.


TWP. RD.
Site 2
1000
SOUTH BRANCH TWO RIVER
Dam
1005
28
Statutory Boundary
Site 1
CAMPGROUND
PICNIC AREA
DAM
LAKE BRONSON
10
TWP. RD.
State Ditch
Approximate area of potential impoundment
N
Scale in Feet
0 500 1000 2000

A detailed study should be undertaken in order to determine the overall effects of the above two suggested alternatives, as well as to recommend other possible solutions to the problem of siltation and algal bloom. Recommended solutions should not be cosmetic (i.e., chemical treatment of the water), but rather should address the ultimate source of the problem and suggest measures which would be useful outside of the statutory boundaries of the park as well. The report should:

1. Estimate the effective surface area and total volume of the storage area
2. Evaluate various alternatives and determine which would be the most effective in reducing silt load, nutrient load, and salt load
3. Present recommendations for impoundment design including a detailed contour map showing normal water elevation and high water elevation
4. Develop a design for the impoundment to retain maximum amounts of water that would remain confined within the statutory boundaries of the park during normal periods
5. Recommend the acquisition of easements to store water during periods of high runoff
6. Document the effects of such an impoundment on the river and lake fisheries, including anticipated changes in water temperature
7. Document anticipated changes in water quality under a given set of circumstances, comparing present conditions to expected results
8. Analyze the effects of the impoundment on fish and wildlife. A conversion of habitat will result if the impoundment is constructed. Change in overall wildlife productivity needs to be measured as well as changes in species composition.
9. Estimate cost of the recommended alternatives

Note: This study should be coordinated with the dams/spillway study so that solutions are compatible and non-duplicative.

Priority: High Estimated Cost: $15,000

FISHERIES

Introduction

The primary goal for many fisheries management programs is to maintain the optimum natural fish population that a water body can support. This optimum is determined by such factors as water fertility, oxygen supply, food supply, and water temperature. Periodic fisheries surveys are conducted to determine species diversity and the size and condition of fish populations. Classification and site-specific management goals are based on the results of these surveys.

Inventory

The fisheries potential of Lake Bronson is somewhat limited by the fast water turnover rate associated with a large watershed feeding a small artificial reservoir. However, 30% of the lake surface contains submerged and/or emergent aquatic vegetation which provides habitat for substantial numbers of black bullhead, perch, white sucker, and other species. Channel catfish were probably a major indigenous species in the river before the lake was created.

Although the spawning potential is rated as poor for sport species, northern pike do utilize flooded grass fringe areas near the inlet.

Emergent Aquatic Plants

Species	Abundance
Bulrush	abundant
Cattail	common
Phragmites	occasional
Wild rice	rare

Extent: Occupy 10% of lake basin
Location: Shallow fringes of lake and inlet area

Submerged and Floating Aquatic Plants

Species	Abundance
Coontail	abundant
Elodea	abundant
Clasping leaf pondweed	common
Flatstem pondweed	common

Floatingleaf pondweed	common
Sago pondweed	common
Yellow waterlilly	common

Extent: Occupy 20% of lake basin
Location: Limited to shallow water (maximum 12 foot depth)
Habitat: Occur in dense mats

Fish Populations*

Species	Abundance
Black bullhead	30 times above state median
Perch	12 times above local median
White sucker	3 times above state median.
Rock bass	Slightly above state median
Pumpkinseed	Slightly above state median
Northern pike	Near average local median; varies with natural reproduction success
Walleye	Near average local median; dependent on stocking
Black crappie	Below average state median
Largemouth bass	Present in small areas
Channel catfish	Introduced but success unknown

* Based on test net catch frequency and compared with state median catch frequency 9/23/73.
NOTE: Bullheads and perch tend to overpopulate and have required concentrated removal efforts. Black crappie and rock bass are present in small numbers but are not expected to become important at any time.

Fish Size

Growth rates are average-size varies, dependent on dominant year class

Location

Although no localized concentrations of fish are known to exist, the best potential for concentrations probably occurs in and along edges of aquatic vegetation.

Spawning Area

Northern pike utilize the flooded grass fringe areas near the inlet. Black crappie, bass, bullheads, and others species spawn in shallow areas on a variety of bottom types.

Management

Objective:

To provide recreational fishing opportunities consistent with the biological potential of the lake

Introduction:

Present management practices emphasize controlling the water level to avoid excessive late winter drawdown which prevents fish kills or fish migration over the outlet dam. Channel catfish have been introduced in the past, but the success of the effort is not known. Walleye is stocked periodically.

Evaluation of the impoundment study results may suggest a change in the fishery management program.

- Specific Recommendations

A fisheries stocking program should be developed which reflects the needs of the public and which is consistent with the biological potential and carrying capacity of the lake. The area fisheries manager should consider which fish species are most desired by fishermen and direct management objectives toward satisfying those needs. In particular, special consideration should be given to stocking walleye and other game fish.

Techniques which will increase the natural carrying capacity and productivity of the habitat should be implemented. The area fisheries manager will be responsible for the stocking program and determining appropriate methods for habitat improvement.

Estimated Cost: Survey: $2,000
Stocking: $5,000

Source

Latvala, Howard. 1976. Fisheries input - Lake Bronson State Park management plan. Minnesota Department of Natural Resources.

SOILS

Introduction

Soil structure, type, and fertility play an important role in dictating what types of vegetation will be found in the park or which plant communities might logically be reintroduced to approximate those communities which exerted a dominant influence in the formation of that soil type. Soils data must also be considered when locating park roads, recreation buildings, intensive use areas (e.g., campgrounds and picnic areas), sewage lagoons, and septic tank filter fields. Consequently, the development of a park management plan depends heavily upon detailed soil surveys of a park. Through the use of such surveys, environmentally sound, resource management decisions can be made.

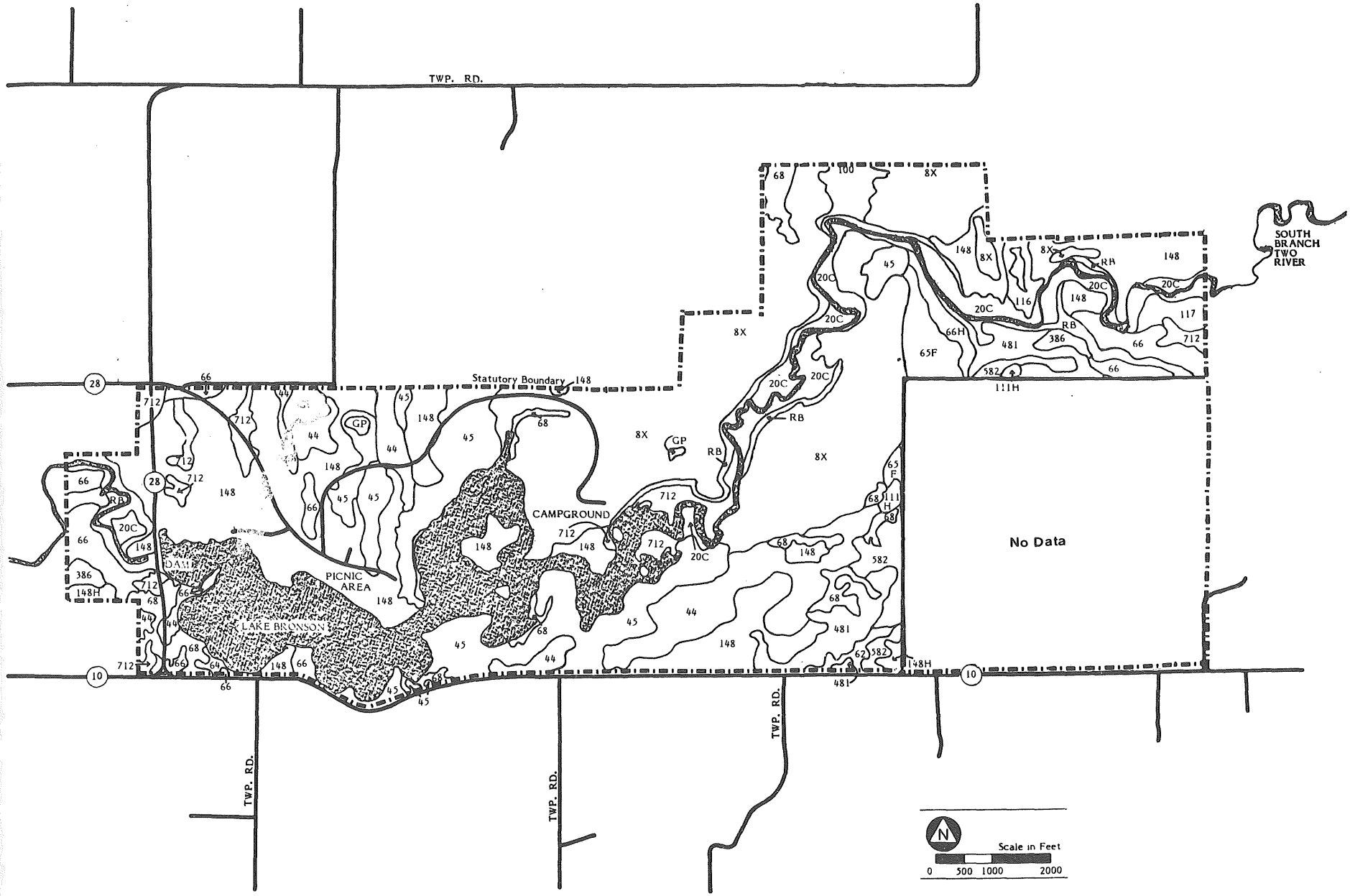
Inventory

The soil textures in Lake Bronson State Park are generally either sandy loams or loamy fine sands except for the alluvial soils associated with the South Branch/Two Rivers floodplain.

The majority of soil in the park, has formed in areas where the soil has blown around and formed a micro-relief of low dunes and hollows. These soils are subject to severe wind erosion. Thus it is vital that vegetation be promoted and maintained on these soils.

The hollow and dune lands have only slight limitations for use as recreational building sites, but certain use impacts are severe. If site deterioration because of fragile soils becomes a serious problem at the east campground, it may be necessary to relocate the campground to more suitable soils. Most of the other soils have generally moderate to severe limitation for all uses because of poor drainage, slope, or surface texture.

The table on page 46 lists the soils found in the park and the major characteristics of each. The map on page 44 shows the locations of each soil within the park.



See Soils Suitability/Characteristics Table, p. 46 for soil type code.

Chart Legend (Soils Suitability/Characteristics Table)

Slight - Limitations for a stated use are minor and can be overcome easily.

Moderate - Limitations for a stated use can be overcome by special planning, design, or maintenance.

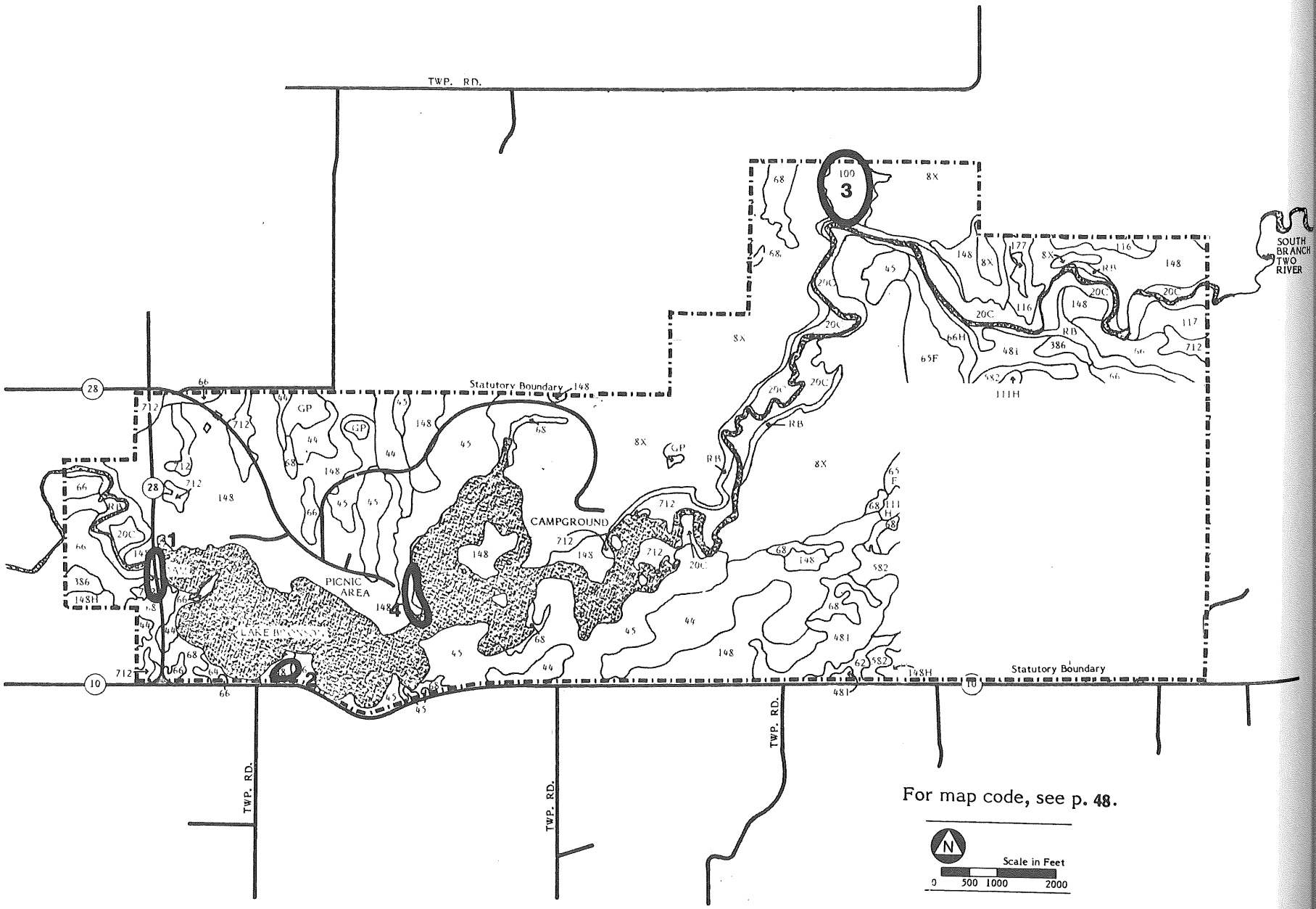
Severe - Limitations for a stated use generally require a major soil reclamation, special design, or intensive maintenance.

*Permeability measured in inches per hour
**Based on buildings with a basement or foundation

LIMITATIONS

[1]Slope
[2]Surface Texture
[3]Depth to Bedrock
[4]Flooding (Duration & Frequency)
[5]Pollution Potential
[6]Permeability
[7]Water Table
[8]Frost Action
[9]Drainage
[10]Shrink-Swell

Soil Type	Slope	Stability	Permeability*	Erodeability	Frost Heavage	Intensive		Paths and Trails	Recreation Buildings**	Sewage Lagoons	Septic Tank Filter Fields
						Picnic Areas	Camp Areas				
Alluvial	20C		Variable	Slight	Mod-High	Mod-Sev[2,4]	Mod-Sev[2,4]	Slt-Mod[4]	Sev[4,7]	Sev[4,6,7]	Sev[4,5,7]
Arveson	68, 61	No Data	2.0-20.0	Sev (wind)	Moderate	Sev[9]	Sev[9]	Severe[9]	Sev[7,9]	Sev[6,7]	Sev[6,7]
Pelan	65F	0-6	0.6-20.0	Slight	Moderate	Slight	Slight	Slight	Mod[7,8]	Mod[6,7]	Mod[6,7]
Poppleton	148, 66	No Data	6-20	Sev (wind)	Low	Mod[2,9]	Mod[2,9]	Moderate[9]	Slt-Mod[7,9]	Sev[6,7]	Mod[5,7]
Cormont	68, 117 712	No Data	2.0-6.0+	No Data	High	Severe[9]	Severe[9]	Severe[9]	Sev[6,7]	Severe[6]	Sev[7,9]
Maddock	45	0-9	6.0-20.0	Mod (wind)	Low	None-Mod[1,2]	None-Mod[1,2]	None-Mod[1,2]	Slt-Mod[1]	Severe[6]	Slt-Mod[1,5]
Blownout land	8X	No Data	6+	Sev (wind)	Low	Severe[2]	Severe[2]	Severe[2]	Slight[6]	Sev[1,6]	Slight[1,5,6]
Breaks & Alluvial Land	Rb, 20C	No Data	No Data	Moderate	Variable	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]
Deerwood	547	No Data	0.6-20.0	Sev (wind)	Moderate	Ver Sev[2,9]	Ver Sev[2,9]	Ver Sev[7,9]	Ver Sev[7,9]	Ver Sev[5,6,7,9]	Ver Sev[5,6,7,9]
Dune Land	100	6-60	6+	Sev (wind)	Low	Sev[1,2]	Sev[1,2]	Sev[1,2]	Slight	Sev[1,6]	Sev[1,5,6]
Enstrom	148H	No Data	0.6-6.0+	Moderate	No Data	Moderate[2]	Moderate[2]	Moderate[2]	No Data	Moderate[2]	Slt-Mod
Foldahl	386	0-6	0.2-2.0	No Data	Slt-Mod	Slight	Slight	Slight	Mod[7,8]	Sev[1,6,7]	Sev[7]
Grygla	481	No Data	0.6-20.0	Sev (wind)	High	No Data	No Data	No Data	Sev[7,8,9]	Severe[6]	Sev[5,6,7,9]
Hangaard	111	No Data	2.0-6.0+	No Data	Moderate	Severe[9]	Severe[9]	Severe[9]	No Data	Severe[6]	Sev[5,7,9]
Percy	62, 582	No Data	0.06-6.0	Sev (wind)	High	Severe[9]	Severe[9]	Severe[9]	Sev[7,8,9]	Sev[6,7]	Severe[7]
Redby	116	No Data	6.0+	No Data	Slight	Moderate[2]	Moderate[2]	Moderate[2]	No Data	Severe[6]	Mod[5,6,7,9]
Strandquist	111H	No Data	0.6-20.0+	No Data	Severe	Severe[9]	Severe[9]	Severe[9]	Sev[7,8,9]	Sev[6,7]	Sev[6,7]
Ulen	64	0-6	6.0-20.0	Sev (wind)	Low	Mod[2,9]	Mod[2,9]	Mod[2,9]	Slt-Mod[7,9]	Sev[6,7]	Mod[5,7]



For map code, see p. 48.

Management

Objective:

To stabilize eroding river banks and the sand dunes area

- Specific Recommendations

The soils of the area are generally susceptible to wind erosion. Also, vegetation is easily disturbed or killed by heavy use.

To prevent wind erosion, bare topsoil should not be exposed. Where it is necessary to bring trails over or near banks, appropriate trail design measures should be incorporated to keep hikers on the paths. Trails should be surfaced with Class V road mix to provide a hard, relatively non-erodable treadway.

Site 1 (Map, page **47**) - During times of high water, the dam cribbing on the downstream side of the dam is eroded. Rocks as large as two feet in diameter are dislodged by the raging torrents. Gabbion baskets (wire mesh filled with rocks) should be used to stabilize the eroding sites.

Estimated Cost: $2,000

Site 2 (Map, page **47**) - The steep hillside near the pioneer cemetery is being eroded by wave action from the lake. Failure to stabilize the bank will result in exposure of the old graves. Use of appropriate stabilizing techniques, materials, and vegetation is recommended.

Estimated Cost: $4,000

Site 3 (Map, page **47**) - Historically, natural forces have periodically disrupted the sand dunes area however, the dunes have become relatively stable over recent years. More recently, their stability has been threatened by motorcycles which may destroy the fragile banks and the creeping juniper beds. If this abuse cannot be curtailed it will be necessary to protect the area with a strong fence until stabilizing vegetation becomes reestablished.

Estimated Cost: See Vegetation Management Section (page **61**).

Site 4 (Map, page **47**) - The river bank is gradually eroding in this general area. Specific problem points and sources need to be identified. At points where a particular overuse is a problem, banks should be stabilized by using appropriate stabilization techniques and plant materials.

Estimated Cost: $4,000

VEGETATION

Introduction

One of the most striking features of any park is its vegetation. To rapidly inventory the vegetation of the park, a system was devised which would not only categorize vegetation, but would also recognize species of wildlife normally associated with these plant communities. The system used to describe vegetation/wildlife associations is called the "Ecological Community System." In designing the system, several factors were considered. These factors include: existing land use patterns, soil wetness, plant species composition, physical appearance, and wildlife habitats commonly found in Minnesota. A process was also needed which would permit a relatively high degree of reliability using 9x9 inch stereoscopic aerial photograph pairs as the primary source of information. Detailed field work was not emphasized for this phase of the inventory because it would be too time consuming to do the larger units. The developed system generally satisfies the stated requirements. The various ecological communities identified in the inventory process are described in Appendix A.*

The vegetation in each specific park will include only certain ecological communities depending on where that park is located in the state.

Original Vegetation

The original vegetation in the Lake Bronson State Park area was predominantly fire-maintained dry prairie, except along the river bottom. The upland vegetation has changed considerably since the advent of fire suppression activities early in the twentieth century.

Presently Existing Ecological Communities

There are 13 ecological communities in Lake Bronson State Park. The brush understory associated with various upland communities provides an additional habitat type.

The predominant ecological communities of Lake Bronson State Park are old fields, agricultural fields, bottomlands, and pioneer hardwoods. Other less extensive communities are brush, marsh, open woods, alder-willow, wooded pasture, dry prairie, meadow, lakes, streams and rivers. The various ecological communities are shown on the map, page **53.** General descriptions of the various ecological communities appear in Appendix A.

Further detailed ground cover data are needed to accurately ascertain the general successional patterns of the communities. At the same time, the accuracy of the ecological community map should be field checked and modified accordingly. The Ecological Community Structural System is explained in Appendix C.

* See note below Table of Contents on page ii for information regarding the availability of the technical appendices which have been printed under separate cover.

Major Ecological Communities

Old Fields - These plant communities are former agricultural fields which have been abandoned either because of acquisition proceedings by the state or because the land is marginally productive. Grasses and herbs are the predominant cover, although scattered trees and brush may occur.

Dominant Ground Cover

Blue grass
Timothy
White Sweet Clover
Canada Golden rod

Left unmanaged except for fire suppression, old field communities will eventually be invaded by aspen-oak and become forested. This aspen-oak community will likely convert to brush and then persist for some time.

Agricultural Fields - Agricultural fields within the park are generally in production. Once acquisition is completed, these fields will be converted to ecological communities more compatible with park management objectives. Left unmanaged, these fields would follow the old field succession process described above.

Bottomlands - Bottomland communities occur along the river valley floodplain. These communities are probably unchanged from those that occurred during the presettlement era. Left without any management, these communities may persist indefinitely. Dutch elm disease does not appear to be a serious problem at present.

Dominant Tree Species

Elm

Dominant Shrub Species

Alder
Willow

Pioneer Hardwoods - Different growth stages of pioneer hardwoods are present in Lake Bronson State Park. These pioneer species invade newly cleared areas, abandoned fields, or burned areas. These plants are generally shade intolerant and thrive only in open areas where there is direct sunlight.

Pioneer species are relatively short lived and are usually replaced by species which are shade tolerant. Prairie fire suppression permitted the growth of aspen. These species were always present on the prairie transitional fringes, but were suppressed by continual grass fires.

Continued exclusion of fire will favor these pioneer communities. Brush density may increase somewhat as the pioneer species mature and die.

Dominant Tree Species:

Trembling Aspen
Oak

Toxic Plants

Poison ivy is common throughout the park.

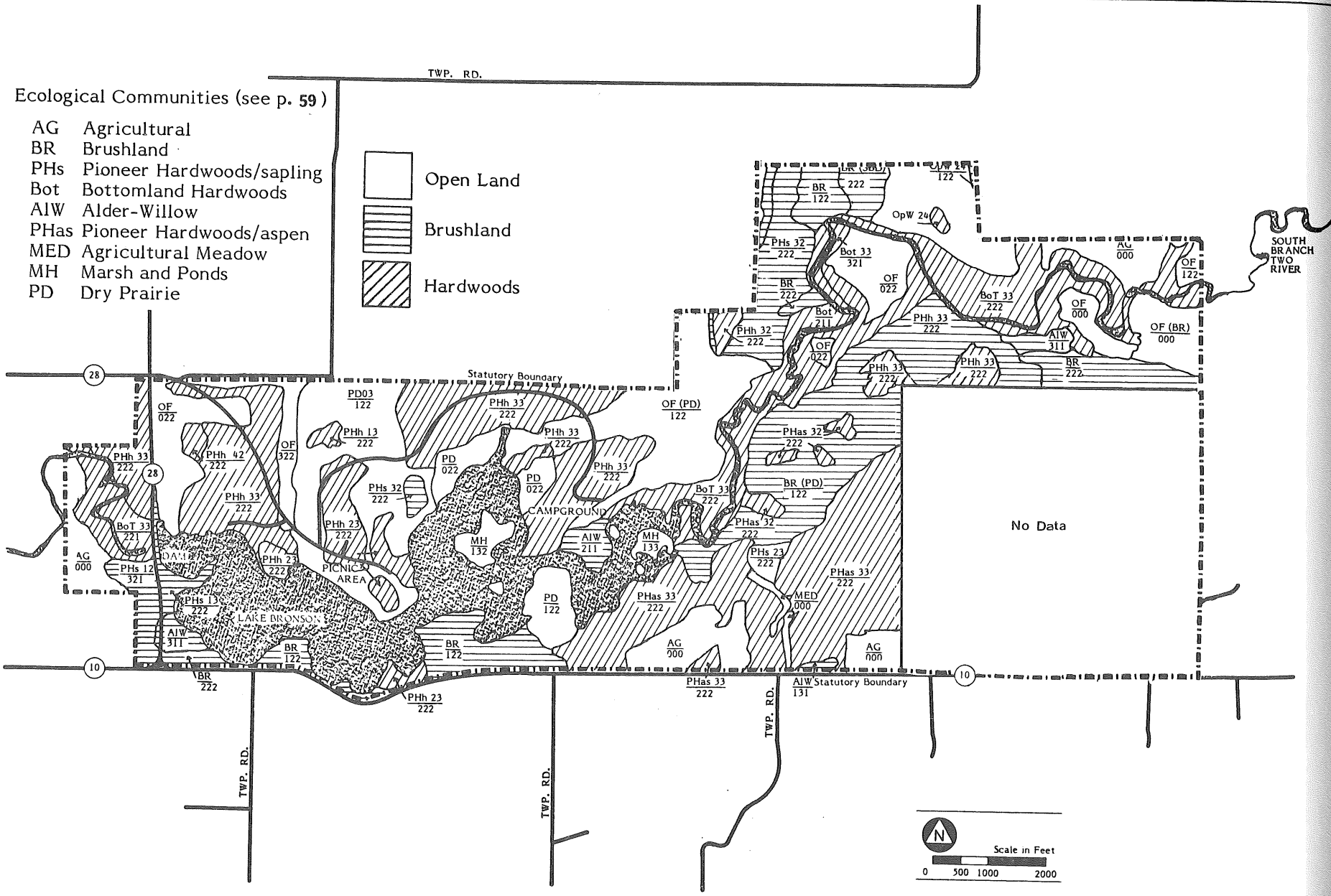
Rare, Endangered, or Unusual Species or Communities

In some areas of the park, especially the sand dunes area, (Map, page 54), horizontal or creeping juniper is found. This form is suspected to be a specialized growth form of northern red cedar found in the unglaciated area in southeastern Minnesota and also on stabilized sand dunes on Glacial Lake Agassiz beach ridges. Creeping juniper do not compete well with other plants which prevent their invasion of the deep glacial soils. They are also easily destroyed by fire. They are not tolerant of uses which would disturb the soil and cause wind erosion.

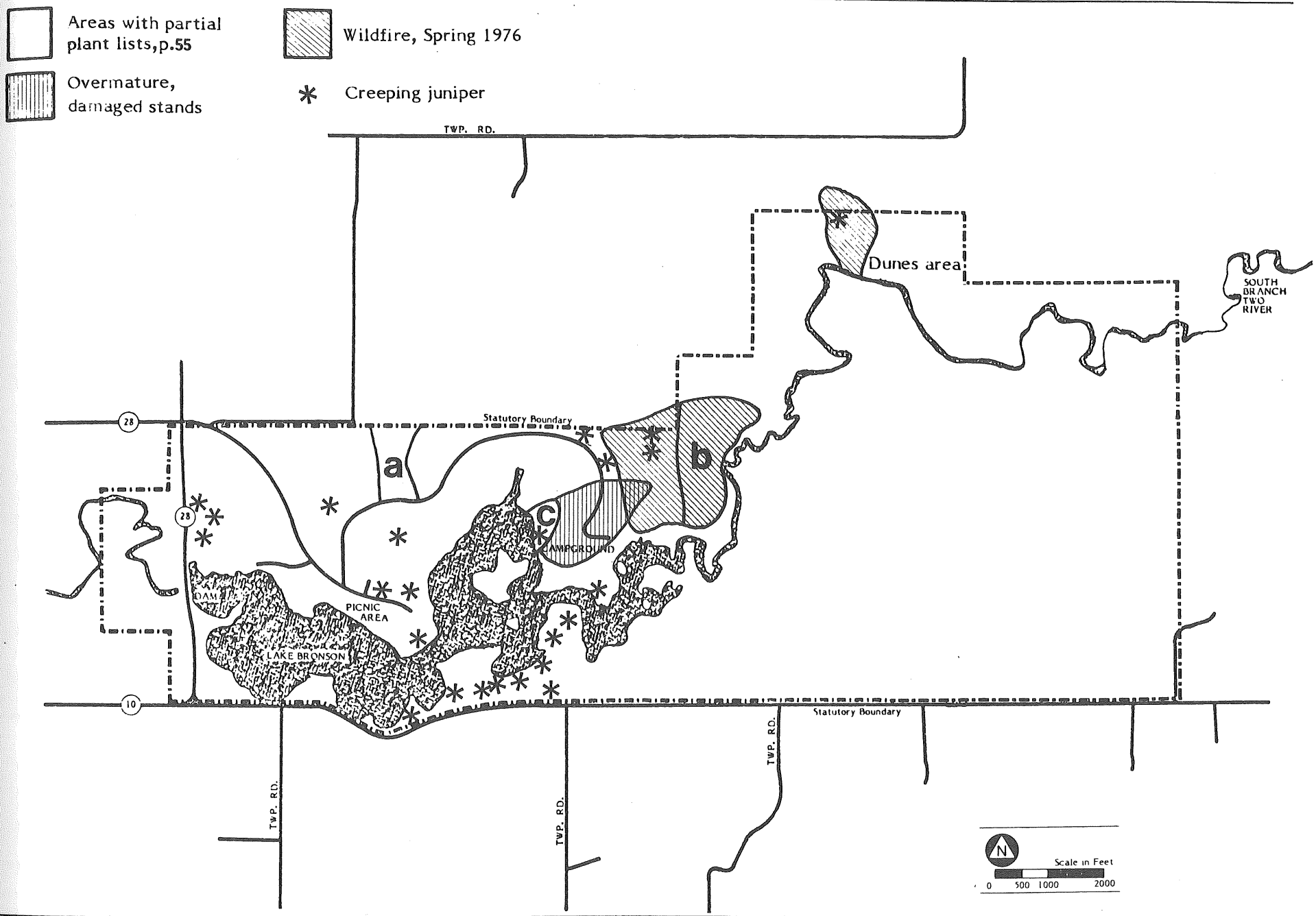
Sensitivity to Intensive Use

Because of the inherent characteristics of both the upland and bottomland soils and the associated vegetation types, intensive use can damage both soil suitability and vegetation. The stand of trees in the campground area has been damaged by intensive use primarily because of soil structure and the shallow-rooted characteristics of the tree species. The affected area is indicated on the map on page 54.

