

LEGISLATIVE REFERENCE LIBRARY
F612.G56 G56 1993
- Glendalough State Park management



3 0307 00025 3818

This document is made available electronically by the Minnesota Legislative Reference Library as part of an ongoing digital archiving project. <http://www.leg.state.mn.us/lrl/lrl.asp>
(Funding for document digitization was provided, in part, by a grant from the Minnesota Historical & Cultural Heritage Program.)



MANAGEMENT PLAN

6/7/93

F
612
.G56
G56
1993

CONTENTS

Page

I. Introduction	1
Park Description	1
Park Advisory Committee and Planning Process	3
Law	4
II. Regional Analysis	6
Population	6
Tourism	6
Supply and Demand of Recreation Facilities	7
III. Park Resources	11
Resource Management Objectives	11
Climate	12
Geology	13
Soils	14
Vegetation	19
Wildlife	25
Waters/Fisheries	29
History/Archaeology	32
IV. Physical Development and Recreation Management	34
Recreation Management Objectives	34
Existing Development	35
Proposed Development	38
V. Interpretive Services	46
VI. Operations, Staffing, and Costs	48
Operations and Staffing	48
Development Cost Estimate	49

RECEIVED
OCT 05 1993
LEGISLATIVE REFERENCE LIBRARY
STATE CAPITOL
ST. PAUL, MN. 55155

List of Maps

Local Area	2
Regional Context	10
Soil Limitations	18
Vegetation	23
Existing Development	37
Proposed Development	45

INTRODUCTION

Park Description

Glendalough State Park is located in Otter Tail County, about 20 miles east of Fergus Falls. The park is situated 3 miles northeast of Battle Lake via State Highway 78 and County Road 16 (see Local Area map, p. 2).

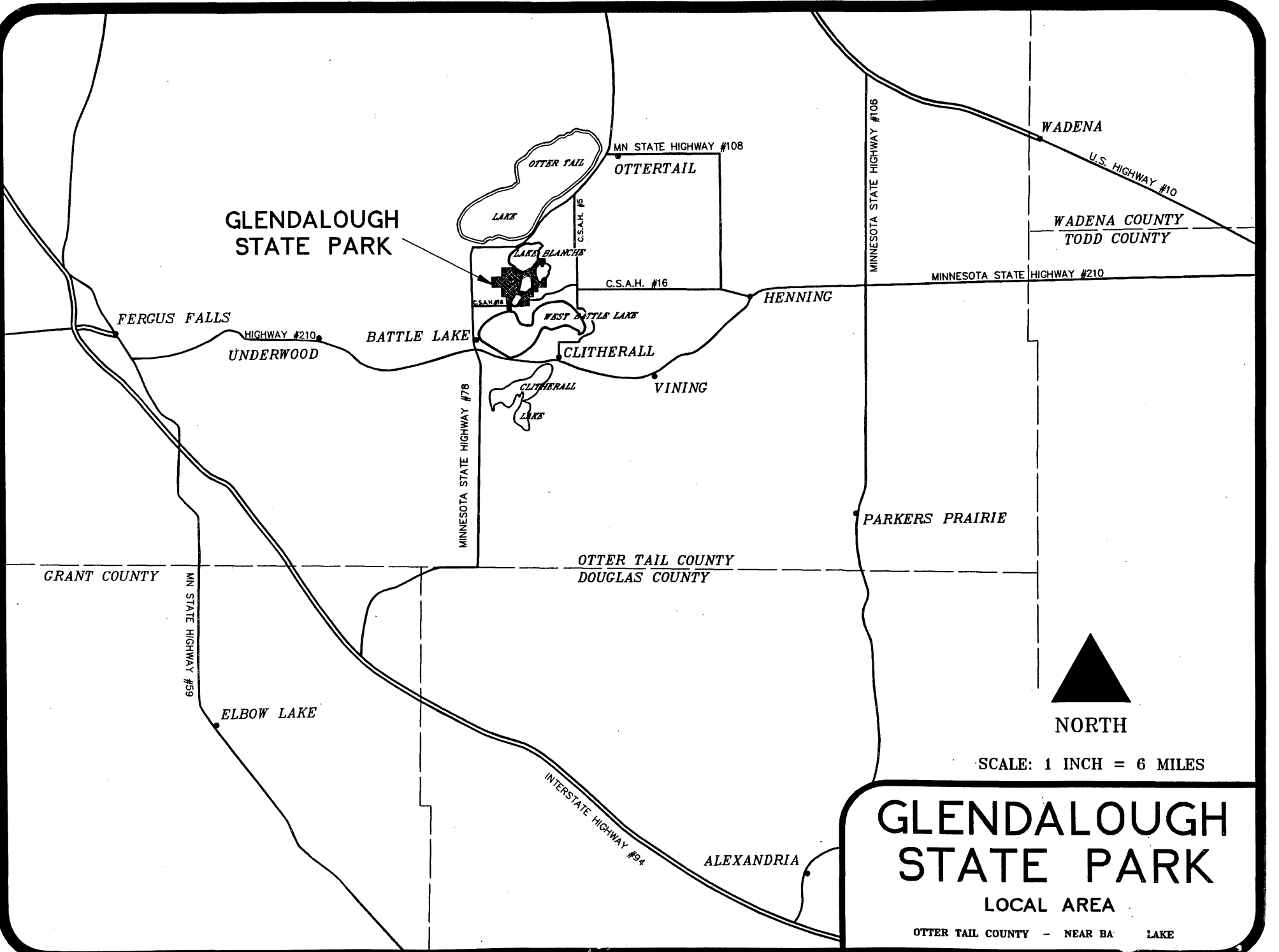
The park includes approximately 1,971 land acres, 894 water acres, and over 9 miles of shoreline on six lakes. About 47 acres within the park boundary are privately owned.

The park was managed as a private game farm for over 50 years prior to becoming a state park. This type of stewardship has protected a variety of habitat areas and preserved marshland, hardwood forests, streams, open lakes, shoreline, open fields, and prairie.

The park is unique in its establishment and future management. The park was generously donated by the Cowles Family to the Nature Conservancy in 1990 and deeded to the state as a State Park in 1992. The 1991 legislation which authorizes the park mandates that the management of wildlife be emphasized and interpreted to the public.

As a result of the planning process described on page 3, this plan recommends that Glendalough State Park be managed to offer a more "primitive" recreational experience than some other state parks. Annie Battle Lake will be the focal point of this less-developed theme. Management of the park will include cart-in and canoe-in camping, a bicycle trail around Annie Battle Lake and connecting into the City of Battle Lake, a "Heritage Fishery" on Annie Battle Lake (managed for quality fishing with restrictions on motors and electronic fishing aids), and a central interpretive and undeveloped "commons" area that provides access to the areas managed for wildlife within the park.

GLENDALOUGH STATE PARK



WADENA

U.S. HIGHWAY #10

WADENA COUNTY
TODD COUNTY

MN STATE HIGHWAY #108

OTTERTAIL

C.S.A.H. #5

C.S.A.H. #16

MINNESOTA STATE HIGHWAY #210

FERGUS FALLS

HIGHWAY #210

UNDERWOOD

BATTLE LAKE

CLITHERALL

HENNING

CLITHERALL

VINING

MINNESOTA STATE HIGHWAY #78

PARKERS PRAIRIE

GRANT COUNTY

OTTER TAIL COUNTY
DOUGLAS COUNTY

MIN STATE HIGHWAY #59

ELBOW LAKE



NORTH

SCALE: 1 INCH = 6 MILES

GLENDALOUGH STATE PARK

LOCAL AREA

OTTER TAIL COUNTY - NEAR BA LAKE

Park Advisory Committee and Planning Process

Soon after the Cowles Media Company donated the park to the Nature Conservancy in April, 1990, the Glendalough State Park Advisory Committee was formed. The committee is a voluntary, unincorporated citizens organization. The committee includes nine directors which serve staggered three-year terms. The committee has adopted by-laws, meets quarterly, and holds an annual meeting in August.

Committee by-laws define its purpose as: "...to assist the Department of Natural Resources in preserving and utilizing Glendalough State Park by assisting with its development, proper planning and management of its facilities and use. It shall be a communicating link with the public and the Division of Parks and the Legislature. It shall have such other purposes as its Board of Directors may determine from time to time that are related to and beneficial to Glendalough State Park."

During the park planning process, the board of directors called several special meetings. Meetings concerning major park planning issues were held during 1992 on the following dates.

February 20, 1992
May 21, 1992
July 16, 1992
August 20, 1992
October 1, 1992
November 12, 1992

In addition, a public "open house" was held August 22, 1992 to gather public input and reaction to the general planning direction for the park at that time.

In 1993, the board of directors reviewed a draft plan on February 17. A public "open house" to review the draft plan was held in Battle Lake on April 8, 1993.

