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Glacial Lakes State Park Management Plan

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Draft

Glacial Lakes State Park Management Plan

This draft management plan for Glacial Lakes State Park was completed by the Minnesota Department of Natural Resources, Office of Planning, Park Planning Section, September, 1982, Laurie Young, Park Planner. Funding was provided by the Legislative Commission of Minnesota Resources.

Draft

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INTRODUCTION

In 1975 the Minnesota State Legislature passed the Outdoor Recreation Act (ORA). The intent of this legislation is to ensure, through long-range planning, the protection and perpetuation of Minnesota's outstanding resources. Also included in this legislation is the mandate to provide recreational facilities which are desired by the citizens of Minnesota but which do not compete with those provided by the private sector. The Park Planning Section of the DNR, Office of Planning was established to formulate long-range resource management and recreation development plans for 82 state parks, recreation areas, and waysides.

The park planning process consists of six steps:

1. An inventory of natural resources, visitor use, and existing facilities is compiled. Specialists from other DNR divisions and sections assist in collecting pertinent data. At this point the first public workshop is held.
2. Alternatives for park management and development are developed. A second public workshop may be held to review these alternatives and invite further public comment. These alternatives are then reviewed by the Park Planning staff and the DNR, Division of Parks and Recreation.
3. The recommendation for park classification is made, the park goal is developed, and the draft plan is written. This step culminates in the first interdepartmental review.
4. The draft plan is revised as the result of the interdepartmental review. The revised plan is made available to the public for a 30 day review period, after which the final public meeting is held.
5. The draft plan is revised according to information received from the public review. The plan is then sent to the Department of Energy, Planning, and Development for a 60 day reviewal period.
6. The plan is implemented by the DNR, Division of Parks and Recreation.

SUMMARY

The management and development recommendations for Glacial Lakes State Park are directed towards perpetuating the natural resources and enhancing recreational opportunities which provide access to them. It is a goal of park management to preserve the quiet, natural character which currently exists.

Vegetation management efforts will be directed toward maintaining and improving prairie, primarily through prescribed burning. Wildlife management priorities are managing the deer herd, providing waterfowl habitat, and initiating a prairie chicken restoration project. Maintaining the water quality of Mountain Lake and the fishing experience provided there will also be a management priority.

Improvements to the campground include development of a trail to the lake and the construction of a fishing dock. A campground expansion is recommended if future use warrants. The provision of a well is recommended at the walk-in sites and the development of additional walk-in sites are recommended if future use warrants.

Improvements to the group camp^{are} recommended, including the development of tent sites, planting vegetation, and constructing a shelter. The construction of a small deck overlooking Mountain Lake in the picnic area is recommended to encourage use of that portion of the picnic area. An expansion of the beach is recommended along with elimination of the swimming dock. Two improvements to the boat ramp will include dredging the channel and landscaping the parking area.

Some modifications will be made to the trail system. A designated ski touring trail system will be developed. Some existing snowmobile/horseback riding trail loops will be eliminated and others added to maintain the mileage. A shelter is recommended for the trail center/group camp area. Development of self-guided interpretive facilities with a number of interpretive signs, an interpretive trail, and a brochure are recommended as priority.

AN OVERVIEW OF GLACIAL LAKES STATE PARK

Glacial Lakes State Park offers a variety of recreational opportunities in a beautiful and diverse natural setting. The park is located in central Pope County, four miles (6.4 km) south of Starbuck. All of the acreage within the statutory boundary of the park (1,345 acres/544 hectares) is state owned.

The park is characterized by the rolling prairie hills of the Alexandria moraine complex. The colorful progression of blooming prairie wildflowers provides opportunities for the study of prairie ecology as well as the appreciation of this uncommon Minnesota plant community.

There are also numerous wetlands in the park which are associated with unique vegetation. These wetlands provide habitat for a variety of resident and migratory waterfowl. Oak woods provide a contrast to the rolling prairie and wetlands. This topographic and vegetational diversity provides excellent habitat for a variety of wildlife.

There are 39 campsites in the park. There is also a separate group camp. Mountain Lake is a focal point for many park activities including swimming, fishing, and picnicking. Another picnic area provides additional picnicking opportunities. The trails in the park provide access to the park's resources, and several vistas provide the park visitor with a scenic overview of the landscape and offer a perspective for understanding the glacial history of the area. See Existing Development Map, p 87 and Existing Trails Map, p 89.

REGIONAL ANALYSIS

INTRODUCTION

In order to determine a park's potential role in perpetuating natural resources and fulfilling recreational needs, an analysis of the area around the park is completed. This regional analysis addresses the state park's interrelationship with factors such as: accessibility, population distribution, economy, transportation, and other recreational facilities and natural resources nearby. An understanding of this interrelationship will help ensure that park development will be planned to protect outstanding natural and historic resources, meet appropriate recreational demands, avoid competition with private recreation providers, and avoid duplication of recreational opportunities.

THE SURROUNDING AREA

Accessibility

The accessibility of Glacial Lakes State Park in terms of time and distance from the population it currently serves and may potentially serve must be evaluated when recreational programs, developments and resource management projects are considered. Alternative methods of transportation need to be considered in light of the energy situation.

Glacial Lakes State Park is located in Pope County in west central Minnesota. The nearest town is Starbuck, approximately 4 miles (6.4 km) north. Glenwood is located 13 miles (20.8 km) to the northeast; Morris 20 miles (32 km) to the west; Benson 20 miles (32 km) to the south; and the Twin Cities metropolitan area approximately 135 miles (216 km) west. The park is accessible from the south and north by Trunk Highway 29 (TH 29) and from the east and west by TH 28 and TH 55 from the southeast and the northwest.

The increase in gasoline prices in the past years has affected recreation travel patterns. There is no specific data on how this increase has affected visitation to Glacial Lakes State Park, but it can be speculated that many people who once travelled longer distances to recreate are staying closer to home. Visitation by people living in more distant areas such as the Twin Cities and Moorhead may increase as people vacation in Minnesota rather than traveling further. Residents of Starbuck, Glenwood, Morris, and Benson can be expected to continue their use of the park. Campers may stay longer at the park rather than visiting a number of destinations.

Alternative types of transportation provide additional means of access to the park. Bicycle access is generally good and there are a number of roads rated good or fair by the ^{Minnesota Department of Transportation,} MN/DOT Bicycle Program which provide access to the park from the surrounding communities. There are some segments of road which need to be upgraded in order to provide the most direct and suitable route. Public transportation is available in the form of a bus line which serves Starbuck from the Twin Cities metropolitan area daily. There is also daily service from Morris to Starbuck. This service does not provide direct access to the park.

Population

Glacial Lakes State Park is within close proximity to a significant population base. According to 1980 census figures, the closest city, Starbuck, has a population of 1,224. Glenwood has a population of 2,523. Both of these cities are located within Pope County which has a population of 11,657. Morris has a population of 5,367 and the county in which it is located, Stevens, has a population of 11,322. Benson has a population of 3,656 and the county in which it is located, Swift, has a population of 12,920. The 7 county Twin City metropolitan area which is within a 3 hour drive from the park has a population of 1,985,705 which is approximately 49 percent of the state's population.

There is a total estimated population of 178,353 within a 50 mile (80 km) radius of the park, which is approximately 4 percent of the state's total population a total estimated population of 35,738 within a 25 mile (40 km) radius of the park.

This population base has a definite effect on the visitation pattern of the park. The adjacent towns are often the source of day visitors. The population base is a source of potential users and it is important to know its size and distribution.

Economy

The predominant land use in Pope County is agricultural. Towns near the park provide services to the agricultural community and support a variety of manufacturing and service firms. Major industries in Starbuck include education, health care, ^{the manufacture of cement products} ✓, and agricultural services.

Glenwood is the county seat. Predominant industries include the manufacture of machine parts, metal fabricating, railroad yard, and the manufacture of airline and farm equipment.

Predominant industries in Benson manufacture farm equipment. The University of Minnesota at Morris has an important impact on the local economy.

There are a number of resorts and summer homes along the shore of Lake Minnewaska which have a significant impact on the local economy.

Excellent hunting opportunities draw people to the area.

Surrounding Land Use

Most of the land adjacent to the park is used for agricultural production, grazing animals, or wood lots.

There are two parcels of publicly owned land south of the park. One is a 273 acre (110 hectare) Waterfowl Production Area (WPA) administered by the U.S. Fish and Wildlife Service; the other is a 40 acre (16 hectare) parcel administered by the DNR, Division of Forestry. *see map, p. 45.*

Cooperative Land Management

In some areas, lands which have recreational potential and a complementary resource base are located close to one another but are managed by different government agencies. This is the situation with Glacial Lakes State Park administered by the DNR and the adjacent Waterfowl Production Area administered by the U.S. Fish and Wildlife Service. At present the only recreational activity in this 273 acre (110 hectare) WPA is hunting, an activity which is not allowed in the park. However, cooperative resource management such as joint prairie burns could be implemented. The development of trails on the WPA acreage is also a possibility which will be explored.

The 40 acre (16 hectare) parcel of land bordering the park on the southwest is administered by the DNR, Division of Forestry. The eastern half of the parcel is leased for agricultural purposes. A cooperative tree planting effort with park personnel has been undertaken in the past on the western half. Any future management proposals for this tract could be jointly undertaken by the DNR divisions of Forestry and Parks and Recreation. No specific use of this acreage for park purposes was identified during the planning process.

Supply and Demand of Recreational Facilities

It is important in the planning of Glacial Lakes State Park that an analysis is conducted of the interrelationship of the park with other recreation units. This is necessary to assess the demand for particular activities and how Glacial Lakes might function to help meet this demand and avoid duplication of recreational opportunities.

The inventory of some of the recreational facilities is done in terms of a 25 mile (40 km) radius. Others are done in terms of a 50 mile (80 km) radius. This is the form in which the current data is available. The determining factor was willingness to travel.

The distance non-metropolitan Minnesotans are willing to travel to use a recreational facility has been surveyed. The following chart was compiled from information collected by the DNR in the preparation of the State 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.

Distance willing to travel
(for non-metro Minnesotans)

| Activity | Miles | Kilometers |
|------------------|-------|------------|
| Camping | 76 | 122 |
| Picnicking | 32 | 51 |
| Hiking | 31 | 50 |
| Swimming | 16 | 26 |
| Bicycling | 14 | 23 |
| Horseback riding | 22 | 35 |
| Ski touring | 32 | 51 |
| Snowmobiling | 43 | 69 |

SCORP information was collected according to Economic Development Regions. There are a total of 13 of these regions in the state. The Economic Development Region #4 in which Glacial Lakes State Park is located includes the counties of Pope, Stevens, Traverse, Wilkin, Clay, Grant, Douglas, Ottertail, and Becker.

SCORP '79 also ranked a number of summer and winter recreational activities according to expressed desire by Minnesotans for more recreational opportunities. 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 #4 Residents

1. Fishing
2. Swimming
3. Camping
4. Bicycling
5. Tennis
6. Baseball/softball
7. Golfing
8. Picnicking
9. Hiking
10. Horseback riding
11. Canoeing
12. Target shooting

Winter Activities

All Minnesotans

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

Region #4 Residents

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

Following is a summary of the supply of each facility type in the area of the park and then a brief discussion of the demands for that opportunity on a regional and statewide basis.

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 provide. 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

The following table summarizes the number of campgrounds within a 50 mile (80 km) radius of the park.

| <u>Administration</u> | <u>Number of Campgrounds</u> | <u>Walk-in Campsites</u> | <u>Drive-in Campsites</u> |
|-----------------------------------|----------------------------------|------------------------------|-------------------------------|
| State | 5 | 0 | 299 |
| County | 3 | 0 | 81 |
| City | 6 | 10 | 132 |
| Private (resorts, campgrounds) | <u>118</u> | <u>327</u> | <u>2,012</u> |
| | 132 | 337 | 2,524 |

There are 132 campgrounds within a 50 mile radius of the park. Approximately 89 percent of these campgrounds are privately owned.

Camping is an increasingly popular outdoor activity in Minnesota. According to SCORP '79 10-year projections (1980-90) predicts a 9.4 percent increase in camping occasions statewide and a 5.3 percent increase in Region 4. Camping ranks third behind fishing and swimming as the activity people desire more opportunities for in Region 4.

Picnicking

There are 58 picnic areas within a 25 mile (40 km) radius of the park. The largest percentage of these are privately or municipally owned. The municipal areas offer a different type of experience from the park's. The privately owned picnic areas are associated with resorts.

| <u>Administrator</u> | <u>Number of Picnic Grounds</u> | <u>Number of Picnic Tables</u> |
|---------------------------|-------------------------------------|------------------------------------|
| County | 1 | 20 |
| DNR, Trails & Waterways | 1 | 6 |
| DNR, Parks and Recreation | 3 | 215 |
| Municipal | 18 | 360 |
| MN/DOT Rest Areas | 4 | 13 |
| Private | <u>31</u> | <u>299</u> |
| Total | 58 | 913 |

Swimming

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

| <u>Administrator</u> | <u>Beach</u> | <u>Pool</u> |
|-------------------------|--------------|-------------|
| DNR, Trails & Waterways | 1 | - |
| Municipal | 4 | 1 |
| Private | <u>33</u> | <u>1</u> |
| | 38 | 2 |

The greatest percentage of the beaches within a 25 mile radius of the park are associated with privately owned resorts and campgrounds. There are 4 beaches administered by municipalities. The nearest is in Starbuck where a beach is located on Lake Minnewaska.

SCORP shows that swimming was the second most desired activity in Region 4. Swimming followed fishing as the most desired opportunity.

Trails

The following table summarizes the trail mileage within a 25 mile radius of the park.

| Administrator | Hiking | Bicycle | Cross Country | Horseback | Snowmobile |
|-------------------------|----------|------------|------------------|-----------|------------|
| County | 2 | | 10 | | 22 |
| DNR, Parks & Recreation | 19 | | 10 | | 6 |
| Municipal | <u>8</u> | <u>9.5</u> | <u>0</u> | <u>8</u> | <u>8.5</u> |
| Total | 29 | 9.5 | 20 | 8 | 36.5 |

According to SCORP additional ski touring and snowmobile trails were requested by Region 4 respondents. Ski touring and snowmobiling ranked second and third behind hunting as the activity people desire more opportunities for in Region 4.

Surrounding Resource Inventory

An inventory of the natural resources and their management near Glacial Lakes State Park can be used to establish how the park fits into the resource pattern of the surrounding area and the entire state. This inventory can provide direction for classification and resource management in terms of setting goals for overall management and for establishing priorities. It is important for interpretive planning as well, and also provides a framework for planning recreational developments.

Prairie and wetlands are two vegetative communities in Glacial Lakes State Park which should be put in a regional perspective. Pope County is located in the central part of the Minnesota Wetland Management districts administered by the U.S. Fish and Wildlife Service. There are two districts which cover most

of western and central Minnesota. The purpose of the federal Wetland Management Program is to preserve wetlands and waterfowl habitat and manage them for waterfowl production. Since the program began, 135,000 acres (54,635 hectares) of wildlife habitat have been preserved in Minnesota. These are known as waterfowl production areas (WPA's). WPA's range in size from 30-2,000 acres (12-809 hectares) with an average size of 200 acres (81 hectares). WPA's are open to hunting. There are 12,255 acres (4,960 hectares) of WPA's in Pope County. There is a 273 acre (110 hectare) WPA which borders on the south boundary of the park. These WPA's consist of both uplands and wetlands. The uplands provide nesting cover and other habitat. The USFWS is converting some of these uplands to native grasses. The purpose of these plantings is to establish habitat, not recreate prairie.

Prairies once covered most of western Minnesota. Almost all of this once vast plant community has been converted to agriculture or another form of development. There are only a few scattered patches of native prairie remaining in the state.

There are a few small patches of prairie (privately owned) ranging in size from 37 acres (15 hectares) to 160 acres (65 hectares) in Pope County. The Nature Conservancy owns three prairies in the area of the park. The 80 acre (32 hectare) Staffanson Prairie in Douglas County, the 40 acre (16 hectare) Strandness Prairie in Pope County, and the 582 acre (236 hectare) Ordway Prairie in Pope County.

There are 20 wildlife management areas (WMA's) administered by the DNR totaling 2,704 acres (1,094 hectares) in Pope County. They range in size from 20 to 452 acres (8 to 183 hectares) with an average size between 80 to 120 acres (32 to 49 hectares). The purposes of these units are for waterfowl production, wintering habitat for deer and upland habitat preservation. Most of these areas contain wetlands. The difference between federal WPA's and state WMA's is that the federal WPA's are acquired and managed exclusively for waterfowl, although other wildlife benefit. The state WMA's are managed for a broader spectrum of wildlife.