Development zones must be carefully selected to avoid overuse of such sensitive areas.



Code in parenthesis indicates the ecological community which will most likely replace the existing one barring fire or wind damage.


Areas with partial plant lists, p.55
Wildfire, Spring 1976
Overmature, damaged stands
Creeping juniper
TWP. RD.
Dunes area
SOUTH BRANCH TWO RIVER
Statutory Boundary
a
b
c
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
28
10
TWP. RD.
TWP. RD.
TWP. RD.
Statutory Boundary
N
Scale in Feet
0 500 1000 2000

Species Inventory

The areas indicated by the letters A, B, and C on the Areas of Special Considerations Map, p. 54 have been partially inventoried by the park naturalist.

Area A

Galium boreal - Northern bed straw
Rosa sp. - Wild prairie rose
Cerastium avense - Prairie chickweed
Potentilla arguta - Tall cinquefoil
Chrysopsis villosa - Golden aster
Melilotus alba - White sweet clover
Solidago candensis - Canada goldenrod
Poa pratensis - Kentucky bluegrass
Artemisia sp. - Sage
Phleum pratense - Timothy
Populus tremuloides - Quaking aspen

Area B

Rosa sp. - Wild prairie rose
Poa pratensis - Kentucky bluegrass
Rumex sp. - Dock
Amorpha canescens - Lead plant
Petalostemum purpureum - Purple prairie clover
Galium boreal - Northern bedstraw
Prunus pumila - Sand cherry
Campanula rotundifolia - Harebell
Andropogon scoparius - Little bluestem
Andropogon furcatus - Big bluestem
Artemisia sp. - Sage
Solidago rigida - Stiff goldenrod
Arctostaphylos uva-ursi - Evergreen bearberry
Symphoricarpus occidentalis - Wolfberry
Chrysopsis villosa - Golden astor
Juniperus horizontalis - Creeping juniper
Allium stellatum - Wild onion
Liatris ligulistylis - Blazing star
Panicum sp. - Panicle grass
Salix humilis var. microphylla - Dwarf prairie willow

Area B

Rumex sp. - Dock
Solidago missouriensis - Missouri goldenrod
Equistem kansanum - Horsetail
Lygodesmia juncea - Skeleton weed
Symphoricarpus accidentalis - Wolfberry
Artemisia frigida - Prairie rose
Rosa sp. - Wild prairie rose
Arctostaphylos uva-ursi - Evergreen bearberry
Allium stellatum - Wild onion
Amorpha canescens - Lead plant
Prunus pumila - Sandcherry
Campanula rotundifoia - Hareberry
Cerstium arvense - Prairie chickweed
Juniperus horizontalis - Creeping juniper
Selaginella densa - Bulb moss
Petalostemum purpureum - Purple prairie clover
Archillea millifolium - Common yarrow
Prunus virginiana - Choke cherry
Chrysopsis villosa - Golden aster

Fire/Vegetation Relationships

Fire burned the areas indicated on the map, p. **54** in the spring of 1976. Unfortunately, it happened too early to eradicate exotic grasses thereby promoting the growth of native prairie species. The effects of the fire on the creeping juniper has not been determined. An inspection of the areas on May 20, 1976 revealed that it is likely the juniper will regenerate, but the time required for regeneration is unknown.

Management

Objectives:

To restore the prairie-aspen-oak brushland mixture which characterized the area at the time of settlement by Europeans

To maintain a variety of successional stages to perpetuate this prairie-aspen-oak mosaic

To promote and enhance wildlife diversity

To eliminate the use of herbicides in the park

- Specific Recommendations

Management practices and programs listed on pages **61-69** will need to be implemented by park personnel or volunteer help. To provide plant community diversity for wildlife and for the enjoyment for park visitors, it is essential that the management practices and timetable are followed.

Note: Aspen, harvested in the park for management purposes, may be sold to offset costs, provided that a market for aspen fiber develops.

The table, page 61 and map, page 58, show specific ecological community management units and recommendations. The phasing recommendations should be closely followed.

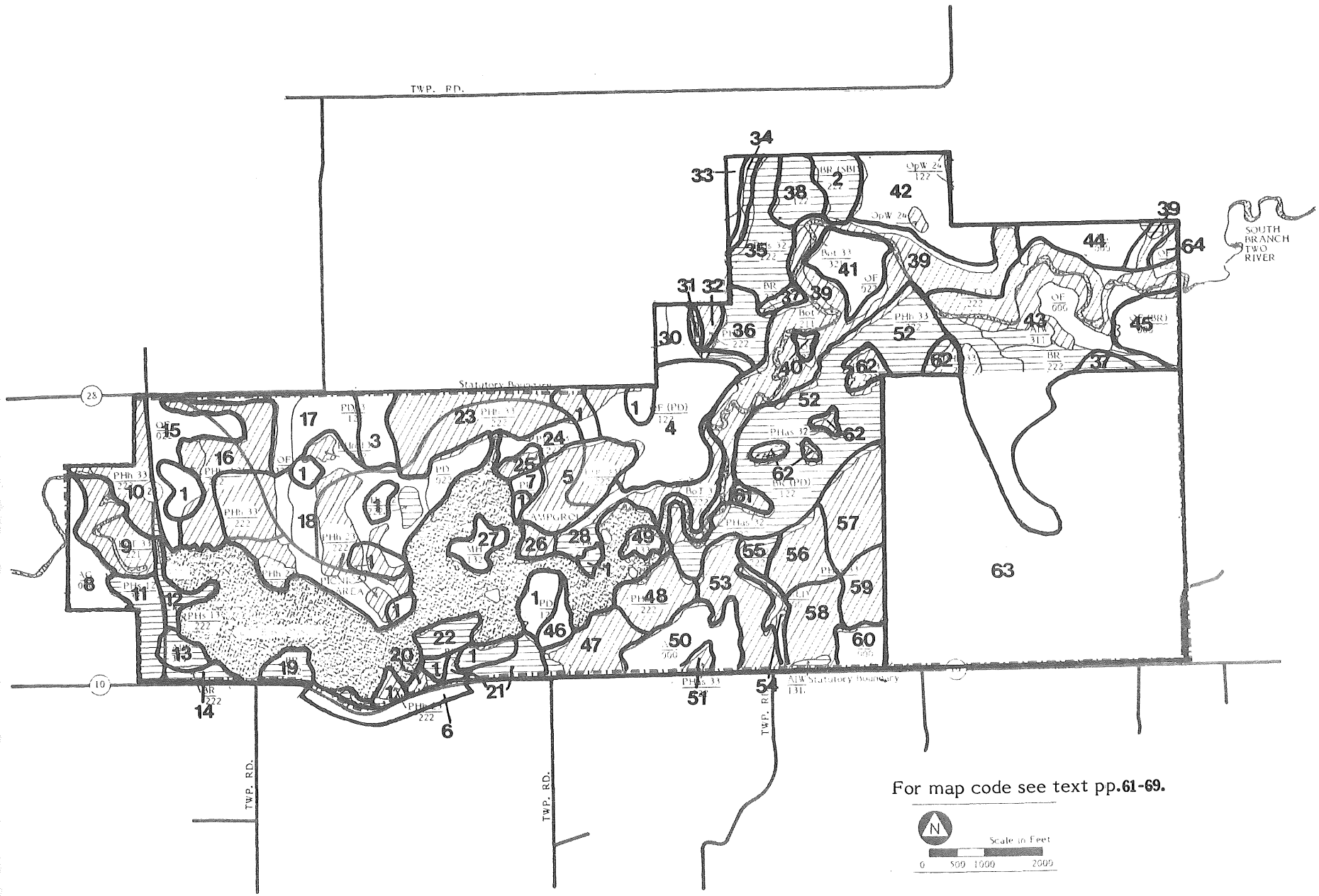
Leafy spurge is a problem generally in the NW quarter of Section 34 and is being controlled through the use of herbicides. It is recommended that alternative control measures be sought out immediately since herbicide application also destroys certain desirable prairie species. Sources of information for developing alternative control measures include: plant ecologists, plant pathologists, botanists, agronomists, and horticulturalists.

Prairie restoration has been recommended for several old fields. Prairie sod may be taken from the proposed highway right-of-way reconstruction zone. Specific locations are indicated on diagrams in the appendix. Prior to highway construction, sod blocks should be lifted and moved to prepared locations within the park. These sod blocks will provide a source of prairie plants which should spread into the surrounding area. These blocks, approximately 100 square feet each, may be placed at 500-foot intervals throughout the prairie restoration units. Each unit should have at least one source plot. Additional plots may be added as personnel, time, and materials permit. Frequent watering is recommended until the transplanted materials have had the opportunity to reestablish sound root systems.

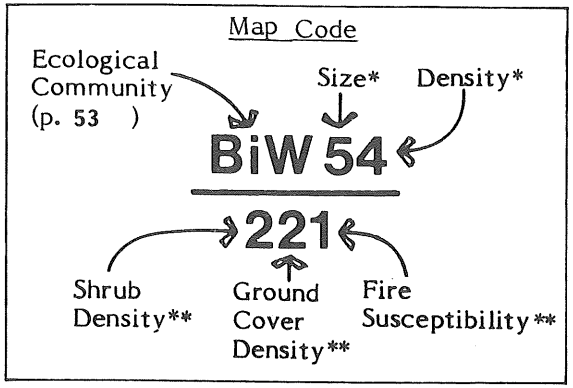
Sources

Marschner, F. J., 1930. The original vegetation of Minnesota. North Central Forest Experiment Station Map.

Curtis, J. T., 1959. The vegetation of Wisconsin. The University of Wisconsin Press.



For map code see text pp.61-69.



* See table below.

** See p. 60 .

Overstory Size and Density Code

	Size				
	1	2	3	4	5
Density	Seedlings (0-1"dbh) Trees/Acre	Saplings (1"-5" dbh) Trees/Acre	Poles (5"-9" dbh) Trees/Acre	Small Saw Timber (9"-15" dbh) Trees/Acre	Large Saw Timber (15"+ dbh) Trees/Acre
0	*	*	0-30	0-19	9-5
1	0-500	0-250	31-90	11-40	6-20
2	501-1,000	251-500	91-150	41-60	21-30
3	1,001-2,000	501-1,000	151-210	61-80	31-45
4	2,001-5,000	1,001-2,500	211-270	81-100	46-60
5	5,001-10,000	2,501-5,000	271-330	101-130	61-75
6	10,001-20,000	5,001-10,000	331-390	131-150	76-90
7	20,001-30,000	10,001-15,000	391-450	151-180	91-105
8	**	**	451-510	181-200	**
9	**	**	511+	201+	**

* dbh - diameter/breast height

** Not a valid density code for these size classes

Shrub Density

0. None: Brush layer absent, may have been removed by artificial means.

1. Light: High visibility within stand even when leaves are out; no difficulty encountered in walking through stand.

2. Moderate: Some visual obstruction by small to large brush pockets. Walking may be hindered to some degree by brush.

3. Heavy: Visual obstruction severe, visibility limited to less than 100', walking is extremely difficult.

Ground Cover Density (Plant material less than 3' tall.)

0. None: Litter layer absent, native ground cover absent or heavily disturbed by use.

1. Light: Litter layer readily visible, low-growing plants widely scattered or in small clusters.

2. Moderate: Litter layer somewhat obscured by low-growing plants; occasional extensive areas without plants may occur.

3. Heavy: Litter layer obscured by low-growing plants.

Fire Susceptibility (Ease with which the plant community can carry a fire during the normal seasonal fire period.)

0. None: Fuel is sparse or absent.

1. Low: Adequate fuel to carry a fire is present in scattered patches.

2. Moderate: Fuel is present in sufficient amounts to carry a fire some distance.

3. High: Large accumulations of fuel. Potential for extensive, damaging fire is great.

Specific Management Programs

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
1	Creeping Juniper	Fire Protection	When conducting prescribed burns in the area of these beds, precautionary measures should be taken to exclude fire from the beds. Intensive use should not be encouraged in the immediate area where the beds are located, however, it does appear that these plants will tolerate a certain amount of dispersed use.	78-79 80-81 82-83 84-85 86-78	$1,000 1,000 1,000 1,000 1,000
2	Sand Dunes	Educational Programs/ Fencing	Established vegetation is presently being destroyed by illegal motorcycling actitities. A fire during the spring of 1976 also destroyed many of the creeping juniper plants in the area. An intensive local education effort should be initiated through local media by the regional naturalist to inform local citizens about the value and uniqueness of the creeping juniper. If education and enforcement does not discourage motorcycling, then a fence will be necessary to allow stabilization of the vegetation.	80-81	$10,000
3	Dry Prairie	Prairie Restoration	Implement Recommendation 6, p. 75.* The area should preferably be burned prior to implementing restoration. Thereafter, a routine burning program conducted at 3-5 year intervals should be sufficient to reduce litter accumulation and eliminate competition from undesirable species. Source material may be obtained from Unit 6.	78-79 82-83 86-87	$1,400 700 500

* Vegetation Management Recommendations 1 - 7 are found on pp. 70 -77.

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
4	Dry Prairie	Prairie Restoration	Implement Recommendation 6. Obtain source material from Unit 6. A series of 2 or 3 repetitive hot burns at this location would eliminate undesirable encroaching brush and permit management of the entire block as prairie. A fire during the spring of 1976 killed much of the brush in the unit, but without repetitive burning, it will quickly resprout.	78-79 82-83 86-87	$2,000 1,500 700
5	Campground Area	Sanitation Cut	The condition of many of the trees is poor because of soil compaction associated with campground use. Trees which are dead or dying should be removed for the protection of park visitors. Replacement of plant materials should satisfy the following criteria: a) be able to withstand dry conditions, soil compaction, and intensive use; b) must grow rapidly to provide shade quickly as other trees are lost; c) may be an exotic species, but must not compete or hybridize with native species.	78-79 80-81 82-83 84-85 86-87	$2,000 2,000 3,500 2,000 4,000
6	Highway Right-of-Way, Dry Prairie	Salvage	Salvage plant materials in this area for transplanting in Units 3, 4, and 7.		
7	Dry Prairie	Prairie Restoration	Implement Recommendation 6. Obtain source material from Unit 6. Manage in a similar fashion to Unit 3 in conjunction with Unit 4. Protect creeping juniper from fire while conducting prescribed burns.	78-79 82-83 86-87	$2,600 1,800 500

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
8	Agricultural Land	Prairie Restoration	Begin prairie restoration using appropriate techniques when property is acquired. Implement Recommendation 7.		
9	Bottomland Hardwoods	Maintain	Permit species to mature to provide habitat for cavity nesting species.		
10	Pioneer Hardwoods	Maintain	No management recommended during next 10 years, except fire suppression.		
11	Pioneer Hardwoods	Maintain	No management recommended during next 10 years, except fire suppression.		
12	Pioneer Hardwoods	Maintain	Allow stand to mature.		
13	Alder-Willow	Maintain	Suppress wildfires.		
14	Brush	Maintain	Suppress wildfires.		
15	Old Field	Oak Savanna Restoration	Implement Recommendation 7 to restore prairie conditions. After a prairie has been established, the tract should be burned and either oak seedlings should be planted, or acorns should be gathered and randomly scattered throughout the unit. The unit should be burned annually 2 or 3 times after seedlings are established to develop a strong root system. Then suppress fires and burn only to control undesirable brush encroachment.	84-85	$6,000

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
16	Pioneer Hardwoods	Timber Removal	Clearcut unit and remove salvageable material. Remaining slash should be removed by prescribed burning to allow hardwood regeneration. Buffer strips should be left along the entrance road to soften the view of the cut. Five years after the major cut, the buffer strips should be cut.	86-87	$6,000
17	Dry Prairie/ Old Field	School Wildlife Management Demonstration Plot	Various species of conifers, hardwoods, and shrubs should be planted here. Students will have an opportunity to identify various species of conifers not common to the area. Also, "backyard" wildlife habitat management plots may be developed to show students how they can attract and manage small plots of land for non-game wildlife. Shrub species should be planted for wildlife food and cover. Implement Recommendations 1, 3, and 4.	78-79 82-83 86-87	$2,000 2,000 2,000
18	Development Area	Sanitation Cut	Periodically remove dead and dying trees from high-use areas to protect the public. Replace trees with species tolerant of heavy use and dry conditions which will not hybridize or compete with existing vegetation. Utilize appropriate plant materials for campsite screening. Non-use areas should be clearcut at 40-60 year intervals. Cut separate blocks at approximately 10-year intervals to avoid removing all vegetation simultaneously. Areas with creeping juniper should not be intensively used. These areas may, however, tolerate low level use.	78-79 80-81 82-83 84-85 86-87	$3,000 3,000 4,500 1,000 4,000

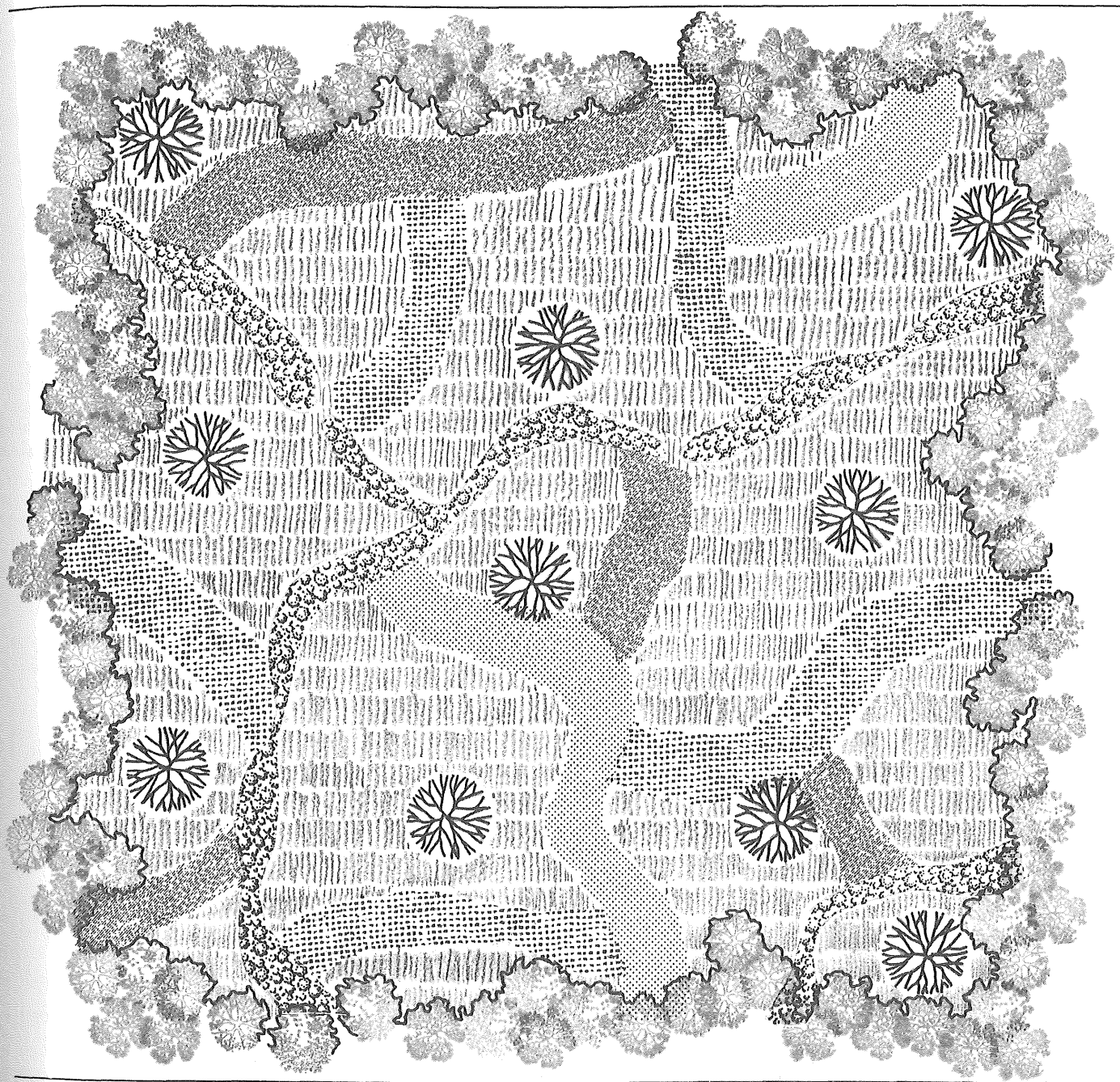
Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
19	Historic Site	Maintain	The pioneer cemetery is located here and artifacts have been found in this area, therefore wildfires should be suppressed.		
20	Brush	Opening Maintenance	Implement Recommendations 1 and 4	78-79	$500
21	Brush	Opening Maintenance	Implement Recommendations 3 and 4.	78-79	$500
22	Development Zone	Maintain	Adequate tree cover should be maintained to provide shade and shrubs for visual diversity and wildlife.		
23	Pioneer Hardwoods	Maintain	Wildfires should be suppressed. Evaluate status in 10 years.		
24	Old Field	Oak Savanna Restoration	This area should be managed in conjunction with Units 4 and 7. Oak savanna restoration should begin in 1985. Implement Recommendation 6.	78-79	$4,000
25	Pioneer Hardwoods	Maintain	Suppress wildfires. Evaluate in 20 years.		
26	Pioneer Hardwoods	Maintain	Suppress wildfires. Evaluate every 5 years to assess effects of campground use.		
27	Island Marsh	Maintain	Allow natural succession to proceed.		
28	Alder-Willow Bottomland Hardwoods	Maintain	Allow natural succession to proceed.		
29	Agricultural Land	This area was deleted from the statutory boundary in 1977.			

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
30	Old Field	Oak Savanna Restoration	Manage in conjunction with Units 4 and 7. Begin oak savanna restoration in 1985. Implement Recommendation 6.	When acquired	
31	Brush	Maintain	Suppress wildfires.		
32	Pioneer Hardwoods	Maintain	Evaluate stand in 10 years.		
33	Agricultural Land/Old Field	Opening Maintenance	Implement Recommendation 4 along park boundary. Permit brush species to encroach into old field.	78-79	$500
34	Brush	Maintain	Suppress wildfires.		
35	Pioneer Hardwoods	Maintain	Suppress wildfires and evaluate the stand in 15 years.		
36	Pioneer Hardwoods	Maintain	Evaluate for possible clearcut in 10 years.		
37	Brush	Maintain	Suppress wildfires.		
38	Brush	Oak Savanna Restoration	Burn annually until brush is suppressed. Either allow oak to regenerate naturally or artificially hand plant to begin stand. Implement Recommendation 7.	84-85	$8,500
39	Bottomland Hardwoods	Maintain	Allow stand to mature and provide habitat for cavity nesting species.		
40	Old Field	Maintain	Allow natural succession to proceed.		
41	Old Field	Maintain	Allow natural succession to proceed.		
42	Agricultural Land	Oak Savanna Restoration	Implement Recommendation 7. Hand or machine plant acorns or oak seedlings to begin oak regeneration process.	When acquired	

Management Unit Number	Ecological Community	Management Practice	Specific Recommendation	Biennium	Estimated Cost
43	Various	Wetland Impoundment	A dam should be constructed according to recommendations in the water resources management section. Water levels should be periodically drawn down to permit dredging of accumulated silt. Drawdown will also set back wetland plant succession and improve habitat for waterfowl and other species. The drawdown interval should be 7-10 years and the pond should remain dry for 1 year.	When acquired	
44	Agricultural Land	Opening Maintenance	Implement Recommendation 4 along park boundary. Allow natural regeneration to revegetate the remainder of the field. If the opportunity presents itself within 5 years, work the land with a disc while the aspen trees are shedding viable seed. Appropriate timing is necessary so that the aspen seed falls on bare moist ground. These conditions are necessary for proper germination of the seed as it is viable for only a few days.	80-81	$500
45	Old Field	Opening Maintenance	Implement Recommendations 1, 3, and 4. Use Recommendation 4 along park boundary fence.	80-81	$1,500
46	Dry Prairie	Opening Maintenance	The area should be periocically burned to reduce litter and eliminate brush. Also, the adjacent creeping juniper bed should be protected.	78-79	$300
47	Pioneer Hardwood	Timber Removal	Clearcut in 10 years. Allow natural regeneration to take place. Burn after cutting to eliminate slash and prepare site.	86-87	$4,000
48	Pioneer Hardwood	Timber Removal	Clearcut in 20 years. Treat in same manner as Unit 47.		

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
49	Marsh	Maintain	Allow natural succession to proceed		
50	Agricultural Land	Oak Savanna Restoration	Implement Recommendation 7. Regenerate oak by transplanting seedlings or preparing site by burning and then scattering acorns throughout area. Then burn newly established prairie as necessary to eliminate brush.	80-81	$4,500
51	Pioneer Hardwoods	Maintain	Evaluate the stand condition in 20 years.		
52	Brush/Pioneer Hardwood	Burn	Manage to maintain brush/prairie mosaic by a program of prescribed burning. Encourage oak regeneration. Control leafy spurge as necessary and with techniques which will not eliminate native prairie plants.	80-81	$3,000
53	Pioneer Hardwoods	Timber Removal	Clearcut in 15 years. Burn to remove slash. Allow natural regeneration to take place.		
54	Meadow	Opening Maintenance	Implement Recommendation 1.	80-81	$1,000
55	Pioneer Hardwood	Maintain	Allow stand to mature. Evaluate condition for 20 years. Suppress wildfires.		
56	Pioneer Hardwoods	Timber Removal	Implement Recommendation 2 in 5 years. Maintain a 5-year cutting cycle for the first rotation. Cut in 10-acre blocks.	82-83	$2,000
57	Pioneer Hardwoods	Timber Removal	Implement Recommendation 2 in 10 years. Maintain 5-year cutting interval for first rotation. Cut in 10-acre blocks.	86-87	$2,500

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Biennium	Estimated Cost
58	Pioneer Hardwoods	Timber Removal	Implement Recommendation 2 in 15 years. Maintain 5-year cutting interval for first rotation. Cut in 10-acre blocks.		
59	Pioneer Hardwoods	Timber Removal	Implement Recommendation 2 in 20 years. Maintain 5-year cutting interval for first rotation. Cut in 10-acre blocks.		
60	Agricultural Land	Oak Savanna Restoration	Implement Recommendation 7. Burn newly established prairie as necessary to eliminate brush competition. Regenerate oak after the prairie is established by transplanting seedlings or by scattering acorns by hand after a burn.	80-81	$3,300
61	Pioneer Hardwoods	Maintain	Exclude fire during prescribed burn in Unit 52. Evaluate stand condition in 10 years.		
62	Pioneer Hardwoods	Burn	Allow units to burn at the same time time Unit 52 is burned.	80-81	$1,500
63	Various	Expansion	Evaluate vegetation communities and update resource maps. Prepare management recommendations consistent with objectives of the park.	78-79	Included in Contingency Fund, See budget, p.96
64	Old Field	Maintain	Allow natural succession to proceed. Suppress wildlife. Suppress wildfires.		



RECOMMENDATION #1

Annually burn or mow 15' wide meandered strips through field in late April to improve hunting conditions for raptors. Burn entire area every seven years.

