

ADMIN 1000 (Rev. 1/78) SF-00006-01

DEPARTMENT_

STATE OF MINNESOTA

Office Memorandum

TO

FROM

All Individuals Interested in the Management Plan For Sakatah Lake State Park DATE: June 3, 1982

Michael Miller Park Planner

Natural Resources

PHONE: 296-6079

SUBJECT:

Sakatah Lake State Park Draft Management Plan Review Process And Upcoming Public Information Meeting

A draft management plan for Sakatah Lake State Park has been completed by the Department of Natural Resources, Park Planning Section. This plan was prepared under the authority of the Outdoor Recreation Act of 1975.

Copies of this draft management plan are available for review at the Faribault and Waseca public libraries, the Lake Region Life, Morristown Life, and Elysian Enterprise newspaper offices, and the Sakatah Lake State Park Office. Any comments you have on the plan should be made in writing and addressed to:

Park Planning Department of Natural Resources Box 10E-Centennial Building St. Paul, MN 55155

The <u>Outdoor Recreation Act of 1975</u> provides for a 30-day review period in which comments may be made by the public. During this 30-day review period a public meeting will be held in Waterville on Tuesday July 6, 1982, at 7:30 p.m. in the Waterville Fire Hall. Additional comments on the proposed management plan for Sakatah Lake State Park will be received at this time.

We hope you can be in attendance. If not, we will be certain to send you a summary of the meeting.

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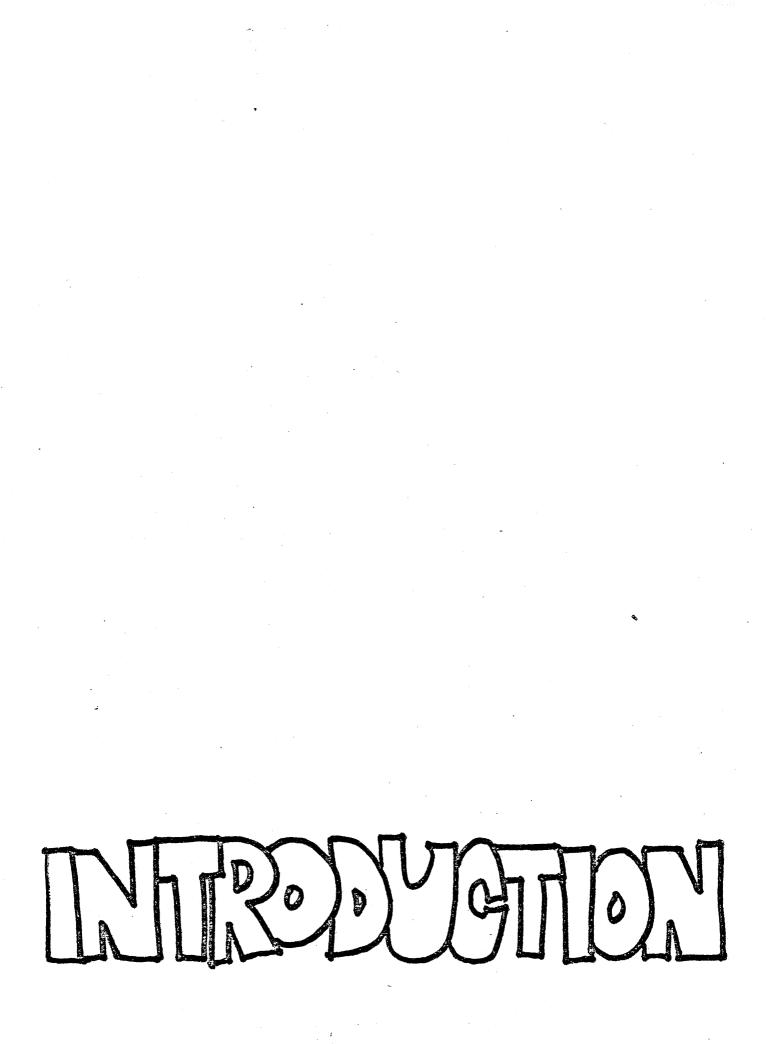
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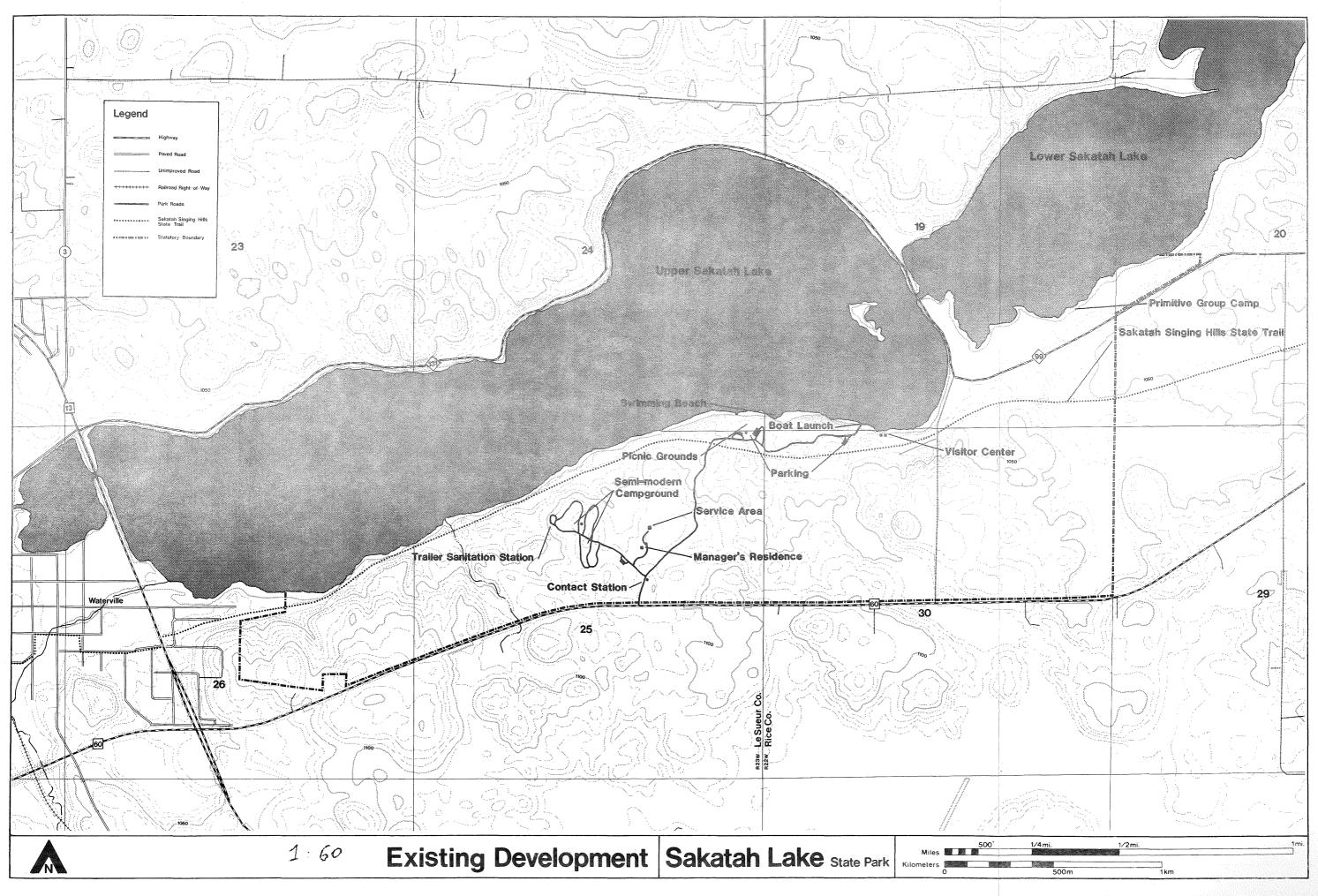
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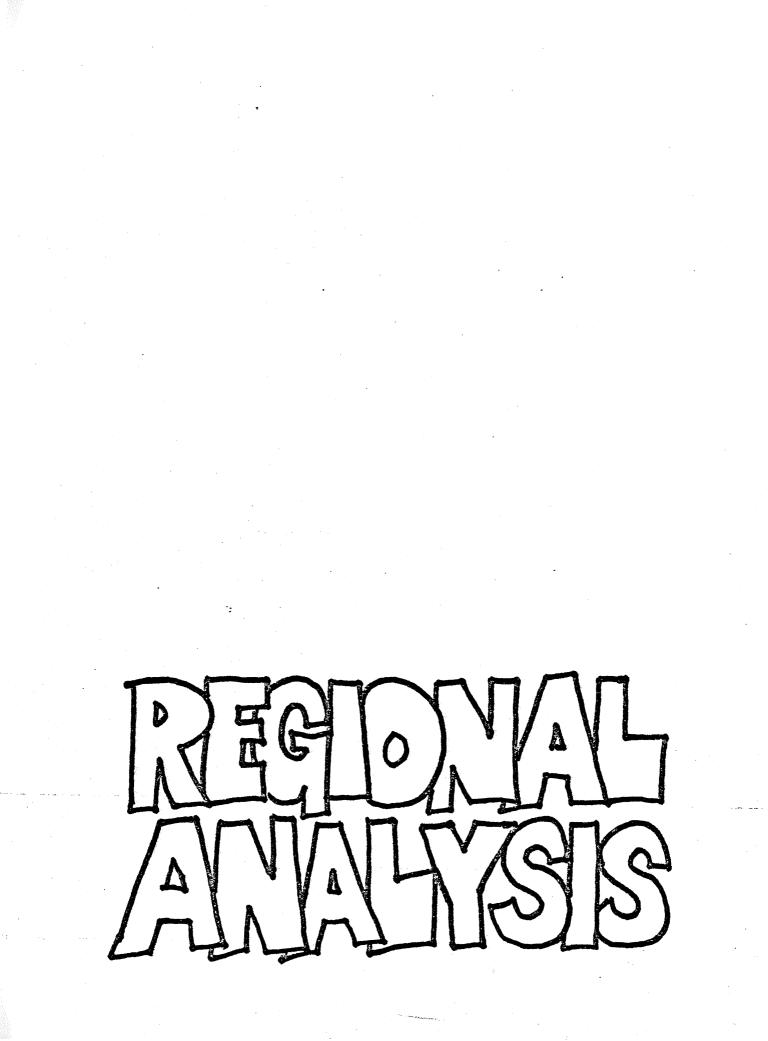
AN OVERVIEW OF SAKATAH LAKE STATE PARK

Sakatah Lake State Park was established in 1963. It is located in extreme southeastern LeSueur County with a portion of the park extending into Rice County. The western end of the park is adjacent to the town of Waterville. Faribault is located 14 miles (23 km) to the east; Waseca is 12 miles (19 km) to the south; and the Twin Cities metropolitan area is approximately 65 miles (105 km) north. The park is accessible from the east and west on Trunk Highway 60 (TH 60).

The statutory boundary of the park encloses 842 acres (341 hectares). Eighty acres (32 hectares) of this is in private ownership and 108 acres (44 hectares) is in life estate.

The topography of the park is rolling with several small drainage ways running from higher park lands into the lake. A bedrock of Jordan sandstone is covered by a 400 ft (122 m) layer of glacial till.

The statutory boundary of the park includes 3.5 miles (5.5 km) of shoreline on Sakatah Lake. The lake provides a variety of recreational opportunities for park visitors. Park facilities include a semi-modern campground with 60 sites, a primitive group camp, a picnic ground, a boat launch, and a total of 5 miles (8 km) of trails. During the winter, two miles (3 km) of ski touring trails and a snowmobile access to the Sakatah Singing Hills State Trail are provided. The interpretive center is operated from June until September.



INTRODUCTION

In order to determine a park's potential role in perpetuating natural resources and fulfilling recreational needs, a regional analysis process is necessary. The analysis is designed to look at a given park's interrelationship with such factors as: accessibility, population distribution, economy, transportation, and other nearby recreational facilities.

Recognition of a state park's interrelationship with these factors will help to ensure that park development will be planned to protect natural and historic resources, meet appropriate recreational demands, and avoid competition with other recreation providers.

THE SURROUNDING AREA

Accessibility

The accessibility of Sakatah Lake State Park in terms of time and distance, by the population it serves must be evaluated when recreational programs and developments are considered. Alternative methods of transportation need to be considered in light of the energy situation.

The increase in gasoline prices in recent years has affected recreation travel patterns. Many people who once traveled longer distances to recreate are now staying much closer to home. Sakatah Lake State Park is one of several public and private outdoor recreation facilities in the Waterville area. Because local citizens have a variety of facilities from which to choose, their use of the park is moderate. With the park less than a two hour drive from the Twin Cities, its appeal as a weekend camping destination for metro area residents is expected to continue. Its location, along with proposed improvements to park facilities should result in an increase in park use.

Another potential result of higher gasoline prices is the increased use of alternative types of transportation. Bicycle access to the park is excellent via the Sakatah Singing Hills State Trail. The Sakatah Singing Hills State Trail is a 37 mile (60 km) hard-surfaced, multi-use trail which runs from Faribault to Mankato. This trail passes through the park and park

facilities are available for trail users. The portion of the trail near the park is most popular with day users bicycling and hiking to the park from the local area.

Near the park most paved roads are unsatisfactory for bicycling. Many north-south paved roads beyond the Waterville area provide good bicycle routes which intersect with the state trail. These bicycle routes in combination with the state trail provide a good bicycling network.

Public transportation makes either end of the trail readily accessible for non local users. Bus transportation is available to both Faribault and Mankato on a daily basis from large population areas such as the Twin Cities, Rochester, and Owatonna. Buses, however, do not stop at or near the park. Visitors using the bus would have to arrange some other form of transportation from Faribault to the park.

Population

Waterville has a population of 1,717 (1980 census). Town residents and others from the immediate area make up a portion of the park's day visitors. Waseca, with a population of 8,219 residents also provide a large share of the day visitation to the park. The Twin Cities, located approximately 65 miles (56 km) to the north, contributes significantly to park visitation, more so with overnight visits than day visits.

The number of potential park users is substantial. Over 179,000 people live within 25 miles (40 km) of the park. People within this distance usually make up the majority of the park users, particularly for day use activities such as picnicking, swimming, and trail use. Approximately 1,765,000 people live within a 50 mile (80 km) radius of Sakatah Lake. This is about 43 percent of the total state population. The population that resides between 25 and 50 miles (40 and 80 km) from the park uses it for same day activities, but on a much smaller scale. They do, however, account for a substantial portion of the campers (see the Camper Origin Map, p $\stackrel{12}{\Longrightarrow}$).

Economy and Land Use

The predominant land use in the area is agricultural. The nearby town of Waterville provides services to the agricultural community. It also has some light industrial development and a thriving tourist industry. Much of the lakeshore on Tetonka and Sakatah lakes has been developed for summer cabins and year round homes.

Cooperative Land Management

In some cases, lands in close proximity which have recreational potential may be managed by different governmental agencies or private individuals. Such is the case with several recreational lands and facilities in the vicinity of the park.

The Sakatah Singing Hills State Trail passes through the park from east to west. The DNR, Trails and Waterways Unit is responsible for the operation and maintenance of this trail. There is a parking lot at the trail head in Mankato and a trail wayside (under construction) near Elysian. Otherwise the trail has limited support facilities, therefore the park plays an important role in providing facilities which enhance the trail users experience. Cooperative management efforts between the two DNR units should be encouraged.

The Cannon River has been designated a state canoe and boating route. The route runs from Sakatah Lake State Park to the Mississippi River. The boat launch and parking lot are available for use by canoeists as are all of the other park facilities. The park provides a good drop-in point for those canoeing all or a portion of the route. For canoeists wishing to canoe a portion of the route and return upstream to their point of departure, the park can serve as a good base of operations providing overnight facilities in addition to the launch and parking facilities.

One-half mile northeast of the park near the dam on Lower Sakatah Lake is a 48 acre (19 hectare) wildlife management area (WMA). It is managed by the DNR, Section of Wildlife. The WMA receives occasional use from pheasant and duck hunters. The presence of the WMA has little effect on wildlife populations in the park. Following discussions with the area wildlife manager, it was determined that a cooperative management program was not necessary.

RECREATIONAL FACILITY SUPPLY AND DEMAND

The inventory of recreational facilities near the park came from the Statewide Comprehensive Outdoor Recreation Plan (SCORP '79).

SCORP '79 is a 4 year study which identifies recreation patterns and activity preferences on state and region levels. SCORP information was collected according to economic development regions. There are a total of 13 of these regions in the state (See Economic Development Regions Map, p_____). Region #9 in which Sakatah Lake State Park is located includes the counties of: Sibley, Brown, Nicollet, LeSueur, Watonwan, Blue Earth, Waseca, Martin, and Faribault.

SCORP '79 ranked a number of summer and winter recreational activities according to expressed desire by Minnesotans for more opportunities to do them. The activities ranked as follows:

Summer Activities

All Minnesotans

1.	Bicycling
2.	Camping
3.	Fishing
4.	Tennis
5.	Swimming
6.	Hiking
7.	Picnicking
8.	Boating
9.	Golfing
10.	Park facilities
11.	Canoeing
12.	Horseback riding

Region #9 Residents

- 1. Camping
- 2. Fishing
- 3. Bicycling
- 4. Swimming
- 5. Hiking
- 6. Tennis
- 7. Boating
- 8. Golfing
- 9. Picnicking
- 10. Park facilities
- 11. Horseback riding
- 12. Trail biking

Winter Activities

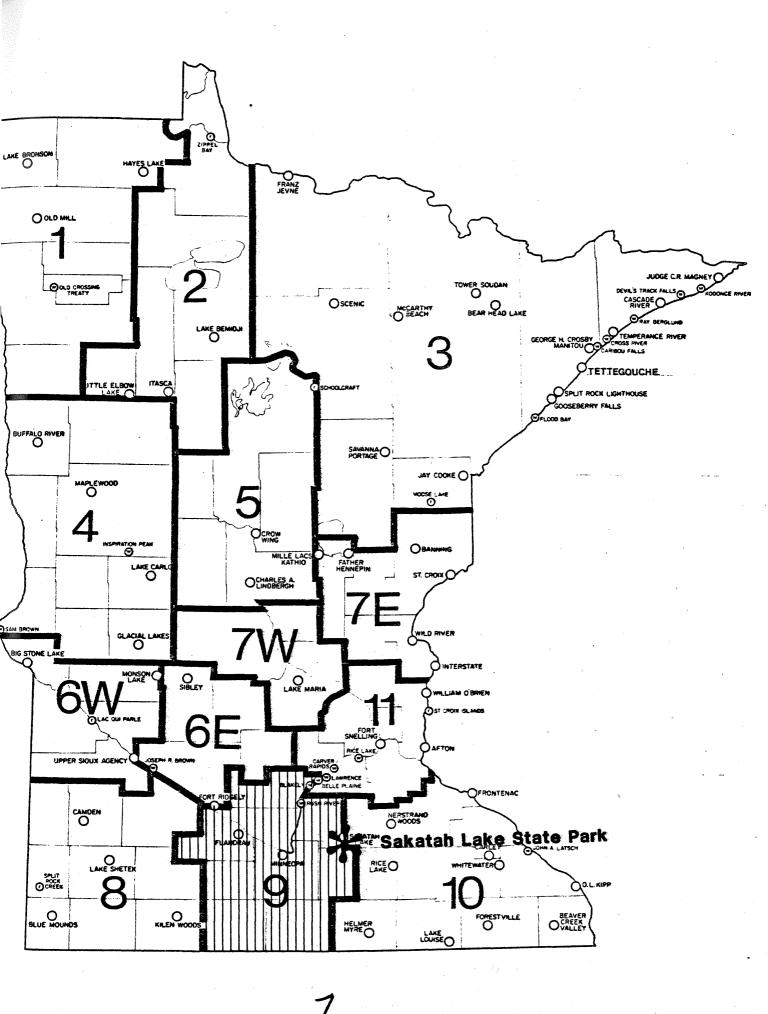
All Minnesotans

- 1. Hunting
- 2. Ski touring
- 3. Snowmobiling
- 4. Downhill skiing

Region #9 Residents

- 1. Hunting
- 2. Snowmobiling
- 3. Ski touring
- 4. Downhill skiing

Following is an inventory of the supply of each facility type in the area of the park and a brief discussion of the demands for that opportunity on a regional and statewide basis. The inventory was done on the basis of a 25 mile (40 km) radius or a 50 mile (80 km) radius. (These were the forms in which the current data were available.)



It is important to note that recreational facilities near a park may duplicate services. However, some people will consistently choose to frequent one area over another in the pursuit of a particular experience. For example, camping is a recreational activity which state parks accommodate. City and county parks in the vicinity of a state park may also have campsites. However, some people will consistently travel to a state park because of the type of experience it offers, namely, camping in a natural setting augmented by other recreational opportunities such as hiking, wildlife observation, and historical interpretation. While camping facilities may be duplicated elsewhere, the total activity experience is not.

Camping

There are 91 campgrounds within a 50 mile (80 km) radius of the park. This high number can be attributed to the fact that the many lakes between Faribault and Mankato are popular recreation resources for Minnesotans and out-of-state visitors.

Type of Facility	Number of Campgrounds	Number of Walk-in sites	 Number of Drive-in-sites
County Parks	10	50	122
State Parks	7	10	486
Municipal Parks	8	2	80
Private Resorts, or Campgrounds	63	292	2792
Private Group Camp		-	60
Total	91	354	3540

Camping is an increasingly popular outdoor activity in Minnesota. According to SCORP '79, 10 year projections (1980-90) predict a 9.4 percent increase in camping occasions statewide and a 8.8 percent increase in Region #9.

SCORP figures for 1978 show that people living in Region #9 accounted for 4.6 percent of the total camping population in Minnesota. As a camping destination, Region #9 received 4.4 percent of the total camping which occurs in the state. Of the people who camped in Region #9, 50 percent came from Region #9, 23 percent from Region #10, 21 percent from Region #11, and 5 percent_from Region #8.

The future demand for camping facilities is expected to grow. The facilities at Sakatah Lake State Park are usually able to meet camping demand. Campground capacity is reached only on holiday weekends such as the 4th of July and a few other summer weekends when the weather is favorable. As transportation costs increase, camping patterns are expected to change. Individuals can be expected to travel shorter distances to camp. This may attract more campers to the Sakatah Lake area, including people from the local area and the Twin Cities. However, with the present moderate level of use of the park campground and the presence of so many privately owned campgrounds in the vicinity, provision of additional camping facilities should not be necessary.

Picnicking

There are 112 places to picnic within a 25 mile (40 km) radius of Sakatah Lake State Park. A large number of these are city parks. The following chart summarizes these facilities.

Type ofFacility	Number of Picnic Grounds	Number of Picnic Tables	
County Parks	13	112	
State Parks and Waysides	5	233	
Municipal Parks	52	922	
MN/DOT Rest Areas	4	7	
Private Resorts or			
Campgrounds	38	630	
Total	112	1904	

Swimming

The following swimming facilities are located within a 25 mile (40 km) radius of the park.

Type of Facility	Beach	Pool
County Parks	7	
State Parks	` 1	
Municipal Parks	7	8
Private Resorts or Campgrounds	34	
Total	49	18

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Trails

The following trail facilities are located within 25 miles (40 km) of the park.

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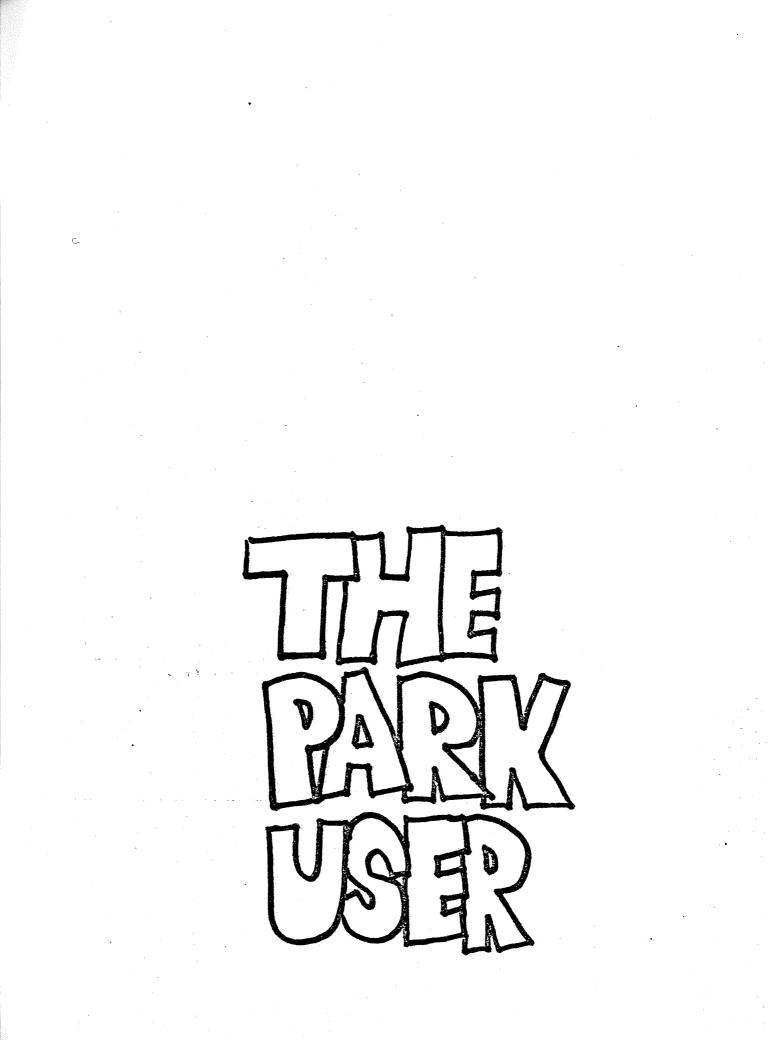
Type of Facility	y Hiking	Snowmobiling	Ski Touring	Horseback Riding	Bicycling
County Parks		10	1	2	
State Parks	265	9.5	9.5 8		
DNR, Trails and	Waterways 37	37			37
Municipal Parks	15	2	5		6
Private Resorts Campgrounds	or 57	9		8	12

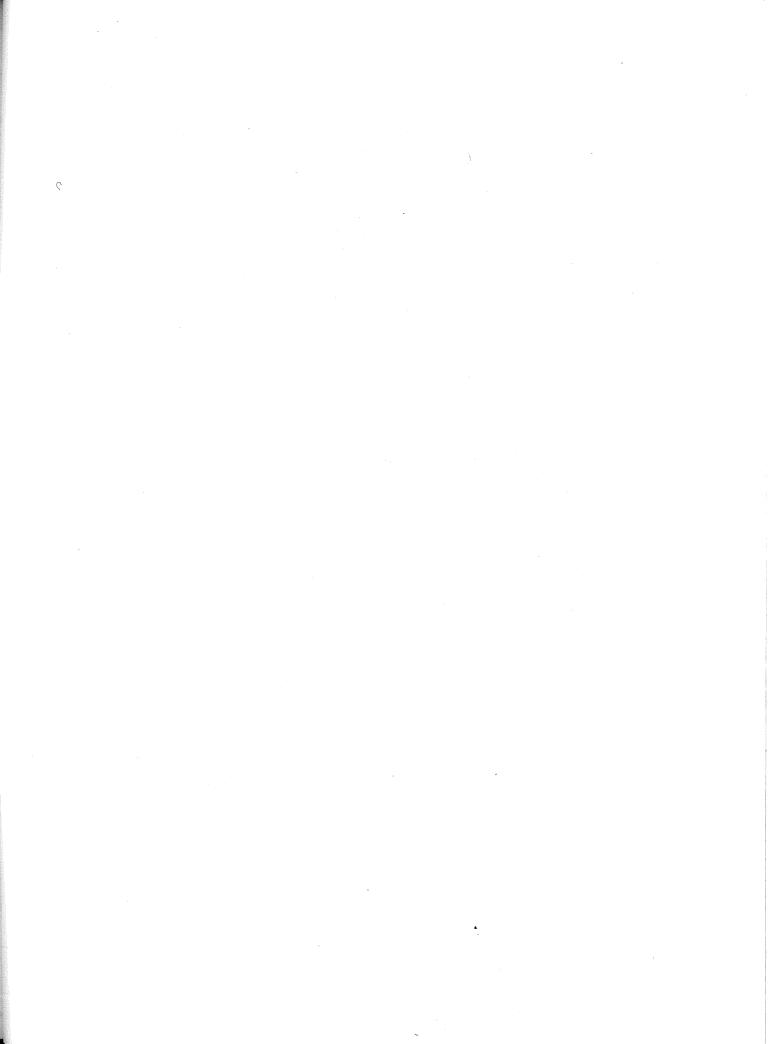
These mileages do not represent separate trails. For example, most of the hiking trails are also used for snowmobiling or ski touring in the winter.