THE PARK USER

INTRODUCTION

The following table summarizes the numbers of day visitors, campers, and group camp users for the ten year period from 1972-1981.

| | <u>Campers</u> | <u>Day Visitors</u> | <u>Group Camp</u> | <u>Total</u> |
|------|----------------|-------------------------|-----------------------|--------------|
| 1981 | 4,581 | 16,010 | 411 | 21,002 |
| 1980 | 5,180 | 20,239 | 164 | 25,884 |
| 1979 | 4,438 | 18,776 | 469 | 23,683 |
| 1978 | 5,786 | 20,771 | 601 | 27,158 |
| 1977 | 5,303 | 19,132 | 237 | 24,672 |
| 1976 | 5,418 | 24,091 | 394 | 29,903 |
| 1975 | 5,487 | 20,056 | 377 | 25,920 |
| 1974 | 5,699 | 20,758 | 404 | 26,861 |
| 1973 | 4,793 | 20,549 | 534 | 25,876 |
| 1972 | 4,200 | 20,956 | 387 | 25,543 |

DAY USE

During the 10 year period from 1972-1981, day users accounted for approximately 77-79 percent of the total park visitation. The majority of these day users come to swim and picnic in combination. The second most popular day use activity is fishing. Picnicking only is next most popular day use activity and the picnic shelter in the lower picnic area is used frequently for group picnics. According to the park manager, day users come predominately from Starbuck, Morris, Glenwood, and Benson.

OVERNIGHT USE

Campers accounted for approximately 19-21 percent of total park visitation for the ten year period. In terms of campers as a percentage of total visitation, an average for a three year period places Glacial Lakes in a position of 39 out of 59 state parks with camping *ranked from highest percentage to lowest.*

Campers who came in groups accounted for approximately 2 percent of total visitation. Groups use either two sites in B loop or the area near the trail center parking lot. Groups are mostly 4H Clubs, Boy Scouts and church groups from Benson, Morris, and Glenwood.

Camper Card Analysis

Camper Profile

Camper registration cards are completed for each campsite which is used by a 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 Glacial Lakes 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 actually be a single individual.

During the period 1977-1979, 87.1 percent of the campers in Glacial Lakes State Park were Minnesota residents, 3.6 percent resided in Iowa, 3.1 percent in South Dakota and 2.4 percent in Nebraska.

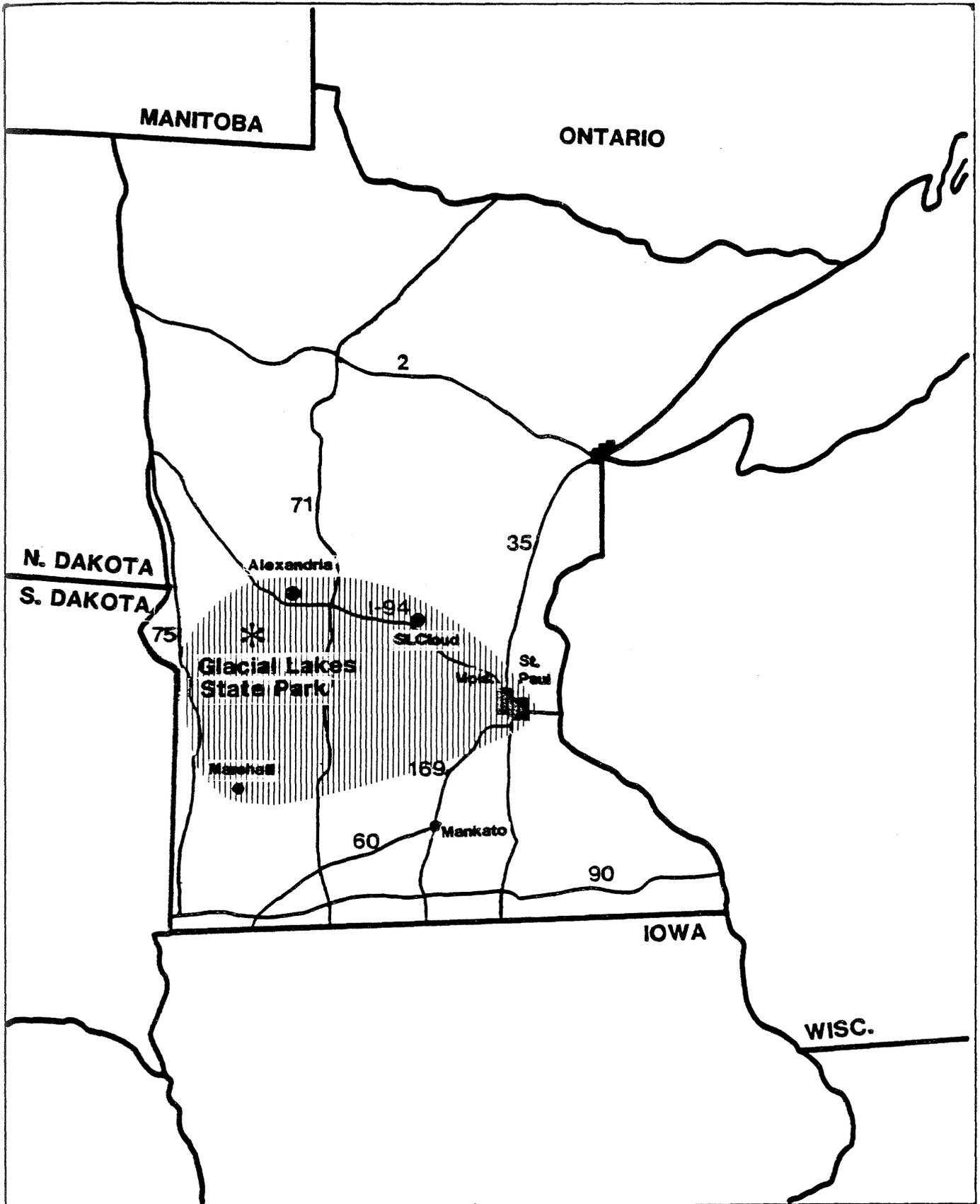
The Minnesota campers were predominately from the Twin Cities and southwestern Minnesota. Approximately 29 percent of the campers came from the Twin Cities. The Camper Origin Map on p 27 shows the area from which most campers originated. People living within this area accounted for approximately 66 percent of all campers.

Camping Seasons

The following table shows the percentage of the camping occasions which occurred each month of the camping season. The figures were averaged for the three year period 1977-1979.

| <u>Month</u> | <u>Percent of Camping Occasions</u> |
|--------------|-------------------------------------|
| April | .7 |
| May | 10.7 |
| June | 24.5 |
| July | 32.3 |
| August | 23.2 |
| September | 7.3 |
| October | 1.3 |
| | <u>100.0</u> |

The vast majority of camping occasions occurred during June, July, and August, as is the case in most of Minnesota's state parks. This demonstrates a use pattern which requires additional staff during these times to maintain facilities.



Glacial Lakes State Park Camper Origin

Number in Camping Party

The following table illustrates the number of people in camping parties for the three year period 1977-1979.

| <u>Number in Party</u> | <u>Percent of Total Camping Parties</u> |
|------------------------|---|
| 1 | 3.8 |
| 2 | 36.5 |
| 3 | 12.5 |
| 4 | 24.1 |
| 5 | 12.0 |
| More than 5 | 11.1 |
| | <u>100.0</u> |

According to the park manager's observations, approximately 60 percent of the campers use fold-out camp trailers and approximately 40 percent use tents. A small percentage of the campers have recreational vehicles. These types of use affect campground design and resource management. According to the park manager's observations, approximately one-third of the campers fish. Many also use the swimming beach. A number of the campers hike. The most popular trail is the one around the lake.

CLASSIFICATION

THE STATE RECREATION SYSTEM

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 outstanding resources. It is the management goal for all state recreational lands, including state parks, to protect and perpetuate resources for the use of 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 that this recreation/resource balance is maintained, the Minnesota State Legislature established, through the Outdoor Recreation Act of 1975 (ORA'75), a classification process whereby each unit in the recreation system can be identified as one or more component in the system. These units 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 legislation are general criteria for classifying, planning, and managing each of these components.

Through this classification system, the role for each recreational unit in the state 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 recreational system.

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.

Glacial Lakes State Park is located in the Blue Hills Landscape Region. See Landscape Regions map, p 35 . This region is located in south-central Minnesota and extends from Alexandria to Litchfield. It consists of 1,764 sq miles (4,570 sq km) or 2.1 percent of the state. The most distinctive feature of this landscape region is the presence of the terminal moraine known as the Alexandria moraine complex. This moraine was largely formed during the last advance of the Wadena lobe of the Wisconsin glaciation. See Geology, p 46 for further discussion. Characteristic vegetation of the Blue Hills Landscape Region includes the plant communities of prairie, oak savanna, aspen-oak lands, and scattered Big Woods. There are no major cultural themes such as Indian or settlement which characterize this region.

Glacial Lakes has a good representation of the key features of this region. It contains the hills and ridge formations which characterize the Alexandria moraine complex. The geologic features of the park can be used to interpret the geologic history of the area. The prairie, oak woods, and wetlands also are representative of the region and its glacial history.

CLASSIFICATION PROCESS

The purpose of the classification process as stated in the Outdoor Recreation Act of 1975 (ORA '75) is to establish "an outdoor recreation 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."

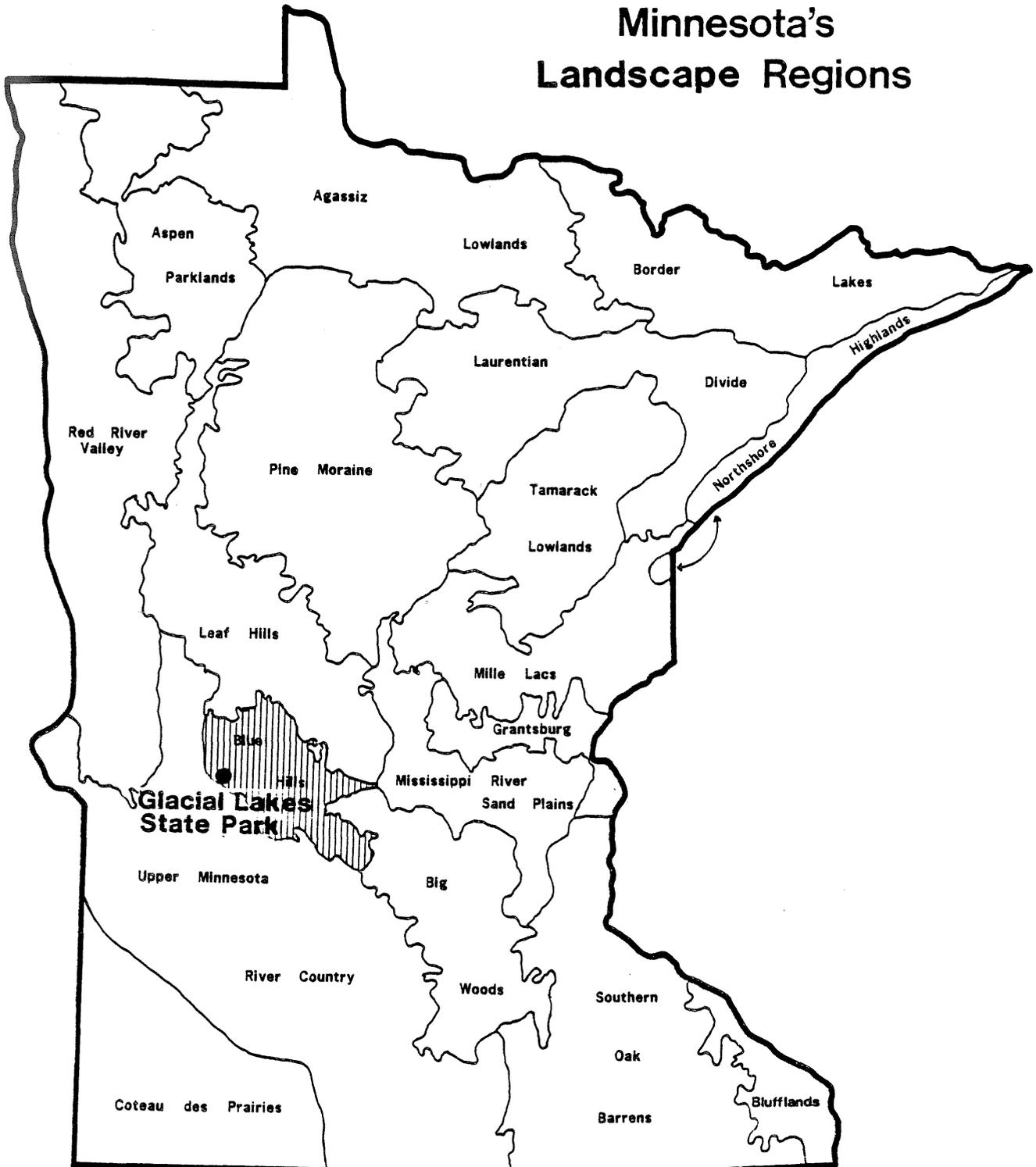
Each state park is managed and developed according to the nature of its natural resources and their ability to tolerate visitor use.

The classification alternatives considered for Glacial Lakes State Park are natural state park and recreational state park.

Natural State Park Alternative

A natural state park shall be established to protect and perpetuate extensive areas of the state possessing those resources which illustrate and

Minnesota's Landscape Regions



exemplify Minnesota's natural phenomena and to provide for the use, enjoyment, and understanding of such resources without impairment for future generations.

It is the objective of the Department of Natural Resources to ensure that proposed natural state parks meet, or have the potential to meet, the following criteria. These criteria are from the DNR policy document for natural state parks which are based on the ORA criteria for natural state parks.

Criterion #1. Depict most of the major components characteristic of the landscape region, or contain a natural component(s) of statewide significance representing a feature of the presettlement Minnesota landscape.

Glacial Lakes State Park contains the characteristic features of the Blue Hills Landscape Region. The rolling hills and ridge formations which comprise the Alexandria moraine complex are located within the park. Some of the representative plant communities of this region are found within the park, the most important being the high quality dry prairie, which is of statewide significance because prairie remnants are rare and decreasing in the state. The park provides an excellent opportunity to preserve and manage the prairie.

Criterion #2. Contain natural resources sufficiently diverse and interesting to attract people from throughout the state.

There are a number of diverse and interesting resources in the park which attract people from throughout the state. Mountain Lake provides fishing and swimming opportunities. Its shores provide excellent wildlife habitat. The prairie is high quality and offers an excellent opportunity to see and experience the dynamics of prairie ecology. The diverse wetland communities provide habitat for an abundance of waterfowl. The forest communities provide an additional type of habitat. The rolling terrain adds another dimension to the park and its resources creating an interesting environment.

People are attracted to this park from throughout the state as the camping records show. Approximately 29 percent of the campers come from the Twin Cities. Although the greatest percentage of the campers came from the Twin

Cities and southwestern Minnesota, campers came from all over the state, including Duluth, St. Cloud, Moorhead, and Rochester. Also, 12.9 percent of the park visitors came from out of the state.

Criterion #3. Be sufficiently large to provide for the maintenance of ecosystems and the protection of other natural features which give an area its special qualities.

The park is approximately 1,400 acres (567 hectares). The entire area which drains into Mountain Lake is located within the park boundary. This helps ensure the high water quality of the lake. The prairie is large enough that a controlled burning schedule can be implemented which will facilitate the maintenance and rejuvenation of prairie vegetation.

All of the other vegetation management objectives can be met within the constraints of the park's size.

Criterion #4. Be sufficiently large and durable so as to provide opportunities for enjoyment of their special natural qualities by significant numbers of people now and in the future.

There is sufficient acreage in the park to provide a number of recreational opportunities including camping, swimming, fishing, picnicking and trail *opportunities* for a variety of users. The resources are capable of sustaining these uses without severe negative impacts on the natural resources. Soil, vegetation, wildlife, water resources, and fisheries can withstand the existing and proposed recreational use of the park.

Recreational State Park Alternative

A recreational state park shall be established to provide a broad selection of outdoor recreation opportunities in a natural setting which may be used by large numbers of people.

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:

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

The natural resources offer good outdoor recreation potential. However the draw of the park is the natural resources not the recreational opportunities per se. People come to the park because of the quiet natural character and high quality resources. The recreational opportunities provide access to the resources.

Criterion #2. Provide outstanding outdoor recreational opportunities that will attract visitors from beyond the local area.

It is the natural resources of the park more than the recreational opportunities that draw from beyond the local area.

Criterion #3. 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 resources do not permit intensive use by large numbers of people. The lake is small and can accommodate the moderate use it is currently receiving, but not much more. The slopes of the lake are subject to erosion and cannot withstand intensive use. Further campground development would have to be located in prairie areas and would increase use of the lake to the point it may negatively impact the quiet character which now exists. The soils of the prairie area are subject to erosion. The beach is small and can be expanded no further. The park can accommodate existing uses and proposed uses, but these cannot be described as "intensive."

Criterion #4. 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 existing and proposed recreational uses of the park do provide needed recreational opportunities. Providing recreational opportunities to meet statewide demand was a guideline in recreational facility development and management recommendations. However resource perpetuation and management and the maintenance of the quiet natural character of the park and its role in preserving and interpreting the natural resources of the state are the primary focuses.