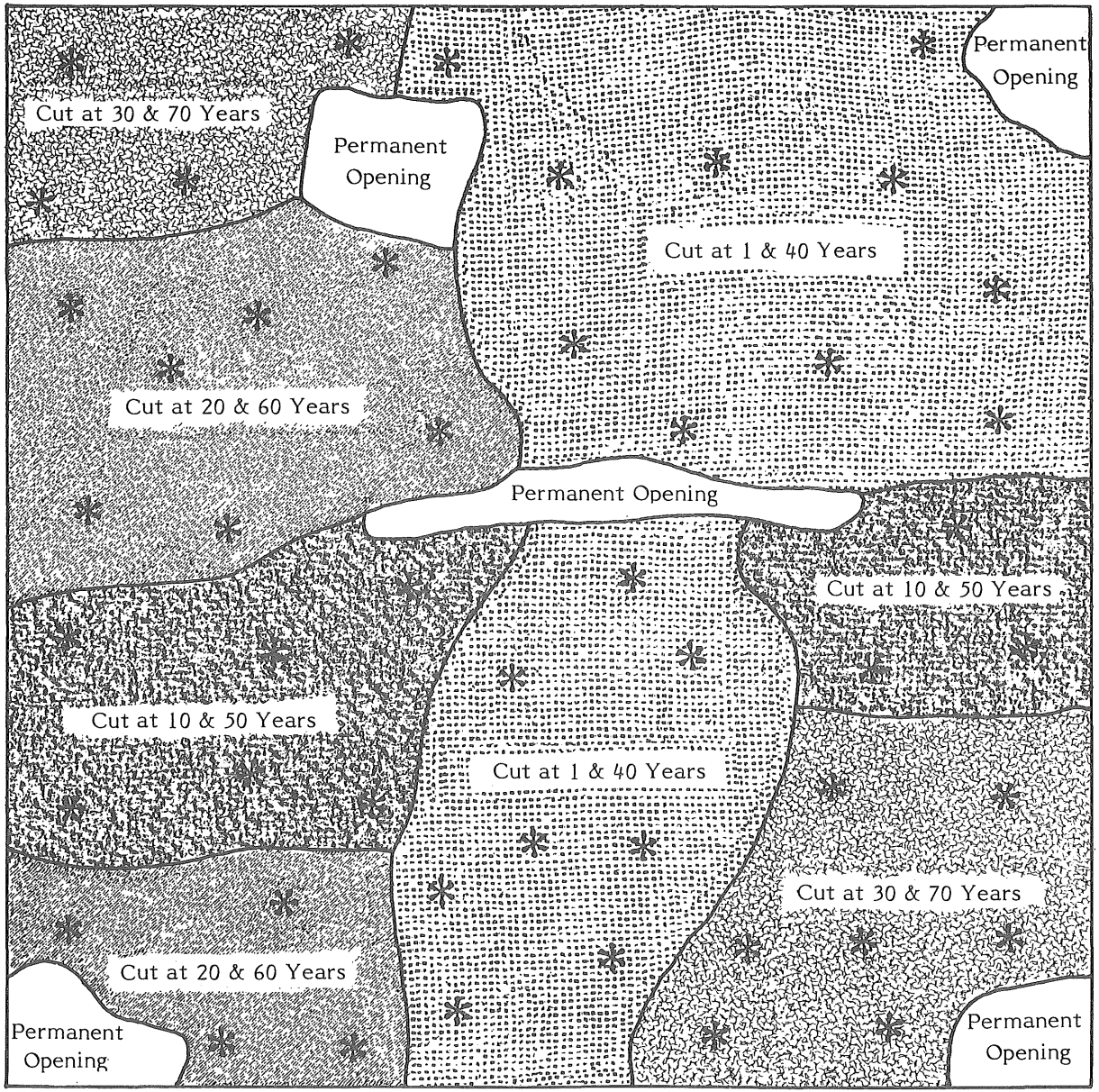
CUT /BURN IN YEAR ONE

CUT/BURN IN YEAR THREE

CUT/BURN IN YEAR FIVE

BRUSH TRAVEL LANE

EXISTING DEAD OR GIRDLED TREES LEFT AS PERCHES



RECOMMENDATION #2

Timber harvest: Clear cut patterns to be used in pioneer hardwood stands, especially aspen. Cuts may be 5 acres, 10 acres, or 40 acres depending on total aspen stand area. Maintain 1 acre permanent openings implementing Recommendation #1. Burning of slash is optional. Allow natural regeneration of aspen. Leave 10 large diameter trees per acre on ground to provide drumming sites for ruffed grouse and cool moist areas for reptiles and amphibians.

Cut at 1 & 40 Years

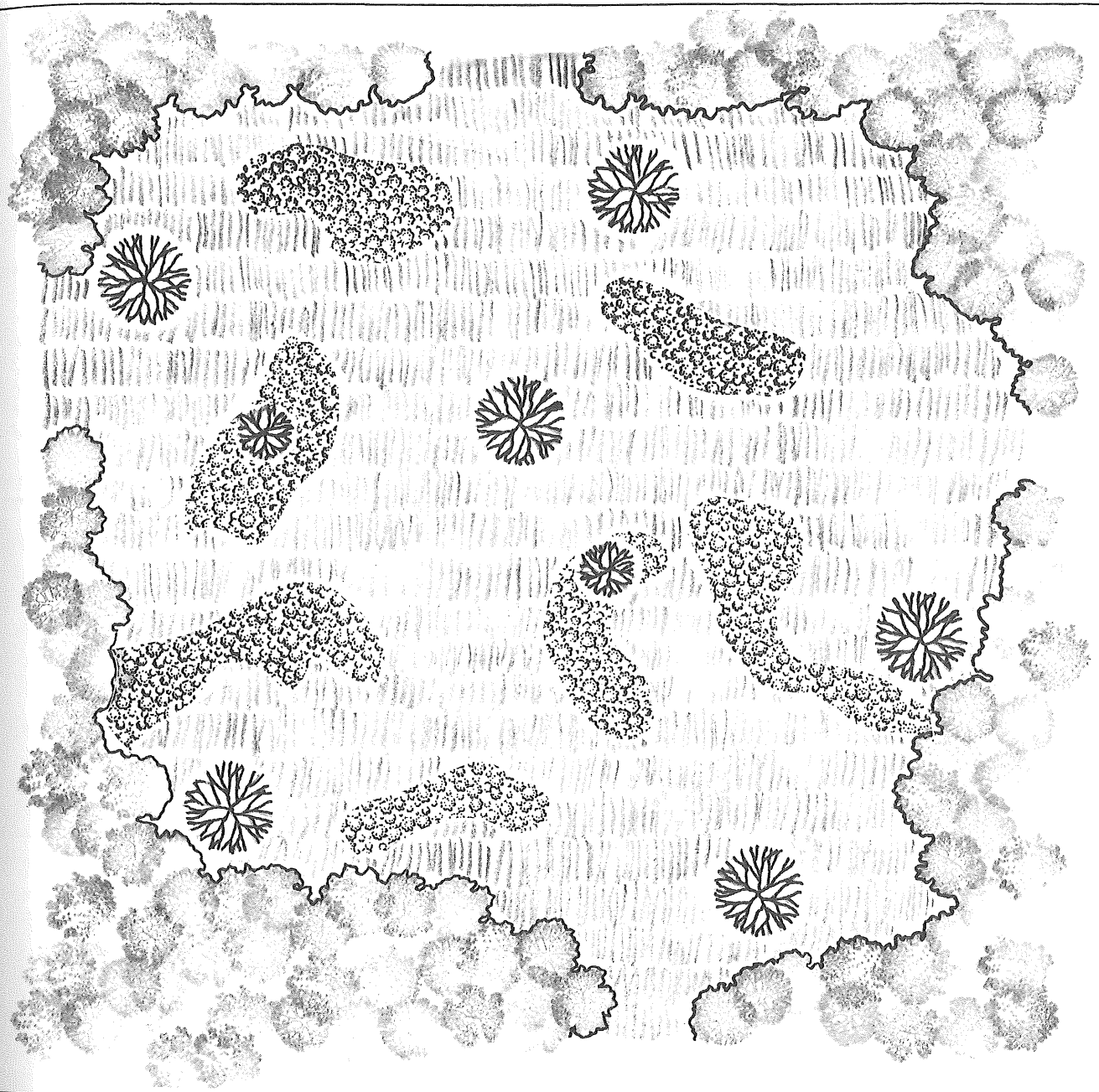
Cut at 10 & 50 Years

Cut at 20 & 60 Years

Cut at 30 & 70 Years

Permanent Openings

Large Trees Felled and Limbed to Provide Habitat for Various Forms of Wildlife

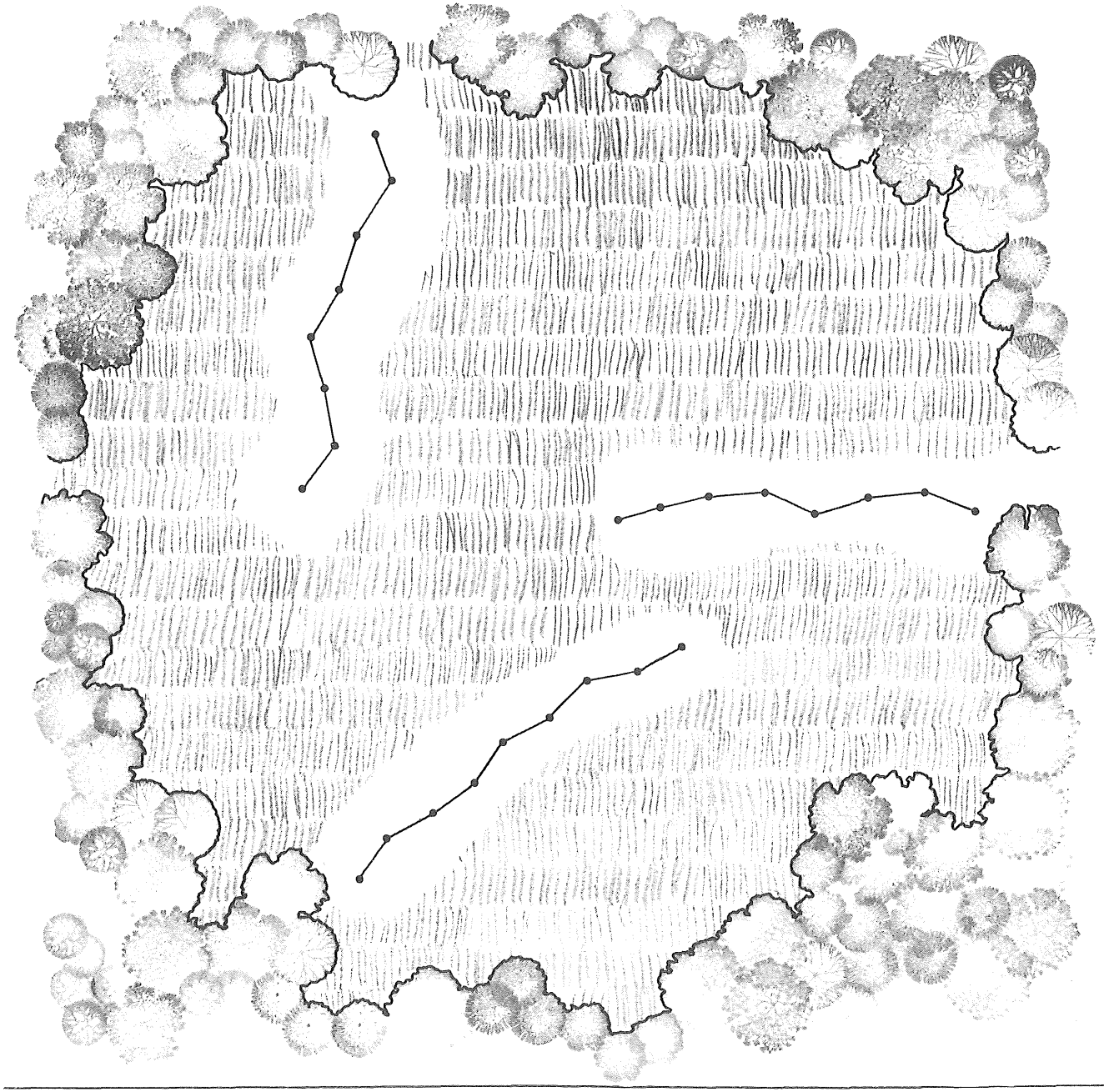


RECOMMENDATION #3

Naturalized Wildlife Food Plot. Plant native brush, herb and grass species to attract wildlife and increase their visibility to park visitors.

BRUSH POCKETS

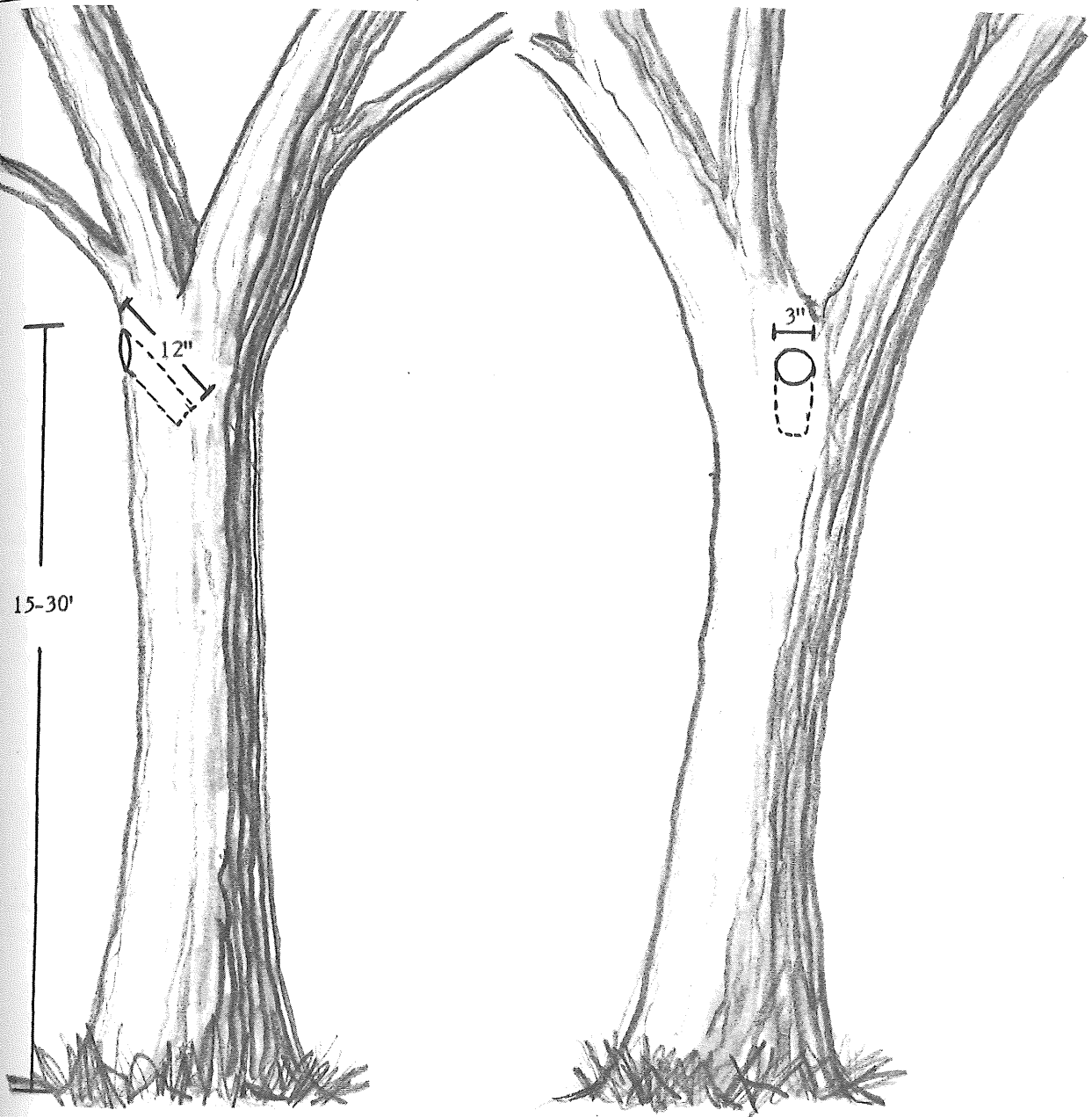
STANDING LIVE DECIDUOUS OR CONIFEROUS TREES OR DEAD SNAGS



RECOMMENDATION #4

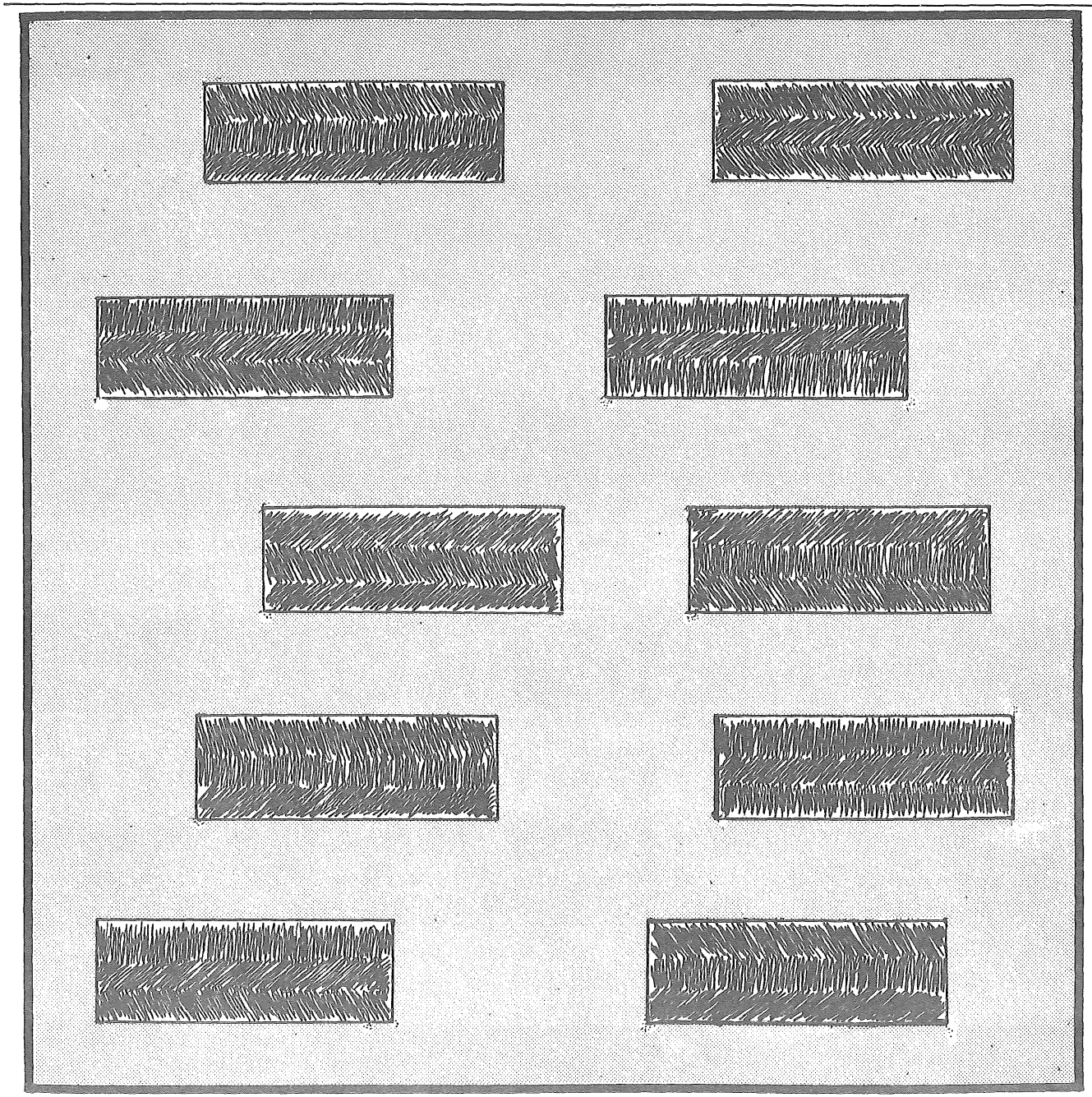
Natural regeneration of wildlife brush plots.

Sod bound old fields can be made more attractive to songbirds and other wildlife by removing the sod layer in four foot wide strips and then placing a single strand of wire about three feet above ground lengthwise down the center of the cleared area. Birds will use the wire as a perch and as their droppings are deposited on the scarified ground natural seeding will result. The seeds will sprout and eventually mature into desirable fruit and seed bearing plants which will be attractive to songbirds and other animals associated with brush travel lanes.



RECOMMENDATION #5

Holes should be drilled in overmature hardwood trees facing toward open water. The holes should be 15' to 30' above ground and have an unobstructed access so that nesting waterfowl are able to fly directly to the opening. Use of these cavities must be monitored to determine their usefullness as waterfowl nesting habitat.



RECOMMENDATION #6

Prairie restoration plots.

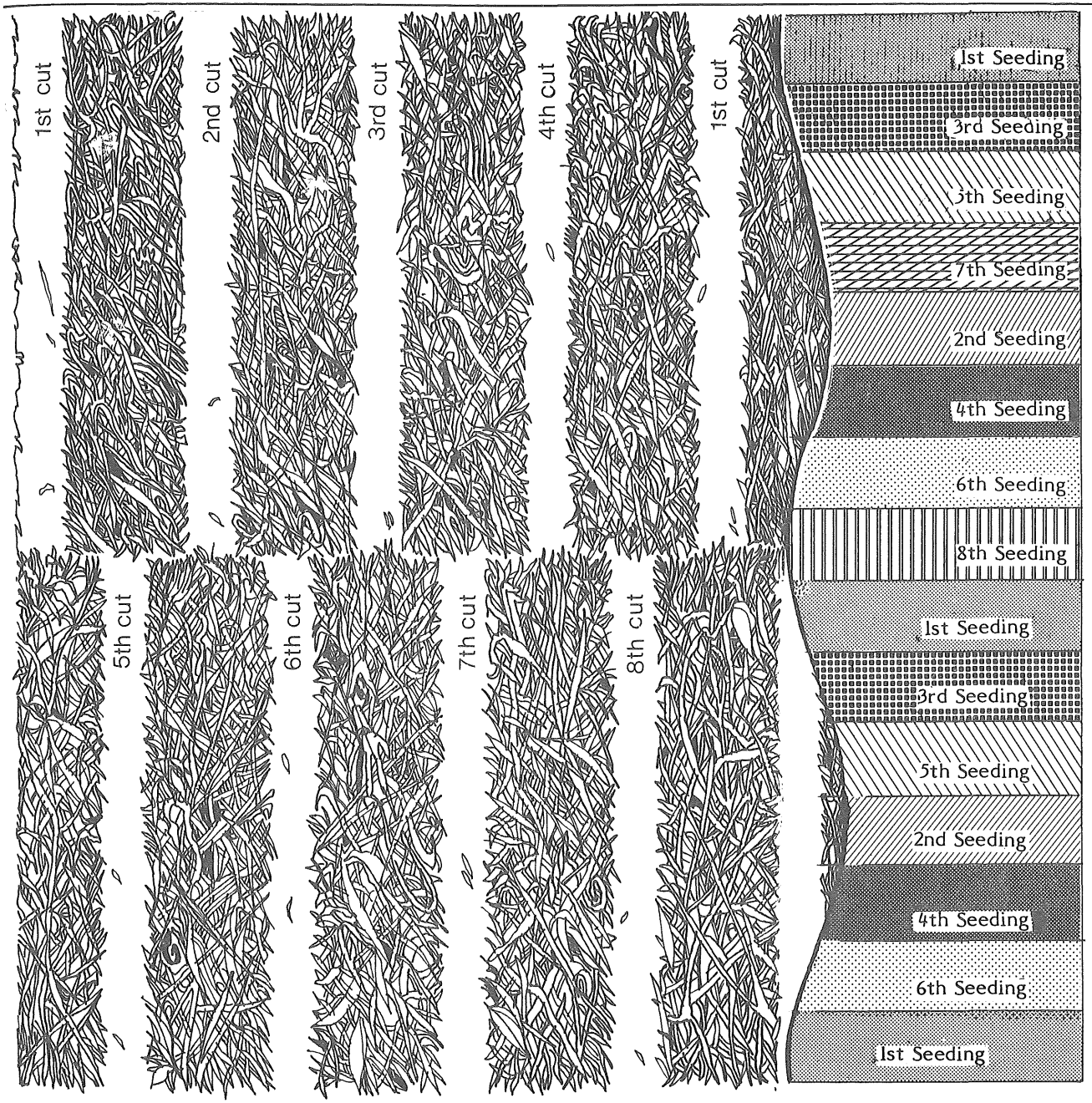
Prior to placement of prairie sod materials the restoration plot should have established sod layers removed so that transplanted prairie sod would not be competing with established vegetation. Transplanted sod material may be randomly placed in a 10 x 10 foot grid, if hand transplanting is done.

As the transplanted material becomes established it should radiate out from the prepared plot. A front end loader on a rubber tired vehicle would be the best piece of equipment to use to move sod layers since large amounts of dirt could be scooped up minimizing disturbance to plant root systems. A restoration plot could be considerably larger if mechanical equipment is used.

Prairie Sod Source Material

10 x 10 ft. - Hand Transplanting

100 x 100 ft. - Mechanical Transplanting



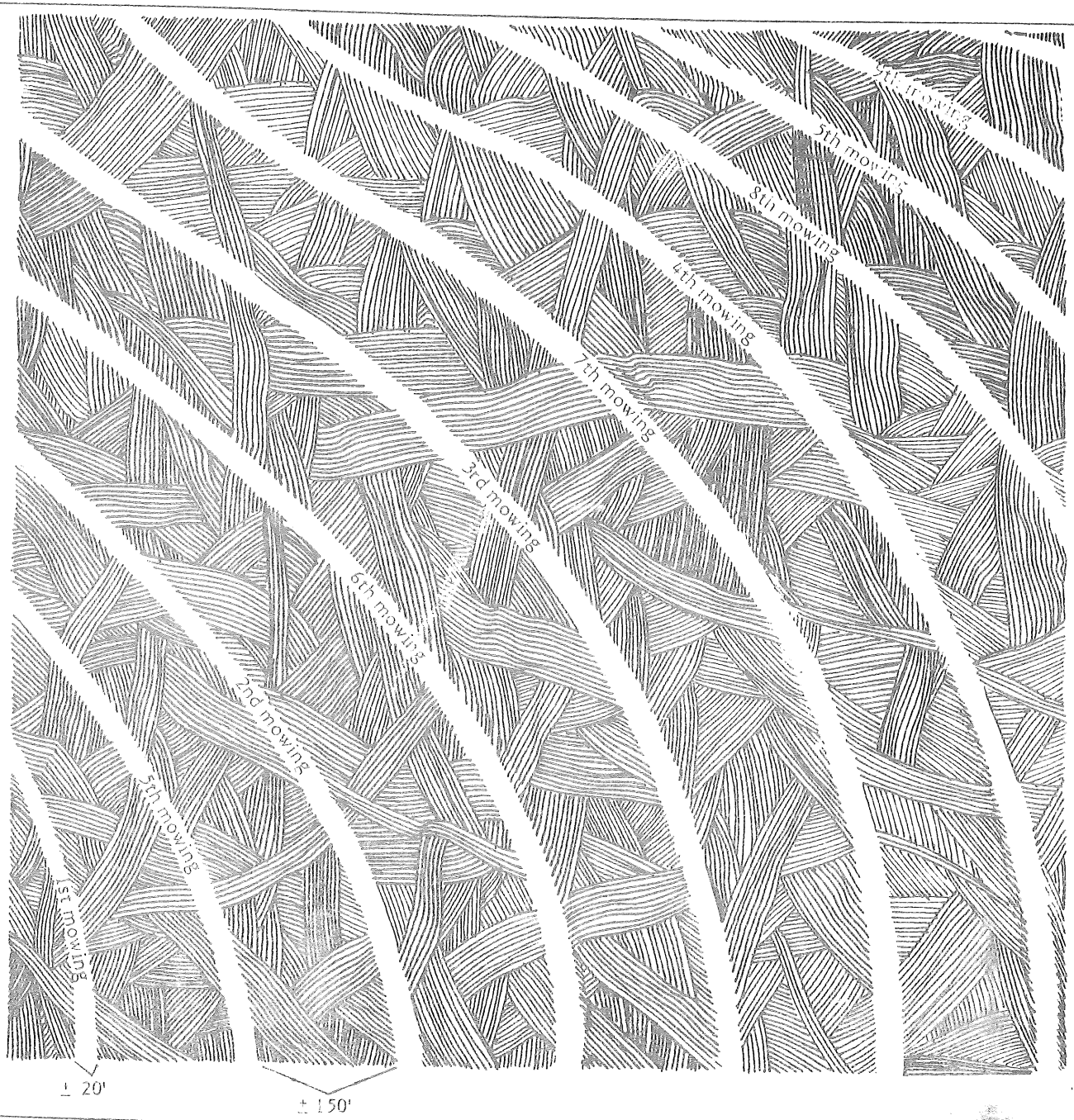
HARVEST AREA

RESTORATION AREA

RECOMMENDATION #7

Prairie restoration.

Using a haylage chopper, harvest strips of established prairie at 3 week intervals throughout the summer as various prairie plant species mature. Harvested material should then be seeded in strips in the prairie restoration area using the appropriate equipment to ensure proper distribution of the collected material. Harvesting may begin in June and should continue at appropriate intervals until mid-September. The seeded area should then be burned the following spring to break seed dormancy and prepare the seed bed.



RECOMMENDATION #8

Pioneer Hardwood Restoration in Old Fields.

To provide suitable areas for pioneer hardwoods to germinate in old fields the above technique is suggested. Strips approximately 20' wide should be mowed or burned at approximately 150' intervals every third week throughout the summer. The first mowing should occur around May 1. Size of the management blocks may vary. The following year the mowed strips should be checked for pioneer hardwood growth. About 2 years after the first mowing strips should again be mowed between those mowed earlier. Follow this with mowings during the 4th, 6th, 8th and 10th years. Records shall be kept of mowing dates, location and number of days that strip was mowed before or after a measurable rainfall.

WILDLIFE

Introduction

One of the most intriguing assets of any park is its resident wildlife. Many species are commonplace, but unnoticeable because of their elusive behavior. For many visitors, the mere awareness of the presence of wildlife is all that is needed to change a dull, uneventful walk through the brush into a challenging, refreshing stroll.

To provide such an experience for park users, detailed inventories of park wildlife are needed so that managers are better able to manage habitat to attract certain species or protect habitat which will ensure the continued presence of existing species.

The following wildlife inventory was based on checklists and reports submitted by local residents, "birders", naturalists, area game managers,and park managers. The list is not all inclusive and will be revised and updated as new data are reported. Therefore, additional detailed studies must be continued in those areas where management needs for wildlife have been identified.

Inventory

There are 206 bird species which either reside in or adjacent to Lake Bronson State Park or utilize it during spring and fall migrations. The park area also provides habitats for 41 species of mammals and 24 species of reptiles and amphibians.

Certain wildlife species found within the park are especially noteworthy because special precautions are required in their management or protection or because they have the potential for creating damage to vegetation and property or harming park visitors. These wildlife species and the potential management problems associated with them are discussed in the following paragraphs.

Endangered, Threatened, or Rare Species

Species included in this group are: those which are presently in danger of extinction in Minnesota within the immediate future; species which could become endangered in the forseeable future in Minnesota, but not necessarily throughout their entire range; or species that once resided in Minnesota, but have disappeared or nearly so because of changes in land and water use patterns.

Migrants

Birds

Sandhill crane

Species of Special Interest

Species within this group include those which are uncommon or locally distributed in Minnesota and are not presently threatened or endangered but which might become so, and those which presently are not having any difficulty, but should be closely watched because they have unusual or special values, are of special interest or because their habitat is especially vulnerable. Special management may be required.