All of the state park trails listed above are in Sakatah Lake State Park, provides Smi. of hiking, A mi. of ski towing and .5 mi of snowmobiling trails. These mileages are included in the state park trail mileages listed above. Within a 25 mile (40 km) radius of the park, there are 3 county grant-in-aid snowmobile trails which total 162 miles (260 km). The Sakatah Singing Hills State Trail, a 37 mile (59 km) multi-use trail administered by the DNR, Trails and Waterways Unit, runs between Faribault and Mankato. The trail is used by bicyclists, snowmobilers, and hikers.

Bicycling

The Sakatah Singing Hills State Trail provides the best bicycling access to the park. Bicycling access from the park to nearby Waterville on either of the state highways which pass through town (TH 13 and TH 60) is poor because these highways do not have hard surfaced shoulders and have a fairly high volume of traffic. Other bicycle access to park facilities is not good because the roads are gravel surfaced. Access could be improved by paving the park roads and providing an access trail between the park entrance and the state trail.





DAY USE

In almost all cases, day use in state parks is considerably higher than overnight use. For the three year period 1977-79, day users at Sakatah Lake accounted for about 75 percent of the total visitation. The majority of these day users visited the park to use trail and picnicking facilities.

OVERNIGHT USE

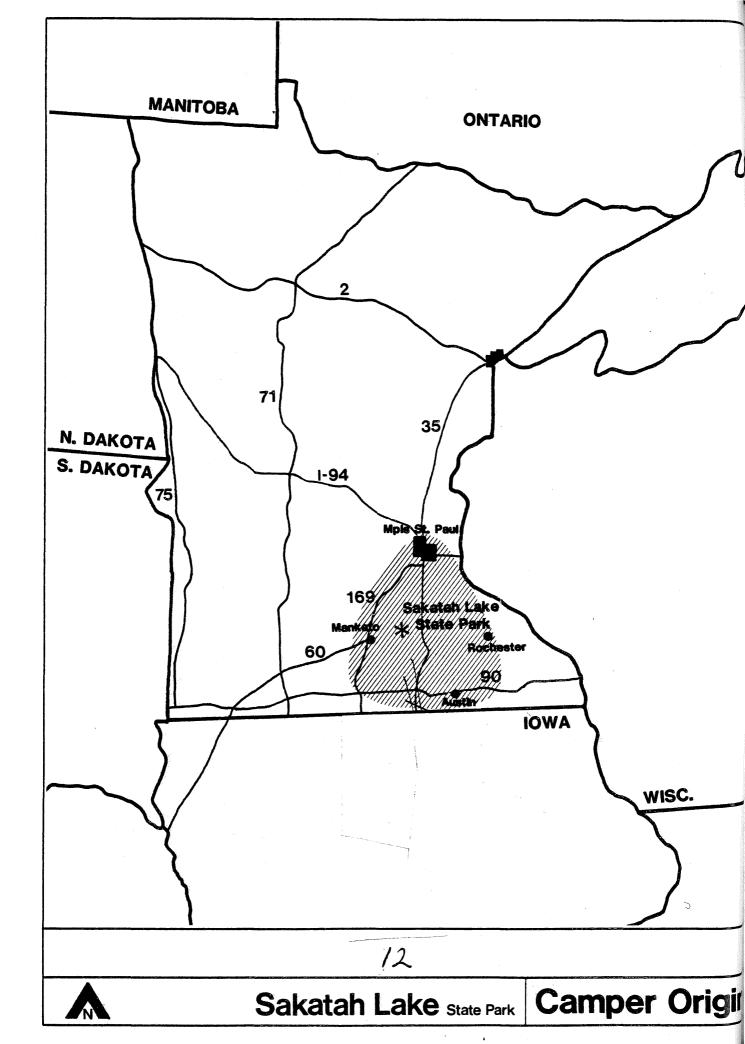
For the three year period 1977-79, overnight users of both the campground and primitive group camp have accounted for about 25 percent of total park attendance. In 1980, over 8,300 people camped at Sakatah Lake State Park. This ranked the park 25th of the 59 state parks and waysides which have campgrounds.

The campground accommodates a variety of users including tent campers, camper-trailers, and motor homes (although there are no electrical or water hookups). The following chart illustrates the number and type of visitors who used the park during the six year period from 1976-1981.

	Primitive Group Camp	Campground	Day Visitors	Total Park Visitors
1981	259	6,866	36,304	43,429
1980	139	8,169	34,091	42,399
1979	302	7,371	22,606	30,279
1978	169	7,770	27,439	35,378
1977	448	9,412	28,267	38,127
1976	564	11,136	31,493	43,193

Camper Profile

Camper registration cards are completed for each camping party. This card records camper name and address, number in party, length of stay, and dates the campsite was used. A sample of these cards for the three year period 1977-79 was taken. The following information on campers at Sakatah Lake State Park was drawn from this sample. This information does not necessarily provide data on individual campers. Information gathered is on each group of campers who register for a campsite. In some cases, groups may include an entire family; in others, it may be an individual.



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<u>Origin</u>		Percent	Largest out-of-state percentages		
Mi	nnesota	82.4	Iowa	10.0	
Ou	t-of-state	17.6	Illinois	2.0	

The Camper Origin Map on p 12 shows the area from which most campers at Sakatah Lake originated. People living within this area accounted for 73 percent of all the campers in the park. A significant number of campers came from urban areas such as Minneapolis/St. Paul, Mankato, Rochester, and Faribault. The seven county metropolitan area accounted for 34 percent of all camping parties in the park.

Camping Seasons

This chart shows the percentage of camping occasions for each month of the season. The figures were averaged over a three year period from 1977 to 1979.

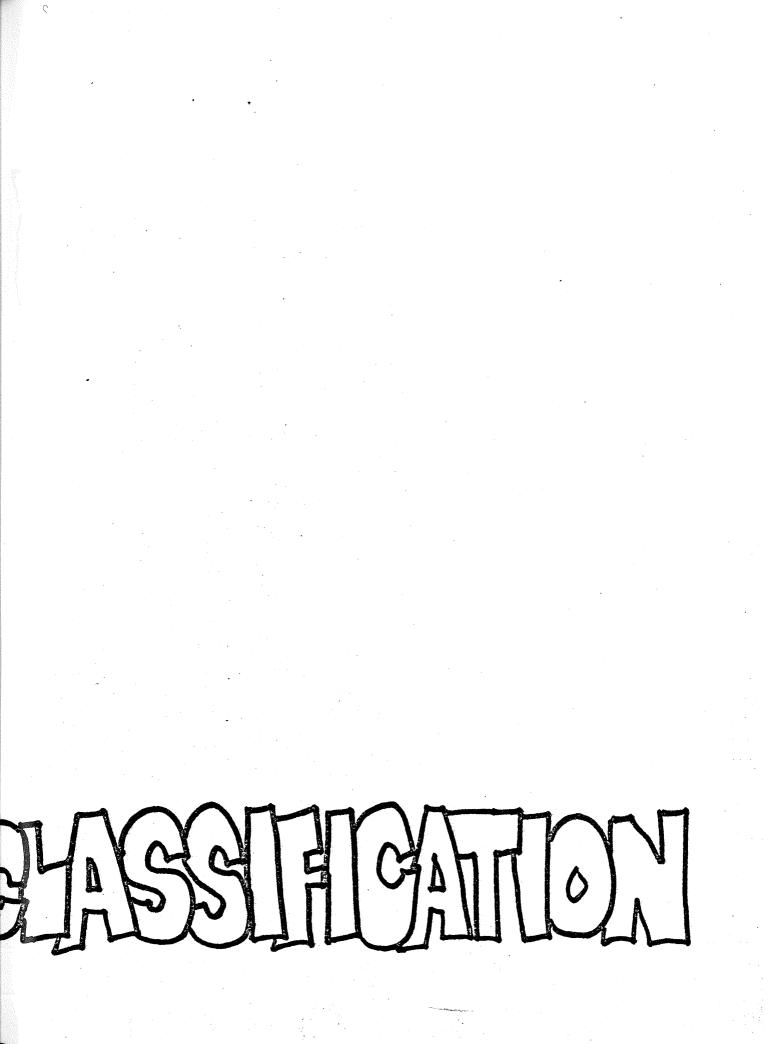
Percent	
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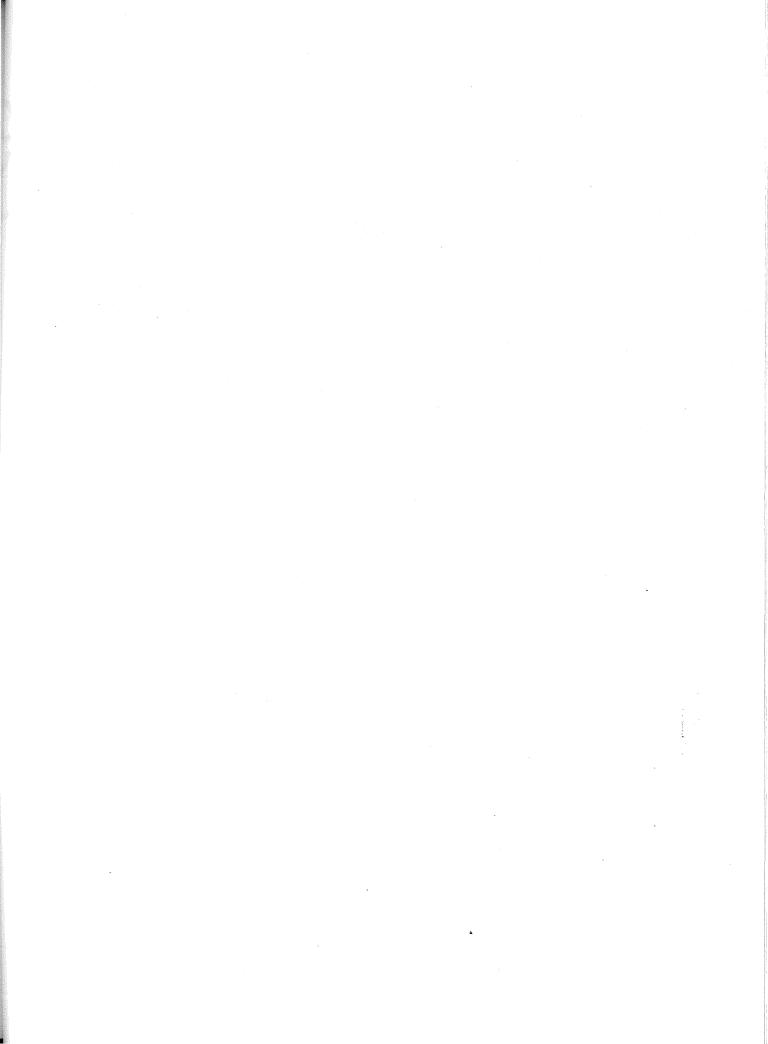
April	2.2
May	14.1
June	22.1
July	22.3
August	18.3
September	17.0
October	3.3
November	.7

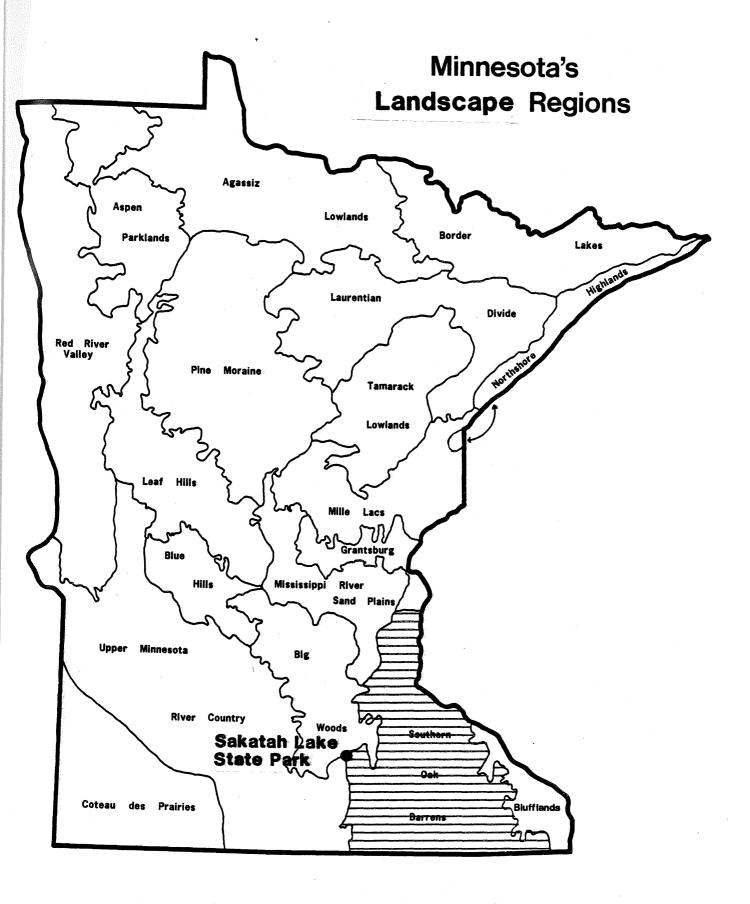
As is the case with most of Minnesota's state parks, the majority of camping occasions occur during June, July, and August. Sakatah Lake receives a larger percentage of camper use during the spring and fall than do state parks in northern Minnesota. This may be a result of climatic differences. The large percent of campers using Sakatah Lake State Park during May and September demonstrates the need for hiring adequate staff on a seasonal basis for the full duration of the camping season.

Over 46 percent of the camping parties in Sakatah Lake are made up of four or more people (see chart below). If a campsite receives regular use throughout the summer, the result is a large number of people using a very small piece of land. High use of a campsite can cause soil compaction or erosion and damage to or loss of vegetation. Sites which receive a considerable amount of use should be monitored by park staff for such damage and appropriate action taken when necessary.

Number in Party	Percent of Total Camping Parties
1	3.6 37.1
2 3	13.2 17.9
4 5 Maria than 5	13.2
More than 5	15.0







INTRODUCTION

Minnesotans are fortunate to live in a state with such a wide variety of natural, scenic, and historic resources. To ensure public access and to prevent inappropriate development, the state has set aside lands which exemplify these outstanding resources. It is the management goal for all state recreational lands, including state parks, to protect and perpetuate these resources for use by the citizens of Minnesota.

There is a delicate balance which must be maintained when recreational facilities are provided for large numbers of people in areas of outstanding and often sensitive resources. Inappropriate development can result in irreparable damage to the resource. To help ensure this recreation/resource balance, the Minnesota State Legislature established, through the Outdoor Recreation Act of 1975 (ORA '75) a classification process whereby each unit in the state recreation system can be identified as one (or more) component in the system. These components are: natural state park; recreational state park; state trail; state scientific and natural area; state wilderness area; state forest and state forest sub-area; state wildlife management area; state water access site; state wild, scenic, and recreational rivers; state historic site; and state rest area. Included in this law are general criteria for classifying, planning, and managing each of these components.

Through this classification system, the role for each recreational unit in the system is identified. The two primary classifications for state parks are natural and recreational. These two, along with other classifications, are considered during the planning process. The most appropriate is recommended for the park. If a state park does not meet the established classification criteria, the DNR will consider the possibility of eliminating the park from the state recreation system.

THE LANDSCAPE REGION SYSTEM

The landscape region system divides the state into 18 regions. These regions are differentiated according to the characteristic plant and animal life, landforms, and cultural patterns which existed before, during, and after European settlement. The landscape region system is a framework which provides information valuable in the planning of Minnesota's state parks.

Sakatah Lake State Park is located on the border between the Big Woods and Southern Oak Barrens landscape regions (see the Landscape Region Map, p_15). The description of park vegetation from the original Land Office surveys (see Vegetation, p_24 , for discussion) indicates the park best fits the description of the Southern Oak Barrens Landscape Region. Its location along the Cannon River valley, suppression of fires, and past land uses (cropland and grazing) of the park, have extensively modified park vegetation. Small areas of the park have vegetation which resembles the descriptions of both landscape regions.

The Southern Oak Barrens Landscape Region extends from the Iowa border north to the Twin Cities and covers 5.790 sq. miles (14,986 sq. km) or 6 percent of the state. Biologically, this area is a broad transition zone between the prairie to the west and the deciduous forest to the north and east. Originally, the dominant vegetation of this area was prairie with occasional groves and scattered individual oak trees.

The Big Woods Landscape Region is located in the south central Minnesota and extends from -19 miles ($_{x}30$ km) south of St. Cloud to Mankato and covers 3,420 sq. miles (8,860 sq. km) or 4.1 percent of the state. This region is characterized by the rough, wooded terrain and terminal moraines left by retreating glaciers. The area was originally covered by northern hardwoods (maple, basswood, elm, and oak). Fire was an important factor controlling the limits and succession of these communities. The control of fire by European settlers affected this community allowing it to spread and mature.

Today most of the area for both of these landscape regions has been cleared for agricultural use which makes parks in this region and their interpretation an important part of the statewide park system.

CLASSIFICATION RECOMMENDATION

Each state park is managed and developed according to its natural resources and their ability to withstand visitor use. Sakatah Lake State Park is recommended for classification as a recreational state park because it best fulfills the criteria for this designation.

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CLASSIFICATION JUSTIFICATION

The Outdoor Recreation Act of 1975 (Minnesota Statute 86A.01 to 86A.11) establishes an outdoor recreational system which will (1) preserve an accurate representation of Minnesota's natural and historical heritage for public understanding and enjoyment, and (2) provide an adequate supply of scenic, accessible, and usable lands and waters to accommodate the outdoor recreational needs of Minnesota's citizens. Recreational state parks are established as one component of this outdoor recreation system.

In keeping with the legislative mandate of the Outdoor Recreation Act of 1975, the Department of Natural Resources has established a goal, objectives, and policies for recreational state parks. It is the goal of the Department of Natural Resources in recreational state parks to:

PROVIDE LANDS WHICH OFFER A BROAD SELECTION OF OUTDOOR RECREATIONAL OPPORTUNITIES IN A NATURAL SETTING AND WHICH MAY BE USED BY LARGE NUMBERS OF PEOPLE.

To facilitate meeting this goal, objectives and policies have been described. It is the objective of the Department of Natural Resources to ensure that proposed recreational state parks meet, or have the potential to meet, the following criteria:

A. Possess natural resources, or artificial resources in a natural setting, with outstanding outdoor recreation potential.

The park, located on the shores of Sakatah Lake, contains a combination of natural and recreational opportunities which attract a variety of users. The presence of the Sakatah Singing Hills State Trail adds to the recreational opportunities available for park visitors. In addition, the state trail has increased the accessibility of the park, bringing in visitors who previously made little use of the park.

B. Provide outstanding outdoor recreational opportunities that will attract visitors from beyond the local area.

The natural and recreational resources of the park attract a substantial number of overnight users from the metropolitan area. The state trail has brought additional visitation to the park. Sakatah serves as an excellent complementary facility for state trail users such as bicyclists who are looking for camping opportunities. The DNR Trails and Waterways Unit anticipates that usership of the state trail will increase over the next few years, bringing even more visitors to the park.

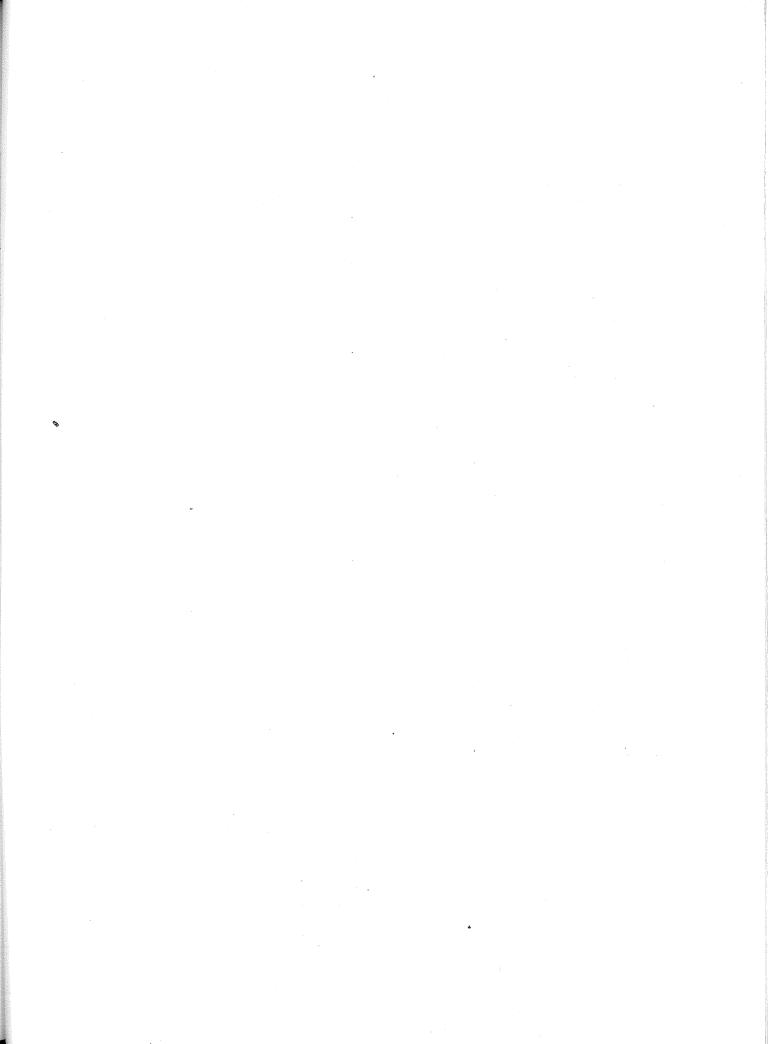
C. Contain resources which permit intensive recreational use by large numbers of people and be of a size sufficient to provide for effective management and protection of the natural and/or artificial outdoor recreational resources, so that they will be available for both present and future generations.

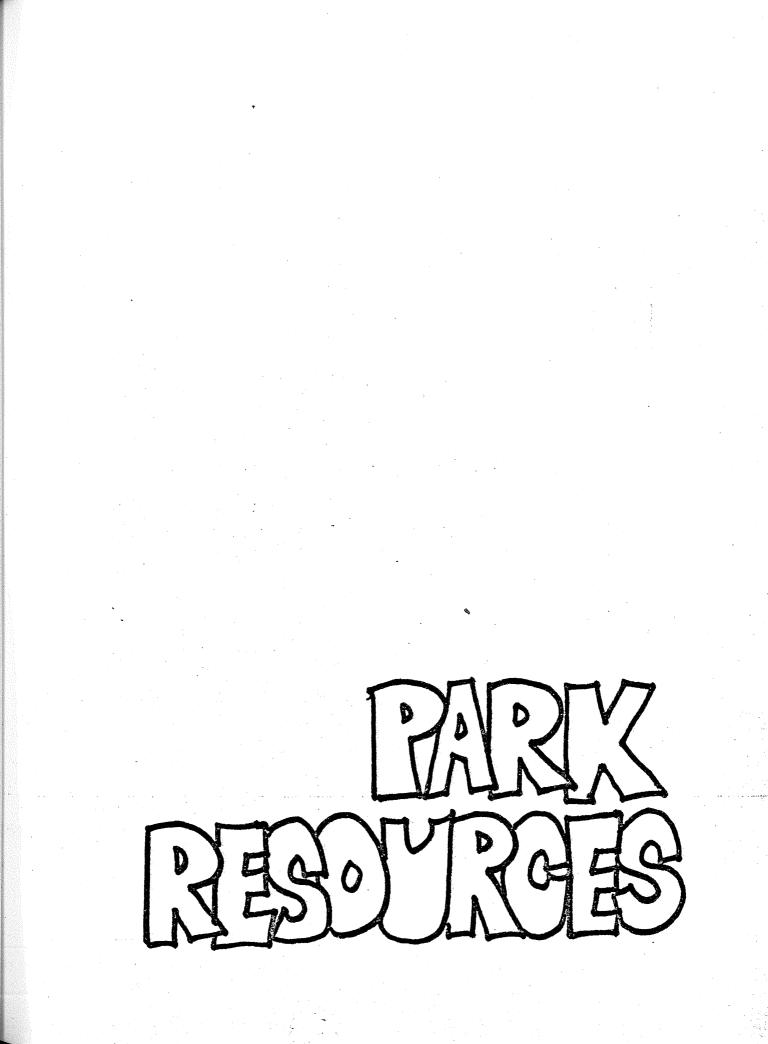
The park currently has recreational and natural resources which have been providing recreation for 30,000 to 43,000 people in each of the last five years. The park also provides access to Sakatah Lake for a broad range of water-oriented recreational activities. Specific areas of the park and major portions of the shoreline are sensitive to intensive recreational use. Recreational development in these areas has either been avoided or is being relocated.