RECOMMENDED CLASSIFICATION

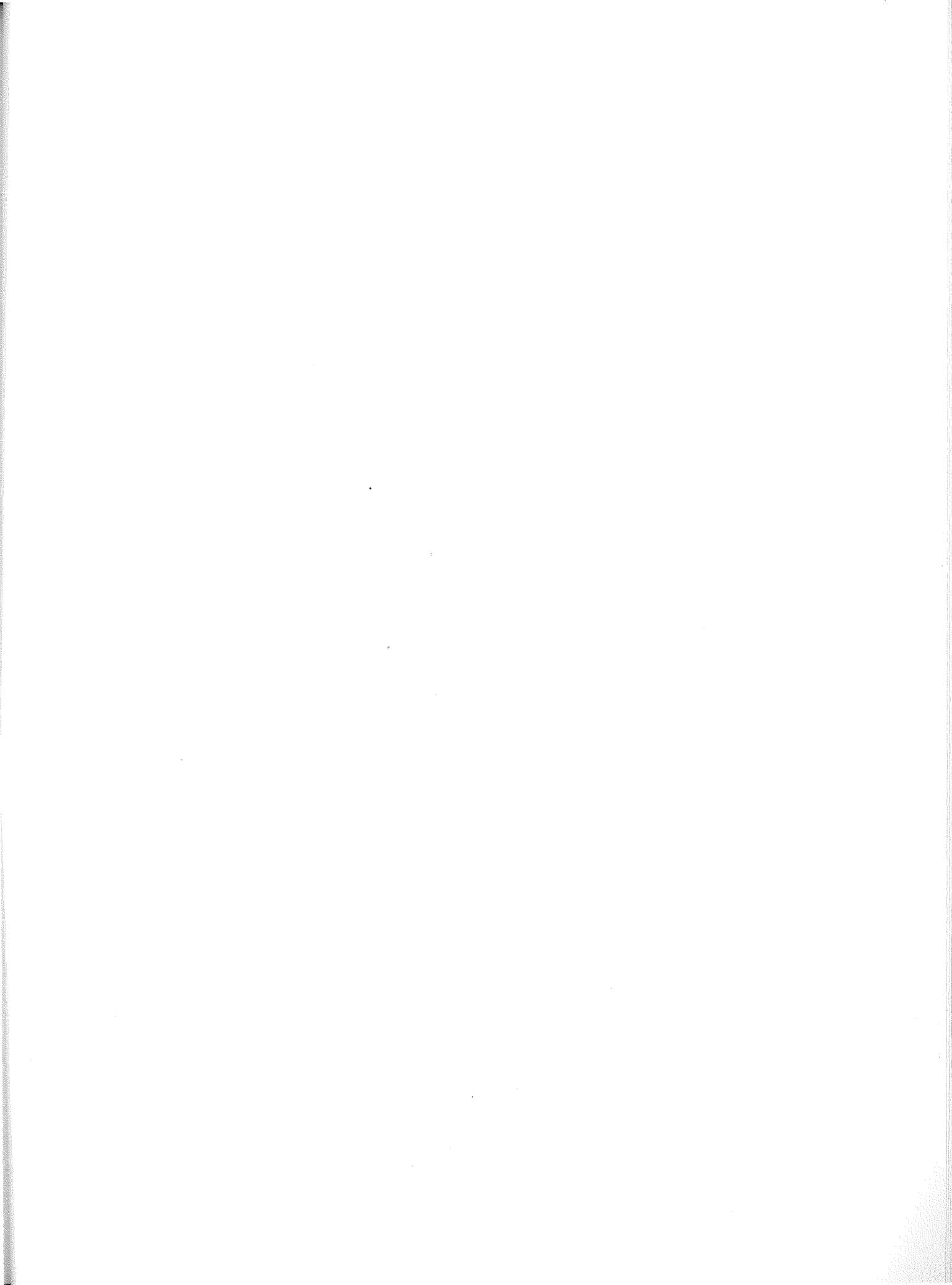
A natural state park classification is recommended for Glacial Lakes State Park.

This classification is recommended because the park is representative of the key features of the Blue Hills Landscape Region. The natural resources especially the prairie, are of such high quality as to have statewide significance and attract people ^{from} throughout the state. The park is of sufficient size and has enough desirable resources to accommodate the existing and recommended recreational uses.

GOAL FOR THE PARK

The goal for Glacial Lakes State Park can be found in the purpose for all natural state parks as stated in the ORA '75.

"A natural state park shall be established to protect and perpetuate extensive areas of the state possessing those resources which illustrate and exemplify Minnesota's natural phenomena and to provide for the use, enjoyment, and understanding of such resources without impairment for future generations.



PARK RESOURCES

OBJECTIVES

The following administrative objectives will be used in the management of Glacial Lakes State Park as outlined in the policies for natural state parks.

To use management techniques which have minimum impact on current park users but which still comply with the long-range goals of the park as established in the unit management plan.

To encourage appropriate use of natural state parks by all segments of the public.

To encourage and facilitate user access by encouraging energy-efficient forms of transportation to and within a park.

To coordinate park development with nearby private enterprise for the mutual benefit of the public, the department, and the private sector.

To coordinate park development with existing and potential facilities and resources.

To allow for special events and projects in natural state parks, providing they conform to the management goals of the park.

To establish land acquisition priorities on the basis of need for (1) perpetuation of resources, (2) land needed to protect the qualities of the unit, and/or (3) additional recreational facilities.

To regulate motor vehicles and motorized watercraft and to prohibit them when necessary to minimize conflict with other park users and to preserve the quality of the park environment.

The department will rely on the following administrative objectives to ensure maintenance of a park's natural resource character in order to enhance a park's ecological, aesthetic, interpretive, and educational values.

To direct resource management programs consisting of, but not limited to, wildlife, vegetation, and fisheries, toward establishing and maintaining species or communities that were present during presettlement times or successional stages of the biotic communities thereof.

To utilize resource management techniques that will enhance a park's natural systems.

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

To direct vegetation management toward utilizing natural methods in the maintenance and establishment of vegetative communities.

To direct fish management programs toward maintenance and enhancement of native aquatic populations or desirable non-native species through habitat and other appropriate management practices.

To prohibit surface and subsurface mineral extraction for commercial purposes.

To direct water resource management within a natural state park toward conserving and protecting the park's water resources.

ELEVATION AND SLOPE

The highest altitudes in western Minnesota are found in the Alexandria moraine complex with elevations of 1,700 ft (518 m) above sea level. Elevations in the park range from 1,352 to 1,200 ft (412 to 366 m) above mean sea level.

The topography of the park can best be described as gently rolling hills. The summits of these hills provide the park visitor with scenic vistas of the surrounding landscape. Slopes of the hills range up to 40 percent.

CLIMATE

Glacial Lakes State Park is located in an area that has a midcontinental climate. This type of climate is characterized by warm, moist summers and cold, dry winters. The average July minimum temperature is approximately 60° F (16° C) and the average maximum July temperature is approximately 84° F (29° C). The average temperature for June, July, and August is 69° F (21° C), the average January minimum temperature is approximately 0° F (-18° C) and the average maximum is approximately 20° F (-7° C). The average temperature for December, January, and February is 13.9° F (10° C).

The annual precipitation is approximately 22.6 inches (56.5 cm). About 75 percent of that annual precipitation (17 inches/42.5 cm) falls during April through September.

The average total precipitation for these months is:

| | |
|-----------|-----------------|
| April | 2.1 in (5.3 cm) |
| May | 3.0 in (7.5 cm) |
| June | 3.9 in (9.8 cm) |
| July | 3.2 in (8.0 cm) |
| August | 3.0 in (7.5 cm) |
| September | 1.9 in (4.8 cm) |

The average depth of snow is 4 in (10 cm) during the months of December, January, February, and March.

The prevailing direction of the wind is from the northwest in the winter and the south in summer. The average windspeed is approximately 12 m.p.h. Because of the open prairie in the park, the direction of the wind is an important consideration in the location of winter trails and in the location of other developments such as the proposed shelter for the group camp.

Microclimate

A microclimate is a smaller, distinct climate within a larger climate area. There are several microclimates in the park resulting from the nature of the topography. There are different microclimates on the slopes depending on directional orientation. These differences are primarily caused by the amount of sun which reaches the surface, wind speed and vegetation. The most dramatic difference is between the north and south facing slopes. Vegetation is the most visible indicator of these differences. An example is the ridge formation in the northwestern corner of the park. Prairie is located on the warm, dry, sunny, south facing slopes. Oak woods are located along the shady, cool, moist, north facing slope. Differences in vegetation exist between the prairie vegetation on north and south facing slopes in the park.

Microclimates are important to consider in the location of winter trails because of retention of snow cover and drifting.

GEOLOGY

The geology of Glacial Lakes State Park is one of the outstanding aspects of the park. The history of glacial actions can be interpreted by analyzing the soils and topographical features in the park and the surrounding area.

Glacial action which occurred during the Wisconsin ice stage 100,000 - 10,000 years ago shaped the present landscape. The park is located in the Alexandria moraine complex which is composed of an end moraine interrupted by outwash areas. An end moraine is an accumulation of material forming ridges and hills that was deposited in front of a glacier as it remained in one place for a period of time. Outwash areas were formed when glacial meltwaters carried and deposited material. The Alexandria moraine complex is 10-20 miles (16-32 km) wide and extends north of Detroit Lakes and curves south to Willmar.

The Alexandria moraine complex was formed by the advances of two glacial lobes. The Wadena lobe formed the moraine at its margin 30,000 years ago. The moraine was overridden from the west by the Des Moines lobe 14,000 years ago. The Des Moines lobe modified the moraine. Drift from both lobes is found in the park, with drift from the Des Moines lobe overlaying that of the Wadena lobe. The thickest glacial drift in the state is found in the Alexandria moraine complex with depths up to 700 ft (213 m). Deposits in the park are approximately 300 ft (91 m) deep. The material which was deposited in the park is from both the northeast and northwest. Further research is needed to determine the exact origin of the deposits.

There is a formation in the park which is most likely an esker. An esker is a ridge which was formed by a stream flowing in glacial use. This formation is located in the northwestern part of the park and borders Mountain Lake. Research is needed to verify the fact this formation is an esker. Mountain Lake and the wetlands in the park were also formed by glaciers. Mountain Lake was formed when water was dammed by the end moraine. The other wetlands in the park were formed when ice chunks broke off the glacier and were buried in the glacial deposits. Meltwater filled the depression left by the ice chunk and created lakes and wetlands.

Management

Objective:

To understand and document the glacial history of the park and determine its impact on the existing topography of the area.

Action #1. Conduct geological research to help determine the glacial history of the park.

Research should be conducted to determine the glacial history of the park including verification of the esker formation and determination of the location of the source of the deposited material. Information gained as a result of this study should be used to develop an interpretive display of the glacial history of the park. The research project should include a literature search, a small drilling program, and field reconnaissance. The feasibility of conducting the research cooperatively between the University of Minnesota,

Morris, the United States Geological Survey (U.S.G.S.), and the DNR should be explored. A cooperative research program is recommended.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---------|---|---|---|---------|
| COST | | \$2,000 | | | | \$2,000 |

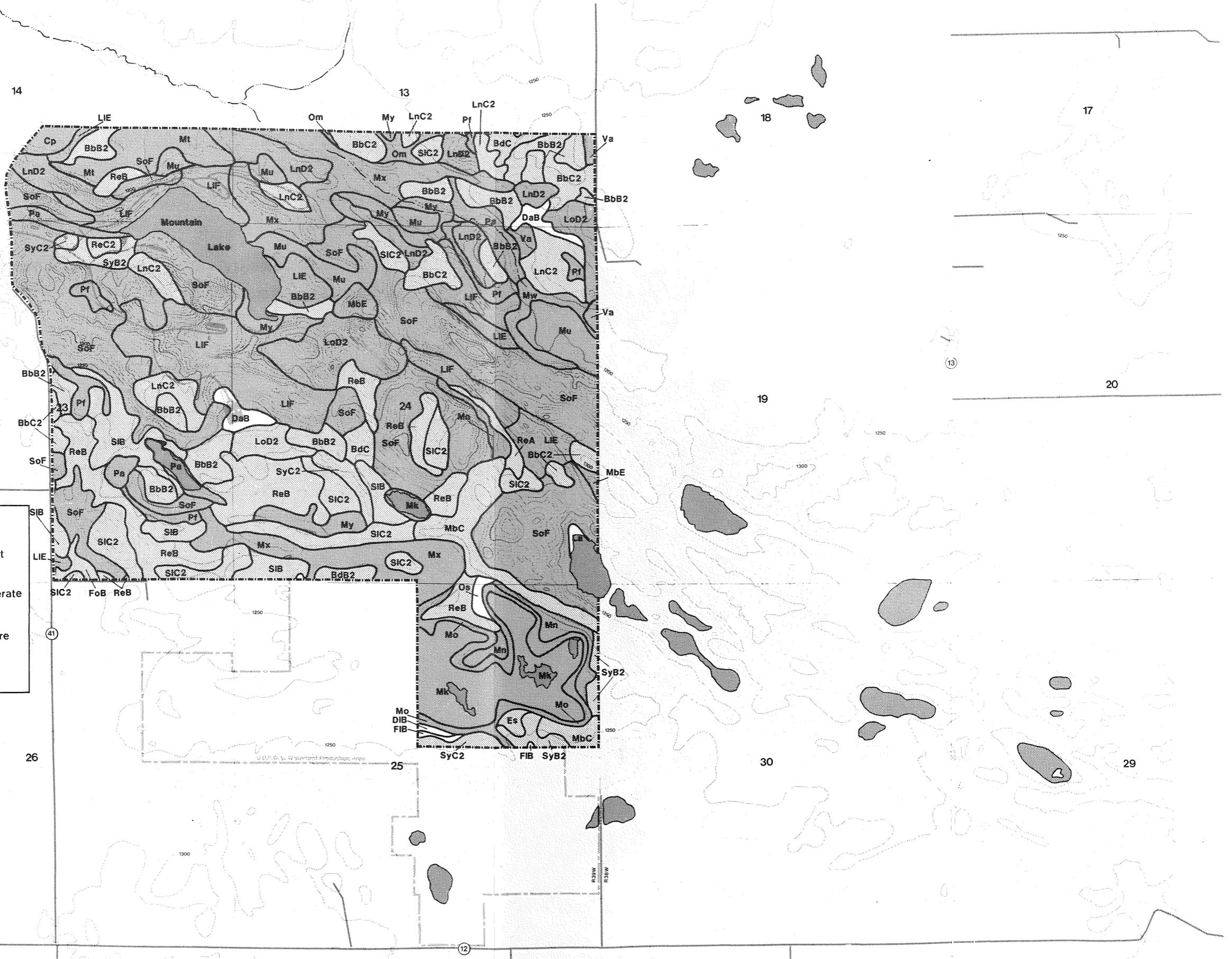
SOILS

Inventory

The majority of the soils in the park belong to the Sioux-Maddock association which is located in the Alexandria moraine complex. The Sioux-Maddock association is located in the central part of Pope County and comprises approximately 3 percent of the county. The soils in this association are hilly to steep and excessively drained. They are very shallow soils over sand or gravel. There are some level areas, poorly drained areas, potholes, marshes, and lakes in this association.

Sioux soils make up the greatest percentage of this association, comprising approximately 70 percent. Maddock soils comprise approximately 10 percent of the association and other soils 20 percent. The Sioux soils are excessively drained shallow soils. The surface layer is dark gray loam 5 in (13 cm) thick. The next layer is grayish brown gravelly loam 3 in (8 cm) thick. These layers overlay calcareous sand and gravels. Maddock soils are deep, sandy, and well drained. The surface layer is dark gray loamy fine sand 14 in (36 cm) deep. The next layer is brown fine sand 16 in (41 cm) thick. These layers overlay fine sand. The other soils in this association include excessively drained Sverdrup, Renshaw, Langhei soils, and well drained Barnes soils. The soils in this association are subject to erosion.

The Soil Conservation Service (SCS) has established limitations for development based on soil suitability. The limitations are meant to be guidelines for development location rather than absolute criteria. Site specific designs and technology can overcome many of the restrictions defined by soil suitability. The Soil Limitations Map p. 49 illustrates those areas which are suitable for development based on the SCS soil suitabilities.



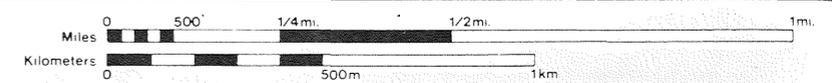
Legend

- Slight
- Moderate
- Severe

49

Soil Suitability

Glacial Lakes state Park



VEGETATION

Presettlement Vegetation

Information on the vegetation prior to European settlement was obtained from the map "Original Vegetation of Minnesota" by Francis J. Marschner and from the original U.S. General Land Office survey notes. Copies of these notes are available in the Management Plan Details (MPD).

Before European settlement, the vegetation pattern in the vicinity of the park included five major plant communities: prairie, oak savanna, aspen oak lands, wet prairies, and marshes and sloughs.

Prairie was once a vast and extensive community covering most of the western portion of the state. A wide variety of grasses and forbs grew in this community including big and little bluestem, Indian grass, gramma grass, prairie clover, pasque flower, asters, and goldenrod. A few small shrubs and trees such as various wild rose species, wolfberry, and scrub oaks were found. Because the prairies were large and relatively flat with rich soils, they were nearly eliminated by cultivation, grazing and other development.

There is prairie in the park on the rolling hills and ridges. It is a drier prairie than that found on the flat land because of the gravelly soils.