	Seasonal Residents	Migrants
Birds		
	Double-crested cormorant	Common loon
	Great blue heron	White pelican
	Marsh hawk	Osprey
	Cooper's hawk	Bald eagle
	Common tern	Franklin's gull
	Pileated woodpecker	
Mammals		
	Bobcat	
Reptiles and Amphibians		
	Common snapping turtle	
	Central newt	
	Red-backed salamander	

Troublesome Species

Troublesome species include those species of wildlife which as individuals or populations might become nuisances to either the natural resources of a park, park property or park visitors.

	Species	Potential Problems
Mammals		
	Bats	May disturb users
	Beaver	Overutilization of vegetation, flooding roadways and property

Wildlife Definitions

Abundant - Trained observer may see several individuals in one day during the residency period of the species.

Common - Trained observer may see one or more individuals in a day.

Uncommon - Trained observer may see one individual in the course of a summer.

Rare - Species normally not observed by the trained observer.

Endangered - Listed in the federal register as a threatened or endangered species.

Unknown - Abundance of an individual species in a given park has not been determined.

Permanent Resident - Resident in the park area on a year-round basis.

Summer Resident - Only found in the park area during the summer months, presence may or may not indicate breeding activity.

Migrant - Normally found in the park area only during the spring or fall migratory season.

Winter Visitant - Normally found in the park area only during the winter months.

Uncertain - Seasonal occurrence status is not known for the species in the park area.

Seasonally Inactive - Species is seasonally inactive in the park area; may enter dormancy, hibernation, or aestivation.

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	SEASONAL OCCURRENCE: MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Common Loon						◐		◐				
	Red-throated Loon												
●	Red-necked Grebe						◐		◐				
●	Horned Grebe						◐		◐				
●	Eared Grebe						◐		◐				
●	Western Grebe						◐		◐				
●	Pied-billed Grebe						◐		◐				
●	White Pelican						◐		◐				
●	Double-crested Cormorant						◐		◐				
●	Great Blue Heron						◐		◐				
●	Green Heron						◐		◐				
	Cattle Egret												
●	Great Egret						◐		◐				
●	Black-crowned Night Heron						◐		◐				
	Yellow-crowned Night Heron												
●	Least Bittern						◐		◐				
●	American Bittern						◐		◐				
●	Whistling Swan						◐			◐			
●	Canada Goose						◐		◐				
●	White-fronted Goose						◐			◐			
●	Snow Goose						◐			◐			
●	Mallard						◐		◐				
	Black Duck												
●	Gadwall						◐		◐				
●	Pintail						◐		◐				
●	Green-winged Teal						◐		◐				
●	Blue-winged Teal						◐		◐				
●	American Wigeon						◐			◐			
●	Northern Shoveler						◐		◐				
●	Wood Duck						◐		◐				
●	Redhead						◐		◐				
●	Ring-necked Duck						◐		◐				
●	Canvasback						◐			◐			
	Greater Scaup												
●	Lesser Scaup						◐			◐			
●	Common Goldeneye						◐			◐			
●	Bufflehead						◐			◐			
	Oldsquaw												
	Harlequin Duck												
●	White-winged Scoter						◐			◐			
	Surf Scoter												
	Black Scoter												
●	Ruddy Duck						◐		◐				
●	Hooded Merganser						◐		◐				
●	Common Merganser						◐			◐			
●	Red-breasted Merganser						◐			◐			
●	Turkey Vulture						◐			◐			
●	Goshawk						◐				◐		
●	Sharp-shinned Hawk						◐		◐				
●	Cooper's Hawk						◐		◐				
●	Red-tailed Hawk						◐		◐				

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	SEASONAL OCCURRENCE: MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
	Red-shouldered Hawk												
●	Broad-winged Hawk						◐		◐				
●	Swainson's Hawk						◐			◐			
●	Rough-legged Hawk						◐				◐		
	Ferruginous Hawk												
●	Golden Eagle						◐			◐			
●	Bald Eagle						◐			◐			
●	Marsh Hawk						◐		◐				
●	Osprey						◐		◐				
●	Peregrine Falcon									◐			
●	Merlin						◐			◐			
●	American Kestrel						◐		◐				
	Spruce Grouse												
●	Ruffed Grouse						◐		◐				
	Greater Prairie Chicken												
	Sharp-tailed Grouse												
	Bobwhite												
●	Ring-necked Pheasant						◐		◐				
	Chukar												
●	Gray Partridge						◐		◐				
●	Sandhill Crane				◐		◐			◐			
	King Rail												
●	Virginia Rail						◐		◐				
●	Sora						◐		◐				
●	Yellow Rail						◐		◐				
●	Common Gallinule						◐		◐				
●	American Coot						◐		◐				
	Semipalmated Plover												
	Piping Plover												
●	Killdeer						◐		◐				
●	American Golden Plover						◐			◐			
●	Black-bellied Plover						◐			◐			
	Ruddy Turnstone												
●	American Woodcock						◐		◐				
●	Common Snipe						◐		◐				
	Whimbrel												
●	Upland Sandpiper						◐		◐				
●	Spotted Sandpiper						◐		◐				
●	Solitary Sandpiper						◐			◐			
●	Greater Yellowlegs						◐			◐			
●	Lesser Yellowlegs						◐			◐			
	Willet												
	Red Knot												
●	Pectoral Sandpiper						◐			◐			
	White-rumped Sandpiper												
●	Baird's Sandpiper						◐			◐			
●	Least Sandpiper						◐			◐			
	Dunlin												
●	Semipalmated Sandpiper						◐			◐			
	Western Sandpiper												
●	Sanderling						◐			◐			

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
	Short-billed Dowitcher												
	Long-billed Dowitcher												
	Stilt Sandpiper												
	Buff-breasted Sandpiper												
●	Marbled Godwit						○		○				
●	Hudsonian Godwit						○			○			
	American Avocet												
●	Wilson's Phalarope						○		○				
	Northern Phalarope												
	Parasitic Jaeger												
	GlaucousGull												
●	Herring Gull						○			○			
●	Ring-billed Gull						○			○			
●	Franklin's Gull						○		○				
●	Bonaparte's Gull						○			○			
●	Forster's Tern						○		○				
●	Common Tern						○		○				
	Caspian Tern												
●	Black Tern						○		○				
●	Rock Dove					○	○						
●	Mourning Dove						○		○				
●	Yellow-billed Cuckoo						○		○				
●	Black-billed Cuckoo						○		○				
●	Screech Owl						○	○					
●	Great Horned Owl						○	○					
●	Snowy Owl						○				○		
	Hawk-Owl												
	Burrowing Owl												
●	Barred Owl						○	○					
	Great Gray Owl												
●	Long-eared Owl						○	○					
●	Short-eared Owl						○	○					
●	Saw-whet Owl						○	○					
●	Whip-poor-will						○		○				
●	Common Nighthawk						○		○				
●	Chimney Swift						○		○				
●	Ruby-throated Hummingbird						○		○				
●	Belted Kingfisher						○		○				
●	Common Flicker						○	○					
●	Pileated Woodpecker						○	○					
	Red-bellied Woodpecker												
●	Red-headed Woodpecker						○		○				
●	Yellow-bellied Sapsucker						○		○				
●	Hairy Woodpecker						○	○					
●	Downy Woodpecker						○	○					
	Black-backed 3-toed Woodpecker												
	Northern 3-toed Woodpecker												
●	Eastern Kingbird						○		○				
●	Western Kingbird						○		○				
●	Great Crested Flycatcher						○		○				
●	Eastern Phoebe						○		○				

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Yellow-bellied Flycatcher						○			○			
	Acadian Flycatcher												
	Willow Flycatcher												
●	Alder Flycatcher						○		○				
●	Least Flycatcher						○		○				
●	Eastern Wood Pewee						○		○				
●	Olive-sided Flycatcher						○			○			
●	Horned Lark						○	○					
●	Tree Swallow						○		○				
●	Bank Swallow						○		○				
●	Rough-winged Swallow						○		○				
●	Barn Swallow						○		○				
●	Cliff Swallow						○		○				
●	Purple Martin						○		○				
●	Gray Jay						○	○					
●	Blue Jay						○	○					
	Black-billed Magpie												
	Common Raven												
●	Common Crow						○	○					
●	Black-capped Chickadee						○	○					
	Boreal Chickadee												
	Tufted Titmouse												
●	White-breasted Nuthatch						○	○					
	Red-breasted Nuthatch												
●	Brown Creeper						○	○					
●	House Wren						○		○				
●	Winter Wren						○		○				
●	Long-billed Marsh Wren						○		○				
●	Short-billed Marsh Wren						○		○				
	Mockingbird												
●	Gray Catbird						○		○				
●	Brown Thrasher						○		○				
●	American Robin						○		○				
	Varied Thrush												
●	Wood Thrush						○		○				
●	Hermit Thrush						○			○			
●	Swainson's Thrush						○			○			
●	Gray-cheeked Thrush						○			○			
●	Veery						○		○				
●	Eastern Bluebird						○		○				
	Blue-gray Gnatcatcher												
●	Golden-crowned Kinglet						○			○			
●	Ruby-crowned Kinglet						○			○			
●	Water Pipit						○			○			
●	Sprague's Pipit						○			○			
●	Bohemian Waxwing						○				○		
●	Cedar Waxwing						○	○					
●	Northern Shrike						○				○		
●	Loggerhead Shrike						○		○				
●	Starling						○	○					
	Bell's Vireo												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Yellow-throated Vireo						●		●				
●	Solitary Vireo						●			●			
●	Red-eyed Vireo						●		●				
●	Philadelphia Vireo						●			●			
●	Warbling Vireo						●		●				
●	Black-and-white Warbler						●			●			
	Prothonotary Warbler												
●	Golden-winged Warbler						●		●				
	Blue-winged Warbler												
●	Tennessee Warbler						●			●			
●	Orange-crowned Warbler						●			●			
●	Nashville Warbler						●		●				
●	Northern Parula						●			●			
●	Yellow Warbler						●		●				
●	Magnolia Warbler						●			●			
●	Cape May Warbler						●			●			
●	Black-throated Blue Warbler						●			●			
●	Yellow-rumped Warbler						●			●			
●	Black-throated Green Warbler						●			●			
●	Cerulean Warbler						●		●				
●	Blackburnian Warbler						●			●			
●	Chestnut-sided Warbler						●		●				
●	Bay-brested Warbler						●			●			
●	Blackpoll Warbler						●			●			
●	Pine Warbler						●			●			
●	Palm Warbler						●			●			
●	Ovenbird						●		●				
●	Northern Waterthrush						●			●			
	Louisiana Waterthrush												
●	Connecticut Warbler						●			●			
●	Mourning Warbler						●		●				
●	Common Yellowthroat						●		●				
●	Wilson's Warbler						●			●			
●	Canada Warbler						●			●			
●	American Redstart						●		●				
	House Sparrow												
●	Bobolink						●		●				
●	Eastern Meadowlark						●		●				
●	Western Meadowlark						●		●				
●	Yellow-headed Blackbird						●		●				
●	Red-winged Blackbird						●		●				
●	Orchard Oriole						●		●				
●	Northern Oriole						●		●				
●	Rusty Blackbird						●			●			
●	Brewer's Blackbird						●		●				
●	Common Grackle						●	●					
●	Brown-headed Cowbird						●		●				
●	Scarlet Tanager						●		●				
●	Cardinal						●	●					
●	Rose-breasted Grosbeak						●		●				
	Blue Grosbeak												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Indigo Bunting						●		●				
●	Dickcissel						●		●				
●	Evening Grosbeak						●			●			
●	Purple Finch						●			●			
●	Pine Grosbeak						●			●			
	Hoary Redpoll												
●	Common Redpoll						●			●			
●	Pine Siskin						●			●			
●	American Goldfinch						●		●				
●	Red Crossbill						●			●			
●	White-winged Crossbill						●			●			
●	Rufous-sided Towhee						●		●				
	Lark Bunting												
●	Savannah Sparrow						●		●				
●	Grasshopper Sparrow						●		●				
●	Henslow's Sparrow						●		●				
●	Le Conte's Sparrow						●		●				
●	Sharp-tailed Sparrow						●			●			
●	Vesper Sparrow						●		●				
●	Lark Sparrow						●		●				
●	Dark-eyed Junco						●			●			
●	Tree Sparrow						●			●			
●	Chipping Sparrow						●		●				
●	Clay-colored Sparrow						●		●				
●	Field Sparrow						●		●				
●	Harris' Sparrow						●			●			
●	White-crowned Sparrow						●			●			
●	White-throated Sparrow						●			●			
●	Fox Sparrow						●			●			
●	Lincoln's Sparrow						●			●			
●	Swamp Sparrow						●		●				
●	Song Sparrow						●		●				
●	Lapland Longspur						●			●			
	Smith's Longspur												
●	Chestnut-collared Longspur						●			●			
●	Snow Bunting						●				●		
●	Gyrfalcon						●				●		

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Opossum			○									○
	Eastern Mole												
●	Star-nose Mole					○	○						
	Cinerous Shrew												
	Richardson Shrew												
●	Water Shrew					○	○						
	Pygmy Shrew												
	Least Shrew												
●	Short-tailed Shrew					○	○						
●	Little Brown Bat					○	○					○	
	Keen Myotis												
●	Big Brown Bat					○	○					○	
	Pipistrelle Bat												
●	Silver-haired Bat					○			○				
●	Red Bat					○			○				
●	Hoary Bat					○			○			○	
●	White-tailed Jackrabbit					○	○						
	Snowshoe Hare												
●	Eastern Cottontail Rabbit					○	○						
●	Woodchuck					○	○					○	
	Richardson's Ground Squirrel												
●	Thirteen-lined Ground Squirrel					○	○					○	
●	Franklin Ground Squirrel					○	○					○	
	Least Chipmunk												
●	Eastern Chipmunk					○	○					○	
●	Red Squirrel					○	○						
●	Eastern Gray Squirrel					○	○						
●	Fox Squirrel					○	○						
●	Southern Flying Squirrel					○	○						
●	Northern Flying Squirrel					○	○						
	Northern Pocket Gopher												
	Plains Pocket Gopher												
	Pocket Mouse												
●	Beaver					○	○						
	Western Harvest Mouse												
	Northern Grasshopper Mouse												
	Prairie Deer Mouse												
	Woodland Deer Mouse												
●	White-footed Mouse					○	○						
	Bog Lemming												
	Northern Bog Lemming												
	Boreal Redback Vole												
●	Meadow Vole					○	○						
	Rock Vole												
●	Prairie Vole					○	○						
	Pine Vole												
●	Muskrat					○	○						
	Norway Rat												
	House Mouse												
●	Meadow Jumping Mouse					○	○						
	Woodland Jumping Mouse												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Porcupine						○	○					
●	Black Bear				○			○			○		
●	Raccoon						○	○			○		
	Fisher												
	Marten												
●	Short-tailed Weasel						○	○					
●	Long-tailed Weasel						○	○					
●	Least Weasel						○	○					
●	Mink						○	○					
●	River Otter						○	○					
	Spotted Skunk												
●	Striped Skunk						○	○			○		
●	Badger						○	○			○		
●	Red Fox						○	○					
●	Gray Fox						○	○					
●	Coyote						○	○					
	Timber Wolf												
	Canada Lynx												
●	Bobcat						○	○					
●	White-tailed Deer						○	○					
	Moose												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE							SEASONAL OCCURRENCE							
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN			
●	Common Snapping Turtle						●	●				●				
	Wood Turtle															
	Map Turtle															
●	Western Painted Turtle						●	●				●				
	Blanding's Turtle															
	False Map Turtle															
	Western Spiny Softshell															
	Eastern Spiny Softshell															
●	Northern Prairie Skink						●	●				●				
	Five-lined Skink															
	Six-lined Racerunner															
●	Northern Red-bellied Snake						●	●				●				
	Texas Brown Snake															
	Northern Water Snake															
●	Eastern Plains Garter Snake						●	●				●				
	Eastern Garter Snake															
●	Red Sided Garter Snake						●	●				●				
	Plains Hognose Snake															
●	Eastern Hognose Snake						●	●				●				
	Blue Racer															
●	Eastern Smooth Green Snake						●	●				●				
●	Western Smooth Green Snaké						●	●				●				
●	Bullsnake						●	●				●				
	Western Fox Snake															
	Black Rat Snake															
	Eastern Milk Snake															
	Eastern Massasauga															
	Timber Rattlesnake															
●	Mudpuppy						●	●				●				
●	Central Newt						●	●				●				
●	Jefferson Salamander						●	●				●				
●	Eastern Tiger Salamander						●	●				●				
	Gray Tiger Salamander															
●	Red-backed Salamander						●	●				●				
	Dakota Toad															
●	American Toad						●	●				●				
	Great Plains Toad															
●	Northern Spring Peeper						●	●				●				
●	Eastern Gray Treefrog						●	●				●				
●	Blanchard's Cricket Frog					●	●	●				●				
●	Boreal Chorus Frog						●	●				●				
●	Western Chorus Frog						●	●				●				
	Pickerel Frog															
●	Mink Frog						●	●				●				
●	Northern Leopard Frog						●	●				●				
●	Green Frog						●	●				●				
●	Wood Frog						●	●				●				

Species of Special Interest

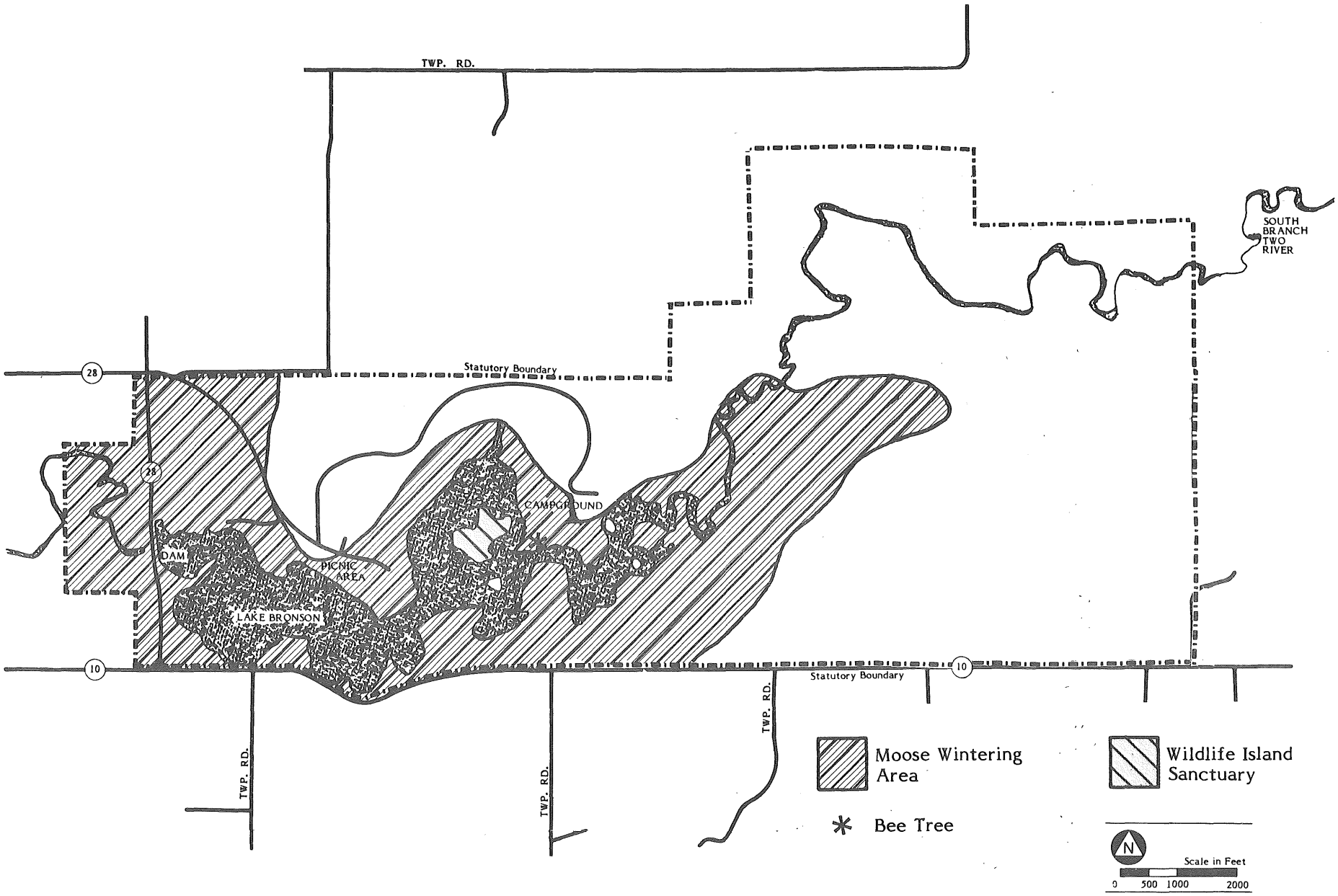
Species within this group include those which are uncommon or locally distributed in Minnesota and are not presently threatened or endangered, but which might become so and those which presently are not having any difficulty, but should be closely watched because they have unusual or special values, are of special interest, or because their habitat is especially vulnerable. Special management may be required.

	Seasonal Residents	Migrants
Birds		
	Double-crested cormorant	Common loon
	Great blue heron	White pelican
	Marsh hawk	Osprey
	Cooper's hawk	Bald eagle
	Common tern	Franklin's gull
	Pileated woodpecker	
Mammals		
	Bobcat	
Reptiles and Amphibians		
	Common snapping turtle	
	Central newt	
	Red-backed salamander	

Troublesome Species

Troublesome species include those species of wildlife which as individuals or populations might become nuisances to either the natural resources of a park, park property or park visitors.

	Species	Potential Problems
Mammals		
	Bats	May disturb users
	Beaver	Overutilization of vegetation, flooding roadways and property


TWP. RD.
SOUTH BRANCH TWO RIVER
Statutory Boundary
28
28
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
10
10
Statutory Boundary
TWP. RD.
TWP. RD.
TWP. RD.
Moose Wintering Area
Wildlife Island Sanctuary
Bee Tree
N
Scale in Feet
0 500 1000 2000

Raccoon	Raiding garbage cans
White-tailed deer	Overbrowsing vegetation
Moose	May threaten visitors during calving and rutting season
Skunks	Have no fear of park users

Sensitivity to Humans

Species listed within this group are those which are unusually sensitive to disturbance by human activity. Disturbance during one season or another may result in nest or den abandonment, decrease in territorial size, or shift in territorial movement. A disturbance might be detrimental to the survival of the species in a given area or may have effects over a much larger area.

Mammals

Red fox
Gray fox
Coyote
Bobcat

Wildlife/Vegetation Relationships

A matrix indicating which given ecological communities each species of wildlife is normally associated with may be found in Appendix B. *

Management

Objective:

To maintain a variety of plant community types and successional stages native to the area to insure that all resident species continue to exist within the park

- Specific Recommendations

The vegetation management program discussed in an eariler section describes the details of a program which will provide plant community and successional stage variety. Such a program will maintain the existing vegetative characteristics of the park, resulting in maintenance of existing wildlife populations. However, species whose seasonal range requirements extend beyond the park boundaries may be affected by activities which cannot be controlled and consequently may diminish in numbers.

*See note on page ii.

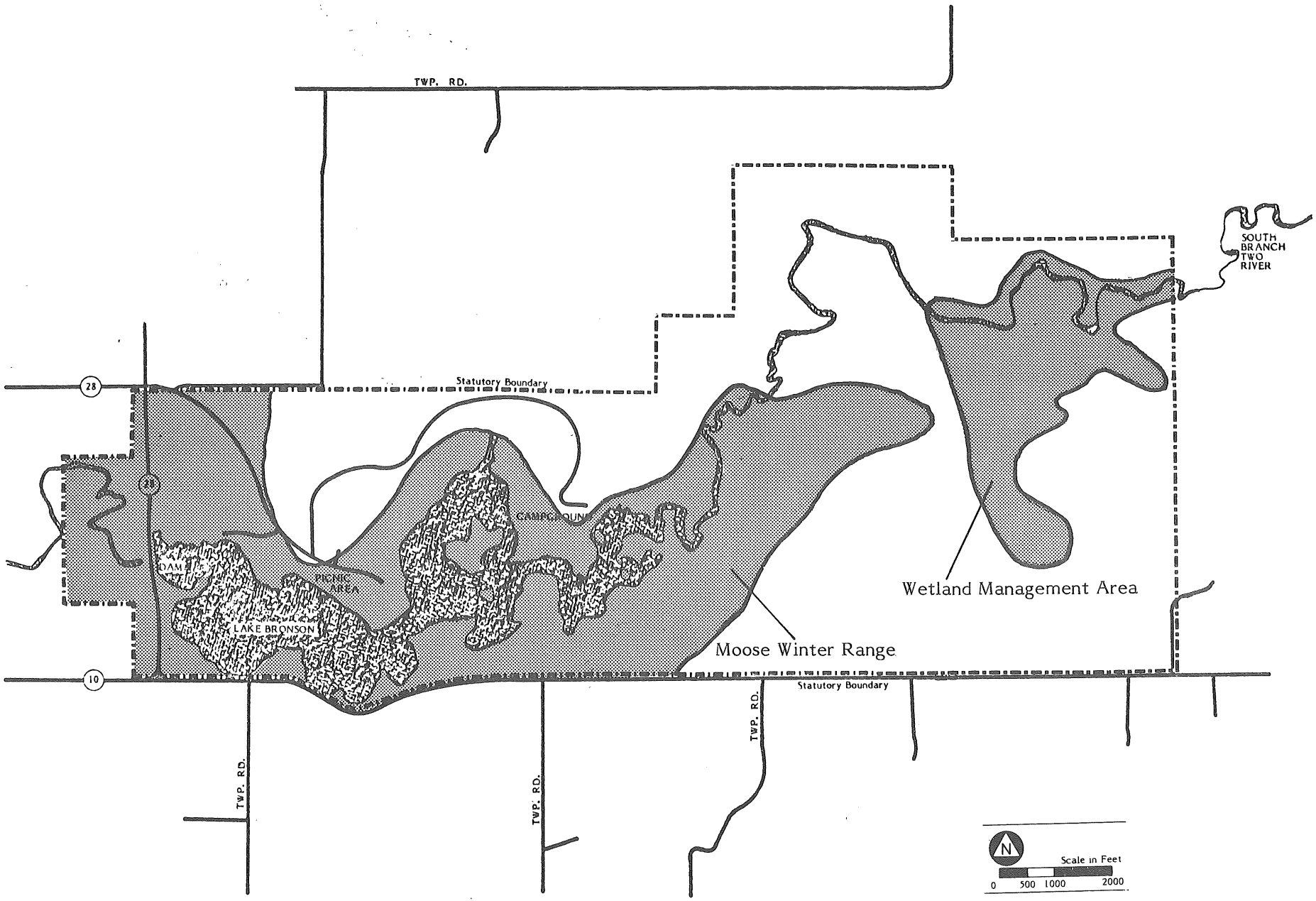
The moose is an example of this situation. Several moose winter in the park, but go elsewhere to breed. Loss of breeding habitat and summer cover would adversely affect the species. These requirements could not be met in the park even with the vegetation management programs. In fact, a general decline in the moose population can be expected, considering the extensive land clearing operations presently occurring in northwestern Minnesota.

It is recommended that DNR adopt a policy which stresses the need for maintaining and regenerating moose habitat in northwestern Minnesota on both public and private lands to provide a viable population for viewing opportunities and hunting.

Winter Moose Range (Map, page **90**) - Oak appears to be a favored browse species for moose wintering in the park area. Vegetation management will emphasize the regeneration of oak in some areas to increase the amount of available browse. Presently, the oaks are being heavily utilized and appear to be in short supply. Regeneration of browse species will provide winter food for moose for the future and attract these animals for park visitors to observe and photograph during the winter months.

Wetland Management Area (Map, page **90**) - Wetland habitat will be developed as a result of the second impoundment recommended to reduce the silt and nutrient load into Lake Bronson. Approximately 80 acres of land will be flooded, much of which will be shallow marsh. Emergent vegetation in these shallows will provide habitat for waterfowl, shorebirds, reptiles, and amphibians as well as cover for deer. The conversion of habitat from a combination of bottomland hardwood (Wildlife Diversity Index - WDI 103, See Appendix B) alder-willow (WDI 44), brush (WDI 65), old field (WDI 84), pioneer hardwood/hardwood (WDI 102), and agricultural land (WDI 45) may increase wildlife species diversity to a potential of 135 species for the marsh alone. A mosaic of plant community diversity will continue to exist around the marsh. Adjacent communities will include brush, alder-willow, pioneer hardwoods, bottomland hardwood, and old field. The result of the impoundment will be that wildlife species diversity and populations will benefit.

Skunks are reported to be a problem in the campground area because they are too tame. Periodic skunk removal from the campground area will be done in accordance with park policy to ensure the safety and well-being of campers and park visitors.


TWP. RD.
SOUTH BRANCH TWO RIVER
Statutory Boundary
28
28
10
DAM
PICNIC AREA
LAKE BRONSON
CAMPGROUND
Wetland Management Area
Moose Winter Range
Statutory Boundary
TWP. RD.
TWP. RD.
TWP. RD.
N
Scale in Feet
0 500 1000 2000

HISTORIC AND PREHISTORIC SITES

Inventory

Human activity in the Lake Bronson area dates back to prehistoric time. A group of nine mounds is located just south of the park which represent a distinct prehistoric culture called Arvilla (500 A.D. - 1000 A.D.). These mounds are one of the few remaining examples of the linear mound complex of the Red River Valley. Artifacts found within the park suggest the possibility of a related site immediately north of the mounds.

To the east of the Arvilla mound site is the possible site of another former village. An abundance of artifacts such as stone hammers, "bird points", and grinding stones have been found by Wesley Hazelton, an early Kittson County settler, in his cultivated fields just south of the park. The existence of old beaver dams and snail shells in this currently waterless area suggests that the river once passed through the area and lends further credence to the riverside village theory.

A third area of historical note is the Red River Oxcart Trail which followed the South Branch/Two Rivers. Part of the route, now partially flooded by Lake Bronson, passed through the southwest corner of the park. Other known historical sites located within the park include two pioneer cemeteries and two historic river crossing points on the South Branch/Two Rivers.