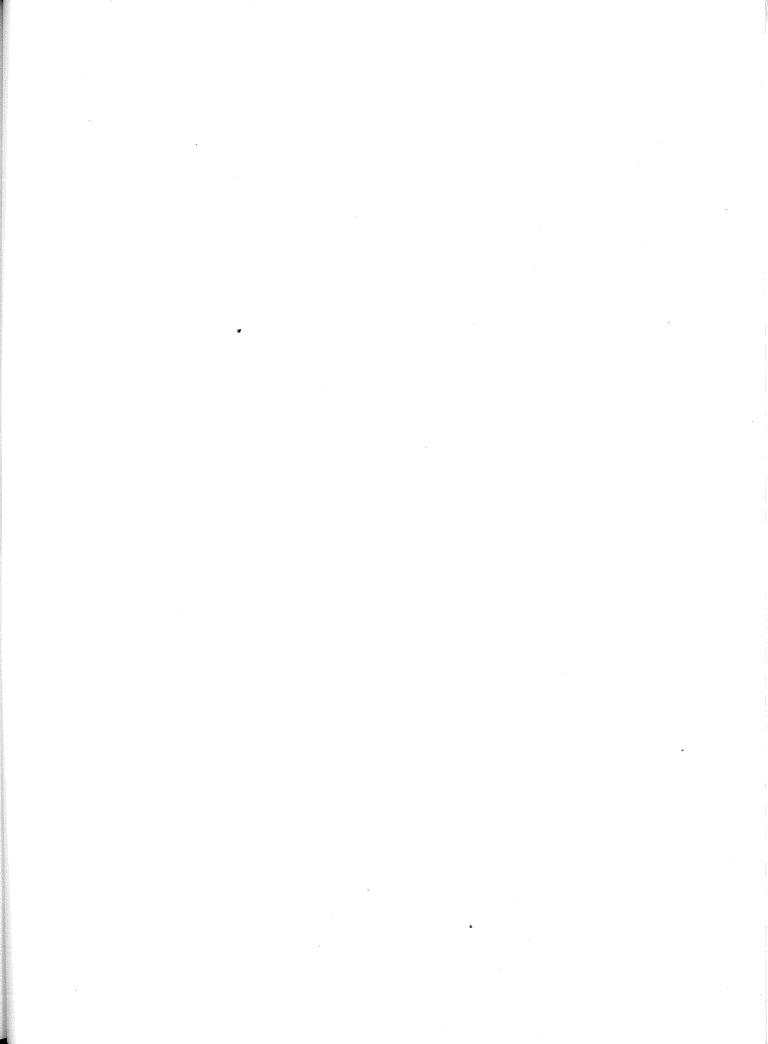
D. Be located in areas where they effectively accommodate the outdoor recreational needs of the state population, provided that they complement but are not in place of recreational service normally offered by local units of government and the private sector.

The area around Sakatah Lake State Park contains a large number of both private and public recreational facilities. Counties and municipalities operate a number of water access sites, day use parks, and playgrounds. The counties and municipalities within 25 miles (40 km) of the park provide 54 percent of the picnicking, 39 percent of the swimming, and 29 percent of the trail facilities. They also provide 6 percent of the camping facilities within 50 miles (80 km) of the park. The state park is not providing recreational facilities in lieu of municipal, county, or regional facilities, but because of its size and management, offers an excellent complement to the other public facilities in the area.

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CLIMATE

Information on annual temperature and precipitation for the park comes from a weather station in Faribault. The low, rolling hills surrounding the Cannon River valley have no sharply marked differences in topography, therefore the climate in the region around the park is quite uniform.

The average temperature for December, January, and February is $17^{\circ}F$ (- $8^{\circ}C$). Almost all winters have an average of 5 days when the temperature is $-20^{\circ}F$ or lower.

The average temperature for June, July, and August is $70^{\circ}F$ ($21^{\circ}C$) The daily maximum during these months ranges from the mid-seventies to the mid-eighties, and the daily minimum ranges from the mid-fifties to the mid-sixties. The growing season in this area is 140 days.

About 75 percent of the annual precipitation (23 inches/58 cm) falls from April through September. Rainfall intensities of about 1.5 inches (4 cm) an hour can be expected once every two years. Annual precipitation has ranged from 10.8 inches (27 cm) in 1910 to 39.1 inches (99 cm) in 1965. Annual snowfall averages 38.5 inches (98 cm). In winter months, the area averages 95 days of snowcover.

GEOLOGY

The landforms of LeSueur and Rice counties are the result of glacial activity. It is estimated that the last glacial advance which affected this area occured about 10,000 years ago. Sakatah State Park is situated on the Altamont moraine which was formed about 13,000 years ago by the Des Moines lobe of the Wisconsin glaciation. A moraine is a large mound of unconsolidated unstratified rock and mineral debris deposited at the edge of glacial ice. The Des Moines lobe formed a series of moraines along its eastern edge, extending south from the Minneapolis area to the Iowa border and beyond. This area has rolling, steep hills, crooked streams, and many lakes. South and west of Waterville is a minor recessional moraine. Immediately east of Waterville and south of Sakatah Lake is an area of high hills where the Altamont moraine is joined by an east-west recessional moraine. Glacial drift in the region ranges from 100 ft (30 m) to more than 400 ft (120 m) thick. The main area of the park is estimated to have 200-400 ft (60-90 m) of glacial deposits and the east end of the park 100-200 ft (30-60 m). The bedrock formations underlying the glacial deposits dip regionally to the southeast. The bedrock directly underlying the drift in the area of the park is the Shakopee-Oneota dolomite of varying thickness.

Sakatah and Tetonka lakes are part of the Cannon River valley. Along this valley glacial ice blocks were left by receding glaciers forming depressions which fill with water creating lakes such as Sakatah and Tetonka.

SOILS

There is are a variety of soil types in Sakatah Lake State Park all of which are the result of glacial activity depositing till over underlying rocks. Soil development is largely a function of the type of vegetation which became established and the type of climate which prevailed in the region (Wilde, 1958). An inventory of existing soils can provide information about original vegetation patterns with the park.

The western two-thirds of the park is dominated by Lester soils interspersed with deposits of Webster and Glencoe soils. Webster and Glencoe soils are nearly level, with drainage ranging from poor to very poor. Both soil types have moderate limitations for recreational developments such as campgrounds and picnic areas. Lester soils are undulating to steep, well-drained, loamy soils. They vary greatly in recreational development limitations depending on the degree of slope. Developments such as the campground and service area are located on Lester soils which have only slight development limitations. More steeply sloped Lester soils, such as the area between the lakeshore and the Sakatah Singing Hills State Trail, have moderate to severe limitations for most recreational development. However trails can be developed within the requirements of these soil limitations.

Soil deposits in the eastern third of the park are more varied and mixed. Lake beach and marsh soils make up the majority of the lakeshore with smaller areas of Salida and Lester soils intermixed. All of these have moderate to severe recreational development limitations due to erosion and

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Soi	1	S	•	Кеу	
So	i	I	S		

Ck	-	Caron	
Cn	-	Clarion	
Cs	-	Clarion	
Es	-	Esterville	
Gc	-	Glencoe	
GP	-	Gravel pit	
		Lake beach	
L1	-	Lester	
Lu	-	LeSueur	
Ma	-	Marsh	
Mu	_	Muck	
Pa	-	Palms	
Ru	-	Rough broken	land
		Salida	
We	-	Webster	

Slope

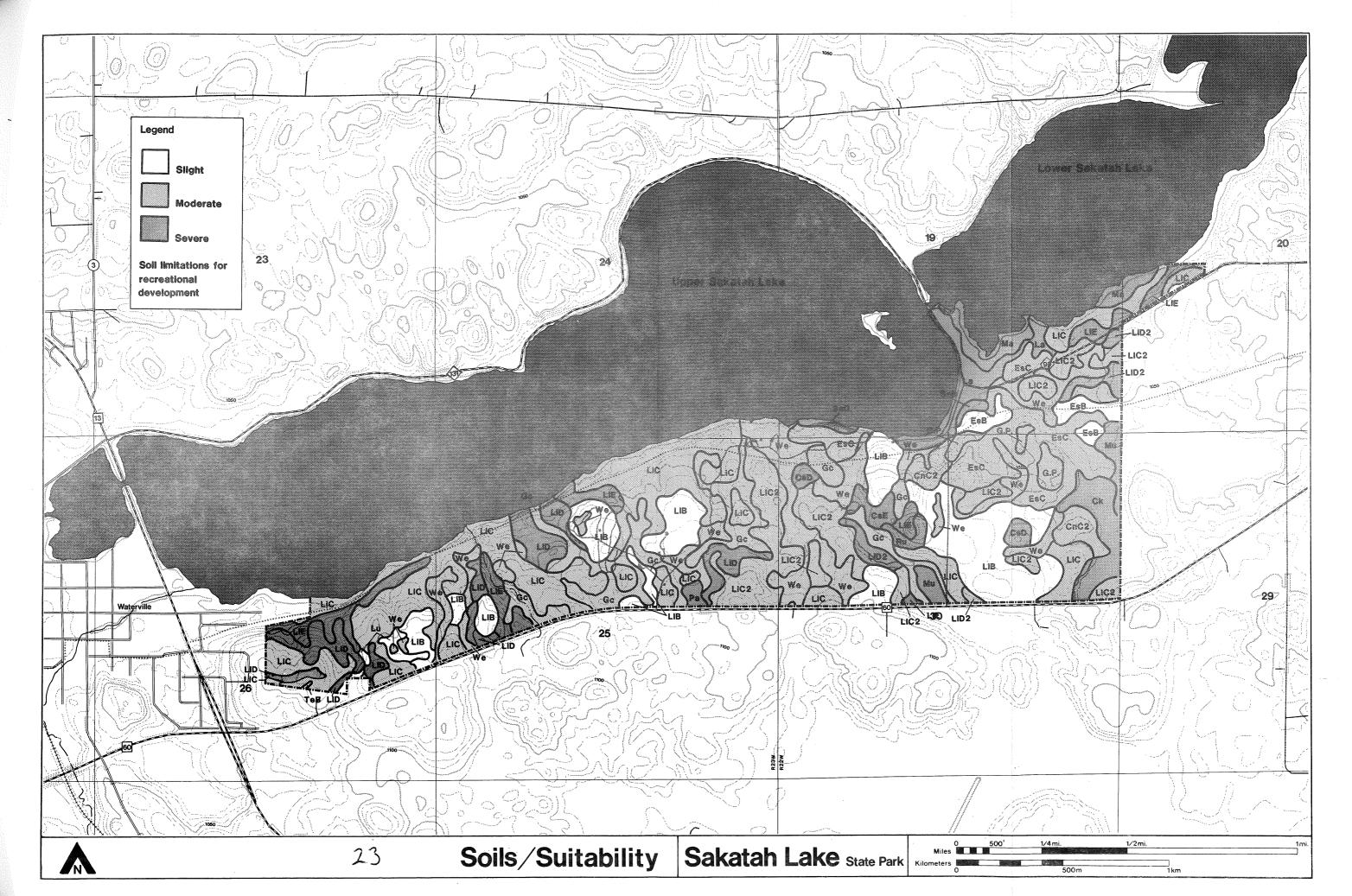
В	-	3-6%
С	-	6-12%
D	-	12-18%
Ε	-	18+ %

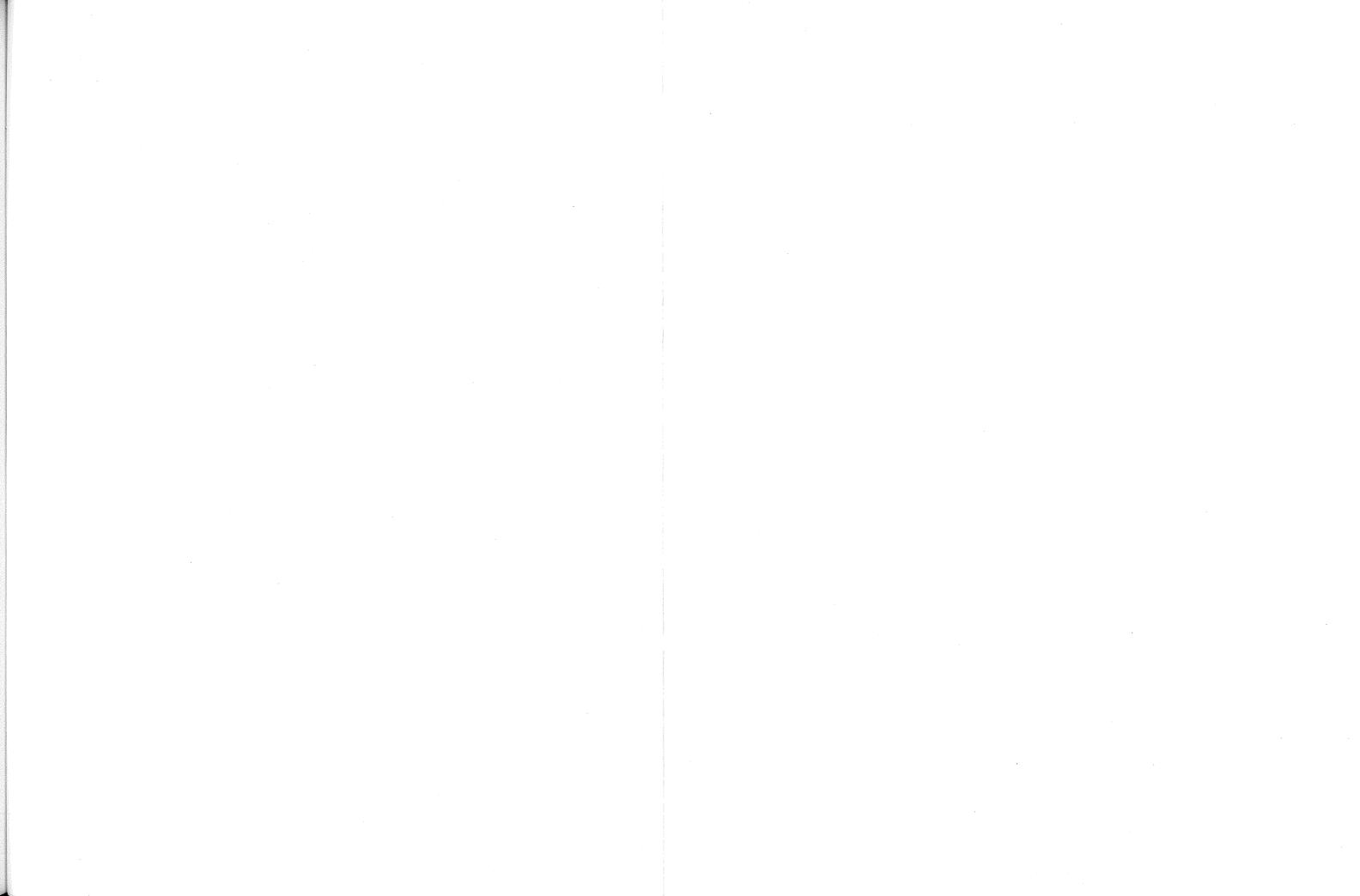
Soil Limitations

Slight-Suitable for development

Moderate-Suitable for most development

Severe-Unsuitable for most development





drainage problems. Away from the lakeshore, deposits consist of about equal amounts of Lester and Esterville soils with smaller deposits of Clarion soils scattered throughout. The majority of these soils have slight to moderate development limitations. There are also a few gravel deposits in this portion of the park. In the past, gravel was removed from these areas for road construction. These gravel pits are no longer in operation. The Soils Suitability Map (p 23) was developed to locate areas of the park in which the soils are acceptable for the development of recreational facilities. In almost all cases, present facilities are located on acceptable soils. Facilities can be developed in some unacceptable areas if special construction techniques are used. Some areas which have wet, mucky soils are unacceptable for most development, but these areas can be used in the winter for ski and snowmobile trails.

Soils are a resource which can be impacted by human use. Soil compaction and erosion can result from use. Consideration should be given for soil protection.

VEGETATION

Vegetation History

Following the retreat of late Wisconsin glaciation about 10,000 years ago, extensive areas of forest replaced grassland (Curtis 1959). Curtis theorized that these early forests in Wisconsin were composed largely of oak and other hardwoods. Southeastern Minnesota probably had similar forests.

As the climate became warmer and dryer, considerable vegetational readjustments in the early oak and other hardwood forests occurred. This climatic change favored the development of prairie species and resulted in prairie encroachment upon the forested areas. Also, at this time the oak element in the deciduous forest increased to a maximum (Voss 1934). After the peak of the warm, dry period about 3,500 years ago, the climate began changing toward the more mesic (moderately moist) condition of today.

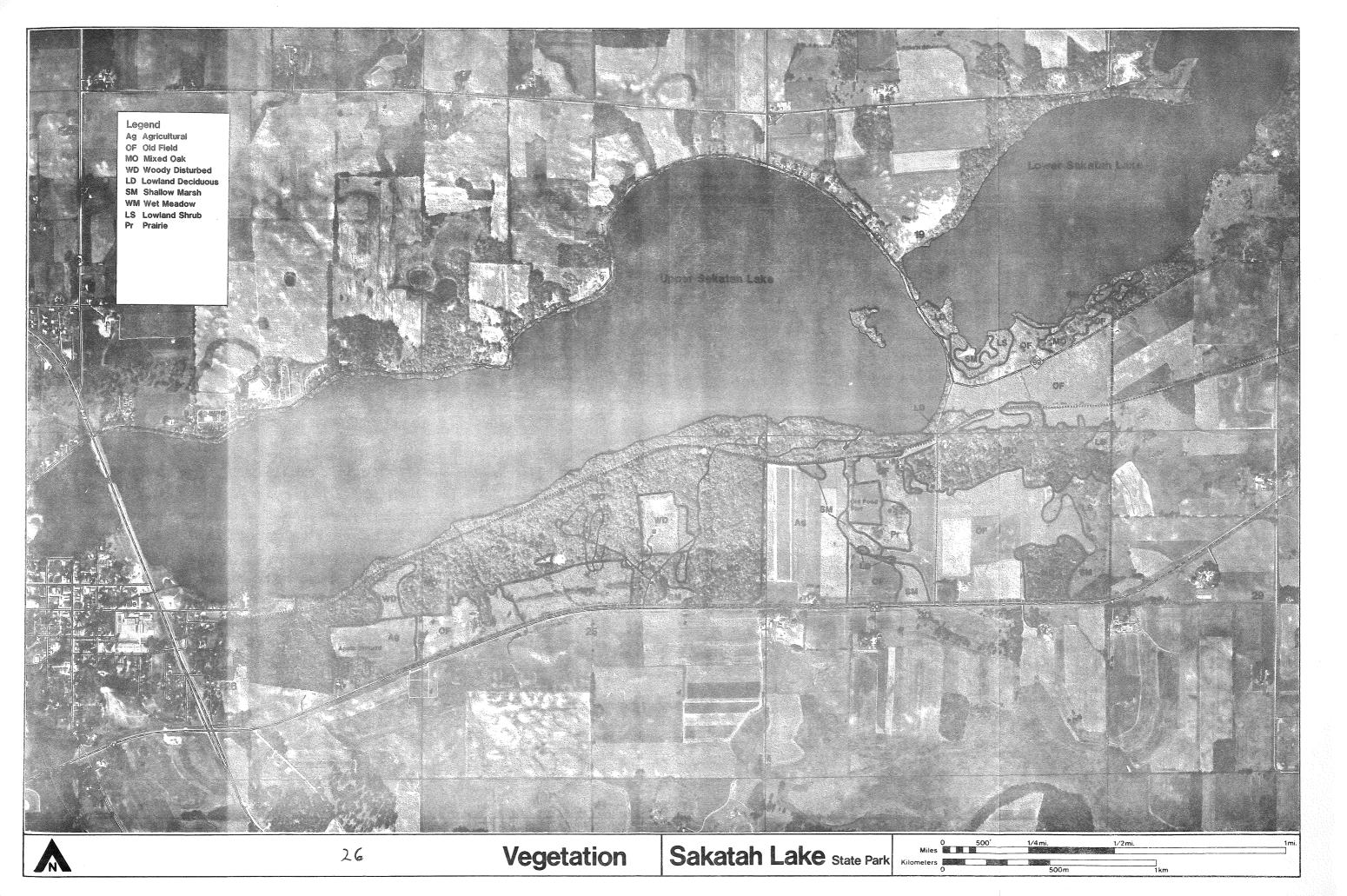
This change allowed the deciduous forest to reestablish itself in areas which had been invaded by prairies. Microclimates and natural (fire) and human influences have affected the establishment of vegetative communities in specific sites. A description of the vegetation

prior to settlement is available in General Land Survey Office records. These records constitute the field notes of the original surveyors of Minnesota during the late 1800's. They provide detailed information regarding presettlement vegetation.

Surveyors walked along the section lines of each township, marking the mile and half-mile intervals by recording tree species, diameter at breast height (dbh) and distance from the survey corner to the nearest tree (these were called bearing trees). They also recorded the locations of uplands, swamps, streams, roads, and lakes. The area which is now the park was described in the survey records as low, rolling land with second rate timber and prairie. Areas were timbered with bur oak (10-16" dbh); basswood, and aspen (10-14" dbh); butternut, elm, and ash (8-10" dbh); and ironwood (6" dbh). The land had several low depressions which contained marshes and seasonal wetlands. Several small drainage creeks were located in the area of the park. The soils of the area were described as "primarily first rate." The general description recorded the land south of Sakatah Lake as having pin oak, aspen, crab apple, prickley ash thickets, and rolling prairie. The land north of the Sakatah Lake was described, in general, as having a very good growth of sugar maple, linden, elm, and some walnut.

Marschner (1930) used the General Land Survey Office notes to develop a map of the original vegetation of the entire state. He mapped the vegetation south of Sakatah Lake as "Aspen-Oak Land, Prairie, Wet Prairies, Marshes and Sloughs," and the areas north of Sakatah Lake as "Big Woods." This information indicates that at the time of settlement, the big woods in this area began north of the Cannon River.

The primary factor limiting the extent of the big woods in this area was fire (Daubenmire 1936). Several species of the big woods, such as sugar maple and red oak are fire-intolerant, Fire is an ecological factor which restricts the establishment of forests. Large bur oak and prairie species are fire tolerant and are maintained as primary elements in the plant community as a result of frequent fires. The frequency of fire in an area directly affects the species, sizes, and overall composition of the plant community.



The Cannon River appears to have acted as a natural barrier restricting fires which usually advanced in an eastward direction. In the 1860's the area was settled, roads were built, and the land was plowed. This resulted in increased suppression of recurrent wildfires.

Curtis (1959) noted that when the fires were stopped by new settlement, rapid changes took place. Within a decade, oak openings were filled in with saplings and brush and within 25 to 30 years, oak forests were present.

In some areas of the park, large bur oaks, with large horizontal branches and erect limbs can be found. These trees probably developed under savanna conditions and have since had younger trees grow in around them closing the forest canopy. Prairie species can be found in several parts of the park. The quality of these areas and number of species found is poor. Schwartz Hill is the only good remnant of prairie existing in the park.

Existing Vegetation Inventory

Vegetation communities were delineated from 1980 color slides taken by the Agricultural Stabilization and Conservation Service (ASCS) and from aerial photographs (Soil Conservation Service - 1937, 1938, 1940, 1951, 1958, 1964, and 1979). The general composition of the communities was field checked by DNR, Park Planning staff in October of 1981.

The scope of the inventory was to define communities with characteristics important to vegetation and wildlife management, recreational use, and park development. These characteristics include the gneral composition, density, and age structure of the canopy, the high shrub-sapling layer (taller than one meter), the low shrub-tree seedling layer (shorter than one meter), and the ground cover. The descriptions also include the relationships of communities to soils, landforms, and general successional trends.

Mapping

Unit

MO

Code

<u>Mixed Oak</u> These woods are quite variable. This vegetation type includes several different kinds of areas that are intermixed to the point that it will take a more intensive inventory to delineate them. In general, it is typified by an overstory of large red oak, basswood, green ash, and elm. Common saplings are bitternut hickory, green ash, hackberry, basswood, ironwood, and occasionally sugar maple. The shrub layer is moderate to dense depending on canopy coverage and past land use. The forest has been generally closing in since settlement. Recent openings are often the result of windthrow or disease damage (Dutch elm disease, oak wilt, butternut canker).

Close to the lakeshore, oak is not as important in the canopy. Hackberry, basswood, and elm are dominant in the largest size classes. The overstory is quite open in places, possibly due to Dutch elm disease. A small mature stand of maple and basswood is located along the south shore of Sakatah Lake. The sapling-shrub layer is moderate to continuous. Ironwood, bitternut hickory, and hackberry are the most common tree saplings.

In some areas, the canopy is dominated by box elder or cottonwood. In wetter areas, it is dominated by elm, green ash, black willow, and box elder. Bur oak is most common near the southern edges of this type. They generally have low, horizontal branching patterns, but these now exist in a relatively closed canopy.

The ground layer in the upland areas is superficially similar throughout. Common forbs include Virginia waterleaf, sweet cicily, blue cohosh, wild geranium, sarsaparilla, and early meadowrue. Ground cover is approximately 50-75 percent forbs and grasses and 25-50 percent duff.

2 X

- <u>Shallow Marsh</u> This type includes several small marshes. The soil is usually waterlogged during the growing season. Often it is covered with a few inches of water. Reed canary grass and sedges are dominant in the drier areas. In wetter areas, three square is common and cattail occasionally occurs.
- OF <u>Old Field</u> These are formerly cultivated or pastured areas that were left fallow or seeded to a grass-legume mixture after park acquisition. Some of the areas harbor species designated by the state and county as noxious weeds and/or species that present difficulties to grassland management. The worst areas appear to have formerly been barnyards. Common grasses include bromegrass, timothy, quack grass, and bluegrass.
- WD <u>Woody Disturbed</u> These are areas dominated by early successional tree species. They are the result of clearing or cessation of cultivation and planting. Cottonwood, green ash, and box elder are common and have established naturally. Green ash and Amur maple have been planted in some areas. Sumac is common as a shrub. Bluegrass commonly dominates the ground layer.
- LD <u>Lowland Deciduous</u> This vegetation type occurs on the edge of the lakeshore and marshes. Common tree species include elm, boxelder, green ash, black willow, and occasionally silver maple.
- LS <u>Lowland Shrub</u> Willows and red osier dogwood are the major shrub species. The ground layer is dominated by wet grasses, such as reed canary grass and sedges. Elm and green ash saplings can occur within this type. It occupies lake and marsh margins.
- PR <u>Prairie</u> The only major prairie area occurs on a sandy/gravelly knoll in the E 1/2 of the NW 1/4 of section 30. The prairie species present are characteristic of a dry or dry-mesic prairie. Side oats gramma is the dominant prairie grass. Characteristic forbs include pasque flower and whorled milkweed. The entire knoll is mapped as prairie, however, the best examples of this type are on the upper west and north slopes.