The Department of Natural Resources formed an Integrated Resources Management (IRM) team to assist in developing this park plan. The team included area representatives from the Trails and Waterways Unit and Divisions of Forestry, Parks and Recreation, Fisheries and Wildlife, Waters, and Enforcement. The team met formally on July 8, 1992 and February 16, 1993 (there were also several informal meetings with individuals on the team throughout the process).

The recommendations in this plan are the result of this partnership-based planning process. This plan provides a basic management direction for the park and is not intended to provide specific management or development details.

The Department of Natural Resources Senior Managers approved the management plan dated June 7, 1993, at their meeting on June 21, 1993.

**LAWS of MINNESOTA for 1991
Chapter 254, Art. 2**

Sec. 47. GLENDALOUGH STATE PARK.

Subdivision 1 185.0121 [Subd. 23a.] GLENDALOUGH STATE PARK.
Glendalough state park is established in Otter Tail county.

Subd. 2. ACQUISITION. The commissioner of natural resources is authorized to acquire by gift or purchase the lands for Glendalough state park. The Commissioner shall give emphasis to the management of wildlife within the park and shall interpret these management activities for the public. Except as otherwise provided in this subdivision, all lands acquired for Glendalough state park shall be administered in the same manner as provided for other state parks and shall be perpetually dedicated for that use.

Subd. 3. PAYMENT IN LIEU OF TAXES FOR PRIVATE TRACTS. (a) If a tract or lot or privately owned land is acquired for inclusion within Glendalough state park and, as a result of the acquisition, taxes are no longer assessed against the tract or lot or improvements on the tract or lot the following amount shall be paid by the commissioner of natural resources to Otter Tail county for distribution to the taxing districts:

(1) in the first year after taxes are last required to be paid on the property, 55 percent of the last required payment;

(2) in the second year after taxes are last required to be paid on the property, 40 percent of the last required payment; and

(3) in the third year after taxes are last required to be paid on the property, 20 percent of the last required payment.

(b) The commissioner shall make the payments from money appropriated for state park maintenance and operation. The county auditor shall certify to the commissioner of natural resources the total amount due to a county on or before March 30 of the year in which money must be paid under this section. Money received by a county under this subdivision shall be distributed to the various districts in the same proportion as the levy on the property in the last year taxes were required to be paid on the property.

Subd. 4. BOUNDARIES. The following described lands are located within the boundaries of Glendalough state park:

Government Lots 3 and 4 and that part of Lake Emma and its lake bed lying in Section 7; all of Section 18 Government Lot 1, the Northeast Quarter of the

Northwest Quarter and the Southwest Quarter of the Northwest Quarter of Section 19: all in Township 133 North, Range 39 West.

All of Section 13; Government Lots 1 and 2, the West Half of the Southeast Quarter, the Northeast Quarter and the Southwest Quarter of Section 14 Government Lots 1 and 2, the East 66 feet of the West Half of the Southeast Quarter and the Northeast Quarter of Section 23; Government Lots 1, 2, 3, 4, 5, 6, and 8, the Northwest Quarter of the Northwest Quarter, the East Half of the Southeast Quarter of Section 24 that part of Government Lot 7 of Section 24 lying easterly of the following described line: commencing at the northeast corner of Government Lot 1 of Section 25, Township 133 North, Range 40 West; thence North 89 degrees 22 minutes 29 seconds West on an assumed bearing along the north line of said Section 25 a distance of 75.00 feet to the point of beginning; thence on a bearing of North 37 feet more or less to the shoreline of Molly Stark Lake and there terminating; that part of Government Lot 1 of Section 25 northerly of County State Aid Highway No. 16 and westerly of the following described line: commencing at the northeast corner of said Government Lot 1; thence on an assumed bearing of South along the east line of said Government Lot 1 a distance of 822.46 feet, thence North 77 degrees 59 minutes 14 seconds West 414.39 feet to the point of beginning; thence North 04 degrees 28 minutes 54 seconds East 707 feet more or less to the shoreline of Molly Stark Lake and there terminating; the westerly 50 feet except the northerly 643.5 feet of Government Lot 1 of Section 25; Government Lot 1 of Section 26 except the easterly 50 feet of the northerly 643.5 feet all in Township 133 north, Range 40 West.

REGIONAL ANALYSIS

Population

The population in Otter Tail County totaled 50,714 in 1990. The three largest cities in the county are Fergus Falls (12,362), Perham (2,075), and Pelican Rapids (1,886). The population in Otter Tail County is widely dispersed with the largest concentration in the southwestern corner.

The median age of persons residing in Otter Tail County is 37 and 19 % are 65 years of age or older. Statewide, 12.5% of all persons are 65 years of age and older. The percentage of persons 65 years of age and older in the major communities surrounding the park is as follows:

<u>City</u>	<u>Percentage 65 and older</u>
Battle Lake	41%
Clitherall	21%
Ottertail	19%
Fergus Falls	12%

This information reveals there is a significant retirement community in the area surrounding Glendalough State Park.

Tourism

The Minnesota Office of Tourism estimates that domestic travel and tourism in Otter Tail County generated 1122 jobs, \$19.2 million in wages and salaries, and \$57 million in gross receipts in 1990. The 1990 Statewide Comprehensive Outdoor Recreation Plan (SCORP) identifies Otter Tail County as one of the areas to receive significant increases in tourism in the 1990's. The recreational facilities and significant resources at Glendalough State Park will draw tourists to this area and help increase the local area's share of the expected increase in tourism.

Glendalough State Park is situated approximately 30 miles southeast of Maplewood State Park and 45 miles northwest of Lake Carlos State Park (see Regional Context map, p. 10). Maplewood's use market is primarily from the Fargo - Moorhead, Fergus Falls, and eastern North Dakota area. Lake Carlos' use market is primarily from the Alexandria and Twin Cities market (30% of all campers are from the Twin Cities Metropolitan area). Glendalough is situated between these two state parks and will likely draw from both market areas.

Supply & Demand of Recreation Facilities

Supply

As part of the SCORP process, the DNR has maintained a data base of recreational facilities since the early 1970's. While the data for most of the public facilities has been updated in recent years, the private facility data can be old and out of date. Private facility information in this plan is supplemented by information from the Office of Tourism and local publications (1992).

Table 1 shows an estimate of selected recreational facilities within a 50-mile radius of Glendalough State Park. Fifty miles was chosen as an area roughly within one hour's drive of the park. The abundance of facilities is based in part on the fact that Glendalough is situated in the heart of "lake country". Otter Tail County has more lakes than any other county in the state (1048). Each type of recreational facility is briefly discussed below Table 1 (see Planning Process File for complete facility listing).

Table 1. Facilities Within a 50-Mile Radius of Glendalough State Park

	Number of Facilities				Miles			
	Boat Accesses	Picnic Grounds	Campgrounds	Beach	Hiking Trails	Horse Trails	Ski Trails	Snowmobile Trails
US Fish & Wildlife	15	4	0	0	12.5	0	7.9	0
DNR Forestry	4	0	4	1	0	24	0	37.6
DNR T & W	194	11	2	2	0	0	0	0
DNR F & W	10	1	0	0	0	0	0	0
DNR P & R	3	3	2	2	37.6	28	18	24
MNDOT	5	2	0	1	0	0	0	0
County	37	19	9	3	11	4	50.7	1179.5
City	32	17	6	12	3.2	0	8.5	5.5
Public Subtotal	300	57	23	21	64.3	56	85.1	1246.6
Private	153	229	200	242	55.9	12	2	0
Total	453	286	223	263	120.2	68	87.1	1246.6

Boat Access - There are approximately 300 publicly owned boat accesses within 50 miles of the park; about 200 of these are owned and operated by the Minnesota DNR, Trails and Waterways Unit.

Picnic Grounds/Beaches - There are over 50 publicly owned picnic grounds and over 20 publicly owned swimming beaches within 50 miles of the park. The privately owned picnic grounds/beaches (over 200 of each) are primarily associated with lake resorts.

Campgrounds - There are approximately 23 public campgrounds within 50 miles of the park. Lake Carlos State Park provides 127 drive-in campsites (68 with

electricity) and Maplewood State Park provides 61 drive-in campsites (no electricity). Lake Carlos provides 7 walk-in/canoe sites and Maplewood provides 5 walk-in/canoe sites. DNR Forestry provides approximately 37 sites within Huntersville State Forest - these sites are on the Crow Wing River and are a combination of canoe-in and rustic sites. There are about 15 city and county campgrounds within 50 miles of the park.

There are about 200 privately owned campgrounds within 50 miles of the park. Most are associated with the lake resort and lodging industry in Otter Tail, Douglas, and Becker Counties. There are approximately 15 private campgrounds within a 10 mile radius of the park. Most of these campgrounds have about half of their sites available for seasonal occupancy and most offer individual electric/sewer/water hookups at their campsites. Most private campgrounds offer relatively few tenting campsites.

Hiking and Cross-Country Ski Trails - There are over 60 miles of publicly owned hiking trails and 85 miles of publicly owned skiing trails within 50 miles of the park.

