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Minnesota Dept - Lake Carlos State Park management



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# Lake Carlos State Park Management Plan

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# Draft

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# INTRODUCTION



## 1201 PREFACE

The primary concern in the development of the park management plan format was the identification of the "audience." For whom are these plans to be written? Eight different audiences were identified.

1. DNR reviewers of the whole planning process
2. DNR reviewers whose main concern is one specific part of the plan
3. DNR regional administrators, supervisors, and park managers
4. SPA reviewers
5. The general public
6. Special interest groups
7. Reviewers of the environmental impacts of proposed actions
8. Legislators

The requirements of each of the audiences are different. All audiences require a document which includes some technical data, but the degree of detail as well as the manner of presentation varies. Some audiences require that specific topics be discussed in detail in all phases from inventory through recommended management. Other groups require a short, non-technical, yet comprehensive and logical management plan. A plan, obviously, cannot be both technical and non-technical nor can it be both long and short. It seemed logical then to produce two documents: 1) a short, comprehensive, non-technical document for the general public ("General Park Management Plan" GPMP), and 2) a detailed, technical document for specialists ("Management Plan Detail" MPD).

This document is the General Park Management Plan. All recommendations, both resource management and physical development, are included in this document. Detailed inventory data and specific instructions necessary for implementation of the plan are not included. This information has been compiled into technical appendices, which are on file at:

Park Planning  
Department of Natural Resources  
444 Lafayette Road  
St. Paul, Minnesota 55101

## 1202 SUMMARY

A recreational state park classification is proposed for Lake Carlos State Park. This classification directs the park's development and resource management toward providing a potentially large number of people with a broad selection of outdoor recreation opportunities in a natural setting.

Vegetation and wildlife management focuses on maintaining the diversity of habitat that presently exists in the park. Implementation of a burn program for the grassland and wetland areas, maintaining an abundance of snag (dead and downed) trees, and providing plantings of known wildlife value will help to achieve this goal. Plantings in recreational development areas will attempt to preserve the resource, encourage recreational use, and maintain the park's scenic integrity.

A forestry demonstration/education area will be established in the park to demonstrate woodlot management techniques to local landowners, school groups, and park visitors. The program will be implemented by the DNR, Division of Forestry in cooperation with the DNR, Division of Parks and Recreation.

A portion of the lakeside campground (peanut row) will be closed for a 3 to 6 year rest period, during which time the area will be rehabilitated. An erosion protection plan will be developed for the lakeside campground shoreline.

Recreation management is intended to improve existing development, remove unused facilities, add new facilities where need dictates, and ensure park accessibility to special populations.

Major proposed changes to existing park development include: upgrading and improving the group camps, picnic grounds, swimming beach, ramp, and service court areas; developing the upper campground by adding electrical sites, constructing a new shower/sanitation building, and eliminating one deteriorating camping lane and adding another lane in a more suitable location; developing the lakeside campground by modifying roadways and rehabilitating the sanitation

building; adding a second boat ramp and expanding the adjacent parking lot; realignment or removal of selected park roads and parking lots; reorganizing and expansion of the trail system; and improving visitor services with the construction of a new trail/interpretive center and 3 self guided trails.

## 1203 THE PLANNING PROCESS

The variety of outstanding natural, cultural, and historical resources of Minnesota provide abundant opportunities for outdoor recreation and education. In order to ensure that present and future generations will have the opportunity to enjoy these resources, we must plan now to protect, perpetuate, and provide access to these resources. For this reason, the Minnesota Legislature passed the Outdoor Recreation Act of 1975 (ORA '75).

This act mandated that a comprehensive management plan be completed for each of the major units in the state recreation system. In the source of this planning process, each park will be classified in recognition of its resources and its role in the statewide system.

This plan sets the long range goals and objectives for resource management and recreational development which are appropriate for the park's classification. The actions that should be taken to move toward fulfilling these goals and objectives are then stated and scheduled.

The planning process consists of five steps:

1. Compilation of an inventory of natural resources and existing facilities. Task forces of specialists from other DNR divisions and sections are mobilized to assist in collecting pertinent data. At this point the first public workshop is held.
2. Identification of alternatives for park management and development. A second public workshop is held to review these alternatives and invite further public comment. These alternatives are then reviewed by the Division of Parks and Recreation.

3. Classification of park, development of park goal, and writing draft plan. This step culminates in the first interdepartmental review, followed by a 30 day public review. Within this 30 day period, the third public workshop is held.
4. Revision of the draft plan according to information received from public and interdepartmental reviews. Plan is sent to the State Planning Agency for a 60 day reviewal period.
5. Implementation of development plan by the Division of Parks and Recreation.

DEPARTMENT NATURAL RESOURCES  
Park Planning

# Office Memorandum

TO : All Individuals Interested in the Management Plan for Lake Carlos State Park

DATE: May 19, 1981

FROM : Michael Miller *Michael Miller*  
Park Planner

PHONE: 296-6079

SUBJECT: Lake Carlos State Park Draft Management Plan Review Process and Upcoming Public Information Meeting

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

Copies of this draft management plan are available for review at the Alexandria Public Library, the Alexandria Chamber of Commerce, and the Lake Carlos State Park Office. Any comments you have on the plan should be made in writing and addressed to:

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

The Outdoor Recreation Act of 1975 provides for a 30-day review period in which comments may be made by the public. During this 30-day review period a public meeting will be held in Alexandria to discuss the draft management plan. The public meeting will be held on Tuesday, June 9 at 7:30 p.m. in the Council Chambers of the Alexandria City Hall. Additional comments on the proposed management plan for Lake Carlos State Park will be received at this time.

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

MM:la



# REGIONAL ANALYSIS



## 1204 INTRODUCTION

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

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

## 1205 THE SURROUNDING AREA

### Accessibility

The accessibility of Lake Carlos to the population it serves must be evaluated when recreation programs and developments are considered. Alternative methods of transportation for park users must also be considered in light of the energy situation.

Lake Carlos State Park is located in Douglas County in west central Minnesota 10 mi (16 km) north of Alexandria, Minnesota. To the northwest are Fergus Falls (61 mi/97 km) and Moorhead (117 mi/187 km). To the southeast are St. Cloud (80 mi/128 km) and the Twin Cities metropolitan area (145 mi/232 km).

The park is accessible from the north and south on Trunk Highway 29 (TH29). Interstate 94 (I-94) is a 13 mi (21 km) south of the park, and all of the population centers mentioned above are situated along the interstate. In terms of accessibility to the park, I-94 plays an important role to Minnesotans as well as out-of-state visitors.

The dramatic increases in gasoline prices in the past two years have affected travel patterns. Many people who once travelled longer distances to recreate are now recreating much closer to home.

Camping records for the 3 year period, 1977-1979 revealed that Lake Carlos attracted one-quarter of its camping visitation from out-of-state. Thirty percent of visitation came from the Twin Cities metropolitan area, and the remaining 45 percent came from outstate Minnesota. Although some local residents camp at the park, the great majority of visitors travel substantial distances to camp at Lake Carlos. The close proximity of Lake Carlos to I-94 enhances this type of visitation.

Another potential result of higher gasoline prices is the increased use of alternative types of transportation. At the present time, a combination of unpaved shoulders and high area traffic volume make bicycle access to the park difficult. Many roads that exist between lakes are very narrow, and paved shoulders are difficult to build. This situation limits the development of formal bike trails in the area.

Public transportation is available in the form of bus lines which serve Alexandria from the Twin Cities and Fargo, North Dakota on a daily basis. These buses, however, do not stop at or near the park. Visitors traveling by bus would have to arrange some other form of transportation from Alexandria to the park.

### Population

The city of Alexandria has an estimated population of 8,200 (1980 estimate). Local residents account for about four percent of the total campers at Lake Carlos. An estimated 57,000 people live within 25 mi (40 km) of the park. Another 154,000 live between 25 and 50 mi (40-80 km). People within a 25 mi (40 km) radius make up a substantial portion of day users. Much of this is due to the fact that the only public water access on Lake Carlos is in the park. Popular day use activities at the park include picnicking, swimming, and trail related activities. The majority of camping visitors, however, travel greater distances to utilize the facilities at Lake Carlos (see the Camper Origin Map, M 4).

## Economy

The predominant land use in the Douglas County area is agricultural. The major exception to this is the town of Alexandria which, in addition to providing service to the agricultural community, supports a variety of industrial firms. Manufactured products include aircraft, coated abrasives, and machinery. The recreation industry plays a significant role in the Douglas County economy. During 1979, tourist travel expenditures (related services such as lodging, transportation, food, and beverage sales) accounted for eight percent of the total services sold within the county. The statewide average of tourist travel expenditures is three percent.

## Surrounding Land Use

The predominant land use surrounding the park is agricultural. Maple-basswood forests are intermixed among the agricultural lands.

With the city limits of Alexandria located only 10 mi (16 km) to the south, the lands surrounding the park and near the lake are an attractive area for residential development. Cabins and year-round homes occupy most of the frontage on the lake. There are two bible camps southwest of the park. One of these camps operates year around. There is a 120 acre (49 hectare) future residential area currently being developed adjacent to the southwestern corner of the park. The existing residential areas that are adjacent to the park contribute a number of walk-in visitors. This new, large development may increase the walk-in visitation to the park.

The park encompasses the northern end of the lake, and occupies about 10 percent of the total lake shoreline. The extensive residential development on the remaining 90 percent has a definite impact on the park. This impact is increased by the fact that the park has the only public boat access on the lake. In recent years, the intensity of residential development around the lake has warranted the installation of a central sewer system.

There is a 30 acre (12 hectare) type IV marsh (see Water Resources, p62) just outside of the northeastern corner of the park boundary.

Known locally as Schumacher Marsh, this wetland provides excellent wildlife habitat, especially for migrating waterfowl.

The DNR, Division of Fish and Wildlife maintains a 64 acre (26 hectare) wildlife management area adjacent to the southeastern corner of the park. This lowland-marsh area is not actively managed, but it does provide additional wildlife habitat within the Lake Carlos area.

There are several gravel pits in the Lake Carlos area. Two gravel pit areas are shown on the Surrounding<sup>Land</sup> Use Map, M | . The pit south of CSAH 38 is privately owned and operated. One portion of the pit north of the road is owned by the state, and the remainder is privately owned.

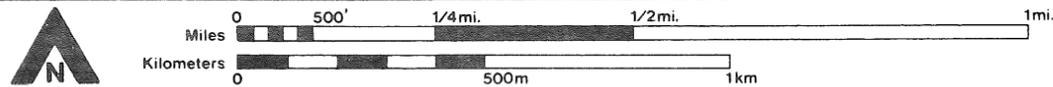
Commercial establishments within close proximity to the park are limited. A restaurant is located at the junction of TH29 and TH38. A private resort that offers boat rentals, groceries, and camping supplies is located on the lake about one-half mile west of the restaurant. Visitors pass both of these establishments as they enter the park and frequently make use of their services.

Beyond this peripheral park land use, the area surrounding Lake Carlos is used primarily for agricultural purposes. There are also numerous resort-recreational lakes to the north, west, and south of the park.

#### Cooperative Land Management

The DNR, Division of Fish and Wildlife maintains a 64 acre (26 hectare) wildlife management area adjacent to the southern boundary of the park. Carlos Lake Wildlife Management Area includes the outlet of the Long Prairie River which has its beginning at Lake Carlos. Vegetation types include aspen-brush openings on the uplands and lowland habitat along the river. The area is open to public hunting, and supports populations of ruffed grouse, deer, and wetland wildlife.

The additional habitat provided by this area increases wildlife populations within the Lake Carlos vicinity. Wildlife observation is an important component of a park visitor's total recreational experience.

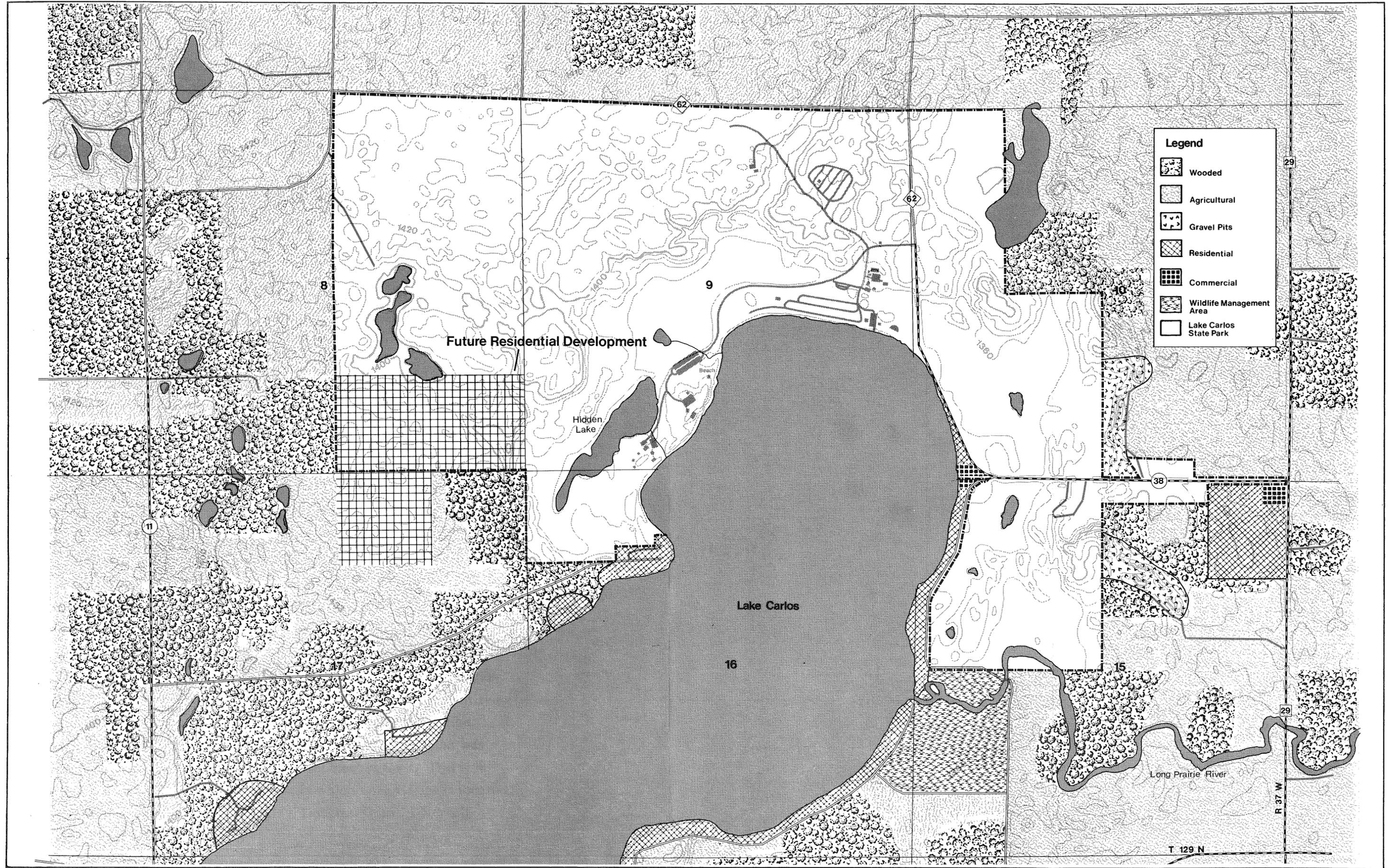


Mi.

**Lake Carlos** State Park

**Overview**





**Legend**

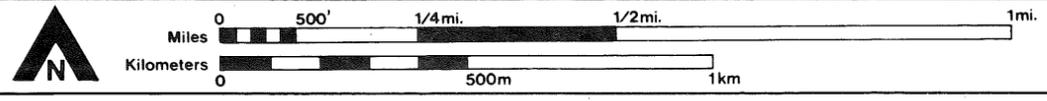
- Wooded
- Agricultural
- Gravel Pits
- Residential
- Commercial
- Wildlife Management Area
- Lake Carlos State Park

Future Residential Development

Hidden Lake

Lake Carlos

Long Prairie River



MI

Lake Carlos State Park

**Surrounding Land Use**



The Douglas Area Trail Association (DATA) was formed in 1974 to promote snowmobiling opportunities within Douglas County. Today the organization maintains 270 mi (432 km) of snowmobile trails under the state grant-in-aid program, making Douglas County one of the most organized snowmobile recreation areas in the state. There are about 2 mi (3.2 km) of the DATA trails in Lake Carlos State Park, connecting the park snowmobile trails to the county system. The DATA trail connects into the park near the southeast and northeast corners of the park boundary. Snowmobilers frequently enter and use the park trail system via the DATA trails. The picnic shelter has a wood stove and is utilized as a warming shelter during the winter by both skiers and snowmobilers. In recent years DATA has expanded its interests to bicycle and cross country skiing trails. The association now maintains 2.6 mi (4.2 km) of bicycle trails and 6 mi (9.6 km) of skiing trails in the Alexandria area, with plans for more of both in the near future.

#### 1206 RECREATIONAL FACILITY SUPPLY AND DEMAND

In the planning of Lake Carlos State Park it is important to analyze the potential interrelationship of the park with other area recreational facilities. This is necessary in order to assess the demand for particular activities and how Lake Carlos might function to fill this demand.

The inventory of recreational facilities was done using either a 25 mi (40 km) or 50 mi (80 km) radius. This was the form in which data was available. The determining factor was willingness to travel. The following mileage figures on an individual's willingness to travel to make use of a recreational facility came from information collected by the DNR in preparation of the State Comprehensive Outdoor Recreation Plan (SCORP '79). SCORP '79 is a four year study which is identifying recreation patterns and activity preferences on state and region levels. The study is continually updated. SCORP information was collected on the basis of economic development regions. There are 13 regions in the state. Region 4, in which Lake Carlos is located, includes the counties of Becker, Clay, Douglas, Grant, Ottertail, Pope, Stevens, and Wilkin.

## Willingness to Travel

<u>Activity</u>	<u>Distance willing to travel to participate (non-metro Minnesotans)</u>	
Camping	76 miles	123 km
Picnicking	32 miles	52 km
Hiking	31 miles	50 km
Swimming	16 miles	26 km
Bicycling	14 miles	23 km
Horseback Riding	22 miles	36 km
Ski Touring	32 miles	52 km
Snowmobiling	43 miles	69 km

SCORP '79 has ranked the following recreational activities according to Minnesotans' desire for more opportunities to do them.

## Preferred Recreational Activities

### 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

#### Region 4 Residents

1. Hunting
2. Ski Touring
3. Snowmobiling





The 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 accommodate. City and county parks in the vicinity of a state park may also have campsites. However, some people will consistently travel to a state park because of the type of experience it offers, namely, camping in a natural setting augmented by other recreational opportunities such as hiking, wildlife observation, and historical interpretation. While camping facilities may be duplicated elsewhere, the total activity experience is not.

### Camping

There are 176 campgrounds within a 25 mi (40 km) radius of Lake Carlos (including Lake Carlos State Park). Privately owned campgrounds provide 88 percent of the total campsites available in this area.

The following is a summary of the number of campgrounds and campsites.

<u>Type of Facility</u>	<u>Number of Campgrounds</u>	<u>Number of Campsites</u>
State Park	1	146
County Park	---	---
City Park	1	10
Private – Group (church, scouts)	2	55
Private – Individual (resorts, campgrounds)	<u>172</u>	<u>1566</u>
Total	176	1777

Camping is an increasingly popular outdoor activity in Minnesota. According to SCORP '79, 10 year projections (1980–90) predict a 9.4 percent increase in camping occasions statewide and a 6.7 percent increase in Region 4 (where Lake Carlos is located).

SCORP figures for 1978 show that people living in Region 4 account for 3.4 percent of the total camping population in Minnesota. As a camping destination, Region 4 receives 6.8 percent of the total camping which occurs in the state. The majority of the people who camp in Region 4 come from Region 4 (39 percent), Region 11 – the metro area (30 percent), Region 8 in the southwestern corner of the state (11 percent), and Region 6W (7 percent), located just south of Region 4 (see Regional Development Commission Map, M 2).

The future demand for camping facilities is expected to grow. The lakeside campground at Lake Carlos is frequently filled to capacity during June, July, and August. The upper campground is not as intensively used. As camping demand increases, the upper campground may become more heavily used. There are a sufficient number of sites available in the upper campground to handle a significant increase in camping attendance.

There are 172 private resorts and campgrounds with 1566 campsites within a 25 mi (40 km) radius of the park. This abundance of private facilities will alleviate any increased camping pressure in the area.

### Picnicking

There are a number of places to picnic within a 25 mi (40 km) radius of Lake Carlos, the majority of these being city parks. The following chart summarizes these facilities.

<u>Type of Facility</u>	<u>Number of Parks</u>	<u>Number of Picnic Tables</u>
State Parks	1	84
Dept. of Transportation	5	15
County	3	30
City	<u>26</u>	<u>259</u>
Total	35	388

### Swimming

The abundant lakes in Douglas County provide ample natural swimming opportunities. Numerous swimming beaches with sandy beaches

and clean water attract many visitors to the area. Because of the abundance of natural swimming areas, there are only two pools within a 25 mi (40 km) radius of Lake Carlos. The following chart summarizes the natural swimming beaches in the area.

<u>Type of Facility</u>	<u>Number of Beaches</u>
State Park	1
City Park	5
Township Park	1
Resorts	<u>137</u>
Total	144

### Trail Opportunities

There are no other state parks within a 25 mi (40 km) radius of Lake Carlos. The park has a total of 20 mi (32 km) of trails. The majority of these miles are used for more than one activity.

<u>Activity</u>	<u>Trail Miles</u>
Hiking/Interpretive	9 mi 14 km
Horseback Riding	3 mi 5 km
Ski Touring	3 mi 5 km
Snowmobiling	8 mi 13 km

The DNR manages 2 mi (3.2 km) of hiking trail at Inspiration Peak State Wayside, about 15 mi (24 km) northwest of the park. The Douglas Area Trail Association (DATA) sponsors 270 mi (432 km) of grant-in-aid snowmobile trails throughout the county. DATA also maintains a 6 mi (9.6 km) grant-in-aid ski touring trail approximately 18 mi (29 km) south of Alexandria. DATA plans to develop two additional grant-in-aid ski trails in the near future. All three of these ski trails are administered by the county.

There are 5 additional county trails and 2 municipal trails within a 25 mi (40 km) radius of Lake Carlos. Within the same distance, several private resorts and campgrounds provide 46 mi (74 km) of diversified trail opportunities. These are basically shorter trails which provide trail opportunities of a general nature.

Douglas County has traditionally been a popular snowmobiling area. The well coordinated Douglas Area Trail Association has helped to promote snowmobiling in this popular resort recreation region. Snowmobile trail use remains popular with 10 year projections indicating a steady 8 percent increase statewide and a 4 percent increase in occasions for Region 4.

The demand for ski touring has grown rapidly in recent years. According to Chamber of Commerce officials, commercial recreation establishments in Region 4 are recognizing the potential influx of tourism revenue via the cross-country skiing public. Ten year projections (1980-90) indicate a 10.3 percent increase in ski touring statewide. Ski touring occasions in Region 4 are expected to steadily increase 6 percent over the next ten years.

Hiking is a much more dispersed kind of activity which can occur in a variety of areas. Unlike some activities such as snowmobiling or ski touring, hiking requires no special equipment and can be participated in by almost everyone.

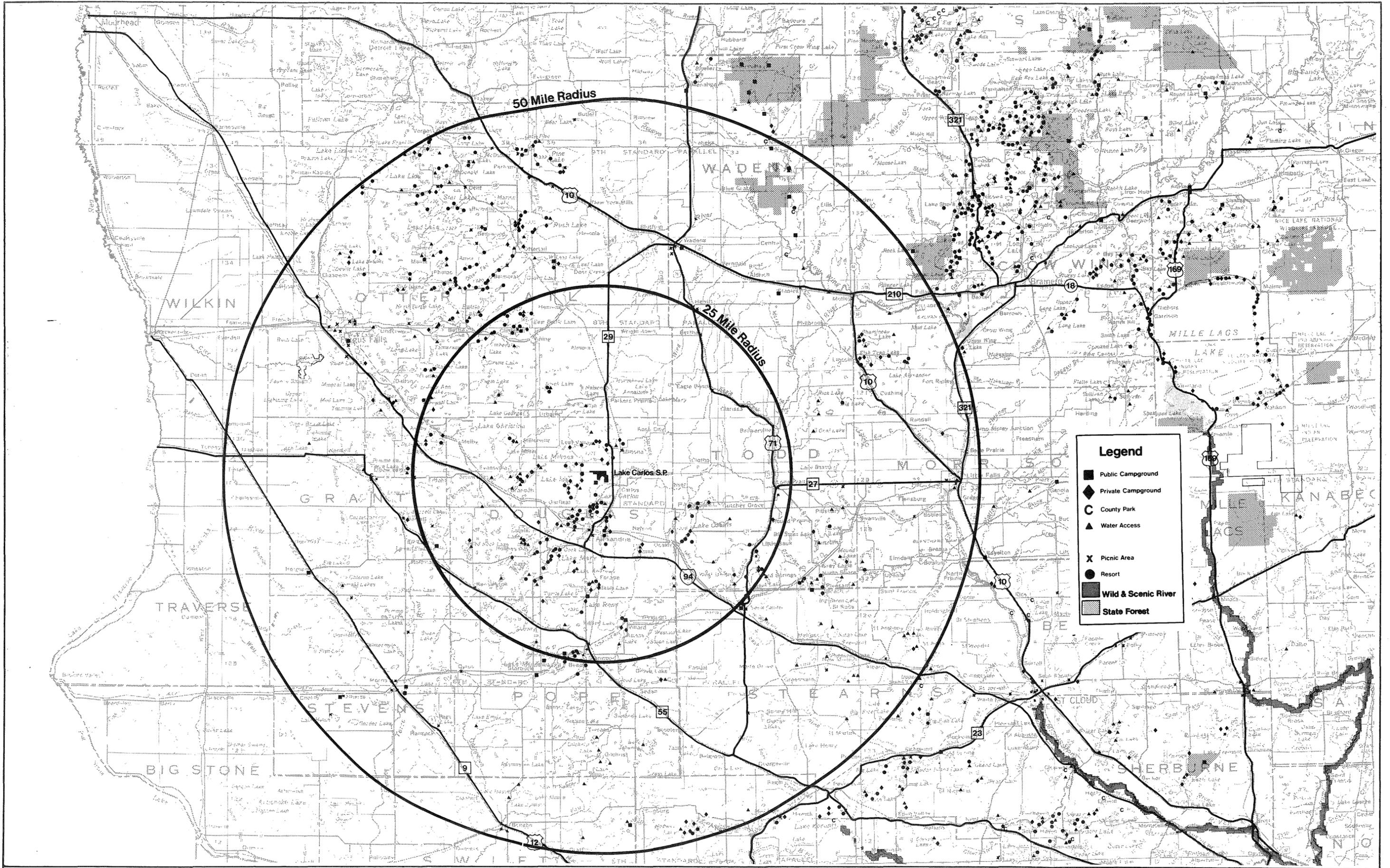
### Bicycling

The 1978 Douglas County Recreation Plan outlined three proposed bicycle trails in the Alexandria area. The Douglas County Highway Department has established one of these trails and another is planned for implementation during the summer of 1981. These state funded bike trails consist of 5 foot paved shoulders along existing roadways that are signed and striped.