SM

Woody encroachment of sumac, wolfberry, and prickly ash has resulted in the suppression of prairie grassland species over most of the knoll. Bluegrass is the dominant species under the shrub layer. A few open grown bur oaks, red oaks, and elms also occur on the knoll. The abundance of a species in a strata of a given vegetative community was recorded as follows:

- a = abundant
- o = occasional
- c = common
- r = rare

Annotated List of Some Common Species

COMMON NAME	SCIENTIFIC NAME	ABUND- DANCE	COMMENTS	ASSOCIATED VEGETATIVE TYPES
Trees Red oak	Quercus borealis	с		MO
Northern pin oak	Quercus ellipsoidali	<u>s</u>		
Bur oak	Quercus macrocarpa	0		MO
Basswood	<u>Tilia americana</u>	с		MO
American elm	<u>Ulmus americana</u>	C	large trees, mostly dead, common as saplings in open are	MO/LD
Red elm	Ulmus-rubra			
Bitternut hickory	<u>Carya cordiformis</u>	0	locally abundant	MO
Butternut	Juglans cinerea	0	locally more common	MO
Black walnut	Juglans nigra	0		MO
Green ash	Fraxinus pennsylvani	<u>ca</u> c	common to abundant as saplings in openings-planted in some areas	MO/LD WD
Cottonwood	Populus deltoides	С	common to abundant in field edges	MO/WD

Aspen	Populus tremuloides	0		MO/WD
Box elder	Acer negundo	с	invades old field areas, locally abundant as overstory trees	MO/WD
Sugar maple	Acer saccharum	0	more common as a sapling	MO
Black cherry	Prunus serotina	0		MO
Black willow	<u>Salix nigra</u>	0	along lakeshore, marsh edges	WD
Apple	Prunus malus	0		OF
Red cedar	Juniperus virginiana	r		OF
Hackberry	<u>Celtis occidentalis</u>	0	locally common	MO
Shrubs				
Prickly ash	Xanthoxylum americanum	с	often very dense in openings	MO/WD Pr
Elderberry	Sambucus cf. pubens	0	-	MO
Sumac	<u>Rhus</u> spp.	с		OF/WD
Currant/gooseberry	<u>Ribes</u> spp.	C		MO
Chokecherry	Prunus virginiana	0		WD/MO/ OF
Hawthorne	<u>Crataegus</u> sp.	C	common in fence rows	OF
Virginia creeper	Parthenocissus sp.	0		M0/0F
Raspberry	<u>Rubus</u> sp.	с		MO/OF
Willow	<u>Salix</u> spp.	C	marsh edges	WD LS
Snowberry	<u>Symphoricarpos</u> cf. <u>albus</u>	0	locally abundant on prairie knolls	PR
Grape	<u>Vitis</u> sp.	0		OF/MO
Dogwood	<u>Cornus</u> sp.	0		MO
Amur maple	<u>Acer ginnela</u>	с	locally common, planted	WD

Forbs

Nettle	<u>Urtica dioica</u>	с			0F
Burdock	Arctium sp.	с	weed	problem	0F
Great ragweed	Ambrosia trifida	с	weed	problem	0F
Milkweed	Asclepias syriaca	с			0F
Blue vervain	<u>Verbena hastata</u>	с			0F
Goldenrod	<u>Solidago</u> spp.	с			0F
Aster	<u>Aster</u> spp.	с			0F
Sweet clover	<u>Melilotus</u> spp.	C	weed areas	problem in prairie s	OF
Red clover	Trifolium pratense	C			0F
Velvet leaf	Abutilon theophrasti	0	weed	problem	0F
Canada thistle	Cirsium arvense	с	weed	problem	0F
Goosefoot	<u>Chenopodium</u> sp.	0	weed	problem	0F
Horseweed	Erigeron canadensis	с			0F
Alfalfa	<u>Medicago sativa</u>	С			0F
Smartweed	Polygonum sp.	0		6	OF
Yarrow	Achillea millefolium	C			OF
Goatsbeard	Tragopogon sp.	0			OF
Bindweed	<u>cf. Convolvulus</u> sp.	0	weed	problem	OF
Whorled milkweed	Asclepias verticillata	0			PR
Pasque flower	Anemone patens	C			PR
Wild bergamot	<u>Monarda fistulosa</u>	0			PR
Ragweed	<u>Ambrosia</u> sp.	C	nati	ve	PR
Thimbleweed	Anemone cylindrica	0			PR
Purple prairie Clover	Petalostemum purpureum	r			PR

Butter and eggs	Linaria vulgaris	с	alien	PR
Mullien	Verbascum thapsus	0		
Brome grass	Bromus inermis	C	difficult to eradicate with fire	OF
Foxtail	<u>Setaria</u> sp.	с		0F
Bluegrass	<u>Poa</u> sp.	С		0F
Quack grass	Agropyron repens	С		0F
Timothy	Phleum pratense	с		0F
Side oats grama	<u>Bouteloua curtipendulua</u>	0	abundant on prairie knoll	PR
Big bluestem	<u>Andropogon gerardii</u>	0		PR
Reed canary grass	Phalaris arundinaceae			SM
Sedge	<u>Carex</u> spp.			SM
Sweet cicily	<u>Osmorhiza longistylis</u>	с		MO
Virginia waterleaf	<u>Hydrophyllum virginianum</u>	a		MO
Early meadowrue	Thalictrum dioicum	с		MO
Blue cohosh	Caulophyllum thalictroides	C		MO
Ginsing	Panax quinquefolium	r		MO
Sarsaparilla	<u>Aralia nudicaulis</u>	r		MO
Wood nettle	<u>Laportea</u> canadensis	0	locally dominant	MO
Moonseed	<u>Menispermum canadense</u>	0		MO
Baneberry	<u>Actea rubra</u>	0		MO
Geranium	<u>Geranium</u> sp.	C	н ^с	MO
Catnip	cf. <u>Nepeta cataria</u>	0		MO
Aster	<u>Aster</u> spp.	с		MO
Bedstraw	<u>Galium</u> sp.	с		MO
Lopseed	<u>Phryma leptostachya</u>	с		MO

Bladdernut

Jack in the pulpit	Arisaema triphyllum	0	MO
False Solomon's seal	Smilacina racemosa	0	MO
Black snakeroot	<u>Sanicula marilandrica</u>	0	MO
Wood strawberry	Fragaria virginiana	0	MO

Additional Species observed by the Regional Naturalist

Common elderberry Sambucus canadensis

Staghorn sumac Rhus typhina

Management

Prior to European settlement, the park vegetation was a mixture of oak savanna, oak woods, brush areas, marshes, and prairie. Remnants of each of these communities can still be found in the park today. The condition of these communities has been highly impacted by grazing, timber cutting, agricultural practices, and a major reduction in the frequency of fires. These environmental and land use changes have made it impractical to manage the entire park for its pre-settlement vegetation.

Objectives:

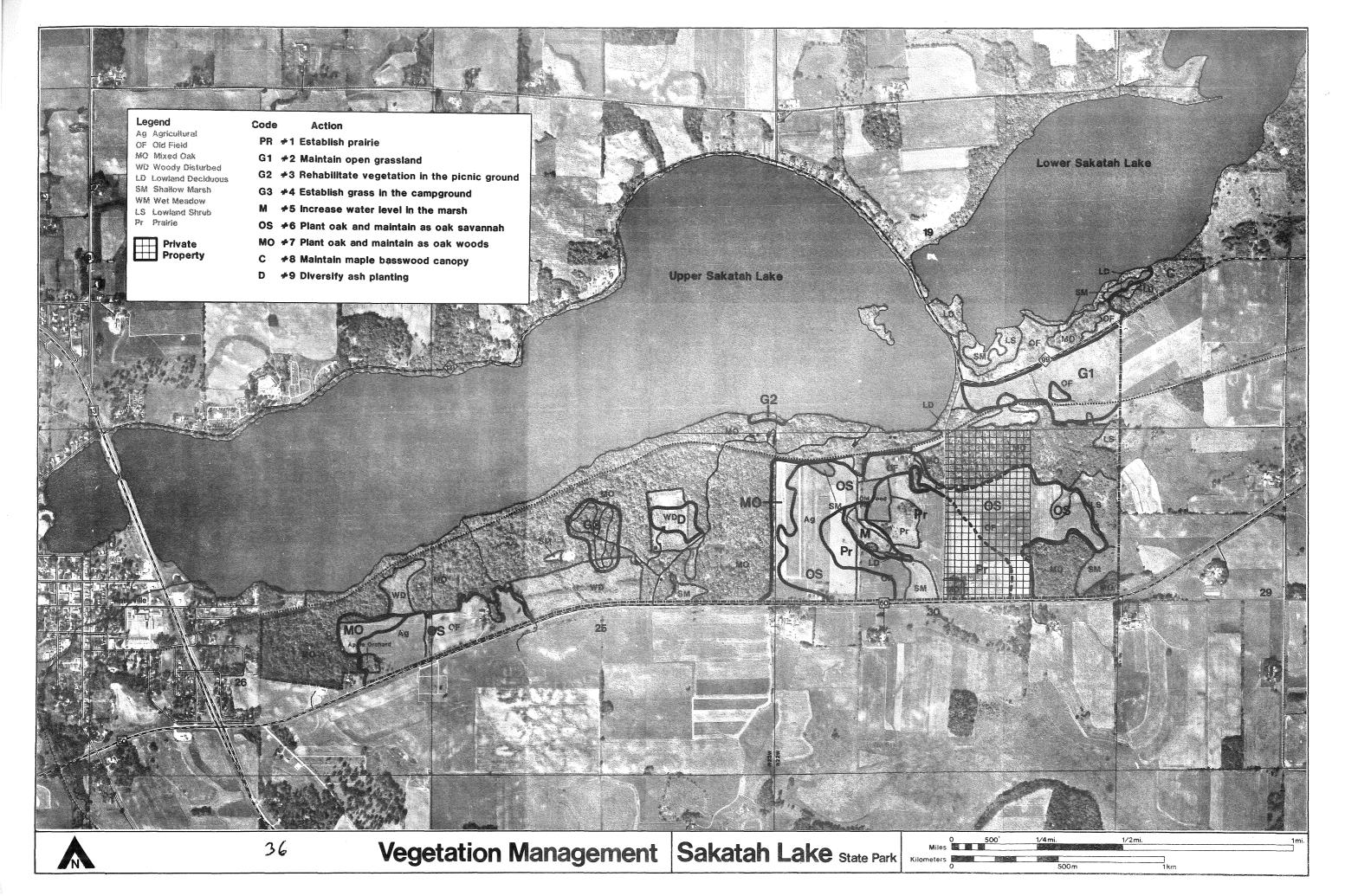
To reestablish a representation of the vegetation communities which existed prior to settlement in areas of the highest natural quality or greatest significance in the park

To provide areas for teaching ecological principles to park users

To provide a refuge for plants and animals of the local area

To improve habitat in order to better support a diversity of wildlife species in the park







Action #1.	Establish	and	maintain	ta]]	grass	prairie	in	key	areas	of	the
park.					in an			•			

There is a prairie remnant in the park on the knoll in the E 1/2 of the NW 1/4 of Section 30. This prairie remnant should be restored to a diverse tall grass prairie representing the park's pre-settlement vegetation patterns. The area is becoming over grown with shrubs and exotic grasses. A burn program should be developed immediately to reduce woody encroachment and enhance the growing conditions for the native prairie species. Expansion and diversification of the prairie remnant can be accomplished by the addition of native grasses and forbs acquired from sites which are located within a 30 mile (48 km) radius of the park. Collecting species from within this radius of the park will help to ensure the local genetic characteristics of the plants. A prairie on a similar site is located one mile east of the park. This prairie should be used as a model for species composition.

The management of prairie requires periodic fires to suppress the encroachment of forest species. A burn management program will be developed for the park. (See this section, Action #11, p - 44.)

	2	3	4	5	TOTAL
COST	3,000	3,000	3,000	1,000	Ongoing

Action #2. Maintain open grassland north of the Sakatah Singing Hills Trail.

A major portion of the area between the state trail and Cty Rd 99 should be maintained as open grassland. This area is now being encroached upon by boxelder and shrub species. Side oats gramma was identified along the north edge of this grassland. A controlled burn should be conducted in this area to maintain the open grassland appearance and encourage growth of any remanent prairie species. Maintaining the open appearance of this area will enhance the views from the Sakatah Singing Hills Trail to the lake and over an adjacent marsh.

 1
 2
 3
 4
 5
 TOTAL

 COST 2,000
 1,000
 Ongoing 3,000

Action #3. Remove understory trees, thin canopy, and establish grass in the lakeside picnic ground.

The lakeside picnic ground is located on a Webster soil. This soil has moderate limitations for picnic areas because the surface layer becomes sticky and soft when wet. A dense tree canopy heavily shades the ground, hindering evaporation. Water seepage from an adjacent hill increases the moisture in the soil for much of the summer. As a result, the grass is in very poor condition. In order to correct this problem, the canopy should be opened, and the ironwood saplings removed to allow more sunlight to penetrate to the ground. Measures should be taken to reduce soil compaction and to establish a healthy grass cover. A shade tolerant grass should be added to the seed mix. If excessive surface moisture persists in the area (because of water seepage from the adjacent hillside), construction of a gravel drainage trench at the base of the slope may be considered. The east-west drainage trench should divert water to the existing natural drainage ways at either end of the picnic ground. The expense and benefits of this added development should be reviewed by an engineering study before implementation. Long term management of this area is required to keep the canopy open allowing good sunlight penetration.

Action #4. Establish grass in the campground.

Most campsites no longer have grass cover. In some sites, shade may be the cause. In these cases, the tree canopy should be pruned to allow some sunlight to penetrate to the ground. However, it should be done only where necessary and on a very limited basis to maintain the wooded character of the campground. Since lack of sunlight is only one of several possible causes of the problem, a study should be conducted to determine the full scope of the problem. Other factors could be soil type and soil compaction due to excessive use. The most suitable seed mixtures, soil fertilizers,

and soil modifications should be identified. Requirements are expected to vary for different sites. Improvements should be phased a few sites at a time. This will allow for an evaluation of results before proceeding with work on additional sites. Recommendations for management should be obtained from the area S.C.S. office. (Major upgrading of the campground organization is discussed in Camping Action #1, p **62**.)

]	2	· · · · · · · <u>5</u> · · · · · · ·	TOTAL
COST	1,000	500	500	Ongoing 2,000

Action #5. Increase the water level in the shallow marsh southwest of Schwartz Hill (SE 1/4 of NW 1/4 of Section 30) when the adjacent life estate becomes available for park use.

This shallow marsh has waterlogged soils and is partially covered with a few inches of water. A narrow water channel draining a wetland south of TH 60 flows through the center of the marsh. The marsh vegetation is primarily sedge surrounded by some cattails, shrubs, and trees.

Increasing the water level of this marsh to a depth of 2 to 4 ft (.6 to 1.2 m) would require a small water control structure at the north end. This control structure should be natural in appearance. It may include a variable water level feature. Increasing the water level will flood an area which is currently an agricultural field. For this reason, it is not possible to proceed with this action until the life estate is under state management. Drainage of land south of TH 60 will not be affected. Prior to any construction work the DNR regional hydrologist should review the project to determine if a Dam Safety or Work In the Beds permit is required for the water control structure.

Deep water marshes provide excellent breeding and feeding habitat for waterfowl. Increasing the depth of the water to maintain an area of open water at the center will enhance the wildlife visibility, the visual qualities of the marsh, and habitat diversity. The increased water level may kill trees on the edge of the marsh. These dead trees should be left standing to enhance wildlife visibility. Increasing the water depth in the marsh, implementation of snag management recommendations, and installation of nest boxes (see this section, Action #13, p<u>47</u>), are intended to enhance wildlife observation.

<u>COST</u> Conditional

Action #6. Plant old field grasslands and life estate lands with oak.

The presettlement character of the park had more of an oak savanna/brush vegetation pattern than exists today. Many areas of the park have grown up into mixed oak forest. Other areas were used for agricultural purposes which has resulted in large, open areas with straight edges.

There are currently three life estates in the park. (See Ownership, p<u>**94**</u> for discussion.) The life estates are currently in crop production and pasture. As these lands become available for park use, they should be planted to native communities of oak openings and prairie. A representation of the oak savanna that once occurred throughout much of the park can be established and managed in these areas. Scattered oak planted in the fields should follow the distribution patterns and overall composition of an oak savanna community. Priority sites for this management are the area around the Schwartz Hill prairie remnants and the area north of the Sakatah Singing Hills Trail on the west end of the park. The reestablishment of oak savanna with native prairie forbs and grasses will provide a more diverse wildlife habitat, enhance the visual aspects of the park, and serve as a representation of presettlement vegetation.

Local seed sources should be used for this project. The availability of a seed supply may limit the planting to a few acres per year. In areas not immediately planted to native prairie species, a mixed cover planting of fast-growing, short-lived plants should be established. The cover crop will help to crowd out weeds and reduce soil erosion. Perennials, especially brome grass should not be planted. These species are highly competitive

with native grasses and may cause difficult management problems later. The overall grassland conversion program should be determined by the regional resource coordinator and the park manager.

Establishment of oak is a very slow process which can be greatly aided by some management techniques. Competition from other vegetation for light and moisture is very great and should be considered in selecting management techniques.

Recommended management techniques include:

<u>Fertilization</u>. Periodic applications of nitrogen and phospherous will stimulate rapid height growth. This will aid in getting the trees out of reach of the deer faster. Slow release fertilizers should be considered.

<u>Removal of Competition</u>. Annual removal of all trees, shrubs, and grasses around planted oak until trees are 6 to 8 ft (1.8 to 2.4 m) tall. This can be accomplished by mowing, selective hand cutting, prescribed burns, mulching, or total removal by chemical treatments (Vogel 1980).

Wildlife Deterrents. Chemical or other deterrents for deer.

<u>Fencing</u>. Wire or plastic cages should be used to protect young seedlings from deer and rodents.

<u>Transplant</u>. Transplanting large oak in desired sites. After oaks are established, a burn program should be implemented.

<u>Interplant Oak with Legumes</u>. Legumes can attract more deer which can result in increased seedling damage. However, legumes fix nitrogen in the soil which can increase the survival rate and growth of the trees. Fencing should be combined with this action. Planting with grasses alone appears to decrease survival and growth due to competition for nitrogen and moisture (Vogel 1980).

The results of these management techniques will vary from site to site. A combination of techniques should be used and the results should be monitored by the regional resource coordinator.

Tree planting should be phased to determine the most effective management for specific sites and species. A burn plan should be developed to maintain the open character of the native grasses in the oak savanna community.

COST Conditional (will be ongoing)

Action #7. Plant mixed oak species along edges of life estate agricultural fields as they become available for park use.

Large clumps of native trees, primarily oak, should be planted to interrupt the existing straight edge of the woods currently surrounding the agricultural land. These areas should be managed as mixed oak forest and should not be burned.

The slow growth of oak and the competition between forest species for moisture, light and nutrients necessitates establishing and managing the area primarily for oak if they are to become a strong forest species. Oak are a good food source for many wildlife species. It is anticipated that other native tree and shrub species common to other areas of the park will establish naturally in these areas. To insure a diverse structure some native tree species may be planted in a manner which does not compete with young oak.

COST Conditional

Action #8. Maintain mature maple basswood canopy.

This maple basswood community is representative of the big woods which probably existed along the shores of Sakatah and Lower Sakatah lakes and north of the Cannon River at the time of European settlement. The wildlife species which inhabit mature big woods are different from those in grasslands and young disturbed forests. Maintaining the existing mature canopy will increase the diversity of wildlife, enhancing wildlife observation.

COST No Development Cost

Action #9. Diversify the species content of the ash planting north of the service court.

Some of the ash should be removed, and oak, sugar maple, basswood, hackberry, and cottonwood planted to diversify the stand. Providing a diversity of canopy species will improve wildlife habitat. Monocultures are of low value to wildlife species. Also, monocultures are more susceptible to extensive damage due to diseases and pests than are mixed woods. If practical, removed ash may be transplanted into the park's use areas. Removal of trees from the rows and replanting the area with mixed species will enhance the natural appearance of the area.

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Action #10. Control weed infested areas of the park.

The park contains several old fields and abandoned farmyards which have moderate to severe weed problems. These sites should be monitored by the regional resource coordinator. If the weed problem does not improve naturally, a mowing or fire program should be considered. Herbicides may be used in the park where the regional resource coordinator determines it necessary. There is a weed problem around the abandoned farmyard site south of the interpretive center. The weeds in this area should be erradicated and the area replanted with native grasses blending into the forest edge along the Sakatah Singing Hills Trail. Bluegrass and other shade tolerant grass mixtures may be used in the area where tent pads are to be established. A mowing program should be developed for this area in conjunction with relocating the group camp. (See Proposed Development, Camping, Action #4, $p_{\underline{63}}$.)

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 TOTAL

 COST
 No Cost - to be covered by park maintenance

Action #11. Develop a fire management plan and conduct prescribed burns.

Prescribed burning will be used to maintain converted prairie, enhance areas which have natural remnant prairie species and to maintain grassland openings. A fire management plan should be developed by the regional resource coordinator, area forester, and park manager. This plan should determine the safest, most effective method to control wild fires and conduct prescribed burns. A system of fire breaks, using the topography, vegetation, water, and trails should be included in the fire management plan.

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 TOTAL

 COST 1,000
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 2,000
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 2,000
 0ngoing 8,000

Action #12. Identify tree diseases throughout the park and monitor their progression.

Several tree diseases have been identified in the park. Butternut canker which is caused by a fungus (<u>Sirococcus clavigignenti-juglandacearum</u> sp. nov.) is present throughout much of the butternut range. Trees of all ages and sizes and on all types of sites and be infected. Cankers spread around branches and trunks, eventually girdling them. After several years, the

disease kills them. There is no known control for butternut canker. Cultural controls such as avoiding injuries and keeping infected logs out of regions where the canker is not present might reduce the spread. Fungicide control does not appear practical for native forest areas such as those in the park (Nicholls 1978).

Dutch elm disease (<u>Ceratocystis ulmi</u>) is a fungus which has killed a large number of elm throughout the park. The fungus is carried by beetles which burrow under the bark. It grows in the water-conducting vessels of the elms and produces a substance which, along with the fungus, plugs the vessels, preventing water uptake. This causes the tree to wilt and die (French 1977). In 1980, 28 diseased elm were removed from the park (Forest Insect and Disease Report, 1980). Dead standing and dying elm can be found throughout the park. The recent loss of elm from the forest canopy has created large openings which are being rapidly overgrown with shrubs and saplings. The most heavily affected area is the woods east of the park entrance road where dense stands of prickly ash, ironwood, and maple saplings are becoming established.

Oak wilt is caused by the fungus Ceratocystis fagacearum which develops in the outer sapwood of the tree, mainly in vessels conducting water and nutrients from the roots to leaves. Like Dutch elm disease, this causes the tree to produce substances which clog the vessels, thereby cutting off the tree's water supply. All species and varieties of oak tested have been found susceptible to oak wilt. Red and black oak are very susceptible and are killed rapidly by the fungus. Bur oak varies from susceptible to resistant, and white oak is reasonably resistant to the disease (French 1978). The disease spreads by means of natural root grafts and spores. Detection of this disease in its early stages is important for control. Methods which may be used to reduce the spread of the disease include: clear cutting diseased pockets and properly disposing the wood, developing root barriers, and preventing spore formation on hazard trees by girdling and silvicides. Pruning and trimming oaks in May and June should be avoided and all wounds during these months should be covered immediately with a tree wound dressing to prevent infection (French 1978).

Oak mortality is a disease which is not fully understood. Red oak appears most susceptible; white and bur oak are less susceptible. The exact cause of the disease is yet undetermined, although stress probably contributes to its advancement (USDA Forest Service 1977). It should be monitored in the park.

A minor disease which is common in the region is shoestring root rot. This is caused by a fungus found in all forest soils. This fungus can become a pathogen under stress conditions (i.e. drought and excessive competition in a dense forest stand). When trees are in a weakened state, the fungus moves up the tree under the bark and prevent nutrients from being transported upwards, eventually killing the tree.

Periodic monitoring is necessary to evaluate the development and spread of these diseases throughout the park. High use areas such as the campground, picnic area, interpretive area, and trails should be inventoried for diseased trees. Undetected diseases may result in an increased loss of trees. Extensive loss of trees in developed areas can result in added cost for reforestation and an interim where tree canopy is missing. The existing and potential disease areas should be mapped. A control program then should be developed cooperatively with the forestry pest specialist, park manager, and regional resource coordinator. In unusually large disease areas, selective removal may be considered for visitor safety, visual appearance, and natural revegetation.

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 TOTAL

 COST
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 1,000
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 0ngoing 5,000

Action #13. Maintain a maximum abundance of dead standing and downed trees (snags).

Wherever possible dead trees should be left standing in use areas to enhance wildlife visibility for the park user. Approximately 85 species of North American birds are dependent on dead and dying trees for nesting, roosting, sites for hunting, resting, territorial declaration, food sites, and winter shelter. Mammals use snags for denning, food storage, winter hibernation, and shelter. Snags are also used by amphibians, reptiles, and insects.

Snags in high use areas might pose some danger to park users. These can be trimmed of hazardous limbs and left standing. A broken trunk or a trimmed snag will remain upright and pose no danger for a long time. If a trimmed snag becomes unsound, it should be removed. It is generally beneficial to place nest boxes in use areas where snags have already been removed.

1	1 · · · · · · · · · · · · 2 · · · · · ·	3 4	5	TOTAL
COST	500			500

Action #14. Inventory and map rew DNR, Natural Heritage Elements found in the park.

No natural heritage elements have been identified in the park. If future findings indicate an element to be located in the park the DNR, Natural Heritage staff should verify and map the element. The Natural Heritage staff should also review any new development areas within the park.

· · · · · · · · · · · · · · · · · · ·	····· 4 ···· 5··	TOTAL
COST	No Development Cost	

WILDLIFE

The combination of open fields, upland forests, lowland hardwoods, varied wetlands, and open water in the park provides habitat for a variety of wildlife species. The large amount of forest edge and shrubby land further enhances the habitat for wildlife.

All state parks are designated by state law as game refuges. This prohibits hunting within state parks unless under special orders from the Commissioner of Natural Resources (see Trails discussion, p74).

	Percent of Cropland	Percent of Forest	Percent of Open land	Other
LeSueur	71	5	12	12
Rice	70	5	15	· 10
Steele	77	2	17	4
Waseca	84	2	8	6

The diversity and abundance of area wildlife species is affected by these land use patterns. This area has a low percentage of forested lands and a high percentage of agricultural lands. Farmland wildlife species are inventoried by the DNR, Section of Wildlife each fall and spring. Since the census is primarily concerned with pheasant populations, it is conducted in the pheasant habitat range. Incidental sightings and subsequent data relating to other species give a general population overview of several wildlife species. The farmland wildlife census has a 20 percent error ratio.

In 1981 the estimated breeding pheasant population in LeSueur, Rice, Steele, and Waseca counties was 50 percent higher than the statewide average in that year. This is common for this area of the state. The estimated population was 60 to 70 birds per square mile.

The estimated population of Hungarian partridge in the four county area is 11-12 birds per two square miles. The population is 40 to 50 percent less in this four county area than the average for the total area surveyed. This represents no change from previous years.

The estimated white-tailed deer population in the four county area was 1.6 per square mile. This meets the DNR, Section of Wildlife management goals for the area. In 1981 the combined harvest of deer by firearms and bow was .53 per square mile. This is below the recreational hunting harvest goal for the area of .71 deer per square mile. The deer population is recorded annually by the DNR, Section of Wildlife, by aerial survey.