Horse Trails - There are approximately 56 miles of public and 12 miles of private horseback trails within 50 miles of the park. The majority of publicly owned horse trails are at Huntersville State Forest (24 miles), Maplewood State Park (20 miles plus a 30-acre horseback camping area with 50 campsites), and Lake Carlos State Park (8 miles).

Snowmobile Trails - There are almost 1200 miles of County Grant-In-Aid (GIA) snowmobile trails accessible within a 50 mile radius of the park. GIA trails are funded by snowmobile registrations and unrefunded gas taxes through the Minnesota DNR to local units of government who in turn distribute the funds to local snowmobile clubs for trail development and maintenance. The largest trail systems in this area are the Douglas Area Trail Association (DATA-495 miles) and the Todd Trail in Todd County (350 miles). These two systems are connected by the Otter County Trail (88 miles) which goes through Battle Lake. Lake Carlos State Park offers 9 miles of snowmobile trails and Maplewood State Park has 15 miles. Both parks are connected to the GIA system described above.

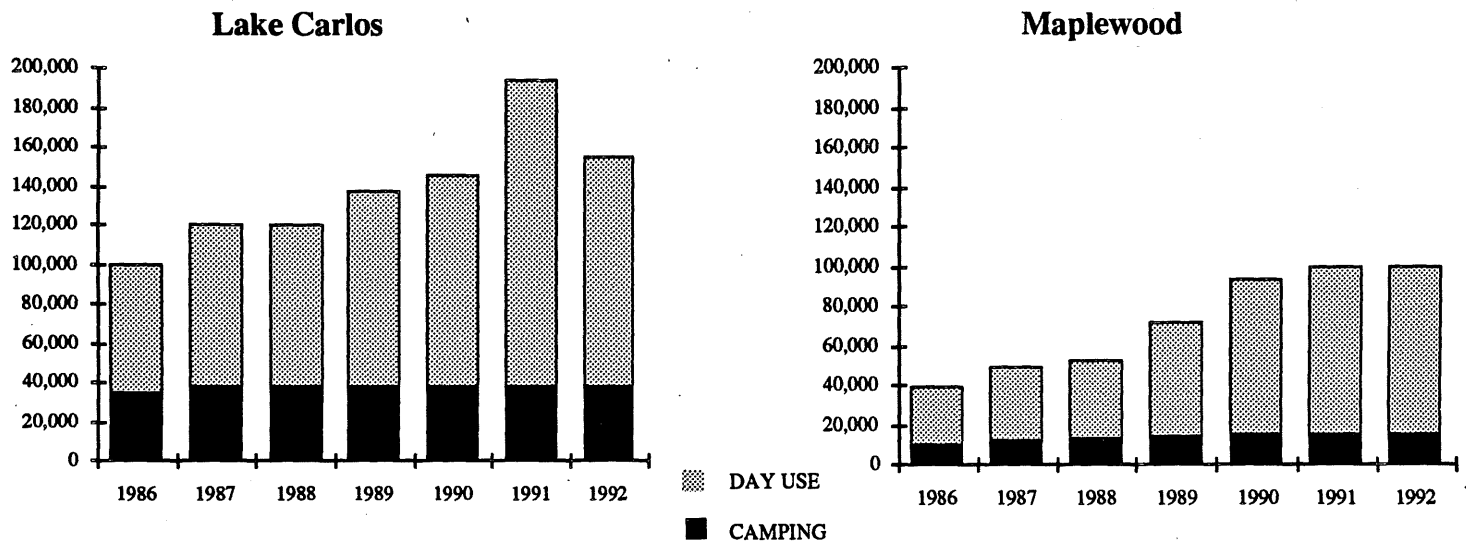
If a GIA snowmobile trail connection is proposed in the Glendalough area in the future, a route along County Road 16 may be considered.

Demand

There is considerable demand for the types of services which will be offered at Glendalough State Park. State Parks offer a variety of recreational opportunities in a natural resource-based setting. These opportunities are in contrast to most city, county and private recreational facilities primarily because of the significant resources and the atmosphere and opportunities associated with them.

Even though other state parks in this vicinity offer different combinations of opportunities and experiences, they are still the best measure of existing, expressed demand for state park services in the Glendalough area.

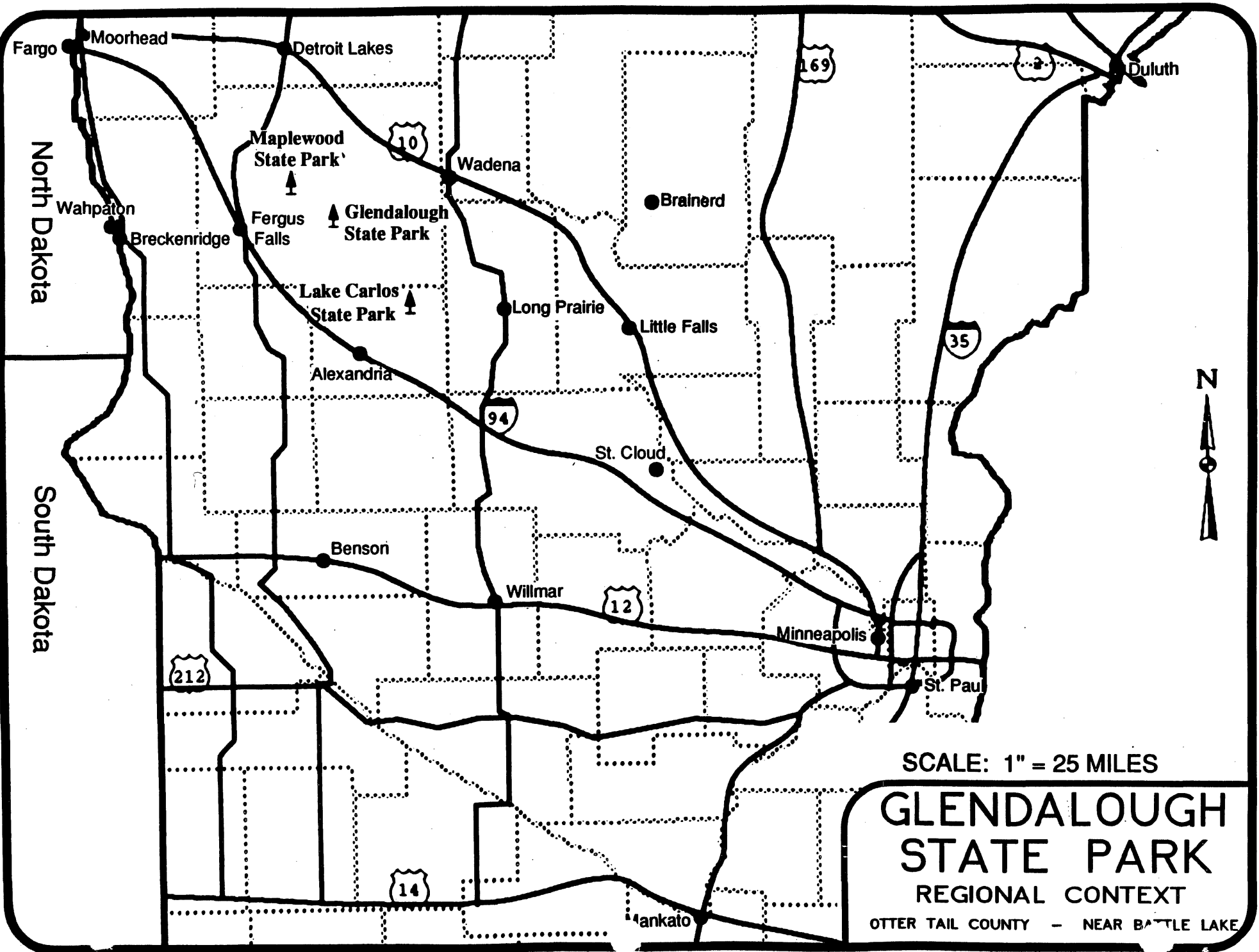
Table 2. Visitation at Lake Carlos and Maplewood State Parks



Lake Carlos State Park (1,250 acres) is an intensively used park with extensive developments clustered together adjacent to a swimming beach. Electrical campsites, showers, and boating and swimming facilities are all readily available. Snowmobile, hiking, and horseback trails are provided. Day use has increased significantly in recent years while camping has stabilized with campgrounds at full capacity on summer weekends and holidays.

Maplewood State Park (9,250 acres) is a much larger park with much more dispersed development. Extensive hiking, snowmobile and horseback trails are provided along with camping (no electric sites) and a swimming beach. The swimming beach is several miles from the campground. Day use has increased steadily in recent years while camping has stabilized with campgrounds at full capacity on most summer weekends and holidays.

Glendalough State Park will offer a combination of opportunities and facilities different from the two state parks described above. The park will provide major opportunities for bicycling, tent-camping, canoeing, and wildlife observation/interpretation.