The current trail is 2.6 mi (4 km) long and runs along Douglas Co 90 and CSAH 82 from Alexandria west to the beaches at Latoka and Brophy Lakes. The newer trail will run from Alexandria northeast to Lake Le Homme Dieu via MN 29. The third trail would run between Lakes Le Homme Dieu and Carlos, however implementation of this trail is questionable because the narrow width of the road between the lakes makes the addition of a paved shoulder difficult. These trails are maintained by the County Highway Department and advertised by the Douglas Area Trail Association.

Establishing bicycle trails along existing highways in this recreational lake area is difficult because of several complications (see Accessibility, p 8). Because of the lack of safe bicycle access to the park, cycling trips to Lake Carlos can be expected to increase only slightly. If the current problems are improved enough to establish a bicycle route to the park, cycling trips to Lake Carlos can be expected to increase.





M3

Lake Carlos State Park

Regional Analysis



THE  
PARK  
USER



## 1207 INTRODUCTION

Lake Carlos State Park offers a wide variety of recreational activities including camping, picnicking, and several different trail use activities. Many visitors are attracted to Lake Carlos because of the abundance of water-based activities which include fishing, swimming, canoeing, and sailing. These opportunities draw both day and overnight users to the park.

### DAY USERS

Over the past decade, day users have accounted for approximately 60 percent of the total visitation to Lake Carlos. Because the only public water access on Lake Carlos is the boat ramp in the park, a substantial portion of day users are local residents seeking access to the lake. Other day users come to enjoy the wide variety of short-term recreational opportunities such as picnicking, swimming, and year-round trails.

### OVERNIGHT USERS

Over the past decade, overnight visitors to both the campground and the structured group camp have accounted for 40 percent of total park visitation. This is an unusually high percentage of overnight use.

The campgrounds accommodate a wide variety of users, including tent campers, camper-trailers, and motor homes. Electrical hookups are available in the lakeside campground.

The structured group camp can serve up to 60 visitors at one time. There are 2 barracks, a staff quarters, a crafts building, kitchen, mess hall, and a toilet building with showers. The group camp is available during the summer only and receives use from many different groups including family reunions, youth and church groups, and miscellaneous adult groups. Approximately two-thirds of these groups are from the west central Minnesota area, the remaining third travel from the Twin Cities.

During June, local residents sponsor an annual "Horseman's Holiday" which attracts about 200 riders from Minnesota and neighboring states. This event is held in the north central area of the park adjacent to the primitive group camp.

### Camper Profile

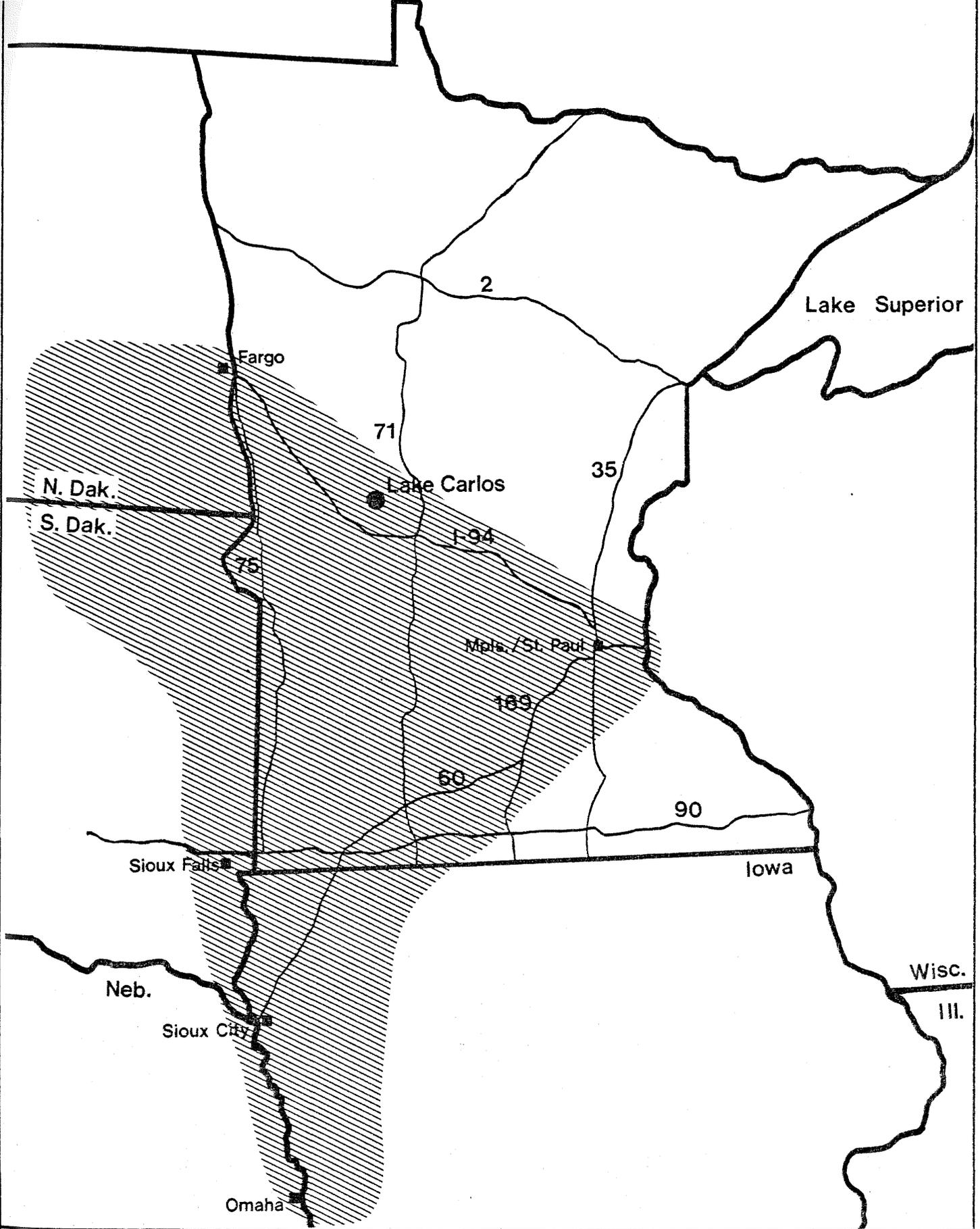
Camper registration cards are completed for each campsite which is used. Information on this card includes camper name and address, number in party, length of stay, and dates the campsite was used. A sampling of these cards for the three year period, 1977-79, revealed the following.

### Camper Origins

<u>Origin</u>	<u>Percent</u>	
Minnesota	74.7	
Out-of-State	25.3	Largest out-of-state percentages
		Iowa 7.2
		South Dakota 3.4
		North Dakota 3.1
		Illinois 3.1

A Camper Origins Map (M 4) was prepared to show the home residence of those who camp at Lake Carlos. Seventy-six percent of all camping parties in the park came from within the shaded zone (see map). This shaded zone covers portions of Minnesota, North and South Dakota, and Iowa. Some camping parties from each of these states did originate outside the shaded zone. However, the zone represents those areas from which the vast majority of campers originated.

Large urban areas such as Minneapolis/St. Paul, Fargo/Moorhead, Sioux Falls, Sioux City, and Omaha/Council Bluffs accounted for significant numbers of campers at Lake Carlos. The seven county metro area including Minneapolis/St. Paul accounted for thirty percent of all camping parties in the park.

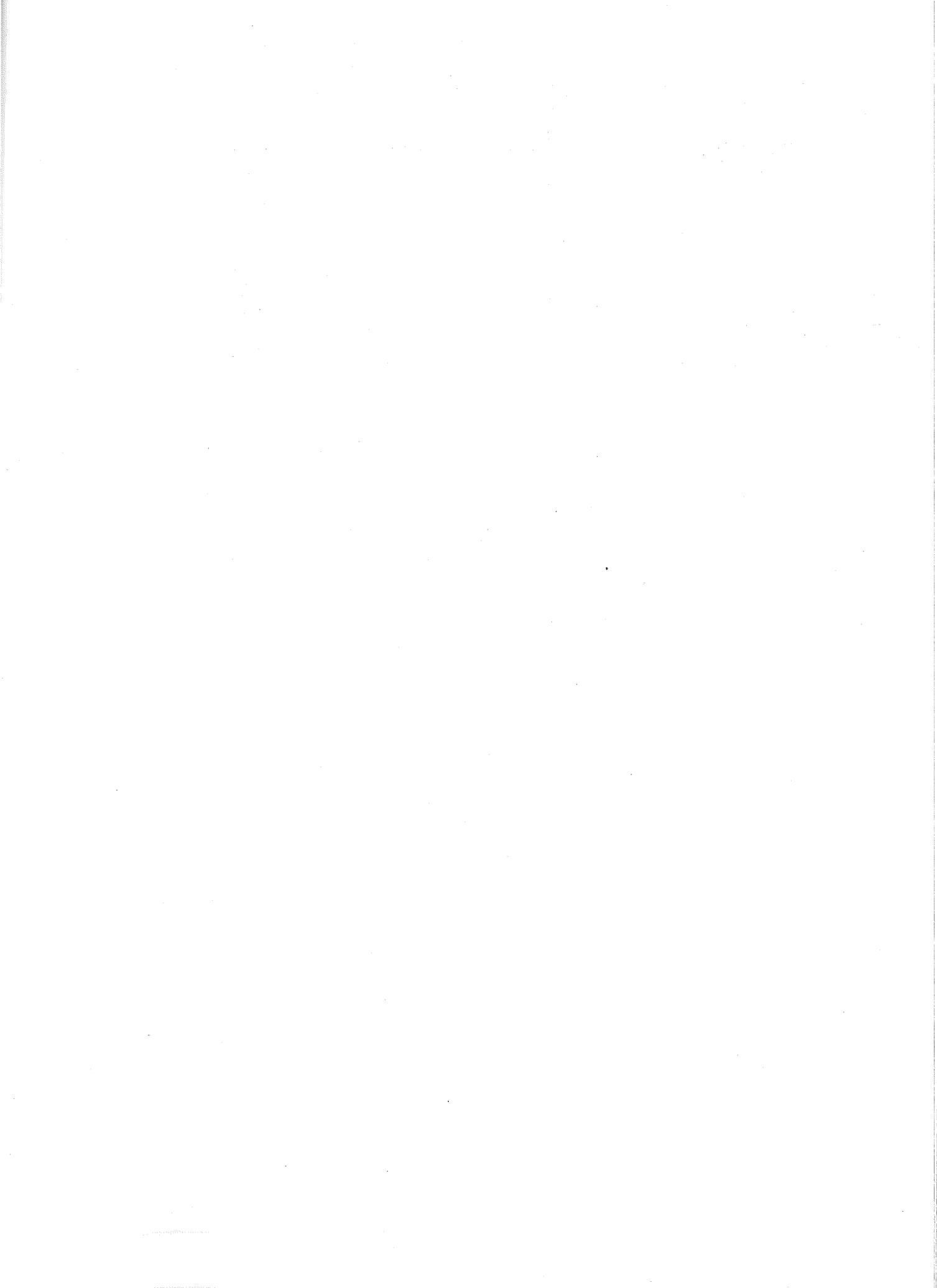


M4



Lake Carlos State Park

Camper Origins



## Camping Seasons

Each of these percentages represents the percent of camping parties for the total three year period, 1977-79, which camped at Lake Carlos during a particular month.

April	.2%
May	7.6%
June	23.5%
July	31.8%
August	27.8%
September	7.8%
October	.9%

As is the case with most of Minnesota's state parks, the vast majority of camping occasions occurred during June, July, and August. These percentages demonstrate the need for hiring additional staff on a seasonal basis to maintain facilities used by campers.

## Number in Camping Party

<u>Number in Party</u>	<u>Percent of Total Camping Parties</u>
1	2.2%
2	40.8%
3	11.2%
4	22.6%
5	14.3%
6	5.4%
More than 6	3.2%

Nearly 46 percent of the camping parties in Lake Carlos are made up of 4 or more people. If a campsite receives regular use throughout the summer, the result is a large number of people using a very small piece of land. High use of a campsite can cause soil compaction or erosion and damage to or loss of vegetation. Sites which receive a considerable amount of use should be monitored by park staff for such damage and appropriate action taken when necessary.



# CLASSIFICATION



## 1208 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 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 state recreation system can be identified as one (or more) component in the system. These components are: natural state park; recreational state park; state trail; state scientific and natural area; state wilderness area; state forest and state forest sub-area; state wildlife management area; state water access site; state wild, scenic, and recreational rivers; state historic site; and state rest area. Included in this 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.

## 2201 THE BIOCULTURAL REGION SYSTEM

The biocultural 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 biocultural region system is a framework which provides information valuable in the planning of Minnesota's state parks.

Lake Carlos State Park is located in the Leaf Hills Biocultural Region (see Biocultural Region Map, M 5 ). This region encompasses 2,750,000 acres (1,100,000 hectares) or about 5.1 percent of the state.

Steeply rolling terrain and abundant lakes characterize this region. The area includes the northern portion of the Alexandria moraine complex, a broad terminal moraine left by the last advance of Wisconsin glaciation. Big Woods vegetation dominates the region with maple-basswood forests and aspen-oak openings. Brush prairie openings are common along the western portion of the region. Presettlement vegetation of Douglas County included all three vegetative types, with brush prairie more common in the southern and western portions of the county.

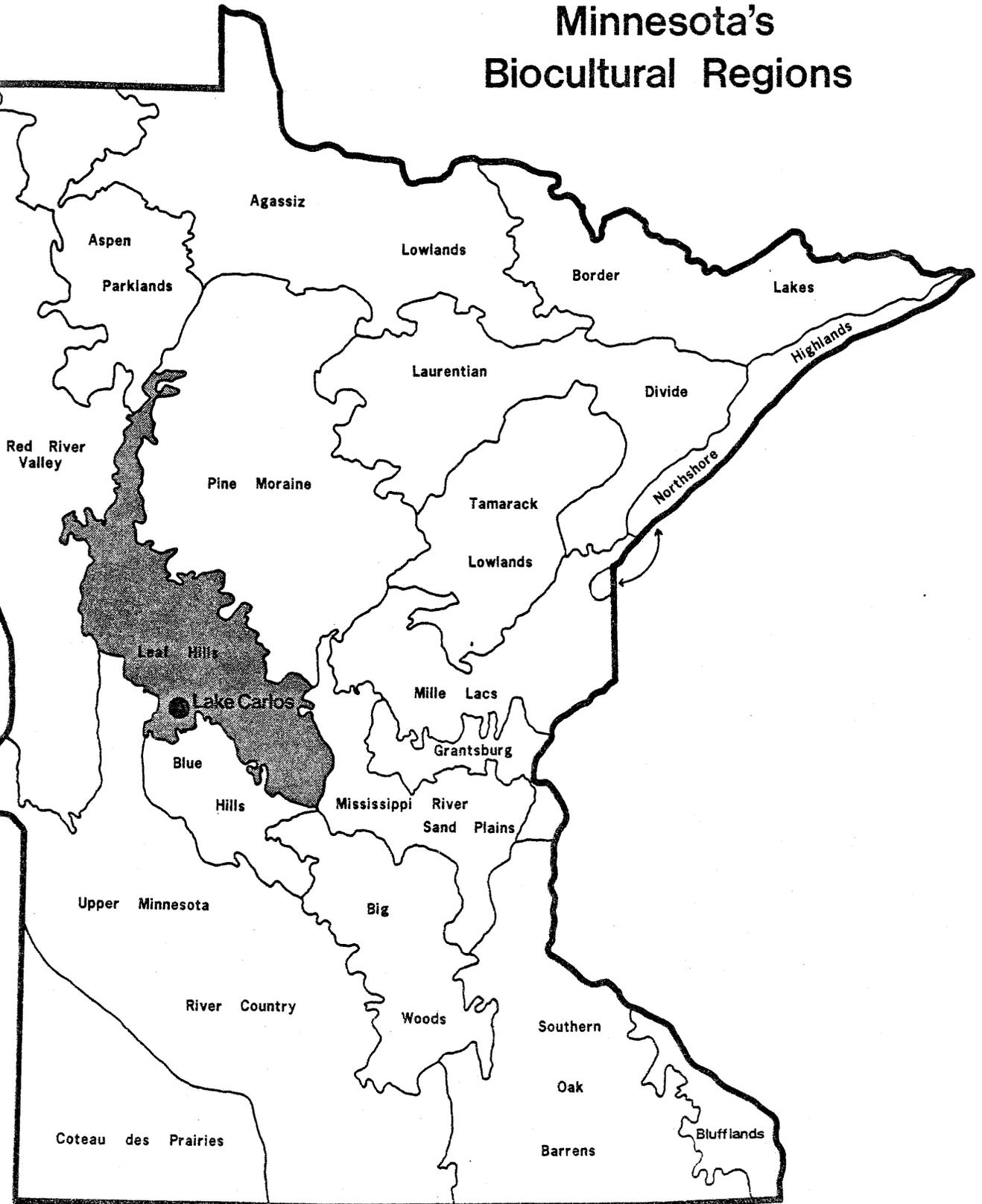
The Leaf Hills Biocultural Region encompasses an intensively used resort-recreation area. The popularity of this scenic rural area is attributable to the abundant lakes and their accessibility from population centers.

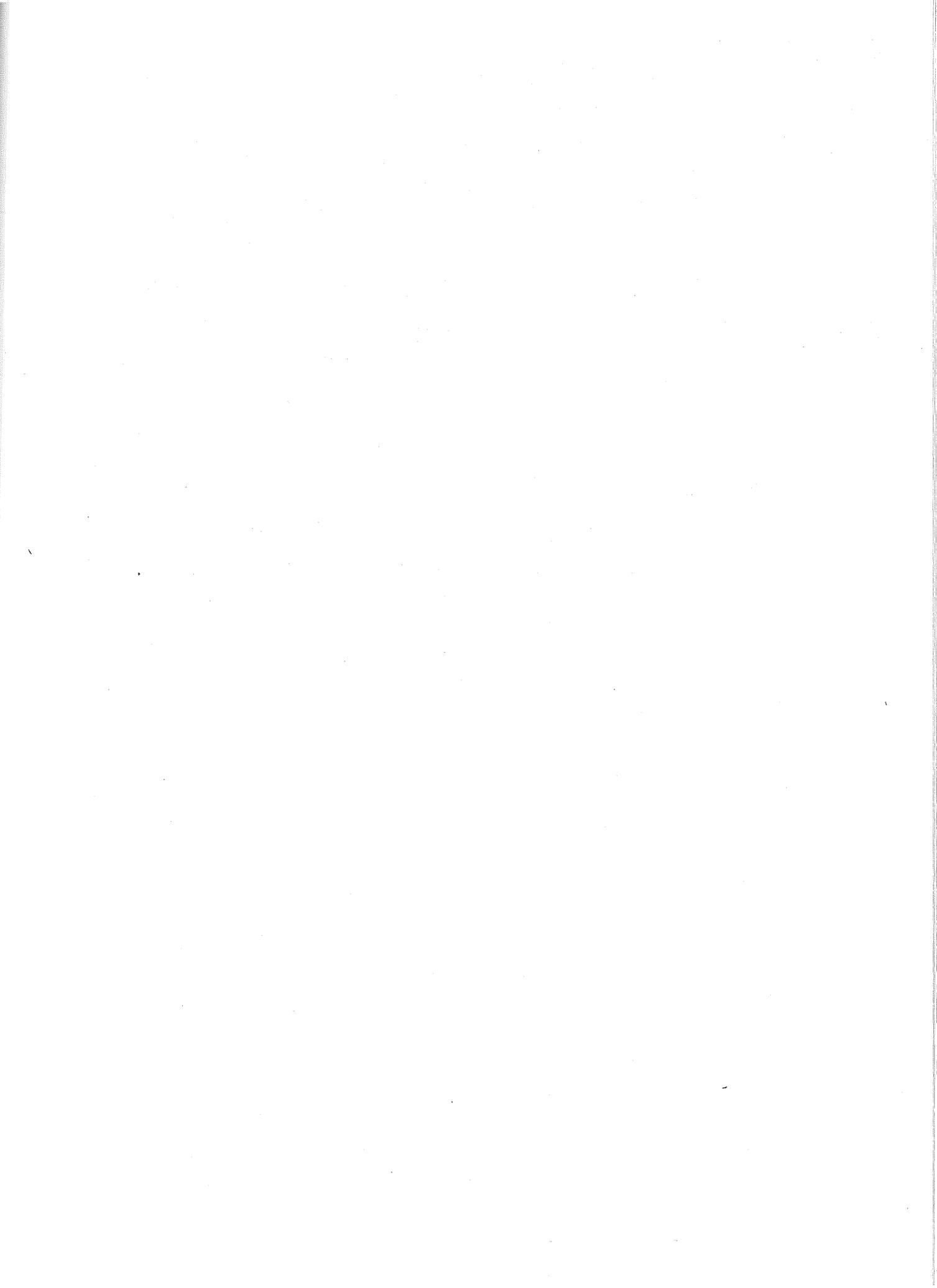
#### CLASSIFICATION PROCESS

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 Lake Carlos State Park were recreational state park or natural state park.

# Minnesota's Biocultural Regions





The criteria in ORA '75 for a natural state park are as follows:

1. Exemplifies the natural characteristics of the major landscape (biocultural) region of the state, as shown by accepted classification, in an essentially unspoiled or restored condition or in a condition that will permit restoration in the foreseeable future; or contains essentially unspoiled natural resources of sufficient extent and importance to meaningfully contribute to the broad illustration of the state's natural phenomena;

Lake Carlos is located in the Leaf Hills Biocultural Region. The majority of the park is a good example of the maple-basswood forest that was characteristic of the area prior to European settlement. It also exemplifies several of the surrounding communities that influence the Lake Carlos vicinity (see Vegetation Pre-European Settlement Vegetation, p34). The park typifies the rolling terrain of the Alexandria moraine complex. All of these characteristics, however, are exemplified on a much larger scale at Maplewood State Park, which is situated about 50 mi (80 km) northwest of Lake Carlos.

The portions of the park that have been significantly altered are the old field (OF), agricultural (AG), and recreational development (Rec) areas (see Vegetation Map and Code, p36), which constitute about 25 percent of the total park area. Most of the old field (OF) areas were cleared of the hardwood forests for cropland, and the agricultural (AG) areas are currently planted annually with small grains. The recreational development areas support intensive recreation during the summer months.

2. Contains natural resources, sufficiently diverse and interesting to attract people from throughout the state;

Although the park contains a rich diversity of natural resources, the majority of visitors are attracted to Lake Carlos State Park by the water-based recreational opportunities that the lake provides. Extensive park development along the lakeshore (campground, swimming beach, picnic area, and group camp) makes this park a very appealing recreation area. The main lakeside campground is the primary attraction

at this park. Fishing, speed-boating, waterskiing, canoeing, swimming, and sailing are among the most popular summer activities at Lake Carlos State Park.

3. Is sufficiently large to permit protection of the plant and animal life and other natural resources which give the park its qualities and provide for a broad range of opportunities for human enjoyment of these qualities;

Lake Carlos State Park encompasses 1,250 acres (500 hectares). There is a diversity of habitat and consequently abundant wildlife. Visitors have a wide variety of outdoor activities to choose from. Many of these activities are possible because of the park's abundant shoreline access to Lake Carlos.

The criteria in ORA '75 for a recreational state park are as follows:

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

The diversity and quality of outdoor recreational opportunities at Lake Carlos attract the majority of present visitation from significant distances. The natural resources enhance the desire to travel to Lake Carlos. The majority of camping visitors travel from large urban areas such as Minneapolis/St. Paul, Fargo/Moorhead, Sioux City, and Omaha/Council Bluffs.

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

Historically, Lake Carlos has been very heavily used for recreational activities. Summer activities center around the intensively used lakeside campground and the water-based recreational opportunities of the lake. During the winter, one of the largest snowmobile trail systems in the state (provided by the Douglas Area Trail Association) passes through the park. Both snowmobiling and ski touring are popular winter activities.

Much of the park contains resources which can be used by large numbers of people without undue disruption of these resources. Areas that are sensitive should be avoided or developed so that disruption is minimized.

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

Lake Carlos is situated in a resort-recreation area that has several public and private recreational facilities. Within a 25 mi (40 km) radius of the park there are no other state parks. There are, however, 3 county parks and 13 municipal parks. Lake Carlos is the only facility which accommodates a variety of recreational activities in a natural setting. The others are typical of city and county parks providing such things as picnic tables, playgrounds, and, in some cases a swimming beach. None of these parks provides the kind of water-based recreational opportunities that Lake Carlos does, supplemented by a campground and picnic ground.

#### RECOMMENDED CLASSIFICATION

A recreational state park classification is recommended for Lake Carlos State Park.

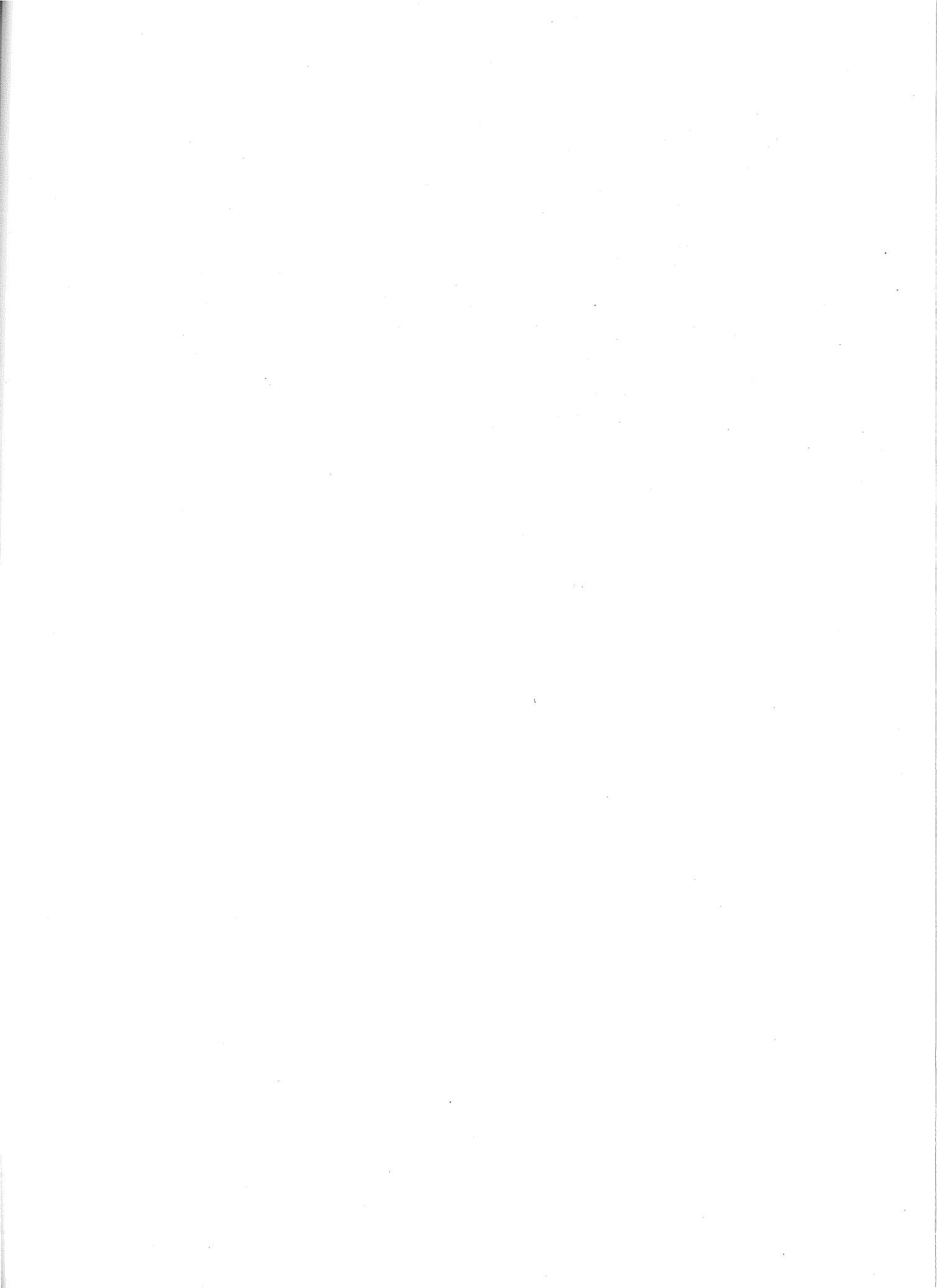
There are two state parks in the Leaf Hills Biocultural Region: Maplewood and Lake Carlos. The 1978 management plan for Maplewood State Park designated Maplewood as a natural state park. Both Maplewood and Lake Carlos are representative of the Leaf Hills Biocultural Region, however Maplewood is much larger (9,000 acres/3,600 hectares). Lake Carlos has a higher visitation and more intense recreational usage than Maplewood. Designating Lake Carlos as a recreational state park would provide complementary recreational facilities within this biocultural region. Although under certain circumstances Lake Carlos could be considered for either classification, the intensive use it receives combined with its geographical and biocultural relationship to Maplewood State Park makes the recreational classification the best alternative.