	Deer Counted		
Year	Park	Wetland south of park	
1979	30	21	
1980	15	11	
1981	No Count Li	mited Snow Cover	
1982	21	46	

Deer winter in the park and in a large wetland area immediately south of the park. The deer tend to move back and forth between these two areas. They cross TH 60 near the park creating a hazard for motorists. Several deer are hit and killed in the area of the park each year. The area has been signed to warn motorists of the crossing area. If roadkills increase significantly, management alternatives must be considered. The present situation is being evaluated by DNR Parks and Wildlife personnel. Recommendations on measures to alleviate the roadkill problem should be submitted to the state Department of Transportation and the Division of Parks. Other than the road kills there are currently no major wildlife problems in the park. Large areas of lowland shrubs and shrubby forest edge provide excellent browse for the deer and there has been little negative impact on park vegetation in recent years. This may be due to the mild winters of 1980 and 1981 which reduced deer yarding. Heavier browse was noticed in the park during the 1982 winter. In past years, food plots have been used periodically in the park to provide a supplementary food source for the wintering deer herd. Park policy directs that "agricultural food plots or other artificial feeding programs will be provided when there are no other reasonable alternatives for the protection of park resources, adjacent lands, and/or the perpetuation of a wildlife population." If the population of the wintering deer herd increases to a level that results in depredation of park resources or adjacent lands, the regional resource coordinator, park manager, and area wildlife manager should develop a management program to control the population.

A variety of small game species inhabit the park. A list of mammals observed in the park was obtained from the park naturalist's files, it includes the following species: beaver, muskrat, raccoon, mink, cottontail rabbit, and red fox.

.8 A 48 acre (19 hectare) wildlife management area is located .5 miles (45km) northeast of the park on the shore of Lower Sakatah Lake. It is not actively managed for wildlife production at this time. It is used occasionally by pheasant and duck hunters.

The wooded shoreline north of County Road 99 has excellent wildlife value. This area should be left in a natural state for wildlife habitat. This area is available for the park naturalist to conduct programs.

Non-Game Mammals

Several non-game species are known to inhabit the park and surrounding area. The following mammal list was obtained from the park naturalist files.

Badger	Virginia opossum
Eastern chipmunk	Red squirrel
Eastern gray squirrel	Striped skunk
Eastern mole	Thirteen-lined ground squirrel
Fox squirrel	Woodchuck

Additional species identified in the Guide to Non-game Mammals (Henderson 1979) known to inhabit LeSueur, Rice, and Waseca counties include the following species: hoary bat, Franklin's ground squirrel, deer mouse, Virginia opossum, long-tailed weasel, and spotted skunk. The long-tailed weasel and the spotted skunk are considered a priority species because the range or numbers within the range, has declined significantly. All sightings should be reported to the DNR, non-game biologist.

Birds

The U.S. Fish and Wildlife Service conducts a breeding bird survey for the state of Minnesota. This survey inventories and documents the relative abundance and distribution of birds statewide. The 1978 breeding bird survey documented a high overall abundance of birds and moderate distribution of species in the southeast and south central portion of the state compared to the whole state. A species list of birds observed during the survey is available from the DNR, Division of Fish and Wildlife.

An inventory of colonial water bird nesting sites in Minnesota was documented by the DNR in the fall of 1978. Within 15 miles (24 km) of the park, two active and one inactive colonial bird nesting sites have been identified. Nesting species include: great blue heron (<u>Ardea herodias</u>), great egret (<u>Casmerodius albus</u>), and western grebe (<u>Aechmophorus occidentalis</u>). Colony sizes range from 40 to 250 nesting pairs. These species occasionally frequent the shores of Sakatah Lake. The 6 acre (2.4 hectare) island in Sakatah Lake offers potential nesting and loafing sites for heron. Over 65 species of birds have been recorded in the 1981 park naturalist files as being observed in the park. A copy of this list has been included in the Management Plan Details (MPD).

Three of these observed birds are considered priority species, which are uncommon or local in Minnesota, but are not presently threatened or endangered. They are the marsh hawk (<u>Circus cyaneus hudsonius</u>), the white pelican (<u>Pelecanus erythrorhyncus</u>), and the eastern bluebird (<u>Sialia sialis</u>). Another priority species which may occur in the park is the upland sandpiper (Bartramia longicauda) (Moyle 1980).

Reptiles and Amphibians

Twenty species are known to inhabit LeSueur, Rice, and Waseca counties. A list of these is included in the MPD. Nine of these have been observed and identified in the park by the naturalist. The 1981 naturalist list is included in the MPD.

Management

Objectives:

To direct wildlife management programs toward establishing and controlling wildlife populations by natural means.

To enhance, through wildlife management, the park's ecological, aesthetic, interpretive, and educational values.

To enhance wildlife observation in the natural setting of the park.

Action #1. Maintain large, undisturbed forest areas.

An average of 75.5 percent of land in the three counties surrounding the park has been cleared for agricultural purposes making large expanses of continuous forest uncommon. Large mature forest tracts are excellent habitat for certain bird species. Noon and others (1979) showed that undisturbed, mature forest plots have both a higher overall population and a higher proportion of rare species than disturbed or successional plots. This includes birds of prey (hawks and owls), bark drillers (woodpeckers), hover gleaners (parula and blackburnian warblers), and salliers (flycatchers). The value of mature forests for cavity nesters has often been documented (Evans & Conner 1979). Forest edge species are more adaptable to a variety of habitats and have a higher reproductive rate (Robbins 1979). Forest edge species, then, are less sensitive to habitat change and require less need for protection.

Management of park forest should include plantings and natural regeneration to connect existing wooded areas to increase the overall forest size, and to enhance habitat for forest bird species. The forest canopy along lower Sakatal Lake shall be maintained, This area should be a low use area of the par and designated a wildlife habitat area.

COST: No Development Cost

Action #2. Inventory the shorebird nesting habitat on the island in Sakatah Lake.

Although this island is currently under federal ownership, it should be evaluated for nesting potential. The area wildlife manager and the regional resource coordinator should evaluate this resource and make management recommendations.

Action #3 Develop a management program for the park's deer population.

The deer herd size and its movement patterns in and around the park should be monitored. A management program for deer should be determined to achieve both long and short term management goals. The regional resource coordinator, local conservation officers, area wildlife manager, park manager, and parks environmental specialist should work together to develop and implement a management program.

COST No development cost

SURFACE WATER

The park is situated along 3.5 miles (5.6 km) of the south shore of Sakatah Lake. This lake is a part of the Cannon River system. The portion of the watershed which is above the lake covers about 225 sq. miles (583 sq. km). The topography of this watershed is the result of glacial erosion and deposition. It is characterized by low, rounded knolls, many undrained depressions, and poor drainage patterns. These characteristics minimize rapid runoff, allowing surface water to percolate slowly into the soil. Some of the undrained depressions form small, shallow, fertile lakes.

Lake Tetonka west of Sakatah Lake is the largest lake in the watershed. Its size is 1,336 acres (541 hectares) with 9.4 miles (15 km) of shoreline. The maximum depth is about 37 ft (11.3 m) with an average depth of 20 ft (6 m).

Sakatah and Lower Sakatah Lakes total about 1,350 acres (546 hectares) in size and have 13 miles (21 km) of shoreline. Their maximum depth is about 10 ft (3 m). They have 62 seasonal and permanent homes and 7 resorts on their shores. The resorts have a total of 68 cabins and 352 campsites. More than one-third of the shoreline is in state ownership within the park boundary.

There are two designated public boat accesses on Sakatah Lake. A concrete plank boat ramp is located on the channel between lakes Tetonka and Sakatah in the city of Waterville. The second, a steel grate ramp, is located in the park. Small boats can also be launched at the bridge on County Road 99 (Cty Rd 99) at the west end of Lower Sakatah Lake.

Runoff from farm lands in the watershed is considered to be the primary source of the nutrients. The tributary streams flowing into the lakes are also fertile and a source of suspended solids. Lakes Tetonka and Sakatah have high levels of nutrients. This has resulted in low oxygen levels and siltation. During the summer months lakes Tetonka and Sakatah have several periods of high algae bloom which is indicative of high nutrient concentrations. Periodically these algae blooms interfere with activities such as swimming.

The glacial moraine topography of the area is dotted with woodland ponds, marshes, wet meadows, and small lakes in the depressions between the rolling hills. The park contains a diversity of wetland types. Shaw and Fredine (1956) identified the following continuum of wetland types classified primarily by water depth and species present. This is a brief interpretation of the continuum; a more complete description will be included in the MPD.

Type I well drained, flooded seasonally

Type II fresh meadows, waterlogged within a few inches

Type III shallow fresh marsh, water depth up to 6 in (15 cm)

Type IV deep fresh marsh, water depth 6 in. (15 cm) to 3 ft (.9 m)

Type V open fresh water, water depth up to 10 ft (3 m)

Type VI shrub swamps, water depth up to 6 in. (15 cm), alder, willow, and dogwood common

Type VII wooded swamps, water depth up to 1 ft (.3 m), tamarack, black spruce, and black ash common

Type VIII bogs, waterlogged with spongy mosses

Types II, IV, and VI can be found in the park. Although many areas may not fit exactly within the bounds of a particular type, they do contain enough of the distinctive characteristics to qualify for that particular type.

GROUND WATER

In the area of the park, sand and gravel lenses in the glacial drift contain water sources adequate for low volume use. The thickness of this drift is commonly 100 to 300 ft (30.5 to 91 m).

In the Waterville area, the St. Peter sandstone which underlies the glacial drift is more than 100 ft (30.5 m) thick. This formation is a principal source for large quantities of water. The park is a different situation, however. Three Minnegasco structural test wells indicate that there is no St. Peter sandstone strata underlying the glacial drift in the park. The Shakopee dolomite formation is located directly beneath the drift. Below that is the Jordan sandstone formation. These units are geologically distinct but hydrologically continuous, and are capable of supplying large amounts of water.

The two primary wells in the park were drilled to their present depths in 1970. They draw water from the Jordan formation. The well which serves the campground, service court, and manager's residence is 507 ft (155 m) deep. A second well, located in the picnic ground, is 455 ft (139 m) deep. There are large amounts of iron and magnesium in park water. These concentrations affect the water's color, taste, and smell and they stain the plumbing fixtures.

A third well is located at the interpretive center and also serves the nearby seasonal residence. A well with a hand pump is located in the group camp on the lake. The depths of these wells are unknown. A second well with a hand pump is located in the picnic ground, It is approximately 200 ft (61 m) deep. All of the park's wells currently meet the water quality standards required by the Minnesota Health Department (personal communications with Greg Stevens, Deptartment of Health, South Central District, Nov. 1981).

Newly acquired life estates within park boundaries typically include abandoned wells. The park currently has four abandoned wells on life estate lands. Use should be made of the wells where appropriate and the remainder should be abandoned following Minnesota Health Department abandonment procedures.

Management

Objectives:

To provide an adequate supply of good quality water for park users To protect groundwater from contamination by park development

Action #1. Test well water quality and make corrections to improve the existing water supply.

An engineering study should be conducted to determine existing water conditions. Recommendations for improving the water quality of the park should be included. A green sand filter system with potassium should be considered in the recommendations. Deepening the well to the Galesville

formation would produce only moderate yields of water and would be costly. A water quality improvement system should be selected on the basis of overall cost effectiveness over the system's expected life and maintenance requirements.

COST Done by DNR, Bureau of Engineering and Division of Waters

FISHERIES

Fishing is a popular activity in the Waterville area. Sakatah and Tetonka lakes are connected by channels making both lakes accessible to boaters using the boat ramp in the park. Sakatah Lake is generally dominated by rough fish species and bullhead fishing is very popular. Fair populations of crappie, northern pike, and white bass are also present.

The classification system of the DNR, Division of Fish and Wildlife includes both an ecological and a management classification. The ecological classification is described as the natural and characteristic fish populations which are best adapted to the physical, chemical, and biological characteristics of a lake, and which the lake could be expected to support if no special management was undertaken. The management classification describes the most important species or combination of species toward which the management effort should be directed.

Ecological Classification

Management Classification

Tetonka Lake - Roughfish, bass, panfish Sakatah Lake - Roughfish, crappie, bullhead Lower Sakatah Lake - No classification

Walleye, northern pike, panfish Warm water game fish No classification

Fish kills are frequent in Sakatah Lake (averaging 3 every 5 years). They are the result of a lack of oxygen in the water. This is caused by algae blooms in summer and minimal penetration of sunlight through the ice and snow in the winter. Because of this situation, coupled with a large population of rough fish, minimal management is being done on this lake.

Fish removal and stocking records on Sakatah Lake date back to 1922. Management of Tetonka Lake began in 1923. The primary management for these lakes was rough fish removal. Today, commercial removal of rough fish, excluding bullheads, is being done. Game fish caught in this practice are salvaged by the DNR, Section of Fisheries for stocking elsewhere. Large numbers of walleye and sunfish have been periodically stocked since 1950. Other species occasionally stocked include bass, crappies, perch, northern pike, and bullheads. Walleye pike have been the primary species stocked in Tetonka Lake since 1945.

Fish do migrate between the lakes. In the spring northern pike migrate from Tetonka Lake to Sakatah Lake and then into Whitewater Creek for spawning.

A stop log dam, located at the east end of Lower Sakatah Lake, controls the water level of the three lakes. Changes in this structure and water levels are impractical. This management plan supports the continuation of the fisheries management practices as they now exist.

HISTORY/ARCHAEOLOGY

Prehistory

A preliminary archaeological survey of Sakatah Lake State Park was conducted by the University of Minnesota, Department of Anthropology in 1971. Four burial mounds first reported in the late 1800's were still present. A habitation site is believed to exist in the area of the point separating Sakatah Lake from Lower Sakatah Lake. However, no detailed analysis was made of this site.

Prehistoric habitation is a likely possibility considering the resources of the area. The lakes contained many species of fish and attracted many waterfowl. In addition, the Cannon River served as an east-west water transportation route.

History

During early historic times, the area was inhabited by Dakota Indians. These people lived by hunting, gathering, and trapping. The fur pelts they collected were traded for such staples as salt, tobacco, gunpowder, clothing, and weapons. In 1826, the trader, Alexander Faribault, established a trading post on the northeast shore of Cannon Lake near present day Faribault. He eventually established at least five trading posts at various points along the Cannon River. One of these may have been on a site that is now a part of Sakatah Lake State Park. Information on this is incomplete and a good deal of research would be necessary before the site could be verified.

The area surrounding the park has an interesting local history which has been documented in the master plan for the Sakatah Singing Hills State Trail and in the Cannon River resource analysis.

Management

Objectives:

To preserve and protect all prehistoric and historic sites in the park

To interpret prehistoric and historic use of the park and surrounding area for park visitors

To encourage archaeological and historical research that will increase the existing knowledge of prehistoric and historic human activity in Minnesota

Action #1. Conduct an archaeological survey of the park.

Survey work should include evaluation of the possible habitation site on the point separating Sakatah Lake from Lower Sakatah Lake. Here work should be done to determine the age, extent, and condition of the site. All proposed development sites should be surveyed. Where prehistoric or historic remains are found, an assessment will be made to determine the size and significance of the site. If significant, the site will be preserved and the development relocated.

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COST	5,000	 5-000		5,000

Action #2. Consult with the Intertribal Indian Affairs Board and state archaeologist prior to any management near archaeological sites.

They should be consulted prior to any earth moving operations (i.e., grading, digging, tree planting or sodding). This is primarily due to the potential of damaging prehistoric Indian sites.

Action #3. Conduct historical research in an attempt to locate the site of the Alexander Faribault trading post.

If located, this site would be an important addition to the history of the area and would be of great value to the park interpretive program. The project should be limited to researching literature and available records and possibly some minor excavation. Major excavation is not desirable due to the cost involved and because the site has more historical value if left intact.

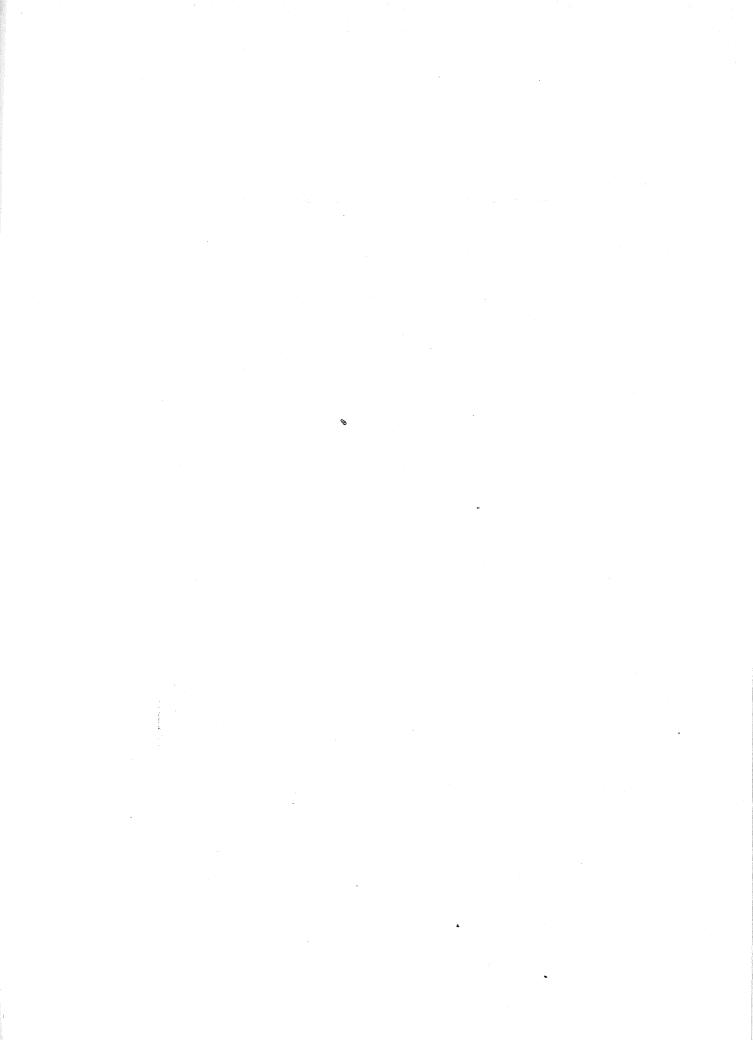
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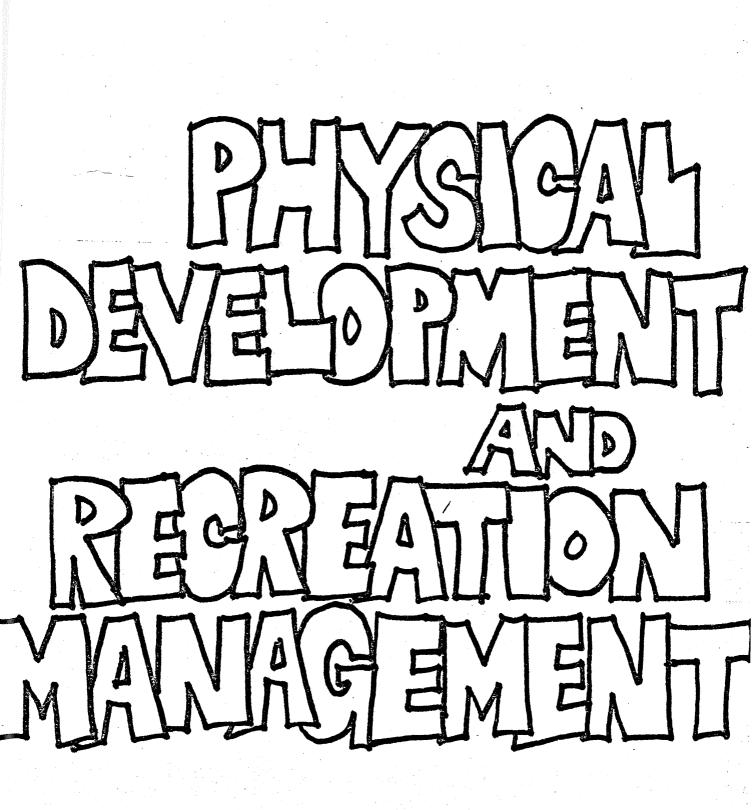
Action #4. Make all information regarding prehistoric or historic sites in the park available to the park interpretive staff.

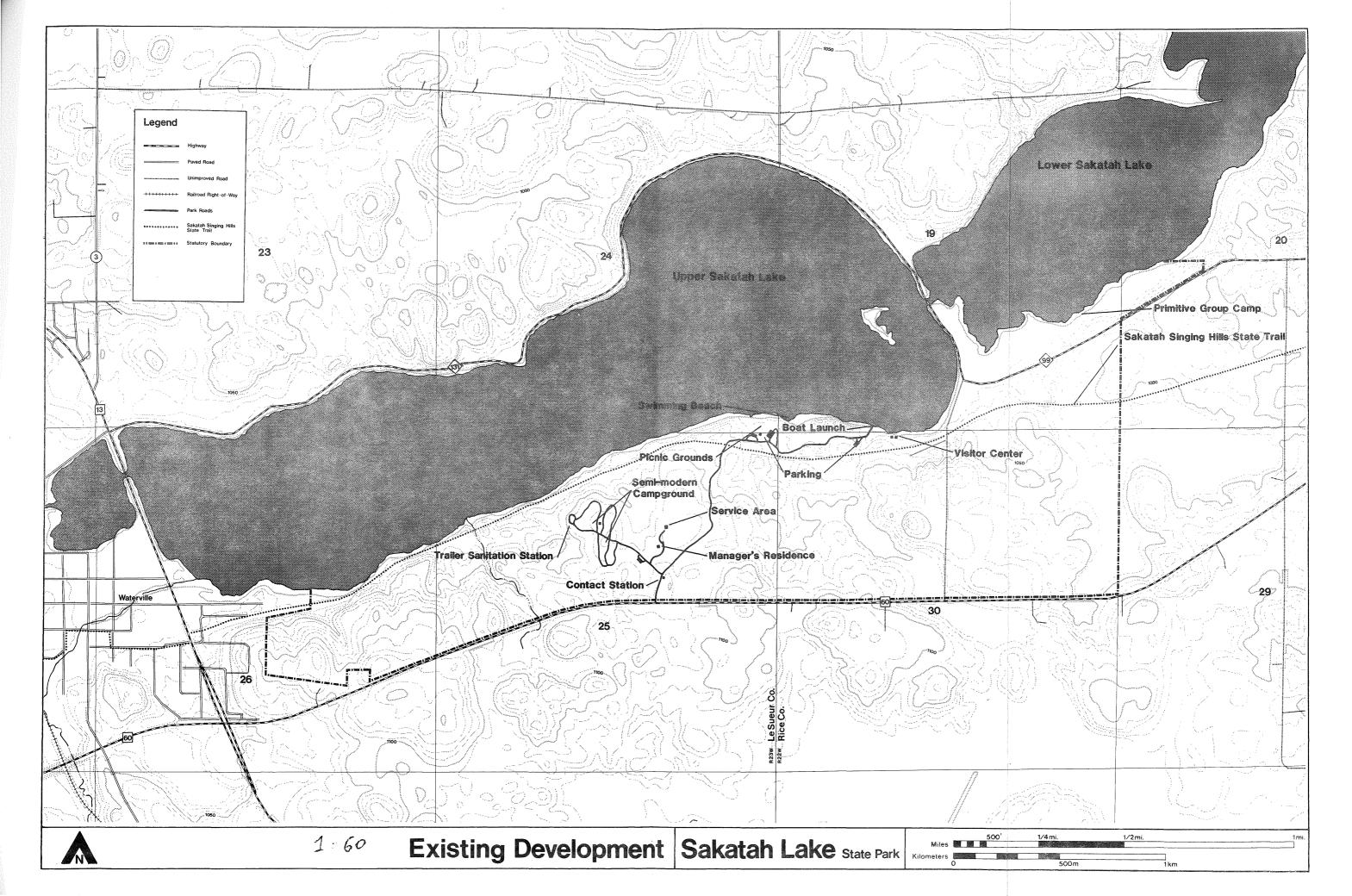
Such information will be used in developing interpretive programs for presentation to the public. Human history should be an important feature of the park interpretive program.

COST No development cost (Also see Interpretive Services,

Action #3, p 🕰.)











EXISTING DEVELOPMENT <u>Campground</u> 60 campsites modern toilet building (with flush toilets and showers) trailer dump station

Primitive Group Camp pit toilet hand pump

<u>Picnic Grounds</u> modern toilet building (vault) picnic tables 60 car parking lot

Swimming Beach changing stalls 2 pit toilets sand beach

Boat Launch metal grate launch ramp gravel surfaced parking lot

Administrative/Support Facilities contact station/park office manager's residence shop building

Interpretive Center interpretive building seasonal residence outdoor amphitheater 2 pit toilets

Trails 5 miles (8 km) hiking 2 miles (3.2 km) ski touring 1/2 mile (.8 km) snowmobiling Sakatah Singing Hills State Trail passes through the park

RECREATION MANAGEMENT OBJECTIVES

To coordinate park development with private and other public facilities and resources in the vicinity

To provide park development which is necessary for efficient management and for the public to experience, study, and enjoy the natural resources

To locate park development where it will have the least impact on sensitive natural or historic resources, will not detract from the enjoyment of other users, and will allow easy access to areas of high scenic or study value

To ensure physical accessibility and program usability of new developments by special populations (i.e., persons with physical disabilities, the elderly, and the very young)

To recognize and make efforts to comply with appropriate state, county, and municipal regulations as they relate to park development and management.

PROPOSED DEVELOPMENT Camping

Objectives:

To provide quality camping facilities that allow the public to enjoy the park resources 24 hours a day

To provide for a variety of camping experiences

Action #1. Upgrade poorly designed campsites.

Some of the campsites have short parking spurs, are located on sloping ground, or have water drainage problems. The DNR, Bureau of Engineering should examine the entire campground and repair or relocate any inadequate sites. The total number of campsites should remain the same.

8,000

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62

COST 8,000

Action #2. Pave the campground roads with asphalt. (See Roads and Parking, Action #2, p 69.)

Action #3. Manage vegetation in the campground. (See Vegetation Management, Action #4, p 38.)

Action #4. Relocate the primitive group camp.

The existing primitive group camp site is low, often wet, and the access trail erodes easily. The camp is located in a remote area far from other park facilities such as the swimming beach. In addition, the remoteness of the camp makes supervision by the park manager difficult.

Providing a group camp facility which would have separation yet good access to the other park facilities and the state trail will greatly enhance the and recreation opportunities experiences for campers. Current use of the park group camp is low. Selection of a more desirable site is expected to increase use. Increased use of the recently completed Sakatah Singing Hills State Trail is anticipated as people become aware of its opportunities. This may add to the use of the group camp.

There is a better site for the group camp on the old farmstead adjacent to the state trail, west of the township road which runs north-south through the park. (See Proposed Development Map, p<u>**90**</u>.) Needed site improvements include removal of the house and two outbuildings, some tree and shrub planting to increase screening around the site, and the development of a small (3-5 car) parking lot. The existing well should be useable although it may need repair. A hand pump should be installed. For the next few years, the existing gravel driveway should be used to access the site.

63

The group camp location along the state trail would provide an excellent camping area for all state trail users. The group camp can be made available on a first come basis when it is not being occupied or reserved ahead of time by groups. A direct phone from the contact station to the group camp area would allow trail users to request use of the area and register with the park manager without riding or walking the extra distance to the contact station. A park staff person could then collect fees for use of the area at his convenience. The cost of phones should be provided, at least in part, by the DNR, Trails and Waterways Unit. The abandoned group camp site shall be returned to a natural state. The pit toilet, parking lot, fencing, and well must be removed. Revegetation is recommended.