North Dakota

South Dakota



SCALE: 1" = 25 MILES

GLENDALOUGH STATE PARK

REGIONAL CONTEXT

OTTER TAIL COUNTY - NEAR BATTLE LAKE

Resource Management Objectives

- **Minimize and concentrate park development in order to preserve the remaining portions of the park (also a development objective)**
- **Emphasize wildlife management and its interpretation (also a development objective)**
- **Identify and protect significant natural and cultural resources**
- **Identify degraded/disturbed resources and design resource management actions to restore them**
- **Maintain and improve resource quality and the park's primitive character**

Temperatures for the month of July in the City of Ottertail (located approximately 6 miles northeast of the park) vary from an average high of 83 degrees F to an average low of 60 degrees F. Temperatures for the month of January range from an average high of 17 degrees F to an average low of -4 F.

Precipitation information collected in the city of Ottertail reveals the total average precipitation, including both rain and snow, is about 26 inches. During the winter, the average annual snowfall in Otter Tail is about 43 inches, which is adequate for winter recreational activities such as snowmobiling and cross-country skiing. The average day of the first 1 inch snow depth is November 14. The duration of depth of snow is shown below.

Duration of Depth of Snow

Greater than 1"	113 days/year
Greater than 3"	87 days/year
Greater than 6"	55 days/year
Greater than 12"	20 days/year

Otter Tail County is covered by a very thick layer of glacial deposits, mainly in the Alexandria Moraine Complex with flatter areas of outwash in the central portions of the county. There are no rock outcrops. The hilly, lake-strewn, and partially wooded countryside is an excellent setting for recreational activities. The county contains the greatest number of lakes of any county in the state, all of which are the result of glaciation. Those lakes in ice-block basins in outwash of the central and eastern portions of the county include East Battle, Otter Tail and West Battle.

The Alexandria Moraine was formed by the Wadena lobe of Wisconsin glaciation and is a large terminal moraine which extends in an arc 10 to 20 miles wide and nearly 200 miles long through West Central Minnesota. The relief is rugged and the slopes are heavily wooded, so much of the area has a greater value as recreational land than as agricultural land.

"Leaf hills" is a term often used to describe the hills evident in Otter Tail County. The hills were created by glacial ice and meltwater deposits of sand and gravel. The highest hills extend to 1800 feet above sea level. The outwash drift in the Glendalough area is mainly sandy loam and loamy sand.

The following list describes the soils within Glendalough State Park and the typical uses of those soils in Otter Tail County (USDA, Soil Conservation Service, Perham office, 1992). The soils in the park range from level, well drained soil with minor development limitations to an excessively wet soil with severe development limitations. The chart at the end of the list describes soil limitations related to specific types of development. A map of the park and the soil types follows the soil descriptions and chart.

127AB SVERDRUP SANDY LOAM

A deep somewhat excessively drained soil formed in sandy glacial outwash sediments under tall prairie grasses on moraines and outwash plains. Slopes range from 0 to 6 percent. Cropland is the main use in Otter Tail County. Areas have minor limitations for development.

127C SVERDRUP SANDY LOAM

A deep somewhat excessively drained soil formed in sandy glacial outwash sediments under tall prairie grasses on moraines and outwash plains. Slopes range from 6 to 12 percent. Cropland is the main use. Slopes create moderate limitations which can be overcome by special planning, design or intensive maintenance.

191 EPOUFETTE SANDY LOAM

Poorly drained soil formed in glacial fluvial sediments on uplands. Slopes are 0 to 3 percent. Woodland is the main use. Very wet soils cause severe limitations for development.

339B FORDVILLE LOAM

Well-drained soil formed in loamy sediments, moderately deep over sand and gravel on outwash plains and terraces. Slopes range from 1 to 4 percent. Areas are used for cropland. Areas have minor limitations for development.

341AB ARVILLA SANDY LOAM

Deep, somewhat excessively drained soil formed in glacial outwash on uplands and terraces. Slopes range from 0 to 6 percent. Most areas are used for rangeland. Slopes create moderate limitations which can be overcome by special planning, design or intensive maintenance.

375 FORADA LOAM

Deep poorly drained soil formed in 20 to 40 inches of loamy sediments over sandy and gravelly materials on plane or concave surfaces of outwash plains. Slopes are 0 to 3 percent. Cropland is the main use. This wet soil causes severe limitations for development.

567B VERNDALE SANDY LOAM

Deep, well drained soil formed in loamy sediments over sandy material on outwash plains. Slopes range from 2 to 6 percent. Cropland is the main use. Areas have minor limitations for development.

711C ARVILLA-SANDBERG COMPLEX

Deep somewhat excessively drained soil formed in glacial outwash on uplands

and terraces. Slopes range from 6 to 12 percent. Most areas are used for rangeland. Slopes create moderate limitations which can be overcome by special planning, design or intensive maintenance.

711D SANDBERG-ARVILLA COMPLEX

Deep somewhat excessively drained soil formed in glacial outwash on uplands and terraces. Slopes range from 12-20 percent. This soil has severe limitations for developments.

721B CORLISS LOAMY SAND

A very deep excessively drained soil that formed in sandy or gravelly outwash sediments these soils are on outwash plains, valley trains, beach ridges, and glacial moraines. Slopes range from 2 to 6 percent. Most areas are used for cultivated crops or wooded pastures. Slopes create moderate limitations which can be overcome by special planning, design or intensive maintenance.

1077 FORADA AND LEAFRIVER SOILS

Deep, very poorly drained soil formed in 20 to 40 inches of loamy sediments over sand and gravel materials on plane or concave surfaces of outwash plains. Slopes are 0 to 3 percent. Cropland is the main use. This wet soil causes severe limitations for development.

1113 HASLIE

Nearly level very poorly drained soil formed in organic materials over marl in bogs on glacial outwash plains and moraines. Slopes range from 0 to 2 percent. The surface soil is black muck, therefore it has severe limitations for development.. Most areas are in native vegetation.

1120 RUSHLAKE-WHEATLEY COMPLEX

A very deep moderately well drained soil formed in sandy and gravelly deposits on lake beaches. Slopes range from 0 to 3 percent. Most areas are adjacent to lakes and are wooded. Wetness may cause moderate limitations for development.

4236 LIDA SANDY LOAM

Moderately well drained soil formed in a loamy to sandy mantle over outwash sediments under mixed tall grasses and deciduous forest. Slopes are 0 to 3 percent. Areas are used for cropland, pasture land and woodland. This soil has minor limitations for development.

4255B LIDA-TWO INLETS COMPLEX

Well drained soil formed in glacial outwash under forest vegetation on outwash plains. Slopes range from 1 to 8 percent. Most areas are used as woodland but are also used for pasture, hay land or cropland. This soil has minor limitations for development.

4255C LIDA-TWO INLETS COMPLEX

Well drained soil formed in glacial outwash under forest vegetation on outwash plains. Slopes range from 8-15 Percent. Slopes create moderate limitations which can be overcome by special planning, design or intensive maintenance.

4257AB SYBIL-GRAYCALM COMPLEX

Well drained soil formed in glacial outwash under forest vegetation on outwash

plains. Slopes range from 0 to 8 percent. Most areas are used as woodland but some areas are used for pasture, hay land or cropland. This soil has minor limitations for development.

4257C GRAYCALM-SYBIL COMPLEX

Well drained soil formed in glacial outwash under forest vegetation on outwash plains. Slopes range from 8 to 15 percent. Most areas are used as woodland but some areas are used for pasture, hay land or cropland. Slopes create moderate limitations which can be overcome by special planning, design or intensive maintenance.

4257E GRAYCALM-SYBIL COMPLEX

Well drained soil formed in glacial outwash under forest vegetation on outwash plains and valley trains. Slopes are greater than 15 percent. Most areas are used as woodland but some areas are used for pasture, hay land or cropland. Slopes create severe limitations for development.