## GOAL FOR THE PARK

The goal for Lake Carlos State Park follows the overall goal for recreational state parks as stated in the Outdoor Recreation Act of 1975 (ORA '75):

"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."

# PARK RESOURCES



## 2202 CLIMATE

Average summer temperatures in Minnesota vary only a few degrees from north to south. The only major exception to this is the North Shore of Lake Superior where the temperatures can vary from 10 to 15 degrees Fahrenheit ( $5.5^{\circ}$  to  $8^{\circ}$  C) cooler than southern Minnesota. Temperatures for the month of July in the Lake Carlos area vary from an average high of  $84^{\circ}$ F ( $29^{\circ}$ C) to an average low of  $60^{\circ}$ F ( $16^{\circ}$ C).

During the winter there is much broader variation in average temperatures. Temperatures for the month of January in the Lake Carlos area vary from an average high of  $16^{\circ}$ F ( $-9^{\circ}$ C) to an average low of  $-2^{\circ}$ F ( $-19^{\circ}$ C). By comparison, average highs and lows during the same period in selected areas of northern and southern Minnesota are shown below.

	<u>High</u>	<u>Low</u>
Thief River Falls	$12^{\circ}$ F ( $-11^{\circ}$ C)	$-10^{\circ}$ F ( $-24^{\circ}$ C)
Duluth	$20^{\circ}$ F ( $-7^{\circ}$ C)	$0^{\circ}$ F ( $-18^{\circ}$ C)
Lake Carlos area	$16^{\circ}$ F ( $-9^{\circ}$ C)	$-2^{\circ}$ F ( $-19^{\circ}$ C)
Rochester	$24^{\circ}$ F ( $-4^{\circ}$ C)	$4^{\circ}$ F ( $-16^{\circ}$ C)

Information on annual precipitation in the Lake Carlos area comes from a weather recording station in Alexandria. There the total annual precipitation (rain and snow) is about 24 in (60 cm). During the winter of 1977-78, snowfall in Douglas County was about 40 to 50 in (100-125 cm). This amount of snowcover, which is average or slightly above for the Lake Carlos area, represents an adequate snowcover for winter recreational activities such as snowmobiling and ski touring.

## 2203 GEOLOGY

The landforms of Douglas County are the result of glacial activity. It is estimated that the last glacial advance occurred about 10,000 years ago. Lake Carlos State Park is situated in the Alexandria Moraine complex, which was formed by the Wadena lobe of Wisconsin glaciation. Hills rising to heights of 50-100 ft (15-45 m) are typical of the area's glacial moraine topography.

Clearly stratified layers of gravel, sand, and clay outwash record the gradual filling of a preglacial valley which lies in a north/south orientation. Included in the valley is a chain of four lakes: Carlos, Darling, Cowdry, and Latoka. As the glaciers retreated, stagnant ice blocks were left by the main ice mass. Usually these ice blocks were partially or completely buried in glacial debris. As the ice blocks melted, they filled the basin with meltwater, forming lakes.

The outwash drift in the Lake Carlos area is primarily sand and gravel, and is commonly 20–40 ft (6–12 m) thick. Other portions of Douglas County are covered by deeper deposits of moraine (200–400 ft/60–120 m) and till plain (150–250 ft/45–75 m) drift. The drift is underlain by a bedrock of Precambrian granite, gneiss, and schist of unknown thickness. There are no rock outcrops in the county.

#### 2204 SOILS

There is a variety of soil types in Lake Carlos State Park. Roughly two-thirds of the park is covered by Nebish loams and Nebish sandy loams interspersed with marsh. These types cover the majority of the western half of the park. The Nebish series is comprised of deep, well-drained soils that were formed under hardwood forests in calcareous loamy glacial till. Significant characteristics of this series include medium natural fertility, medium to high available water capacity, and moderate permeability. One of the more common soils in the area, the Nebish series supports crops, woodland, and pastures. Nebish soils occur on morainic uplands, with slopes varying from 2 percent to 18 percent. As the degree of slope increases, erosion hazard becomes more severe, and recreational development becomes less desirable (see Soil Limitations Map, M 6 ). The majority of existing and proposed development is located on Nebish soils. The major exception to this is the lakeside campground, which is located on a lake beach (La) soil.

Perhaps the most intensively used area in the park is the campground along the north shore of the lake. Its 86 campsites are located on a sandy beach soil. The water table is near the surface in these

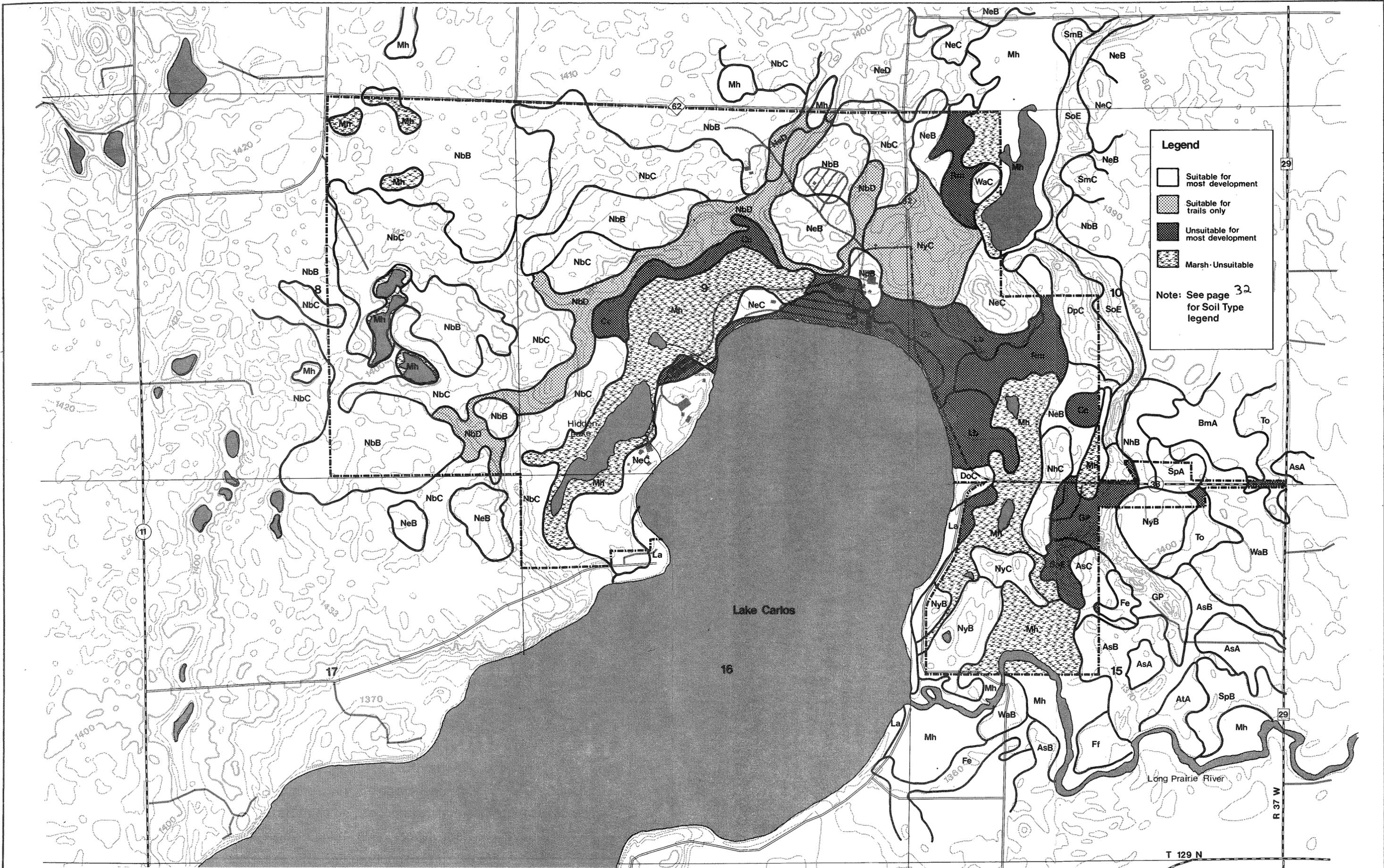
soils, and drainage is poor to excessively poor. There are severe soil limitations for development on sandy beach soils, however on most lakes, cabins and campsites are built on them.

Soils of the Nymore series are found in the eastern half of the park. Nymore soils are characteristically deep, sandy, and well-drained. Existing and planned development on these soils is limited to trail use. Both Cathro muck and Rifle mucky peat also occur in the eastern half of the park. These poorly-drained soils are flooded most of the year, and they are well suited for wildlife habitat. Soils of the Dorset-Sioux association are sand and gravel sources for Douglas County. There are gravel pits near the park entrance road outside the park boundary. The soil types in which these gravel pits are located extend into the park.

Arvilla, Dassel, Foroda, Sverdrup, Tonka, and Waukon loams and sandy loams make up the remainder of soils within the park.

2205 Soils Legend

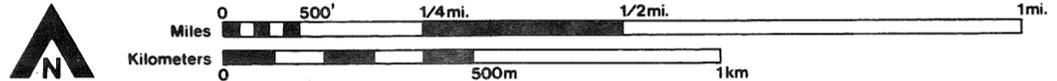
AsB	-	Arvilla
AsC	-	Arvilla
Cc	-	Cathro muck
De	-	Dassel (depressional)
DoC	-	Dorset
DpC	-	Dorset, thick solum
Fe	-	Forada
La	-	Lake beach - sandy
Lb	-	Lake beach - loamy
NbB	-	Nebish sandy loam - 2-6% slope
NbC	-	Nebish sandy loam - 6-12% slope
NbD	-	Nebish sandy loam - 12-18% slope
NeB	-	Nebish loam - 2-6% slope
NeC	-	Nebish loam - 6-12% slope
NeD	-	Nebish loam - 12-18% slope
NhC	-	Nebish-Dorset complex
NyB	-	Nymore - 2-6% slope
NyC	-	Nymore - 6-18% slope
Rm	-	Rifle mucky peat
SoE	-	Sioux
SpA	-	Sverdrup
To	-	Tonka
WaC	-	Waukon



**Legend**

- Suitable for most development
- Suitable for trails only
- Unsuitable for most development
- Marsh - Unsuitable

Note: See page 32 for Soil Type legend





### Vegetation

#### Pre-European Settlement Vegetation

Since the last glacier retreated about 10,000 years ago, various soil, climate, topographic conditions, and disturbance factors such as fire and flooding have influenced plant community succession. Since settlement times vegetation succession has been further altered by suppression of wildfires and draining. It is important to note that although a plant community may appear to be stable at any given point in time, it is continuously changing.

Lake Carlos State Park is situated in a deciduous forest transition zone between grassland prairies to the southwest and conifer forests to the northeast. Extensive prairies that began just south of Alexandria covered the southwestern portion of the state. Conifer forests that covered northeastern Minnesota began near Staples about 40 mi (64 km) northeast of the park. The deciduous corridor is approximately 25 to 45 mi (40 to 72 km) wide in the Lake Carlos area and is highly influenced by its neighboring vegetation types. Small pockets characteristic of the prairie or conifer forest can be found within this deciduous forest transition corridor. Intermixed vegetation in such a situation has been referred to as a "tension zone." (Curtis, 1959)

The existing vegetation within Lake Carlos State Park is very similar to what was present during presettlement times. The Nebish soils that cover the western two-thirds of the park are finely textured, loamy soils that were formed under hardwood forests. The mesic (moderately moist) deciduous forests known as the "big woods" have probably covered this portion of the park for several centuries. The exception to this is the old field (OF) area in the northwest corner of the park which may have been cleared for cultivation at the time of settlement. The original surveyor's notes from this area (circa 1857) indicate the vegetation to be predominantly basswood-oak-aspen forest with areas of tamarack or sugar maple. Even though the shade tolerant sugar maple competes with the predominant basswoods, the basswoods have maintained themselves over the years via their vegetative reproduction habits.

Prior to the establishment of the park, much of the present park land was used for agricultural purposes. The majority of northern hardwoods (NH) and oak (O) areas were used for grazing, however these areas are recovering very well from the disturbance. An example of an undisturbed northern hardwoods area can be found directly south and southwest of Hidden Lake. Development in this area should be kept at a minimum. See Management Areas Map, M 8, for further discussion.

The generally wetter eastern third of the park is underlain by soils that were formed under grasses and lowland brush (LB) areas. The original surveyor's notes indicate that this area was much as it is today, although chances are that much of the area has grown over due to fire suppression.

A mixture of vegetation types occurred within close proximity of the park. Marshner (1930) identified a large pocket of aspen-oak brushland between lakes Carlos and Milona. This young, fire-maintained forest type was common within the prairie-forest transition zone. Pockets of conifer bogs began as close as 5 mi (8 km) north of the park. Parcels of wet prairie were abundant throughout the transition zone. From an 1855 township survey, Trygg (1963) identified a 2 sq mi (5 sq km) prairie less than 1 mi (1.6 km) southeast of the park. The rich vegetative diversity which surrounds and influences the park's successional direction provides a background for understanding the forest composition that exists today.

#### Present Vegetation

Present day vegetation at Lake Carlos is a rich diversity of plant communities that are related not only to the maple-basswood "big woods" forest, but oak-aspen brushland as well. The location of Lake Carlos State Park within the deciduous forest transition-tension zone makes it a unique area that contains a variety of plant community types. The following description of plant communities and present day land use was compiled from field surveys conducted during spring 1980 and early winter 1981.

- A Aspen. This medium aged aspen stand is dominated by bigtooth aspen (Populus grandidentata) and trembling aspen (Populus tremuloides) that average 5" dbh (diameter at breast height). The rolling mesic terrain becomes more wet-mesic in the lower areas, where green ash (Fraxinus pennsylvanica) of about the same average diameter become more apparent. The understory consists of prickly ash (Xanthoxylum americanum) and small ironwood (Ostrya virginiana). Sumac (Rhus spp.) becomes apparent near the open edges of this community.
- AG Agricultural. These land areas are being actively used for agricultural purposes. In Lake Carlos State Park, the two AG areas are privately owned. In recent years, the primary crops in these fields were small grains, with the most recent planting in oats (1980).
- LB Lowland Brush. Lowland brush areas frequently surround marsh areas. The waterlogged soil favors shrub species including willow (Salix spp.) and red-osier dogwood (Cornus stolonifera). Roundleaf dogwood (Cornus rugosa) is also common. Portions of the lowland brush area in the southeastern corner of the park could well be considered type VI shrub swamps.\* The somewhat drier periphery of lowland brush areas contain trembling aspen intermixed with paper birch (Betula papyrifera). The understory and open edges contain abundant prickly ash.
- LG Lowland Grass. The only lowland grass area in the park is located on an old farmstead site. Indications are that the area may have been drained and burned over. Wet grasses such as reed canary grass (Phalaris arundinaceae) dominate, with pockets of lowland shrubs and occasional deciduous trees.

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\*See Water Resources Section.

LH Lowland Hardwoods. This rolling, wet community is dominated by American elm (Ulmus americana) and ash. The two LH areas in the park are very similar.

The area north of Hidden Lake is dominated by elm and black ash (Fraxinus nigra) averaging 8" dbh. Basswood (Tilia americana) of about 5" dbh are mixed within this area, and a large stand of tamarack (Larix laricina) borders the park road. The understory includes numerous black ash seedlings and fern species.

The area in the southeastern portion of the park is dominated by large elm and green ash trees that average 15" dbh. Trembling aspen also reach this size, and scattered tamarack are evident. Understory species include red-osier dogwood, willow, reed canary grass, and numerous green ash seedlings. Sphagnum moss (Sphagnum spp.) occurs infrequently in this area.

Mh Marsh. Most marsh areas are dominated by cattail (Typha latifolia) and willow shrubs. Some of the wetlands in the northwestern portion of the park are dominated by sedge species, with only small pockets of cattail. For a more complete description of marsh areas, see Water Resources Section, pp - .

NH Northern Hardwoods. This community is dominated by basswood. In the area north of the upper campground (NH 33) the basswood are extremely dense and average about 4" dbh. In other northern hardwood areas, basswood average about 11" dbh. Intermixed in these areas are larger (15" dbh) bur and red oak (Quercus macrocarpa and Q. borealis, respectively), and smaller (6" dbh) paper birch (Betula papyrifera). Other important species in these areas include sugar maple (Acer saccharum), ironwood, American elm, and trembling aspen. Understory shrub species include hazel (Corylus americana) and gooseberry (Ribes spp.). Ironwood, sugar maple, basswood, and in some areas green ash are apparent as understory seedling species.

In the Lake Carlos area, this rolling mesic maple-basswood community comes the closest to what some ecologists term a "climax" forest. Curtis (1959) preferred to describe such a condition as a state of "dynamic equilibrium," because even a stable community is subject to many influential change factors.

- O Oak. Red oak and Northern Pin oak (Quercus ellipsoidalis) dominate in this dryer upland community. Bur oak is also prevalent in some areas, and trembling aspen are mixed among the oaks. Clusters of paper birch are intermittent in these stands. Green ash and American elm are secondary species in many areas, and basswood becomes apparent in oak communities that are adjacent to northern hardwood areas. Understory shrub species include gray dogwood (Cornus racemosa) and prickly ash. Prostrate Juniper (Juniperus communis depressa) is an infrequent species in the oak community located in the northwestern corner of the park (051 area).

- OF Old Field. Old field areas constitute the most open areas of the park. Many of these areas were once used as cropland. Smooth brome grass (Bromus inermis) and/or bluegrass (Poa spp.) are the dominant cover species in these dry, rolling areas. Foxtail (Sertaria spp.), goldenrod (Solidago spp.), mullein (Verbascum spp.), clover (Trifolium spp.), and thistle (Cirsium spp.) are common in these areas. Scattered green ash and American elm seedlings are prolific in many areas, and pockets of larger green ash, trembling aspen, and American elm (3-10" dbh) appear in savanna-like fashion.

The old field area in the northwestern corner of the park contains many marsh areas. As old field merges into these depressional marshes, larger trees frequently dominate small marsh-edge communities. Black willow (Salix nigra 25" dbh), red and bur oak (15" dbh) and trembling and bigtooth aspen (6-12" dbh) are common in these areas.

Ox      Offsite Oak. This dry community is dominated by bur oak (7" dbh) that are stunted and/or deformed because of various limiting factors. Sometimes referred to as "scrubby oak," foresters do not consider this a merchantable tree type. American elm (7" dbh) are also dominant in this community, and green ash (5" dbh) become apparent as a secondary species. The understory is composed mainly of prickly ash intermixed with ironwood seedlings and saplings.

Rec      Recreational Development. These areas have been developed as recreational use areas.

Since the establishment of the park in 1936, several areas have been planted with non-native trees and shrubs. The most extensive plantings are located along the northern boundary, just south of county road 62 (Cty Rd 62). Several rows of pea-shrubs (Caragana spp.) are alternated with Siberian (Amur) maple (Acer ginnala). Rows of green ash (native) are also located in this area.



VEGETATION MAP LEGEND



Type

Code
A -Aspen
AG -Agricultural
LB -Lowland Brush
LG -Lowland Grass
LH -Lowland Hardwoods
Mh -Marsh
<b>NH -Northern Hardwoods</b>
O -Oak
OF -Old Field
Ox -Offsite Oak
Rec-Recreation Development

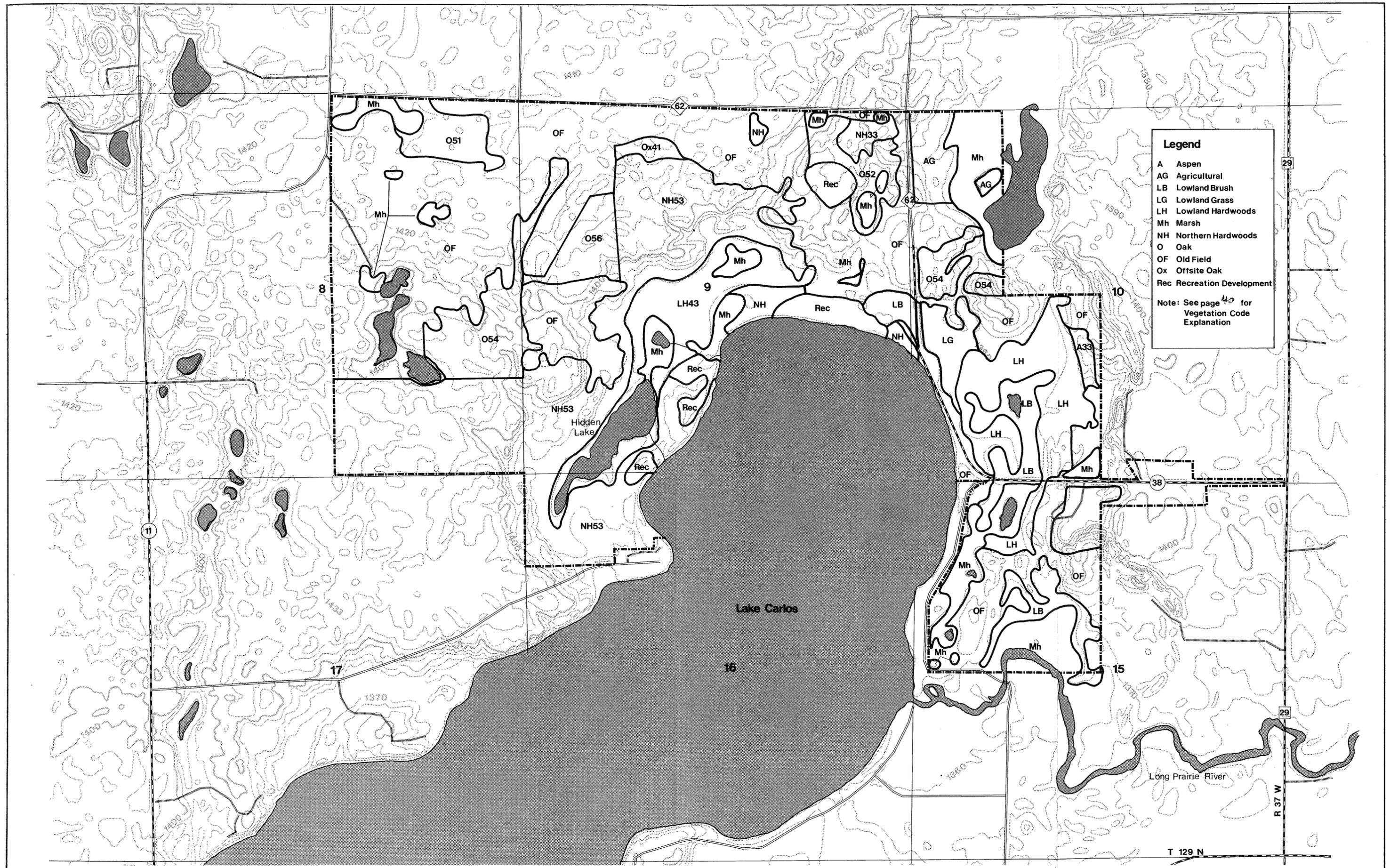
Size

Code	DBH (Diameter at Breast Height)
0	Not applicable for the type
1	0 to 1 inches
2	1+ to 3 inches
3	3+ to 5 inches
4	5+ to 9 inches
<b>5</b>	<b>9+ to 15 inches</b>
6	15+ inches

Density

Code	Seedlings	Saplings	Poles	Small	Large
	0-1" Trees/ Acre	1-5" Trees/ Acre	5-9" Trees/ Acre	Timber <b>9-15"</b> Trees/ Acre	Timber 15" Trees/ Acre
	1	2	3	4	5
0	*	*	0-30	0-10	0-5
1	0-500	0-250	31-90	11-40	6-20
2	501-1,000	251-500	91-150	41-60	21-30
<b>3</b>	1,001-2,000	501-1,000	151-210	<b>61-80</b>	31-45
4	2,001-5,000	1,001-2,500	211-270	81-100	46-60
5	5,001-10,000	2,501-5,000	271-330	101-130	61-75
6	10,001-20,000	5,001-10,000	331-390	131-150	76-90
7	20,001-30,000	10,001-15,000	391-450	151-180	91-105
8	30,001-40,000	15,001-20,000	451-510	181-200	106-120

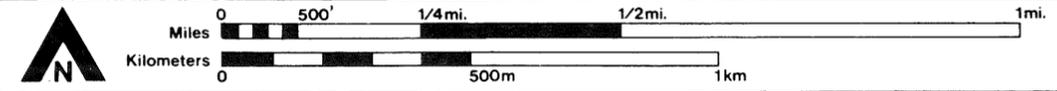
\*Not a valid density code for these size classes



**Legend**

- A Aspen
- AG Agricultural
- LB Lowland Brush
- LG Lowland Grass
- LH Lowland Hardwoods
- Mh Marsh
- NH Northern Hardwoods
- O Oak
- OF Old Field
- Ox Offsite Oak
- Rec Recreation Development

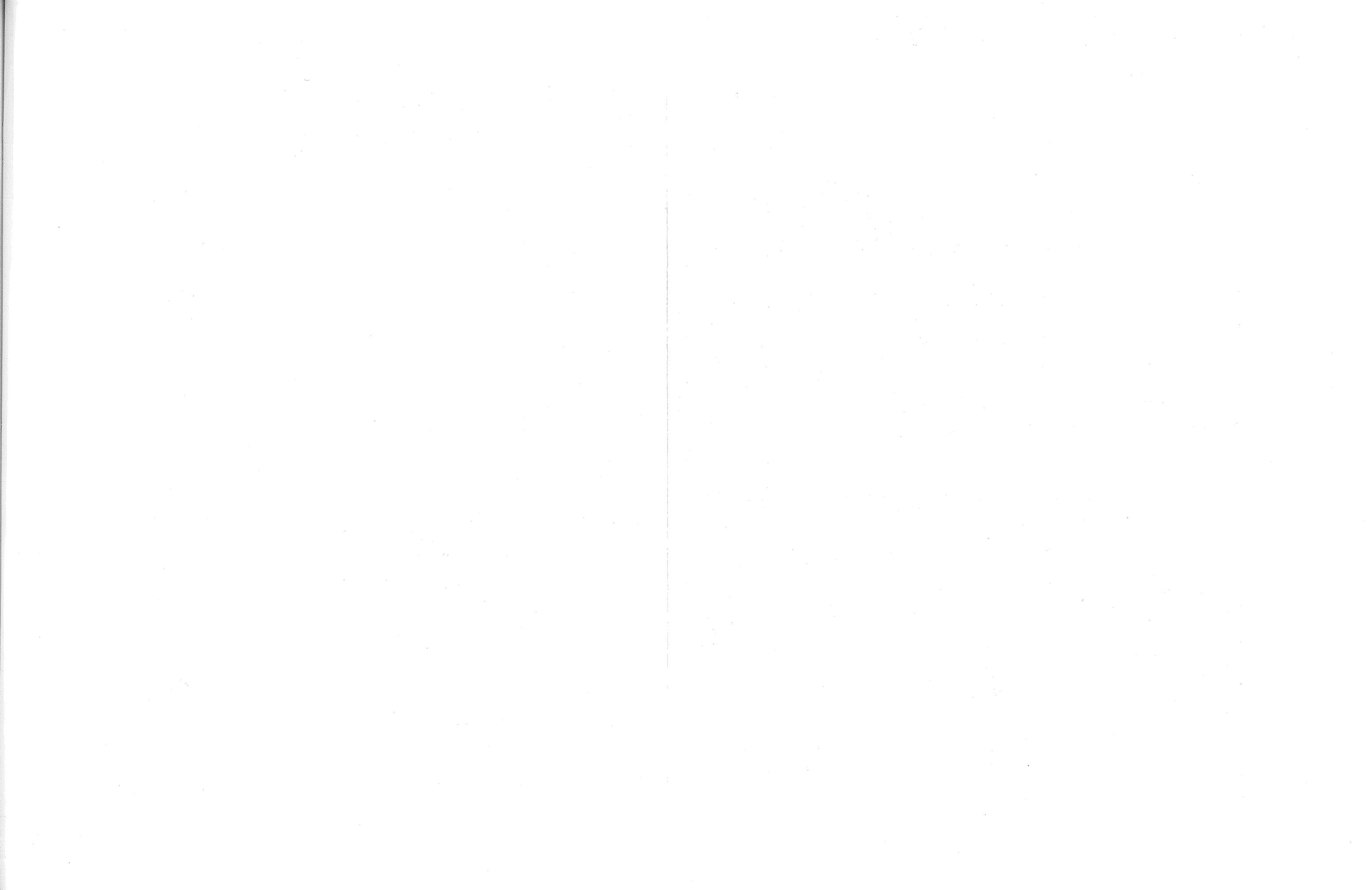
Note: See page 4 for Vegetation Code Explanation



M7

**Lake Carlos State Park**

**Existing Vegetation**



## 2207 Wildlife

The diversity of plant communities in the park provides habitat for a variety of wildlife species. Abundant and varied wetlands, diverse upland forested areas, and plenty of open field areas bordered by forest edges provide an excellent haven for many species of wildlife.