Oak savanna were areas with scattered oak trees and groves of oak with prairie groundcover. They were generally found at the interface of prairie and forest. There is some oak savanna in the park where the oak forest interfaces with the prairie. There is a question as to whether portions of the oak woods in the park were oak savanna at one time.

Aspen oak lands were communities with dense aspen with some oak, elm, ash, and basswood. There are no aspen oak ^{lands} remaining in the park.

Wet prairies were found in transitional zones between tall grass prairies and marshlands. Some of the species present in this community included bluejoint grass, New England aster, hairy stargrass, cowbane, Virginia mountain mint, large goldenrod, slough grass, purple meadowrue, culver's root, and golden Alexander. Most wet prairies have been drained and cultivated. There are no examples of wet prairie in the park.

Species characteristic of marsh included reeds, marsh grasses, cattail, rushes, willow, and alder. There are several marshes in the park.

Existing Vegetation Inventory

Plant communities are delineated on a 1972 aerial photograph. See Vegetation Map, p. 55. A series of photos taken in 1939, 1951, 1958, and 1965 were used to delineate each type. Color slides taken by the Agricultural Stabilization and Conservation Service (ASCS) in 1980 were also examined. The vegetative composition of these communities was field checked by DNR, Park Planning staff in September, 1981.

OF Old Fields

The old field communities are predominately located in the southern half of the park and in the northeast corner. These areas have been cultivated in the past. The old field communities are dominated by brome and bluegrass which are non-native grasses. Some big bluestem, a native prairie grass, is present in these areas. Other non-native species present include mullein, sweet clover, blue vervain, goldenrod, and aster.

PR Prairie

The prairie is of high quality and is one of the park's most outstanding resources. There are areas which have been relatively undisturbed except for grazing. There are reportedly two areas which have never been plowed or grazed.

Mid-grass prairie communities are located on the tops of the hills and ridges throughout the park. The soils here are dry and gravelly so the prairie is dry in nature. The dominant grasses are little bluestem and side oats grama. A more complete list of species in this community is included in the MPD. Some common species include:

Andropogon scoparius
Bouteloua curtipendula
Andropogon gerardii
Sporobolus heterolepis
Panicum perlongum
Petalostemum purpureum
Anemone patens
Aster sericeus

Little bluestem
Side oats grama
Big bluestem
Dropseed
Panic grass
Purple prairie clover
Pasque flower
Silky aster

Euphorbia corollata
Solidago nemoralis
Amorpha canescens
Artemisia sp
Coreopsis villosum

Flowering spurge
Goldenrod
Lead plant
Sage
Tickseed

Dry mesic prairie is found on the lower portion of the knolls. Some species which were observed here, but not in the drier prairie include:

Linum sulcatum
Lobelia spicata
Anemone cylindrica
Crateagus sp.
Gerardia sp.
Onosmodium molle
Zizia aptera
Zizia aurea

Flax
Lobelia
Anemone
Hawthorne
Rough gerardia
False gromwell
Golden alexander
Golden alexander

O Oak Woods

Bur oak is the dominant species in this community. Tree borings of a few oaks aged the trees at approximately 80 years. Other species present include ash, elm, and basswood. The presence of multiple stemmed trees in many areas is evidence of cutting. Grazing has also occurred in the past. The understory is dominated by poison ivy, prickly ash, wolfberry, and honeysuckle. There are open grown oaks along the edge of the oak woods and grasslands which have an oak savanna character.

Common groundlayer species include Virginia waterleaf, Canada anemone, and columbine.

There are some disturbed areas within the oak community where aspen and cottonwoods are present. There is some boxelder along the shore of Mountain Lake.

B Basswood

This community is dominated by basswood which comprises almost all of the overstory. Scattered bur oak and ash trees are present. Some small black walnut were found in an open area located southeast from the beach picnic area. The basswood communities in the park are located most often on steep north facing slopes. The ground cover is dominated by a sedge, Carex sp.

which comprises 70 to 80 percent of the ground cover. There is evidence of grazing in these areas. There is minimal understory and few shrubs in the basswood community, but some basswood seedlings are present.

LS Lowland Shrub

The lowland shrub areas are dominated by willow. Red osier dogwood is also present and ash trees are located in some areas. Sedges are abundant in the groundlayer. These communities are generally located in low and wet areas. Aerial photos show the lowland shrub areas were more open in the past. They are becoming more filled in with trees and shrubs as time goes on. The number and distribution of trees and shrubs varies in this community throughout the park.

WM Wet Meadow

The wet meadow areas generally have standing water present in the spring but are dry during the summer. They are found in depressions in the open grassland areas and along the wet margins adjacent to open water. Dominant species include sedges, rushes, and grasses. Some species which were observed in the wet meadow area on the east side of Mountain Lake near the boardwalk are:

Eupatorium maculatum
E. perfoliatum
Polygonum natans

Joe-pye weed
Boneset
Water smartweed

M Cattail Marsh

Open water is present in these areas throughout the summer. The dominant species in this community is cattail. Bullrush (Scirpus americanus) was also observed. The edges of these areas are often wet meadow with scattered shrubs. The margins of these areas fluctuate. The examination of old aerial photos shows changes in the amount of open water. The ponds in the south half of the park have experienced considerable encroachment by cattails during the past 10 years. One good example of this is the large pond in the southwest corner of the park where only 5 to 10 percent of the pond surface is still open water. The other ponds have good interspersions of water and cattails but the margins are converting to a dense, willow-cottonwood border.

- Legend
- OF Old Field
 - Pr Prairie
 - O Oak Woods
 - B Basswood
 - LS Lowland Shrub
 - WM Wet Meadow
 - M Cattail Marsh
 - Dev Development
- Roman numerals I-VI refer to wetland types. See p.



Vegetation Management

General Objectives:

To maintain or reestablish the plant communities which are consistent with the pre-European settlement vegetation patterns

To protect and perpetuate elements identified by the Minnesota Natural Heritage Program

To enhance the natural qualities of recreational areas

To manage vegetation with natural forces wherever feasible

Prairie Areas and Old Field

Objectives:

To eradicate non-native weed species including: sweet clover, mullein, brome and bluegrass

To control the invasion of woody species onto the prairie including sumac, wolfberry, boxelder, willow, plum, and oak

To maintain and invigorate native species and release nutrients

To convert old field areas from non-native species to native species

Action #1. Implement a program of prescribed burning in the park.

A prescribed burn schedule such as the one on page 58 will be implemented. See Vegetation Management Map, p. 63 for the location of the burn units. This schedule may be modified contingent upon the effectiveness of initial burns in achieving the desired results and on new data regarding prairie management.

PROPOSED BURNING SCHEDULE FOR GLACIAL LAKES STATE PARK

| Burn Unit | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|-----------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | | Spring | Spring | Spring | | | | Fall | | | | |
| 2 | Spring | | | Fall | | | Spring | | | | Spring | |
| 3 | | Spring | Spring | Spring | | Spring | | | Spring | | | Spring |
| 4 | | Fall | | | Spring | | | Spring | | | | |
| 5 | | | Fall | | Spring | Spring | | | | Spring | | |
| 6 | Summer | | | Fall | | | Fall | | | Fall | | |
| 7 | | | | | | | | | Fall | | Spring | Spring |
| 8 | | | | | | | | | | | Fall | |
| 9 | Spring | | | | | | | | | | | |
| 10-11 | No burns currently scheduled. Burns will be scheduled in the future. | | | | | | | | | | | |

58

Consecutive spring burns are meant to eradicate the non native weed species such as sweet clover. Fall burns stimulate seed germination and may favor different native species than spring burns. Fall burns are also a part of sweet clover control.

In the long run, areas 10 and 11 should be burned and converted to prairie. They are lower in priority for management and at this time not scheduled for management for several years.

Because of the high visibility of burning (i.e. smoke and short term blackened vegetation), a public information program conducted in conjunction with the burns is essential. There are standard policies and procedures to be followed by DNR personnel when prescribed burning is used as a resource management tool. A copy of this policy is found in the MPD. It includes a statement regarding safety and publicity and states that "preburning planning must provide for sufficient manpower, equipment, and precautions to ensure the safety of personnel and adjoining property." This policy also states that "advance publicity on a local level shall be undertaken in order that the prescribed burn is not mistaken for a wildfire."

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---------|---------|---------|---------|---------|
| COST | \$2,000 | \$2,000 | \$2,000 | \$2,000 | \$2,000 | ongoing |

Action #2. If the prescribed burns do not bring about the conversion of old field to prairie, additional prairie restoration techniques should be undertaken.

It is likely there are certain areas where burning alone will not bring about the desired results. Prescribed burning is only one method of prairie management. Seeding, may be used to convert the old field areas to prairie. Areas to be targeted for restoration are yet to be determined based on initial burn results. The type of prairie would be more mesic in nature and would provide a complement to the dry prairie already existing in the park. It was the more mesic prairies located on the flatter areas that were plowed and thus are the most disturbed. A restoration plan should be developed by the regional resource coordinator, regional naturalist, park manager, and DNR, Park Planning Section.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-------|-------|-------|-------|-------|---------|
| COST | \$500 | \$500 | \$500 | \$500 | \$500 | ongoing |

Action #3. Monitor the results of the prescribed burn program with regard to its effectiveness in controlling the encroachment of woody species.

The long period of fire suppression has allowed woody encroachment to exceed natural conditions. Some species and/or areas may be difficult to convert back. If the desired results are not achieved, the burn program should be supplemented by cutting or other techniques.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|---------|---------|---------|
| COST | | | | \$2,000 | \$2,000 | ongoing |

Action #4. Monitor the results of the prescribed burn program with regard to its effectiveness in weed control. Supplemental hand weeding may be necessary.

Keeping the prairie free of weedy species is a major potential problem in the park. The old field areas provide a large reservoir of problem species.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---------|---------|---------|---------|
| COST | | | \$1,000 | \$1,000 | \$1,000 | ongoing |

Action #5. Control the occurrence and spread of buckthorn (Rhamnus cathartica) in the park if it becomes a problem.

Buckthorn is present in the wooded areas. Buckthorn is a non-native shrub and may aggressively spread once established. It may replace native understory species and alter the composition of the native plant communities.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-------------|---|---------|---|---|-------|
| COST | conditional | | \$5,000 | | | |

Action #6. Burn a portion of the oak woods to create oak savanna.

This should be undertaken on an experimental basis to study the effects and see if fire will reestablish oak savanna. This should be done only in areas which may have been oak savanna originally. It should also be done in an area where fire can be easily controlled.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|---------|---|---------|
| COST | | | | \$3,000 | | ongoing |

Action #7. Conduct a vegetation inventory in the park.

The purpose of this inventory would be to identify species of statewide significance and to monitor the results of the burn management program and its effectiveness. This inventory should be done in the prairie areas first, then be expanded to other areas as is needed to implement the vegetation management proposals.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---------|---|---|---|---------|
| COST | | \$3,000 | | | | \$3,000 |

Action #8. Screen the gravel pit in the northwestern corner of the park by planting trees along CSAH 41.

The gravel pit is clearly visible to all park visitors approaching the park south CSAH 41.

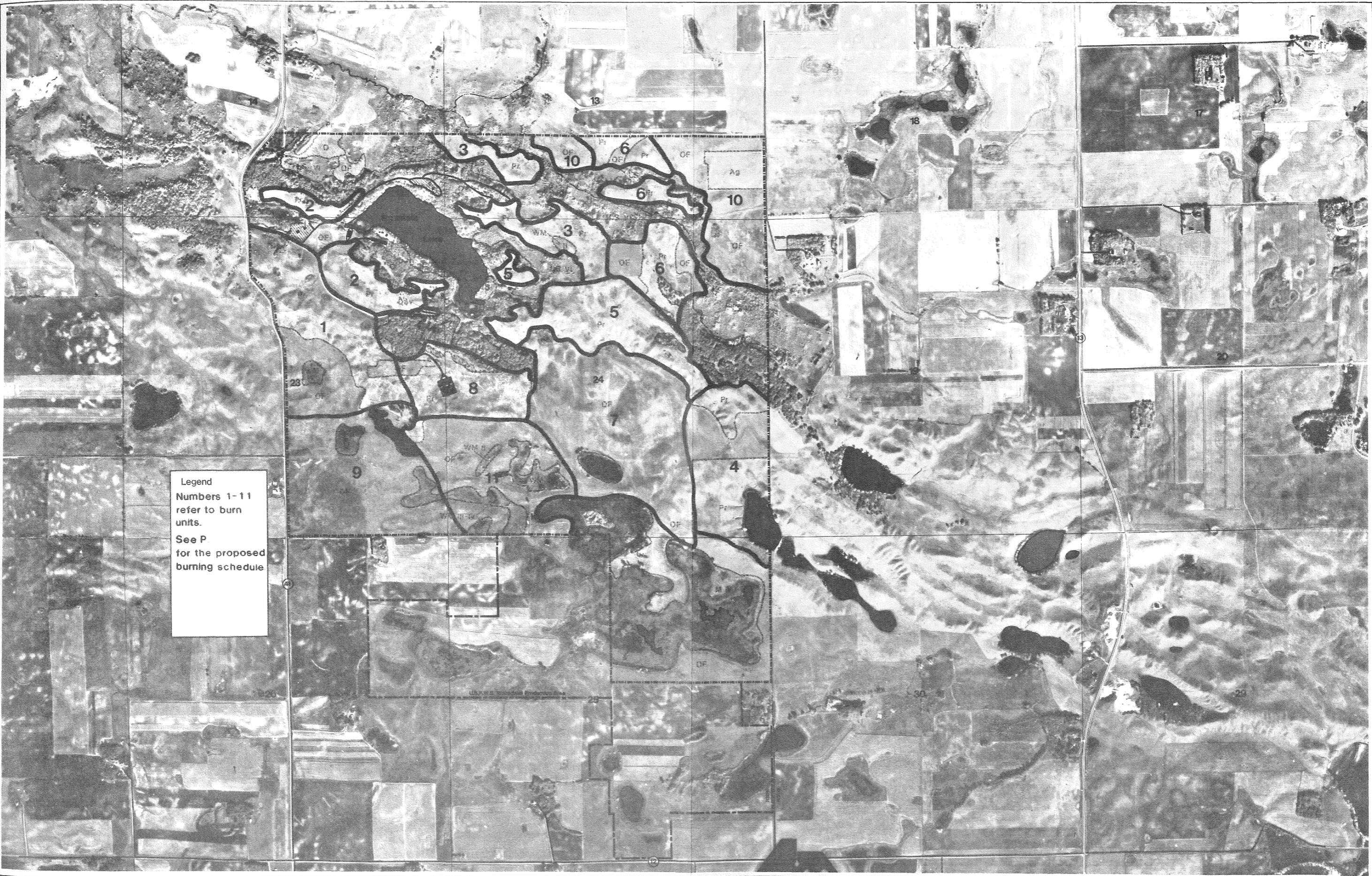
| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$2,000 | | | | | \$2,000 |

WILDLIFE

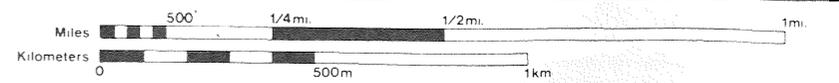
Birds

An abundance and diversity of wildlife is found in the park due to the varied habitats in the park including prairie, forest, and wetlands. The park naturalist has identified 165 species of birds in the park. A list of these species is found in the MPD. Of the 165 species, 11 have been identified as being species which merit special consideration, according to the DNR Natural Heritage Program. These species are:

| | | |
|----------------------|-----------------------------|---------------------|
| Common loon | Horned grebe | Burrowing owl |
| Cooper's hawk | King rail | Pileated woodpecker |
| Yellow rail | Little blue heron | |
| Marbled godwit | Black throated blue warbler | |
| Loggerhead shrike | Lark bunting | |
| Sharp tailed sparrow | Upland plover | |



Legend
 Numbers 1-11
 refer to burn
 units.
 See P
 for the proposed
 burning schedule



The DNR, Heritage Program identifies species which are exemplary, unique, threatened or endangered on a national or statewide basis. The program's aim is to identify these species' habitats before they are lost. An effort is needed to save these targeted species for their scientific, educational, and aesthetic values and for other practical uses for them which may be discovered in the future.

The study Breeding Birds in Minnesota 1975-1979; Abundance, Distribution and Diversity completed by the Minnesota DNR determined the following species were most abundant in Region I-south, the region in which Glacial Lakes is located.

- | | |
|--------------------------|-------------------------|
| Pied-billed grebe | *Canvasback |
| Double crested cormorant | Ruddy duck |
| *Gadwall | Pintail |
| Sora rail | Yellow billed cuckoo |
| *Green winged teal | Western kingbird |
| *American wigeon | Purple martin |
| *Northern shoveler | Yellow headed blackbird |
| Redhead | Brewer's blackbird |

Most of these birds prefer marshland habitat. The species marked with an asterisk were considered among the most uncommon and/or most locally distributed birds in Minnesota according to the Breeding Bird Survey, recorded 1975-1979.

Glacial Lakes is located along the migration corridor of several species of waterfowl. Therefore these birds are attracted to the wetlands in the park. Birdwatching in the park during fall migration is an exciting experience.