Soil Limitations Chart

(see Soil Limitations map for soils location)

Map Unit	Description	Slope	Permeability*	Water Table	Soil Suitability										
					Septic Tank	Absorption Fields	Sewage Lagoon Areas	Buildings**	Local Roads & Streets	Intensive Camp Areas	Picnic Areas	Playgrounds	Paths & Trails	Lawns & Landscaping	Overall Suitability
127A	Sverdrup sandy loam	0 to 2%	0-60"/2.0 to 20	> 6 feet	S	S	L	L	L	L	L	L	M	L	
127B	Sverdrup sandy loam	2 to 6%	0-60"/2.0 to 20	> 6 feet	S	S	L	L	L	L	M	L	M	L	
127C	Sverdrup sandy loam	6 to 12%	0-60"/2.0 to 20	> 6 feet	S	S	M	M	M	M	S	L	M	M	
191	Epoufette sandy loam	0 to 3%	0-60"/6.0 to 20	.5 to 2.0 feet	S	S	S	S	S	S	S	S	S	S	
339B	Fordville loam	1 to 4%	0-20"/.6 to 6	> 6 feet	S	S	L	L	L	L	L	L	L	L	
341A	Arvilla sandy loam	0 to 2%	0-60"/2 to 20	> 6 feet	S	S	L	L	L	L	L	M	L	L	
341B	Arvilla sandy loam	2 to 6%	0-60"/2 to 20	> 6 feet	S	S	L	L	L	L	L	M	L	L	
375	Forada loam	0 to 3%	0-60"/2.0 to 20	1.0 to 3.0 feet	S	S	S	S	S	M	S	M	M	S	
567B	Verndale sandy loam	2 to 6%	0-60"/2.0 to 20	> 6.0 feet	S	S	L	L	L	L	M	L	M	L	
711C	Arvilla-Sandberg complex	6 to 12%	0-60"/2.0 to 20	> 6 feet	S	S	M	M	M	M	S	L	M	M	
711D	Sandberg-Arvilla complex	12 to 20%	0-60"/2.0 to 20	> 6 feet	S	S	S	S	S	S	S	M	M	S	
721B	Corliss loamy sand	2 to 6%	0-60"/>6	> 6 feet	S	S	L	L	M	M	M	M	S	M	
1077	Forada and Leafriver soils, depressional	0 to 3%	0-28"/2.0 to 6	1 foot	S	S	S	S	S	S	S	S	S	S	
1113 or 995	Haslie, Seelyeville, and Cathro soils, ponded	0 to 3%	0-44"/.2 to 6	(+) 2.0 to 0 feet	S	S	S	S	S	S	S	S	S	S	
1120	Rushlake-Wheatley complex	0 to 3%	0-60"/6.0 to 20	2.0 to 5.0 feet	S	S	S	M	M	M	M	M	S	M	
4236	Lida sandy loam, moderately wet	0 to 3%	0-19"/2.0 to 6	2.5 to 6 feet	S	S	M	M	L	L	L	L	M	L	
4255B or 1196B	Lida-Two Inlets complex	1 to 8%	0-25"/2.0 to 6	> 6 feet	S	S	L	L	L	L	L	L	M	L	
4255C or 1196C	Lida-Two Inlets complex	8 to 15%	0-25"/2.0 to 6	> 6 feet	S	S	M	M	M	M	M	M	M	M	
4257A ro 1195A	Sybil-Graycalm complex	0 to 2%	0-60"/2.0 to 20	> 6 feet	S	S	L	L	L	L	L	L	S	L	
4257B or 1195 B	Sybil-Graycalm complex	2 to 8%	0-60"/2.0 to 20	> 6 feet	S	S	L	L	L	L	L	L	S	L	
4257C or 1195C	Graycalm-Sybil complex	8 to 15%	0-60"/2.0 to 20	> 6 feet	S	S	M	M	M	M	S	L	S	M	
4257E or 1195 E	Graycalm-Sybil complex	15%+	0-60"/2.0 to 20	> 6 feet	S	S	S	S	S	S	S	M	S	S	

Chart Legend-Soils Suitability/Characteristics

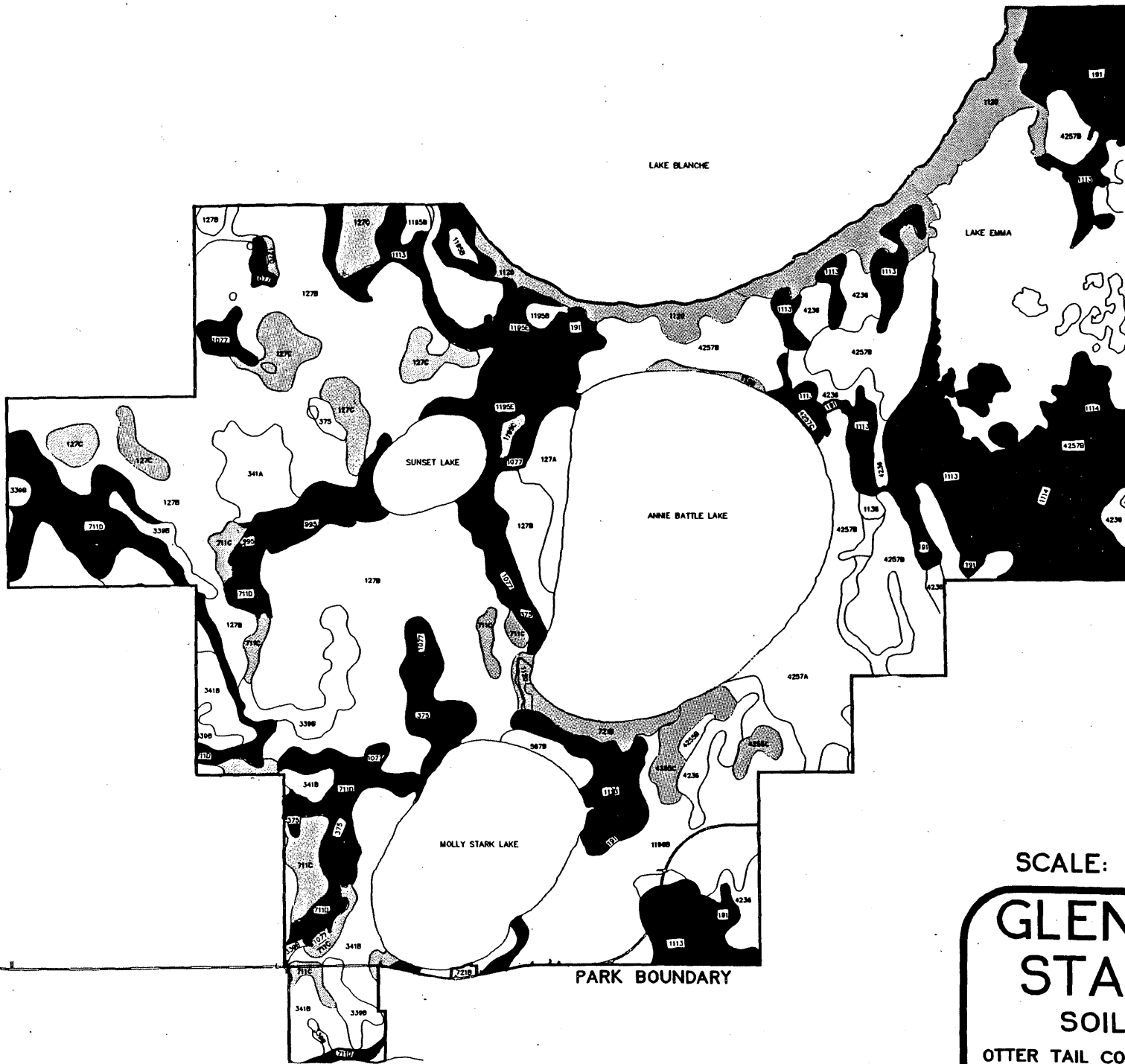
L - (Low) Limitations for a stated use are minor and can be overcome easily.

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

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

*Permeability measure in inches per hour.

**Based on buildings with a basement or foundation.



	LOW
	MODERATE
	SEVERE
SEE TEXT FOR EXPLANATION	



SCALE: 1 INCH = 2000 FEET

**GLENDALOUGH
STATE PARK**
SOIL LIMITATIONS
OTTER TAIL COUNTY - NEAR ATTLÉ LAKE

Pre-European Settlement Vegetation

Glendalough State Park is situated in the eastern deciduous forest transition zone between tallgrass prairie to the southwest (starting roughly along a line between Fergus Falls and Alexandria) and northern coniferous forest to the northeast (starting roughly along a line from New York Mills to Staples). The eastern deciduous forest consisted primarily of Oak Woodland/Brushland (bur oak and pin oak, aspen and hazel thistles, and prairie openings) and "big woods" (elm, basswood, sugar maple, red oak, and white oak). Smaller areas of wet prairie and marsh were abundant throughout the transition zone.

Public land survey records indicate the Glendalough area was surveyed in 1858. The records include a description of general vegetation as well as specific section corner and half-section bearing trees. These records indicate the western half of the park was covered primarily by oak woodland/brushland except for the sunset lake wetland complex. The fire-maintained oak woodland/brushland included several areas of prairie grasses. The northeastern corner of the park was marsh (Lake Emma), with some tamarack noted at the southeastern corner of section 18 (south of Lake Emma). The southeastern corner of the park was protected from fires approaching from the southwest and was likely covered by a northern hardwoods forest (oak, elm, and ironwood were noted bearing trees and "some good timber" was described). An area of maple-basswood forest existed on the fire-protected peninsula into West Battle Lake just south of the park. At the time of the original survey, several plowed fields existed in the western portion of the park, including land claims in sections 14 and 23 (T133N, R40W). Sections are shown on the Existing Development Map, p. 37.