### Game species

The predominant land use in Douglas County is agricultural. Fifty-two percent of the total land surface is cropland, 9 percent is forested, and 21 percent is pasture (Minnesota Pollution Control Agency, Agriculture Pkg.). Farmland wildlife species are censused by the DNR, Section of Wildlife each fall and spring. The census is primarily concerned with pheasant populations, but incidental sightings and subsequent data relating to other species give a general overview

of several wildlife populations. The following table presents results from the 1980 census in west central Minnesota.\*

	Pheasant	Gray Partridge	Cotton-tail	White-tailed Jack-rabbit	Mourning Dove	White-tailed Deer	Red Fox
Spring 1980	27.2	7.8	6.2	-----No data-----		1.67	.3
Fall 1980	70.9	59.9	4.6	3.9	747	1.5	No data

values are:  $\frac{\text{total animals seen}}{\text{total miles driven}} \times 100$

Beaver and mink are known to inhabit the park. At times beaver activity has warranted trapping to alleviate unwanted flooding from persistent beaver damming.

The Big Woods North Deer Management Unit, which includes the region surrounding Lake Carlos, supports one of the most productive populations of deer in the state. Although there is abundant cover outside of the park, an estimated herd of 75 deer spend the winter in or near Lake Carlos State Park. If the amount of cover in the surrounding area decreases, the wintering population of deer may increase, although the numbers are not expected to be excessive.

#### Non-Game Mammals

Non-game mammals known to inhabit Douglas County include the following species: spotted skunk\*\*, striped skunk, coyote, and woodchuck. Virginia opossum also occurs, but very infrequently.

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\*Includes Norman, Clay, Wilkin, Ottertail, Traverse, Grant, Douglas, Stevens, Pope, Big Stone, Swift, Lac qui Parle, Chippewa, and Yellow Medicine counties.

\*\*Spotted skunks are considered a priority species. They are also classified as "rare" by the Minnesota Natural Heritage Program (NHP). Report all sightings to the DNR non-game biologist.

In addition, several smaller mammals typical of grasslands, wetlands, and upland forests are known to inhabit the park.

In considering the overall character of an area, it is important not to exclude consideration of the surrounding land area. For this reason, a list of all non-game mammals within DNR Region I-south\* is included in the Management Plan Detail (MPD). There are no threatened or endangered non-game mammals within Region I-south.

#### Birds

Over 150 species of birds are known to inhabit Douglas County. A list of these birds is included in the MPD.

Birds which are known to inhabit Douglas County that the Minnesota Natural Heritage Program considers threatened, rare, or of special concern are listed below.

<u>Threatened</u>	<u>Rare</u>	<u>Special Concern</u>
Bald Eagle	Cooper's Hawk	Common Loon
	Goshawk	Upland Sandpiper
	Wilson's Phalarope	

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Lake Carlos is fortunate to be located within a north to south oriented corridor of numerous lakes and wetlands. These water bodies are situated along the migration corridors of several species of waterfowl. Many of these birds are attracted to the diverse wetland types within the park. Breeding bird surveys conducted by the U.S. Fish and Wildlife Service between 1975 and 1979 suggested that 16 Minnesota species reach their highest relative abundance in Region I-south (a list of these species is included in the MPD). Most of these birds

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\*There are 6 DNR regions within the state. DNR Region I includes the northwestern corner of the state. Region I-south includes Clay, Becker, Wilkin, Ottertail, Traverse, Grant, Douglas, Stevens, and Pope counties.

prefer marshland habitat. Five of the 16 species are also considered uncommon and/or of limited distribution over Minnesota.\* These five species are: gadwall, green-winged teal, American wigeon, Northern shoveler, and canvasback.

#### 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 17 species are known to exist in Douglas County. These ~~five~~<sup>eight</sup> species are: American toad, black-banded skink, common snapping turtle, Eastern red-sided garter snake, Northern leopard frog, smooth green snake, Western painted turtle, and Western plains garter snake.

#### Vegetation and Wildlife Management

Because all wildlife species are dependent upon their respective habitats for survival, any vegetation management will affect the wildlife populations within the vicinity of the vegetative community being altered. For this reason, vegetation and wildlife management will be considered together in the following discussion. For the purposes of this plan, management objectives have been identified in three broad areas -- grassland and wetland management, forest management, and developed recreation area management.

The regional resource coordinator was instrumental in the development of the vegetation and wildlife management in this plan. In many cases, the actions are proposed, reviewed, and/or implemented by the coordinator. Whenever the regional resource coordinator is mentioned in the text, actions requiring ~~his~~<sup>his/her</sup> cooperation should also be reviewed by the DNR, regional park supervisor.

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\*DNR, Non-game Program.

## Grassland and Wetland Management

### Objectives:

To manage vegetation for a diversity of wildlife habitat

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

To enhance wildlife observation as a recreational experience for all park visitors

Action #1. Maintain selected open grassland (OF) areas by implementing a burn program.

The rich diversity of wildlife species at Lake Carlos can be directly related to the variety of community types that support those species. One important element of that diversity is the old field (OF) community that provides contrast to the forested areas of the park. Many of the areas that were cleared to serve agricultural purposes now provide habitat to open field dwelling wildlife species.

Old field areas provide diversity of habitat. The irregular forest interface along the fields provides a tremendous amount of linear "edge" that is extremely valuable to wildlife. Within the old fields there are microcommunities which surround marsh areas that also provide food and cover for wildlife. The old field area in the northwestern corner of the park supports type II and type III wetlands dominated by cattail, sedge, and willow species (see Water Resources Section, p62).

The main area where a burn program should be implemented is in the old field area in the northwestern corner of the park. The soils in this area indicate that they were formed under hardwood forests. If a burn program is not implemented, the surrounding forests will eventually begin to reestablish themselves. A burn program, however, would retard the succession of the area and maintain the open character

that now exists. According to Curtis (1959), climatic conditions in the prairie-forest transition zone will allow either grassland or forestland. The presence or absence of grassland will be determined by the decision whether or not to implement a program of management burns. Controlled burns favor grassland and suppress tree generation.

In addition to retarding succession in these areas, burns should improve the physical structure of the old fields as well. Idle grasslands build up litter, tie up soil nutrients, decrease the amount of new plant growth, and produce generally weaker plants (DNR, 1973). Fire should release nutrients to provide a more vigorous regrowth of plants.

The majority of old field areas are dominated by smooth brome grass and bluegrass species. Snowcover flattens these grasses, leaving them mostly matted down for the nesting season. The increased cover provided by stouter mixed grasses would encourage nesting by upland game birds, upland nesting ducks, and shorebirds. In general, wildlife use of the open areas dominated by brome and bluegrass is lower than it would be if a diversity of mixed grasses existed.

Burning these fields may provide for some increased grass diversity, however brome grass is characteristically tolerant of spring and fall burns and does not carry a fire well during the summer. If grass species diversity does not increase following the burns, consideration should be given to replanting selected areas to native prairie grasses. Recommended species include big bluestem (Andropogon gerardi), switchgrass (Panicum virgatum), and indiagrass (Sorghastrum nutans) in areas surrounding wetland communities. The intention would not be to convert the entire area to prairie, but to attempt to diversify selected areas to improve wildlife cover.

A burning program for the old field area in the northwestern corner of the park should be planned by the regional resource coordinator. The burn area should exclude the tree nursery and the proposed tree planting clusters in the Horseback rider's area (see Vegetation Management, Developed Recreation Area Management, Action # 3a & 3c, <sup>56-57</sup> p 1). The remainder of the horseback rider's area should be included

in the overall burn plan. All other old field areas should be evaluated for their inclusion into the burn program.

There are two areas that have potential as small prairie communities. These areas are located southwest of Schumacher marsh and just south of the horseback rider's area. Elements of prairie such as big bluestem, indiangrass, switchgrass, prairie smoke, sideoats grama grass and pasque flower presently exist within these areas. These areas should be included in the overall burn program on an experimental basis. If these potential prairie communities respond to the initial burns by naturally reverting to prairie communities, a burning rotation should be planned for both areas.

Cost: \$1,000/year burned

Action #2. Develop an artificial nest platform for Canada geese on the lower end of Schumacher marsh.

The majority of Schumacher marsh is located just outside of the park boundary in the northeastern corner of the park. A portion of the southern end of the marsh is state ~~owned~~<sup>owned</sup> and within the park boundary. Schumacher marsh is a 30 acre type IV wetland (see Water Resources Section, p62) that is surrounded by rolling, open hills. Small grain agricultural fields are located just west of the marsh. An interpretive trail that runs east of the contact station has been planned which utilizes the southern end of the marsh as an observation area (see Visitor Services, Action #1, p101). If nesting waterfowl were within view of the trail alignment, it would enhance the recreational experience for many park visitors.

Lake Carlos is situated within the Eastern Prairie Canada Goose population migration corridor (Bellrose, 1976). During migrations, between 125,000 and 250,000 Canada geese utilize this corridor. Canada geese are known to nest in other areas of the park. Canada geese will nest on muskrat houses. During 1980, at least 20 houses were located on Schumacher marsh. Many of these houses, however, are close to shore and prone to predation. It is not known if geese presently utilize Schumacher marsh as a nesting area.

The regional resource coordinator and area wildlife manager should determine if the marsh is a suitable goose-nesting area. If feasible, one or two round hay bales could be placed on the ice 20-50 yards (6-15m) from shore on the southern end of the marsh. The aggressive territorial behavior of Canada geese may allow only one nesting pair on the marsh. Because of a conditioning factor, geese prefer muskrat houses to artificial platforms. If the houses are prone to predation, however, geese may be attracted to the more protected hay islands.

Cost: <sup>Minimal</sup> ~~No development~~ cost - included in park operations budget

Action #3. Control cattail encroachment on selected wetlands.

The wetlands within the park exist on a continuum of types, ranging from type II fresh meadows to type VII wooded swamps (see Water Resources, p62). While some marshes contain only minimal amounts of cattail, others are almost completely filled in with cattail growth. Cattails are a natural part of wetland ecosystems, and they provide desirable habitat for many marshbirds and mammals (especially waterfowl and muskrats). At present, many wildlife species utilize the cattail marshes within the park.

Because of their ability to proliferate and extend their areas of coverage, cattail frequently become the dominant plant in wetland communities. In such instances, wildlife utilization of the marsh will decline. A common recommendation for optimal wildlife conditions is to maintain a 50:50 cover to water surface ratio. This ratio refers to an interspersion of cover and water surface, not just an overall percentage.

The regional resource coordinator and area wildlife manager should monitor the extent of cattail in the park's wetlands and open dense cattail areas to maintain a good interspersion of cattail and water surface. Because wildlife currently utilize wetland areas, management should be implemented only in areas of obvious need. In some cases, muskrats will open areas to provide good interspersion of cattail and water surface.

Several methods of cattail control are available. Cutting cattail at least 3 in (7 cm) below the water surface at a period when the plants have their lowest carbohydrate reserves (late June or early July) is an accepted and effective method.

Cost: No development cost

### Forest Management

Objectives:

To preserve rare and/or unusual plant communities

To minimize the potential effects of tree diseases

To provide habitat for a diversity of forest wildlife

To educate the local public in proper woodlot management techniques

Action #1. Restore proper drainage surrounding the tamarack stand north of Hidden Lake.

The largest tamarack stand within the park is located just north of Hidden Lake. Because of the location of the park within the deciduous forest transition-tension zone (see Pre-European Settlement Vegetation p34), it is subject to influences from the conifer forests to the northeast. The fact that tamarack exist within the park is a reminder of the tension zone association; in fact, this stand represents one of the largest southwesternmost groupings of tamarack along the transition zone corridor. Every effort should be made to ensure that this significant tree species representing the vegetation province to the northeast be protected from unnatural disturbance.

At present, the tamarack stand north of Hidden Lake is subject to flooding which reaches depths that sometimes cover the park road and parking lot. (Construction of the park road has blocked natural drainage from the marsh to surrounding areas.) This flooding not only hampers park operations, it also reaches depths that threaten

the tamarack stand's survival. The existing culvert to the lake must be reopened. Another culvert may be needed to reestablish natural drainage. These culvert locations are situated east of the tamarack stand.

There is also a need for an additional drainage culvert south of the tamarack stand. Construction of a trail link along the north shore of Hidden Lake has impeded proper drainage between the lake and the marsh area to the north. The drainage from this marsh also affects the tamarack stand. Although this new culvert will not at this time be located under a roadbed, it should meet length and durability specifications to allow possible future construction of a road over it.

Cost: \$2,000

Action #2. Identify the various tree diseases throughout the park and monitor their progression.

Several tree diseases have been identified in the park. The drought conditions of the 1976 and 1977 seasons stressed several tree species enough to allow secondary infections to take hold. Shoestring root rot (Armillariella spp.) can affect both hardwoods and conifers, but the oak trees seem to have been affected the most in this area. Two-lined chestnut borers (Agrilus bilineatus) have been identified in the park. Much of the oak dieback may be attributed to the presence of this species. Oak dieback has been most severe in the upper campground (see Developed Recreational Area Management). It is probably the result of a combination of conditions. Similar oak mortality resulting from a combination of factors has been termed "Oak Decline" (Walters and Munson, 1980). Hopefully a return to "normal" climatic conditions coupled with the completion of infectious cycles will return the oak population to a healthy status.

Hypoxylon canker (Hypoxylon mammatum) has been identified in several aspen stands within the park. This common fungal disease is one of the most serious aspen ailments in the United States. No direct control measures for Hypoxylon canker are known.

The cause of maple and birch dieback in the park is unknown but drought stress has probably been a contributing factor. The bronze birch borer (Agrilus spp.) is probably a factor in the case of the birch dieback. During the 1980 season, about 15 maple were removed from the upper campground and approximately 60 mature birch were observed dead-standing in the organized group camp area. Both of these areas are moderately to heavily wooded, and replanting will be needed only on a supplementary basis.

The most devastating tree disease in the park is Dutch elm disease (Ceratocystis ulmi). Although Dutch elm disease can be found throughout the park, the area most heavily infected is in the lakeside recreation development zone from the organized group camp to the main campground (see Developed Recreation Area Management, p<sup>38</sup>). During 19~~78~~ 77 and 19~~79~~<sup>78</sup>, 70 diseased elms were removed from the park. Sixty-five diseased elms were marked for removal in 19~~80~~<sup>79</sup>. Because of funding cutbacks, however, the majority of these diseased trees are still standing. The Minnesota Department of Agriculture maintains a dutch elm disease study plot just north of Hidden Lake.

The regional resource coordinator should identify the various tree disease and insect problem areas within the park. Any trees that pose a safety hazard should be trimmed or removed. Replanting of trees will be addressed in the Developed Recreation Area Management Section, p<sup>54</sup>. The progression of various tree diseases should be monitored and sanitation methods considered. It is realized that for many of the tree diseases identified there is no known direct control measure. Tree diseases are a natural occurrence, and wildlife will make use of some of the down and dead standing "snag" trees.

Cost: No development cost

Action #3. Maintain a maximum abundance of snags.

In recent years, value of dead trees (snags) to wildlife has been receiving increased recognition. Snags serve a variety of purposes other than providing nest sites and dens for many cavity-nesting birds and mammals (Scott, Whelan, and Svoboda, 1980). Many species of raptors, waterfowl,

and woodpeckers also use snags for perching, feeding, and roosting. The park supports a large number of American kestrels (hole-nesters) and several other raptors which utilize snags in a variety of ways. Trees surrounding wetlands (such as Hidden Lake) provide snag nest sites for woodducks, goldeneyes, and other tree nesting ducks. Woodpecker species utilize snags for perching, nesting, and foraging insects. As many as 30 mammal species and 13 reptile and amphibian species have been identified as known users of either standing or fallen snags in northern Minnesota (Niemi, 1979). Many of these species are known to inhabit the park.

An effort should be made to leave all trees both standing and downed unless they pose safety hazards and/or physical obstruction (e.g., along trails, roads, campgrounds).

Cost: No development cost

Action #4. Establish a forestry demonstration/education area in the central portion of the park.

Increased demands for fuel wood in recent years has led to an increased interest in private forest woodlot management. The Lake Carlos area is no exception. The Alexandria district forester has expressed a desire to implement a forestry demonstration/education area within the park. The DNR, Division of Forestry has no available forest land to implement such a program on its own. The nearest state forest is 40 mi (64 km) northeast of the park.

Maplewood State Park, located 50 mi (80 km) northwest of Lake Carlos, began a similar program in 1968. The program has been moderately successful. It interprets forestry techniques to primary and secondary level students, 4H groups, park visitors and area landowners. Recent extensive oak decline within the demonstration area warranted a timber sale which was reviewed and approved by the DNR, Division of Parks and Recreation prior to the sale. Because this sale significantly altered the forest, the program will take on a new approach. Its interpretive potential should be evaluated after the next several seasons.

The program at Lake Carlos will not be as intensive as the Maplewood State Park program. The Lake Carlos program will involve a 12 acre (5 hectare) northern hardwoods and oak area northwest of Hidden Lake (see Management Areas Map, M 8 ). The boundaries of the area should have an irregular edge that conforms with the natural topography of the landscape. The program will be developed for demonstration to the general public, and address the following practices:

- thinning and pruning techniques
- sugar maple tapping
- importance of snag management, i.e., leaving some downed and dead standing trees
- other related woodlot management practices which demonstrate conscientious woodlot stewardship

No commercial timber harvest or sale is anticipated. Any wood from larger trees should be made available to the park manager for park use (firewood, construction, etc.).

The majority of interpretation will be led by the district forester and forestry technicians. If signs are used, they must meet state park quality standards. Entry to the forestry area should be by the hiking trails that connect the primitive group camp/horseback rider's area to the proposed demonstration area site. Visiting groups should park at the primitive group camp area, however, some school groups will be allowed to park adjacent to the demonstration area because of classtime limitations. In these cases, vehicles can use the dirt park service road that borders the forest edge in the north central portion of the park. The district forester and park manager should coordinate visits to the demonstration area so that park visitors using the primitive group camp/horseback rider's area are not disturbed. The existing snowmobile/horse trail that runs through the demonstration area does not pose any conflict problems.

The program will be implemented by DNR, Division of Forestry personnel. A preliminary plan of any forest alteration will be reviewed by the park manager and the regional resource coordinator before the plan is implemented. In addition, the ongoing program will be

periodically monitored by the park manager. A cooperative agreement between the DNR, Division of Parks and Recreation and the DNR, Division of Forestry must be formalized before the demonstration/education area plan can be implemented. An Environmental Assessment Worksheet (EAW) must be submitted to the Environmental Quality Board (EQB) before any timber can be cut. Any activity which deviates from state park policy or the scope of this plan must be approved by the DNR, Division of Parks and Recreation.

Cost: Will be funded by the Division of Forestry

#### Developed Recreation Area Management

The majority of vegetation management recommendations within this section are directed toward the areas marked "Rec" (Recreation Development) on the vegetation map (M 7). The exceptions to this are actions #3b, 3c, and 3f, which deal with areas just west and south of the upper campground. The location of these areas will be discussed in the text.

#### Objective:

To manage vegetation to preserve the resource, encourage recreational use, and maintain the scenic integrity inherent to Minnesota state parks

Action #1. Assess the severe erosion problem along the main campground shoreline and develop an erosion protection plan. (see Lakeside Campground, Action #1, p80).

Action #2. Close peanut row for 3 to 6 years, during which time the entire area should be rehabilitated.

The ten lakeside campsites at the west end of the main campground known as "peanut row" have been in use for nearly 40 years. The area was never designed to withstand intensive use. The narrow dirt road is lined with cramped, rutted sites. The sites themselves do not have visible tent pads, and groundcover is virtually non-existent.

Peanut row should be closed for 3 to 6 years to allow the area to recover. At the onset of the rest period, the following actions are recommended.

1. Expand and level sites to provide suitable parking and cooking areas, tent pads, and inter-site screening. This may require reducing the number of sites.
2. Sites should be relocated to minimize the amount of tree removal.
3. The road/hiking path through peanut row should be leveled and resurfaced for pedestrian and future vehicle use.
4. Fill in or drain a low water holding pocket near the toilet building to prevent future flooding of adjacent sites and eliminate standing water.
5. Artificial soil aeration measures to supplement the natural soil rejuvenation process\* should be used. Soil preparation for shrubs and groundcover may warrant extensive cultivation and addition of topsoil.
6. All construction which will possibly disturb vegetation should be completed before the rest period begins.
7. Fire rings and picnic tables should be installed at each site just prior to opening of the area for camping.

During the first or second year of rest, shrubs and groundcover should be planted to provide intersite screening and a durable, attractive groundlayer. Native shrub species are preferred. If trees are planted, hackberry, green ash, silver maple, and basswood are among recommended species.

The road in peanut row has always served as a path between the main campground and the swimming beach-picnic area. There is no viable alternative route between these two areas. During the

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\*A study by Thourud and Frissell (1969) indicated that rejuvenation of a sandy loam soil (peanut row is mostly Nebish loam) by natural means would take 5 to 6 years. Their study involved artificial compaction methods in a Minnesota oak stand.

rest period, peanut row should be closed to vehicle traffic and signed on both ends. The signage should explain the current redevelopment and rest rotation, and ask that pedestrians remain on the trail.

Cost: \$10,000 2nd Phase, and \$10,000 5th Phase

Action #3. Implement a shrub and tree planting program to provide screening, visual diversity, and in some cases wildlife habitat.

A good planting program should screen certain areas from view, create an aesthetically appealing landscape, and provide additional wildlife habitat. In some cases, screening may be most important. In others, the potential utilization of the plantings by wildlife will be paramount. For this reason, the following discussion will give a general direction for plantings in each area.

Action #3a. Utilize current nursery stock from the present location, but eventually relocate the nursery and diversify the species planted there.

In recent years the park planting program has focused on planting green ash saplings from its present nursery. There are approximately 3,000 green ash seedlings and saplings in stock. This has been a successful program, but species such as sugar maple, basswood, and hackberry should be added.

The nursery is located in the old field (OF) area in the northwestern corner of the park. This location is over a mile from the nearest recreation area. The efficiency of planting procedures would be greatly increased if the nursery was located closer to the developed recreation areas. The park manager has identified a convenient, centrally located, and well-screened nursery area on Nebish soils. The Nebish soils that cover the western two thirds of the park have worked well at the present green ash nursery, and the USDA Douglas County Soil Survey identifies this soil as one of the better tree and shrub supporting soils in the area. The new tree nursery will be located in an old field area adjacent to the northern boundary of the forestry demonstration/education area. The nursery will be

situated just east of a snowmobile trail. Because Lake Carlos snowmobilers have traditionally stayed on park trails, no problems are anticipated at the new tree nursery location. Trees will be planted in such a pattern that those left will not have a plantation type appearance.

Cost: \$1,000

Action #3b. Plant clusters of a variety of species among the row plantings along Cty Rd 62 on the northern park boundary.

About 1,500 amur maple (Acer ginnala) have been planted in the park, mostly in rows along Cty Rd 62 on the northern park boundary. These row plantings do not fit the natural tree cluster character of the area. Sugar maple, green ash, and possibly basswood should be planted in clusters to break up the linear artificial feeling created by the row plantings. This action will create a more aesthetic view both from the road and from the recreation areas.

Cost: \$1,000

Action #3c. Vegetate the Horseback Rider's Area.