Reptiles and Amphibians

Seventeen species are known to inhabit Region I-south. A list of these species is included in the MPD. Eight of these species have been officially recorded in Pope County. They are:

- | | |
|------------------------------|-----------------------|
| Common snapping turtle | Mudpuppy |
| Western painted turtle | American toad |
| Western plains garter snake | Great plains toad |
| Plains western hognose snake | Northern leopard frog |

This list is from the Guide to the Reptiles and Amphibians of South Central Minnesota Region, published by the Minnesota DNR.

Non-game mammals

A list of all non-game mammals within DNR Region 1-south is included in the MPD. No threatened or endangered non-game mammals are known to occur in this region. The occurrence of the following non-game species of mammals has been documented in Pope County.

| | |
|--------------------------------|------------------------------|
| Short tailed shrew | Long tailed weasel |
| Franklin's ground squirrel | Richardson's ground squirrel |
| Striped skunk | Eastern chipmunk |
| Coyote | Red squirrel |
| Woodchuck | Plains pocket gopher |
| Thirteen lined ground squirrel | |

Game Mammals

Game mammals which are likely to occur in the park are:

| | |
|-------------------|-------------------|
| White tailed deer | Red fox |
| Beaver | Jack rabbit |
| Gray fox | Gray squirrel |
| Mink | Fox squirrel |
| Raccoon | Cottontail rabbit |
| Muskrat | |

Wildlife Management

Objectives:

To increase the diversity of wildlife and maximize the opportunities for park visitors to observe wildlife

To reestablish a population of prairie chickens in the park

To improve waterfowl habitat by maintaining and invigorating the existing diversity of wetland types

To manage deer, both the resident and winter herd, to minimize crop depredation on adjacent farmland and to minimize overbrowsing of vegetation in the park.

To ensure the survival, in a natural state of any element (species indicated by an asterisk in the preceding lists) identified by the DNR, Natural Heritage Program.

Many of the actions discussed in the Vegetation Management Section will benefit wildlife by improving habitat. A diversity of habitats will be created and maintained to provide the preferred forest edge environment and food for wildlife. The prairie management actions will also benefit wildlife by improving habitat.

Deer Management

The management of the deer population was an issue of concern during the planning process because of crop deprecation on adjacent farmland and overbrowsing of vegetation in the park.

Overbrowsing of vegetation is a problem in the park for two reasons. Deer affect species diversity in an area because they select preferred species for food. They may also affect the form and vigor of species because of the stress which occurs due to browsing. These impacts are negative in terms of the vegetation management objectives for the park.

The number of deer wintering in the park was rather constant from 1975- 1978. However, during the winter of 1979 the count doubled any previous winter count. The aerial counts listed below were made in February of the following years. Aerial counts serve as an estimate. They are lower than the actual population because it is impossible to observe all animals from the air. They serve as a good basis to evaluate trends and changes in the population over time.

| | |
|------|-----|
| 1969 | 60 |
| 1975 | 115 |
| 1976 | 87 |
| 1977 | 115 |
| 1978 | 95 |
| 1979 | 224 |

Special deer hunts were conducted in 1980 to reduce the wintering herd. The following chart summarizes the results.

| <u>Type</u> | <u>Date</u> | <u>Number of Days</u> | <u>Number of Permits</u> | <u>Number of Hunters</u> | <u>Number of Deer Killed</u> |
|-------------------|----------------|---------------------------|------------------------------|------------------------------|----------------------------------|
| Shotgun with slug | Nov. 15-16 | 2 | 40 | 31 | 30 |
| Muzzleloader | Nov. 29-Dec. 3 | 5 | 41 | 27 | 12 |
| Muzzleloader | Dec. 4-8 | 5 | 19 | 12 | 2 |
| Muzzleloader | Dec. 9-14 | 6 | 12 | 11 | 3 |
| | | <u>18</u> | <u>112</u> | <u>81</u> | <u>47</u> |

The wintering population in 1980 was estimated to be 25 by the park manager. The deer hunt along with the mild winter were the reasons for this lower population level. The impact of the hunt on the population was difficult to determine. In 1982, the area wildlife manager counted 158 deer wintering in the park area. At this level crop degradation and overbrowsing are problems.

The Section of Wildlife has divided the state into 101 quota blocks based on the amount of available deer habitat. Glacial Lakes State Park is located in quota area #91 which encompasses southwestern Pope County, northeastern Swift County and a small portion of east central Stevens County. The current population of quota area #91 is 30% above the target population set by the area wildlife manager. The population is expected to be at the goal within the next few years. The Section of Wildlife strives to maintain a population which will provide an optimum hunting resource for the area. The number of antlerless permits which are issued annually is based on habitat and the deer population level. The interrelationship of the deer population in the park and the deer population, habitat and hunting success in quota area #91 must be evaluated in the determination of a management strategy which is mutually agreeable to management goals of the divisions of Parks and Recreation and Wildlife.

Determination of the appropriate number of deer for the park is difficult. The park contains approximately 300 acres (121 hectares) of winter deer habitat. A resident herd of approximately 30 and a wintering herd of approximately 80 are target numbers which may be used initially on a trial basis to direct management efforts. To reach these levels, both the resident deer herd and wintering deer herd need to be reduced.

The impact of deer management in the park on the goals for providing hunting in the surrounding area must also be considered. The constraints on the use

of potential management tools such as food plots and hunting seasons must be considered.

Deer management must be continually reevaluated, new strategies attempted, and results analyzed. This process of management modification should be continued on an ongoing basis.

Action #1. Reduce both the resident and wintering deer population in the park.

This will be attempted by redistributing some of the population to other available habitats in the surrounding area and by reducing the population through hunting pressure. The hunting pressure may play a role in redistributing the population as well. Further research is needed to determine this. Other potential wintering areas can be created by the development of food plots away from the park. The food plot would be phased out of the park and eliminated completely if one can be located on the WPA acreage to the south that would attract deer. A very late hunting season in the park for a period of three years would serve to both reduce the herd and keep them from wintering in the park. More pressure should be put on does than currently exists at present. In order for this program to be successful, a research management program conducted by the farmland wildlife research unit should accompany the implementation of this strategy.

Moving the food plot may play a role in the redistribution effort. Also because Glacial Lakes is classified as a Natural State Park, it would be desirable to not have a food plot in the park.

This action for deer management was jointly developed by the park manager, area wildlife manager, regional parks supervisor, regional wildlife manager, regional resource coordinator and farmland wildlife research personnel. It is important that this type of coordination continue.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-------------------------------------|-------|-------|-------|-------|---------|
| COST | Ongoing management and coordination | | | | | |
| | \$500 | \$500 | \$500 | \$500 | \$500 | ongoing |

Action #2. Establish a population of prairie chickens in the park.

Glacial Lakes State Park has the potential to sustain and support a population of prairie chickens if an appropriate management program accompanies the introduction. Their requirements include 400-500 acres of grassland for booming grounds, roosting areas, and a winter food source. The introduction of prairie chickens would benefit the park because it would reintroduce the species into its former range. It would be an added attraction to the park, and fit in with the prairie management of the park. The restoration project should be a joint effort between the park, DNR, Non-game Program, DNR Regional Wildlife, ^{and} DNR Division of Parks and Recreation.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|-------|-------|-------|---------|
| COST | | | \$500 | \$500 | \$500 | ongoing |

Action #3. Maintain the maximum abundance of dead standing and downed wood (snags).

The dead and dying elm trees and other species in the park are of great benefit to wildlife. The diversity and density of bird species in an area are directly related to the quality and quantity of snags. Birds use snags for a variety of purposes including: cavity nesting, drumming, roosting, hunting perches, loafing and food caches. Snags are sources of food for some species due to the insects found there.

It has been demonstrated that amphibians, reptiles, and mammals also require snags for habitat.

No dead standing or downed wood should be removed from the park unless it poses a safety hazard or is removed for development. Where possible, sound snags in high use areas should be trimmed for safety and left standing. This will increase the abundance and diversity of wildlife close to main park activities and increase the opportunities for park visitors to view wildlife.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #4. Monitor the park for Natural Heritage Elements, particularly those identified in the inventory section and where found, protect the habitat.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #5. Create open water in some of the marshes that have filled in with cattails.

This will provide additional waterfowl habitat in the park and help compensate for the previous loss of such habitat in the region. It will also increase the park visitor's opportunity to view wildlife.

SURFACE WATER

Glacial Lakes State Park is located in the Chippewa River Watershed. It is 2,080 sq miles (5,387 sq km) in size and drains to the south. There are a number of outstanding surface water resources in Glacial Lakes State Park. Mountain Lake is the most exceptional. It is a clean beautiful lake which provides opportunities for fishing, swimming, and boating. It also provides wildlife habitat and is an aesthetic attraction in the park. The lake is 56.5 acres (11 hectares) in size with a maximum depth of 15 ft (4 m). It has 1.50 miles (2 km) of shoreline and the water level fluctuates between -.5 and +1 foot above the average per year. There are no drainage outlets. The only flow into the lake is from springs located along the shore. This spring water is high in iron as the rusty color of the surrounding vegetation indicates. The water quality of the lake is good. One reason for the high quality is that the entire drainage system is located within the park.

The glacial moraine topography of the park is dotted with marshes, wet meadows, and small lakes scattered among rolling hills. Every depression among the hills seems to support a wetland area, and 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 |

The wetland types which are present in the park are labelled on the Vegetation Map, p. 55 with the corresponding Roman numeral. These wetlands provide valuable wildlife habitat and plant community diversity within the park.

Signalness Creek begins at a spring in the northern part of the park and flows northwest. It is fed by additional springs as it flows through the park. An earthen dam with a drop spillway has created an approximately 3 1/2 acre impoundment. This impoundment provides additional wildlife habitat and a refuge for migrating species.

Management

Objectives:

To protect the water quality of Mountain Lake, Signalness Creek, and other surface water resources within the park

To maintain the quiet, natural character which currently exists in the park.

Action #1. Continue to enforce a no motor use policy on Mountain Lake.

Mountain Lake is small enough so the entire lake can be fished without motor boats. The noise and pollution of outboard motors would have a detrimental impact on the quiet atmosphere of the campground and trails near the lake.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #2. Install a monitoring device to monitor water levels in the park.

There has been a 4 ft (1.4 m) drop in water level from 1939 to 1965. Establishing a long term record of fluctuations will allow resource managers to analyze the data in an attempt to determine the cause of the fluctuations.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|--|---|---|---|---|-------|
| COST | No development cost - Coordination with the Division of Waters | | | | | |

GROUNDWATER

Most aquifers in the area of the park are ice contact sand and gravel. This type of aquifer is located almost exclusively within the moraine area. The sand and gravel was deposited at the edge of a moving glacier. Sometimes, this sand and gravel is covered by glacial till. The water-yielding potential of this type of aquifer is good and artesian conditions are common.

The water supply for the park is provided by four wells:

| <u>Well Location</u> | <u>Depth in feet</u> |
|----------------------|----------------------|
| Campground | 80' |
| Picnic ground | 175' |
| Headquarters | 69' |
| Trail center | 115' |

These wells are located and constructed in accordance with the standards of the Minnesota Department of Health.

Objectives:

To maintain high quality ground water

Action #1. Continue the testing of the water supply which is currently conducted by the Department of Health.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

FISHERIES

Inventory

Mountain Lake provides an opportunity for fishing in Glacial Lakes State Park. It is the only water resource in the park that supports game fish populations. A fish survey of the lake conducted in 1978 revealed the following species present:

Northern pike
Walleye
Largemouth bass
Bluegill - sunfish
Yellow perch
White sucker
Yellow bullhead
Crappie

This survey indicated the northern pike population was twice the local average in numbers and weight. The 15 acre (6 hectare) marsh area in the southeast and northwest corner of the lake provides a good spawning area for northern pike. The numbers and weight of walleye were down in comparison with the previous survey in 1963. Very few walleye were present. The lake has a muck bottom and lacks flowage, which are conditions unfavorable for walleye spawning. Bass and sunfish have good spawning areas. Yellow perch and white suckers have good populations and the 1978 survey indicated they were twice the local average in abundance and weight. Overall the game fish population is considered well balanced. Lakes are classified in two ways for fisheries purposes. The ecological classification describes what species the lake is best suited for naturally. The management classification describes species for which the lake will be managed. The ecological classification of Mountain Lake is largemouth bass, panfish, and northern pike. The management classification is the same.

The lake has been stocked for many years. From 1924-1946, 530,000 walleye fry, 1,200 bass fingerlings, and 200 sunfish fingerlings were stocked. During 1953-1969, 60,000 walleye fry, 30,000 northern pike fingerlings and 3,800 bass fingerlings, and 11,500 panfish were stocked. Largemouth bass broodfish have been stocked periodically to stimulate the bass population. Walleyes have not done well even though they were stocked.

Mountain Lake winterkilled in 1975. In March, the attempt was made to raise oxygen levels by use of a pumping station. There was also a slight winterkill in 1982. In March of 1982, very low oxygen levels were recorded and it was expected that much of the fish population did not survive this stress period.

The Division of Fish and Wildlife stocked the lake in May of 1982 with yearling and adult age fish including northern pike, largemouth bass and bluegill sunfish. This stocking was intended to provide immediate family fishing for the following summer.

Management

Objectives:

To manage Mountain Lake for family fishing

To maintain the current management classification of Mountain Lake.

Action #1. The Division of Fish and Wildlife should continue to stock the lake as they determine necessary to provide family fishing.

Habitat improvements should be implemented if recommended by fisheries. The lake will be managed for what it is best suited naturally.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

HISTORY AND ARCHAEOLOGY

There is evidence that the Woodland tradition, a group of prehistoric Indian cultures, lived in the region in which the park is located from approximately 500 BC-1700 AD. Two cultural features which distinguish this culture from earlier cultures are the use of pottery and burial mounds. Burial mounds are widely scattered throughout the central part of the state.

The central part of Minnesota was the site of Dakota and Ojibwa conflict for many years. No permanent settlements were located near the park and no decisive battles were fought in the area.

The most significant interpretive theme for the area is the story of the immigrant farmer. The history of settlement in the area by various ethnic groups and the subsequent development of agriculture and towns is representative of the immigration and rural settlement story throughout the state.

The first settlers of Pope County were predominately Swedish and Norwegian. Later settlers included people of German, English, and Bohemian descent.

The development of railroads influenced the location and growth of towns. Westport, Villard, and Cyrus grew up along the Little Falls and Dakota Railroad now a branch of the Northern Pacific constructed in 1882. Sedan, Lowry, and Farwell developed along the Soo Line constructed in 1866. The growth of Glenwood, established in 1866, was influenced by both railroads.

The park should interpret its resources as they relate to the immigration and settlement theme.

Management

Objectives:

To identify, preserve, research, and document significant prehistorical and historical resources in the park

To interpret these sites so the park visitor can gain a better understanding of Minnesota's heritage

Action #1. Field check all proposed development sites for the presence of prehistoric and historic artifacts before any work is begun.

Where artifacts are found, an assessment will be made of the size and importance of the site. If the site proves to have archaeological significance, it will be excavated before any development occurs or construction of the development in another location will be considered.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$5,000 | | | | | \$5,000 |

Action #2. Incorporate all information gained through excavation and other research regarding prehistoric and historic sites into the interpretive program.

This could be done through the signs and brochures used in park interpretation.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #3. Locate, excavate if possible, and interpret the marl pits which were located in the park.

Marl is a mixture of clay, sand and limestone. It was put in pits dug in the park area. Fires were built over the pits to cure the marl. Oak which was abundant in the park was used to fuel these fires. The cured marl was used similarly to concrete in construction.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|---------|---|---------|
| COST | | | | \$3,000 | | \$3,000 |

Action #4. Conduct an archaeological survey of the park.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|---|---------|---------|
| COST | | | | | \$5,000 | \$5,000 |

MANAGEMENT AREAS

SPECIAL MANAGEMENT AREAS

Waterfowl Production Area

The U.S. Fish and Wildlife Service administers a 273 acre (110 hectare) waterfowl production area south of the park (see map, p. 115 for the location of this area). The primary purpose of this acreage is to preserve wetland habitat and provide public hunting opportunities.

Opportunities for joint resource management efforts include a joint burning plan for vegetation management, wildlife management programs including deer management, the location of food plots, and prairie chicken restoration efforts. There are also opportunities for joint recreation ventures in trail development and interpretation.

DNR, Division of Forestry Administered Acreage

The DNR, Division of Forestry administers 40 acres (16 hectares) adjacent to the southwestern boundary of the park. The eastern half of this area is leased to a private landowner for agricultural purposes and the western half has been planted with trees.

No specific coordination possibilities were identified during the planning process. However, in general, any future management proposals for this tract could be jointly undertaken by the DNR, Division of Forestry and the Division of Parks and Recreation.

Glacial Lakes State Trail

The Glacial Lakes State Trail was legislatively authorized in 1971. The proposed trail alignment begins at Green Lake in northeastern Kandiyohi County, passes through Glacial Lakes State Park and portions of Pope and Douglas counties, and ends in Lake Carlos State Park. A management plan has not been prepared for this proposed trail and the DNR has no plans to prepare one at this time.