Existing Vegetation

Present day vegetation reflects a variety of past agricultural practices, woodlot management and community succession in the absence of fire. Most of the western half of the park has been converted to agricultural fields. The oak woods which remain were selectively cut and heavily grazed by livestock or poultry. A remnant prairie and oak savanna area is located west of Molly Stark Lake (see description below). The northern hardwood forests in the eastern half of the park are less disturbed, but have also been selectively cut (and appear to have been clear-cut in areas southeast of Annie Battle lake) and grazed. The oldest northern hardwood area appears to exist between Annie Battle Lake and Lake Blanche.

The Minnesota Natural Heritage Program (MNHP) identifies and documents natural communities, plant and animal species, and geologic features that are protected by law and/or warrant special attention. Significant natural communities, plants, animals, and geologic areas are included on an official register and identified as "elements." Elements are defined as threatened or endangered on a statewide and/or national basis. At the state level, there is also a special concern element category. Special concern species are extremely uncommon in Minne-

sota, or have unique or highly specific habitat requirements. Glendalough State Park has not been inventoried for element occurrences. A review of known element occurrences within 10 miles of the park suggests that two habitats in particular should be protected within the park: prairie/oak savanna and shoreline/aquatic areas.

MNHP Elements within 10 Miles of Glendalough

Prairie Elements

Hill's Thistle (Cirsium hillii) - Special Concern

Gravel Prairie

Mesic Prairie

Shoreline/Aquatic Elements

Cooper's milk-vetch (Astragalus neglectus) - Special Concern

Loose-flowered milk-vetch (Astragalus tenellus) - proposed element status

Sheathed pondweed (Potamogeton virginatus) - proposed element status

Missouri spurge (Euphorbia missurica) - proposed element status

Other

Bald Eagle (Haliaeetus leucocephalus) - Threatened

Since the park was established, the following element occurrences have been identified within Glendalough State Park.

Bald Eagle (H. Leucocephalus) - Threatened

Gravel Prairie

Snapping turtle (Chelydra serpentina) - Special Concern

More element occurrences are expected to be found as park resources are inventoried. Areas which should be protected from disturbance include Lake Emma (Bald Eagles nest in the southern portion), the prairie/oak savanna area west of Molly Stark Lake, the southern shores of Blanche, Annie Battle, and Molly Stark Lakes, and the oldest northern hardwood areas between Annie Battle Lake and Lake Blanche.

The following description of plant communities and present day land use corresponds to the vegetation map (see p. 23) and was compiled from field surveys conducted during the summer of 1992. The descriptions reflect the cursory nature of the review. A DNR, Division of Forestry Cooperative Stand Assessment is being completed (winter, 1992-93), and this plan recommends additional resource assessment.

Northern Hardwoods (NH) - This community exists in the northern and eastern portions of the park, and is dominated by basswood. In the areas north of Annie Battle Lake, basswood are often large, single stem trees (14" to 20" Diameter at

Breast Height - DBH), indicating an older growth forest. These stands should be evaluated according to the DNR's old growth guidelines. Sugar maple (10" DBH) and ironwood (4-6" DBH) are common, and larger red oaks (15 to 17") and bur oaks (up to 28" DBH) occasionally occur. Ironwood saplings and prickly ash are abundant in the shrub layer. Ground juniper is also found. Ground cover is dominated by sedges (Carex springelii, C. pennsylvanica, and C. pedunculada), and includes sarsaparilla, hog peanut, meadow horsetail, strawberry, and yellow bellwort.

The 100 acre "block" of NH forest southeast of Annie Battle Lake is a much younger, even-aged stand that was likely clear-cut about 60 years ago. Aerial photos from 1938 indicate a very young forest (5 to 10 years old) at that time. Basswood, sugar maple, and ironwood all average about 8 to 12" DBH, often in stump-sprout rings. Although prickly ash is abundant, other shrubs are common including hazel, smooth sumac, and chokecherry. Groundcover is similar to the descriptions above; however, indian pipe was also found in this area.

Aspen (A) - Small areas of trembling aspen are found in the park, most notably in the 100 acre NH block described above. Big-toothed aspen was noted mixed among the hardwoods in the forest directly north of Lake Emma.

Oak Woods (OW) - This community is dominated by bur oaks with an average size of 6 - 10" DBH. Basswood is also abundant in these areas, with green ash commonly occurring. Black cherry and hackberry are rare, with box elder common in more disturbed areas. These woods were selectively cut, and multiple stump sprouts indicate past clear-cutting in some areas. All of these woods have been heavily grazed, especially those west and south of Annie Battle Lake. Prickly ash dominates the shrub layer; nettle, burdock, and sedges are common groundcover species.

Oak Savanna (OS) - This community is dominated by scattered open-grown bur oaks. Groundcover consists of the prairie grasses and forbs described below.

Prairie (P) - This remnant gravel-ridge prairie of approximately 30 acres has not been tilled, but it has been moderately to lightly grazed. Predominant cover includes big bluestem, indiagrass, blue gramma grass, side-oats gramma grass, and prairie junegrass. Other prairie plants include prairie onion, white and purple prairie clover, prairie sand reed, pasque flower, prairie smoke, and two species of lead plant (Amorpha canescens and Amorpha nana). This prairie, along with the 10 acre oak savanna described above, is a candidate for element status with the MNHP.

Restored Prairie (RP) - Approximately 25 acres of prairie were restored by the DNR and the park's agricultural area lessee during 1992 along the western boundary of the park.

Lowland Hardwoods (LH) - Lowland hardwood areas are dominated by large cottonwood, green ash, and in some cases elm. Aspen and some basswood can also be found in these areas. Willow and cattail are common, with reed canary grass dominating the groundcover.

Tamarack (T) - A low, wet community of tamarack is located south of Lake Emma.

Lowland Grass and Lowland Brush (LG and LB) - These wetter areas are dominated by reed canary grass, cattail, willow, red-osier dogwood, and sedges.

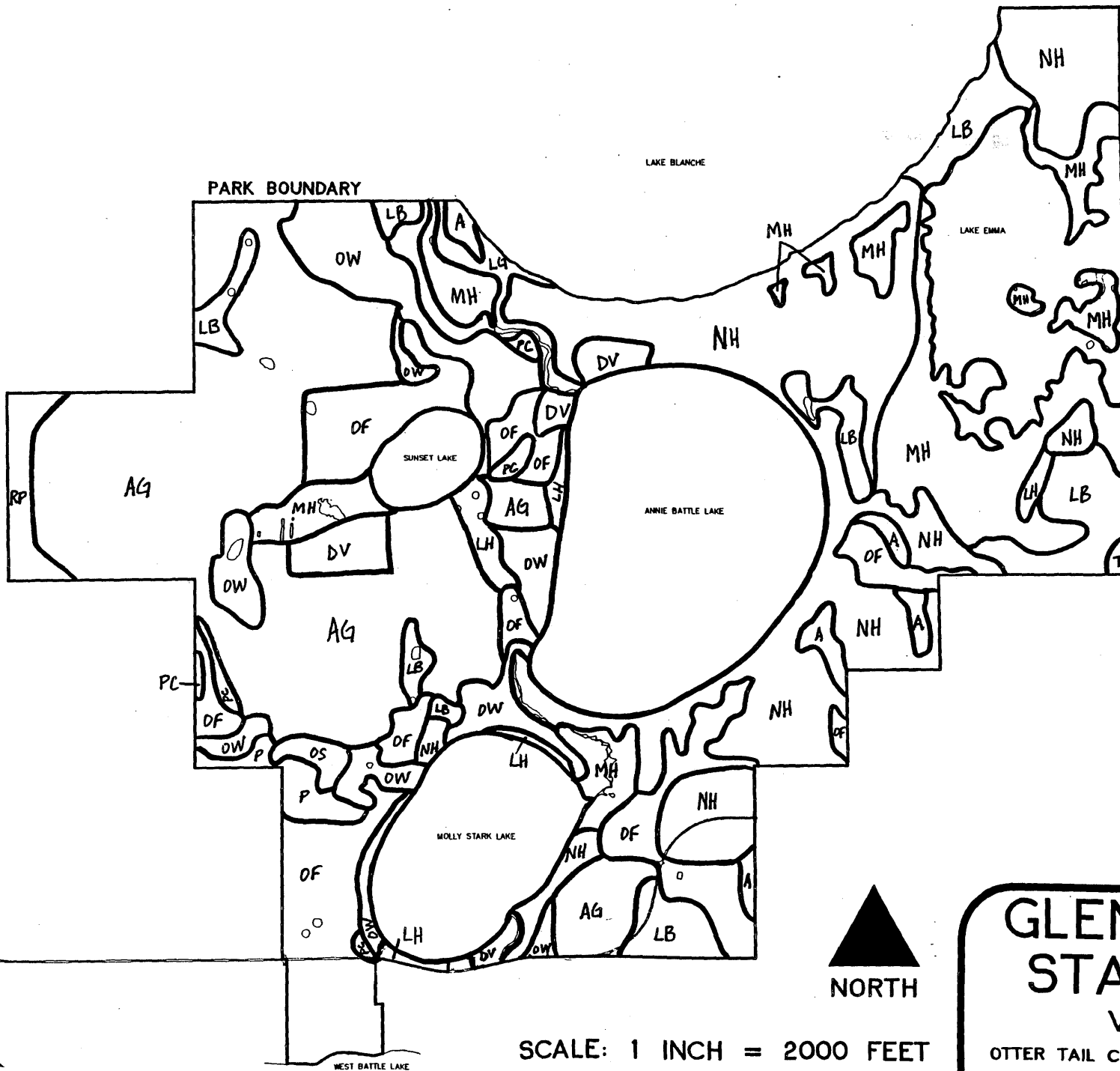
Marsh (M) - The largest marsh area surrounds Lake Emma; significant marsh areas also occur southwest of Sunset Lake, and in connecting streams between Lake Blanche, Annie Battle, and Molly Stark Lakes. Marsh areas are dominated by cattail and some bulrush and sedges. Willow is common, and wild rice is abundant in some portions of Lake Emma.