The area utilized for horse camping will be upgraded (see Horseback Rider's Area/Primitive Group Campground, Action #3, p7B). The horseback rider's area is located in the old field (OF) area west of the upper campground. The area between Cty Rd 62 and the horseback rider's area is void of trees and shrubs. Plant 5 to 8 groups of trees in the open field to break up and visually screen the area from the road. Some tree groups should be used to enhance the horse/snowmobile trail which passes through the open field. Recommended tree species for cluster plantings in the old field, along the road, and among the new campsites include basswood, sugar maple, and red or pin oak. Native shrub species that enhance wildlife habitat such as American plum or Honeysuckle are preferred.

Cost: \$5,000

Action #3d. Manage vegetation in the upper campground.

The upper campground experienced the most devastating oak decline in the park. In oak decline, a combination of factors contribute to the death of the tree (see Vegetation Management, Forest Management, Action #2, p50). In the case of the upper campground, soil compaction may have been an additional stress factor. Approximately 30 mature oaks had to be removed over the 1980 season. Roughly 15 mature sugar maples were also removed. The cause of the maple dieback is unknown. The area is heavily wooded, and replanting may not be warranted unless additional dieback occurs. In the future, dead trees should not be removed unless they pose a safety hazard. If possible, the trees should be trimmed to reduce the hazard, leaving the remaining snag as wildlife habitat.

The upper campground will be undergoing a redevelopment plan involving the removal of one road and adjacent campsites and the addition of another road with new campsites. The area of road and campsite removal must be revegetated to blend into the forested edge with species inherent to that area. Recommended plantings include basswood, green ash, and trembling aspen. Native shrubs that enhance wildlife habitat should be planted in this and other peripheral areas around the campground, and shrubs that provide for maximum intersite screening should be planted to complement the feeling of privacy in this "back-in-the-woods" campground.

Overstory vegetation should be trimmed to accommodate larger recreational vehicles. Opening the canopy will also encourage groundlayer growth and increase wind ventilation to discourage insects.

Cost: \$6,000

Action #3e. Manage vegetation in the lakeside recreation development area.

The lakeside recreation development area extends from the organized group camp to the main lakeside campground. Planting recommendations have been based on the variety of soil types that exist within this area. The following discussion will address the vegetation management from south to north.

Dutch elm disease has occurred throughout the recreation development area. The hardest hit area is the picnic grounds which lost over 100 trees in the last two seasons. In addition, many trees were lost before this time. Replanting has begun with about 50 green ash saplings. Sugar maple, basswood, and hackberry should be considered to diversify the plantings.

The area between the beach parking lot and the beach is considered an open play area. Several of the cottonwood trees that were planted in this area are suffering from a combination of root compaction and excessive water from the high water table. As a result of these pressures, the trees are not growing true to form and are in need of pruning and trimming. Green ash and silver maple should be considered for additional plantings. Most of the plantings should be done on the periphery of the open play area to avoid conflicting with recreational activity.

Consideration should be given to planting trees and shrubs on the beach parking lot island to enhance the natural feeling of the area. Recommended species include green ash, bigtooth aspen, and silver maple trees. Because of the intensive use of this area, shrub species should be chosen for their screening capabilities.

Many elm trees have been lost as a result of Dutch elm disease in the main lakeside campground. Unfortunately, this area does not have an abundance of trees and must be replanted as soon as possible. Basswood seem to grow well in the campground and should be considered along with green ash, silver maple, and aspen as replanting stock. Because the campsites are located in close proximity to one another, intersite screening will be difficult. In addition, intersite screening is not recommended because of the social nature of this camping community. An attempt should be made, however, to plant vegetation along the campground periphery. The private feeling created by the heavily wooded upper campground provides a complementary contrast to the lakeside camping community.

The parking lot behind the boat launch will be expanded along the road and toward the assistant manager's residence (see Recreation

Development, Water Access, Action #1, p87). Plantings between the assistant manager's residence and the parking lot are essential, but they should still allow breezes to flow through the area. They should also maintain the view of the lake from the assistant manager's house. The proposed parking lot expansion and the assistant manager's house are located on Nebish soils, which are suitable for many trees and shrubs. The soils on either side are depressional and muck soils that are not capable of supporting a number of vegetation types. Plantings should be implemented with the knowledge of how these three soil types merge. In the selection of species to be planted, consideration should be given to the native species that have already done well here.

Cost: \$15,000

Action #3f. Manage the vegetation in the service court and surrounding areas.

The service court needs to be screened from the view of park visitors (see Proposed Development, Administrative/Support Facilities, Action #5, p90). All species should be selected for their screening capabilities. Green ash and basswood are preferred tree species.

The service road that runs between the contact station and the lakeside campground will be redesigned for use as a hiking trail (see Proposed Development, Trails, Action #5, p100). Vegetation of the proposed trail along this route should reduce the linear feeling of the road, yet allow ventilation to discourage insects. Vegetation should ultimately screen the service court to the east of the trail and blend into the marsh to the west. Native species that occur adjacent to the road are preferred. Shrub species that encourage wildlife utilization such as American plum and honeysuckle should be considered.

The small parking lot near the present interpretive center will be removed (see Proposed Development, Roads and Parking, Action #1, p92). This area should be revegetated. The vegetation on either side of the center will also provide screening for the service court

area. Recommended tree species include basswood, green ash, and hackberry. Wildlife from the adjacent lowland area to the east may utilize planted shrubs such as American plum or honeysuckle.

Cost: \$1,000

## 3202 WATER RESOURCES

### Surface Water Inventory

The park is situated along 1.5 mi (2.4 km) of shoreline on 2,520-acre (1020 hectare) Lake Carlos. Total shoreline of the lake is 14 mi (22 km). The average depth of the lake is 50 ft (15 m), with a maximum depth of 163 ft (49 m).

The only adequate public access on the lake is located in the park. Access to the lake can also be made by boat from channels that connect Lake Carlos to Lake Le Homme Dieu (under CSAH 42 on the southeast end of the land) and Lake Darling (under CSAH 11 on the south end of the lake). The DNR also owns a parcel of land on the northeast corner of the lake which is designated as an access site but is inadequate for this purpose. Toward the end of summer, Lake Carlos experiences a moderate algae bloom, during which time the abundance of algae (mostly Gleotrichia spp.) gives the water a green tint.

The Long Prairie River flows from Lake Carlos to the Crow Wing River near Motley. The Crow Wing River drains into the Mississippi River in Crow Wing State Park, just south of Brainerd. The outlet of the Long Prairie River is located in the wildlife management area adjacent to the southeast corner of the park. There is a spillway on the river within the wildlife management area, and downstream of this structure the river passes through a corner of the park.

Lake Carlos State Park is located in the southwestern corner of the Crow Wing River watershed. The watershed drains 3,760 sq mi (9,776 sq km) and is completely covered by glacial drift of clay, silt, sand, and gravel.

The glacial moraine topography of the area is dotted with woodland ponds, 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

Elements of areas typed I through VII can be found in Lake Carlos State Park. Although many areas may not fit exactly within the bounds of a particular type, they do contain enough of the distinctive elements to be considered characteristic of that freshwater wetland type.

Type III wetlands can be found throughout the park. A few of the wetlands within the Old Field (OF) area in the northwestern corner of the park verge on being type II wetlands. These type II and III wetlands are dominated by cattails (Typha latifolia) and in some cases various sedge species. These cattail and sedge areas are usually surrounded by willow (Salix spp.) shrubs that are frequently intermixed with rose (Rosa spp.) bushes.

Schumacher marsh (located just outside of the northeastern corner of the park boundary) and Hidden Lake can be considered type IV and V wetlands, respectively. Elements of type VI wetlands can be seen in the lowland brush (LB) areas located in the eastern third of the park, and elements of type VII wetlands can be found in the lowland hardwoods (LH) area just north of Hidden Lake (see Vegetation Section, p<sup>36-37</sup><sub>36</sub>).

## Groundwater Inventory

The thickness of glacial drift in the vicinity of Lake Carlos State Park is commonly 20–40 ft (6–12 km), though it sometimes reaches a depth of 100 ft (30 km). The drift is composed of outwash materials (mostly sand and gravel with some clays) underlain by pockets of undifferentiated drift and a bedrock of granite, gneiss, and schist.

The main park well was drilled to a depth of 150 ft (45 km) in 1953. Two wells have been added since that time; one at the group camp (190 ft/58 km), the other at the primitive campground (51 ft/15 km). The picnic area, service court, and upper campground also have their own wells.

Outwash areas characteristically yield abundant supplies of water. Area groundwater moves from the higher morainal areas on the north and west of Lake Carlos to the lower outwash plains surrounding the park. Because of the abundance of carbonate rock fragments in the glacial drift, most of the water throughout the entire watershed is of the calcium bicarbonate type. This type of water is normally suitable for most purposes, although it tends to be very hard.

## Management

### Objectives:

To provide an adequate supply of high quality water for park users

To protect groundwater from contamination by park development

To provide an up-to-date inventory of the well and water line system within the park

Action #1. Requisition an updated utility map for the park.

The utility map for the park is outdated. Water, sewer, electric, and telephone lines that are known to exist are not outlined on the current utility map. The DNR, Bureau of Engineering should work with the DNR, Division of Parks and Recreation in compiling the new map.

Because of the recently installed central sewer system around Lake Carlos, the quality of the park's ground and surface waters should increase over the next few years. This will ensure park users an adequate supply of high quality water in the future.

Cost: To be drawn by the Bureau of Engineering

#### 4202 FISHERIES

Fishing is one of the most popular activities in the park. The fish species most commonly caught in Lake Carlos are panfish and northern pike, with a fair amount of walleye and largemouth bass. Lake surveys conducted in 1948, 1954, 1973, and 1980 indicate that Lake Carlos is an excellent game fish lake. Fish populations of northern pike, walleye, largemouth bass, and bluegill sunfish are above the statewide average.

Stocking records date back to 1910, but regular stocking began in 1945. Species stocked regularly include walleyes and northern pike, and occasional stocking of large and smallmouth bass, sunfish, and crappies. Data in 1973 indicated that stocking of panfish and northern pike was not necessary to maintain a good population of those species. During the past seven years, spawning runs from adjacent natural wetland areas have maintained the northern pike population.

The DNR, Division of Fish and Wildlife classification system uses both an ecological and a management classification. The ecological classification (e.g., Hardwater Walleye) indicates that the lake is moderately fertile with a well established natural walleye population. The management classification (Walleye) suggests directing management to favor the established walleye population. Current management recommendations include walleye stocking on a rotational schedule (an occasional year of no stocking) and discouraging future northern pike production. At present, the abundant northern pike population is reducing the number of perch which is necessary forage for walleyes.

Despite heavy fishing pressure, Lake Carlos fish populations are in relatively good condition. Northern pike and sunfish populations exceed state and local averages, but their average size is small. The walleye population is above the state average and below the local average; however the average weight of walleyes netted was nearly 3 pounds (1980 Lake Survey). Sunfish and bass populations are very abundant and do not need stocking. Largemouth bass are given protection by posting designated spawning areas within the park. The first carp recorded in Lake Carlos were netted in the 1973 lake survey. Their numbers remain below the state and local medians.

Other species recorded in the 1980 lake survey not previously mentioned include bowfin, bullheads, rock bass, shiners, and tullibee.

The DNR Fisheries Section considers Hidden Lake to be a freezeout lake with limited fishing value. Although a limited number of bass and sunfish may inhabit the lake, low oxygen levels (below 2 ppm) occur most winters, which indicates winterkill potential. The first lake survey of Hidden Lake is scheduled for the summer of 1981.

### Management

#### Objectives:

To maintain the present level of fishing opportunities

To protect game fish habitat

The DNR, Division of Fish and Wildlife is responsible for fisheries management in Lake Carlos. This plan recommends a continuation of the management programs which are currently being implemented by the Fisheries Section.

### Prehistory

Archaeologists believe that ancient people ventured into western Minnesota before the last glacial advance around 10,000 years ago. Although knowledge of this early culture is limited, we do know that they were hunters of big game like the giant bison and woolly mammoth.

The Alexandria lakes region was attractive to both wildlife and prehistoric cultures. Within 10 mi (16 km) of the park there are at least 5 archaeological sites, mostly lakeside habitation areas of the Woodland culture. Woodland populations existed between 1000 B.C. and 1700 A.D. Archaeological finds of this culture are characterized by pottery and burial mounds. One of the five sites is located directly beneath the present lakeside campground at the park. During 1963, the University of Minnesota conducted a limited excavation and found that the lakeside campsite was probably used seasonally by a group of late Woodland peoples. Records of the five sites are on file in the Archaeology Department of the State Historic Preservation Office, Minnesota Historical Society.

### History

With the signing of the treaty of Traverse des Sioux on July 23, 1851, the Dakota (Sioux) Indians ceded their land in western and southern Minnesota to the United States. Known early on as the "park region," this area brought settlers who recognized the area's agricultural potential along with its natural beauty. Just as the area was being settled, however, a major uprising of the Dakota Indians in August of 1862 practically evacuated the entire region. Although most of the major military events took place in the Minnesota River Valley about 100 mi (160 km) south of Lake Carlos, central Minnesota saw a number of raids and skirmishes associated with the uprising. Upon hearing of the uprising, general panic spread among the scattered settlers of Douglas County. Alexandria area residents decided to flee to the larger population centers to the west, mainly Sauk Centre

and St. Cloud. When the first group attempted to return to Alexandria in September, they were ambushed by Indians. Settlers were unable to return to the area until late October and early November of 1862.

During the summer of 1858, Alexander and William Kinkaid settled at the junction of Lakes Agnes and Winona. This settlement became known as Alexandria. Later that year, it became the county seat for the newly established Douglas County.

During the mid-19th century, the Red River Oxcart Trails were an important part of commercial transportation in Minnesota. They connected the rich fur trading posts near present day Winnipeg with the large metropolitan trading center of St. Paul. The section of the trail that stretched from the Red River to St. Cloud was known as the Middle Trail. Passing through Alexandria, the Middle Trail was one of the most heavily used portions of the Red River trail system. The strategic location of Alexandria (halfway between Breckenridge and St. Cloud) ensured its success as a commercial center. In 1859 the Minnesota Stage Company contracted to carry mail and Hudson Bay Company goods along the section of the trail that passed through Alexandria. This section of the Middle Trail became known as the Stage Road. Stagecoach passengers wrote numerous newspaper columns inspired by the picturesque landscape of the area. All traffic in the region was suspended during the Sioux Uprising of 1862. Financial panic a decade later caused land prices to drop and work on the railroad to stop at Melrose, 35 mi (56 km) to the east. By 1876 Alexandria was economically stable and was once again a growing community.

By the turn of the century there was already evidence of tourists coming to the area and lakeshore property being purchased. During the early 1930's, the state of Minnesota recognized the need for a state park in the Alexandria lakes region. The scenic attributes of the area together with the potential water-based recreational opportunities made the site an excellent choice for a new recreational facility. Because of the economic distress during the great depression, many conservation projects were instigated in an attempt to rebuild the economy. The land for Lake Carlos State Park was acquired in 1936 by the State Emergency Relief Administration. From 1937

to 1941, the park was developed through the Work Progress Administration (WPA). Many of these early developments are still being used and appreciated by park visitors today.

### Management

#### Objectives:

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

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

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

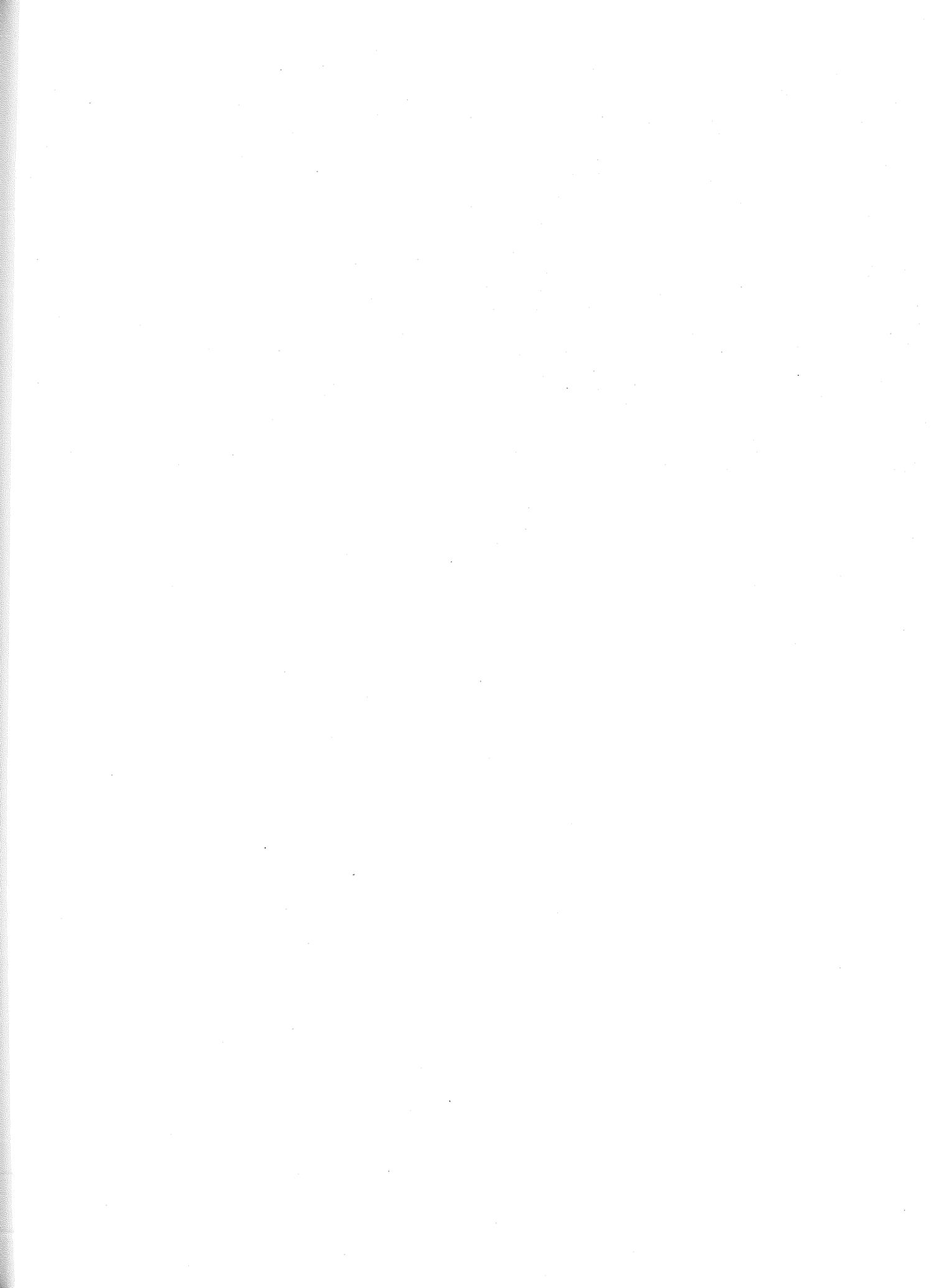
Action #1. Field check all proposed development sites for the presence of prehistoric and historic remains before any work is begun.

Development plans should be reviewed with the state archaeologist in accordance with state laws. Upon recommendations of the state archaeologist, a field check of proposed development sites for the presence of prehistoric and historic remains should be completed before any work is begun. Where remains are found, an assessment will be made including the size and importance of the site. Where archaeological or historic sites may be endangered by construction or development activities relocation of the development should be considered. Because of the archaeological site beneath the lakeside campground, review of the development within this vicinity should be of special concern.

Cost: \$5,000

Action #2. Make all information regarding prehistoric or historic sites in the park and surrounding area available to the park interpretive staff.

# MANAGEMENT AREAS



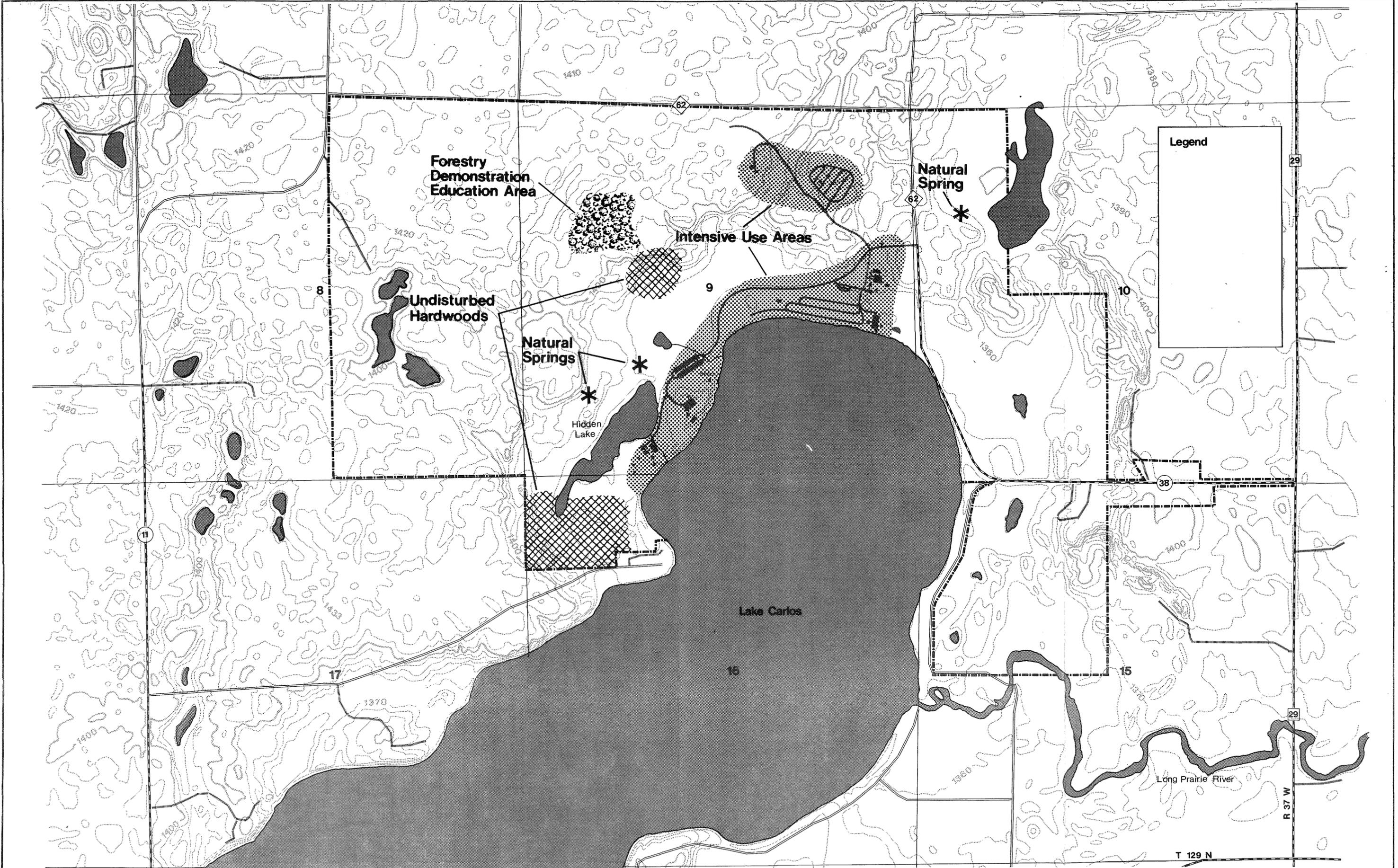
The park can be divided into two general areas for management. One will be managed for intensive use and the other for passive use (see Management Areas Map, M 8 ). Upon establishment, the 12 acre (5 hectare) Forestry Demonstration/Education Area located in the central portion of the park will be considered an intensive management area.

Lake Carlos State Park is subject to intensive summertime recreational use. The majority of use occurs within the intensive use areas delineated on the Management Areas Map (M 8 ). The lakeside intensive use area extends from the organized group camp to the main lakeside campground. The management proposals for this area (see Vegetation and Wildlife Management, Developed Recreation Area Management, Action #3c, p57) are directed toward maintaining and/or improving the existing recreation development for the use and comfort of visitors. The upper campground/horseback rider's area will also be managed for intensive use (see Vegetation and Wildlife Management, Developed Recreation Area Management, Action ~~#3c~~, <sup>#3c+3d, 57-58</sup> pPA ). While the lakeside campground is more of an open, social camping experience, the upper campground provides a more remote camping experience.

The DNR, Division of Forestry will establish a Demonstration/Education area in the central portion corner of the park (see Vegetation and Wildlife Management, Forest Management, Action #4, p52). While this 12-acre area (see Management Areas Map, M 8 ) will be maintained by the DNR, Division of Forestry, the DNR, Division of Parks and Recreation will retain land ownership and stewardship. After this program has been established, this area can be considered an intensive management area.

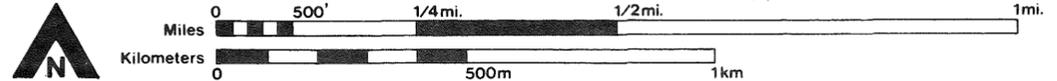
The passive use area encompasses the remainder of the park. Use in this portion of the park is limited to trails and a few overlooks. During the winter snowmobile and ski touring are popular activities in the park, and trail use is at its peak. Management proposals throughout the passive use area (see Vegetation and Wildlife Management, pp 45-59) are directed toward maintaining visual diversity and aesthetics and enhancing the diversity of wildlife habitat.

There are at least five areas within the passive use portion of the park that should be considered limited development areas. Two of these areas (situated directly north and south of Hidden Lake) are the only remaining undisturbed mature hardwood sites within the park. The other three sites are natural spring areas. The natural spring between Hidden Lake and the marsh to the north supports a small hydrolic raised bog which is maintained by water pressure from below ground. More natural springs exist just west of Hidden Lake and just west of Schumacher marsh. All of these limited development areas are outlined on the Management Areas Map (M 8 ). Any future development proposed in these limited development areas should be reviewed by the regional resource coordinator before implementation. The proposed development outlined in this plan does not directly involve these limited development areas.



**Legend**

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M8

**Lake Carlos State Park**

**Management Areas**



PHYSICAL  
DEVELOPMENT  
AND  
RECREATION  
MANAGEMENT



## 4205 RECREATION MANAGEMENT OBJECTIVES

These recreation management objectives are intended to guide the development of recreational facilities in all recreational state parks.