Glacial Ridge Trail

The Glacial Ridge Trail is a scenic automobile trail approximately 200 miles (320 km) in length. It is designated by signs and follows the scenic ridges of the Alexandria moraine on state trunk highways and county and township roads. The Glacial Ridge Trail was a project developed in the late 1960s by

WesMin, a resource and conservation development project of the U. S. Department of Agriculture. The purpose of the project is to improve the economy and quality of life in rural western Minnesota. The alignment of the trail was developed with citizen involvement. The Glacial Ridge Development Association, a group of private citizens, published a brochure which includes a map of the trail. (This brochure is included in the MPD.) The association also deals with a variety of issues related to the trail.

There is an excellent opportunity for cooperation between the DNR and the Glacial Ridge Development Association in developing interpretive information on the area for the public.

PHYSICAL
DEVELOPMENT
AND
RECREATION
MANAGEMENT

EXISTING DEVELOPMENT

See Existing Development Map, p 87.

Campground

The campground is located north of Mountain Lake. It consists of two loops, A and B, which have a total of 39 semi modern sites. The first loop, A, has 21 sites and a sanitation building with flush toilets and showers. A playground with metal playground equipment is located just south of the sanitation building. Two pit toilets are located in this loop also. Some sites are well shaded by oak and basswood trees. Others are moderately shaded by young silver maple which were planted in the campground. The second loop is more open and has 18 sites. Two pit toilets are located in this area.

A parking area for the walk-in campsites is located at the end of B loop. Two walk-in campsites are located just over a half mile from this point along a trail across the prairie. These two sites are located in a grove of oak trees. Each site has a fire ring and picnic table. A pit toilet is located between the sites. No water is available at the site and campers must carry in their water.

Group Camp/Horseback Rider Camp

Often, groups use B loop or the trail center parking area for camping. The latter is also used for the horseback rider camp. A large parking area with a capacity of 100 cars is located at the base of the hills, well screened from the surrounding landscape. It accommodates winter trail users and sledgers. A well is located near the parking area. A horse tie area, picnic table and fire ring are located on top a hill in a small grove of trees to the west. A pit toilet is located in the area also.

Picnic Areas

There are two picnic areas in the park. One area is located near the southeastern end of the lake. It has approximately 20 tables, two pit toilets, and a picnic shelter with a fireplace. The parking lot accommodates 55 cars. This area does not receive as much use. An outdoor amphitheater is located just north of this picnic area. It is occasionally used for church services and interpretive programs. It has a seating capacity of 100.

The other picnic area is located adjacent to the beach. It contains approximately 15 tables, grills, a sanitation building, and a parking lot with a capacity of 58.

Swimming Beach

There is a 75 ft (22 m) long swimming beach in the park. It has a small sand beach and dock. Two cabanas for changing are located in the adjacent picnic area. Parking is provided in the picnic area parking lot.

Boat Ramp

A boat ramp is located on the western tip of Mountain Lake. There is space for approximately 10 cars with trailers. There are six canoes and three row boats for rent.

Trails

There are approximately 9 miles (14 km) of horseback riding and snowmobiling trails in the park. There are 11 miles (18 km) of hiking trails in the park. Most of this mileage is on the prairie. There are no designated ski touring trails in the park at the present time. Parking for snowmobile trailers and cars is at the trail center parking area. It is also the trail head for winter trail users. See map, p 87.

Sliding Hill

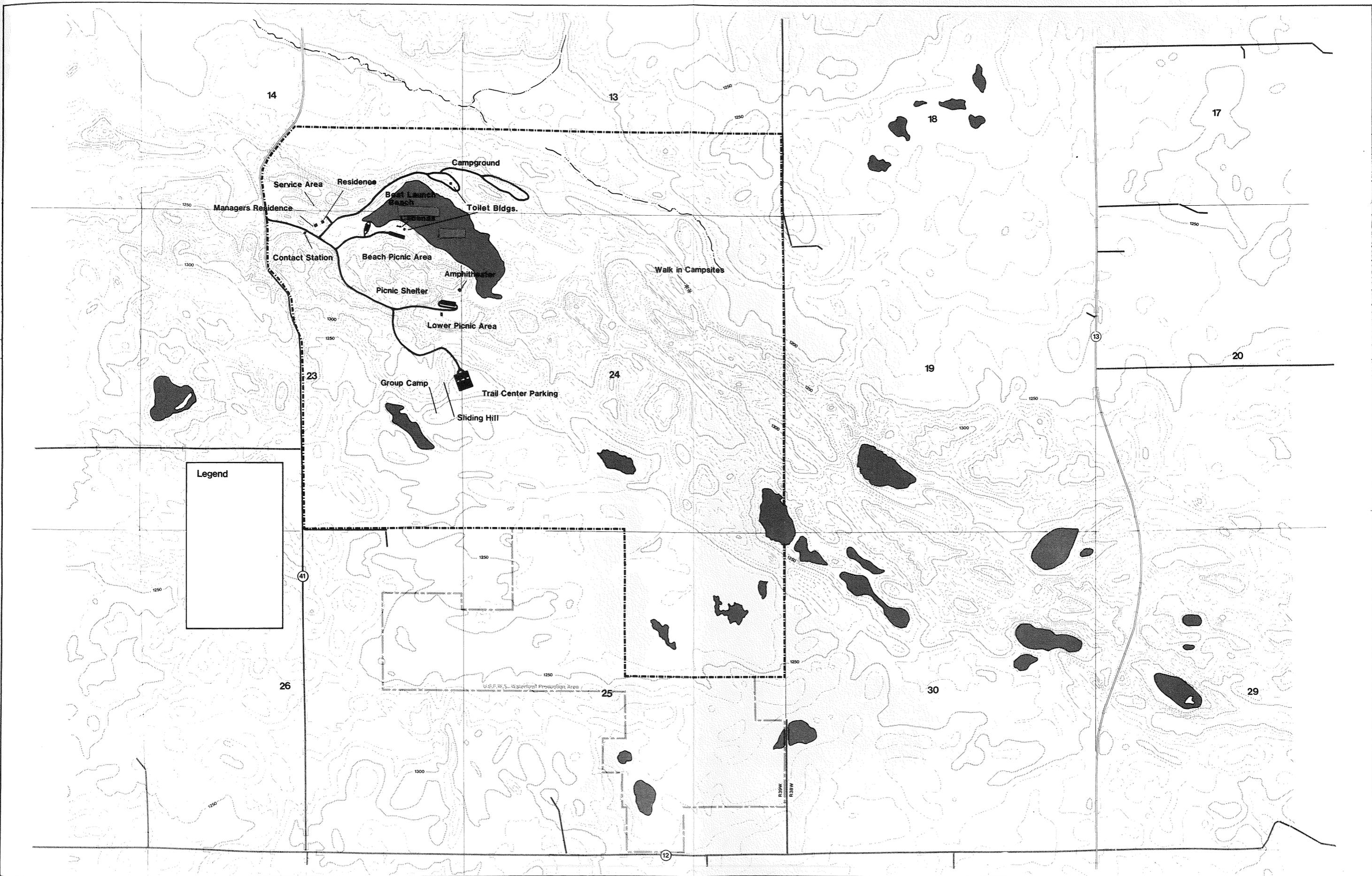
A sliding hill is located near the trail center parking area.

Administrative Facilities

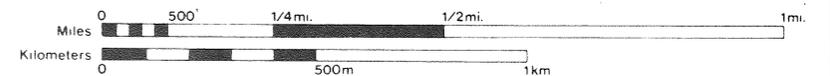
A contact station/park office and park manager's house are located at the entrance to the park. A house which was once the manager's residence and is currently the assistant manager's summer residence is located nearby, to the northeast. A service court is located near the northeastern boundary. The buildings in the service court include a wood-frame warehouse and a cement block wood-frame garage/shop and a metal quonset.

PROPOSED DEVELOPMENT *see Proposed Development Map, p. 107*

The department will rely on the following administrative objectives relative to development to ensure maintenance of the park's resources and recreational opportunities:



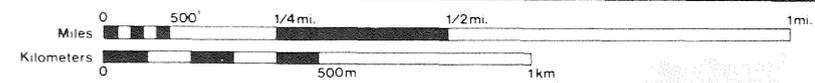
Legend





Legend

- Snowmobile
- - - Horseback
- Hiking only



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

To locate and design development in such a way as to:

- 1- heighten visitor awareness of the natural environment and minimize disruption of the natural environment both ecologically and as perceived by all the senses
- 2- disperse and screen activities so that an individual user's experience is dominated by the natural environment
- 3- separate large group use of the park from individual or small group use and/or control use in such a way that large groups do not dominate general use areas of the park

To ensure that development in a state park results in no significant deterioration of the park's air or water quality and no significant increase in noise levels

To allow for management areas to be delineated in order to guide management and development programs. A development area may be outlined in park plans as a method for focusing and limiting future development in appropriate areas of the park. Development will be limited to not greater than ten percent of the park

To provide only those facilities and types of recreation necessary for appropriate use and enjoyment of the park's resources

To design or locate facilities in a manner that will be compatible with the aesthetic qualities of the park and will not significantly affect the natural resources

To establish an architectural design theme and appropriate color combination for each park

To direct building site selection, design, and construction to emphasize energy efficiency and energy conservation and accessibility by persons with physical disabilities

To ensure that developments are cost-effective and designed for efficient maintenance and operation

To give prime consideration in facility design, location, and construction to user health and safety. In particular, all potential natural hazards will be addressed

To conduct general planning of park utilities during the management planning process

Campground

Objectives:

To provide opportunities for visitors to experience the park on a 24 hour a day basis

To provide a variety of camping environments to accommodate campers' different needs and preferences

Action #1. Plant intersite screening between some campsites.

Intersite screening is needed to provide privacy for campers.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---------|---|---------|----------|
| COST | | | \$5,000 | | \$5,000 | \$10,000 |

Action #2. Develop a trail with steps from site A-15 to the lake. *See map, p. 107.*

There is a path in this location that has eroded. A well-developed path with stairs would help control the erosion problem and still provide campers access to the lake.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$2,000 | | | | | \$2,000 |

Action #3. Develop a fishing dock for campers' use. *See map, p. 107.*

This dock should be constructed parallel to the shore so it is less visually intrusive on the lake. It will facilitate the opportunity for campers to fish and will direct use to designated locations which will help control erosion on the shore.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$5,000 | | | | | \$5,000 |

Action #4. Remove the existing playground equipment and construct a small play structure of natural forms and materials.

The playground equipment should be replaced to make it consistent with the state park policy for natural state parks regarding playgrounds which reads "creative play facilities consistent with and derived from the natural setting

may be provided. Traditional municipal playground equipment will not be provided. The existing equipment in the campground is traditional municipal playground equipment.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---------|---|---|---------|
| COST | | | \$3,000 | | | \$3,000 |

Action #5. Develop approximately 15 additional campsites if campground use increases and maintains the level it was in 1976, 1977, and 1978 for ~~three consecutive~~ seasons with indications that the trend will continue. See Proposed Development Map, p. 107.

Campground expansion is limited in this park by slope, the presence of numerous marshes, the presence of high quality prairie, and the goal to maintain the existing character of the park, and to avoid overcrowding on the lake. There is a small area where development could occur.

A trail which provides access to the lake and fishing dock should be developed in conjunction with the development of these sites.

The construction of another sanitation building should be considered if the building in A loop becomes overused and use of a new building be justified.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-------------|----------|---|---|---|-------|
| COST | Conditional | \$18,000 | | | | |

Action #6. Develop five tent sites in the campground expansion area.

This will provide an alternative camping environment in the park and accommodate a group of campers which use the park frequently. It will also provide an opportunity to monitor what kind of use this type of area will receive in the park.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$2,000 | | | | | \$2,000 |

Action #7. Provide water (hand pump) at walk-in sites.

This would encourage use of these sites.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|---------|---|---------|
| COST | | | | \$8,000 | | \$8,000 |

Action #8. Develop additional walk-in sites if use warrants. See Proposed Development Map, p. 107 for the location of these sites.

There is space to provide more of this type of camping experience if there is demand for it.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-------------|---------|---|---|---|-------|
| COST | Conditional | \$2,500 | | | | |

Action #9. Develop a dump station in the campground.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|----------|---|----------|
| COST | | | | \$10,000 | | \$10,000 |

Group Camp

Action #1. Improve the group camp in the trail center parking area. See map p/07.

The group camp should include picnic tables, fire rings, a group cooking area/meeting area, and a shelter. Some additional plantings may be necessary to provide shade and a windbreak.

This area will be used by both groups and horseback riders. The use areas should be separated to whatever extent possible. Water and toilet facilities and parking should be shared.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$6,000 | | | . | | \$6,000 |

Action #2. Provide a shelter in the trail center parking area which could be used by the group camp in the summer and as a winter warming shelter in the winter. See map, p/07.

The shelter should not include toilet facilities. The existing pit toilets should be adequate. The structure should be located on site so that it can't be seen from the trails and vistas in the park, but the sliding hill should be visible from the building to enhance supervision.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|----------|---|---|---|----------|
| COST | | \$35,000 | | | | \$35,000 |

Picnic Areas
Objectives:

To provide a location where people can eat in the out-of-doors

To provide a variety of environments which accommodate people's different needs and preferences

Action #1. Decrease the size of the lower picnic area by not mowing and allowing natural succession to proceed.

The area is too large for the use it gets which is mostly group use and overflow from the beach picnic area. The area could be smaller and still accommodate these uses. Maintenance of the area would be decreased.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #2. Construct a small deck overlooking Mountain Lake in the beach picnic area. See Proposed Development Map, p. 107.

This structure should be placed northeast of the sanitation building in the low use area of the picnic ground. Currently use of this area is concentrated near the beach. This structure would provide an attractive facility and may help to distribute use throughout the area.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$6,000 | | | | | \$6,000 |

Action #3. Monitor erosion in the picnic area, particularly between the parking lot and sanitation building.

Erosion here has been a problem in the past. Planting shade tolerant ground cover, opening up the canopy by thinning the trees, and less mowing in the area should help control the erosion.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #4. Develop an overflow parking area for the beach picnic area if parking continues to be a problem. See map, p/107.

Parking has been a problem at times in the past and a small lot could be integrated into the proposed site with minimal intrusion.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|--------------|---------|---|---|-------|
| COST | | Conditional, | \$5,000 | | | |

Swimming Beach

Objectives:

To provide an opportunity for swimming in a natural setting

Action #1. Expand the beach 30 to 35 ft (9 to 11 m).

The existing beach is small and often overcrowded. This expansion is the maximum possible but it will help alleviate the crowding problem. A permit from the DNR, Division of Waters is required.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---------|---|---|---|---------|
| COST | | \$6,000 | | | | \$6,000 |

Action #2. Move the dock from the swimming beach to the boat launch area. See map, p/107.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

A dock would facilitate boat launching. The dock must be moved from the beach area because the Division of Parks and Recreation has a policy not to provide docks, rafts, or other structures on state park beaches for reasons of safety. Many park users expressed disappointment over this action because it is felt that the dock enhanced the beach. If the policy is changed in the future and docks are allowed at state park beaches, one could be placed in Glacial Lakes State Park if it is requested by the park users.

Boat Ramp/Water Access

Objective:

To provide access to Mountain Lake

Action #1. Clear the channel from the launching area to the lake.

The channel has filled in. Opening this channel would facilitate access into the lake. A permit from the DNR, Division of Waters is required.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-----------------------|---|---|---|---|-------|
| COST | Cost to be determined | | | | | |

Action #2. Landscape the boat ramp parking area. See map, p 107.

The appearance of this area could be improved with plantings and by defining the parking area.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---------|---|---|---------|
| COST | | | \$8,000 | | | \$8,000 |

Administrative Facilities

Objective:

To facilitate control and management of the park, ensuring, maximum safety for park visitors and resources

Action #1. Remove the house adjacent to the park manager's residence.

This structure is not needed and is visually obtrusive in its existing location.

The building should be declared surplus and removed. The utilities should be relocated to the basement of the manager's residence. The area should be graded to establish natural looking landforms.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------------------|---|---|---|---|-------|
| COST | No development cost | | | | | |

Action #2. Bury utility lines.

There is approximately one mile of utility lines in the park. They are a visual intrusion on the natural character of the park.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|----------|---|----------|
| COST | | | | \$10,000 | | \$10,000 |

Action #3. Clean up the sites of the old residences in the park.

Some trash still remains which should be removed. Also, the non-native trees should be removed.

Roads

Objective:

To provide direct and safe access to use areas

Action #1. Surface the road to the boat landing, beach, and campground with asphalt.

This will eliminate dust which is an annoyance to park users, and reduce erosion and maintenance costs.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|----------|---|---|----------|
| COST | | | \$50,000 | | | \$50,000 |

Trails

The overall design philosophy for trails and specific alignment recommendations resulted from a review of the natural and physical features of the park and user information. Key features considered were scenic vistas, proximity to water, variety of vegetative communities, wildlife habitat, topography and soil conditions. User information included SCORP data, observations from the park manager, and comments received at public meetings.

The overall design philosophy of the trail system is to provide access to the park's natural resources and allow the park visitor to experience the varied type of environments in the park. The trail system is designed to lead the park visitor through the prairie and experience being surrounded by a native grassland with minimal visual intrusions. The trail system is also designed to lead the park visitors to vistas where the park visitor can get an overview of the park and gain an understanding of the effects of glacial activity of the area and gain an understanding of the Alexandria moraine complex.