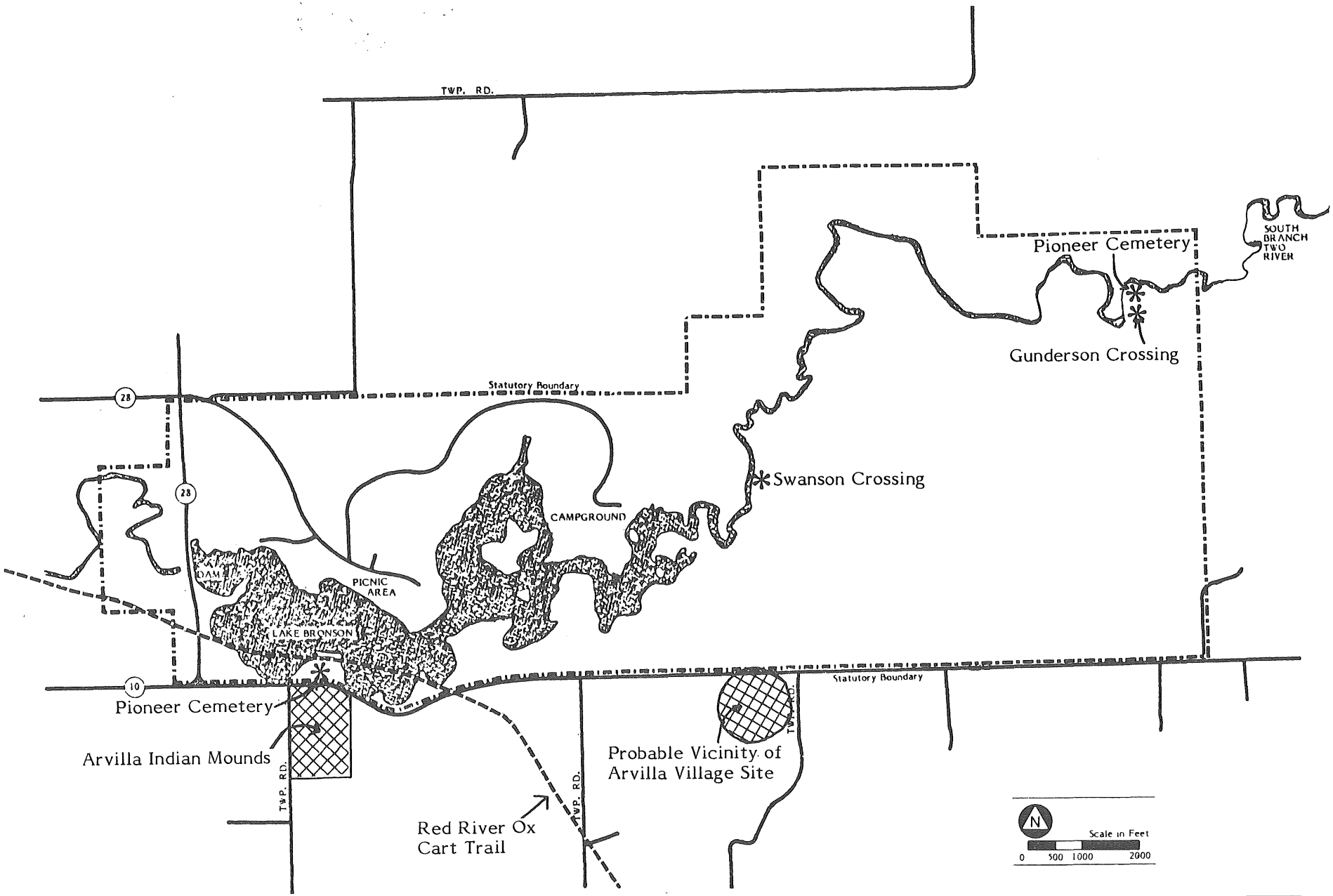
Management

Objective:

To protect known and suspected locations from activities which could adversely affect irreplaceable cultural resources

Discussion

The prehistoric mound site, 21-KT-1, belonging to the Arvilla Complex is located immediately adjacent to the southwest boundary of the park. Nine linear mounds were originally recorded and in 1936, Jenks and Wilford excavated the two northernmost mounds. In June, 1976, Michlovic of Moorhead State University conducted an archaeological salvage excavation of the habitation area in this vicinity. Preliminary analysis suggested that the site represents a seasonal occupation over a number of years.

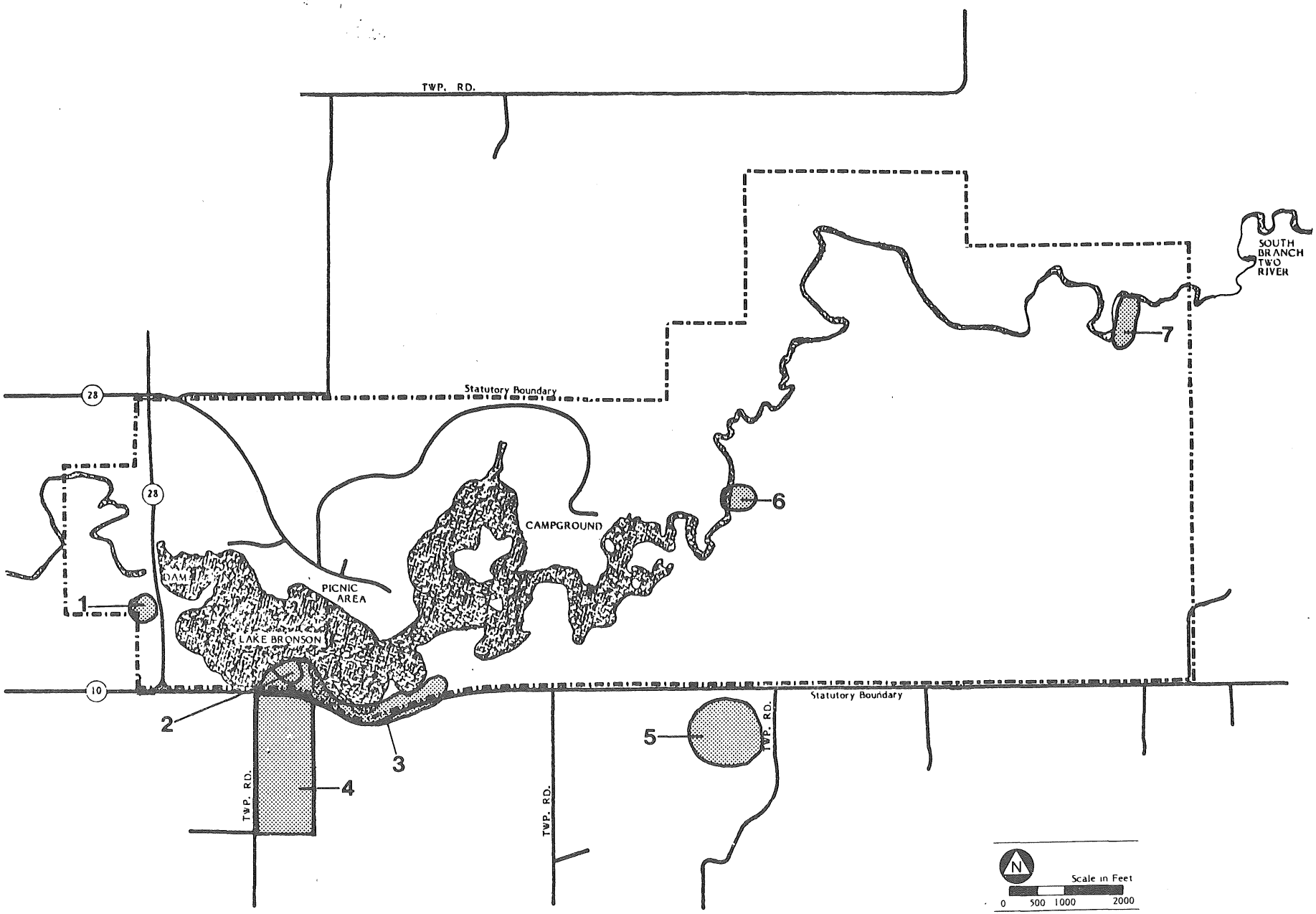

TWP. RD.
Pioneer Cemetery
SOUTH BRANCH TWO RIVER
Gunderson Crossing
Statutory Boundary
28
28
Swanson Crossing
CAMPGROUND
DAM
PICNIC AREA
LAKE BRONSON
10
Statutory Boundary
Pioneer Cemetery
Arvilla Indian Mounds
TWP. RD.
TWP. RD.
TWP. RD.
Probable Vicinity of Arvilla Village Site
Red River Ox Cart Trail
N
Scale in Feet
0 500 1000 2000

Other areas of local historic and cultural significance are marked on the map, page 92 . The table below suggests management recommendations for each site.

Since the park has not been surveyed systematically, an intensive search for prehistoric and historic sites is needed.

Specific Management Programs

Map Code	Site	Specific Recommendations	Estimated Cost
1	Red River Oxcart Trail	Interpret the site through the use of signs and an informative brochure.	$ 2,000
2	Pioneer Cemetery	Banks being eroded by wave action on the lake will be stabilized in accordance with recommendations given in the soils management section (page). The site will be maintained, protected, and interpreted.	$ 1,500
3	Lakeshore	The park manager has recently discovered artifacts throughout this general area. Further testing and surveying is recommended for the area. Interpretation of the remains is recommended following completion of the testing.	Testing $ 2,000 Interpretation $ 1,000
4	Arvilla Mound (Outside Park Boundary)	This site has recently been added to the National Register of Historic Sites. Reconstruction of CSAH 10 will impact a segment of the complex. According to Scott Anfinson in his Report On The 1976 Excavations At The Lake Bronson Site (21-KT-1) In Kittson County, Minnesota, "the 1976 excavations appear to have given us a good idea of what went on at the site and the proposed construction of CSAH 10 can now proceed without a significant loss of important and irreplaceable information about Minnesota's prehistory." Should acquisition be required to protect the area, the significance of the site suggests that the property should be acquired and managed by the Minnesota Historical Society.	


TWP. RD.
SOUTH BRANCH TWO RIVER
Statutory Boundary
28
28
10
DAM
PICNIC AREA
CAMPGROUND
LAKE BRONSON
1
2
3
4
5
6
7
TWP. RD.
TWP. RD.
TWP. RD.
Statutory Boundary
N
Scale in Feet
0 500 1000 2000

5	Probable Vicinity of Arvilla Village Site	This area is outside of, but adjacent to the park boundary. Not much information was available regarding this site. It is recommended to investigate the site to determine its significance.	
6	Swanson Crossing	A low water crossing of local significance is located at this point. Protection and interpretation is recommended.	$ 1,000
7	Pioneer Cemetery/ Gunderson Crossing	A pioneer cemetery with at least one grave is located here. A former low water river crossing is also present. The grave site needs to be marked, protected, and interpreted through a brochure. The low water crossing also needs to be marked and its significance documented in a brochure.	$ 2,000
	Whole Park	Since the park has not been surveyed systematically, an intensive search for prehistoric and historic sites is recommended.	$ 3,500

Sources

A memo from LaMonte Gross. Fall, 1975.

A memo from LaMonte Gross. Winter, 1976. Lake Bronson State Park/park planning information: archaeology.

Anfinson, Scott. 1977. Report on the 1976 excavations at the Lake Bronson Site (21-KT-1) in Kittson County, Minnesota.

Coddington, Donn. 1970. Preservation in Minnesota. Minnesota Historical Society. In a report submitted to DNR Parks Planning by Minnesota Historical Society, F.H.A. "Lake Bronson State Park." July/August, 1976.

Conversation with LaMonte Gross, Lake Bronson Park Manager (8/25/76). (Confirmed by Susan Queripel, Historical Society in 8/26/76 letter.)

Minnesota Historical Society, F.H.A. July/August, 1976. Lake Bronson State Park.

RESOURCE MANAGEMENT BUDGET

Management Practice	Biennium 78-79	80-81	82-83	85-85	86-87	Total
WATER						
Spillway Study	$ 8,000					$ 8,000
Impoundment Study	15,000					15,000
Impoundment Construction			Contingent upon results of study			
FISHERIES						
Stocking		$ 2,000	$ 1,000	$ 1,000	$ 1,000	5,000
Fishery Study			2,000			2,000
SOILS						
Gabbion Baskets	2,000					2,000
Bank Stabilization	3,000		3,000		2,000	8,000
VEGETATION						
Fire Protection	1,000	1,000	1,000	1,000	1,000	5,000
Educational Programs/Fencing		10,000				10,000
Prairie Restoration	6,000		4,000		1,700	11,700
Oak Savanna Restoration	4,000	4,800		14,500		26,300
Sanitation Cut	5,000	5,000	8,000	3,000	8,000	29,000
Timber Removal			2,000		12,500	14,500
Opening Maintenance	1,800	3,000				4,800
Demonstration Plot	2,000		2,000		2,000	6,000
Burn		4,500				4,500
Contingency fund for inventory, evaluation, and management of areas within 1977 boundary expansion and other newly acquired areas as well as to cover cost overruns	6,000	7,000	4,000	3,000	6,000	26,000

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
CULTURAL/HISTORICAL						
Phase #1						
Survey of Park	3,500					3,500
Historic Site Interpretation		7,500				7,500
Archaeological Survey of south shore of Lake Bronson	2,000					2,000
TOTAL	$ 59,300	$ 47,800	$ 27,000	$ 22,500	$ 34,200	$ 190,800


HQ 623
CHEETAH

USER ANALYSIS

Introduction

Careful consideration must be given to future needs of the park user. Although a great deal of data exist concerning disparate elements of the subject, no comprehensive authoritative study on recreational tourism demand within Minnesota is currently available. Trends in travel patterns are now discernible, but estimates of the time period over which this demand develops and of its magnitude are only speculative at this time. Furthermore, published data largely documents what people have done in the past. Only if it is assumed that these trends will continue can valid conclusions be drawn.

Obviously, these data are not sensitive to any unpredictable technological changes or political events. For example, the oil embargo created an "energy crisis" overnight. This development and its implications have had a direct impact upon travel patterns.

There are two basic aspects of recreational demand. The first involves measurement of the amount and kind of recreational opportunities/facilities currently demanded by the public (e.g., the size of the park or the number of campsites). The second aspect involves an estimate of latent demand for recreational opportunities/facilities which would exist if citizens were given ample opportunity and adequate conditions to participate in an activity (e.g., the number of handicapped campers that would have utilized campsites if the architectural barriers to their use had been removed).

In the planning for the use and development of state parks, an attempt has been made to anticipate the recreational needs of the public by providing increased recreational opportunities while protecting the park's natural resources.

This section of the plan will evaluate Camden's past use and future anticipated use as well as make appropriate recommendations concerning the parks recreational facilities.

Statewide Analysis

Minnesota's population in 1970 was 3,805,000. The Population Distribution Map (p. 14) indicates distribution of residents throughout the state in that year. Of course, the heaviest population concentration is in the Twin Cities and surrounding area. Other important urban centers include Duluth-Superior, Fargo-Moorhead, Rochester, St. Cloud, and Austin-Albert Lea.

Minnesota covers approximately 84,000 square miles, of which nearly 4,000 square miles is water. More than 12,000 lakes of ten acres or more in size are scattered across the landscape, thousands of miles of rivers and streams wind through the state, and approximately 19 million acres of land are forested. These waters and forests, coupled with seasonal changes and abundant wildlife, form a unique resource base providing outstanding recreational opportunities.

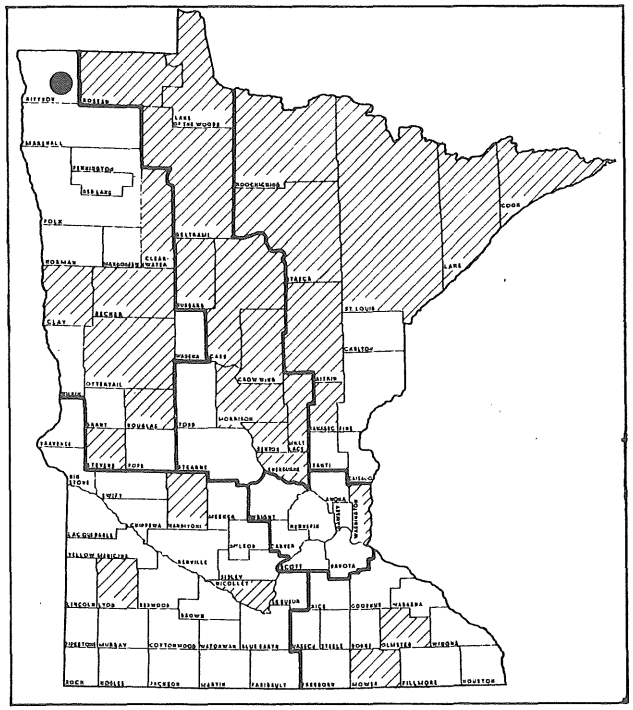
Not all of Minnesota is appreciated the same way. For instance, one person might prefer a forest experience over a prairie experience or vice versa. One thing is clear -- when a significant portion of the population identifies an area as a vacation destination, it is the result of a complex process of positive reinforcement between lodging facilities, natural resources, and other supporting businesses. It would appear that those areas offering the greatest diversity of opportunities receive the greatest use.

The Department of Economic Development (DED) has divided the state into six tourism regions–Arrowhead, Heartland, Metroland, Hiawathaland, Pioneerland, and Vikingland (see Tourism Regions Map, p.**102**). The number of lodges and motels within a given area are an important indicator of its attractiveness. The rank order of the regions based upon total overnite lodging capacity is as follows: Metroland (399,719), Arrowhead (192,842), Hiawathaland (136,519), Pioneerland (129,374), Heartland (88,018), and Vikingland (74,752). When this capacity is compared on a per capita basis, their rank order changes dramatically–Arrowhead (50%), Hiawathaland (34%), Heartland (29%), Vikingland (26%), Pioneerland (25%), and finally Metroland (21%).

Another measure of regional attractiveness is tourist travel expenditures. Using sales and use as data, the DED has estimated that $996,000,000 was spend within Minnesota in tourism-related activities in 1974. Although there are some exceptions (notably Olmsted and Mower counties), counties having in excess of $10,000,000 of tourist-travel expenditures were located in the northern two-thirds of the state. Generally, this trend was strengthened by data showing that northern counties had expenditures, as a percent of county gross sales, above the state average. (See Tourism Travel Maps, p.**101** .) Both measurements, lodging units per capita and tourist-travel expenditures, indicate heavy recreational use in the northern portion of the state.

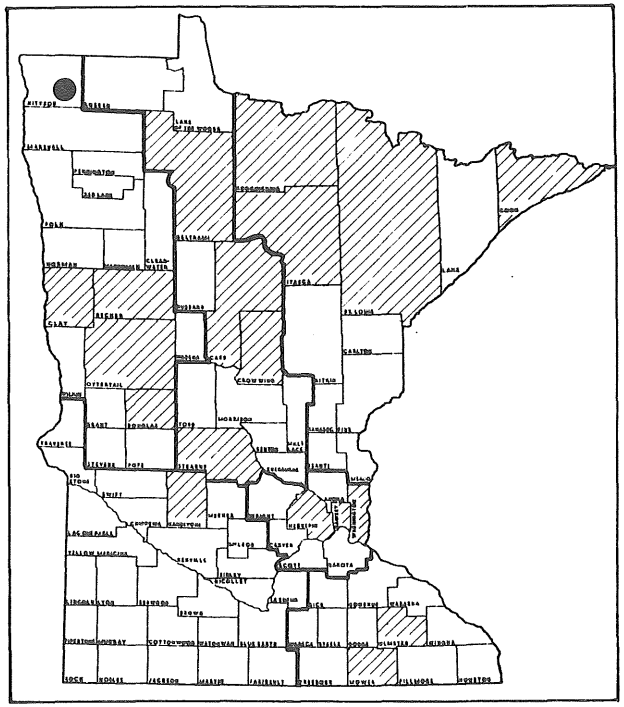
A 1974 opinion survey of residents within the 10-county Twin City area conducted by the Minneapolis Star and Tribune showed that, for Twin City residents, the northern half of the Arrrowhead region, which includes St. Louis, Itasca, Koochiching, Lake, and Cook counties, is the most popular vacation area in the state. Thirty-eight percent of those planning a vacation of a week or more and 39% of those planning a vacation of less than a week in the state said they planned to vacation in that area. Second in popularity was the southern Heartland region (Crow Wing, Mille Lacs, Sherburne, Benton, Stearns, Morrison, and Todd counties). Twenty-five percent of those planning both long and short vacations said they would vacation in southern Heartland.

TOURISM-TRAVEL MAP #1



Minnesota Counties with Tourist-Travel Expenditures as Percent of County Gross Sales Above State Average.

TOURISM-TRAVEL MAP #2



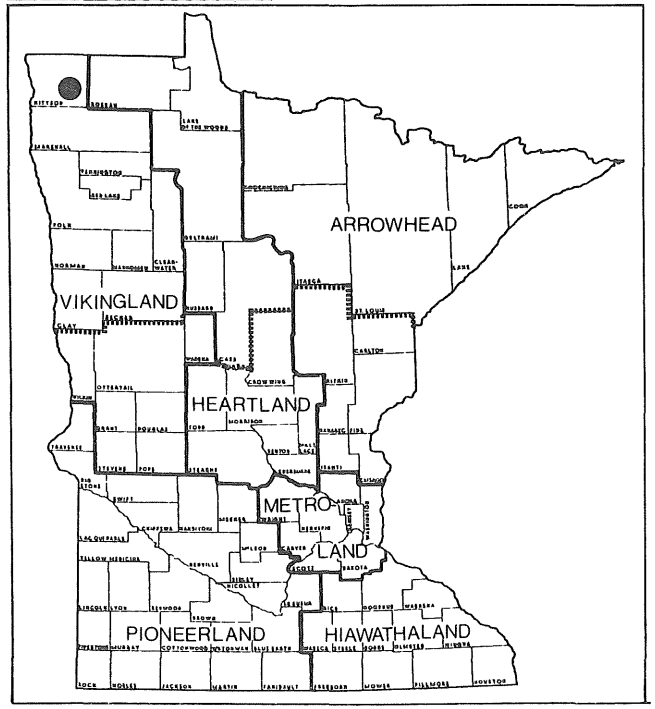
Minnesota Counties with Estimated Tourist-Travel Expenditures of $10,000 and Over in 1974

Vacation Destination Survey

Planned Destination	Vacation of One Week or Longer	Vacation of Less Than One Week
North Arrowhead	38%	39%
South Arrowhead	6	7
North Heartland	11	9
South Heartland	25	25
North Vikingland	6	4
South Vikingland	7	9
Pioneerland	4	8
Hiawathaland	3	8
Metroland	2	3
Undecided	6	12
	108%*	125%*

*Does not total 100% because some respondents named more than one area.

Tourism Regions Map



PHILOSOPHY OF DEVELOPMENT

Introduction

Physical developments within state parks should be limited to those which are necessary for management, park use, and enjoyment. Moreover, these necessary developments should be provided only under carefully controlled safeguards against unregulated and indiscriminate use to insure the least damage to park resources. The location, design, and materials for developments should be consistent with the objectives of perpetuating and conserving the natural environment.

Administrative facilities, including roads and trails, are necessary in all parks for proper management. In most parks, public accommodations such as campgrounds are also necessary. Furthermore, roads, trails, or campgrounds can serve to channel uses within specifically designated locations, thus preventing indiscriminate use of areas which are easily damaged or destroyed.

Within economic and natural resource constraints, it is DNR's policy to provide recreational opportunities for all Minnesotans. However, topographic relief, restrictive soil conditions, or major physical obstructions in some units may require an extensive system of switchbacks, hard surfacing, or bridging to make facilities accessible to the handicapped. These developments may destroy the natural atmosphere for which the unit was established. Therefore, the DNR will concentrate its efforts upon providing accessibility in parks which have the most potential for utilization by the handicapped. Within these potentially accessible parks, a systematic approach will be followed to remove barriers to the handicapped and elderly.

As in all state parks, all future park buildings and facilities in Lake Bronson State Park will be handicapped accessible in compliance with the Minnesota State Building Code, Chapter 55.

User Demand

Lake Bronson State Park, despite its remoteness from Minnesota population centers, is heavily used both by local citizens and by Canadians from Winnipeg who often spend three-day weekends there. Use projections for 1980 had been surpassed as early as 1972. Because of the recreational classification, additional development to meet additional demand is seen as justifiable and consistent with the Outdoor Recreation Act of 1975.

Because of the popularity of interpretive programs and bicycling (a majority of campers bring bicycles with them to Lake Bronson), development of facilities for these activities is recommended. Because of the relatively flat terrain, the development of these facilities is anticipated to be relatively easy, especially for trails.

The continuing development of this northern park will not only help to maintain the area's tourist economy, but will be physical evidence of Minnesota's good will toward our Canadian neighbors and will provide opportunities for international social interaction.

EXISTING DEVELOPMENT

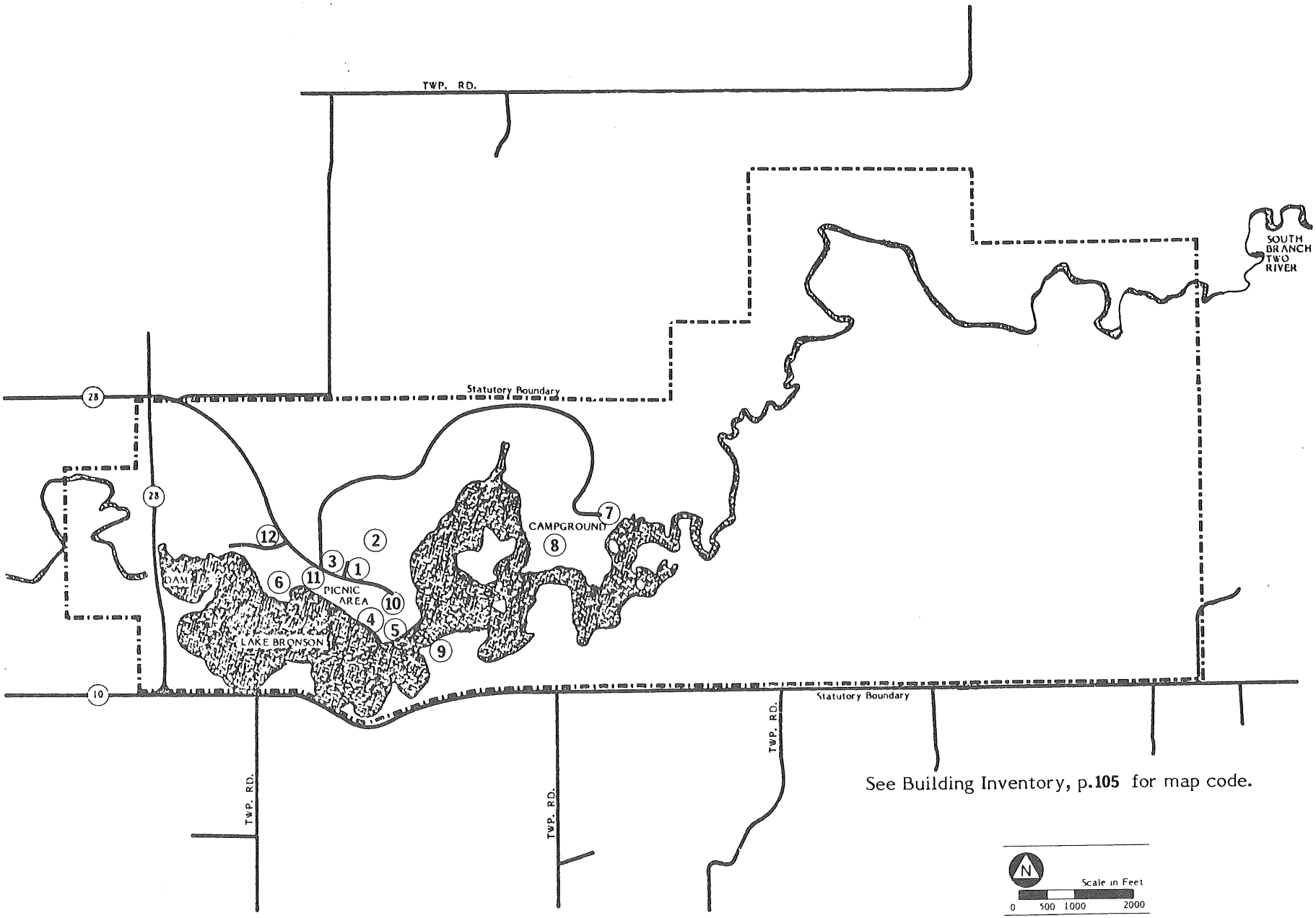
Lake Bronson is a relatively old park developed around a man-made lake created by a unique dam. Much of the park's development took place during WPA days and the granite masonry structures still stand today. Additional frame structures have been added since then.

Major use areas include: three campgrounds, a group camp, a picnic area, and a swimming beach. A sewage lagoon and a drainfield serve modern sanitation buildings in the two main campgrounds. An overflow campground has pit toilets.