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

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

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

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

## 4206 EXISTING DEVELOPMENT

### Lakeside Campground

86 campsites

2 sanitation buildings with showers (1 not accessible to special populations)

### Upper Campground

62 campsites

Sanitation building with showers (not accessible to special populations)

### Primitive Group Campground

Picnic shelter

Barn (miscellaneous storage)

Well house

9 pit toilets

Gravel parking lot

### Structured Group Camp

2 barracks (24 beds each)  
Crafts building  
Dining hall  
Staff quarters/infirmary (12 beds)  
Sanitation building with showers  
2 pit toilets

### Boat Launch

1 concrete boat launch  
1 dock  
Fish cleaning house  
Gravel parking lot

### Swimming Beach

Bathhouse/sanitation building (changing rooms and vending machines)  
Sand beach  
Large gravel parking lot

### Picnic Grounds

Picnic shelter  
50 picnic tables  
Water tower (upper tank is not used for water storage)  
Sanitation building (not accessible for special populations)

### Administrative Facilities

Contact station (includes manager's office)  
Manager's residence and garage  
Assistant manager's residence  
Shop building (half heated)  
2 miscellaneous storage buildings

### Visitor Services

Interpretive Center/Equipment Storage Building

### Trails

9 mi (14 km) Hiking  
3 mi (5 km) Ski Touring  
3 mi (5 km) Horseback Riding  
8 mi (13 km) Snowmobiling

## 4207 PROPOSED DEVELOPMENT

### Camping

#### Objectives:

To provide a variety of quality camping experiences for families and groups

To enjoy the park resources 24 hours-a-day

#### Structured Group Camp

The group camp is located at the southwest side of the park, well removed from the other park campgrounds. No noise or activity conflicts occur between the campgrounds and the group camp. The trail which is between the group camp and swimming beach is in good condition. The limited boat access on Lake Carlos for the group camp has some erosion damage.

The group camp receives continual use from mid-May through September. The camp can accommodate up to 60 people. There are six wood structure buildings. They include two barracks, one staff barracks, dining, craft, and sanitation buildings, ranging in age from less than ten to thirty years. None of the buildings are accessible to special populations. All of the group camp buildings are structurally sound. The basement floor of the staff barracks is badly cracked. The buildings require varied amounts of repair to upgrade, maintain, and make them accessible to special populations.

Action #1. Repair roofs and eaves of group camp buildings.

This will include roof repairs ranging from water damage, reroofing, replacement of some eaves and installation of new flashing on the dining hall fireplace.

Cost: \$5,000

Action #2. Provide access for special populations to the barracks, sanitation buildings (see this section, Action #3), dining hall, and recreational building.

Access ramps should be installed and entrance modifications made where required. Possible entrance modifications include widening of doorways, removing door sills, and removing or modifying existing steps.

Cost: \$ <sup>9,000</sup> [REDACTED]

Action #3. Upgrade the sanitation building and make it accessible to special populations.

The roof is in need of repair (see this section, Action #1). The outside sinks should be removed. They are not used and are an unnecessary maintenance problem. The water pressure tank should be insulated to reduce sweating, thereby alleviating the continual problem of wet floors. Major remodeling is required to make this building accessible to special populations. Needed remodeling includes a barrier-free entrance which may require widening of the doorways, removing doorsills, installing ramps, and changing the location of the wing walls. Interior remodeling should include installation of new showers, sinks, toilets, stalls, and urinals.

Cost: \$ <sup>28,000</sup> [REDACTED]

Action #4. Construct timber stairs and upgrade the boat landing.

The area between the crafts building and the boat launch shows severe signs of soil compaction and loss of vegetation. This area is heavily used by camp visitors. Wide timber stairs and shrub revegetation should be considered to enhance this area. Methods for soil aeration should also be considered to increase vegetative vigor. Sand should be added to the shoreline at the boat landing to improve the landing for small boats and canoes.

Cost: \$1,000

Action #5. Repair the crack in the basement floor of the staff barracks.

Temporary repairs should be made to patch and level the floor.

If this temporary action is insufficient and the structure requires more extensive repairs, alternatives should be considered. Determinating the cause of the foundation's uneven settle will require an engineering study. The type and extent of repairs will be determined from this study.

Cost: To be done with existing park maintenance funds. If additional repairs are required, the cost and extent of these will be determined by DNR, Parks and Recreation, and the DNR, Bureau of Engineering.

#### Horseback Rider's Area/Primitive Group Camp

The horseback rider's area is well-sited. It provides an adequate riding area, access to trails, ample room for group activities, and easy access for trailers and equipment. Camping facilities, however, are marginal.

The current demand for horseback rider's campsites has been limited to two weekends a year. No immediate changes are foreseen in this pattern. Development of an improved horseback rider's camping area and an increase in the miles of park trails will improve the user's experience.

The horseback rider's area also serves as the primitive group camp area. The current demand for primitive group camp facilities at Lake Carlos has been low, so shared facilities are satisfying current demands. The primitive group camp is not optimally located for providing the greatest user satisfaction and minimizing user conflicts. Future considerations for relocating the primitive campground should be made.

Action #1. Redesign and construct 3 to 5 small camping pods near the trees at the south edge of the field.

The horseback rider's area provides a poor quality camping experience. Campsites are not designated and tent pads are not provided. Horses are not provided ample shade near the camping areas.

Each new camping pod should be designed to include a picnic table, fire ring, level tent pads, and a shaded area for tying horses. Pit toilets and drinking water should also be provided in the area. The camping pods should be located within reasonable walking distance from the parking lot.

Cost: \$5,000

Action #2. Remove the barn.

The barn is almost 60 years old. It is currently used for the storage of miscellaneous park equipment. The roof is in poor condition, and the building is classified by the DNR inventory as a surplus building. Rather than invest money for required remodeling, the building should be removed.

Cost: Sell for salvage

Action #3. Vegetate the horseback rider's area.

(See Vegetation and Wildlife Management, Developed Recreation Areas, Action #3c, p51.)

Action #4. Correct dripline erosion around the shelter building.

Alternatives should be evaluated and selection made based on the most cost effective long term solution. Rain gutters and extension of the hard surface apron should be reviewed as alternatives. The roof runoff water should be collected and dispersed to avoid future erosion of adjacent ground. Existing erosion damage should be repaired and the area revegetated.

Cost: \$2,000

Action #5. Monitor use of the horseback rider's/primitive group camp for changes in use and recommend changes in facility location.

If demand increases substantially for either activity to the point where existing facilities cannot meet the demand, the primitive group camp should be relocated. Also, if the demand for the horseback rider's camping area declines significantly, it should be phased out and the primitive group camp should be relocated to a better site.

The primitive group camp is too close to other park developments, thus reducing the privacy and quality of the primitive group camping experience. The existing site has noise conflicts with the other park users. It is poorly located for receiving the cooling lake breezes which also help to keep the area free of insects. The existing site does have good access to the proposed interpretive trails and a shelter for rain protection.

An alternative site has been located which provides a higher quality experience for the user (see Proposed Development Map, M || ). If use warrants and costs permit this <sup>new</sup> site should be developed for primitive group camping.

Cost: No initial cost. The park manager will monitor use and determine the need to relocate the primitive group camp. An engineering study will be required to determine the feasibility and costs for developing an alternative site if use warrants.

#### Lakeside Campground

The campground is easily accessible from the park entrance and is well separated from the day use areas of the park. Close proximity to Lake Carlos, boat launch, contact station, phone, and swimming beach make this a desirable campground. It is heavily used throughout the summer. The campsites are close together (60 ft/18 m on center) and are in relatively good condition. No screening exists between sites. The lakeshore is used by campers for pulling up boats. A significant number of campers have shown a definite preference for lakeside campsites with electricity. The existing sanitation facilities are adequate, but in need of some repair.

Peanut row has poor quality campsites and shows signs of severe over use. Dutch elm disease and shoreline erosion are significant problems which may deteriorate the quality of the entire campground.

Action #1. Assess the severe erosion along the main campground shoreline and develop an erosion protection plan.

The beach in front of the main campground is in the most intensively used portion of the park. Campers enjoy beaching their boats on the sand and use the beach as a waterskiing take-off and return point. The entire shoreline is lined with basswood trees whose roots have been exposed by ice heaves and wave action.

Alternatives explored along with associated problems are listed below.

<u>Alternatives</u>	<u>Associated Problems</u>
Plant aquatic vegetation to lessen wave action.	Bottom drops off too quickly, vegetation would be difficult to establish, and ice movement may pull vegetation out annually.
Install concrete structures to break up ice.	Development cost high, aesthetically disturbing, and limits recreational uses.
Offshore aerators to alleviate ice pressure.	Liability responsibility, high maintenance cost.
Anchored timbers (horizontal or vertical)	Ice pressure may push timbers out.
Rip-Rap	Limits recreational uses, aesthetically disturbing.
Rip-rap covered with gravel.	Annual maintenance to recover rip-rap.
No action.	Loss of basswood and continued erosion.

By the time that this action is implemented, the dynamics of the situation may pose new problems or alternatives of action.

An on-site analysis should be conducted by the regional hydrologist and representatives from the DNR, Division of Parks and Recreation and the DNR, Bureau of Engineering. This team should assess the current state of the problem and decide on the alternative that

seems most feasible. It may be possible to preserve selected portions of the shoreline, alternating protected basswood areas with non-protected segments.

If this problem is not addressed at the onset of the implementation of this plan, the basswoods may be lost. For this reason, the erosion problem should be a priority in the cost phasing procedure.

Considering all of the alternatives, the rip-rap covered with gravel seems to be one of the more feasible solutions at this time. The approximate cost figure below reflects this alternative for a 1,000 ft (305 m) shoreline with a 16 ft (5 m) wide rip-rap covered with 6 in (15 cm) of gravel.

Cost: \$50,000

Action #2. Modify the lakeside campground roads (see Roads and Parking, Action #5, p<sup>93</sup>).

Action #3. Manage vegetation in the lakeside recreational development area (see Vegetation and Wildlife Management, Developed Recreation Areas, Action #3e, p<sup>58</sup>).

Action #4. Rehabilitate the sanitation building on the east end of the campground.

It is not required that this building be made accessible to special populations as those facilities already exist in the sanitation building on the west end of the campground. This building does require extensive remodeling to solve roof problems and upgrade facilities. The building remodeling should include the installation of showers, quarry tile floors, toilet stalls, mirrors, hand dryers, and skylight domes. A review of the roof options should be made. It should include: a new roof with tapered insulation, roof drains, and piping or a gabled roof. The alternative selected must maintain the architectural theme of the park.

Cost: \$30,000

Action #5. Close peanut row for 3 to 6 years, during which time the entire area should be rehabilitated (see Vegetation and Wildlife Management, developed Recreational Areas, Action #2, p 5A).

### Upper Campground

The upper campground is easily accessible from the contact station. It receives much less use than the lakeside campground, but is often filled on weekends.

The campground does not have easy access to the swimming beach or the boat launch. The lake breezes are reduced by vegetation, increasing the nuisance of insects.

Several campsites are on steep slopes. Some have erosion problems. The tree canopy is dense, reducing the vigor of understory growth. There is inadequate screening between sites and electric hookups are not available. The sanitation building is cheaply built and not accessible to special populations.

For many people the location of this campground is less desirable than the lakeside campground.

Action #1. Eliminate the southernmost camping lane (C lane through site C-16) and construct a new lane north/northeast of the area.

Many of the campsites in the southern lane are built on steep slopes and have erosion problems. The campsites on both sides of the lane should be removed. Also, remove poor sites on steep slopes or in drainageways on the second lane from the south. Sites should be spread out where possible. The south roadbed should be removed and grades returned to their natural condition. The area should be revegetated (see Vegetation and Wildlife Management, Developed Recreation Areas, Action #<sup>2d</sup><sub>A</sub>, p 5B).

A new camping loop (see Proposed Development Map, M 12) should add approximately 20 new campsites. A new centrally located sanitation building with showers, accessible to special populations, should be

constructed (see this section, Action #3). If needed, supplementary facilities in the form of pit toilets and water faucets should be provided.

Cost: \$40,000

Action #2. Install electric service in 12 sites on the west side of the campground.

Close proximity to the lake and electric hookups are two key items requested by campers at Lake Carlos. Thirty-six of the 86 campsites in the lakeside campground already have electrical hookups. There are no electrical sites in the upper campground.

Campers at Lake Carlos frequently take sites in the upper campground because the lakeside campground is full. Many campers move from the upper campground to the lakeside campground when sites become available. Providing electric hookups in the upper campground should relieve some of the pressure currently on the lakeside campground. The new sanitation building (covered in the next section) should also make the upper campground a more attractive area to camp.

Should a strong demand for more electrical sites become apparent after the 12 hookups are installed, consideration should be given to adding no more than 10 additional electrical hookups (the addition of 22 hookups would make 40% of the park's campsites electric). If the electric sites in the upper campground are being heavily used, the 10 added hookups should be installed adjacent to the original sites proposed in this action. An alternate location for the 10 sites would be the back row (furthest from the lake) on the ~~west~~<sup>east</sup> end of the lakeside campground.

Addition of electrical hookups should be made only if it does not compete with private campgrounds in the area. Currently a spokesperson for the Alexandria Area Resort Association (Alexandria Chamber of Commerce) feels that the addition of 12 sites will not significantly compete with the private resorts in the area. If the 10 additional sites are desired, a reassessment of the public/private resort situation should be made.

Cost: \$6,000

Action #3. Remove existing sanitation building and construct a new shower building in a central location which is accessible to special populations.

The present sanitation building is not accessible for special populations and does not meet the needs of the campground. It is an inexpensively constructed building and would be very costly to make handicapped accessible.

The new building should be conveniently located between the existing campground and new loop where the most cost effective connection to the sewer system could be made. The building should meet requirements for special populations.

Cost: \$120,000

Action #4. Manage vegetation in the upper campground (see Vegetation and Wildlife Management, Developed Recreational Areas, Action #3d, p 5b).

Action #5. Remove water storage tank.

This water storage tank was installed to ensure an available water supply to the upper campground. The tank is no longer needed for water storage. The top of the tank is damaged allowing water and air to enter and contaminate the contents. It does supply water to the horseman's area for watering horses. The tank is visually unattractive and should be removed.

Cost: \$500

#### Picnic Ground/Swimming Beach

The picnic grounds receives fairly light use due to the numerous other facilities available in the area. The picnic sites are located on a semi-flat hill crest. The sites and cooking grills are in poor condition. The picnic shelter, when used for a winter trail warming shelter, is very dark and unappealing. Electric outlets are provided

in the shelter but there is no drinking water available in the area. The shelter is not accessible to special populations. The area has a heavy canopy of elm trees. Dutch elm disease is a current problem in the area.

The swimming beach is immediately adjacent to the picnic area and is often used in conjunction with picnicking. This beach serves the entire park. Heavily used paths connect the beach with the structured group camp and lakeside campground. Minor path erosion has occurred at the beach. Due to improper drainage of the tamarack slough, a portion of the beach parking lot floods and is in need of improvements. An area of open lawn and some trees exists near the beach for free play.

**Objectives:**

To provide picnic sites where park visitors can prepare and eat meals in a natural setting

To provide support facilities needed for a pleasant picnicking experience

To provide group picnic facilities

To provide an enjoyable swimming experience

Action #1. Install a drinking fountain and faucet near the picnic shelter. The nearest faucet is located 200 ft (60 m) downhill from the shelter. This is not handy for individuals or groups using the shelter. A drinking fountain/faucet at the shelter would improve the picnicking experience. This facility should meet requirements for special populations and children.

Cost: \$500

Action #2. Provide 3 to 4 picnic sites near the beach open play area.

Picnic tables are frequently moved from the picnic grounds to the beach area by swimmers. The demand for picnic facilities near the beach for swimmers and boaters is moderate. Picnic tables and fire rings should be provided near the beach to accommodate this use. The location of the picnic sites should not interfere or restrict the use of the beach or open play area. For this reason the picnic sites should be located a short distance away from both areas.

Cost: \$1,500

Action #3. Manage the vegetation in the lakeside recreation development area (see Vegetation and Wildlife Management, Developed Recreation Area, Action #3e, p58).

Action #4. Upgrade picnic sites and provide fire rings in the picnic ground.

Most of the existing cooking grills are in poor condition. Some are on pedestals and some are on a concrete base. All the grills should be replaced with metal fire ring and cooking grate now used in all state parks. Picnic sites on slopes with erosion problems should be eliminated.

Cost: \$ <sup>5,000</sup>

Action #5. Convert the west bay of the beach parking lot for use as an access road to the structured group camp (see Roads and Parking, Action #7, p94).

Action #6. Repair erosion at the end of the asphalt path which runs from the bathhouse to the beach.

Construct timber steps at the beach where the asphalt path ends. Prevention of future erosion should be considered in the design.

Cost: \$1,000

## Water Access

The boat launch in the park is the only adequate public water access on Lake Carlos. It is heavily used by local residents, area vacationers, and park campers. Several weekends a year a local sailing regatta is held on Lake Carlos. Many of the sailing boats are launched from the park. The amphitheater east of the boat launch is used for Sunday morning church services. Many of the <sup>people</sup> attending the services park in the boat launch parking lot. Frequently the parking lot is over-crowded making it difficult to park and launch boats.

Action #1. Construct a second boat ramp and upgrade the adjacent parking lot.

The parking lot and single ramp unloading area are inadequate on busy weekends. The DNR, Trails and Waterways Unit is pursuing the purchase of land for a public boat access on Lake Carlos outside of the park. It is not expected that this will significantly reduce the use or congestion which now exists at the park's boat landing. The installation of a second concrete plank ramp next to the existing ramp would reduce the waiting time for loading and unloading boats. Concrete plank ramps can withstand ~~intensive~~ intensive use and hold up well under the strain of ice action. The layout of the parking lot now requires that trailers be detached and parked separately from cars. The parking lot currently provides parking for 25 trailers on the west side and 45-50 cars on the east side. The layout for the expanded parking lot should provide adequate room to park cars and trailers together.

The parking lot should be expanded to the north and east to accommodate 30 to 50 percent more parking. Formal parking should be provided on the north side of the boat launch entrance road. This will require relocation of guide posts, grading, and resurfacing with gravel. A limited amount of vegetation should be used for screening <sup>the</sup> park management buildings from the parking lot. (For further discussion, see Vegetation and Wildlife Management, Developed Recreation Area, Action #3e, p 58.)

A sign should be installed at the boat ramp to illustrate to boaters the parking layout.

Cost: \$30,000

Action #2. Relocate the amphitheater to the new trail/interpretive center.

Relocating the <sup>a</sup>amphitheater will reduce the congestion at the boat landing on Sundays. The parking facilities for the new trail center will provide parking for the service goers and a more centralized location in the park will provide easy walking access from both campgrounds. The trail/interpretive center will provide facilities for services to be held inside should the weather be bad. The amphitheater located at the trail/interpretive center will <sup>also</sup> provide an excellent meeting place from which to start guided interpretive hikes.

Cost: \$1,500

#### Administrative/Support Facilities

The manager's office is located in the contact station. The building is about 5 years old and in good condition. It is located on an open site and has excellent control of access to the park's developed areas. Vehicular circulation at the contact station is a problem.

The service court location provides easy access from the service court to the park for maintenance. Two small wood buildings are in poor condition. The houses and other shop buildings are in good condition. The gravel service court is soft in places, probably due to seepage. The service area is not well-screened from park users.

#### Objectives:

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

To provide sufficient equipment storage and maintenance facilities

Action #1. Remove two wood frame storage sheds on the west side of the service court.

Both buildings are over thirty years old. They are in need of major repairs. They currently do not provide adequate unheated storage for park equipment. Further repairs on these buildings would be a poor investment.

Cost: \$500

Action #2. Construct a new unheated storage building.

The new storage building should be located at the west side of the service court. Garage doors should face into the court. It should provide ample storage for all equipment presently in the two storage sheds, in the attic of the shop building, and at other miscellaneous park locations.

Cost: \$80,000

Action #3. Insulate and provide the option to heat the east bay of the existing shop building.

This would provide an auxilliary heated work space for winter maintenance. Modifications to the shop's existing heating system should be evaluated for providing the necessary heat for the east bay.

Cost: \$2,000

Action #4. Upgrade and install drain tile in the service courtyard to eliminate water problems.

Seepage saturates the courtyard soils and they remain wet until late July. A draintile system could carry excess water to a drainage ditch west of the courtyard. Resurface the service court with gravel to establish proper surface drainage.

Cost: \$1,000

Action #5. Manage vegetation in the service court and surrounding old roadbed areas (see Vegetation and Wildlife Management, Developed Recreation Areas, Action #3f, p60).

Action #6. Remove the 4 to 5 car parking lot adjacent to the existing interpretive/storage building (former contact station). (See Roads and Parking, Action #1, p92).

Action #7. Provide signage at the contact station vehicle turnaround (see Roads and Parking, Action #3, p93).

Action #8. Construct a parking lot north of the contact station (see Roads and Parking, Action #4, p93).

Action #9. Place all park electrical lines underground.

Above-ground electrical lines disrupt the visual character of the park. In addition they are more susceptible to damage. The majority of the park's electrical lines are buried. There are a few areas where lines or transformers are on poles above the ground. These should be placed underground and transformers screened from users view.

Cost: \$1,000

Action #10. Remove the sewage lagoon and develop the area for wildlife habitat.

The sewage lagoon has been inactive since 1978 when the park was connected to the Alexandria Lake area sanitary system. Permission shall be requested from Pollution Control Agency (PCA), Division of Water Quality to discharge the contents of the lagoon. Water samples will be taken from 4 locations in the lagoon and tested in accordance with PCA standards for biochemical oxygen demand (BOD), total suspended solids, fecal coliform, Ph and total phosphorous (personal communications with PCA, Division of Water Quality). The results of these tests should be sent to PCA, Division of Water Quality for review. If water quality standards are met, PCA can approve drainage of the lagoon.

The water level in the lagoon shall be discharged slowly to avoid stirring up the bottom nutrients. Precautions shall be taken that no nutrients will be released into the tamarack bog, thereby protecting the tamarack from potential strain. Portions of the existing dike shall be graded into the lagoon to cover up the remaining nutrient sediments. A portion of the dike shall be retained to maintain some water holding capacity in the basin for vegetation and wildlife.

The remainder of the dike shall be graded to blend with the natural topography of the area. This area will be left for natural revegetation.

*Parking for the trail center may be developed in this area. If so, some or all of the former sewage lagoon area could be used for this purpose. Final determination on this action will be made by DNR Bureau of Engineering.*

Action #11. Construct a small building for gas and oil storage.

A separate gas and oil storage building is needed to meet Occupational Safety and Health Administration (OSHA) safety regulations. It will be located in the service center area.

Cost: \$8,000

Action #12. Upgrade the park's sanitation system.

At such time when the shop building's septic system requires extensive repairs it should be eliminated and the shop building should be connected to the sanitary sewer system.

The Alexandria Sanitary Sewer District maintains a general policy that does not allow waste water to be disposed into their system. Based on the needs of the park the secretary-director of the sewer district indicated that the possibility to provide this service could be negotiated at a future date. This should be considered for the lakeside and upper campground wastewater drains as it would eliminate overflow, odor and flies, thereby enhancing the quality of the camping experience.

#### Roads and Parking

Parking and vehicular circulation are inadequate at the park entrance. The lakeside campground access road has several turns which are difficult to negotiate with large vehicles and boat trailers. Parking

facilities are inadequate at the boat launch area. Several roads and parking facilities are deteriorating or are no longer necessary.

The access road (CSAH 38) to the park's entrance is in excellent condition. An alternative location for this road has been discussed. The location is on the high ground along the east property line of the park. This would enhance the lakeshore for aesthetics and recreational use. However, it is an extremely costly consideration and is not a recommendation of this plan.

Objectives:

To provide ample year-round parking for visitors at high use areas

To upgrade vehicular circulation within the park

To eliminate unused, deteriorating roads

Action #1. Remove the parking area adjacent to the old contact station, and revegetate.

The 4-5 car parking area should be removed because it attracts people to the maintenance area. The old contact station will continue to be used as the interpretive center until the new trail/interpretive center is built. However, the parking area is not needed and should be removed and revegetated. This revegetation should also screen the service court from public view (see Vegetation and Wildlife, Developed Recreation Area Management, Action #3f, p 60, for additional discussion).

Cost: \$ <sup>2,000</sup> ~~10,000~~

Action #2. Close the gravel access road and develop it into a walking trail from the contact station to the lakeside campground (see Trails, Action #5, p 100).

Close the gravel access road between the service court and the entrance road. This road is unnecessary for providing access to the park for maintenance.

Action #3. Provide signage at the contact station vehicle turnaround.

The vehicle turnaround is very close to the contact station. It is often missed or mistaken for a service road. The turning radius at the entrance island is too short for vehicles not using the turnaround loop. A sign should be installed to direct drivers to use the turnaround.

Cost: From Park's operation budget.

Action #4. Construct a small parking area north of the contact station.

There are no parking facilities available for park users at the contact station. People stopping at the contact station park on the road and shoulder. This causes a slowdown in traffic circulation hindering park operations. A parking lot should be constructed. It will provide short term parking for people registering for campsites, buying firewood and ice, and getting park information.

The parking lot should be designed to provide:

1. Parking for 4-6 ~~vehicles~~ vehicles
2. Vehicle drive through and/or turnaround
3. Potential for future lot expansion (see Proposed Development, Trails, Action #1, p45)
4. Easy snowplowing

Cost: \$ ~~2,000~~ 2,000

Action #5. Modify the lakeside campground roads.

Correct poor turning radius of the northwest end of the loop. The existing turn is very sharp and is difficult for large vehicles to maneuver. The entrance road to the lakeside campground should also be realigned to reduce the number of turns and stops for park users. This will also require modification of the service court entrance road. Full visibility of oncoming vehicles must be maintained. A stop sign may be required for vehicles coming from the service court.

Cost: \$5,000

Action #6. Construct a second boat ramp and upgrade the adjacent parking lot (see Water Access, Action #1, p87).

Action #7. Convert the west bay of the beach parking lot for use as an access road to the structured group camp.

The beach parking lot is poorly designed in that the general park traffic circulates through each bay of the lot. Currently the lot can handle approximately 140 vehicles. This greatly exceeds the needs for beach and picnic parking. The abundance of swimming and picnic facilities within 25 mi (40 km) of the park indicates that upgrading of the park facilities will not significantly increase use. The west bay of the lot should be converted to a two-way road. This may require realignment of existing sections of road at the ends of the lot to facilitate parking lot entrance and exit. Signs may be required to direct traffic flow. This area has been prone to seasonal flooding. This situation should be taken into consideration in determining roadbed elevation.

Cost: \$1,000

Action #8. Construct a service driveway from the entrance road to the service court.

Currently all vehicles enter the park past the contact station. When the park is closed to the public the gates are locked. This results in the need to frequently unlock the gates for maintenance and personal use by the park staff. A driveway should be constructed for park staff use to provide an alternate supervised access road into the service court.

Cost: \$5,000

#### Trails

The park's winter trail use is increasing. Several problems concerning the winter trail system exist. There is insufficient ski touring trail mileage, and winter parking is poorly designated.

The Douglas Area Trail Association (DATA) snowmobile trail runs through the east side of the park. A loop snowmobile trail in the park has a spur trail connecting it to the DATA trail. Most of the park's snowmobilers enter the park from the DATA trail.

There is insufficient horse trail mileage to provide a satisfying trail riding experience.

The park has a limited amount of wooded land for development of preferred trails. Some sections of the park's existing trail system are poorly organized. The trail system has a variety of problems. They include, erosion on steep slopes, wet soils, flooding, and conflicts at intersections. ~~\_\_\_\_\_~~  
~~\_\_\_\_\_~~

When an alignment is selected for the Glacial Lakes State Trail, an alignment through the park will be developed in cooperation with the DNR, Trails and Waterways Unit.

#### Objectives:

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

Action #1. Construct a centrally located trail/interpretive center and parking facility for 20 vehicles.