The secondary goal of the trail system is to provide a good trail experience for the park visitor.

Trails will not provide access to some vistas. Some areas of the park should be available for people to hike in and not be directed by trails. This will be encouraged by labeling vistas and other features ^{on the trail map} which will attract some people to explore.

Objectives:

To provide access to the park's outstanding features while minimizing impact on the resources and avoiding sensitive areas

To provide scenic and challenging trail experiences for the park visitor

To provide links with area grant-in-aid trails

Action #1. Develop a system of signed ski touring trails as illustrated on the Proposed Trails Map, p. 109.

The development of a loop system of ski touring trails was recommended because of both the need for and desire for cross country skiing opportunities identified in SCORP. See Regional Analysis Section, p. 22. The park manager identified the desirability of providing cross country skiing trails in the park based on the existing use of the park by skiers and the need to reduce user conflicts. There are no designated cross country ski trails in the park, but a fair amount of use by cross country skiers. Cross country skiers and snowmobilers are using the same trails. Both cross country skiers and snowmobilers expressed the need for a separate system of cross country ski trails.

The terrain in the park is suitable to provide beginning, intermediate and advanced trails. The proposed trail is approximately 4 miles (6.4 km) in length. Portions of the trail pass through the deer yarding area of the park. This was determined not to be a problem based on the deer management strategies as outlined in the Wildlife Section. Use of the system will be predominately local, with skiers coming from within a 25 mile radius.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$6,000 | | | | | \$6,000 |

Action #2. Modify the existing snowmobile trail alignments. See map, p/09.

The purpose of modifying the system is to create a prairie area with no winter trails. There is currently no snowmobile trail system near the park which the park can link into. The existing mileage should be maintained in order to provide a satisfying trail experience within the park. These trails should be monitored for erosion and portions rerouted or closed if erosion becomes a problem.

The recommendation to maintain snowmobile trails in the park was based on both the need for and desire for snowmobile opportunities identified in SCORP. See Regional Analysis section, p22. The park manager and regional trails coordinator identified the trail in the park as serving a need in the area. Snowmobilers at the public meeting expressed the desire that the snowmobile trails be maintained.

The Pope County grant-in-aid trail will provide a link to the park in 1983. The grant-in-aid trail will provide a better snowmobile experience than is possible within the park. Snowmobilers expressed the desire that a link with the park be developed to the Pope County grant-in-aid system.

Current use of the park for snowmobiling is local and trailer-in use is low. Use of the park for snowmobiling may increase and draw snowmobilers from a larger radius when the park can serve as an access point to the county grant-in-aid system and provide a rest area in the system with sanitation facilities, a warming shelter, and interpretive opportunities available.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$3,000 | | | | | \$3,000 |

Action #3. Modify the trail alignments when the Pope County Trails Association develops their system. A link trail into and out of the park should be developed.

The role the park will play in providing snowmobiling opportunities may change from a self-contained trail experience in the park. The link will provide access from the park to the countywide trail system. A loop system will be retained but some trail loops may be eliminated. See the Management Plan Details (MPD) for the proposed Pope County Trail system.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|-------------|---|---------|-------|
| COST | | | Conditional | | \$4,000 | |

Action #4. Modify the existing horseback riding trails. See map, p/09.

The park receives light use for horseback riding. Large groups are discouraged from using the park due to the limited mileage and erosion potential. The goal of the horseback riding trails is to accommodate the use the park currently receives.

These trails should be monitored for erosion problems. Segments of the trail may be realigned or closed if erosion becomes a problem. Seeds of grasses and forbes can be widely distributed by passing through the digestive systems of animals. For example, horses being ridden through the prairie can introduce non-native grasses which could result in management problems. Segments of the trail may be realigned or closed during various stages of vegetation management if this is a problem.

Cost: Included in cost of other trails actions.

The hiking trails are an integral part of the interpretive experience in the park. The hiking trails are used by campers, picnickers and other day users and serve as a complementary facility to other uses in the park. Hiking trails are part of the recreation package available in the park during the summer. Any modifications that were made to the system were made in light of the design philosophy of providing access to the resources. Based on SCORP, the manager's observations, and existing use, there is no need to expand the existing system.

Action #5. Develop a hard surfaced trail which will provide access to the interpretive overlook in the northwestern part of the park.

This will ensure people with physical disabilities will have access to a scenic vista which provides an overview and interpretation of the park and its resources. A parking lot which accommodates 10-15 cars should be developed.

| COST | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|----------|---|---|---|----------|
| | | \$ 8,000 | | | | \$ 8,000 |

Visitor Services

Objectives:

To identify the park's prime resource stories and the park's role in interpreting the natural and cultural history of the landscape region

To provide quality interpretive programs based on the park's role within the state park system, combined with suitable recreational activities whenever possible

To provide visitors with park information and orientation

Glacial Lakes State Park can play an important role in interpreting the natural resources of the state. The resources are representative examples of the state's natural heritage.

The benefits of developing interpretive programs and facilities are many and can have far reaching effects. An effective visitor service program will result in a greater awareness of the state's varied natural resources, respect for the environment, and an awareness of natural resource management in the park. It is also likely to result in improved communication and cooperation between the park visitor and DNR. The park visitor will gain a better understanding of the goals and objectives of park management through the program. The role the park visitor has in carrying out these goals and objectives will be better understood.

A volunteer naturalist conducts programs and hikes in the park on Saturdays and Sundays and by special request for groups. The goal of this program is to create an ongoing interest in the natural environment. Bird and wildflower identification, wildlife, and prairie ecology are the subjects of the existing programs.

Potential primary interpretive themes for this park could include prairie ecology, prairie management, glacial geology and the formation of the Alexandria moraine, waterfowl habitat and migration, and wetland ecology.

Other interpretive themes are:

- prehistoric Indians of the prairie
- European settlement and its impact on the prairie
- plant succession
- plant communities
- birds, trees, wildflowers, mammals, insects, reptiles and amphibians, ferns, mushrooms and lichens
- stream ecology
- lake ecology

Action #1. Develop an area in the contact station that would orient the park visitor to the natural resources of the park and the interpretive opportunities available in the park. See map, p107.

This area should include displays, brochures, booklets, trail maps, and the location of the park's outstanding natural resources such as the best prairie areas, where to see deer, beaver, waterfowl, and wildflowers in bloom.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$1,000 | | | | | \$1,000 |

Action #2. Develop the scenic vista west of Mountain Lake as an interpretive overlook. See map, p107.

A sign which is low to the ground and blends with the landscape should be located here. It should focus on the glacial history of the park interpreting the esker, glacial hills, the formation of Mountain Lake and other geologic features in the area, as well as prairie and marsh.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---|---------|---|---------|
| COST | | | | \$1,000 | | \$1,000 |

Action #3. Construct a council ring in the area southeast of the first campground loop. See map, p107.

Some of the benches should be moved from the amphitheater area in the lower picnic ground. A fire ring and electricity should be provided at this site. Access to this site is good from the major use areas of the park. It will be located in an area that is open and where air circulation is good to decrease the insect problem.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---|---------|---|---|---------|
| COST | | | \$1,000 | | | \$1,000 |

Action #4. Develop a self-guided interpretive trail and accompanying pamphlet from the campground to the lower picnic area.

This trail passes through the major plant communities of the park including prairie, marsh, and oak woods. There is good access to this trail from the campground and picnic areas. A kiosk or display panel should be located at each end providing orientation to the trail and the leaflet box.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$2,000 | | | | | \$2,000 |

Action #5. Develop a display panel in the trail center parking area. See map, p/07.

Interpretation of the park's resources and orientation to the park's facilities will be readily available for winter trail users and for people using the group camp or horseback riding camp.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---------|---|---|---|---|---------|
| COST | \$1,500 | | | | | \$1,500 |

Action #6. Develop a general interpretive brochure on the park's natural resources and facilities.

This brochure can be distributed at the contact station as people enter the park to provide necessary park orientation information.

| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|---|---------|---|---|---|---------|
| COST | | \$1,000 | | | | \$1,000 |

Action #7. Develop interpretive signs which highlight outstanding features of the park at locations as determined by the regional naturalist. Key features may include; overlooks, geologic formations, marshes, and prairies.

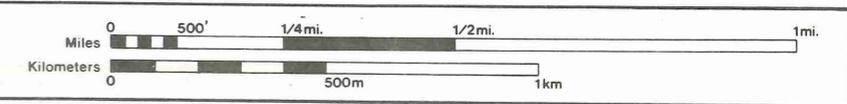
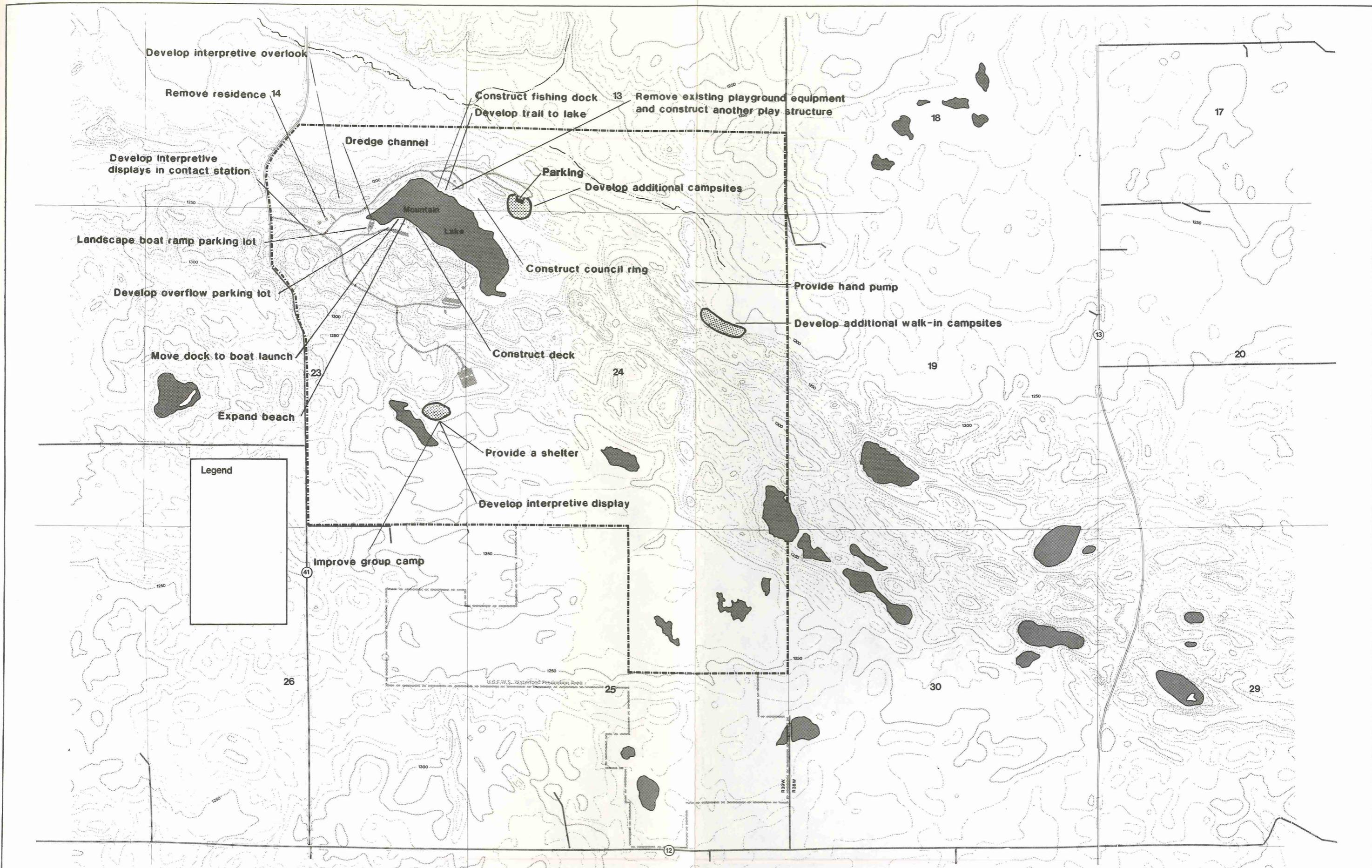
| | 1 | 2 | 3 | 4 | 5 | TOTAL |
|------|-------|---------|---|---|---|---------|
| COST | \$500 | \$1,000 | | | | \$1,500 |

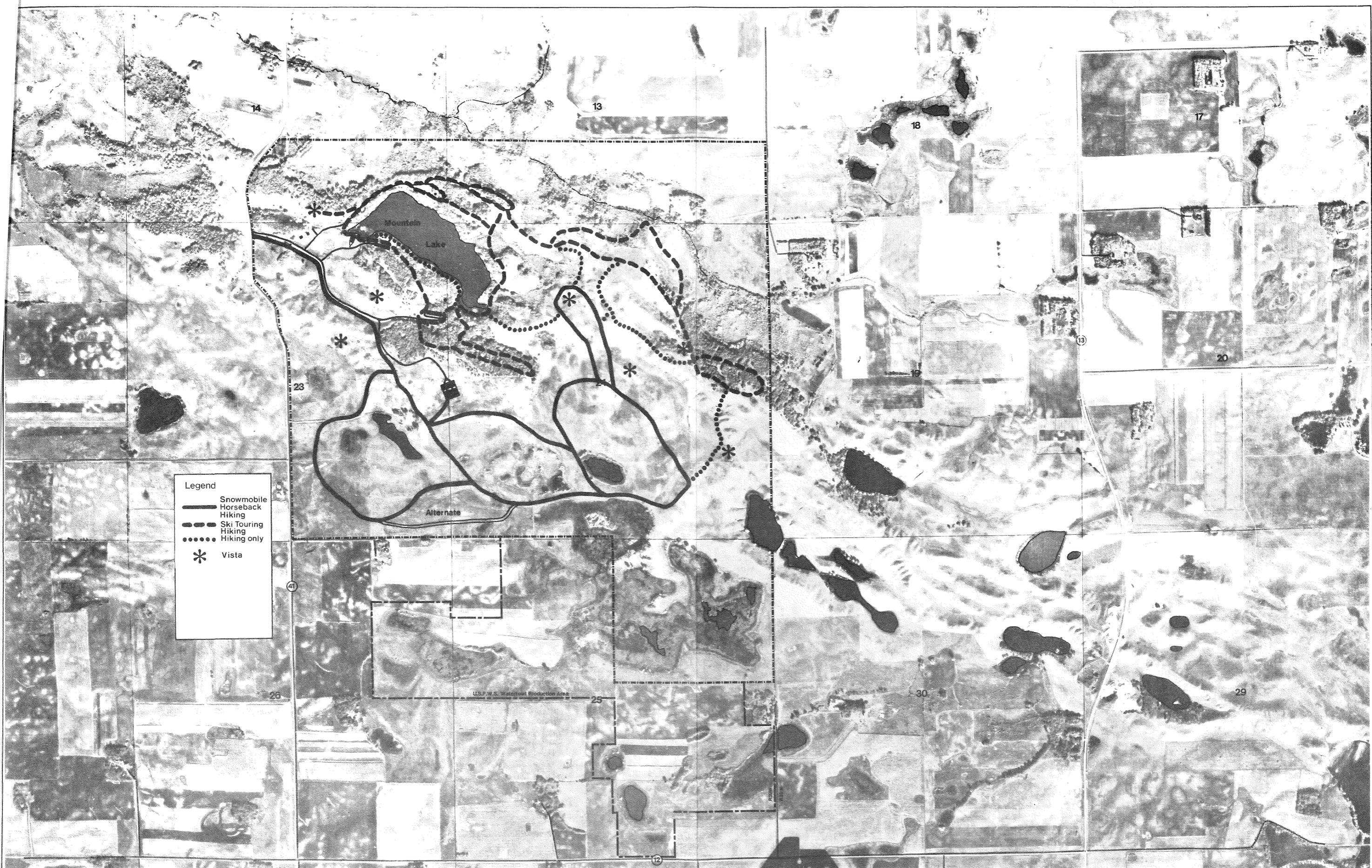
Architectural Theme

The existing buildings within the park do not establish a cohesive architectural style. The sanitation buildings in the campground and picnic area are block structures. The park manager's house is a frame structure. These buildings provide no architectural character for the park.

The only new building recommended for the park is the shelter in the trail center parking area. Other structures recommended in the plan are interpretive display boards, signs, and kiosks. The design of these structures should include efficient use of materials, energy conservation techniques, and a low visual profile. It is important these structures be located where they will not infringe on the natural character of the park.