Planted Conifers (PC) - Several small areas of the park were planted with conifers, primarily as windbreaks. Blue spruce, red pine, and scotch pine are the most common planted species.

Agricultural (AG) - These areas were planted with crops in recent years. During 1992, several AG areas were planted in potatoes and small grains.

Old Field (OF) - Most of these areas were used as cropland and/or grazed in the past. Smooth brome grass, clover, and bluegrass dominate these areas. Some alfalfa and canada thistle can be found in these areas.

Developed (DV) - Developed areas include the game farm, farmhouse, and camp complex (see p. 35).



- NH - NORTHERN HARDWOODS
 - A - ASPEN
 - OW - OAK WOODS
 - OS - OAK SAVANNA
 - P - PRAIRIE
 - RP - RESTORED PRAIRIE
 - LH - LOWLAND HARDWOODS
 - T - TAMARACK
 - LG - LOWLAND GRASS
 - LB - LOWLAND BRUSH
 - MH - MARSH
 - PC - PLANTED CONIFER
 - AG - AGRICULTURAL
 - OF - OLD FIELD
 - DV - DEVELOPED
- SEE TEXT FOR EXPLANATION



SCALE: 1 INCH = 2000 FEET

**GLENDALOUGH
STATE PARK**
VEGETATION
OTTER TAIL COUNTY - NEAR BATTLE LAKE

***RESOURCE INVENTORY AND MANAGEMENT**

(for a listing of Resource Management Objectives, see page 11)

An inventory and assessment of plant communities and associated wildlife species needs to be completed. The development proposed in this plan is primarily in disturbed areas and intentionally avoids sensitive areas (see p. 38). The entrance road is aligned primarily in old fields and agricultural areas; the campground and beach areas are in disturbed oak woods; the Annie Battle Lake access is at the old farmhouse site; and, the bicycle trail will follow an existing road for the majority of its alignment. These proposed development areas need further resource review prior to development, but the remaining portions of the park must also be inventoried and a resource management plan developed. Resource areas which need to be addressed include:

1. Prairie - especially remnant prairie and oak savanna areas
2. Shorelines - especially southern shores of all lakes
3. Wetlands and stream connections between lakes
4. Potential old growth areas
5. Non-native and weed species
6. Reptiles and Amphibians; Avian species; Nongame mammals
7. Erosion areas

A detailed resource management plan needs to be developed for the park. The detailed resource management plan will be an addendum to this Management Plan. In addition to the issues outlined above, the plan must address how the Division of Parks and Recreation will work with the Division of Fisheries and Wildlife to manage the Heritage Fishery on Annie Battle Lake and the overall management of wildlife as prescribed in the law which established the park. Items to be addressed include the appropriateness and placement of food plots, overall restoration of healthy communities within the park and whether a prairie seed nursery might be established using one of the center pivot irrigation systems. For further discussion, see Wildlife Management, p. 26.

Forestry Demonstration Areas have been established at several Minnesota State parks, including Maplewood and Lake Carlos. These areas demonstrate forest management techniques which result in varying vegetation types and may be helpful to private woodlot owners in the area; they also become part of the park interpretive program. The resource management plan should address whether a forestry demonstration area is needed in the Glendalough area and whether it is appropriate at this park. If established, the area should be no greater than 5 acres and situated adjacent to the service road in the southeastern corner of the park.

*Action items are identified throughout the text of this document by an asterisk (as shown above). An action item is a priority recommendation that should be implemented as funds become available.

Introduction

The law which established Glendalough State Park (see p. 4) provided that emphasis be given to the management of wildlife and the interpretation of wildlife management activities. The proposed development in this plan attempts to avoid those portions of the park with the most wildlife values (see p. 38). The management of wildlife will be an important part of this park's operation, and wildlife management activities, wildlife observation, and the interpretation of wildlife/wildlife management will be among the major activities offered at the park.

The interpretation of wildlife and wildlife management activities should include not only game species but all non-game species as well (see p. 46). Game farm history and associated wildlife management activities (e.g. wildlife "dugouts") should also be interpreted.

Game Species

Since much of the land use in Otter Tail County is agricultural, many of the game species in this area are associated with this type of land use. Common game species include white-tailed deer, pheasant, cottontail rabbit, red fox, and beaver. Of these game species, white-tailed deer and beaver are the most common within Glendalough State Park.

Approximately 75 to 100 deer winter in Glendalough State Park. Deer can be observed throughout the year at Glendalough, and often will allow close observation from passing vehicles.

Moose and bear sightings have been reported in the park. These occurrences are rare, but possible (within 50 miles of the known southern range for these species).

Non-game Mammals

At least 30 non-game mammals are known to occur in Otter Tail County (see Planning Process File for list). Both spotted skunk and mule deer occur in the county and are listed as Special Concern species by the Minnesota Natural Heritage Program. Both of these species could occur at the park; sightings should be reported to the DNR, Non-game Program.

Gray wolf sightings have been reported in the park. These occurrences are rare, but possible (within 50 miles of the known southern range for this species). The gray wolf is listed as Threatened at both the state and federal levels (sightings should be reported to the DNR, Non-game Program).

Birds

At least 225 birds are known to occur in Otter Tail County (see Planning Process File for list). Those species which are listed as Threatened or Special Concern which are known to or have the potential to occur in the park are listed below.

<u>Species</u>	<u>Status</u>	<u>Glendalough</u>
Bald Eagle	Threatened (Federal and State)	Resident
Osprey	Special Concern (State)	Sightings
American Bittern	Special Concern (State)	Potential
Red-shouldered Hawk	Special Concern (State)	Potential
Short-eared Owl	Special Concern (State)	Potential
American White Pelican	Special Concern (State)	Potential
Loggerhead Shrike	Threatened (State)	Potential

Reptiles and Amphibians

Approximately 15 species of reptiles and amphibians are known to occur in Otter Tail County (see Planning Process File for list). Snapping turtles are known to occur within the park and are listed as a Special Concern species by the Minnesota Natural Heritage Program.

***WILDLIFE MANAGEMENT**

An overall resource inventory and detailed resource management plan should be completed for the park (see p. 24). In addition to the issue areas described on p. 24, the plan should address the following items.

1. Wildlife Management Definition - The legislation which established the park mandated that wildlife management be emphasized. Wildlife management has traditionally emphasized the production of game species (such as deer and waterfowl) for hunting purposes. The game farm history at Glendalough also emphasized this aspect of wildlife management. State Parks traditionally discourage wildlife management techniques which tend to inflate wildlife populations (such as food plots) in favor of a more balanced ecosystem. The resource management plan for Glendalough should define what "wildlife management" will mean in this state park. As a state park, wildlife management should include management activities (and interpretation) for both game and non-game species.

2. Lake Emma Management - Lake Emma is the most productive and significant wetland area in the park. This important area will be accessible only by hiking trails from within the park and subject to restricted use conditions during portions of the year as needed. A wildlife protection zone will be established (see Proposed Development map, p. 45) which will close portions of Lake Emma to all uses and access (including by foot or boat) to protect the wildlife in this area at

appropriate times of the year. These restrictions will most likely take place during the fall migration months, but may also be imposed during critical spring nesting periods. During these times, the area will effectively be a sanctuary posted with "Restricted Area/No Trespassing" signs.

3. Deer Herd Management - The management of deer populations is a major concern in many state parks. State parks are wildlife refuges and are often attractive to wintering deer herds for cover and protection. The Glendalough area has also been a traditional refuge for deer. As in some other state parks, Glendalough has a relatively high population of deer (when considering the wooded cover available). Browsing (twig eating) is a natural aspect within forest communities, however when the number of browsing animals is higher than the vegetative area can tolerate, overbrowsing occurs. This condition affects the species composition and structure of the forest community. Over time, this effect can be very significant. In state parks where this community imbalance is evident, special deer hunts are allowed to control the deer population and return the park to a more balanced ecosystem. Adjacent to some parks, crop depredation also becomes a problem when deer herds are out of balance with the available food supply. In addition to special hunts, deer population control measures include reducing, relocating, or eliminating food plots and special hunting techniques (doe only season, later hunting season, etc.).