The picnic shelter is now being used as a winter trail center. Its location causes many problems. It is so far from the contact station that supervision of the building is difficult, and extensive snow plowing is required to provide access and parking. Trail access to the center requires snowmobilers to cross ski trails, resulting in user conflicts.

A new trail/interpretive center in the vicinity of the park entrance will alleviate these problems. Three site location alternatives have been selected for the center and an adjacent parking lot (see Proposed Development Map, M12).

The following is a brief discussion of each site and the recommendation for development. An engineering study and detail site planning must be completed to determine the optimum location of building and parking facilities.

Site A This is the recommended location for the trail/interpretive center. It is a large area which has opportunities for siting the building on the northeast face of the slope south of the road leading to the upper campground or angled into the south face of the hill above the abandoned sewage lagoon. A building in either location can be designed to accommodate the campgrounds as a storm shelter.

This area is centrally located to service both the upper and lower campgrounds. The area can be developed in such a manner as to make a trail center highly visible to park users. This location within the park facilitates the optimum relationship between trail center and trails. Also, the site above the lagoon is in an excellent location for interpreting the park's natural and historic resources. This area has ample room to accommodate the relocated amphitheater. Parking facilities for a trail center in this area can be accommodated on top of the hill or at the location of the abandoned sewage lagoon (see <sup>Administrative/Support</sup> ~~A~~ Facilities, Action # 10, p90). The parking facilities must be located and screened in such a manner that they are not a visual intrusion to park visitors.

Studies should be done to determine the feasibility and costs for developing a trail/interpretive center at site A. Alternative sites B and C should also be considered if indicated by studies.

Site B The east-southeast facing slope north of the upper campground access road offers a site that is open, on high ground, and surrounded by woods on three sides.

Site C      The open, level ground north of and adjacent to the contact station is a highly visible location with ample area for parking. This site should be reviewed for vehicle circulation. A facility here would require special considerations to prevent possible interference with contact station operations.

The criteria used for selecting a site should include the following:

1. Easy trail access from either campground.
2. Visual supervision from the park manager's office/contact station.
3. Space for a parking lot for 20 vehicles in the immediate area.
4. Accessibility for special populations.
5. Development of a snowmobile spur trail which would connect to the DATA trail.
6. Clearly visible to park visitors.
7. Access to a variety of trails, including; ski touring, hiking, and interpretive trails.
8. Protection from storms.

The trail center should be designed to optimize the recreational trail experience. It should also provide an interpretive presentation area for use by the park naturalist (see Proposed Development, Visitor Services, Action #3, p104). The trail center facilities should include the following:

1. A winter heating system.
2. Toilet facilities in the immediate area (vault/pit toilet)
3. Accessibility to special populations.
4. Storm protection.
5. Area for interpretive displays.
6. Area for 75 to 100 people.
7. Electric outlets and lighting.
8. Ample storage facilities for portable interpretive display, literature, and miscellaneous equipment.

9. Optional division of interior space for a naturalist's office and private work space.
10. Nearby access to a phone.
11. Nearby access to a fountain or water spigot (summer only)

Cost: \$200,000

Action #2. Modify the horse/snowmobile trail west of the horseback rider's area.

Relocation of the trail center will allow removal of the snowmobile spur into the picnic area. This will eliminate most of the winter trail use conflicts.

Relocation of the snowmobile trail from the southwest to the northwest area of the park allowed expansion of the ski touring trails (see map, M10 ) One section of the snowmobile trail must be signed one way only. This is due to a steep hill on one trail which could present a safety problem if used two ways. There have been no problems on the park's snowmobile trails in the past. However, if use increases, modifications may be required to increase site distances. This should be reviewed annually by the regional trails coordinator and the park manager.

Minor water and erosion problems occur throughout this trail. The underlying soils are generally suited for recreational trail development. The Nebish (Nb) soils have slight to moderate restrictions for trails on slopes 6 percent or greater. The horse trail should be modified in problem areas. Erosion problems should be corrected by one of the following techniques:

1. Place soil filter cloth beneath crushed gravel to stabilize trail.
2. Place logs along edge of trail for support.
3. Realign trails in areas where construction techniques are too expensive or will not correct the problem.

Trails should be constructed according to trail specifications as recommended by the DNR, Trails and Waterways Unit (e.g., all realignments

should be constructed so that a 20 percent maximum slope is not sustained for more than 50 yards (45.7 m). In areas of poor soils, trails should be surfaced with crushed gravel which is no larger than 3/8 in (.95 cm) in size.

Cost: \$2,000

Action #3. Develop a new horse trail east of the horseback rider's area.

Three miles of trails currently exist in the park. This limited amount of trail does not provide a quality riding experience. Up to 3 mi (5 km) of new trails could be developed east of the CSAH 38.

Portions of the existing DATA snowmobile trail and hiking trail should be used where possible. Techniques for hardening the trail surface for horse use will be required. Minor realignment of the DATA snowmobile trail may be required to accommodate both uses adequately on the park trails. Winter use of the park trails by horses will not be allowed. Culverts with gravel trail beds over them should be used where the trail is to be constructed over a wet drainageway.

All horse trails should be constructed to meet DNR, Trails and Waterways Unit construction specifications and specific design solutions determined by the regional trails and waterways coordinator. The development of this trail is contingent on suitable design solutions and the overall trail cost.

Hikers and horses will share portions of this trail unless a substantial increase in horse use occurs. At that time a relocation of the horse trail should be studied.

Cost: Requires further study by regional trails and waterways coordinator and park manager.

Action #4. Realign and expand the hiking/ski touring trails.

The park now has 3 mi (5 km) of ski trails which receive substantial use. An additional 1 mi (1.6 km) of trail should be provided along the lakeshore from the group camp to the campground, and another

1.5 mi (2.4 km) west of Hidden Lake. The multi-loop trail system will start and end at the new trail/interpretive center. The ski trail should be a one way system. This eliminates the need to widen the trail at the south end, which could possibly require removal of several large trees. A steep hill at one point requires a one way trail to prevent a user conflict and possible injuries. Developing a one way trail system at Lake Carlos will reduce the number of encounters between skiers and will enhance the user's experience.

The alignment of the existing snowmobile trails has been modified to eliminate conflict with ski trails. The snowmobile trails limit the amount of ski trails in the park. Further expansion of ski trails to meet demand will require reducing the length of the snowmobile trails.

The trails available for hiking in the park are extensive. Most are lightly used.

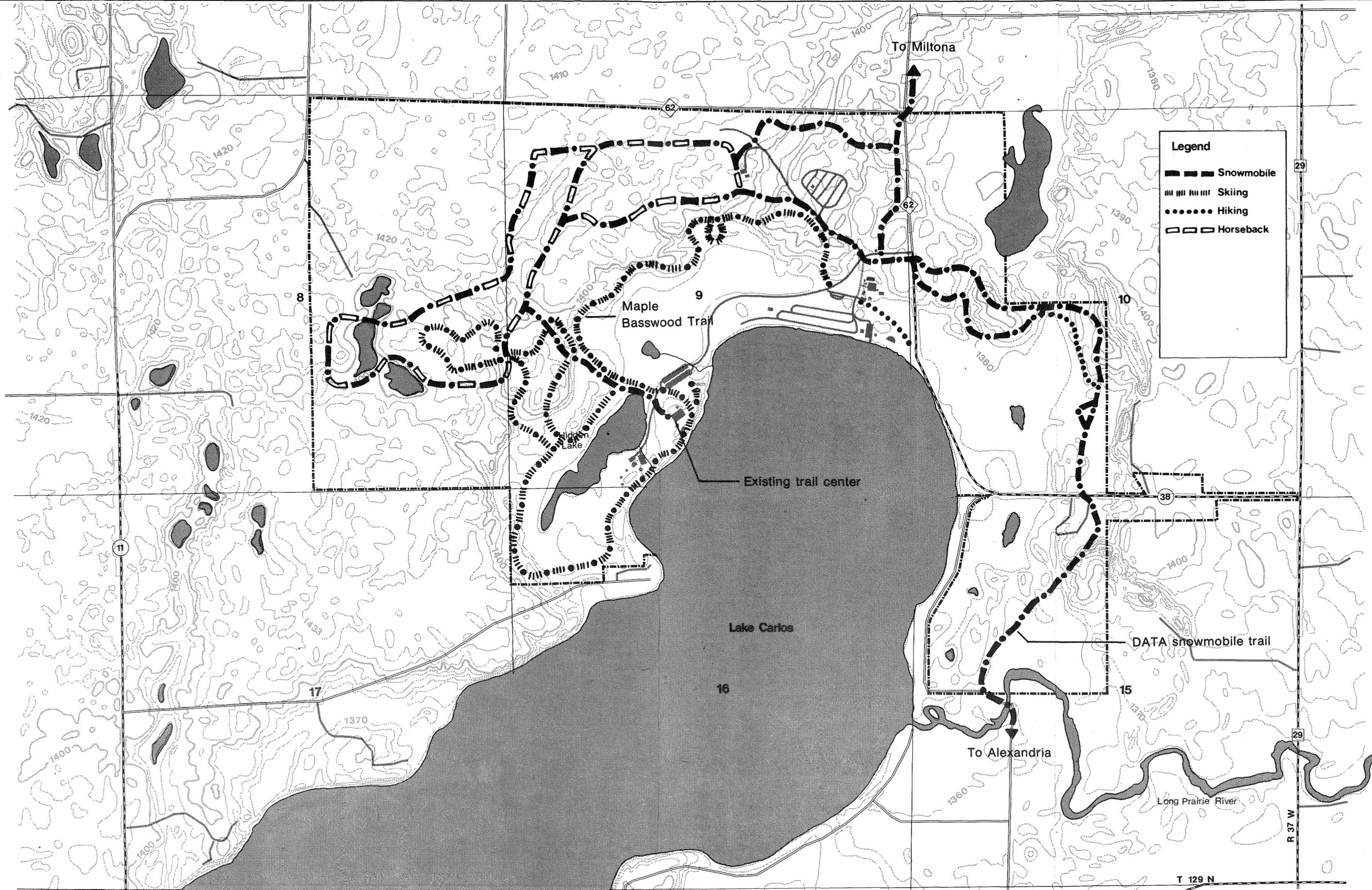
Cost: \$3,000

Action #5. Develop a hiking trail from the contact station to the lakeside campground.

The gravel road between the service court and the entrance road should be closed and modified to create a pleasing hiking trail. This trail will provide access to the contact station. It will also improve the quality of snowmobile access into the park from Lake Carlos.

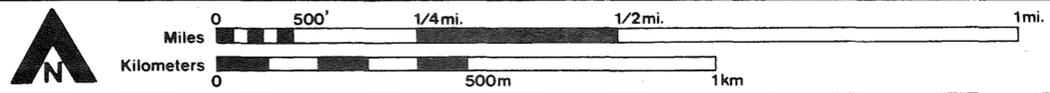
The following considerations should be included in the design of the trail:

1. Reduce the linear feeling of the abandoned roadbed by use of plantings (see Developed Recreation Area Management, Action #3f, p 60).



**Legend**

-  Snowmobile
-  Skiing
-  Hiking
-  Horseback

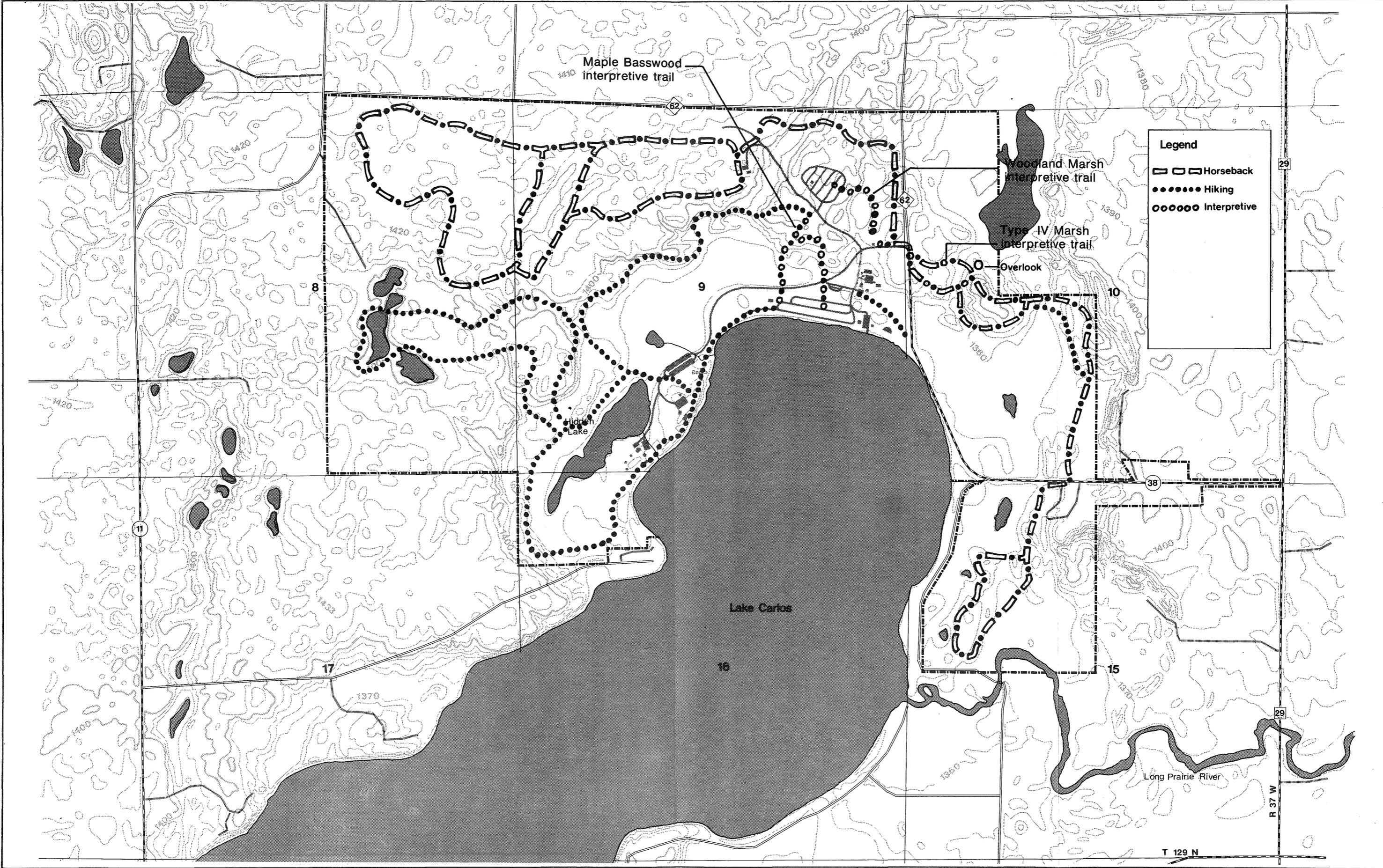


M9

Lake Carlos State Park

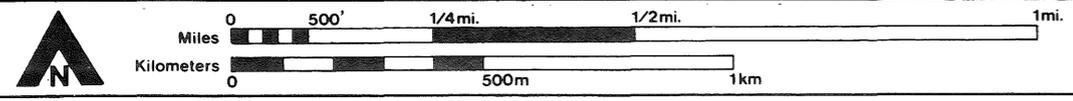
Existing Trails





**Legend**

-  Horseback
-  Hiking
-  Interpretive

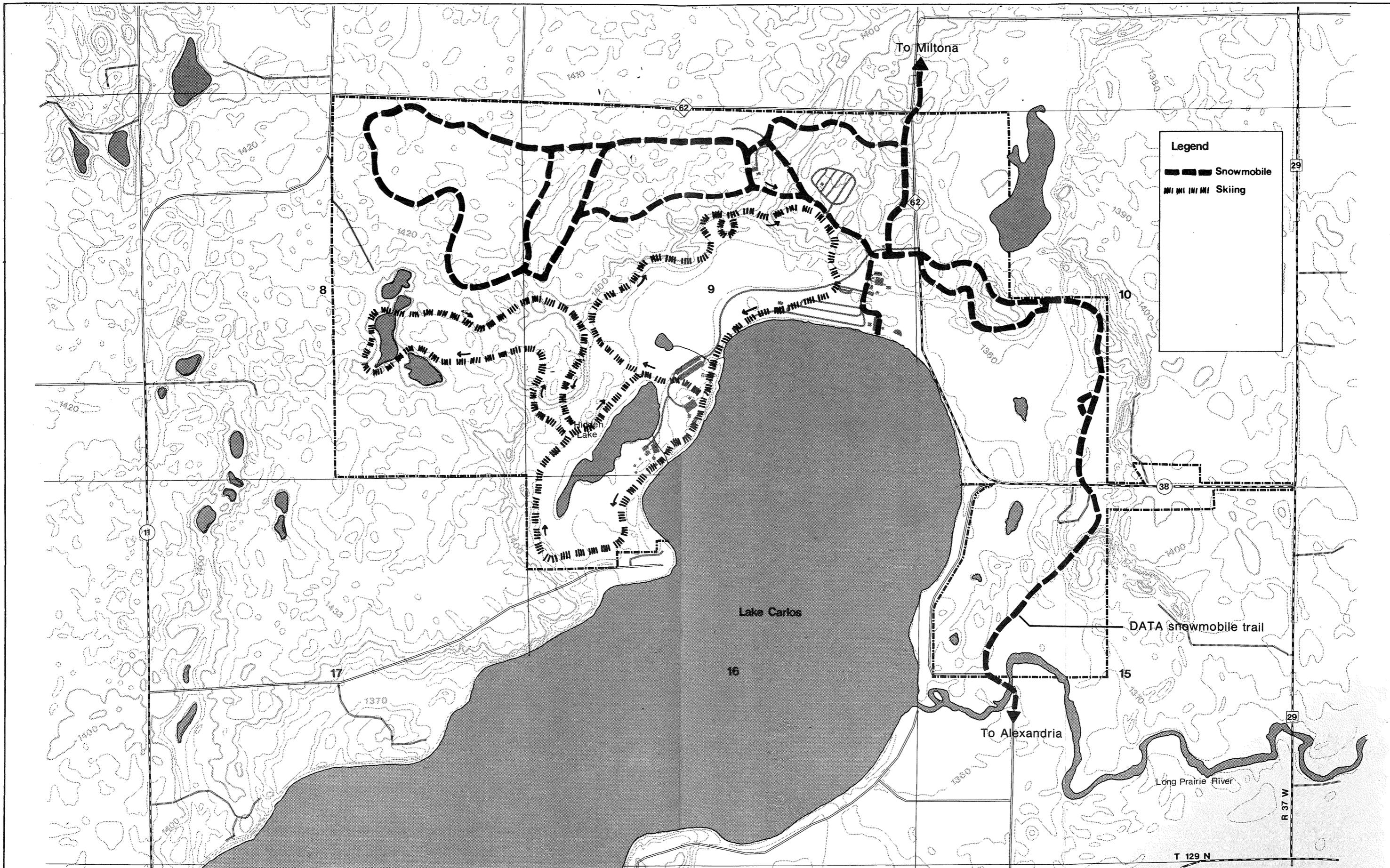


M 10

Lake Carlos State Park

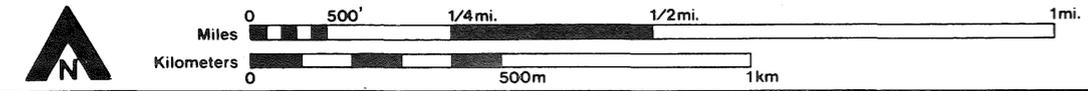
**Proposed Summer Trails**





**Legend**

-  Snowmobile
-  Skiing



M11 Lake Carlos State Park

**Proposed Winter Trails**



2. Allow winds to penetrate trail area to keep bugs away.
3. Maintain existing grade to prevent exposure of buried sewer line.

Cost: \$3,000

#### 5202 Visitor Services

A portion of the old contact station is now being used for the interpretive center. It is not centrally located and is poorly sited for visibility. Its location in the service court area attracts public use to the maintenance area.

The interior of this building does not function well for displays or group talks. The building does not have indoor A-V facilities. Presently the slide and movie programs are presented at the amphitheater. The large insect population in the park reduces the number of campers who will take advantage of the outdoor evening programs.

The park naturalists have been using the maple-basswood trail, the tamarack slough, and the marshes for nature walks. There are no self-guided interpretive trails currently in use in the park.

Lake Carlos is a destination park for most of its campers. The long-stay camper in a destination park is more likely to be interested in a variety of in-depth interpretive opportunities.

#### Objectives:

To provide easily accessible interpretive opportunities for visitors interested in the natural and cultural aspects of Lake Carlos State Park and the Leaf Hills Biocultural Region

To provide interpretive facilities to enhance the quality of the park user's experience

Action #1. Construct 3 self-guided interpretive trails with accompanying trail brochures and visible trail head signage.

These interpretive trails should range in length from 1/4-3/4 mile. They should develop in the visitor an awareness and understanding of the area's natural environment. The trail heads should be highly visible and inviting. Trail information, brochures, and general park displays should be posted at the trail heads. A two sided, enclosed bulletin board with space for displays would be one alternative for providing trail head information in a highly visible manner. A variety of alternatives should be researched with the regional park naturalist to determine the best design to facilitate all display needs. The display facility should follow the architectural theme of the park.

The three interpretive trails should be located as follows:

1. Lakeside Campground
  - a. A trail head/display with interpretive brochures should be located at the west end of the campground in the vicinity of the toilet building.
  - b. The trail should extend across the lowland shrub area between the campground and the road. This will require approximately 30 ft (9.1 m) of simple boardwalk.
  - c. A crosswalk should be painted on the road and posted as an interpretive trail crossing.
  - d. A simple boardwalk and/or trail puncheon system should be developed through the tamarack slough north of the road (approximately 150-200 ft (45.8-61 m in length).
  - e. The trail should extend up the hill to an overlook above the existing sewage lagoon. Proposed modifications to eliminate the lagoon will enhance the area's interpretive qualities (see discussion, Administrative/Support Facilities, Action #10, on p<sup>90</sup>).
  - f. Develop an interpretive brochure for this trail.
  - g. A second trail head/display board with interpretive brochures will be located toward the east central portion of the campground. The final location will be determined during the design development stage by the regional naturalist, park naturalist, park manager, a central office planner and a review of costs.
  - h. A spur trail should be developed to connect the lakeside campground interpretive trail to the upper campground and the trail/interpretive center.

2. Upper Campground
  - a. A trail head/display board should be located in a highly visible location at the east side of the campground.
  - b. The trail will provide an alternate route from the campground to the contact station. It should be located between two type III woodland marshes featured along this trail and use part of the DATA trail as its route.
  - c. Interpretive signage should be provided along its route.
  
3. Contact Station
  - a. The existing display case should be used to identify the park's entire trail and interpretive systems.
  - b. Develop a loop trail to include Schumacher marsh as the feature.
  - c. Install a trail head sign to direct visitors to Schumacher marsh, a type IV marsh, east of the park.
  - d. Develop a simple trail guide brochure and make it available at the trail head.
  - e. Install a trail entrance sign on the east side of CSAH 38.
  - f. An overlook with seating and vandal-proof interpretive displays should be developed on the rise overlooking Schumacher marsh.
  - g. A small trail puncheon should be installed at a point where the trail crosses a drainageway.

Note. Trail boardwalks and puncheons should be in keeping with the types illustrated in the Trails Manual Draft, Minnesota Department of Natural Resources, Trails and Waterways Unit.

Cost: \$11,000

Action #2. Develop a permanent set of Lake Carlos State Park and Leaf Hills Region interpretive aids for year round use by park visitors.

Lake Carlos has been highly rated by the regional naturalist for interpretive opportunities. This is due to a combination of the park's environmental qualities and the high number of park users. Lake

Carlos is also the key interpretive park within the Leaf Hills Biocultural Region. This is because Lake Carlos has the largest visitor population in the biocultural region. The park has a wide range of plant communities and features for interpretation.

A permanent set of maps, photographs, drawings, and narrative descriptions should be developed to interpret the natural and cultural aspects of the park and biocultural region. This series of interpretive aids will be available year round to park users at the trail/interpretive center. Development of this series will require research of both the historic and natural aspects of the park and surrounding area. Text and graphics must be developed to present this information to the general public in a pleasing manner. Low maintenance, vandal-proof displays for wall mounting must be developed and installed. The design of this series may include a selection of displays which are changed by park staff to correspond with the seasons.

A program for the development and display of the interpretive aids should be established by the regional naturalist. The regional naturalist should outline a program which coordinates the development of interpretive aids with other facilities provided within the biocultural region.

Cost: \$4,000

Action #3. Construct a centrally located trail/interpretive center (see Trails, Action #1, p95).

The building currently being used by the park naturalist is poorly located and tends to bring the public to the maintenance area. This not only reduces the quality of an interpretive experience, but it conflicts with park operations.

The building is not centrally located between the two campgrounds. The existing building functions poorly. Even extensive remodeling would not make it function well as an interpretive facility. The new trail center should be designed to accommodate the interpretive program in the summer. The old interpretive center will be used for storage and a garage.

## 6202 ARCHITECTURAL THEME

There is no overall architectural theme for the park. Each building in the park reflects the architectural style of the period in which it was built.

The oldest and most distinctive style is the stone masonry and wood frame structures built by the Work Progress Administration (WPA) in the late 1930's. There are three of these buildings, all located in the picnic area. They are the water tower, the picnic grounds sanitation building, and the bathhouse.