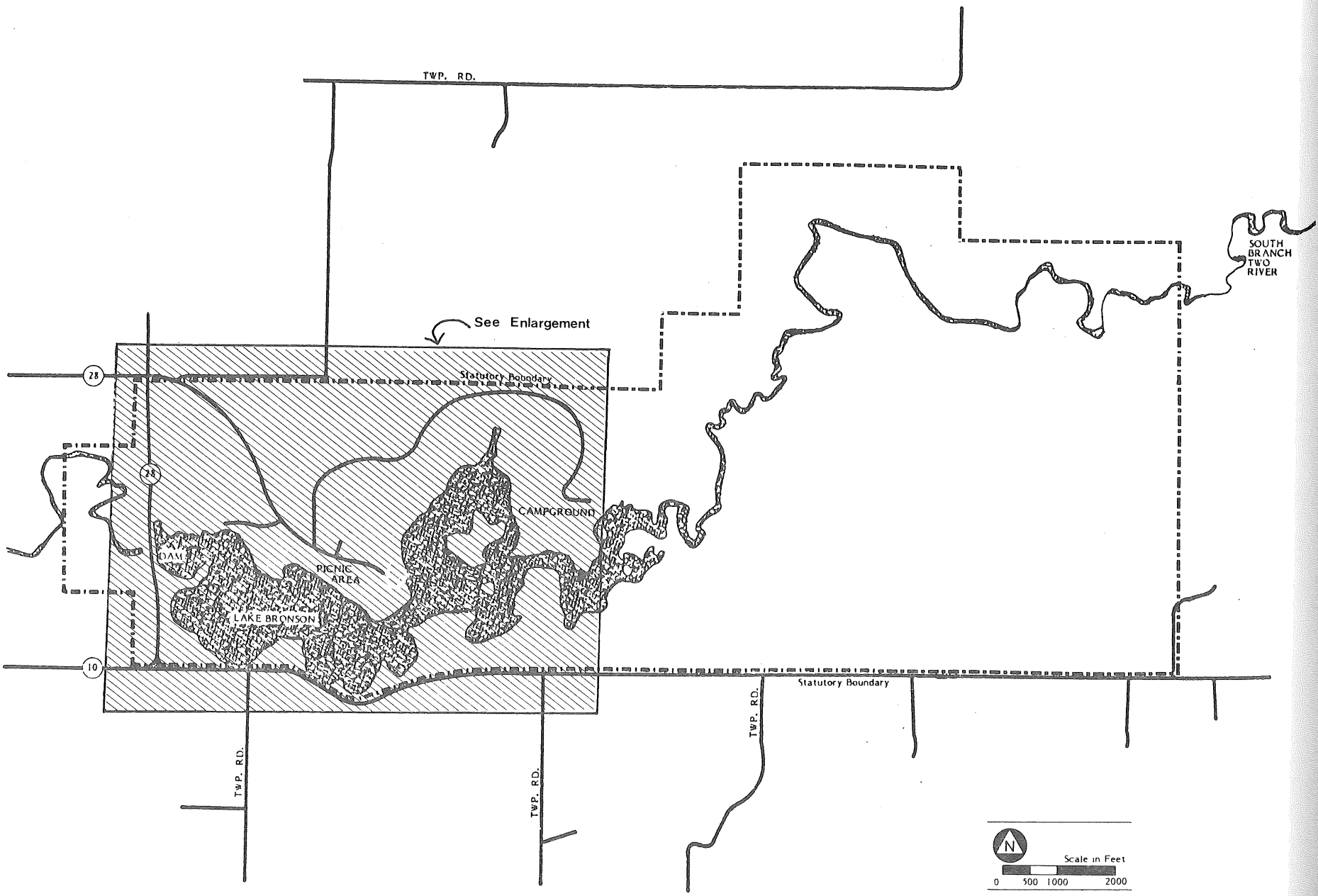
All but 1/2 mile of the major park road is paved with asphalt. The entrance road is built to county state aid highway standards.

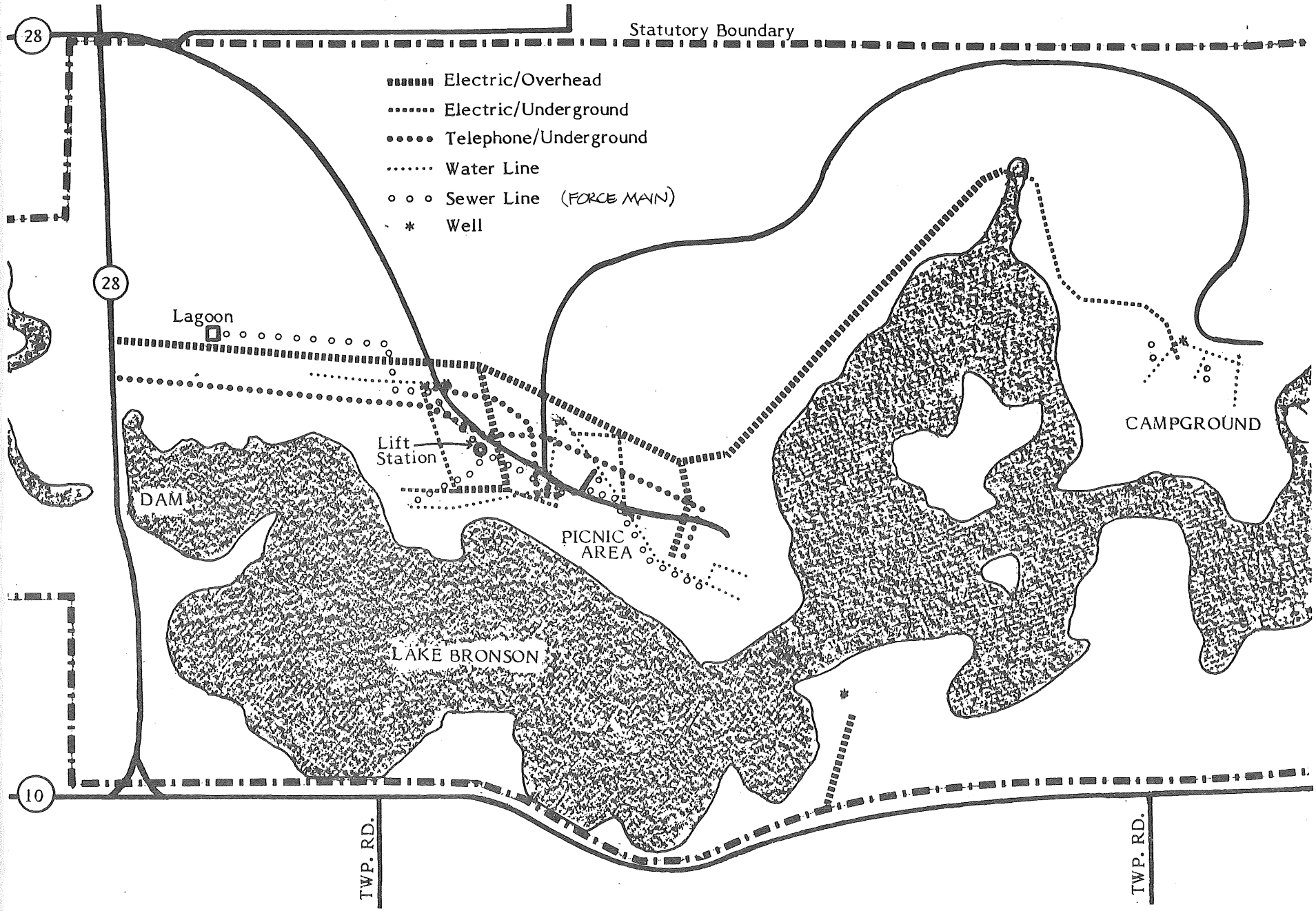
Building Inventory

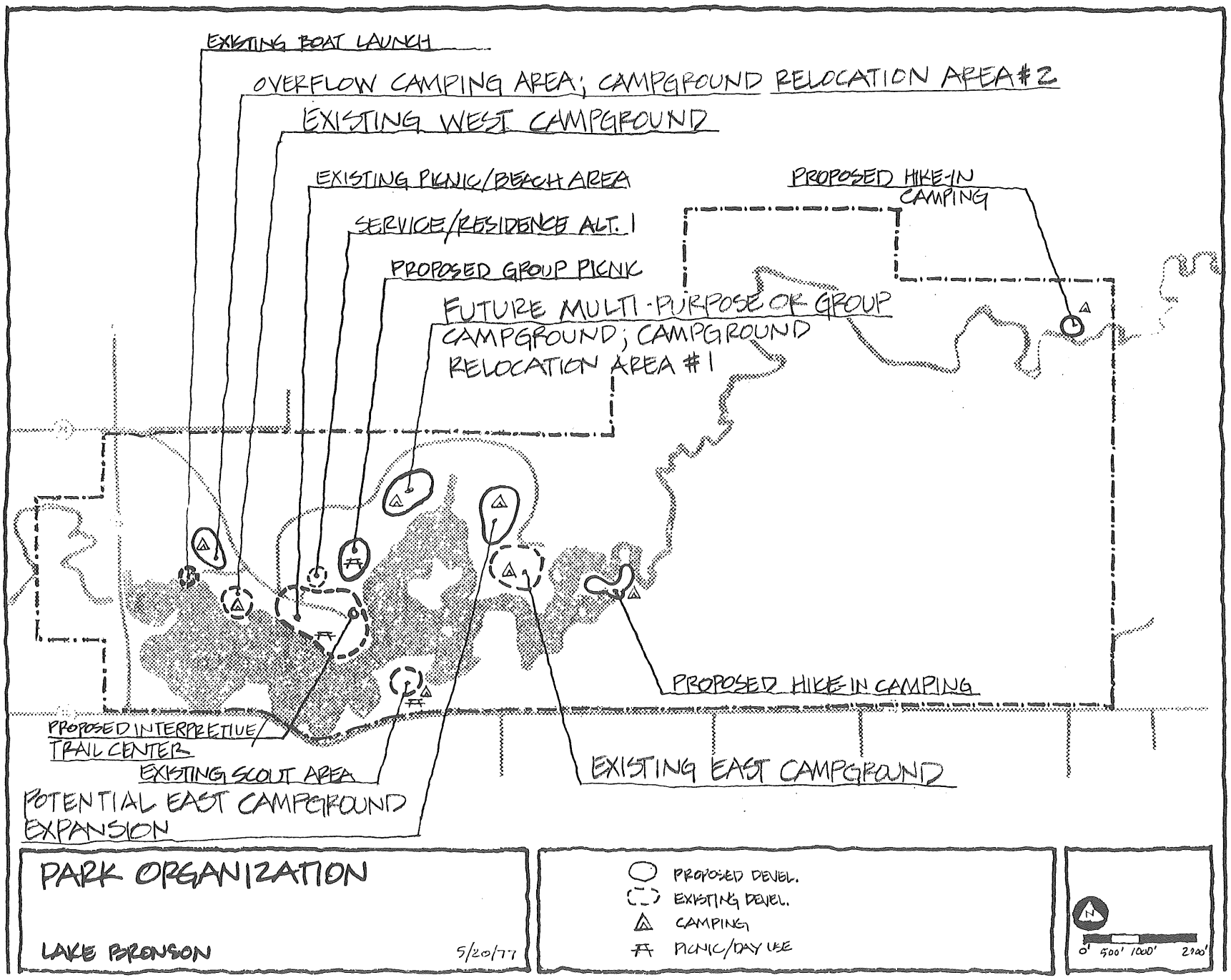
Map Code	Use	Dimensions	Construction	Date Constructed	Condition
	Maintenance				
1	Storage	26'x42'	Stone and wood	1940	Good
2	Shop/warehouse	30'x60'	Board and batten	1964	Good
	Utility				
3	Water tower/observation platform	Hexagon, 14' each side	Stone and wood	1940	Good
	Sanitation				
4	Vault toilet	16'x32'	Stone and wood	1940	Good
5	Change house and refectory	23'x46' 15'x22' addition 14'x24' addition 15'x20' addition	Stone and wood		
6	Sanitation building	25'x36'	Cement block and wood	1960	Good
7	Sanitation building	25'x33'	Cement block and wood	1974	New
8	Sanitation building	25'x33'	Cement block and wood	1975	New
	Group Camp				
9	Mess hall	20'x60' 20'x21' addition	Wood	1940	Good
	Picnic Area				
10	Picnic shelter	27'x68' 24'x24' addition	Stone and wood	1940	Good
	Administrative				
11	Residence	28'x44' 8'x13' addition	Board and batten	1955	Good
12	Contact station	20'x22'	Board and batten	1969	Good



See Building Inventory, p.**105** for map code.


TWP. RD.
See Enlargement
Statutory Boundary
28
28
10
DAM
PICNIC AREA
LAKE BRONSON
CAMPGROUND
SOUTH BRANCH TWO RIVER
Statutory Boundary
TWP. RD.
TWP. RD.
TWP. RD.
N
Scale in Feet
0 500 1000 2000


28
Statutory Boundary
Electric/Overhead
Electric/Underground
Telephone/Underground
Water Line
Sewer Line (FORCE MAIN)
Well
28
Lagoon
Lift Station
DAM
PICNIC AREA
CAMPGROUND
LAKE BRONSON
10
TWP. RD.
TWP. RD.


EXISTING BOAT LAUNCH
OVERFLOW CAMPING AREA; CAMPGROUND RELOCATION AREA #2
EXISTING WEST CAMPGROUND
EXISTING PICNIC/BEACH AREA
SERVICE/RESIDENCE ALT. 1
PROPOSED GROUP PICNIC
PROPOSED HIKE-IN CAMPING
FUTURE MULTI-PURPOSE OR GROUP CAMPGROUND; CAMPGROUND RELOCATION AREA #1
PROPOSED HIKE-IN CAMPING
PROPOSED INTERPRETIVE/ TRAIL CENTER
EXISTING SCOUT AREA
POTENTIAL EAST CAMPGROUND EXPANSION
EXISTING EAST CAMPGROUND
PARK ORGANIZATION
LAKE BRONSON
5/20/77
PROPOSED DEVEL.
EXISTING DEVEL.
CAMPING
PICNIC/DAY USE
N
0' 500' 1000' 2000'

PROPOSED DEVELOPMENT

Introduction

Proposed new development and changes in existing developments in Lake Bronson State Park, as detailed in the following sections, are based on the following objectives, actions, rationales, and should be pursued to the extent that they are consistent with DNR policy.

Objective: To minimize adverse development impacts on natural resources

Action: Restrict the extent and type of development according to zoning map (See Zoning Section).

Rationale: By respecting the development mandates of resource and use zones within the park, the adverse development impacts on the resources will be minimized, while allowing opportunities for high quality park experiences.

Objective: To maximize multiple-use access to the most significant resource areas of the park

Action: Utilize lake frontage and other key areas of the park primarily for trails, secondarily for day-use areas, and only very selectively for campsites.

Rationale: The highest quality sites in the development zones should be shared by all park users. Therefore, the majority of these prime sites should be limited to short term uses. However, because Lake Bronson has extensive shoreline and because camping near the water is popular, a portion of the shoreline can justifiably be allocated to campgrounds, such as the existing west campground.

Objective: To provide information to park users for their enjoyment and education

Action: Locate visitor services such as an interpretive/trail center in a central area of the park.

Rationale: By maximizing the accessibility and effectiveness of these services the reliance on automobiles will be reduced.

Objective: To minimize conflicts among users

Action: Physically separate major use areas which are not directly related, such as facilities for groups and individuals, camping and day-use areas, or trails and picnic grounds.

Rationale: Potential conflicts between areas and users will be minimized. For example, an occupied campsite is somewhat private, whereas a trail is a common facility for the use of any person at any time. Mixing the two would negate the functions of each.

Note: The best solution to some park organization problems is to acquire key parcels of land, notably the Baptist Bible Camp immediately north of the observation tower. Because representatives of the Bible camp indicated at the final public information meeting for this plan that they do not want to sell within the foreseeable future, this plan does not set forth detailed recommendations in those regards. It is recommended that a detailed strategy be developed if and when the land is acquired. In the interim, only minimal investment is recommended. The problems are:

1. The park entrance road separates the observation tower from the remainder of the day-use area. The road should ultimately be rerouted to the north of the tower.

2. Service buildings are located within view of the observation tower. Any new buildings should be located in a screened area. Also, moving existing buildings should be investigated.

3. The manager's residence is located immediately adjacent to the park entrance road and between the observation tower and the lake. Therefore, the residence has a negative visual impact and affords little privacy for the park manager. Moving the structure out of view and adjacent to the service area is recommended. Temporary measures are described in the manager's residence/service area section, p.130.

- Roads and Parking

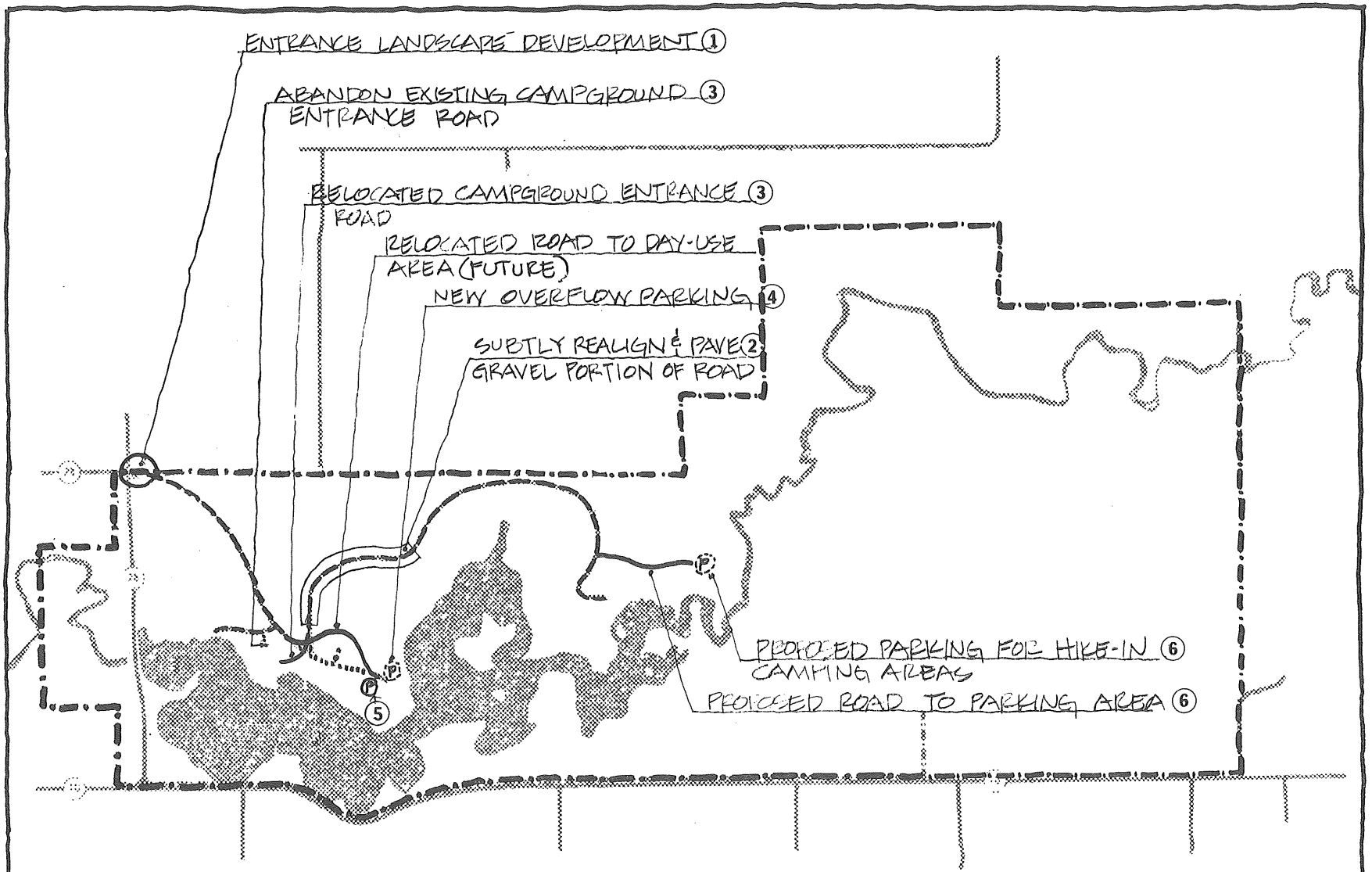
Because of the lack of other transportation systems in the area, private automobiles are expected to provide the major means of access to this park, although the popularity of bicycling and other trail uses may increase (See Trails Section) and provide alternative means of access.

Entrance Road

Objective:

To utilize and modify roads to provide a scenic and enjoyable park experience at the entry and within the park

(1) Action: Plant native vegetation along CSAH 28 as it crosses the park boundary to create an attractive entrance to the park. Place a new sign (donated by Lions Club) in this area. It should be noted that the highway remains CSAH 28 within the park.



FOR MAP CODE, SEE P.P. 111-114

ROADS AND PARKING

LAKE BRONSON

PROPOSED ROAD
EXISTING ROAD
ABANDON ROAD
P/P PROPOSED/EXISTING PARKING

Rationale: The park entrance road is a straight-line extension of CSAH 28 from town, giving the park visitor no awareness of entering the park. Visual definition of the park entrance will make the visitor aware of entering a park environment.

Cost: $1,500

East Campground Road

(2) Action: Realign and pave the remaining unpaved section of road to the east campground as indicated on map page 112. The alignment should be curved and should be placed in the field in order to circumvent all trees.

Rationale: The existing alignment is in two fairly straight segments. A curving alignment will provide a more aesthetically pleasing driving experience.

Cost: $50,000

West Campground Road

(3) Action: Move the entrance to the west campground to the east directly opposite the east campground road as indicated on the map, page 112 , and remove the existing east entrance. The new road should be paved with asphalt.

Rationale: This will allow direct access from the main park entrance road, thus simplifying the traffic circulation pattern. Having entrance roads to both campground areas (north and west) at the same point will further simplify circulation and make the location of use areas in the park easier for the park visitor to perceive. Also, the existing overflow camping area northwest of the east campground will no longer be used for this purpose and, therefore, no direct access from the campground to the overflow area is necessary.

Cost: $5,000

Day-use Area Parking

(4) Action: Repave the existing parking lot with asphalt. Repair or rebuild curbs and wheelchair ramp.

Rationale: This action is needed because the existing facilities are deteriorating.

Cost: $25,000

⑤ Action: Develop an overflow parking area for approximately 150 cars to the north of the existing day-use parking area. Grass, if possible, should be used to cover the overflow parking area to delineate the area in an unobtrusive, yet effective, fashion. The overflow area should be laid out in a field to minimize disruption to trees. The existing parking loop to the east should be eliminated. If the demand increases, measures will be implemented to prevent soil compaction and vegetation deterioration.

Rationale: This action will allow the day-use area to be continuous and uninterrupted by parking areas. Also, it will open up the site for the proposed interpretive center.

Cost: $10,000

Hike-in Camp Parking and Road

⑥ Action: Develop a road and parking lot in the general location indicated on the map (page 112) for approximately 15 cars. Surface with asphalt or class 5 gravel.

Rationale: Provide parking at a logical point for hike-in campers.

Cost: $2,500

- Picnicking

Picnicking, one of the most universally popular forms of outdoor recreation, provides participants an easy opportunity for outdoor recreation. As such, it has a high priority in the park's development program.

Objectives: To improve the park's picnicking facilities

To develop a designated group picnic area

Action: Add a maximum of approximately 50 additional picnic sites to the picnic area as is necessary to meet demand. To the northeast and away from existing picnic area, arrange several sites to encourage group picnicking. Develop other selected sites to be separated and somewhat private by retaining uncut native vegetation between sites.

Rationale: The separation of group picnicking will minimize potential conflicts with individual picnickers. Additional sites will satisfy increased demand.

Cost: $10,000

Action: Develop pit toilets in the group picnic area.

Rationale: Health regulations require these facilities.

Cost: $1,500

Action: Rehabilitate the roof, install new urinals, and generally upgrade the existing picnic ground toilet building.

Rationale: The structure needs these major improvements.

Cost: $5,000

Action: Hard-surface the paths from the parking lot to the sanitation building, picnic shelter, and bathhouse.

Rationale: This action will allow access by handicapped persons.

Cost: $750

Action: Upon completion of the new trail/interpretive center, reconvert the existing picnic shelter to its original character by removing overhead doors and temporary walls.

Rationale: The structure will only be used as picnic shelter. The maintenance of the original character will best accommodate this use.

Cost: $100

Action: Rehabilitate and modernize the mess hall in the Scout area with a new roof, running water, and the addition of refrigeration facilities.

Rationale: This area can be used for group camping and/or group picnicking. These improvements will enable the structure to better serve these uses.

Cost: $5,000

- Camping

Objective: To maintain and modify existing campgrounds to provide high quality tent and recreational vehicle camping opportunities

West Campground

Action: Hard-surface paths to the sanitation building.

Rationale: This action will provide access for handicapped persons. Wheelchair use is currently difficult because the path is not hard-surfaced.

Cost: $1,000

Action: Remodel the existing sanitation building including the installation of new showers.

Rationale: These facilities need major repairs.

Cost: $20,000

Action: Resurface the campground loop roads and spurs with Class 5 gravel.

Rationale: The existing surface is deteriorating and full of chuckholes.

Cost: $10,000

Action: Remove approximately 4 campsites as necessary to achieve a minimum spacing of 60 feet between sites. Revegetate sites.

Rationale: This action will allow a reasonable amount of privacy and will meet minimum standards for state parks.

Cost: $1,000

Action: Establish suitable native vegetation within the campground to create at least one semi-private area in each campsite. Limit mowing accordingly. Do not totally screen campsites from each other.

Rationale: Because the campsites are close together, this campground has developed a clientele which is attracted by the opportunities to socialize. This is a valid use in a recreational state park, especially because the east campground provides more private sites. The creation of some privacy on each site will facilitate this function if done carefully, and will help to soften the appearance of a campground full of cars, tents, trailers, vans, and mobile homes.

Cost: $10,000

East Campground

Action: Hard-surface paths to the sanitation building.

Rationale: This action will provide access for handicapped persons.

Cost: $1,000

Action: Establish, or allow to regenerate, native vegetation in selected areas between campsites and restrict mowing accordingly.

Rationale: This will create some privacy for individual campsites and soften the visual image of the campground when it is full of vehicles and equipment.

Cost: None

Note: Poor soil conditions in this campground may result in further deterioration of the vegetation.

If, in fifteen, years significant deterioration has occurred, and if the land has been acquired, consideration should be given to relocating the campground to the group camp area (Relocation Area 1 on map, page **109**). In this case the campground would serve a multiple function (see group camp, page **118**). If this land has not been acquired, consideration should be given to developing the existing overflow camping area (Relocation Area 2 on map, page **109**) to replace the east campground.

If, in fifteen years, significant deterioration of the soils and vegetation has not occurred, the campground should be maintained in its existing location. In this case, expansion of this campground may be considered if there has been a substantial use increase.

Trail Camping

Action: Develop 3-5 campsites with one pit toilet and a well at each of two locations indicated on the map. Sites should be a minimum of 200 feet apart and have access to the river via a trail and steps.

Rationale: This action will provide an opportunity for novice backpack camping.

Cost: $15,000 ($7,500 each location)

Group Camping

It is recommended that the easternmost Bible camp, if sold to the state, be utilized as a group camp facility. If it becomes necessary to relocate the east campground, the Bible camp area should be developed as a multi-purpose campground to accommodate groups of varying sizes and, alternatively, individual camping parties. Since land acquisition is not anticipated within ten years, the acquisition is not reflected in the budget request.

- Water Activities

Objective: To promote safety and accommodate a high level of swimming, fishing, boating, and waterskiing

Swimming

Action: Enlarge and rehabilitate beach with additional sand.

Rationale: The beach is currently deteriorating.

Cost: $5,000

Fishing

Action: Develop one fish cleaning shelter in each of the two campgrounds. Shelters should be enclosed with screen and have running water, drains, and counters.

Rationale: This action will concentrate by-products and odors from fish cleaning in a place where their impact on other park users and on the resources is minimized.

Cost: $15,000 ($7,500 each)

Action: Develop a fishing deck to be attached to the east side of the bridge at the dam. The deck will double as a trail bridge. Request a 30 mph speed limit on road.

Rationale: This will separate fishermen and others from traffic for safety. Ultimately, the best solution to this conflict might be to close the road to through-traffic.

Cost: $20,000

Boating

Action: Develop the landscape at the boat landing area in east campground by planting and soil amendments as necessary. Also, organize and pave the road and parking areas.

Rationale: Landscaping and paving will prevent soil erosion and improve aesthetics.

Cost: $3,000

Action: Along the shoreline in front of private cabins, develop 3 uniformly designed, low profile, natural color docks to be used on a temporary basis. Each should be able to dock 4-5 boats. Boat docking privileges would be allowed on a yearly permit basis. Existing private boat docks should be removed. All boat docking will occur at these docks, rather than randomly along shore.

Rationale: This action will provide docking facilities in the least obtrusive manner possible, while protecting the scenic quality of the shoreline which is currently being jeopardized by random docking practices. If will also provide shore fishing opportunities. (This action is pending final clearance from DNR legal staff.)

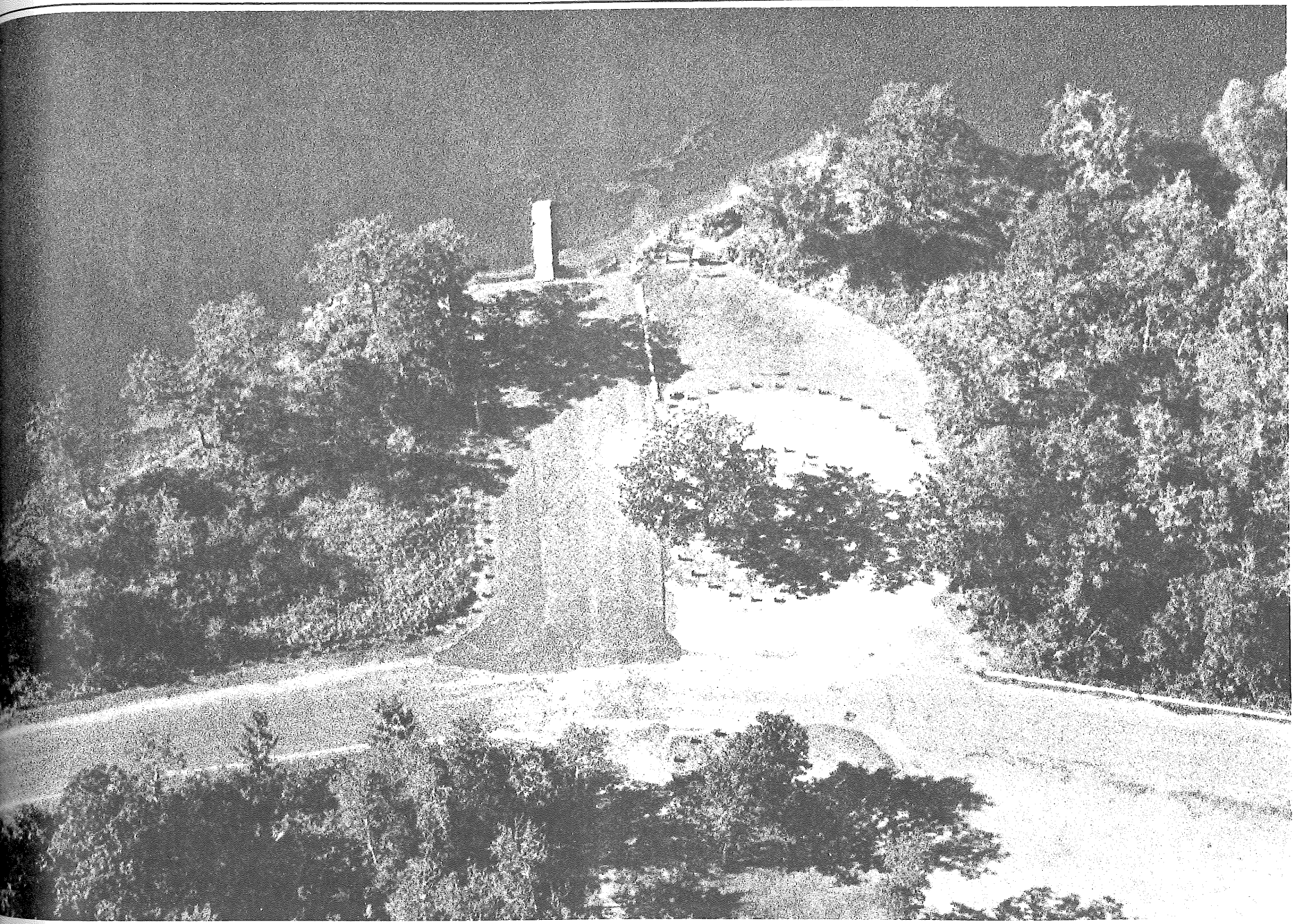
Cost: $2,500

Action: Maintain the west 1/3 of lake as a designated water skiing area, with the remainder a designated 10 mph area.