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 TOTAL

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Action #5. Develop a horseback riders campground.

Development of the site will not be done until a significant segment of the state trail up to or though the park is developed for horseback riding. The Sakatah Singing Hills State Trail currently accommodates hikers, bicyclists, and snowmobilers. The management plan for the trail (completed in January, 1981) recommends the development of a second treadway for horseback riders and skiers. The second treadway is to be built in stages along the eastern half of the trail. The first segment will begin in or near Faribault and extend to Morristown. If use of this portion of the trail justifies an extension, then a second segment from Morristown to Sakatah Lake State Park will be built. A camping and staging area in the park would enhance the trail users experience and increase trail use. There is an excellent site in the park which would not conflict with other park users.

64

The proposed primitive group campsite (see Action #4, this section) would also make an excellent camping and staging area for horseback riders. The site is large and has a well, electrical service, and good access to the state trail. The development of the new access road through the park will allow good supervision. (See Roads and Parking, Action #3, $p_{...70}$.) A small picnic shelter-style building should be included in the development. In addition, water supply should be modified for both human and animal consumption and parking facilities will require expansion. The water supply for human consumption should follow state Board of Health regulations in being separated an adequate distance from toilet facilities and animal watering facilities.

If this site is developed for horseback riders, the primitive group camp should be relocated across the state trail to the present site of the visitor center. (See Proposed Development Map, $p\underline{73}$.) In the future, the visitor center will be removed and another building constructed in a different location to house the interpretive program and serve as a winter trail shelter. (See Interpretive Services, Action #1, p<u>82</u>.) When the existing visitor center is removed, the site will be large enough for the primitive group camp. It will require very little development and will offer the same amenities as the former site south of the state trail.

In addition to the horseback riders camp, the grass field east of the township road and north of the state trail should be made available for horse trails or an open ride area. A spur trail and tieup area for horses should be provided in the day use area (see Trails, Action #B, p78).

Funding for the horseback riders camping and staging area should come, at least in part, from the DNR, Unit of Trails and Waterways because the primary users of the facilities will be users of the Sakatah Singing Hills State Trail.

 COST
 Conditional

Estimated cost should include the cost of relocating the primitive group camp to the present visitor center area.

Picnic Grounds

Objectives:

To provide a variety of picnic facilities to fulfill the needs of a wide range of users.

To provide an adequate number of quality picnic sites to serve present and future needs.

Action #1. Improve the existing picnic area.

The existing picnic area has an excellent location on the shore of Sakatah Lake, however, it has several shortcomings. The grounds are quite shaded and grass does not grow well. The soil is often wet and muddy. This problem is the most severe on the east end where there are many small ironwood trees. Management should include the removal of most of these small trees to decrease the dense shade. Grass should be established by seeding or sodding. Closing portions of the area for one summer will be necessary to give the grass an adequate chance to grow. Rejuventation of this area should not be implemented until the secondary picnic area has been developed with picnic tables and fire rings to compensate for the closed area. (See Vegetation Management, Action #3, p_{38} for further discussion and cost estimate.) Access should be provided to this area from the state trail. Trail signage should identify the facilities provided in this area.

See Vegetation Management, Action #3, p 38. COST

Action #2. Develop a secondary picnic area.

The existing picnic area provides a nice setting for a picnic, however, it has several shortcomings, (see discussion in Action #1 above). In addition, the site is small, there is no picnic shelter to accommodate large groups or offer protection on cool, windy days, and there is no space to provide an open play area. The second bay of the picnic ground parking lot has been filled and leveled but never surfaced. At present it is an open grassy area with large oak trees on the periphery and a gravel access road along one side. It is an excellent location for a secondary picnic area with a large

open play area. The site should be developed to include fire rings for cooking, and picnic tables.

The grassy area will require some fill and regrading to correct drainage. It should be left open and the gravel road redesigned to provide a single bay of parking along its west side. (See Roads and Parking, Action #4, $p\underline{71}$.) Picnic tables, fire rings, and interpretive signage should be placed on the periphery of the area to take advantage of the shade trees and to avoid infringement on the play area. Interpretive signage should be coordinated with the regional naturalist. A picnic shelter should be constructed after a use pattern has been established for the picnic areas.

The picnic shelter should be simple in design, enclosed on one or two sides, with suggested dimensions of 20 ft x 20 ft (61 m x 61 m). The location of the picnic shelter should be dependent on use of the upper picnic area and rejuvenation of the grass and establishment of dryer soils in the lower picnic area. Considerations for locating the picnic shelter include accessibility for special populations, not highly visible from the lake, a short distance from parking lots, provides interesting views and may be visible from the trail.

Adjacent to the secondary picnic area is a ridge overlooking the beach. In the future, it will provide an excellent overlook area but it needs considerable vegetation management before it can be used. At present, it is covered with small elm trees which have died, allowing a thick growth of prickly ash to grow. These must be removed and grass, shrubs, and a few shade trees planted. Because the ridge overlooks the beach, pedestrian traffic between the beach and the group picnic area can be expected. Traffic on the face of the ridge should be avoided to prevent soil erosion. There is an asphalt path which should adequately link the two areas. To discourage "short-cut" trails on the face of the ridge, low shrubby plants such as gooseberry or raspberry should be planted on the slope if existing prickly ash is not sufficient. If this fails to control pedestrian traffic, consideration should be given to constructing a stairway.

 COST
 5,000
 20,000
 25,000
 COST (Does not include cost of stairway)

Pave the picnic ground parking lots with asphalt. (See Roads Action #3. and Parking, Action #2, p69.)

COST

Roads and Parking

Objectives:

To provide ample year-round parking for visitors.

To upgrade vehicular circulation within the park.

Action #1. Make improvements to the park entrance road.

approx:matelyRelocation of the contact station, 500 ft (152 m) north of its present location will provide a more adequate contact station/park office; eliminate traffic tie-ups; and improve a poorly situated intersection. (See Administrative Support Facilities, Action #1, $p \otimes \otimes \otimes \otimes$.) In addition to the building relocation, some roadwork is necessary. It should include the addition of a third traffic lane in front of the contact station. This will allow people who must enter the contact station to pull out of the main traffic lane and avoid blocking incoming traffic. This pull-over lane should accommodate at least three vehicles.

A gravel shoulder which will accommodate additional vehicles may also be developed. Frequently on weekend evenings, six or seven vehicles might be backed up waiting to check into the campground. Those not parked in the pull-over lane should still have their vehicles at least partially out of the incoming traffic lane. A widened gravel shoulder is one possible

solution. The existing campground intersection should be moved from its present location to a site north of the proposed contact station. A short stretch of the campground access road would then be realigned from the new contact station to a point near the campground parking lot. The old roadbed will then be removed and revegetated. The incline on the road just north of the present contact station should be decreased to improve sight distances. A three car parking lot adjacent to the proposed contact station should be developed for park employees.

The entrance into the service court and manager's residence should be realigned. The present entrance brings all service court traffic past the residence, infringing on the privacy of the manager and his family. The entrance to this area should be relocated approximately 100 ft (30 m) north of the proposed contact station in an area of young ash trees. The road should approach the residence/service area and then T. One spur will lead to the service court and the other to the manager's residence. (See the Proposed Development Map, p $\mathbf{q}\mathbf{o}$ for proposed road realignments.)

· · · · · · · · · · · · · · · · · · ·	2	· · · · · · 4 · · · · · · · · ·	5	TOTAL ····
COST	20,000		2	20,000

Action #2. Pave major park roads and parking lots with asphalt.

All roads and parking lots in the park are gravel surfaced. During dry periods in the summer, the dust coats roadside vegetation and causes problems in the campground. In addition, gravel roads require more regular maintenance than asphalt roads.

With the recent provision for bicycling on the Sakatah Singing Hills State Trail, bicycle riding in the park can be expected to increase. Asphalt roads with bike lanes would provide both safer and more enjoyable riding for cyclists. Several parking lots would be better organized and used as a result of asphalting and painting stripes. All roads and parking lots should be paved with the exception of the access road to the service court, the service courtyard and the access road to the proposed group camp area (see Action #3, this section). One picnic ground parking lot requires grading and improved drainage prior to asphalting. The campground overflow parking lot will be expanded to provide adequate winter parking facilities for both ski if the proposed visitor center / Trail shelter is built at this sile tourers and snowmobilers. The design of the expansion and use of vegetative screening will reduce the visibility of this lot from the park road. Prior to asphalting the boat launch parking lot, the Bureau of Engineering, the Division of Parks and Recreation, and the Trails and Waterways Unit will develop suitable plans for the modification of the lot to remedy the existing parking problems. (see Action #5, this section). Final decision on lot modifications may be affected by alternative alignments for the state this section trail and the access road to the group camp area (see Action #3

COST 90,000 90,000

Action #3. Develop an access road through the park to the proposed primitive group camp and the horseback rider campground.

When these two facilities are developed, it will be desirable to provide access from an interior park road rather than from the nearby township road. Interior access would provide better user security, prevent unauthorized use of the area, and make supervision of the area much easier. One option would be to extend the park road to a point east of the boat launch near the existing visitor center. There the road would branch; one portion crossing the state trail to provide access to the horseback riders campground, and the other ending in a small parking lot to serve the primitive group camp. Another option would be to use the state trail and bridge as an access road and realign the trail in this area. This road should be developed for use by vehicles hauling horse trailers. Due to the expected low volume of traffic, it will not be necessary to pave this road with asphalt. Upon completion, the present access to the proposed horseback riders campground (a driveway coming off the township road) should be closed.

Action #4. Upgrade the picnic ground parking lot.

There are two lots now being used for picnic parking. One is a small 10 car capacity lot near the toilet building. This lot should be paved with asphalt but does not need to be redesigned.

The other lot was orginally laid out in two double bays. Only one was finished and surfaced with gravel. The other bay was filled and leveled but never completed. It should be redesigned to have a drive through lane and a single bay of parking on the west side. Both should be paved with asphalt. The remainder of the second bay will be used as a group picnic and open play area. (See Picnic Grounds, Action #2, $p \in 66$.)

Asphalt paving costs are included in Action #2 above.

Action #5. Upgrade the boat launch parking lot. (See Water Activities, Action #2, p 87 for discussion and cost estimate of boat ramp improvements.)

At present the lot is used by boaters and by people using the visitor center. This area is occasionally inadequate and has congestion problems. When the visitor center is relocated (see Interpretive Services, Action #1, p 82), the overcrowding should be relieved. However, parking problems will still exist because there is no parking pattern. Cars and cars with boat trailers are parked wherever space can be found and oriented in whatever direction is convenient. Topography in this area limits

opportunities to improve the parking lot. A new public boat launch in Waterville having ample parking also minimizes the pressure to expand the boat launch facilities in the park. The DNR, Bureau of Engineering, and Trails and Waterways Unit should make recommendations for redesign of the traffic flow and parking.

Action #6. Request that the Morristown Township in Rice County impose a 30 mph (48 kph) speed limit on the township road which connects TH 60 and Cty Rd 99 on the east side of the park.

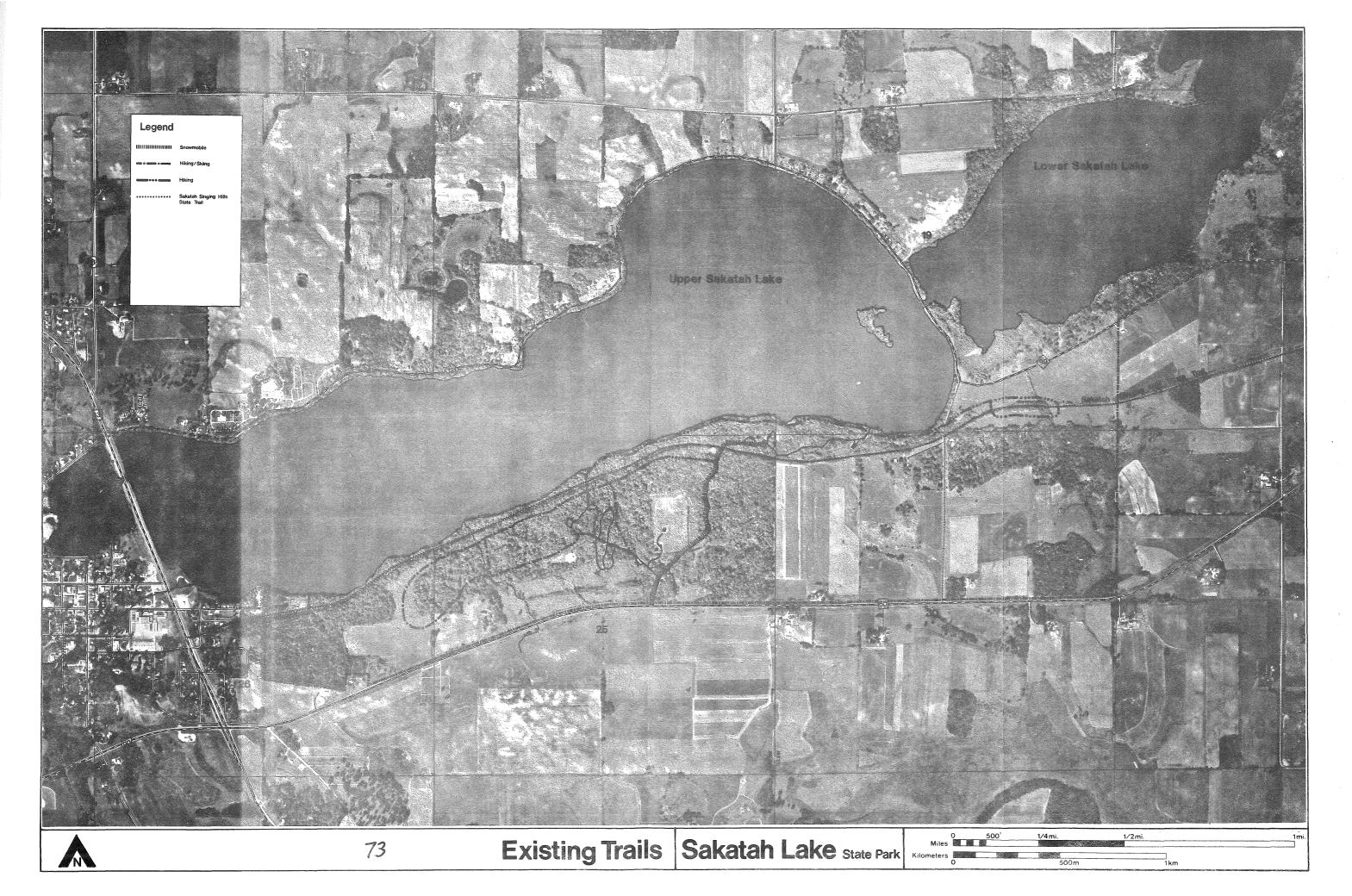
Closure of the road in the future should be considered (see Trails, Action #3, p 76 for discussion).

Trails

Objectives:

To provide access to a variety of areas within the park along alignments chosen for slight gradient, scenic views, interesting study areas, avoidance of sensitive areas, and separation of conflicting uses.

The park trail system is used for hiking in the summer and ski touring in the winter. The Sakatah Singing Hills State Trail which passes through the park is used by hikers and bicyclists in the summer and snowmobilers in the winter. Although the park has no snowmobile trail system, access is provided from the park entrance, along the main park road, to the state trail. (See Existing Trails Map, $p_{...73}$.) In addition, the picnic grounds parking lot has been plowed to provide parking for snowmobilers who wish to trailer their machines into the park to access the state trail.







Hunting is prohibited in Sakatah Lake State Park by Minnesota Statute 99.25, Sub-chapter 1, which designates all state parks as game refuges. Trail rules and regulations allowing hunting within the Sakatah Singing Hills State Trail right-of-way are superceded by the parks designation, therefor hunting is prohibited within the area of the park. Hunting may be allowed in a state park only under DNR, commissioner's order.

Action #1. Expand the park hiking/ski touring trail system.

At present there are a total of 4.2 miles (7 km) of hiking trails and 2 miles (3 km) of skiing trails in the park. Park trails, particularly the ski trails, receive considerable use. There is both demand and available area to increase the trail mileage. The Proposed Trails Map, p<u>80</u> shows the possible loop trails that could be added to the existing system. These loops take advantage of wooded areas, occasional clearings, marsh areas, a stretch of lakeshore, and an open prairie knoll. There are hills to challenge intermediate level skiers as well as more gentle terrain for beginners.

If the entire system is developed, an additional 5.5 miles (8 km) of hiking/ski touring trails would be added. However, all of these trails may not be available for skiing every winter. Drifting or sparse snow cover would limit use of the trails in more open areas such as along the lake and on the open knoll. Initial trail work should focus on the Lakeshore Trail and trails west of the park entrance road. (See Trails, Action #, p 77 for additional discussion.)

Trail preparation will include the removal of small trees, the removal of some boulders, and the minor rerouting of some existing trails to avoid eroded or potentially hazardous areas. Abandoned trail segments will be revegetated with special consideration given to eroded areas.

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COST:	5,000	4,000		9,000

Action #2. The DNR, Trails and Waterways Unit is considering the development of a horseback treadway on the state trail. In the area of the park, consideration should be given to providing an alternative horseback trail alignment in the southern portion of the park, rather than along the existing state trail right-of-way.

If the state trail system provides a second treadway for horses through and beyond the park and use is sufficiently high to warrant the construction of an alternative treadway, an alignment should be developed along the southern portion of the park. This southern alignment will eliminate horse and pedestrian conflicts in the high use areas of the park. An additional concern is that there is limited space to develop a second treadway in the state trail right-of-way through the park due to topography. Where possible the horse trail may take advantage of existing cross-country ski trails while not adversely affecting the summer hiking trail system. Special construction techniques may be required to build and upgrade trails for horse use. Funding should be provided at least in part by the DNR, Trails and Waterways Unit (see Camping, Action #5, p 64 for additional discussion).

COST Conditional

Action #3. Provide a snowmobile access from the park entrance to the state trail.

At present, snowmobilers getting on and off the state trail in the park use the main park road as an access to and from Trunk Highway 60. Once there, they ride in the highway ditches to other destinations. The main park road is also plowed and used by vehicles trailering snowmobiles into the park. It would be preferable not to have snowmobiles and automobiles using the same road. If the proposed trail shelter/visitor center is built adjacent to the campground parking lot, all vehicles will use that lot and the road can remain unplowed. If the building is constructed in the other alternative location, a portion of the park will still have to be plowed. Along here a snowmobile access trail should be provided in the ditch paralleling the road.

75

COST No development cost

Action #4. Request that Morristown Township in Rice County impose a 30 mph (48 kph) speed limit on the township road which connects TH 60 and Cty Rd 99 on the east side of the park.

A township road separates the majority of the park from **park acreage tent** to the east. Closing all or part of this road would be optimal for providing the best uses of park lands and elimination of road crossing by trail users.

This township road is crossed by the state trail. Hikers and skiers using the park also cross this road to get to the east end of the park. The trail approach to this road is vegetated to within 50 ft (15 m) of the crossing. In addition, cars traveling north on the road come down a long steep hill before intersecting the trail. To significantly increase the sight distances at the intersection would destroy much of the visual character of the area. With the amount and variety of users on the state trail year-round, there is the potential for accidents, particularly with snowmobiles or bicycles. The higher rate of speed at which snowmobilers and bicyclers are traveling makes it more difficult for them to stop in an emergency situation. If the speed limit on the township road is reduced to 30 mph (48 kph) from its present 55 mph (88 kph), the hazards would be reduced. Speed limit signs should be placed along the township road. This township road is currently being used for postal and school bus routes. Also, a parcel of private land is located along the road. If these conditions change, closing of this road should be reevaluated and pursued.

76

COST No development cost

Action #5. Reroute the hiking only portion of the Lakeside Trail to avoid badly eroded areas.

Portions of this trail, particularly between the beach and the boat launch, are located on unstable, highly erodable soils. In many areas erosion is severe enough to make it undesirable to use the trail. In these areas, the trail should be relocated away from the lakeshore on higher ground. Overlooks of the lake should be provided. In areas of erosion, measures should be taken to correct problems. Soil and Water Conservation District technicians should be consulted prior to any correction work for their erosion control recommendations.

COST Covered in Trails, Action #1

Action #6. Construct a multi-purpose visitor center/winter trail shelter.
<u>net</u>the confident for the services (See also Interpretive Services, Action #1, p<u>82</u>.)

COST See Interpretive Services, Action #1, p<u>82</u>.

Action #7. Prune and manage vegetation along the state trail to allow views of the lake.

The vegetation along the state trail is very dense. In some areas it is desirable to selectively thin the vegetation to provide views from the trail.

COST To be covered by park and trail operations

Action #8. A bike lockup facility should be provided in the picnic area near the parking lots.

This facility should be provided to allow state trail users to lockup bicycles while they use other park facilities. Also campers would be encouraged to use bicycles to travel from the campground to the beach area. The design of this facility should blend in with the natural surroundings yet be located in a visible area for added security.

Additional bicycle lockup facilities should be provided along the state trail by DNR, Trails and Waterways Unit. Bicycle lockup facilities would allow state trail users to use more of the park's recreation facilities and enjoy more of the park's resources.

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COST	500	and the second second			500
		and the second secon			

Action #9. If the state trail is completed for horses, a tieup should be provided near the day use facilities.

A horse tie up facility near the picnic grounds would provide trail users additional opportunities to use park facilities. Consideration must be given to security for the horses, separation from use areas, and easy access from state trail. (This cost may be shared by DNR, Trails and Waterways Unit.

Action #10. Bicycle concessions should be considered in the park.

Several options are available to provide bicycle rentals in the park. The options include: a private vendor operating bike rentals in Waterville, a private vendor operating rentals in the park, a private vendor providing and maintaining bikes in the park to be rented at the contact station by park staff, or the DNR providing bike rentals.

If a private vendor operates a rental concession within the park, a contract of agreement must be provided between the private party and the DNR, Division of Parks. In addition, concerns about the operations of a rental program include: permanance of the rental program, and storage of the bikes in the park.

The option(s) of a private bicycle concession in or near the park should be encouraged.

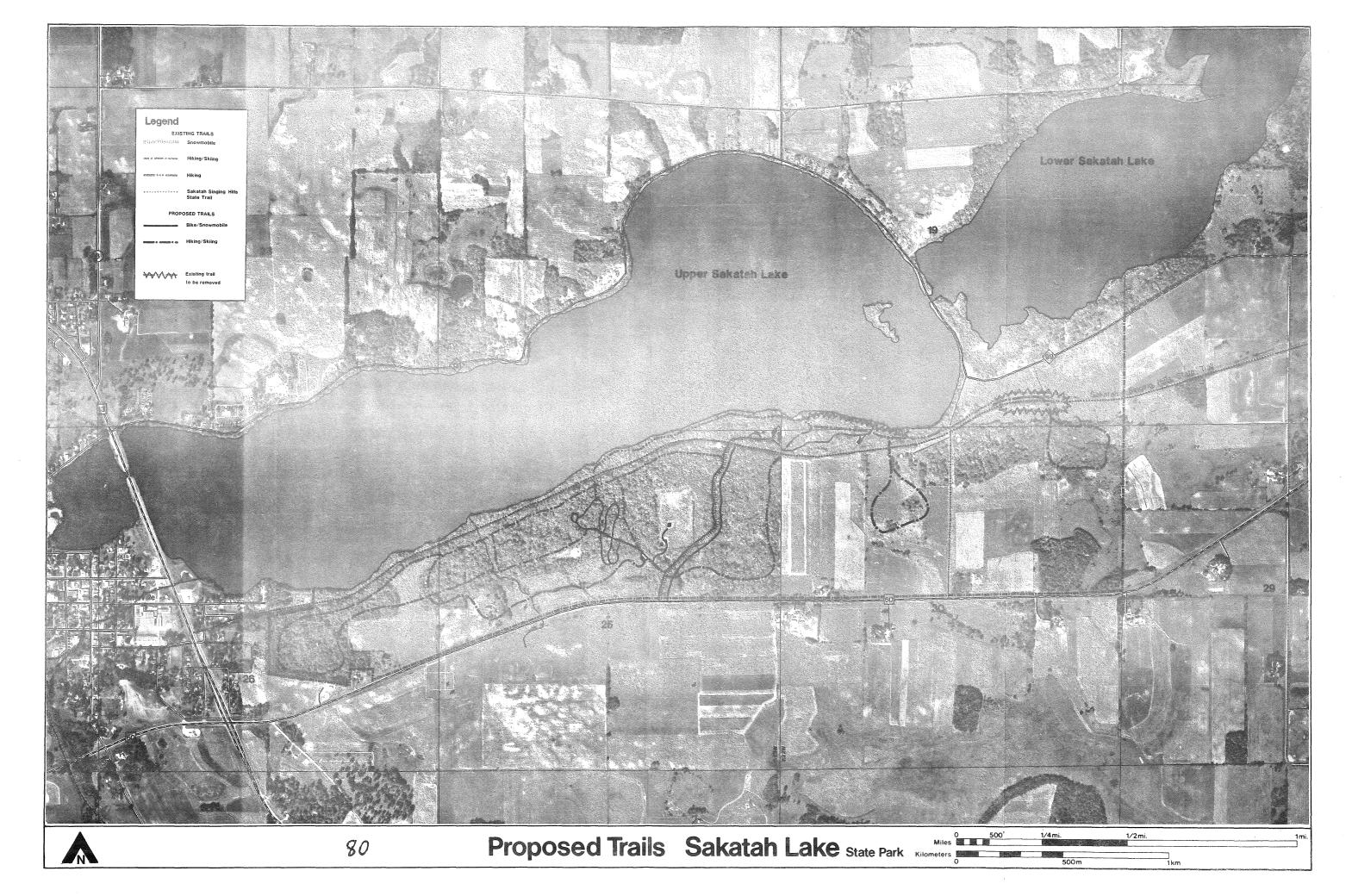
COST No development cost

Action #11. Consider the development of a hostel in the park.

Hostels provide overnight dormitory style lodging for people participating in non-motorized recreational travel.

The DNR, Trails and Waterways Unit has expressed an interest in establishing a hostel at Sakatah. Their interest is due to the presence of the state trail and the fact that there is at least one existing building in the park which might be suitable for use as a hostel.

In 1981, the state legislature mandated a study on the feasibility of developing hostels in state owned outdoor recreation areas. This study, completed in January 1982 provided a good set of criteria for determining the feasibility of developing hostels. In applying these criteria, several state parks were found to have potential for hostel development *g*



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(Tettegouche, Itasca, Afton, and Fort Snelling State Parks). Sakatah was not included in this list, however, this should not eliminate it from consideration for hostel development.

In the future, if demand exists and funds are available, the development of a hostel in Sakatah could be pursued. However, prior to such development, a comprehensive analysis should be made of the area in which the state trail is located to determine if the park is the best site for a hostel or if there is another site, either publicly or privately owned, which would be more desirable.

In most cases, the inclusion of a hostel would be compatible with other state park developments. However, prior to the development of hostels in state parks, the Division of Parks and Recreation and the Trails and Waterways Unit should cooperate in the development of a statewide policy which would address the development, operation and maintenance of hostels in state parks.