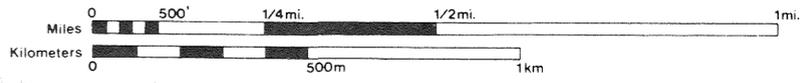






Legend

- Snowmobile
- - - Horseback
- Hiking
- · - · - Ski Touring
- Hiking
- Hiking only
- * Vista



PARK BOUNDARY

PARK BOUNDARY

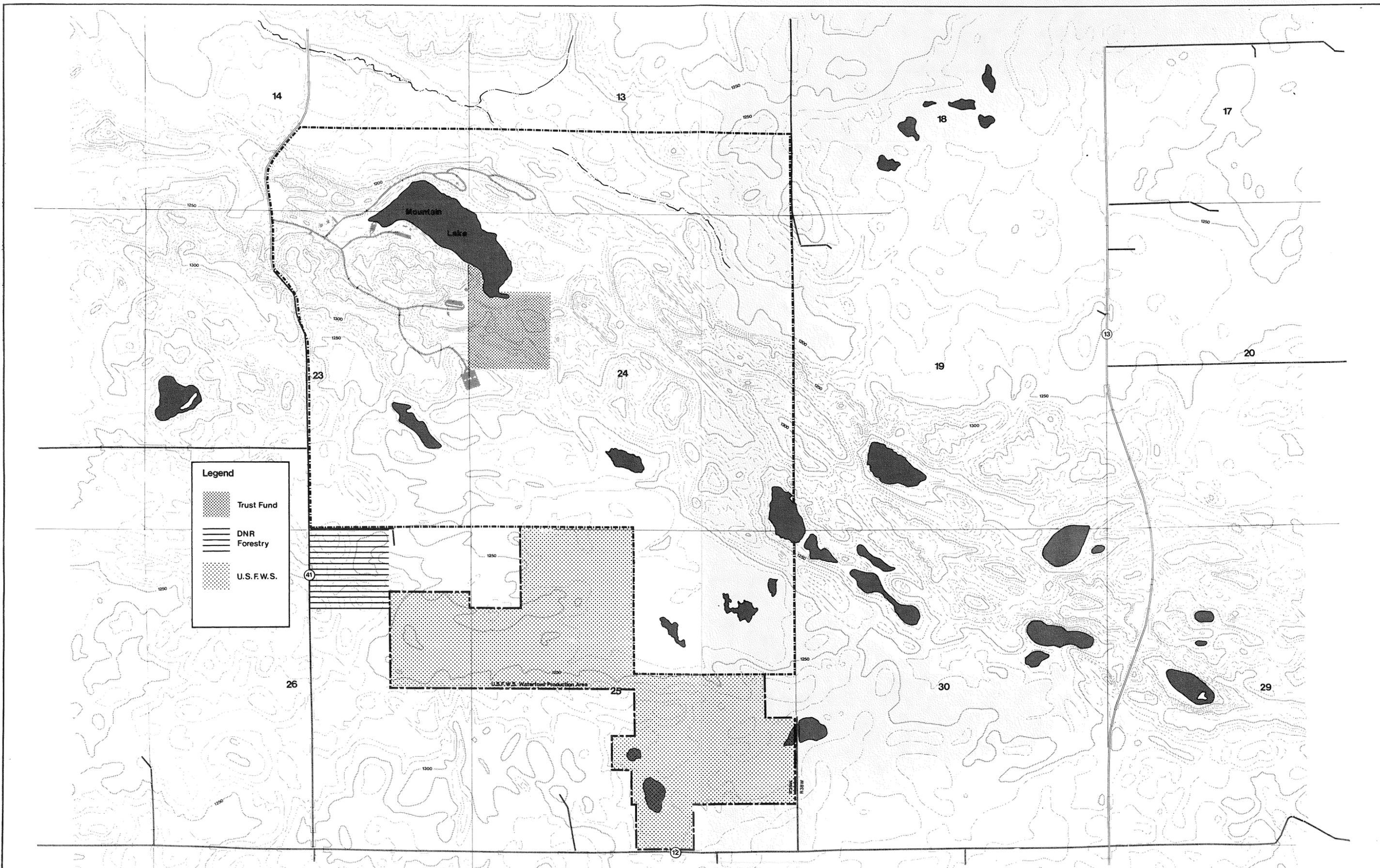
Glacial Lakes State Park was established in 1963. At that time, 1,345 acres (544 hectares) were included in the statutory boundary. No modifications to the statutory boundary have been made since that time. Of the total acreage, 35.75 acres (15 hectares) are trust fund land. See map, p 115.

Proposed Boundary Modification

The statutory boundary of a park defines the lands which have recreational and resource value adjacent to a park which DNR has authority to acquire. It is important to note that when privately owned lands are included within a statutory boundary, the landowner still has all the rights to use and sell as a landowner outside the statutory boundary. Objectives which the DNR seeks to fulfill through designation of a park's statutory boundary are as follows:

- To delineate lands which have outstanding recreation and resource value for future acquisition when funds are available and there is a willing seller.
- To provide a land base that provides for protection of the unique and valuable resources and for park developments.

Resource and recreational value of the land adjacent to the park was evaluated. It was determined that some of this land is of park quality. See map, p 119. This area is a continuation of rolling prairie hills and wetlands. The quality of the prairie appears to be identical to that in the park. These prairie hills are essentially unaltered and the only disturbance has been its use as pasture land. The addition of this acreage to the park in the future would be valuable because it would add a significant amount of high quality prairie to the state park system. The occurrence of prairie remnants within the state is rare and decreasing as prairie is lost to agriculture and other development. The opportunity to preserve and manage high quality prairie in the large tract formed by the existing prairie and future expansion is important and unique to the state. There are no farmsteads or land in agricultural production within this park quality area.



Legend

-  Trust Fund
-  DNR Forestry
-  U.S.F.W.S.

115

Ownership

Glacial Lakes State Park



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It is important to note the prairie within the park quality area has been preserved because of the excellent land use practices and wise stewardship of the current landowners. Therefore there is no immediate need to acquire this area. The recommendation is to acquire this acreage in the future when there are willing sellers and when the DNR has available funds.

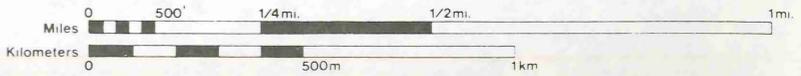
There are other lands adjacent to the park that have resource value and recreational potential. The area west of CSAH 41 has prairie and woods that are extensions of the topographic features and plant communities in the park. This area is valuable wildlife habitat and complements the park because it has wooded acreage of which the park has little.

The WPA to the south also has wildlife habitat and some recreation potential.



Legend

 Park Quality Land



OPERATIONS AND STAFFING

OPERATIONS

Maintenance is an essential responsibility of the Division of Parks and Recreation. It is a responsibility that often goes unnoticed by the park visitor in comparison with new development. 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 a year is monumental. During the busy season, full-time operations are necessary 98 hours a week (8:00 a.m. to 10:00 p.m., seven days a week). The remaining hours are covered by the resident manager. During other seasons, only part-time operations are provided 98 hours per week, however, maintenance, repair, and park security accounts for many extra work-hours. If these responsibilities are to be met, competent trained personnel are essential.

There are four basic aspects to maintenance and operations:

1. Maintenance of resources
2. Maintenance of facilities
3. Provision of services to the park visitors
4. Enforcement of rules and regulations designed to protect the park's resources and facilities

One of the major maintenance problems in recreation areas is the heavy impact of large numbers of people concentrated in specific locations. These areas include: campsites, trails, lakeshores, areas around buildings, and scenic points of interest. Foot traffic affects the ground cover and frequently exposes tree roots to damage. The eventual result may be erosion, slides, disfigured sites, and even danger to the visitors. Regular maintenance programs with adequate personnel, supplies, and equipment reduce damage thereby avoiding major reconstruction expenditures.

STAFFING

The following staffing chart summarizes the existing staff situation. No additional staffing needs are required based on the new developments and programs proposed in the plan. A park naturalist during the summer months would be a desirable additional position.

| <u>Staffing Chart</u> | <u>Total Staff</u> |
|-----------------------|--------------------|
| <u>Existing</u> | <u>Months</u> |
| 1 park manager | 12 |
| 3 student workers | 7 1/2 |
| 1 seasonal laborer | 6 |
| 2 lifeguards | 4 1/2 |

**COST
AND
PHASING
SUMMARY**

The following cost estimates were generated in June 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 implemented until land exchanges have been completed.

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|--|---------|---------|---------|---------|---------|---------|-------------|
| <u>Geology</u> | | | | | | | |
| 1 Conduct geological research to help determine the glacial history of the park. | | \$2,000 | | | | \$2,000 | |
| <u>Vegetation</u> | | | | | | | |
| 1 Implement a program of prescribed burning in the park. | \$2,000 | 2,000 | \$2,000 | \$2,000 | \$2,000 | 10,000 | ongoing |
| 2 If the prescribed burns do not bring about the conversion of old field to prairie, additional prairie restoration techniques should be undertaken. | 500 | 500 | 500 | 500 | 500 | 2,500 | ongoing |
| 3 Monitor the results of the prescribed burn program with regard to its effectiveness in controlling the encroachment of woody species. | | | | 2,000 | 2,000 | 4,000 | ongoing |
| 4 Monitor the results of the prescribed burn program with regard to its effectiveness in weed control. Supplemental hand weeding may be necessary. | | | 1,000 | 1,000 | 1,000 | 3,000 | ongoing |

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|--|-------------------------------------|---------|---------|---------|---------|---------------|-------------|
| 5 Control the occurrence and spread of buckthorn (<i>Rhamus cathartica</i>) in the park if it becomes a problem. | | | | | | | \$5,000 |
| 6 Burn a portion of the oak woods to create oak savanna. | | | | \$3,000 | | 3,000 ongoing | |
| 7 Conduct a vegetation inventory in the park. | | \$3,000 | | | | \$3,000 | |
| 8 Screen the gravel pit in the northwestern corner of the park. | \$2,000 | | | | | \$2,000 | |
| <u>Wildlife</u> | | | | | | | |
| 1 Reduce both the resident and wintering deer population in the park. | Ongoing management and coordination | | | | | 2,500 ongoing | |
| | 500 | 500 | \$ 500 | 500 | \$ 500 | | |
| 2 Establish a population of prairie chickens in the park. | | | 500 | 500 | 500 | 1,500 ongoing | |
| 3 Maintain the maximum abundance of dead standing and downed wood (snags). | No development cost | | | | | | |
| 4 Monitor the park for Natural Heritage Elements, particularly those identified in the inventory section and where found, protect the habitat. | No development cost | | | | | | |
| 5 Create open water in some of the marshes that have filled in with cattails. | No development cost | | | | | | |
| <u>Surface Water</u> | | | | | | | |
| 1 Continue to enforce a no motor use policy on Mountain Lake. | No development cost | | | | | | |

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|--------|---------|---------|---------|---------|---------|-------|-------------|
|--------|---------|---------|---------|---------|---------|-------|-------------|

| | | | | | | | |
|--|---------------------|--|--|--|--|--|--|
| 2 Install a monitoring device to monitor water levels in the park. | | | | | | | |
| | No development cost | | | | | | |

Groundwater

| | | | | | | | |
|--|---------------------|--|--|--|--|--|--|
| 1 Continue the testing of the water supply which is currently conducted by the Department of Health. | | | | | | | |
| | No development cost | | | | | | |

Fisheries

| | | | | | | | |
|--|---------------------|--|--|--|--|--|--|
| 1 The Division of Fish and Wildlife should continue to stock the lake as they determine necessary to provide family fishing. | | | | | | | |
| | No development cost | | | | | | |

History/Archaeology

| | | | | | | | |
|--|--|--|--|--|---------|----------|---------------------|
| 1 Field check all proposed development sites for the presence of prehistoric and historic artifacts before any work is begun. | | | | | | \$5,000 | \$5,000 |
| 2 Incorporate all information gained through excavation and other research regarding prehistoric and historic sites into the interpretive program. | | | | | | | No development cost |
| 3 Locate, excavate if possible, and interpret the marl pits which were located in the park. | | | | | \$3,000 | | \$ 3,000 |
| 4 Conduct an archaeological survey of the park. | | | | | | \$ 5,000 | \$ 5,000 |

Proposed Development Campground

| | | | | | | | |
|--|--|--|---------|--|---------|--|--------|
| 1 Plant intersite screening between some campsites. | | | \$5,000 | | \$5,000 | | 10,000 |
| 2 Develop a trail with steps from site A-15 to the lake. | | | 7,000 | | | | 7,000 |

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|---|------------|------------|------------|------------|------------|---------|---------------------|
| 3 Develop a fishing dock for campers' use. | \$5,000 | | | | | \$5,000 | |
| 4 Remove the existing playground equipment and construct a small play structure of natural forms and materials. | | | \$3,000 | | | 3,000 | |
| 5 Develop approximately 15 additional campsites if campground use increases and maintains the level it was in 1976, 1977, and 1978 for over one camping season. | | | | | | | |
| 6 Develop 5 of the tent sites in the campground expansion area. | 2,000 | | | | | 2,000 | |
| 7 Provide water (hand pump) at walk-in sites. | | | | \$8,000 | | 8,000 | |
| 8 Develop additional walk-in sites if use warrents. | | | | | | | \$2,500 |
| 9 Develop a dump station in the campground. | | | | 1,000 | | 1,000 | |
| <u>Group Camp</u> | | | | | | | |
| 1 Improve the group camp in the trail center parking area. | 6,000 | | | | | 6,000 | |
| 2 Provide a shelter in the trail center parking area. | | \$35,000 | | | | 35,000 | |
| <u>Picnic Areas</u> | | | | | | | |
| 1 Decrease the size of the lower picnic area by not mowing and allowing natural succession to proceed. | | | | | | | No development cost |

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|---|-----------------------|------------|------------|------------|------------|----------|-------------|
| 2 Construct a small deck overlooking Mountain Lake in the beach picnic area. | \$6,000 | | | | | \$ 6,000 | |
| 3 Monitor erosion in the picnic area, particularly between the parking lot and sanitation building. | No development cost | | | | | | |
| 4 Develop an overflow parking area for the beach picnic area if parking continues to be a problem. | | | | | | | \$5,000 |
| <u>Swimming Beach</u> | | | | | | | |
| 1 Expand the beach 30 to 35 ft (9 to 11 m). | | \$6,000 | | | | 6,000 | |
| 2 Move the dock from the swimming beach to the boat launch area. | No development cost | | | | | | |
| <u>Boat Ramp</u> | | | | | | | |
| 1 Clear the channel from the launching area to the lake. | Cost to be determined | | | | | | |
| 2 Landscape the boat ramp parking area. | | | \$ 8,000 | | | 8,000 | |
| <u>Administrative</u> | | | | | | | |
| 1 Remove the house adjacent to the park manager's residence. | No development cost | | | | | | |
| 2 Bury utility lines. | | | | \$10,000 | | 10,000 | |
| 3 Clean up the sites of the old residences in the park. | No development cost | | | | | | |
| <u>Roads</u> | | | | | | | |
| 1 Surface the road to the boat landing, beach and campground with asphalt. | | | 50,000 | | | 50,000 | |

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|--|---------|---------|---------|--|---------|----------|-------------|
| <u>Trails</u> | | | | | | | |
| 1 Develop a system of signed ski touring trails. | | | | | | \$ 6,000 | |
| 2 Modify the existing snowmobile trail alignments. | | 3,000 | | | | 3,000 | |
| 3 Modify the trail alignments when the Pope County Trails Association develops their system. A link trail into and out of the park should be developed. | | | | | | | \$4,000 |
| 4 Modify the existing horseback riding trails. | | | | Included in cost of other trails actions | | | |
| 5 Develop a hard surfaced trail which will provide access to the interpretive overlook in the northwestern part of the park. | | | | | | \$ 8,000 | \$ 1,000 |
| <u>Visitors Services</u> | | | | | | | |
| 1 Develop an area in the contact station that would orient the park visitor to the natural resources of the park and the interpretive opportunities available in the park. | | 1,000 | | | | 1,000 | |
| 2 Develop the scenic vista west of Mountain Lake as an interpretive overlook. | | | | \$1,000 | | 1,000 | |
| 3 Construct a council ring in the area southeast of the first campground loop. | | | \$1,000 | | | 1,000 | |
| 4 Develop a self-guided interpretive trail from the lower picnic area. | | 2,000 | | | | 2,000 | |

| Action | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 | Total | Conditional |
|--|---------------|---------------|---------------|---------------|---------------|----------------|---------------|
| 5 Develop a display panel in the trail center parking area. | \$1,500 | | | | | \$1,500 | |
| 6 Develop a general interpretive brochure on the park's natural resources and facilities. | | \$1,000 | | | | 1,000 | |
| 7 Develop interpretive signs which highlight outstanding features of the park at locations as determined by the regional naturalist. | 500 | 1,000 | | | | 1,500 | |
| TOTAL | 50,000 | 59,000 | 71,500 | 32,500 | 16,500 | 229,500 | 16,500 |

BIBLIOGRAPHY

Bibliography

Bray, Edmund C. 1977. Billions of Years in Minnesota, the Geological Story of the State. The Science Museum of Minnesota.

Cotter, R.D., Bidwell, L.E., VanVoast, W.A., and Novitzki, R.P. 1968. Water Resources of the Chippewa River Watershed, West-central Minnesota. U.S. Geological Survey.

General Land Office Survey Notes.

Minnesota Department of Natural Resources. 1979. Minnesota State Comprehensive Outdoor Recreation Plan. Office of Planning, Research, and Policy Section.

Minnesota Department of Transportation "Bikeway Maps."

Schwartz, George M. and George A. Thiel. 1979. Minnesota's Rocks and Waters. Minneapolis: University of Minnesota Press.

Sims, P.K. and Morey, G.B., editors. 1972. Geology of Minnesota: A Centennial Volume. Published by the Minnesota Geological Survey, University of Minnesota.

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