Rationale: This lake use zoning is necessary for safety because of the large demand by a wide variety of users and because of the lack of other lakes in the region. This action is currently being done. Approved markers have been installed. Further restrictions, such as limiting the number of boats, may be imposed if necessary and practicable in the future.

•Trails

Designated trails provide access to a variety of areas within a park. They allow users to tour and experience the features that make up a park in an efficient manner. Because the trail users keep moving, many visitors are able to share given environments at different times during a day. In conjunction with trail rest areas, trails enables users to spend as much time as they wish in a given area. A second important function of trails is in providing an alternative means of access to the park.



Objectives:

To develop trails which channel visitors through significant park environments

To design trails to enhance visitor sensitivity and enjoyment

To provide a good biking surface

To minimize the impact of trail users on the generally fragile soils of the park (See Soils Section)

Park Access (Regional) Trails

Although there are no designated bicycle or corridor trails in the vicinity of the park, increasing citizen interest as well as other developments such as Voyageurs National Park may generate user demand that might make them a reality. Trails connecting Lake Bronson State Park with other parks and points of interest would be an asset to this park.

One specific opportunity for a trail beyond the park boundaries is recognized by this plan: a multi-use trail along the river between the park and the town of Lake Bronson. Such a trail would provide a safe and scenic link to town. The trail would allow people from the town of Lake Bronson to bicycle, hike, ski, or snowmobile to the park, and allow park visitors to use the same modes of transportation to go to town for meals, groceries, and supplies. There might also be a potential for the private operation of horse-drawn vehicles or sleighs along this route to give visitors an unusual travel experience. Consideration should be given to volume of use and safety before deciding on compatible uses.

Development of this trail, because it is outside the park, would be dependent on local initiative, although funding might be available from a DNR (Trails Section) administered grants-in-aid program. Agreements would also have to be negotiated with the existing landowners.

Internal park trails will be designed to facilitate connection with this trail in the event it is developed in the future.

Internal Trail System

The existing trails within Lake Bronson will be supplemented by additional trails as detailed below. Additional trails to provide shorter loops may be provided at the discretion of the park manager and consistent with park policy. All trails are to be hard-surfaced with compacted Class 5 gravel to provide a good biking surface, a cool hiking surface, and to minimize the impact of trail users on the generally fragile soils of the park (See Soils Section). For winter use, snowmobilers and cross-country skiers will utilize separate trails as indicated on the map, page **125**. In other seasons, all trails will be open to hiking and biking.

High Bank Trail

Action: Extend the existing trail west from the picnic area through the campground area to the dam, taking advantage of views of the lake and the variety of vegetation types along the trail.

Rationale: The High Bank trail extension will provide access to dam, tie in with the South Shore Trail, and tie in with the potential river trail to town.

Cost: $500

Action: Hard-surface the entire High Bank Trail with compacted Class 5 gravel to width of eight feet.

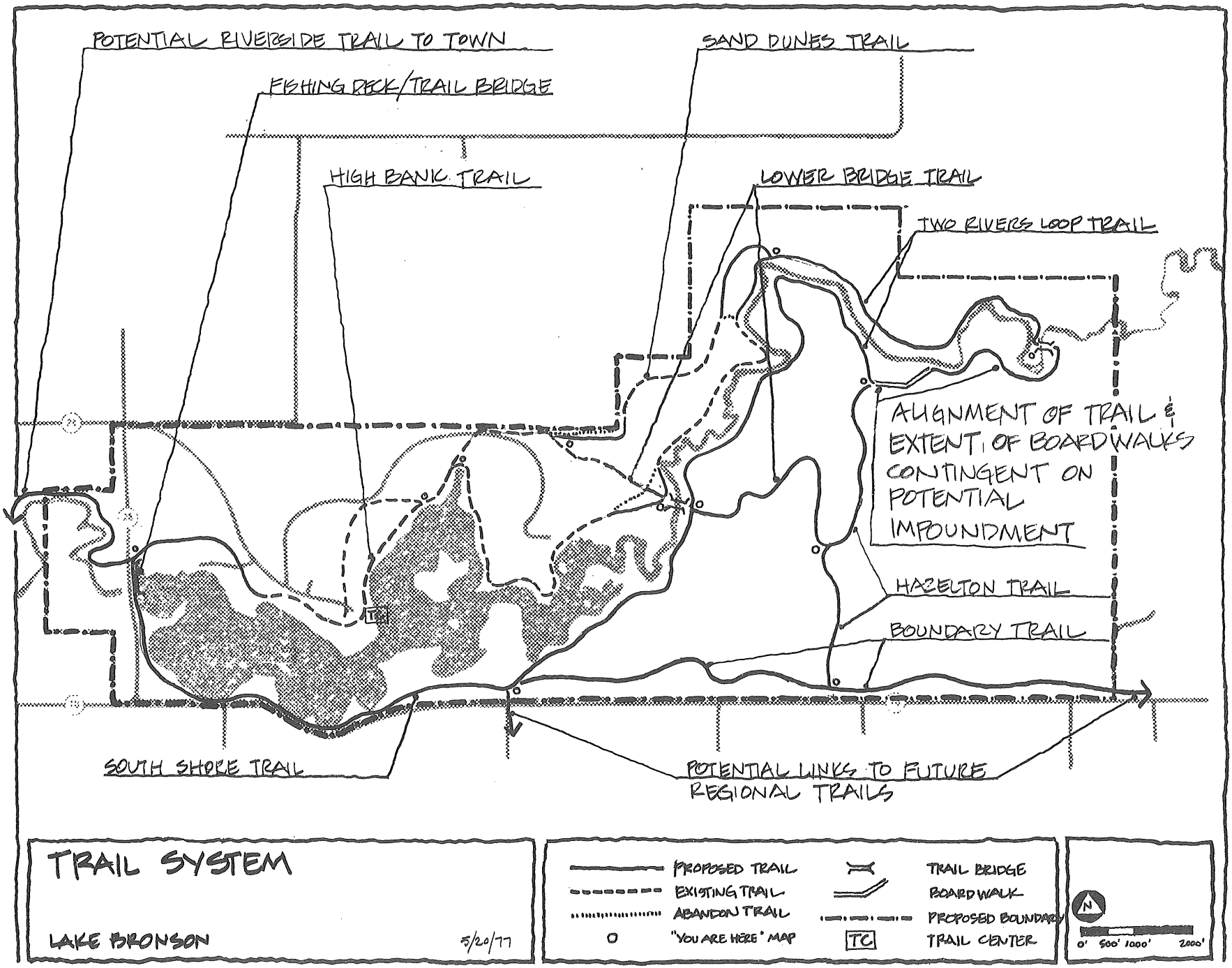
Rationale: It is anticipated that this major trail will receive heavy use. Hard-surfacing will facilitate use and protect resources.

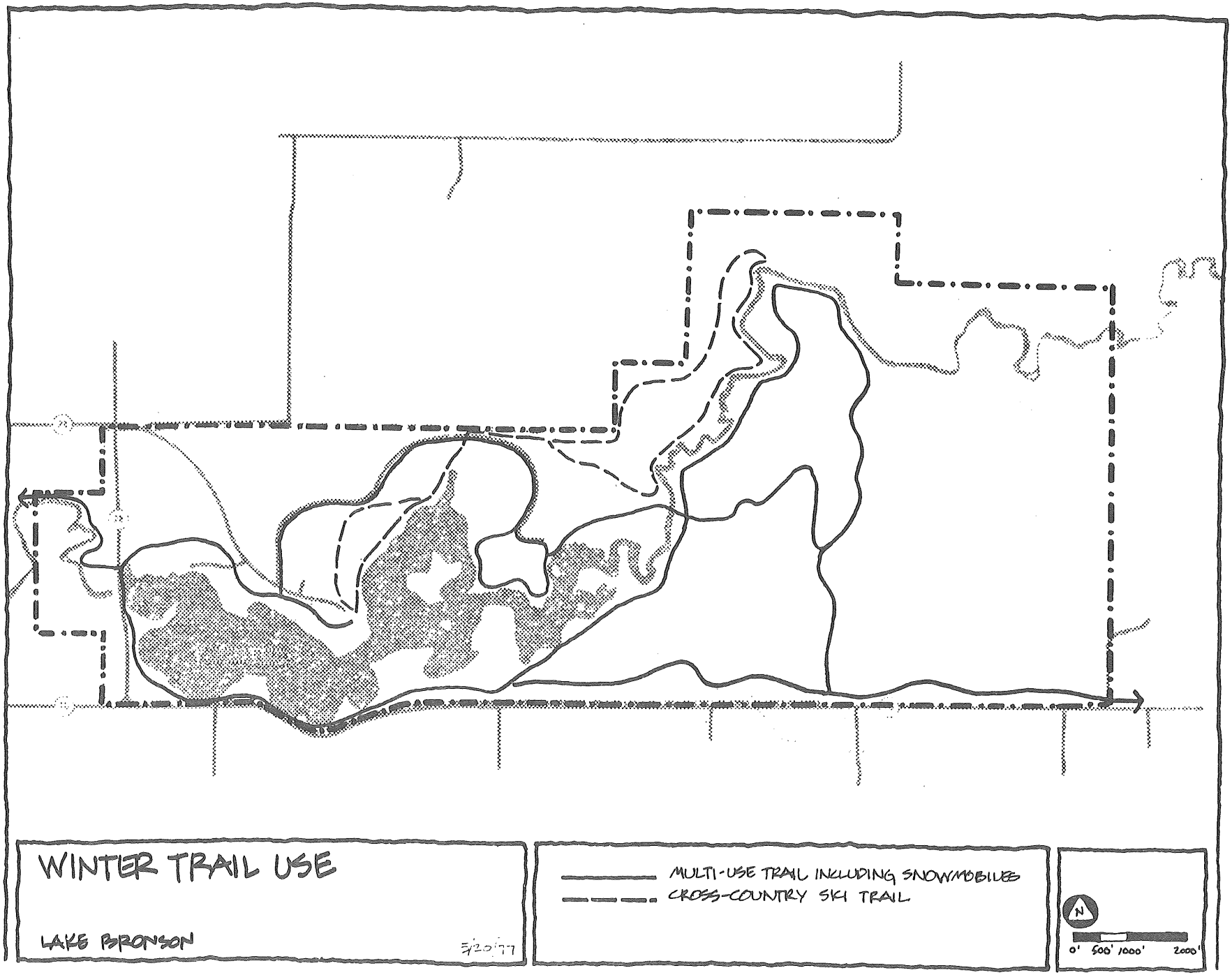
Cost: $12,500

Action: Place 12 benches singly or in pairs at logical rest points and scenic areas at intervals of approximately 1/4 to 1/2 mile, depending on anticipated use volume.

Rationale: This action will provide convenient rest areas along trails and therefore, allow visitors to experience high quality environments for longer periods of time. Since this is a major trail interconnecting use areas within the park, it will be used by a variety of visitors, some of whom may tire easily.

Cost: $1,200


POTENTIAL RIVERSIDE TRAIL TO TOWN
SAND DUNES TRAIL
FISHING DECK/TRAIL BRIDGE
HIGH BANK TRAIL
LOWER BRIDGE TRAIL
TWO RIVERS LOOP TRAIL
ALIGNMENT OF TRAIL & EXTENT OF BOARDWALKS CONTINGENT ON POTENTIAL IMPOUNDMENT
HAZELTON TRAIL
BOUNDARY TRAIL
SOUTH SHORE TRAIL
POTENTIAL LINKS TO FUTURE REGIONAL TRAILS
TRAIL SYSTEM
LAKE BRONSON
5/20/77
PROPOSED TRAIL
EXISTING TRAIL
ABANDON TRAIL
"YOU ARE HERE" MAP
TRAIL BRIDGE
BOARDWALK
PROPOSED BOUNDARY
TC
TRAIL CENTER
N
0' 500' 1000' 2000'


WINTER TRAIL USE
LAKE BRONSON
5/20/77
MULTI-USE TRAIL INCLUDING SNOWMOBILES
CROSS-COUNTRY SKI TRAIL
N
0' 500' 1000' 2000'

Sand Dunes Trail

Action: Extend the existing trail northwest to the sand dunes area. Surface the entire trail with compacted Class 5 gravel to a width of eight feet.

Rationale: Extension of the trail will allow visitors to see dune/juniper complexes and potentially, in conjunction with the interpretive program, to become aware of their sensitive nature. The gravel surface will help define trail to keep visitors on the trail.

Cost: $10,000

Two Rivers Loop Trail

Action: Develop a loop trail between two proposed trail bridges on both sides of the river. Lay out the alignment in a field to allow views of the river and access to the river at logical points, such as sand bars, where the impact on soils and vegetation will be minimized. Align the trail to pass through a variety of vegetation. Occasionally the trail should follow the river bottom areas where possible. Avoid extensive alignment through open areas.

Rationale: Well-planned alignment will enhance a high quality experience of the river ecosystem and provide access to future hike-in campsites.

Cost: $3,000

Action: Surface the trail with compacted Class 5 gravel.

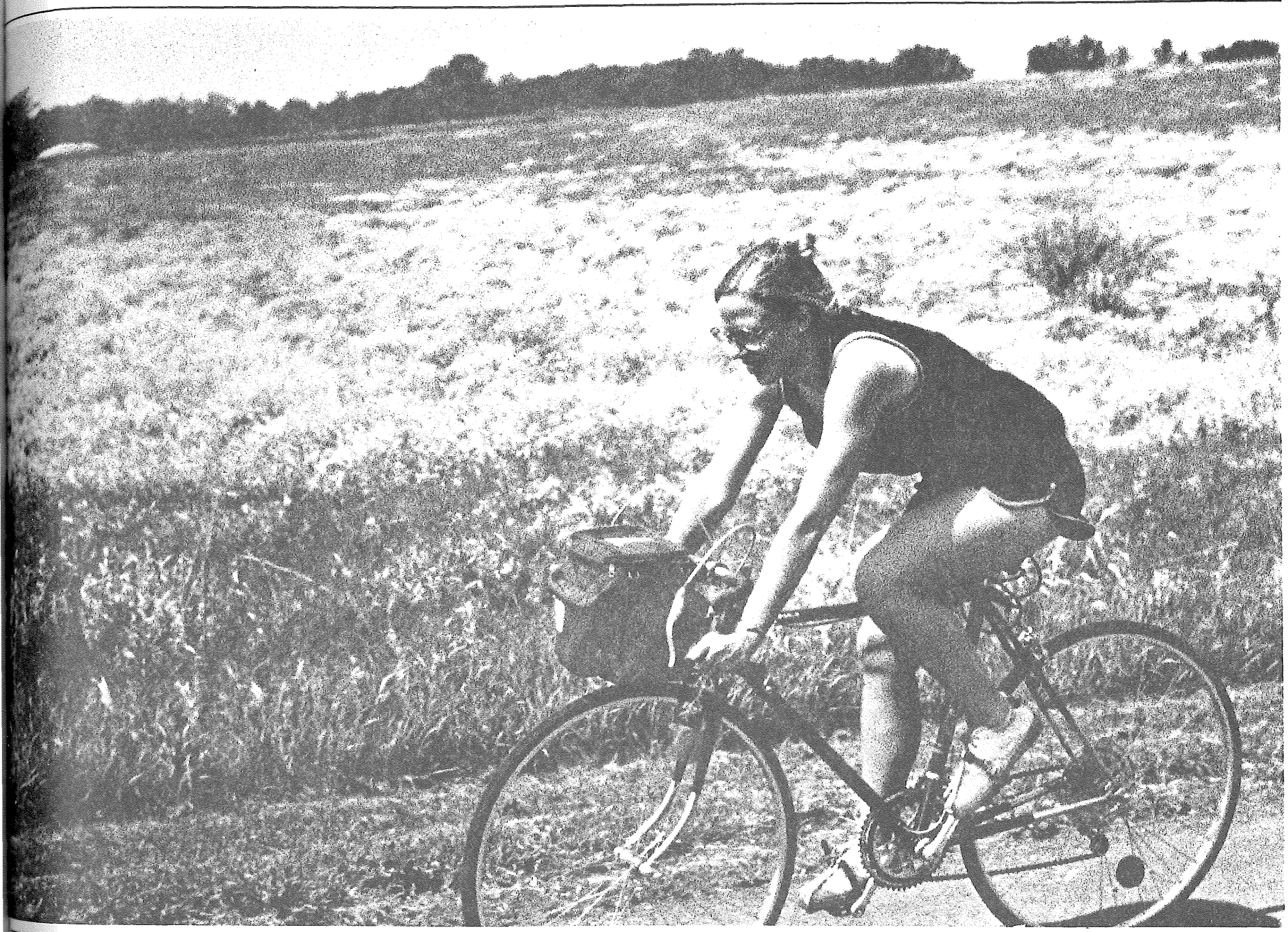
Rationale: This action will minimize erosion and create a good bicycling surface.

Cost: $25,000

Action: Develop two flood-proof bridges in locations indicated on the map, page **124**.

Rationale: The bridges will enable visitors to cross the river at historic points.

Cost: $25,000



Lower Bridge Trail

Action: Develop a trail as is indicated on the map, page 124. Trail alignment will be selected in the field to ensure interesting trail experiences. Surface with compacted Class 5 gravel.

Rationale: This trail will interconnect with other trails and provide a wider range of trail lengths.

Cost: $5,000

Hazelton Trail

Action: Develop a trail as indicated on the map, page 124, utilizing boardwalks through marsh areas as necessary. The remainder should be surfaced with compacted Class 5 gravel. Alignment will be determined in field to take advantage of diverse environments and natural features.

Cost: $8,000 (Boardwalks are $25/foot)

Boundary Trail

Action: Develop the trail as indicated on map, page 124 . The alignment still needs to be determined in the field. Surface the east half of trail with compacted Class 5 gravel. The trail through section 35 will be developed when other connecting trails beyond the park boundary are developed. Work with the Kittson County Engineer to coordinate the trail design through constricted area between Lake Bronson and CSAH 10.

Rationale: This trail may be a portion of the future regional trails system.

Cost: $10,000

South Shore Trail

Action: Develop a trail as indicated on the map, page 124 with an alignment that will be determined in field to take advantage of the views of the lake. Surface the trail with compacted Class 5 gravel.

Rationale: This action will allow hiking, biking, and snowmobiling around entire lake.

Cost: $13,000

Short Loop Trails

Action: In addition to the above trails, develop short loop trails in areas to be determined by the park manager.

Rationale: The need for short loops can best be determined after other developments are completed. They can be used for interpretive or other more general purposes.

Cost: $9,000

- Manager's Residences/Service Area

Objective: To provide facilities which will ensure effective and efficient management of the park

If the Baptist Bible Camp is acquired by the state, this area will be evaluated for the new service area/residence site. Until this time, it is recommended that existing structures be maintained, with the following modifications:

Action: Redevelop the site of the existing manager's residence to screen the residence area from public view and to create privacy for the residence. Utilize transplanted trees and shrubs and/or fences for screening. Remove the existing parking area. Screening techniques should not be obtrusive.

Rationale: The residence currently lacks privacy and is too visible from road.

Cost: $3,000

Action: Build a new equipment storage shed in the area of the existing service yard keeping in mind the possibility that the service area may, in the future, be moved to the north.

Rationale: Existing facilities are overcrowded.

Cost: $8,000

Utilities

Note: The existing sewage system is functioning adequately at the present time. However, to allow for potential demands, $100,000 has been tentatively budgeted for the 1986-87 biennium.

Action: Replace the four-inch water line from the water tower to the picnic area refectory.

Rationale: Since the existing line has deteriorated and is leaking at the rate of approximately 5,000 gallons per day, it should be repaired.

Cost: $15,000

Architectural Theme

Objective:

To develop an architectural theme that maintains continuity with existing structures and that is visually harmonious with the natural environment of the park

An architectural theme will be developed by the Bureau of Engineering in coordination with the Park Planning staff. This theme will be used in the design of all structures built in public areas of the park.

RECREATION MANAGEMENT BUDGET

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Roads and Parking						
Entrance Development	$ 1,500					$ 1,500
East Campground Road		$ 50,000				50,000
West Campground Road		5,000				5,000
Pave Day-Use Parking		25,000				25,000
Overflow Day-Use Parking			$ 10,000			10,000
Trail Camp Road/Parking			2,500			2,500
Picnicking						
Picnic Sites					$ 10,000	10,000
Pit Toilets/Group Area					1,500	1,500
San. Building Rehab.	5,000					5,000
Hard Surface Paths	750					750
Picnic Shelter Modification				$ 100		100
Scout Area Building Rehab.		5,000				5,000
Camping						
West Campground						
Surface Paths	1,000					1,000
San. Building Rehab.	20,000					20,000
Road/Spur Resurface	10,000					10,000
Campsite Spacing/Res.	1,000					1,000
Vegetative Screening	10,000					10,000
East Campground						
Surface Paths	1,000					1,000
Trail Campsites			15,000			15,000

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Water Activities						
Fishing						
Fish Cleaning Shelter		15,000				15,000
Dam Fishing Deck			20,000			20,000
Boating						
East Campground						
Launch Rehabilitation	3,000					3,000
Temporary Cabin						
Boat Docks	2,500					2,500
Swimming						
Beach Rehabilitation		5,000				5,000
Trails						
High Bank Trail						
Extension	500					500
Surfacing	12,500					12,500
Benches	1,200					1,200
Sand Dunes Trail		10,000				10,000
Two Rivers Loop Trail	3,000					3,000
Surfacing		25,000				25,000
Bridges	25,000					25,000
Lower Bridge Trail					5,000	5,000
Hazelton Trail					8,000	8,000
Boundary Trail					10,000	10,000
South Shore Trail				13,000		13,000
Short Loop Trails		3,000		3,000	3,000	9,000

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Residence/Service						
Residence Site Work		3,000				3,000
Equipment Storage Shed		8,000				8,000
Utilities						
Sewage Lagoon Cell					100,000	100,000
Picnic Area Water Line	15,000					15,000
Total	$112,950	$154,000	$47,500	$16,100	$137,500	$468,050

Interpretive Program

INTRODUCTION

Interpretation is "an educational activity which aims to reveal meanings and relationships through the use of original objects, by first-hand experiences and by illustrative media, rather than simply to communicate factual information" (Freeman Tilden). In this light, the interpretive services program aims to foster in the public an understanding of park resources and management by:

1. Revealing the kinship of park visitors to the park environment and, by association, their even broader involvement within ecosystems.

2. Illuminating the historic and ongoing impacts of natural forces within the park and upon the people who use them.

3. Assisting park visitors in the discovery of meaningful and satisfying ways in which to enjoy their visits without intruding on the experiences of others or impairing the quality of the park environment.

4. Explaining the mission of the Department of Natural Resources' interdisciplinary park management practices and the importance of public participation and support in the operation of this agency.

Interpretive services will be developed in recognition of the following:

1. The park contains fragile life communities which can be perpetuated only through careful management.

2. People are a natural and necessary element in the park environment, free to enjoy the environment in non-destructive ways.

3. All natural resource units, and the publics they serve are tied to one another ecologically, economically, socially and politically.

It is hoped that the people who recreate and learn in Lake Bronson State Park will, by experiencing the park and related interpretive services, gradually increase their environmental awareness.

INTERPRETIVE THEMES

Introduction

Lake Bronson is located on one beachline of glacial Lake Agassiz. The awesome geological forces that created glacial Lake Agassiz have had a tremendous impact on the people living near its shores over the past 10,000 years.

Each successive native culture has responded differently to the Agassiz beachline environment. Yet, there are interesting parallels. Burial customs, for example, are similar at both the nearby Arvilla Mound Complex and the park's pioneer cemetery. Many cultural artifacts of these different groups offer fascinating opportunities for recreational exploration. Since these cultural artifacts offer the greatest interpretive potential, a cultural theme will be developed for the park.

Objective:

To promote park visitor awareness and appreciation of recreational opportunities and historic/natural phenomena within and related to the park primarily through resource-oriented activities

Key Displays and Program Opportunities

Human History/Prehistory

The archaeological story of the Arvilla Mound Complex represents a tremendous opportunity for interpretive programming. Visits to the dig and Arvilla Mound Complex have already been conducted as well as other interpretive demonstrations. Also, representative artifacts have been offered to the park by local citizens for the development of displays. A slide series on the archeological dig of 1976 was given to the park. A mural at the visitor center may feature a hypothetical prehistoric view of the burial mounds. This mural will help to explain the ceremonial significance of the Arvilla Mound Complex.

Human History/Settlement

Relics of the homesteading era -- a spring house by the river, foundations, and wells -- can be used to tell the park's story through slide shows, taped oral histories, murals, and tours to points of historic interest. A variety of media will be used to recapture this important period.

Burial practices, as conducted in the park at different times, offer a fascinating comparison of human perceptions, beliefs, and rituals. The park's pioneer cemeteries carry the names that are still prominent in the Lake Bronson area and tie into the history of the park.

Human History/The Dam

A portable display of the history of the Lake Bronson Dam has been developed for the park visitor center. Models and tours of the dam site will be used to illustrate: the events that led up to its construction, its unique construction, and the impact the dam has had on the local environment and the people. Care will be taken so that the historic interpretive program offered at the park will not duplicate the new Kittson County Historical Society facility in the town of Lake Bronson.

Glacial History

Interpretive media will be used to give visitors a concept of the geological forces that created this park landscape. Murals and other visuals will be used to illustrate the vastness of Glacial Lake Agassiz. The naturalist will conduct interpretive hikes along the Agassiz beachline. A collection of glacial erratics (rocks) made by the park manager has been classified, captioned, and is ready to be assembled into a display that will illustrate some fundamental processes.

Natural History

Interesting species representative of the park's prairie communities, oak savanna, bottomland hardwoods, and aquatic environments will be featured in visitor center displays and in audio-visual programs. Special guided tours into the unique sand dune community and other unusual habitats will be conducted by the naturalists. Astronomy programs and tours of the lake environment focusing on water quality are also planned.

INTERPRETIVE FACILITIES

Action: In a location north of the swimming beach/picnic area (see map, page **109**), develop a combination interpretive/trail center that is convenient to, and visible from parking and use areas. The center should be largely screened from the lake, but filtered views of the lake should be visible from the center. The structure will be winterized and should contain the following:

1. An area for orientation displays (see below) near entrance.
2. Areas for in-depth interpretive displays (see below) and activities, with a possible outdoor activity space related to it.

3. A combination program delivery area (for small audiences) and warming area for winter park users. This area should contain a place for built-in projection equipment, a combination reverse/forward projection screen on a north or east outside wall (to minimize effect of sun on screen for outdoor afternoon and evening shows), and a functional and heat efficient fireplace.
4. An outdoor amphitheater situated to utilize a reverse projection screen for program deliveries to large audiences.
5. Office space for the naturalist.
6. Sanitation facilities.
7. A direct telephone line to manager's office.

Rationale: By developing orientation and interpretation programs in this way, efficient and effective communication with park users will be facilitated. The site is well-suited for this center because of its proximity to the park entrance and its convenient location in the major day-use area and to other park developments which allow easy access by trail. No special parking areas are required, as parking needs can be satisfied by existing and proposed day-use parking areas.

Cost: $120,000

Action: Develop displays to be located at each of the following places: the contact station, the interpretive/trail center, the bath houses, the picnic shelter, and at each of the three campground sanitation buildings. There will be a total of seven displays. The displays will include: (1) A large detailed map of the park showing vegetation, all use areas including trails, individual campsites, and landmarks; (2) Photographs keyed to the map of natural features, park wildlife, and facilities; and (3) Handout brochures with a detailed park map and other appropriate information (available at the contact station and interpretive/trail center only).

Rationale: This action will provide orientation information to park visitors.

Cost: $20,000

Action: Develop a detailed topographic model of the park to represent landforms, vegetation types, features of interest, and all developments including trails and individual campsites.

Rationale: A three-dimensional model can be an effective and widely understood medium for communication of what is in the park.

Cost: $8,000

Action: Develop special interpretive displays to communicate various aspects of the park in greater depth. Specific subjects and media will be determined by the Interpretive Prospectus (see below). All displays will be as vandal-proof as possible to ensure that the center can function without the constant presence of staff.

Rationale: Communication with park visitors should help them become aware of interesting features in the park.

Cost: $15,000

Action: Explain to the local community that the creeping juniper beds in the park are rare and fragile so that they will become involved in protection.

Rationale: There is a need to protect creeping juniper from vandals.

Interpetive Prospectus

A detailed procedure for implementing the interpretive plan including: costs, phasing, program and display content, and format will be prepared by the regional naturalist and the interpretive services coordinator, in consultation with the Park Planning staff, during the next biennium. The prospectus may also include recommendations for research on park ecology, visitor use, and oral history, as well as possible plan modifications.

ORIENTATION/INTERPRETATION MANAGEMENT BUDGET

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Orientation Displays	$ 10,000	$ 5,000		$ 5,000		$ 20,000
Park Model				8,000		8,000
Interpretive Displays				15,000		15,000
Interpretive/Trail Center				120,000		120,000
Total	$ 10,000	$ 5,000		$148,000		$ 163,000

Boundary Modification

Introduction

Boundary adjustment and acquisition must be considered in the management of any state park. The amount of land necessary to manage a park correctly must be determined and acquired before management can be efficiently carried out.