COST No development cost

Interpretive Services

Objectives:

To provide interpretive programs and activities that will increase the park visitor's awareness, appreciation, and understanding of the biological, cultural, and recreational features within Sakatah Lake State Park and the Minnesota state park system.

Sakatah Lake State Park has a variety of natural and historical features to form the basis of an interesting interpretive program. Prior to settlement, most of the park was covered by native prairie. Crop production, drainage, and fire supression have altered this original vegetation. The vegetation program proposed in this management plan recommends returning portions of the park to some semblance of its presettlement character. The implementation and management of the vegetation program will provide opportunities for interpretation of prairie aesthetics, plant succession, prairie life cycles, prairie wildlife habitat, plant adaptions, and management with fire. Dutch elm disease, oak wilt, and butternut canker have resulted in swift and significant changes in the park vegetation. This tree loss would be a graphic example for interpretive programs on plant succession, wildlife's response to habitat changes, tree diseases, and the importance of dead trees to wildlife.

Archaeological information on Sakatah Lake is incomplete. However, the abundance of artifacts found in and around the park by local people and park visitors suggests that there is good potential for the presence of prehistoric and early historic Indian sites. In the future, if sites are located, information about them should be incorporated in the park interpretive program.

The potential for historical interpretation is excellent. If it can be authenticated, the presence of an early nineteenth century trading post in the park would be an exciting addition to the park's interpretive program. The first European settlers to the area and their struggle in the new frontier would form the basis for a variety of programs concerning early crafts, trades, foods, and customs of the local area. Local historians and the Rice and LeSueur county historical societies could make valuable contributions to the park interpretive program.

The Sakatah Lake interpretive program is currently housed in a former lakeshore cabin. The program has been staffed by a college work/study naturalist from June 1 to August 31. The existing staff is able to meet the interpretive needs of park visitors during the park's high use season. However, there are times in the spring and fall when visits to the park by school groups would be enhanced if a naturalist were present. Also, staffing the program with work/study students can only be done on a year by year basis with no guarantee that such staffing will continue. The addition of one park naturalist will be necessary to maintain the park interpretive program.

Action #1. Eliminate the existing visitor center and construct a multi-purpose building to be used as a visitor center and winter trail shelter.

The existing visitor center is a remodeled lakeshore cabin which houses a variety of displays and is used for presenting audio-visual programs. The structure is in reasonable condition, although it has plumbing problems. Major repairs such as roof work can be expected in the next 5 to 10 years.

Another problem with the visitor center is its location. Access is difficult for both campers and day users. The center is located in the eastern portion of the park a long way from the campground and picnic ground. As a result most visitors drive to the visitor center, particularly campers attending evening programs. The center does not have a parking lot. People use the nearby boat launch parking lot which is easily congested because of its size and layout.

To remedy this situation and to provide facilities for winter trail users (see Trails, Action #, p<u>77</u>), a multi-purpose building should be constructed. The building should include the following:

- A fireplace or wood stove to provide heat for winter trail users
- Large screened windows for summer use which have insulated insert panels for winter use
- Electrical service
- A secure storage area for interpretive and audio-visual materials and equipment, and winter insert panels.
- Seating for up to 100 people. (Because the interior space must remain flexible, this seating should not be permanently mounted. Stack chairs are a possible alternative.)

Insects are an extreme nuisance during most of the summer. Screening will allow the presentation of evening programs in an outdoor setting without the discomfort caused by insects. Insulated insert panels placed over the screens will allow winter use of the structure. Unscreened portions of the walls should be capable of supporting wall-mounted interpretive materials for summer naturalist programs. This building should be open daily during regular park operation hours. Two options exist regarding the location of this building. One location is adjacent to the campground visitor parking lot. The other is in a wooded area north of the service court and west of the main park road, near the state trail.

The location adjacent to the parking lot would provide campers with easy access to interpretive programs. With minor expansion the parking lot could provide parking for both skiers and snowmobilers and access to the area would require less snowplowing than to the other site. The construction of another parking lot would not be necessary as the existing campground visitor parking lot would be used.

The location in the wooded area north of the service court would be more accessible to state trail users and could be made reasonably accessible to the campground with the construction of a trail. This site has more scenic potential then does the other. Also, there is adequate space for the development of a parking lot.

The expected users of this building will be campers attending interpretive programs, winter trail users needing a place to rest and warm up, and users of the state trail in need of a rest stop or information on the park (this need could also be fulfilled at the proposed picnic shelter, Action #, p $\frac{66}{10}$).

Determination of the building site should not be made at this time because the kind and amount of use the recently completed state trail receives will be a factor selecting the most appropriate site. Construction of the building has been scheduled in the fourth phase of development. This should allow sufficient time to analyze everything necessary to made the final determination on building location. In addition, a site analysis by the DNR Bureau of Engineering may find one site to be more suited for development than the other.

35,000 COST

Action #2. State trail and canoe route information should be included on the state park handout.

The park, the state trail, and the canoe and boating route offer an excellent combination of recreation facilities. Providing the public with information about these facilities is recommended. At such time that the park maps are revised, this information should be included.

 Image: COST
 Image: Covered in park operations

Action #3. Develop two interpretive brochures which highlight important natural and historical features in the park.

There are several important interpretive features which could enhance a park visitor's experience. These should be identified and background information given on them. Thus, even when a naturalist is not available, visitors can gain some interpretive experiences.

Two separate brochures should be developed. The first should focus on the habitation of the area by earlier peoples, including prehistoric and early historic Indians and European traders. Existing and potential archaeological sites should be highlighted and explained in the brochure text.

The second brochure should discuss the plant communities found in the park, now and in the past, how they have changed over time and what forces have altered them. The relationship between the prairie, savanna, and woodland communities should be discussed and human impact explained.

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 TOTAL

 COST
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Action #4. Install interpretive signage at prehistoric and early historic sites.

One existing and two possible archaeological sites are discussed in the History/Archaeology Section of this plan (see p57). If authenticated, these sites should be marked with interpretive signage explaining the kind of site, the people who used it, and why and when they were there. This signage will complement the brochure proposed in Action #2 above and will help to interpret the earlier peoples who inhabited the Sakatah Lake area.

Action #5 Recommend the development of an interpretive brochure for the Sakatah Singing Hills State Trail and the Cannon River Canoe and Boating Route by the DNR, with of Trails and Waterways, \mathcal{U}_{N}

For hundreds of years before European settlement, the Cannon River served as a travel route. The river itself was canoed and many people believe a hiking trail existed near its banks. In historic times, much of this same route was used for a railroad line. This alignment now serves as the state trail. The existence of this travel route and the wealth of history which must accompany it would make an excellent topic for an interpretive brochure. Such a brochure would do much to satisfy the interpretive need of the trail and canoe and boating route users.

COST To be funded by DNR Trails and Waterways Unit

Action #6. Provide park information and interpretation in the picnic area.

Bulletin boards or kiosk style displays should be developed to provide park visitors information and interpretation of the park facilities and resources. This information will familiarize day visitors and trail users with the park's recreation opportunities, rules, and regulations, naturalist programs, and self-guided trails. g_6

		TOTAL
COST	1,000	1,000

Water Activities

To provide an enjoyable swimming experience To provide adequate support facilities for boaters

Action #1. Maintain the beach in its present form

The beach does not receive a great deal of use. Campers are the major users. Local people use the public beach in Waterville on Lake Tetonka. The beach is adequate, although at times it is unusable due to algae blooms. No management actions are necessary at this time.

COST No development cost

Action #2. Upgrade the boat launch ramp.

The existing launch ramp is in usable condition but is subject to erosion from a drainage ditch and runoff from the access road. Erosion control measures and the installation of a concrete plank launch ramp will alleviate the problem. In addition the concrete plank ramp will withstand more intensive use and require less maintenance.

Prior to any construction it will be necessary to obtain a permit for the work from the DNR Division of Waters. A permit may also be necessary from the U.S. Army Corps of Engineers. Water access specialists from the DNR Trails and Waterways Unit should be consulted on this project.

]		5TOTAL
COST	5,000	5,000
	87	

Administrative/Support Facilities

Objectives:

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

To provide a suitable working area for the repair and maintenance of equipment

To alleviate current equipment storage problems

Action #1. Construct a new contact station/park office.

The existing contact station/park office is too small to accommodate both functions. It has no toilet facilities and is poorly located to handle incoming visitors during busy periods.

The new structure should not be elaborate in design. What is needed is a relatively inexpensive, energy efficient structure with a simple architectural style. The building should be relocated about 500 ft (152 m) north of the present site along the main park road. This is necessary to avoid traffic back-up onto TH 60 during busy times. Also, the sharp incline on the main park road just past the contact station creates a potentially dangerous intersection with the campground road. This will be avoided by relocating the contact station and the campground road. (See also, Roads and Parking, Action #1, p.<u>68</u>). The contact station should be designed in a way that it can display the mural which is now housed in the interpretive center.

Action #2. Construct an unheated storage building in the service court.

The lack of adequate storage forces the park manager to use makeshift storage or leave equipment, which should be stored indoors, outside. The makeshift storage should be removed and replaced with a suitably sized, unheated storage building. The DNR, Trails and Waterways Unit also uses the service area of the park to coordinate and store equipment for state trail maintenance. The development and cost of this facility should be coordinated with DNR, Trails and Waterways Unit.

· · · · · · · · · · · · · · · · · · ·	2	TOTAL
COST	55,000	55,000

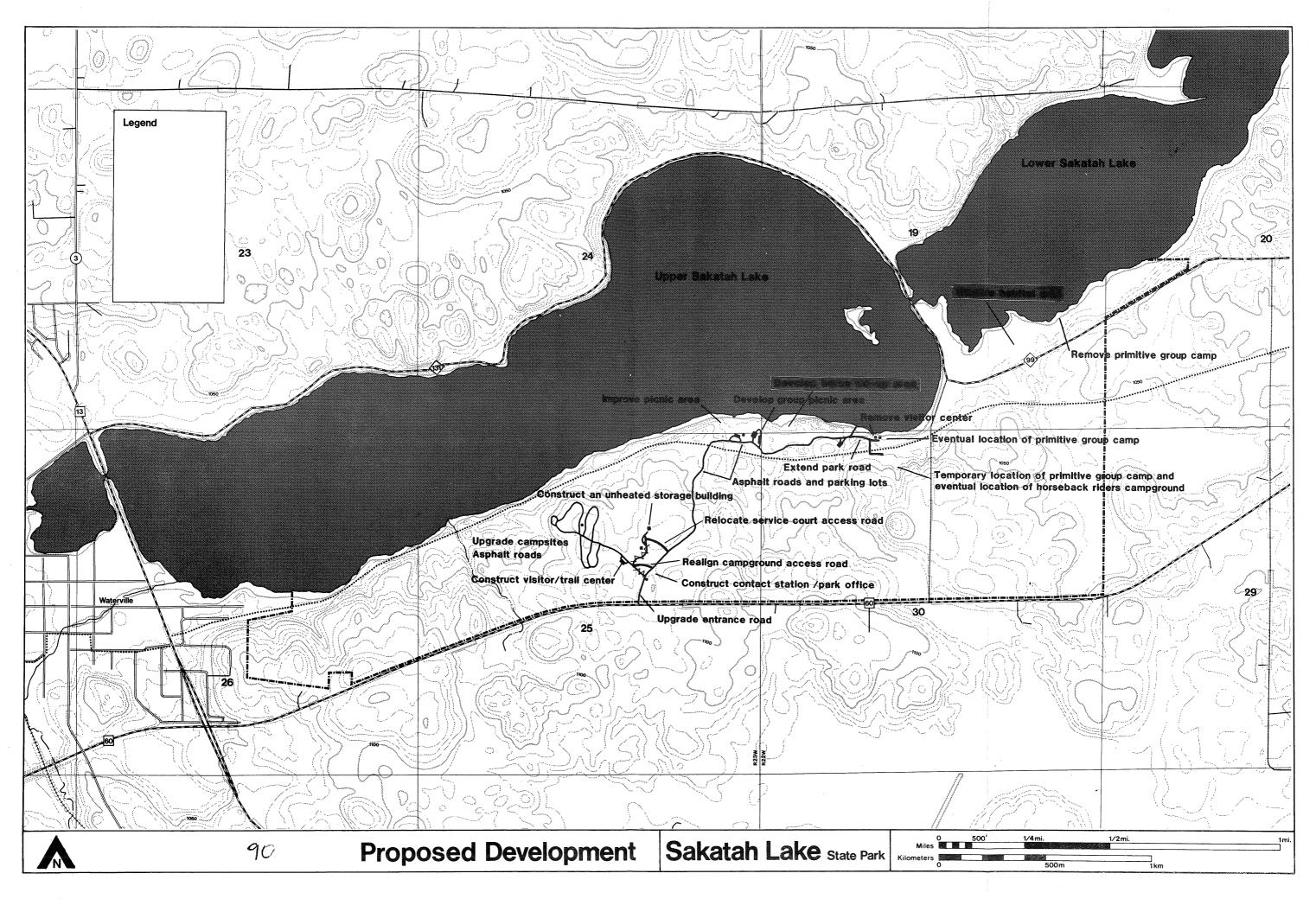
Action #3. Construct a two-car garage for the manager's residence.

At present, there is no garage to house the manager's private vehicle and other belongings. The Division of Parks and Recreation is in the process of establishing a policy to deal with managers' residences in all state parks. Until such a policy is established, no final determination on size and cost of garage or residence can be made.

	1 · · · · · · · 2 · · · · · · · 3 · · · ·	TOTAL
COST	Conditional-estimated cost- 13,000	13,000

Action #4. Maintain the seasonal residence adjacent to the visitor center for the time being.

A small lakeshore cabin purchased several years ago has been used during the summer as a residence for the naturalist. The building is not winterized and is adequate only for summer housing. Residences for seasonal naturalists are not provided in all parks. At present, the DNR, Division of Parks and Recreation has no established policy to address this situation. The building should continue in its present function for the time being until policies are established. In the meantime, minor maintenance should continue, but no large maintenance or repair projects should be conducted.



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COST No development cost

Action #5. Bury overhead power lines.

The majority of the power lines in the park are underground. There are, however, two short stretches of overhead lines. One line runs from TH 60 to a pole next to the campground parking lot. From there the line is buried and serves the contact station, campground, manager's residence, and shop building. The second overhead line runs from the gravel township road west and south to the visitor center. From there it is buried and serves the picnic grounds.

The overhead lines and the clearing beneath are a visual intrusion on the natural setting of the park. In addition, overhead lines are usually more costly to maintain. Therefore, all overhead lines should be buried. The line running from the township road to the visitor center is of lower priority, because it is in an area of the park that few visitors see. However, the line running to the campground parking lot should be buried in the near future because it is highly visible to park visitors and, in the future, several trees would have to be removed to prevent possible damage to the lines.

Architectural Theme

At present, there is no architectural theme for the park. Because Sakatah Lake was established relatively recently (1963), it does not contain some of the more distinctively styled park buildings such as those built by the Work Progress Administration (WPA) in the late 1930's. All buildings currently in use are simple in design and fit well into to the landscape. Future construction should be low in profile and exposed surfaces should be covered with naturally textured materials such as wood or textured concrete or block or stained or painted with earth tone colors. All heated buildings will be designed for energy efficiency and should integrate some of the following energy conservation features: proper sun/wind orientation, maximum insulation, earth sheltering, passive and active solar space and water heating applications, and the use of supplemental wood heat.

Maintenance, Operations, and Staffing

Maintenance is an essential responsibility of the DNR, Division of Parks and Recreation. It is a responsibility that often goes unnoticed by the park visitor in comparison with new developments. Yet, the park and the DNR are continually judged by the appearance of the park and its facilities.

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 operation is necessary 98 hours per week (8:00 a.m. to 10:00 p.m., seven days a week). During other seasons, there is only part-time operation 98 hours per week, however, maintenance, repair, and park security accounts for many extra work-hours. If these responsibilities are to be met, competent trained personnel are essential.

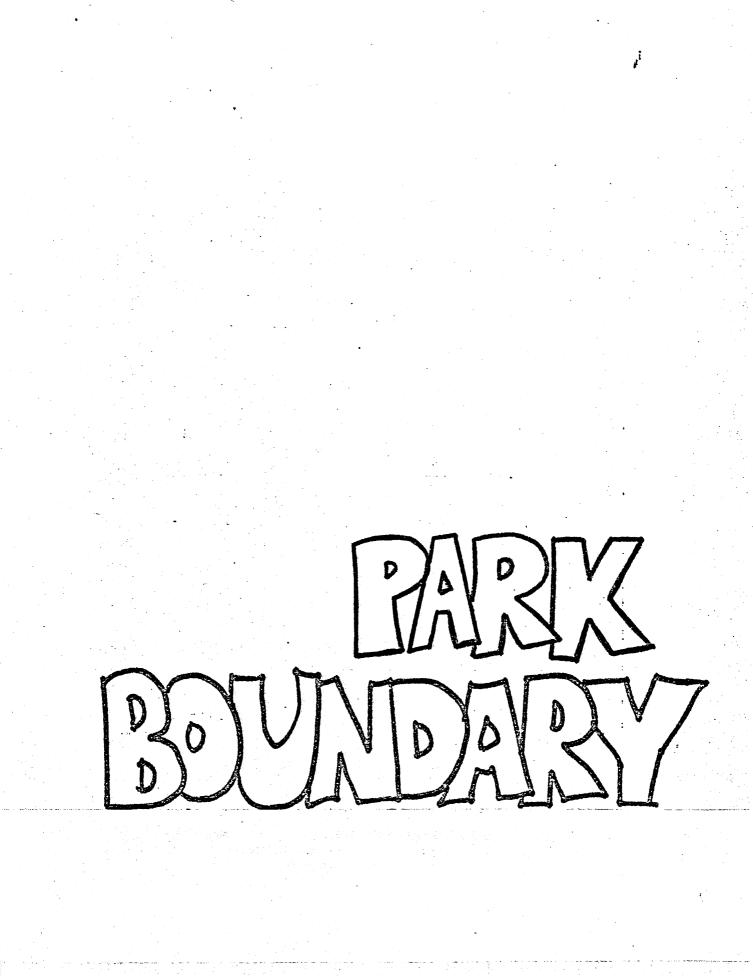
There are four basic aspects to maintenance and operations:

- 1. Maintaining resources
- 2. Maintaining facilities
- 3. Providing services to the park visitors
- Enforcing rules and regulations which protect park visitors, resources, and facilities.

One of the major maintenance problems of parks is the heavy 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 groundcover and frequently exposes tree roots to damage from foot traffic. The eventual result may be erosion slides, disfigured sites, and even danger to park visitors. Education of the park users through signs and brochures explaining the problems may help to alleviate abuse. A regular maintenance program with adequate personnel, supplies, and equipment controls damage, thereby avoiding future reconstruction expenditures.

Current staffing in the park includes a full time park manager and park technician as well as several seasonal employees to help maintain and operate the park during the warmer months when visitation is higher. The existing staff should be adequate to maintain present park facilities as well as any additional proposals in this management plan. The addition of one park naturalist (Natural Resources Specialist I) will be necessary to maintain the park's interpretive program.







Boundaries/Ownership

Objectives:

To provide sufficient park acreage to protect and perpetuate the natural resources and provide the necessary recreational facilities to interpret and enjoy these resources, without including acreage that would be unreasonable to purchase.

Sakatah Lake State Park was established in 1963. The statutory boundary includes 842 acres (344 hectares) in Sections 24, 25, and 26, T109N, R23W and Sections 19, 20, and 30, T109N, R22W. Statutory boundaries are established by the legislature. The DNR, Division of Parks and Recreation can purchase land or easements only within a park statutory boundary. The status of land within this statutory boundary does not change. It simply permits the DNR to talk to an individual landowner and negotiate for the purchase of that portion of land in which the DNR is interested.

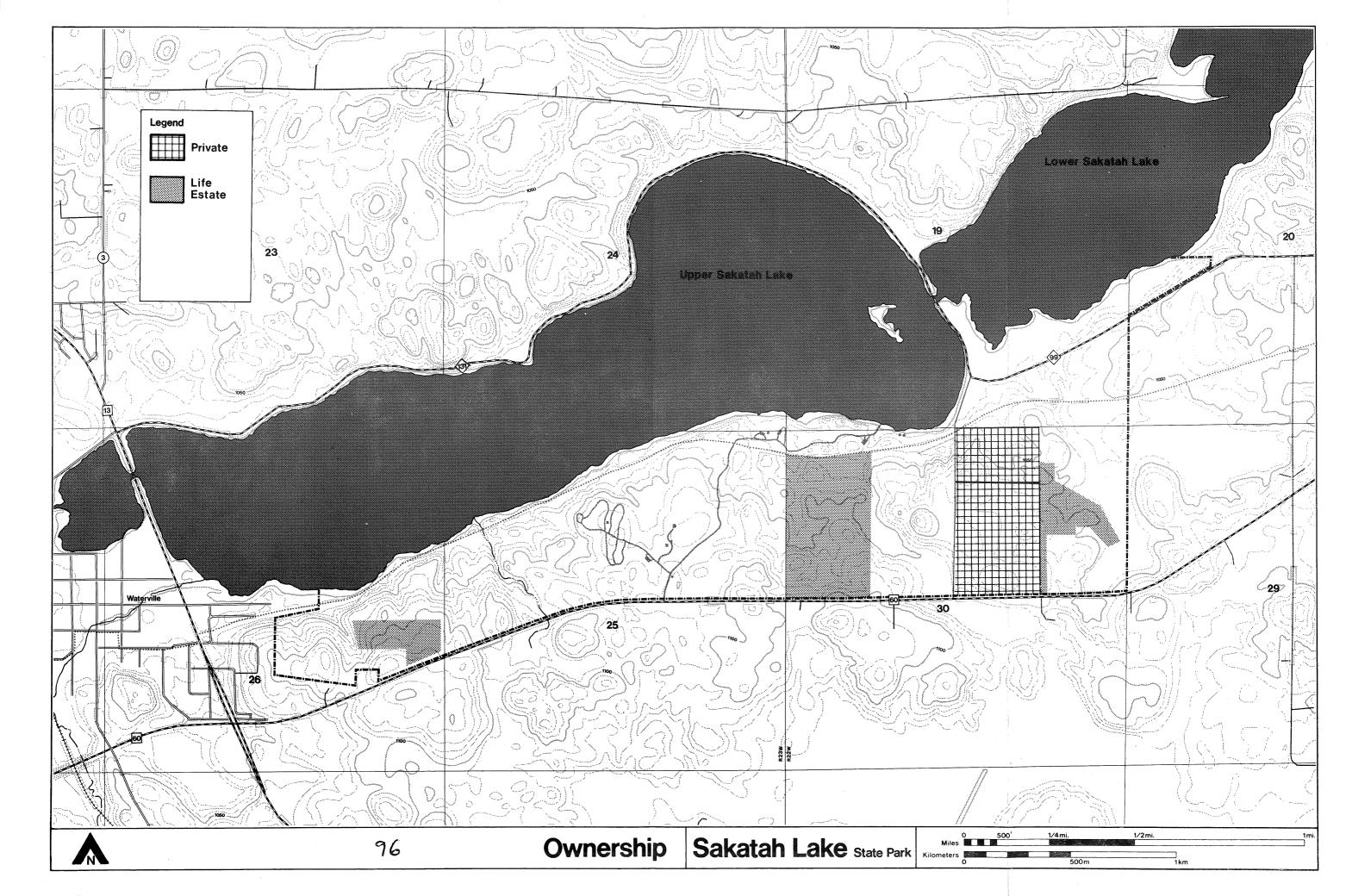
Within the statutory boundary of Sakatah Lake State Park there are two parcels of private land totaling 80 acres (32 hectares). All other land is owned by the state. This includes three parcels of land totaling 108 acres (44 hectares) which are held in life estate. This land is owned by the state, but the sellers have the right to continue use of the property, with certain restrictions for the rest of their lives.

There are two pieces of private land within the statutory boundary. These two parcels are adjacent to and east of the township road which runs through the park. (See Ownership Map, p<u>**96**</u>.) One piece is 52 acres (21 hectares) of agricultural land and the other is 28 acres (11 hectares) of wooded land. The DNR is interested in acquiring all acreage within the statutory boundary, but only with the full consent of the landowners involved and only when money is available and the outlay of funds can be justified. Until this time the land will remain privately owned acreage within the park boundary.

The majority of the land which borders the park has already been developed for residential or agricultural purposes. Therefore, it is not suitable for park purposes. The park has a sufficient amount of land to provide for a variety of winter and summer recreational activities and still maintain the natural and scenic qualities of the park. Only one minor addition to the statutory boundary is proposed. This involves the small 6 acre (2 1/2 hectare) island near the east end of Sakatah Lake.

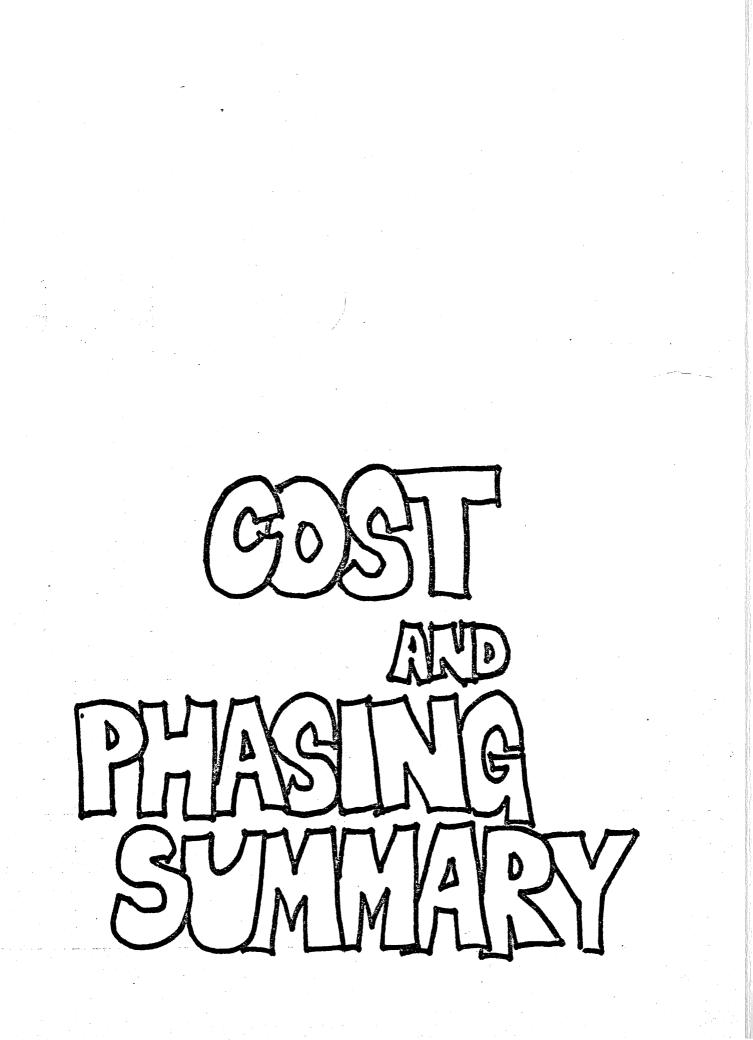
Throughout the state, the U.S. Bureau of Land Management (BLM) owns many small, scattered pieces of land. The management difficulties of these scattered parcels has convinced the BLM to transfer title or sell them.