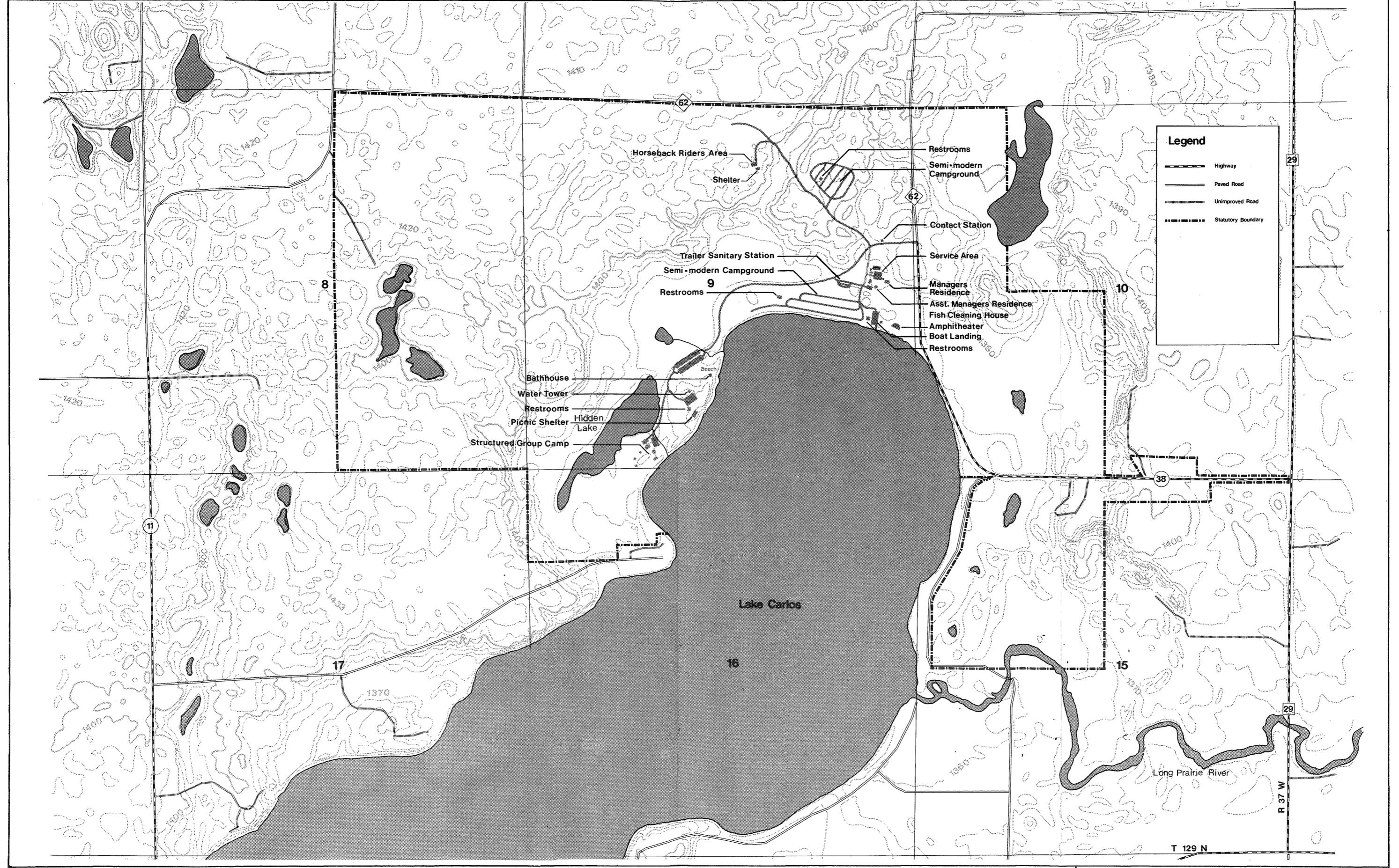
The structured group camp has wood framed buildings, painted dark brown. All six of the buildings have low sloping roofs and a moderate overhang. They were built between 1950 and 1970 and are of a compatible style.

The campgrounds and administrative areas include a variety of structures and style.

Due to the existing variety of architectural styles in the park, it seems most reasonable to maintain a separate architectural theme for each of the three areas. The architectural theme for the structured group camp and the picnic/beach will preserve the character established by the primary buildings in each area. All remodeling in each of these areas should be harmonious in style, materials, and color with these primary buildings.

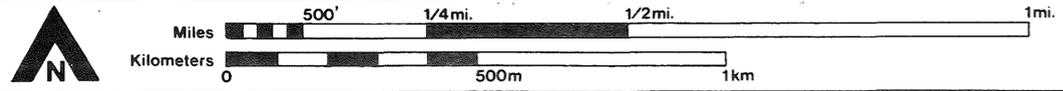
Removal, construction, and major remodeling of several campground and administrative buildings provides the opportunity to establish a consistent architectural style in this area of the park. The architectural theme should have incorporated into it the design of the new, highly visible contact station. New and remodeled structures should be integrated into the landscape. They should be low in profile and exposed surfaces should be covered with naturally textured materials; wood, textured concrete or block, and left natural or stained or painted with earth tone colors. All heated buildings will be designed for energy efficiency and should integrate some of the following

energy conservation features: proper sun/wind orientation, maximum insulation, earth sheltering, passive and active solar space and water heating applications, and the use of supplemental wood heat.



**Legend**

- Highway
- Paved Road
- Unimproved Road
- Statutory Boundary

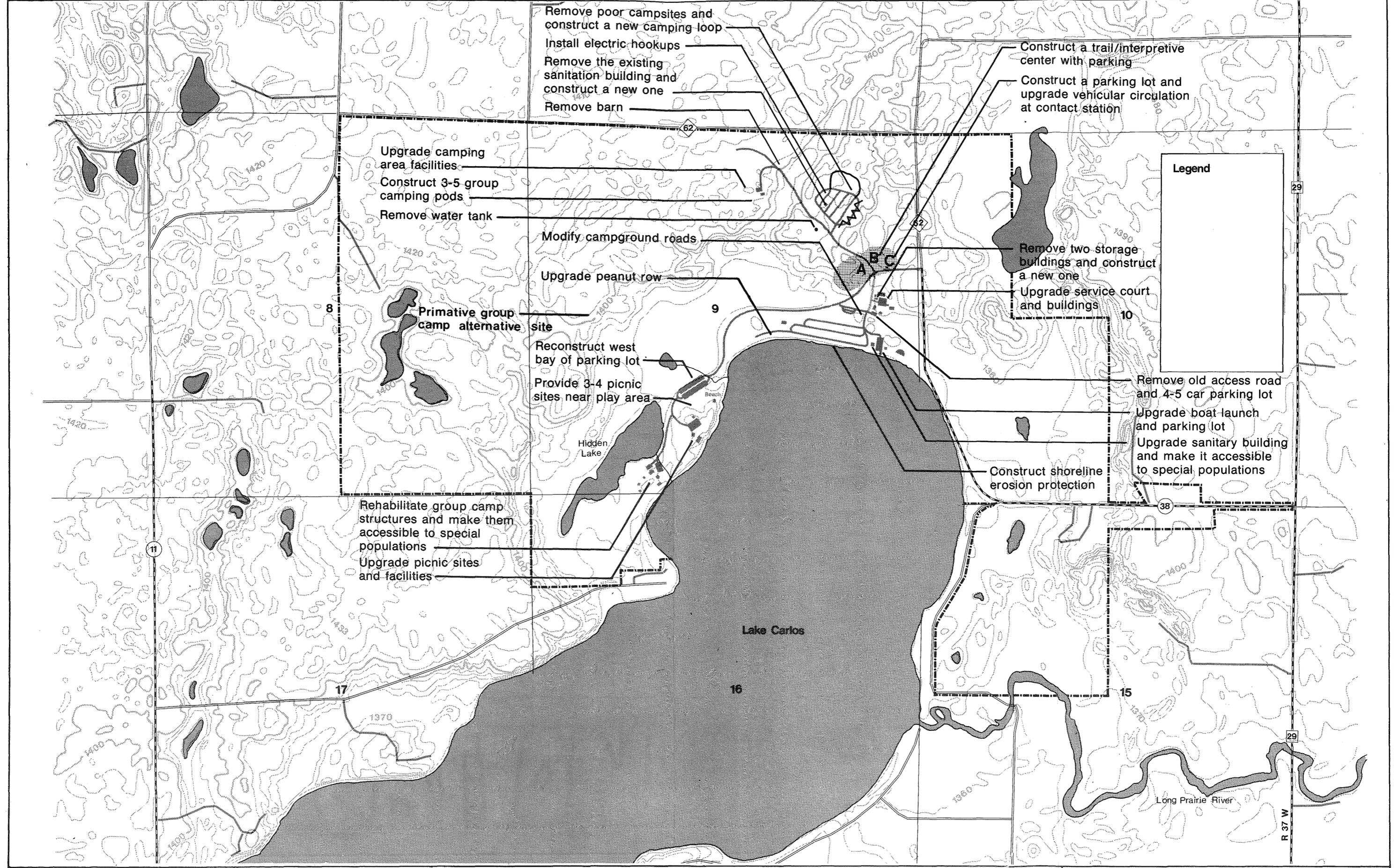


M12

**Lake Carlos State Park**

**Existing Development**





Remove poor campsites and construct a new camping loop  
 Install electric hookups  
 Remove the existing sanitation building and construct a new one  
 Remove barn

Construct a trail/interpretive center with parking  
 Construct a parking lot and upgrade vehicular circulation at contact station

Upgrade camping area facilities  
 Construct 3-5 group camping pods  
 Remove water tank

Modify campground roads  
 Upgrade peanut row

Remove two storage buildings and construct a new one  
 Upgrade service court and buildings

Primitive group camp alternative site

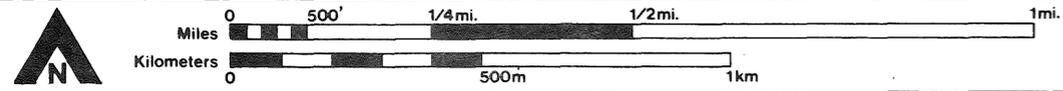
Reconstruct west bay of parking lot  
 Provide 3-4 picnic sites near play area

Remove old access road and 4-5 car parking lot  
 Upgrade boat launch and parking lot  
 Upgrade sanitary building and make it accessible to special populations

Rehabilitate group camp structures and make them accessible to special populations  
 Upgrade picnic sites and facilities

Construct shoreline erosion protection

Legend



M13

Lake Carlos State Park

Proposed Development



# BOUNDARY MODIFICATION



## 6203 Objectives:

To include lands adjacent to the park which have significant value for future development of trails and park facilities

To eliminate private lands currently within the statutory boundary which do not have significant recreational value for park users.

Action #1. Delete the S½ SE¼ of Section 8, T129N, R37W (80 acres/32 hectares) and resurvey the boundary (see Boundary Modifications Map, M13).

The 1977 legislation expanded Lake Carlos State Park by 80 acres (32 hectares). The state has been unable to purchase this land. The area has been subdivided, the lots are being sold and developed. Residential construction on these lots makes the acreage undesirable park land. A boundary survey should be conducted to verify and establish the park boundary adjacent to this new development.

Action #2. The state wildlife management area south of the park on the east of the lake should not be incorporated into the park.

Considerations for including the area into the park were reviewed. It was determined that the area is best used for wildlife habitat and has limited potential for recreation because it is so far removed from the developed areas of the park and is separated by roads. Therefore, it was determined that the area continue to be managed as a state wildlife management area.

Action #3. Maintain the existing boundaries in the area of Schumacher Marsh in the northeast corner of the park.

Schumacher Marsh is a 30 acre (12 hectare) type IV wetland situated along the northeastern border of the park. The majority of the marsh is in private ownership, but about 5 acres (2 hectares) are state owned and within the park boundary. The marsh is a valuable wildlife wetland, and consideration was given to including the marsh in the statutory boundary for future fee or easement purchase. After careful consideration, however, it appears that the marsh is reasonably safe and will be protected regardless of ownership. The only drawback

is that the majority of land surrounding the marsh is subject to development. and if a structure were to be built on the hill east of the marsh, it would be visible from the park.

Major considerations leading to the decision not to include this area were:

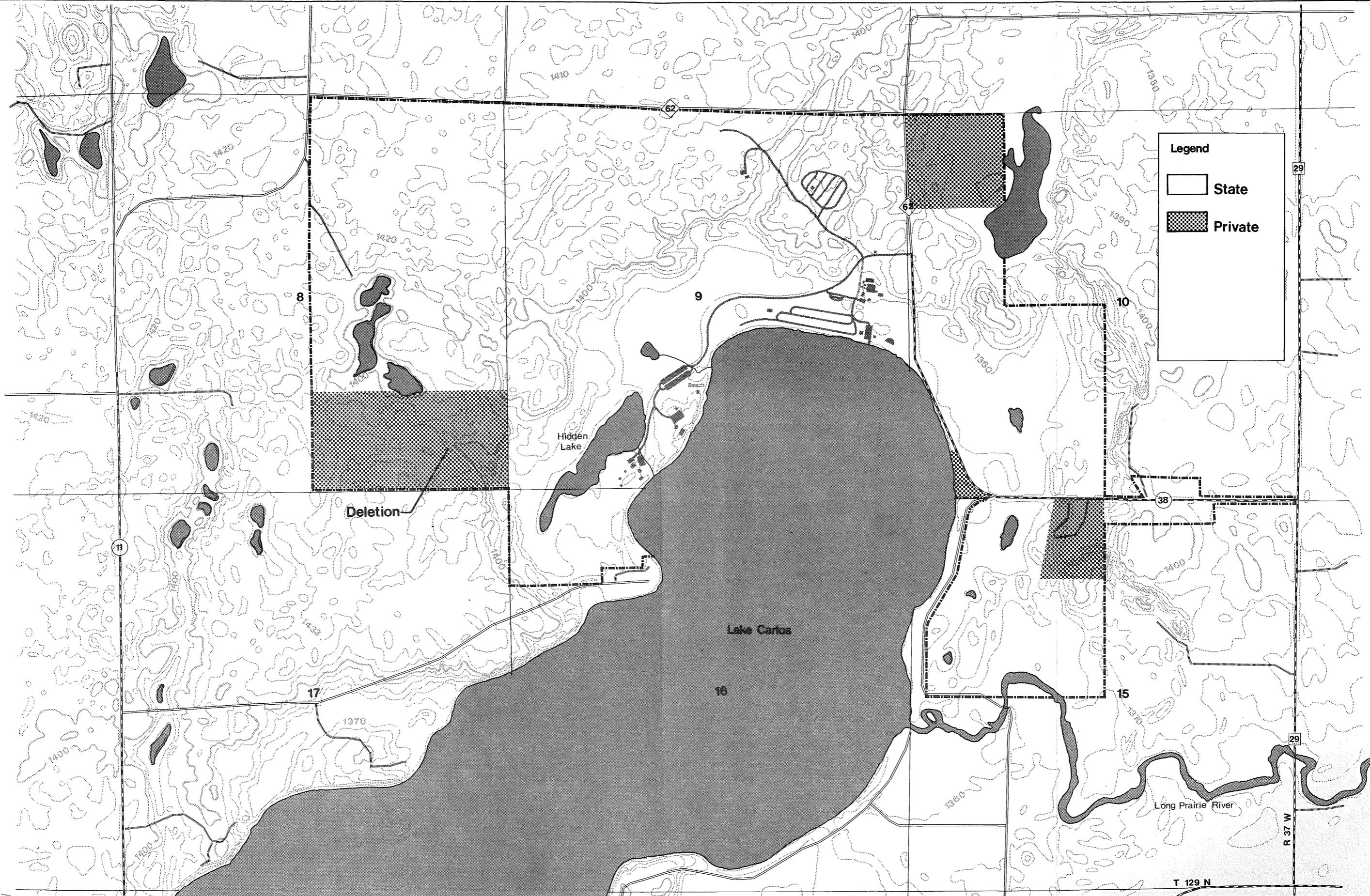
- a diversity of wetland types already exist within the park
- permits to drain type IV wetlands are difficult to obtain; this, in effect, helps to protect the marsh
- the most feasible drainage would be toward the lake which would have to run through park land
- the park is located in an area known for its abundant wetlands. In 1975, Douglas County ranked 10th among all Minnesota counties in the percentage of land being protected for wildlife. At that time, 7 percent of Douglas County was protected by state and federal programs, the majority of this percentage being wetland areas (State Planning Agency, 1978)
- the southwestern corner of the marsh now in park ownership can and will be utilized in the overall management plan (see Vegetation and Wildlife Management, Grasslands and Wetlands, Action #2, p41, and Proposed Development, Visitor Services, Action #1, p11).

Action #5. Retain the present boundaries which include the private agricultural land, gravel pits, and lakeshore residences adjacent to CSAH 38.

The 40 acre (16 hectare) agricultural land between county road 62 and Schumacher marsh is visible from the DATA snowmobile trail in the northeastern corner of the park. Small grains have been grown on the western half of this land for the past several years and the current owners intend on continuing this practice. The eastern half of the parcel is mostly marsh, so the development potential is greatest in the western acreage next to county road 62. The present owner is not interested in selling this land at this time or in the near future.

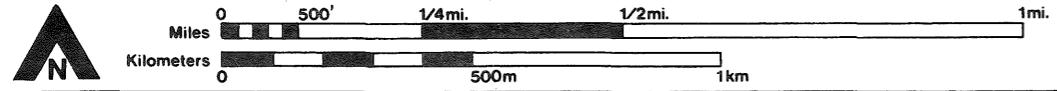
The owner of the 20 acre (8 hecatre) gravel pit south of CSAH 38 is currently leasing this land for gravel mining. By agreement with the landowner, the DATA snowmobile trail passes through the gravel pit area. Because CSAH 38 serves as the park entrance road from State Highway 29, an attempt should be made to purchase and reclaim the gravel pit adjacent to Highway 38. The landowner is possibly interested in selling or developing this area in the near future.





**Legend**

- State
- Private



M14

**Lake Carlos State Park**

**Ownership/Boundary Adjustments**



OPERATIONS

AND

STAFFING



## 6204 OPERATIONS

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

The task of providing services to the public and security for park facilities and resources 24 hours a day, 12 months of the year is monumental. During the busy season, park operations and supervision of park facilities is necessary 98 hours per week (8:00 to 10:00 p.m., seven days a week). During the other seasons the park maintains the same hours, but significantly decreases in visitation, which allows operation of the park by a reduced staff. However, even during the off season, maintenance, repairs and park security are ongoing responsibilities which account for many work hours.

There are four basic aspects to maintenance and operations:

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

One of the major maintenance problems of parks is the heavy impact of large numbers of people concentrated in specific locations. These areas include: campsites, trails, lakeshores, river banks, areas around buildings, and scenic points of interest. This overuse affects the groundcover and frequently exposes tree roots to damage from foot traffic. The eventual result may be erosion, slides, disfigured sites, and even danger to park visitors. A regular maintenance program with adequate personnel, supplies, and equipment controls damage, thereby, avoiding future reconstruction expenditures.

In addition to the maintenance at Lake Carlos State Park, the staff at Lake Carlos maintains Inspiration Peak State Wayside, an 88 acre (35.6 hectare) tract situated 15 mi (24 km ) northwest of the park. Inspiration Peak

is approximately 1,750 ft (<sup>328</sup> m) above sea level, the highest point in the Leaf Hills region of Minnesota. The panoramic view of the Leaf Hills Alexandria Moraine complex is the primary attraction of this wayside. The funding and labor to maintain this wayside comes from the Lake Carlos State Park operations budget.

## 6205 STAFFING

One of the staffing problems in all state parks is the heavy reliance on federally funded work programs, such as the Comprehensive Employment and Training Act (CETA) and the Young Adult Conservation Corps (YACC). The low cost personnel provided by these programs makes it possible for parks to offer programs and services which would otherwise be impossible. However, these employees are hired on a short-term basis, usually 8 to 10 weeks and often do not have the training and experience necessary to provide needed services without constant supervision in already understaffed parks. To avoid these problems, funding should be made available to hire trained personnel for major public service and maintenance programs. Temporary employees should only be hired for minor maintenance and special projects.

Although three CETA positions were filled at the park during 1979, no CETA positions were available during 1980. In light of the current federal budget, we cannot predict the availability of CETA personnel in the future. There have not been any YACC positions at Lake Carlos in recent years.

The following chart summarizes the existing staff in Lake Carlos State Park. Because of the seasonal nature of park operations, the positions in each staffing category have been grouped into total "staff months." Staff months is a common denominator which reflects the amount of time spent in each area of park maintenance and operations.

Existing Staff (1980)

Staff Months

Management

1 full time park manager	12
1 full time assistant park manager	12

Maintenance and Operations

4 seasonal laborers	28
7 seasonal park workers	34

Naturalist and Lifeguard Staff

1 seasonal naturalist	3½
1 student worker naturalist	3½
2 seasonal lifeguards	6



**COST  
AND  
PHASING  
SUMMARY**



6206 The following cost estimates were generated in March, 1981. 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.

Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
<b>VEGETATION AND WILDLIFE MANAGEMENT</b>						
Grassland and Wetland Management						
Action #1. Maintain open grassland, implement a burn program.		\$ 1,000	\$ 1,000		\$ 1,000	\$ 3,000
Action #2. Develop nest platform in Schumacher marsh.	Minimal -- included in park operations budget					
Forest Management						
Action #1. Restore proper drainage in tamarack stand.		2,000				2,000
Action #2. Identify and monitor tree diseases in the park.	No development cost					
Action #3. Maintain an abundance of snags.	No development cost					
Action #4. Establish a forestry demonstration/education area.	Will be funded by the Division of Forestry					
Developed Recreation Area Management						
Action #1. Develop a shoreline erosion protection plan for the campground area.	Cost covered in Lakeside Campground, Action #1					
Action #2. Close peanut row for 3-6 years.		10,000			10,000	20,000
Action #3. Shrub and tree plantings for screening, visual diversity, and wildlife habitat.						
3a. Relocate future nursery stock and diversify species planted.		1,000				1,000
3b. Plant clusters of a variety of species along Cty Rd 62 on north park boundary.			1,000			1,000
3c. Vegetate the Horseback Rider's Area.		5,000				5,000

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Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
3d. Manage vegetation in the upper campground.			\$ 6,000			\$ 6,000
3e. Manage vegetation in the lakeside recreation development area.		\$ 15,000				15,000
3f. Manage the vegetation in the service court and surrounding old roadbeds.				\$ 1,000		1,000

#### UTILITIES

Action #1. Requisition an updated utility map for the park. To be drawn by the Bureau of Engineering

#### HISTORY/ARCHAEOLOGY

Action #1. Field check all proposed development sites for remains before any work is begun.		5,000				5,000
Action #2. Make all information regarding prehistoric/historic park sites available to interpretive staff.			No development cost			

#### PHYSICAL DEVELOPMENT AND RECREATION MANAGEMENT

##### Camping

##### Structured Group Camp

Action #1. Repair roofs and eaves.		5,000				5,000
Action #2. Provide access to group camp building for special populations (not incl. sanitation building).	\$ 9,000					9,000
Action #3. Upgrade sanitation building.	28,000					28,000
Action #4. Construct timber stairs and upgrade the boat landing.				1,000		1,000
Action #5. Repair crack in basement floor of staff barracks.			Initial repairs to be done with existing park maintenance funds; future repairs may require a cost review			

##### Horseback Rider's Area/Primitive Group Camp

Action #1. Construct 3-5 small camping pods.			5,000			5,000
Action #2. Remove the barn.		Sell for salvage				

Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
Action #3. Vegetate horseback rider's area.	Cost covered in Vegetation and Wildlife Management, Developed Recreation Areas, Action #3c					
Action #4. Correct dripline erosion around shelter.		\$ 2,000				\$ 2,000
Action #5. Monitor use of horseback rider's/ primitive group camp for possible relocation.	No initial cost; monitoring will be done by park staff					
<u>Lakeside Campground</u>						
Action #1. Develop a shoreline erosion protection plan for the campground areas.			50,000			50,000
Action #2. Modify lakeside campground roads.	Covered in Roads and Parking, Action #5					
Action #3. Manage vegetation in the lakeside recreational development area.	Covered in Vegetation and Wildlife Management, Developed Recreation Areas, Action #3e					
Action #4. Rehabilitate the east sanitation building of Lakeside Campground.		\$ 30,000				30,000
Action #5. Close peanut row for 3-6 years.	Covered in Vegetation and Wildlife Management, Developed Recreation Areas, Action #2					
<u>Upper Campground</u>						
Action #1. Eliminate south land and construct a new north lane.			\$ 40,000			40,000
Action #2. Install approximately 12 electric services on west lanes.			6,000			6,000
Action #3. Remove existing toilets. Construct a new one accessible to special populations with showers.			120,000			120,000
Action #4. Manage vegetation in the upper campground.	Cost covered in Vegetation and Wildlife Management, Developed Recreation Areas, Action #3d					
Action #5. Remove water storage tank.		500				500
<u>Picnic Grounds/Swimming Beach</u>						
Action #1. Install a drinking fountain/ faucet near shelter.		500				500
Action #2. Provide 3-4 picnic sites near the beach open play area.			1,500			1,500
Action #3. Manage vegetation along the lakeside.	Cost covered in Vegetation and Wildlife Management, Developed Recreation Areas, Action #3e					

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Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
Action #4. Upgrade picnic sites, provide new fire rings.	\$ 5,000					\$ 5,000
Action #5. Convert west bay of parking lot into roadway.	Cost covered in Roads, Action #1					
Action #6. Repair erosion at end of asphalt path.		\$ 1,000				1,000
<u>Water Access</u>						
Action #1. Construct a second boat ramp and upgrade parking lot.						30,000
Action #2. Relocate the amphitheater to the new trail center area.						1,500
<u>Administrative/Support Facilities</u>						
Action #1. Remove two wood frame sheds.			\$ 500			500
Action #2. Construct a new unheated storage building.				30,000		30,000
Action #3. Insulate the east bay of the existing shop building.				2,000		2,000
Action #4. Upgrade and install drain tile in service court.					1,000	1,000
Action #5. Manage vegetation in the service court and surrounding area.	Cost covered in Vegetation and Wildlife Management, Developed Recreation Area, Action #3f					
Action #6. Remove the 4-5 car parking lot at old contact station.	Cost covered in Roads and Parking, Action #1					
Action #7. Provide signage.	Cost covered in Roads and Parking, Action #3					
Action #8. Construct a parking lot north of the contact station.	Cost covered in Roads and Parking, Action #4					
Action #9. Place all park electrical lines underground.					1,000	1,000
Action #10. Remove the sewage lagoon.	Cost undetermined at present					
Action #11. Construct a small building for gas and oil storage.				8,000		8,000
Action #12. Upgrade the park's sanitation system.	Cost undetermined at present					

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Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
<u>Roads and Parking</u>						
Action #1. Remove parking area at the old contact station and revegetate.			\$ 2,000			\$ 2,000
Action #2. Develop a trail from the contact station area to the lakeside campground.			Cost covered in Trails, Action #5			
Action #3. Provide signage at the contact station vehicle turnaround.			Cost covered in park operations budget			
Action #4. Construct a small parking area north of the contact station.			2,000			2,000
Action #5. Modify campground roads.			5,000			5,000
Action #6. Construct a second boat ramp and upgrade parking lot.			Cost covered in Water Access, Action #1			
Action #7. Convert west bay of beach parking lot to a road.			1,000			1,000
Action #8. Construct a service driveway from CSAH 38 to the service court.			5,000			5,000
<u>Trails</u>						
Action #1. Construct a centrally located trail/interpretive center.		\$ 100,000				100,000
Action #2. Modify the horse/snowmobile trail west of the horseback rider's area.			2,000			2,000
Action #3. Develop a new horse trail east of the horseback rider's area.			Requires further study by regional trails and waterways coordinator and park manager			
Action #4. Realign and expand the hiking/ski touring trails.			3,000			3,000
Action #5. Develop a hiking trail from the contact station to the lakeside campground.			3,000			3,000

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Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
<u>Visitor Services</u>						
Action #1. Construct 3 self guided interpretive trails with brochures and signage.		\$ 6,000	\$ 5,000			\$ 11,000
Action #2. Develop a permanent set of interpretive aids for year round use by park visitors.				\$ 4,000		4,000
Action #3. Construct a centrally located trail/interpretive center.			Cost covered in Trails, Action #1			
<u>Park Boundaries</u>						
Action #1. Delete the S½ of Section 8, T129N, R37W, and resurvey.		Legislative Action; no cost				
Action #2. Delete the 4 lake home properties along CSAH 38 in Section 10, T129N, R37W.		Legislative Action; no cost				
Action #3. Maintain existing park boundaries at southeast side of park.		No cost				
Action #4. Maintain existing boundaries in area of Schumacher's marsh.		No cost				
<b>TENTATIVE TOTAL DEVELOPMENT COSTS</b>	\$ 72,000	\$ 253,500	\$ 234,000	\$ 5,000	\$ 11,000	\$ 575,500

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