Objectives:

To study all present and future state parks to determine if they have sufficient acreage to preserve and perpetuate their natural resources and still provide areas for the necessary recreational facilities and activities

To control all land within the statutory boundary by fee title (direct ownership)

The following framework will be used in developing adjustment and acquisition priorities:

1. Land needed for preservation or perpetuation of park resources or values.

2. Land needed for development of facilities.

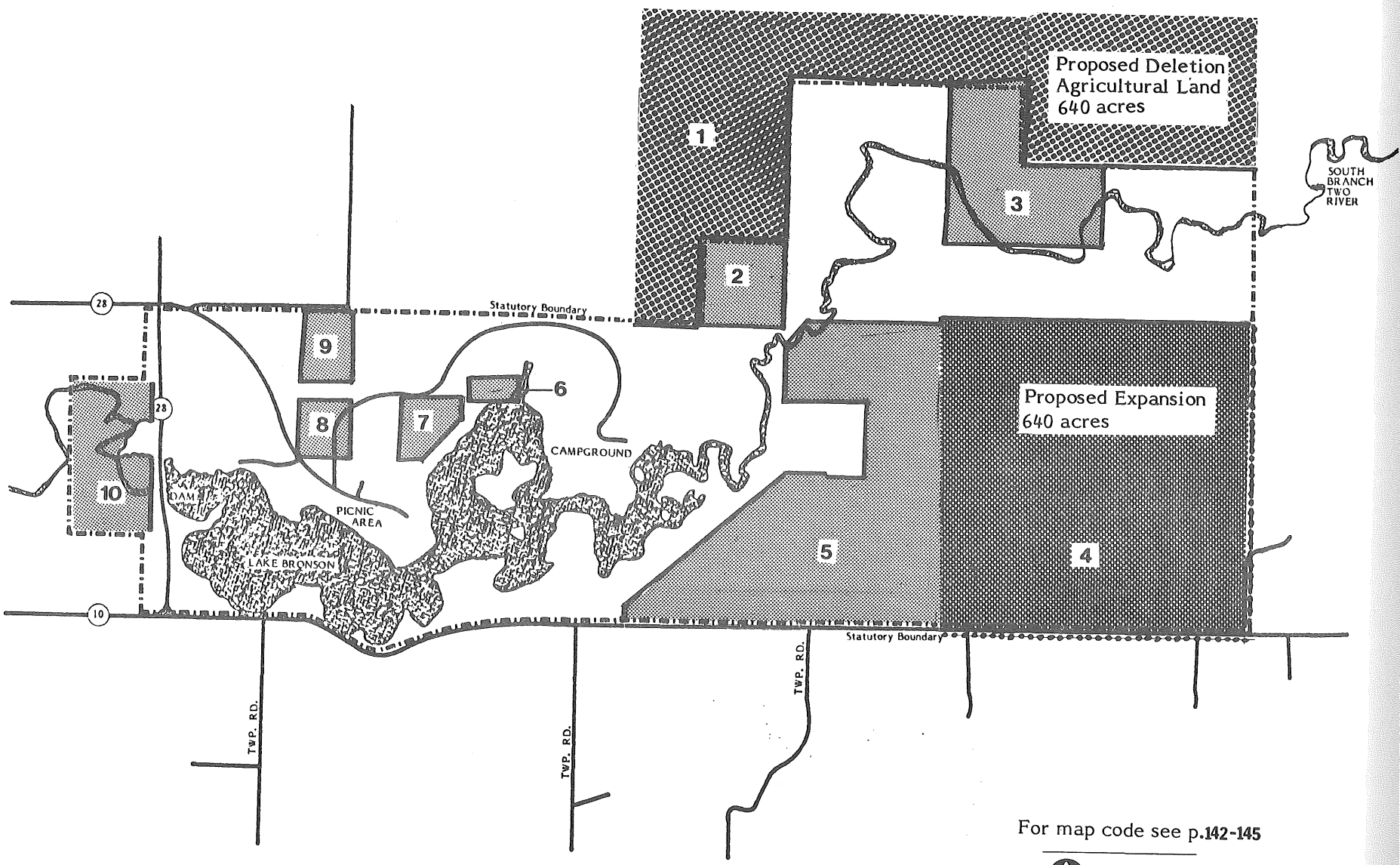
3. Unimproved buffer land needed to prevent threatened development or use which would be incompatible with existing or potential park purposes.

Expansion Potential

The present statutory boundary of Lake Bronson State Park encompasses 2,938 acres. Only 1,654 acres (55%) are presently in state ownership. The remaining 45% is in private ownership. Acquisition, in the past, has been on a willing seller basis and future acquisition should continue on this basis. Certain parcels of land, however, are essential to the park for different reasons and accelerated efforts for acquisition of these parcels should be emphasized. Recommendations in other portions of this plan detail the use of these parcels and alternative methods of providing the required facilities.

Acquisition Recommendations

Map Code p. 143	Recommendation	Rationale/Objectives	Priority
1	Delete	This group of parcels has been farmed in the past and is still being used. Irrigation wells are present and the land has been irrigated in the past. The present landowners are unwilling sellers. These parcels are not necessary to serve the needs of the park visitor or to protect the river. Note: This area of the park was deleted from the statutory boundaries by the 1977 legislature	High
2	Acquisition	Within this parcel are: a pioneer hardwood community, an old field community, and a brush community, all of value to the park. Acquisition is important in order to provide trail access along the river to the upper portions of the park.	High
3	Acquisition	Included in these parcels are bottomland hardwoods, open woods, and about 60 acres of agricultural land. Acquisition is needed to provide access along the river and a buffer area to screen out off-site visual impacts. The hiking trail adjacent to the river will pass through these parcels.	High
4	Proposed Expansion	The proposed expansion of 640 acres is owned by 3 separate individuals. Each has been individually contacted and has either expressed a tentative or definite interest in selling land to the park. The area is generally wooded or brushy with some old fields scattered throughout. The area will be used primarily as an area for a secondary impoundment to reduce the silt, mineral, and nutrient load of the water entering Lake Bronson and to provide additional wildlife habitat. Trails will be a secondary use in the area. Note: This area was added to the statutory boundaries by the 1977 legislature.	High



For map code see p.142-145

5	Acquisition	The present owner of this property has expressed a desire to sell his property to the state. He also owns land in Unit 4 above. To acquire all of his holdings in one purchase, it has been requested that the legislature authorize the above expansion. The predominant plant community is pioneer hardwoods (primarily aspen). The parcel will be primarily used for trail purposes.	High
6	Acquisition	This site is the location of the Lutheran Bible Camp and the proposed location of the park group camp. Presently, the location and architectural appearance of some of the buildings are not compatible with the overall theme of the park. Acquisition on a willing seller basis is recommended.	High
7	Acquisition	Cabins and undeveloped parcels should continue to be acquired on a willing seller basis. Portions of this plat contain creeping juniper beds which could be destroyed if cabins were constructed on the site.	High
8	Acquisition	This property is the site of the Baptist Bible Camp. The buildings are very near the service area. Acquisition should proceed on a willing seller basis. In the future, the historic church at this location could be moved to the town of Lake Bronson as an adjunct to the Kittson County Historical Building and could serve as a focal point for the restoration of a frontier village.	High

9	Acquisition	This tract generally consists of old fields. The value of the tract lies in its buffering effect, shielding the park facilities from outside, non-park users. Vegetative screening along the township road will eliminate views outside the park which may not be consistent with a true park experience.	Medium
10	Acquisition	Plant communities in this tract are predominantly hardwoods along with pioneer hardwoods and some agricultural land. This tract is needed to provide an emergency spillway during periods of high water flows. The hydrological report recommended on page **36** will determine the level of need for a spillway to minimize the potential of downstream flooding. The present owner has indicated an unwillingness to sell this parcel which is of high priority in the event a spillway is necessary.	High

STAFFING AND EQUIPMENT

Introduction

Maintenance is an essential, little noticed, and difficult to finance responsibility of the Parks and Recreation Division of the Department of Natural Resources. The basic obligation of the state is to maintain the landscape resources and state park facilities in a safe, sanitary, environmentally sound, and aesthetically pleasing condition. These facilities must be operated in a manner that provides maximum use and enjoyment at the least possible cost, consistent with state law. There are four basic aspects to maintenance and operations:

1. Maintenance of the landscape resources for the use and enjoyment of future generations
2. Maintenance of the recreation facilities that provide access to those resources
3. Provision of services to the park visitors for maximum enjoyment of facilities and resources
4. Enforcement of rules and regulations to protect the resources from abuse and to ensure enjoyment of the facilities by park visitors

To maintain the park properly and minimize costs, a trained staff, sufficient supplies, and proper equipment are needed.

The task of providing services to the public and security for park facilities and resources 24 hours a day, 12 months of the year is monumental. During the busy season, full-time operations are necessary 98 hours per week (8:00 to 10:00 p.m., seven days a week). The remaining hours are covered by a night patrol and the resident manager. During other seasons, only part-time operations are provided 98 hours per week, however, maintenance, repair, and park security accounts for many extra man-hours. If these responsibilities are to be met, competent trained personnel are necessary.

The work load analysis of park operating functions has been initiated to ascertain the personnel needs of each park based upon existing facilities and current operations. This study identifies the man-hours needed to perform each task required for adequate maintenance and operation. Initial results reveal:

1. an extreme shortage of adequate personnel,
2. that because of procedures necessary in hiring seasonal workers, high cost labor employees are used for jobs more appropriate for other job classifications, and
3. that a high percentage of work-hours are related to direct services to the public.

These factors limit the personnel available for proper maintenance. Because extensive development has occured since the Natural Resources Act of 1963 was passed, the gap between maintenance and development has widened. Standards based on the work load study can be established to determine work-hour operating requirements for future facilities as they are proposed for development so that sufficient personnel and supplies can be provided. Facilities must be properly designed to meet the needs of the public, while being operational with the minimum amount of personnel and cost.

Another contributing factor to the current park operations problem is the heavy reliance on federally funded work programs, such as the Comprehensive Employment and Training Act (CETA), the Neighborhood Youth Corps (NYC), and Green Thumb. The low cost personnel provided by these programs make it possible for parks to offer programs and services which would otherwise be impossible. However, these employees are hired on a short-term basis, usually 8 to 10 weeks and often do not have the training and experience necessary to provide needed services without constant supervision in already understaffed parks. To avoid these problems, funding should be made available to hire trained personnel for major public service and maintenance programs. Temporary employees should only be hired for minor maintenance and special projects.

Enforcement of park rules and regulations is a vital element in the management of state parks. Currently, violations are referred to DNR enforcement officers for prosecution. Park personnel should have the technical training and tools needed to carry out this responsibility in a manner which will protect the resources from abuse, while educating the visitor about the importance of environmental protection.

One of the major maintenance problems of recreation areas is the extreme impact of large numbers of people concentrated in specific locations. These areas include: campsites, trails, lakeshores, river banks, areas around buildings, and scenic points of interest. This overuse affects the ground cover and frequently exposes tree roots to damage from foot traffic. The eventual result may be erosion, landslides, disfigured sites, and even danger to the visitors. Regular maintenance programs with adequate personnel, supplies, and equipment would reduce the damage and consequently prevent major reconstruction expenditures. It will also preserve the aesthetic character of the park by preventing unsightly scars or exposed areas.

The purpose of a maintenance and operations plan is to identify specific problems of each park, develop a solution for these problems, and specify management techniques which decrease the costs of operation. The plan should make specific recommendations for facilities which will serve the needs of visitors with a minimum of regimentation and provide for ease of maintenance and enforcement. It should also identify basic management duties, establish adequate staffing requirements, and identify supply and equipment needs.

•Park Operations and Activities

Lake Bronson is a heavily used recreational park with large crowds from mid-June through August, over half of which are nonresidents. A survey of campers for 1976 shows that 45% are from Manitoba (primarily Winnipeg), 15% from North Dakota, and 40% from Minnesota. Day visitors are estimated as 60% Minnesota residents, with many others from North Dakota. Primary activities are camping, swimming, boating, fishing, and picnicking in the summer, and snowmobiling in the winter. Modern sanitation facilities are opened May 15 and closed in late September each year. Two Canadian holidays (Victoria Day in mid May and Dominion Day in early July) bring numerous Canadian visitors for long weekends.

Interpretive services are presently conducted by a 3-month seasonal naturalist who should be supplemented with an additional employee or volunteer for improved and expanded services.

Swimming is a major summer activity since this is the only beach within 50 miles. It requires the services of 3 lifeguards (existing) from June 15 to August 15. Although the existing diving raft is required for Red Cross swimming lessons and is valuable for that purpose, it is a hazardous attraction to many swimmers who may overextend their abilities and risk drowning. Since one drowning has already occurred, it should be removed. Arrangements for the use of a pontoon boat for swimming lessons only should be explored.

The Contact Station is operated part time from mid-May to Memorial Day and then full time 8:00 a.m. to 10:00 p.m. until Labor Day. The balance of the year it is opened as necessary and while administrative duties are being carried out. Off season enforcement of the vehicle permit law and fee collection is administered from park vehicles.

Campgrounds are filled to near capacity on several weekends during the season. Capacity is typically reached on the 4th of July weekend for the 126 primary sites (13 electric) and 26 overflow sites in 3 areas. Registration, firewood sales, and information are provided from the contact station during this time. Also, a night security patrol is on duty between 10:00 p.m. to 6:00 a.m. daily, from mid June to mid August. These camping services plus janitorial maintenance fill most of the workhours during the summer.

Dam operation is the responsibility of the park manager. Lake Bronson supplies water for the village of Hallock, although plans are underway by Hallock to drill 2 wells in the Lake Bronson area within 2 years. The lake level must be held at a steady level of 973 feet above sea level to prevent erosion of the light soils around the shoreline. Daily guage readings are taken, and adjustments in the release flow are normally made 2 to 3 times weekly, except during spring runoff when around-the-clock readings and adjustments are necessary.

Solid Waste is collected by the park staff with park equipment and is transported to the county landfill twelve miles away. During the busy season, 7 to 8 trips are made per week. Dumping fees are currently $5.00 per load. A contract should be made with a local vendor, as soon as feasible, to free park staff and equipment for other maintenance duties. This arrangement has worked very satisfactorily in other parks.

Snow removal on the service court and parking area for winter users is done with a tractor loader. The county clears the road into the picnic parking area.

A 4-wheel drive vehicle with a blade for snow removal should be purchased. This vehicle can also be used for other maintenance duties. A tractor-mounted snow blower is needed to clear heavy snow drifts.

Firewood for campfires is purchased from a private vendor for resale to visitors. This practice should continue as long as a supply is available.

Grooming for 6½ miles of winter trails at Lake Bronson, 5 miles at Old Mill and 20 miles at Zippel Bay is currently headquartered at Lake Bronson. As needs change, grooming and equipment will be coordinated through the regional DNR headquarters at Bemidji.

- Operational Problems

Staffing

Current park staff consists of a full time manager, a full time assistant, and other seasonal and hourly employees as listed in the staffing chart. In order to meet park maintenance and operation obligations to implement this plan fully, the following additional personnel are necessary:

1. A six month, seasonal technician trained in park operations to assist in managing the park during the heavy visitor season (summer) and the construction season (fall).

2. A 2 month volunteer naturalist from mid-June to mid-August to conduct interpretive activities 7 days per week. The volunteer will be furnished with some living expenses.

3. Two 2 month laborers for night watchmen and cleanup duties 7 days per week (56 hours).

Boating Activities

Fishing and waterskiing are conflicting uses which present a severe problem. Because of the demand for high speed water recreation activities, part of the lake has been zoned for waterskiing above the 10 mph general park speed limitation. Markers are installed as approved by the county sheriff. The balance of the lake is restricted to the 10 mph limit. Future restrictions, such as limiting the number of boats, may be imposed if the need arises.

Through-Traffic

Two private group camps and a number of private cabins within the park boundary also presents an operational problem in this state park. Enforcement of the permit law requires continual patrol.

The ideal long range solution to this problem would be to acquire all the private lands within the revised boundary. However, since complete acquisition is not feasible presently, the extra funding necessary for proper operation must be provided. This funding includes much additional patrol time and expenses during closed hours and seasons when ordinarily a gate could be used for control.

Staffing Chart

This chart shows the existing staff and the additional staff needed. The chart is based upon a workload evaluation which identifies tasks and the workhours necessary to perform each task for a typical workload season.

	Existing 1976-77		Identified Needs for 1977 and Beyond	
Administrative Personnel				
Park Manager	12 mo.	$15,600	12 mo.	$15,600
Assistant	12 mo.	10,700	12 mo.	10,700
Technician	0	0	6 mo.	4,900
Public Services Personnel				
2 Park Workers	4½ mo. each	$ 6,000	4½ mo. each	$ 6,000
3 Park Workers	4 mo. each	6,500	4 mo. each	6,500
3 Lifeguards	2 mo. each	4,200	2 mo. each	4,200
Naturalist	3 mo.	3,000	3 mo.	3,000
Volunteer			Expenses only	
2 Night Watchmen (laborer)			2 mo. each	2,500
Maintenance Personnel				
1 Laborer	9 mo.	$ 8,100	9 mo.	$ 8,100
1 Laborer	7½ mo.	7,000	7½ mo.	7,000
1 Laborer	5½ mo.	5,250	2 mo.	3,600
Total		$66,350		$72,100

Note: In addition, CETA and other work programs provide workers to supplement the existing staff. These workers should be used for miscellaneous maintenance and janitorial duties or for public service in emergency situations only. Project employees are hired for specific projects which are specially funded.

Personnel Needs for Future Facilities

As new facilities are provided, visitation increases, and as this plan is implemented, more maintenance and operating personnel will be required. The following personnel and annual cost needs are carried forward onto the summary chart, p. 155, and calculated into biennial costs.

1978-79	Trail development and plan implementation will require additional labor at an estimated cost of:	$ 6,000
1980-81	A new fish cleaning building, trail construction, and a service area will require maintenance and cleaning at an estimated annual cost of:	4,000
1982-83	Trail campsite development will require maintenance personnel at an estimated annual cost of:	3,000
1984-85	A new trail/interpretive center will require the following winter and summer personnel:	
	1. Naturalist (3 mo. summer)	3,000
	2. Naturalist or Volunteer (3 mo. summer)	2,000
	3. Park Worker (3 mo. summer)	1,800
	4. Labor (Maintenance) (12 mo. part time)	5,000
1986-87	Construction of new picnic sites, east campground expansion, the potential new group camping area, and trail development will require additional maintenance personnel. Estimated annual cost:	5,000
Total Estimated Annual Cost:		$ 29,800

Equipment

The equipment listed below, which is replaced on a regularly scheduled basis, is considered essential for the current overall operations of the park. Future needs, however, may change periodically throughout the 10 year projection. Heavy equipment and specialized equipment not listed should be obtained through the regional office of DNR.

Equipment of the proper size and type must be selected on a park by park basis to match the conditions and job requirements of each park. Proper up-to-date equipment will reduce the personnel needs, the repair costs on old equipment, and the cost of maintenance and improvement projects.

1978-87 Projected Equipment Replacement Schedule

Unit	Existing	1978-79	1980-81	1982-83	1984-85	1986-87	Total
Car	1973	$ 4,100			$ 5,500		$ 9,600
3/4 Ton	1974 - Compactor - Replace with 1 ton or private contract						
3/4 Ton	1977			$ 5,700			5,700
1 Ton			$ 5,600				5,600
4-Wheel Drive	1967	5,500			7,200		12,700
Dump Truck	1953 - Replace from regional equipment						
Tractor	1976					$13,000	13,000
Groomer	1977			5,000			5,000
Snowmobile,	1974	1,300		1,500		1,800	4,600
Mowers, etc.		4,000	4,200	4,400	4,600	4,800	22,000
Radio Equip.		5,000					5,000
Total		$ 19,900	$ 9,800	$ 16,600	$ 17,300	$19,600	$ 83,200

Future replacement will be based upon the following general criteria:

- Light maintenance and administrative vehicles: 5 years or 70,000 miles.
- Heavy maintenance equipment: With the limited use received, this equipment could last a long time and be replaced on an individual item basis when necessary, or be exchanged through the Region for other improved vehicles.
- Small equipment: Mowers and chainsaws need regular replacement with the continuous use they receive. Other motorized equipment will be purchased and replaced as needed.
- Other equipment: Interpretive, furniture, and fixtures will be purchased as needed.

Maintenance and Operations Summary

The figures for the period 1980 through 1987 are estimated projections intended to illustrate the scope of the potential maintenance and operations costs, including the operation of new facilities, plus an estimated 10%, 2-year salary inflation cost.

		Biennium			
	78-79	80-81	82-83	84-85	86-87
PERSONNEL:					
Existing 76-77 $140,000					
Actual Needs (for current operations based on staffing chart)	$ 155,000				
Personnel Costs (from previous biennium)		$183,700	$ 210,800	$238,600	$ 288,400
Additional Personnel Needs* (to operate new facilities)	(1) 12,000	(2) 8,000	(3) 6,000	(4) 23,600	(5) 10,000
Sub Total	167,000	191,700	216,900	262,200	298,400
10% Salary Inflation	16,700	19,200	21,700	26,200	29,800
TOTAL BIENNIAL PERSONNEL COSTS	183,700	210,900	238,600	288,400	328,200
SUPPLIES: Administrative Overhead and Expenses (20% of personnel costs)	36,700	42,200	47,700	57,700	65,600
EQUIPMENT: (from equipment schedule)	19,900	9,800	16,600	17,300	19,600
TOTAL PROJECTED BIENNIAL MAINTENANCE AND OPERATIONS COSTS:	240,300	262,900	302,900	363,400	413,400
ANNUAL COST BREAKDOWN:	120,150	131,450	151,450	181,700	206,700
TOTAL 10 YEAR COST PROJECTION:	$1,582,900				

*See page 152 .

Lake Bronson State Park Management Budget Summary

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Resources	$ 59,300	$ 47,800	$ 27,000	$ 22,500	$ 34,200	$ 190,800
Recreation	112,950	154,000	47,500	16,100	137,500	468,050
Orientation/Interpretation	10,000	5,000		148,000		163,000
Maintenance/Operations	240,300	262,900	302,900	363,400	413,400	1,582,900
Total	$422,550	$469,700	$377,400	$550,000	$585,100	$2,404,750

OVERALL AUTHORITIES

DIVISION OF PARKS AND RECREATION

General

Once the management plan has been completed and approved, it will become the responsibility of the director of Parks and Recreation (hereafter referred to as the director) to insure proper implementation of the concepts established in the plan. As such, the director will act as the coordinator and liaison between the planning staff, regional staff, local officials, and the general public to insure that the plan is kept current, remains on schedule, and becomes a reality.

In order to insure the accomplishment of this cooperative planning and implementation effort, the following responsibilities have been established and must be followed.

Specific Requirements

The director and staff will:

1. Coordinate and administer field operations as delegated by the assistant commissioner of operations
2. Develop and administer all programs necessary to accomplish plan goals and objectives. Programs include those necessary to implement management plans and to maintain and operate parks and other programs assigned to the division. Specific program responsibilities at this time are: acquisition, development, resource management, maintenance and service operations, interpretive services, and accessibility
3. Prepare policies, guidelines, procedures, and standards necessary to implement programs established in the plan (e.g., responsibilities relating to contracts and force account project,)
4. In coordination with DNR legislative liaison, prepare legislation necessary to provide program funding, boundary changes, and operational authorities
5. Review and approve all detailed plans, specifications, and project proposals prepared by the BOE or field staff. Coordinate on-site field staking and site layouts with BOE and regional staff
6. Coordinate divisional administrative functions with other DNR administrative offices

7. Work with DNR's federal grant specialists in order to obtain maximum federal funding (e.g., LAWCON) for all division programs
8. Recommend modifications and provide information necessary to update the management plan. All modifications to the concepts established in the approved plan will be processed through the Office of Planning and Research. The director will submit requests for modifications in writing, stating justification for change and what impact the change would have on the overall management plan. If comments and rationale for opposing a proposed change are not received within 25 working days, agreement is implied. In the event that significant change in the direction of the plan is proposed (e.g., altering goals and/or objectives of the plan) it will be necessary to follow the same procedures established in developing the original plan. If the director and the Office of Planning and Research cannot come to an agreement on the requested change, the director will then submit the request to the commissioner's Planning and Environmental Review Board (PERB) which will formulate the final recommendation to be submitted to the commissioner's Executive Council
9. Assign responsibilities and funding for implementation of the development program to BOE for contracts and to the regional staff for force account projects. In addition, the director shall coordinate the implementation of resource management programs
10. Make recommendations which will expedite the park planning process and evaluate progress toward the achievement of goals and objectives stated in the plan
11. Forward BOE requisitions and field project proposals to the Office of Planning and Research so that the progress of implementation can be monitored

REGIONAL OFFICE

General

The regional administrator and staff will supervise the physical implementation programs for the approved plans as established by the division.

Specific Requirements

1. The regional administrator will assign qualified staff to help implement this management plan. The district forester, wildlife managers, and other specialists should be consulted on specific aspects of the resource management of the plan.
2. The regional park supervisor will supervise and direct the park manager to insure that the management plan is implemented correctly.
3. The regional park supervisor will regularly field inspect all development in the park.
4. The regional park supervisor will submit written reports as necessary to keep the regional administrator and the director informed on the progress of development and any problems encountered.

5. The regional park supervisor will submit information to facilitate plan updates and changes. The regional park supervisor will submit his recommendations for change in writing to the regional administrator and the director. The recommendations should include rationale and an analysis of the impact the requested change will have on the management plan.
6. The regional park supervisor will submit project proposals to the regional administrator and the director for review and approval. The director and staff will review all project proposals verifying compliance with the intent of the plan and its schedule.

The region may implement approved project proposals once detailed specifications have been prepared and funding has been provided.

PARK MANAGER

General

It will be the responsibility of the park manager, under the direct supervision of the regional park supervisor, to coordinate the physical implementation of assigned sections of the management plan. The manager will inform the regional supervisor concerning the progress of the implementation through project proposals and written progress reports.

Specific Requirements

The park manager will:

1. Seek the assistance of the regional park supervisor in the resolution of any major implementation problems
2. Consult the regional park supervisor if there is uncertainity, concern, or opposition to recommended management of a specific item within the plan
3. Assist and give direction to field personnel assigned to the implementation of specific sections of this management plan
4. Maintain records on the development of specific items in this plan to insure continuity and reference for future updating and revision
5. Work with the regional park supervisor in initiating project proposals to be submitted to the director for review and approval
6. Submit to the regional park supervisor information to aid in the updating and revision of the plan

OFFICE OF PLANNING AND RESEARCH

General

The Office of Planning and Research will monitor and evaluate implementation of the management plan and make revisions to the plan as necessary.

Specific Requirements

The Office of Planning and Research will:

1. Review all BOE requisitions and project proposals to evaluate the proposed actions for consistency with the approved plan. Comments, suggestions, or corrections will be submitted to the director
2. Process all modifications to the approved management plan (see Parks and Recreation section)
3. Provide additional information and justification for specific recommendations within the plan when requested by the division
4. Maintain contact with the public, local officials, legislators, and DNR staff regarding the updating of the plan

PROCEDURES

DEVELOPMENT

The development procedure for the Division of Parks and Recreation can be broken down into two categories: (1) contract, and (2) force account.

Contract

Director initiates project by preparing a program, which complies with the management plan.

Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.

Director requests BOE to prepare detail drawings and specifications in accordance with approved program.

BOE prepares detailed drawings and specifications and submits them to the director.

Director approves drawings and specifications, insuring compliance with management plan objectives and goals, and re–submits them to the BOE.

BOE processes contract documents through the Department of Administration, Division of Procurement for bidding and contract award procedures.

Force Account

Director initiates project by preparing the program, complying with the management plan.

Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.

Director assigns funds to regional administrator.

Regional administrator directs regional park supervisor and necessary staff to implement program.

Regional park supervisor may:

Request that the BOE prepare detailed drawings and specifications for review by the director

Assign the park manager to complete the project with field personnel

Assign park manager, in cooperation with the regional staff, to let bids to local contractors

BOE provides direction to the contractor and establishes site location and field staking.

BOE supervises construction and approves completed work according to contract documents.

Director and staff monitor the progress, funding, and necessary coordination between other state agencies and funding sources.

Supervision over the project will be the responsibility of regional, divisional, or BOE staff, depending on the complexity of the specific project.

Regional park supervisor will certify to the division that the project has been completed as planned.

Director and staff will monitor the progress of the development program.

RESOURCE MANAGEMENT

The resource management program for the Division of Parks and Recreation is also broken down into contract and force account categories.

Contract

Director initiates a project by preparing the program, in compliance with management plan.

Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.

Director approves project and initiates bidding process through the Department of Administration.

Force Account

Director initiates project by preparing the program, in compliance with the management plan.

Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.

Director assigns funds to regional administrator.

Regional administrator directs regional park supervisor and necessary resource management staff to implement program.

Director supervises and monitors the program.

Consultant or contractor, in coordination with divisional and regional staff, completes the project.

Director approves the completed project.

Regional park supervisor and resource staff prepare detailed resource implementation program.

Detailed resource management program is submitted to the director for approval.

Once approved, the regional park supervisor and resource managers may:

> Assign the park manager and field personnel to implement program
>
> Prepare contracts to be let to local contractors or consultants to implement program

Regional staff supervises project.

Director and staff monitor the progress of the resource management program.

Regional park supervisor certifies to the division that the project has been completed as planned.

MAINTENANCE AND OPERATIONS

The Division of Parks and Recreation will provide the regional staff with necessary direction to maintain and operate state parks as a statewide system. The director will establish rules and regulations pursuant to the ORA '75 for administering state parks. In addition, training courses and manuals will be prepared by the division on park operations, maintenance, enforcement, signing, and construction standards. If necessary, special operational orders will be prepared by the commissioner for specific problem areas. The following illustrates the general operation and maintenance procedures:

Director in cooperation with the assistant commissioner of operations, will establish policies, guidelines, and statewide procedures for maintenance and operations of all state park facilities.

The regional park supervisors, directed by the regional administrator, will follow policies, guidelines, and statewide procedures, of the Division of Parks and Recreation as well as commissioner's orders.

The regional park supervisor will provide the necessary supervision and direction to the park managers to insure that park maintenance and operation policies, guidelines, and procedures are followed.

It will be the responsibility of the park manager, under the supervision of the regional park supervisor, to maintain and operate all park facilities.

The director and staff will inspect and review operations of state parks on a regular basis to insure that statewide procedures are being implemented and followed correctly.