The island in Sakatah Lake is under the jurisdiction of the BLM. It was never surveyed and no title has been filed on it. In 1973, the DNR, Division of Parks and Recreation leased the island from the BLM to include it as a portion of the park. This lease has since expired. The island has potential value as a wildlife resource, primarily for bird life. (If the inventory conducted by regional DNR staff finds this island to be good shore bird nesting habitat the acquisition priority of this land would be increased.) The island can also provide good wildlife observation for visitors canoeing or boating on the east end of the lake. Negotiations are going on between the BLM and the DNR to transfer these lands to DNR control. If agreement is reached, the island should be requested to become a permanent part of Sakatah Lake State Park.



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The following cost estimates were generated in January, 1982. These cost estimates are based on current prices and available information. As new information is made available and as new or modified programs are initiated, revised cost estimates will be prepared to more realistically represent costs at that time. This plan is intended to be implemented in ten years. The phases noted suggest the level of funding to be requested each biennium. But there is no guarantee that this amount of funding would be received from the legislature. Therefore, some change to these phases can be expected. The conditional column includes those actions which cannot be phased into the development schedule at this time. (See the individual actions in the text for justification.) Estimated costs are for individual projects. Costs for some projects may be reduced if they are done in conjunction with other projects.

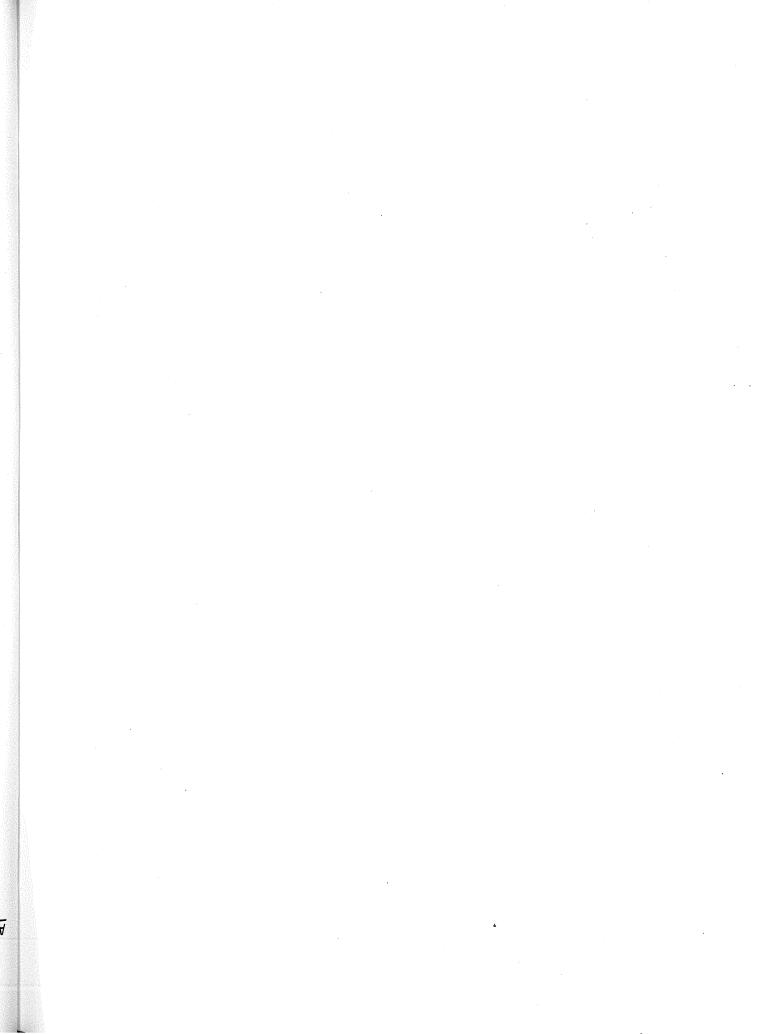
Act	ion	PI	nase 1		hase 2		hase 3		hase 4		hase 5	To	tal	Conditional
	VEGETATION MANAGEMENT													
1	Establish and maintain tall grass prairie in key areas of the													
2	park. Maintain open grassland north of the Sakatah			\$	3,000	\$	3,000	\$	3,000	\$	1,000	\$	10,000	Ongoing
3	Singing Hills Trail. Remove understory trees, thin	\$	2,000						1,000				3,000	Ongoing
	canopy, and establish grass in the lakeside													
4	picnic ground. Establish grass		2,000				2,000						4,000	
	in the campground.		1,000				500				500		2,000	Ongoing
5	Increase the water level in the shallow marsh southwest of													ŝ
	Schwartz Hill when life estate													
c	becomes available.		•	Со	nditior	nal	x							
6	Plant old field grasslands and life estate lands									•				
7	with oak. Plant mixed oak species along			Со	nditior	nal	(will	be	ongoir	1g)				
	edges of life estate agricultural fields as they become available for park use.			ſ	nditior						· · · ·			
	ioi paik use.			00		101								



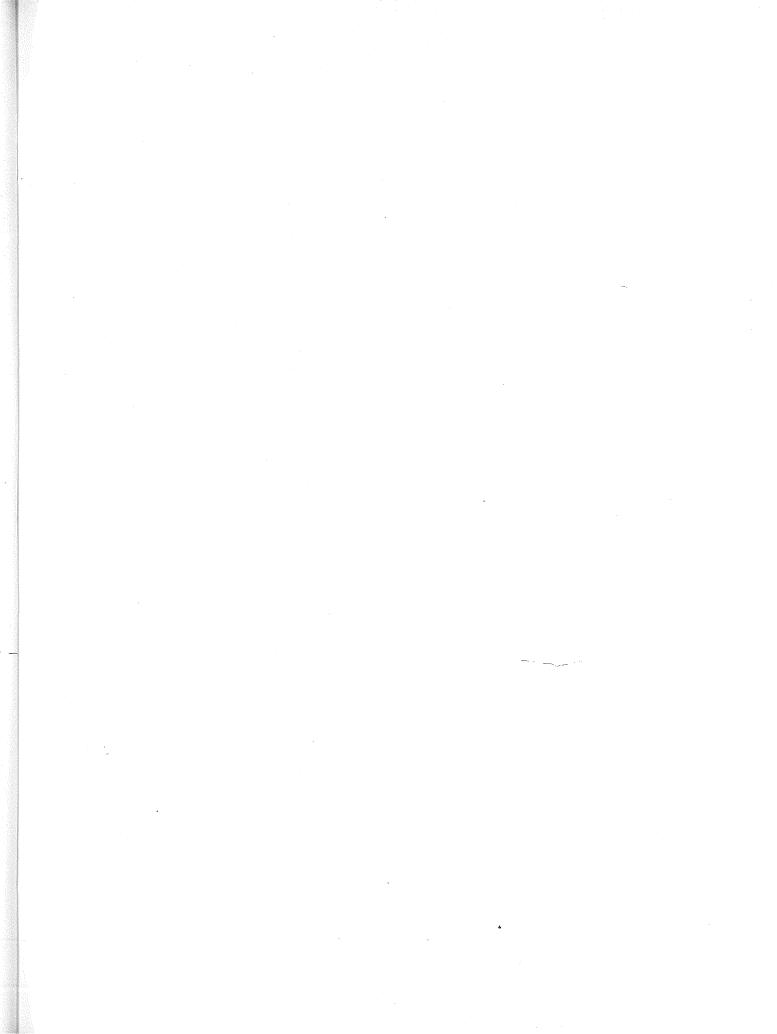
<u>Act</u>	ion	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total	Conditional
8	Maintain mature maple basswood canopy.	•	No develo	pment cos	t			
9	Diversify the species content of the ash planting north of the service court.		500		•		500	
10	Control weed infested areas of	N k					500	
11	the park. Develop a fire management plan and conduct	NO COST -	covered b	y park ma	intenance			
12	prescribed burns. Identify tree diseases throughout the	1,000	1,000	2,000	2,000	2,000	8,000	Ongoing
13	park and monitor their progression. Maintain a maximum abundance	1,000	1,000	1,000	1,000	1,000	5,000	Ongoing
14	of dead standing and downed trees (snags). Inventory and map		500				500	
	new DNR, Natural Heritage Elements found in the park.		No develo	opment cos	t			
1	WILDLIFE Maintain large, undisturbed		:					
2	forest areas. Inventory the shorebird nesting habitat on the		No develo	pment cos	t			
3	island in Sakatah Lake. Develop a management		No develo	pment cos	t			
	program for the park's deer population.		No develo	pment cos	t			
1	GROUND WATER MANAGE Test well water quality and make corrections to improve the existing water	<u>MENT</u>						
- - -	supply.	Done by D	NR, Bureau	of Engine	eering &	Division	of Waters	5

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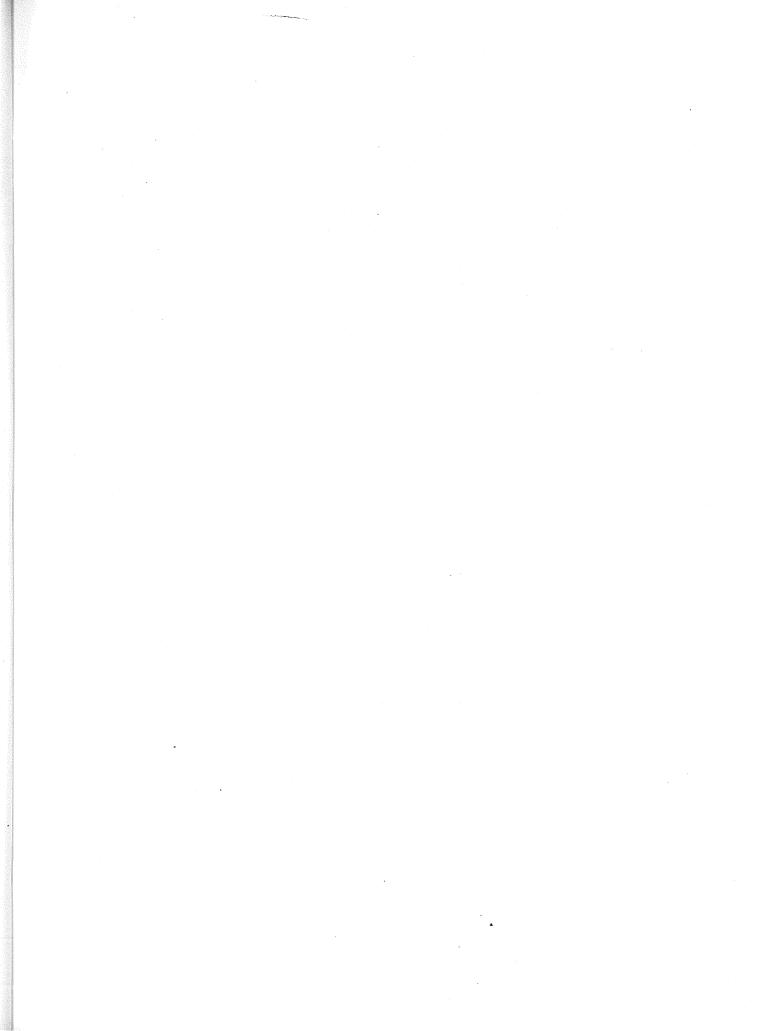
Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total	Conditional
HISTORY/ARCHAEOLOGY 1 Conduct an archaeological survey of the park. 2 Consult with the Intertribal Indian Affairs Board and state archaeologist	•					5,000	
prior to any management near archaeological sites. 3 Conduct historical research in an attempt to locate the site of the		No cost			· · · · · · · · · · · · · · · · · · ·		
Alexander Faribault trading post. 4 Make all information regarding prehistoric or historic sites in the park available to the park interpretive staff.		No devel	2,500 opment co			2,500	•
CAMPING 1 Upgrade poorly							
designed campsites. 2 Pave the campground roads	8,000					8,000	
with asphalt. 3 Manage vegetation in the campground. 4 Relocate the				ing, Actio anagement,		#4	
primitive group camp. 5 Develop a horseback riders	3,500			:		3,500	
PICNIC GROUNDS 1 Improve the		Conditio			-+	Atten	9,000
existing picnic area.	See	Veget.	tion 1	Menage	emenl,	Action	.
	•	99	7				



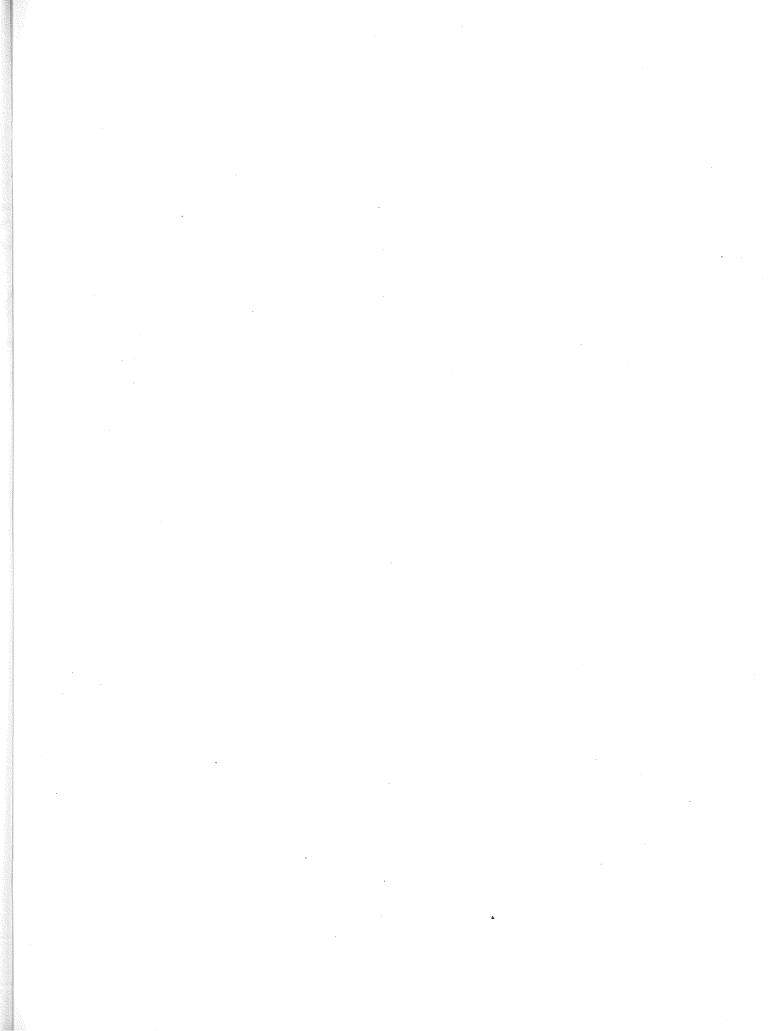
Act	ion	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total	Conditional
2 3	Develop a secondary picnic area. Pave the picnic ground parking lots with asphalt.	5,000	See Roads	20,000 & Parkir	ıg, Action	#2	25,000	
1	ROADS AND PARKING Make improvements to the park		20,000				20,000	
2	entrance road. Pave major park		20,000				20,000	
3	roads and parking lots with asphalt. Develop an access road through the park to the	2 - 2 - - - - - - - - - - -				90,000	90,000	
	proposed primitive group camp and the horseback rider							
4	campground. Upgrade the	• .			5,000		5,000	
5	picnic ground parking lot. Upgrade the boat	5,000					5,000	
	launch parking lot.			5,000			5,000	
6	Request that the Morristown Township in Rice County impose a							
	30 mph (48 kph) speed limit on							
	the township road which connects				·			
	TH 60 and Cty Rd 99 on the east side of the park.		No cost					
1	TRAILS Expand the park hiking/ski		· ·			. 1		
	touring trail system.	5,000		4,000			9,000	



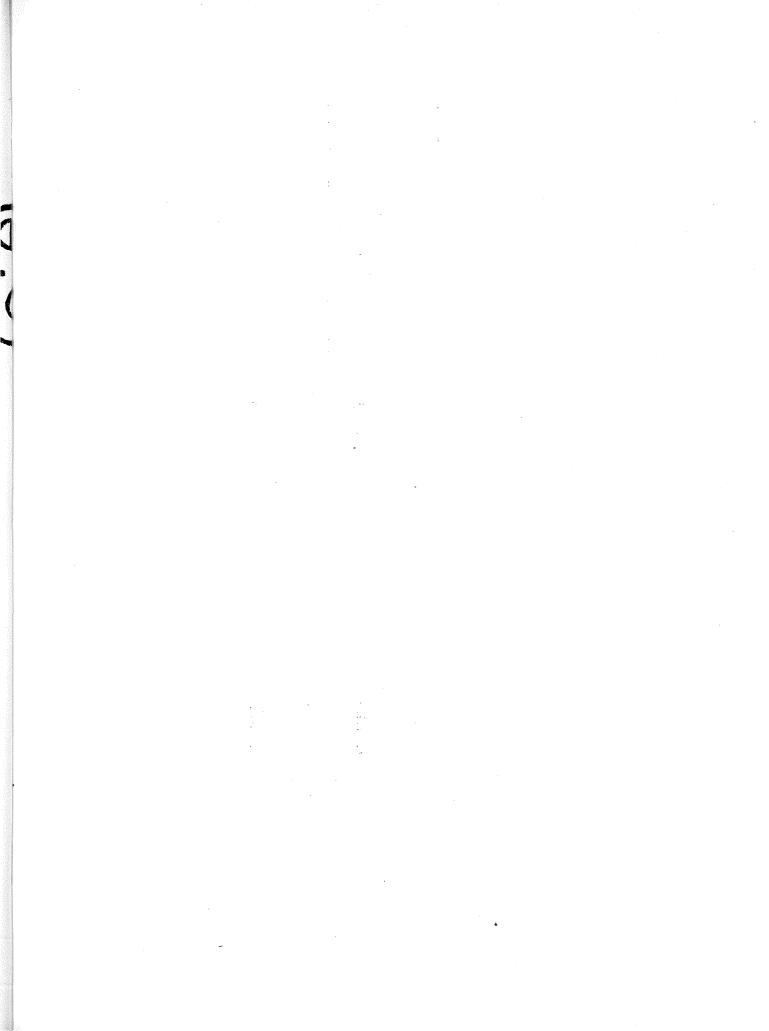
Act	ion	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total	Conditional
2	Consideration							
	should be given to providing an							
	alternative							
	horseback trail							
	alignment in the							
	southern portion of the park,				•			
	rather than along							
	the existing	4			•			
	state trail right-of-way.		Conditio	nal				
3	Provide a		Jonardin	/114.1				
-	snowmobile access							
·	from the park						•	
	entrance to the state trail.		No devel	lopment co	ost			
4	Request that							
	Morristown							
	Township in Rice			~				
	County impose a 30 mph (48 kph)							
	speed limit on							
	the township road							
•	which connects TH							
	60 and Cty Rd 99 on the east side							
	of the park.		No deve	lopment co	ost			
5	Reroute the							
	hiking only portion of the			-				
	Lakeside Trail to							
	avoid badly		e	:9. A.±'	#J			
F	eroded areas.		See Tra	ils, Actio	on #1			
Ø	Construct a multi-purpose							
	visitor				. · .			
	center/winter							
	trail shelter near the							
	campground					I		
	parking lot.		See Inte	erpretive	Services,	, Action	#1	
, ¹ . 7.	Prune and manage							
	vegetation along the state trail							
	to allow views of				ark an	d trai	loper	ations
	the lake.	Tobe	covered	s by P			- - - -	-
8	•							
	facility should be provided in		· .					
	the picnic area							
	near the parking							
	lots.	500					50	JU .
			101					

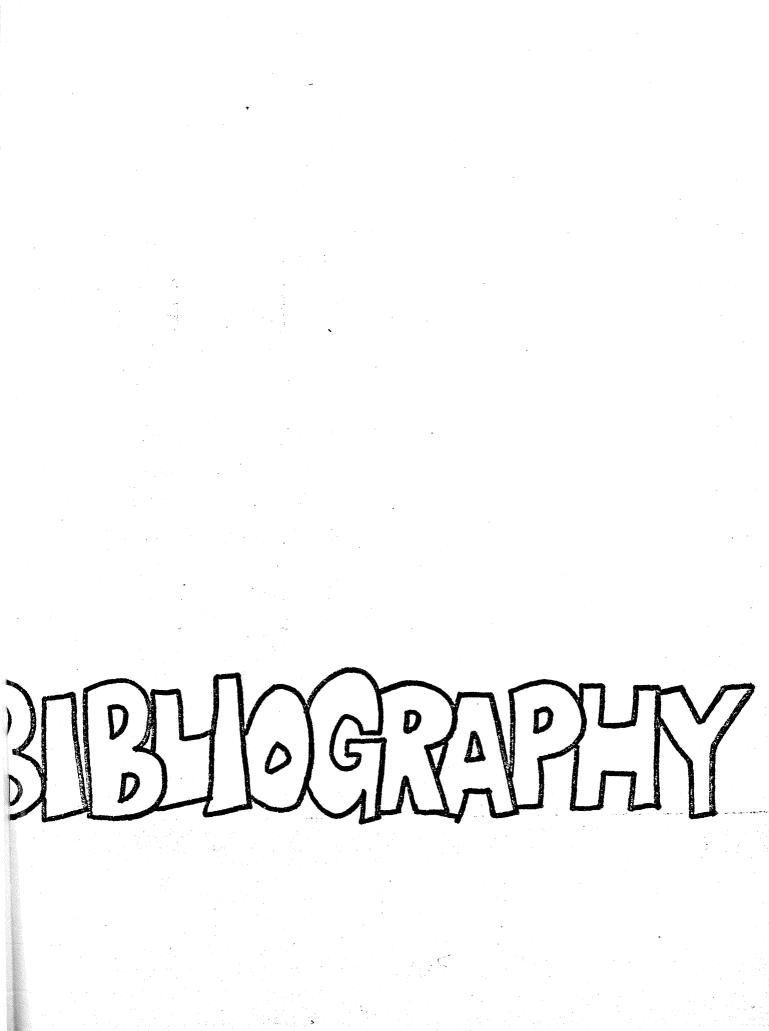


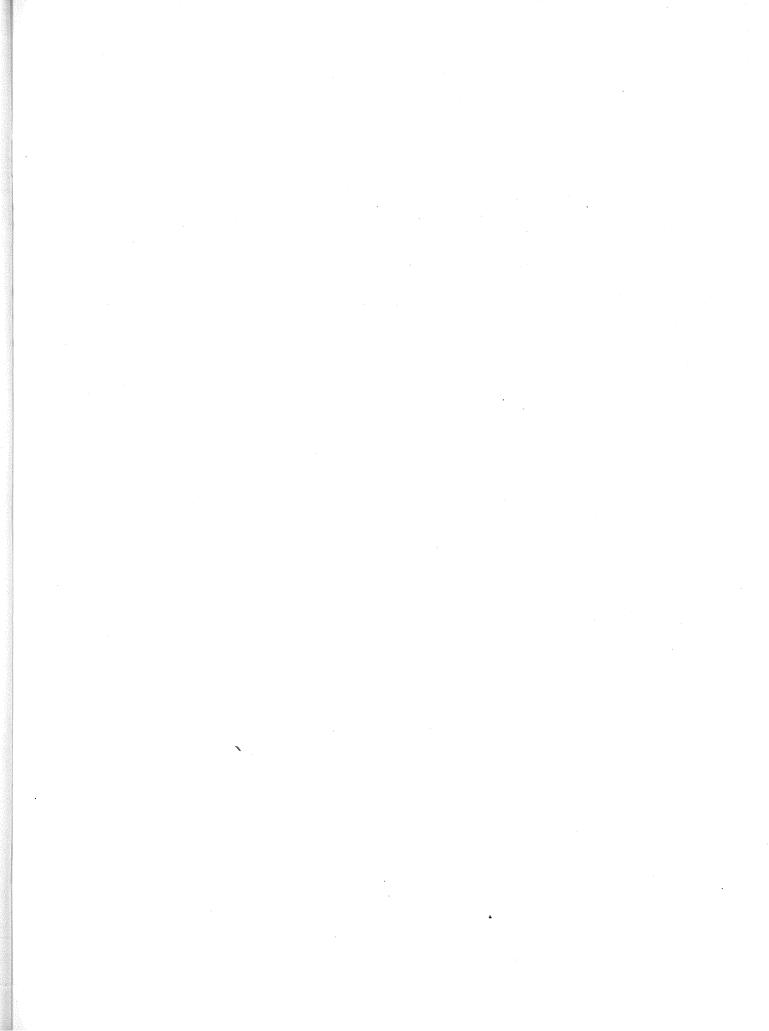
Action	Phase	Phase 2	Phase 3	Phase 4	Phase 5	Total	Conditiona
9 If the state trail is completed for horses, a tieup should be provided							
near the day use facilities. 10 Bicycle concessions should be considered in the		No devel	opment co	st			
park. 11 Consider the development of a hostel in the		No devel	opment co	st			
park.		No devel	opment co	st			
INTERPRETIVE SERVICE 1 Eliminate the existing visitor center and construct a multi-purpose	<u>S</u>		e de la compañía de l Terreter de la compañía				
building to be used as a visitor center and winter trail shelter. 2 State trail and canoe route information should be	· · · · · · · ·			35,000)	35,00	0
included on the state park handout. 3 Develop two interpretive brochures which		To be co	overed in	park oper	ations		
highlight important natural and historical features in the park.	2,000				جو	2,00	0
4 Install interpretive signage at prehistoric and	_,						
early historic sites.			1,000			1,00)



<u>ict</u>	ion	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total	Conditiona
		•						
5	Recommend the							
	development of an							
	interpretive							
	brochure for the							
	Sakatah Singing							
	Hills State Trail							
	and the Cannon							
	River Canoe and Boating Route by						,÷	
	the DNR, Unit of							
	Trails and							
	Waterways.	To be fur	nded by DNR	<pre>Trails {</pre>	6 Waterwa	vs Unit		
;	Provide park	•••••••				/3 0	·	
	information and							
	interpretation in							
	the picnic area.	1,000					1,000	
	WATER ACTIVITIES							
	Maintain the							
	beach in its present form		No develo	somet co	. +			
	Upgrade the boat		NU Gevero	pment cos	. 6			
•	launch ramp.			5,000			5,000	
	-			- ,			- ,	
	ADMINISTRATIVE/SUPPO FACILITIES	<u>RT</u>						
	Construct a new							
	contact							
	station/park							
	office.			70,000			70,000	
	Construct an			-			-	
	unheated storage							
	building in the			55,000			55,000	
	service court.							
	Construct a							
	two-car garage							
	for the manager's residence.	Condition	nal (estima	ted cost	1		13,000	\$13,00
	Maintain the	CONTRACTOR	al (estima	iteu coscj	!		13,000	\$13,00
	seasonal							
	residence							
	adjacent to the		•					
	visitor center		-					•
	for the time							
	being.		No develo	opment cos	st			
;	Bury overhead		2 200					
	power lines.		3,000				3,000	







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