Overbrowse is apparent in portions of Glendalough State Park, however the deer population and vegetation should be analyzed prior to the implementation of control measures. Hunting is a control measure which must be seriously considered at Glendalough. The construction of deer exclosures to help determine the extent of browsing pressure should be considered.

4. Food Plots - Wildlife food plots have been provided at Glendalough for many years. These plots were intended primarily for waterfowl and deer. Food plots are generally discouraged in most state parks because they tend to inflate the deer population (and result in additional overbrowse pressure). However, at Glendalough, wildlife management techniques will be emphasized, and the potential for food plots will need to be examined more carefully.

5. Bald Eagle Management - A pair of bald eagles has nested in the southern portion of the Lake Emma wetland for several years. The pair has used several nests in this area. The nest used to raise young in 1992 was situated near the eastern park boundary and was at least 2500 feet from any proposed park development. This nest tree was blown down during the winter of 1992-93. An alternate nest is situated on the southwest shore of Lake Emma and is approximately 1000 feet from the proposed bicycle trail around Annie Battle Lake. The existing road (which will become the trail) is within the "tertiary" protection zone for the alternate bald eagle nest. Major construction is permitted in portions of this zone

alternate bald eagle nest. Major construction is permitted in portions of this zone during specified months of the year. Development of the trail and selection of canoe-in campsites (see p. 41) in this area must be coordinated with the DNR, Non-game Program.

6. Abandonment of Waterfowl Refuge - A Waterfowl Refuge was established at Glendalough in 1981. Most of the northern portion of the park is included in the boundary. Because state parks are refuges, the Waterfowl Refuge designation is redundant and no longer needed.

7. Sunset Lake Management - Sunset Lake is an important waterfowl staging area in the spring and fall. This lake is a major refuge for large numbers of Canada Geese each fall. Public use of the Sunset Lake area must be managed to protect this important resource. The only development proposed in this area is a hiking trail and waterfowl overlook (see page 43).

Water Resources

The park boundary includes two lakes in their entirety, Annie Battle and Sunset. It borders on four other lakes - Molly Stark, Emma, West Battle and Blanche. There is a stream connection flowing between West Battle, Molly Stark, Annie Battle and Blanche Lakes. These connections provide a canoe route through the park. From West Battle and Blanche Lakes, it is possible for canoeists to paddle to larger lakes, including Otter Tail and East Battle Lakes. The Otter Tail River and Deer Lake are accessible from Otter Tail Lake. The chart below provides pertinent information on lakes at Glendalough.

	Blanche	Annie Battle	Molly Stark	Emma	Sunset	West Battle
Acres	1352	358	148	473	37	5672
Maximum depth	64'	50'	48'	3.5'	10'	113'
Total miles of shoreline	5.4	2.7	1.8	6	0.8	5.9
Miles of shoreline in park	1.8	all	1.7	2.2	all	0.25

Glendalough State Park is located in the southeastern corner of the Otter Tail River Watershed. The watershed drains 1920 square miles and is completely covered by glacial drift of sand and gravel, with fine sands in the lakes. With a 1328 foot water level, Lake Blanche serves as a minor watershed for all the lakes in the park. West Battle Lake (a water level of 1332 feet) is used for the community water supply.

All the lakes except Emma are considered type 5 wetland areas (open fresh water) according to their water depth and the species present. Emma is a type 4 wetland area (a deep fresh water marsh). Although these lakes may not fit exactly within the bounds of a particular type of wetland, they contain enough distinctive elements to be considered characteristic of that specific type.

The glacial sand and gravel outwash around Glendalough State Park holds a water-table aquifer that is about 100 feet thick. The average annual recharge is approximately 4" to 5" per year. The groundwater availability and supply in outwash areas is usually adequate for recreational development. The ground water in the area is hard with a low sodium hazard and a medium salinity hazard - a calcium bicarbonate type. This information would indicate that the groundwater is both abundantly available and chemically adequate for recreational development.

There are 38 sand point wells on the Glendalough property, ranging from 7 to 20 feet deep. There are also two drilled wells approximately 40 feet deep in the

camp complex area and drilled wells associated with the farmhouse, game farm, and acquired residences. Two drilled irrigation wells (140 and 165 feet deep) are located west of Annie Battle Lake. It may be possible to use one of the irrigation wells for a central water supply system for the park, however this will depend on a comparison of piping costs versus new well costs.

***SEAL UNNEEDED (ABANDONED) WELLS**

Most of the existing wells will not be usable for park development. Sand point wells do not comply with public use standards. Drilled wells in the camp complex, farmhouse and game farm area may be usable for park development. Those wells which cannot be used will be sealed according to Minnesota Department of Health Standards. The two irrigation wells should be maintained until the resource management plan assesses their usefulness for park purposes.

Fisheries

Sunset Lake and Lake Emma are shallow lakes used primarily by waterfowl and are not considered fishing lakes. Annie Battle, Molly Stark, and Blanche Lakes are fishing lakes with similar populations of sunfish, crappie, largemouth bass, northern pike, and walleye.

Annie Battle Lake is the only fishing lake entirely within the boundaries of the park. During the planning process, a proposal to provide a high quality fishing experience on Annie Battle Lake was well received by the park advisory committee and others involved in the development of the park plan. The idea evolved into what has been termed a "Heritage Fishery." The goal of the Heritage Fishery is to provide quality fishing, but also to provide a demonstration and education area for fisheries management.

The Heritage Fishery concept fits well within the overall development theme and recreation management objectives for the park (see page 34). This includes the emphasis of wildlife management and its interpretation, the phased management approach which offers more primitive experiences in the park's initial stages, and the preservation of Annie Battle as the "center-piece" of the primitive, undeveloped nature of this park. The basic components of the Heritage Fishery proposal are:

- 1) An angling closure for two years in order to restore and evaluate the fish community. Special experimental regulations tailored to the fish population would be implemented following the two-year closure;
- 2) Not permitting the use of electric or gas motors on the lake or technologically advanced (electronic) fishing aids such as depth finders, pH meters, and temperature gauges. It would be necessary to waive this restriction for State personnel involved in emergency situations or fisheries management activities; and,
- 3) Limiting boat access to Annie Battle Lake to a carry-in access; park rental canoes and rowboats; and, navigable stream access to the lake.

Additional experimental regulations may be studied on Molly Stark Lake in the future. The DNR, Division of Parks and Recreation will work with the Section of Fisheries on the Heritage Fishery proposal and related procedures, including public involvement processes.

History

The Glendalough site was first developed in 1903 by Ezra G. Valentine as a summer retreat called Valentine's Camp. In 1903 he constructed several buildings including a cottage, stables, boat house, and bath houses. When E.G. Valentine died in 1905, the property was left to his son, John Alden and daughter Miss Blanche, who later sold it to Fred A. Everts. The camp was referred to as "Minnechoka Camp" on a 1912 plat map.

F.A. Everts sold the property to W.J. Murphy, who owned and operated the Minneapolis Tribune. In 1927, Mr. Murphy renamed the property Glendalough, after a monastery in Ireland. As surrounding farms came up for sale during the Depression, Murphy expanded Glendalough's acreage and started a turkey and game farm.

In 1941, Glendalough was purchased along with the Minneapolis Tribune by the John Cowles Family. The game farm and hunting preserve hosted several dignitaries, including President Dwight Eisenhower, President Richard Nixon, and Vice-President Walter Mondale.

The Cowles family donated the property to the Nature Conservancy in 1990. Glendalough was transferred to the state for use as a state park in 1992.

Archaeology

Archaeologists believe that ancient people ventured into western Minnesota after the last glacial advance around 10,000 years ago. Although knowledge of this early cultural tradition (the Paleo-Indian tradition) is limited, we do know they hunted large game animals such as the giant bison (which is now extinct).

The Otter Tail County Lakes region was attractive to both wildlife and prehistoric cultures. Evidence of Native American populations inhabiting lakeside and streamside areas in the region is especially well documented for the Woodland cultural tradition, which dates to between 1000 B.C. and A.D. 1650. Archaeological finds related to this culture are characterized by pottery and frequently smaller, corner-notched and triangular stone projectile points that could be hafted to an arrow. Also during this time period, burial mound sites, or cemeteries, were established. Many of these burial features are still visible today.

An initial cultural resource record search for the park area was completed in the spring of 1990 by the State Park Cultural Resource Management Program. Two cemetery (burial mound) sites are recorded between Co. Rd. 16 and the north shore of West Battle Lake. One of the two sites is within the park boundary. Both sites have been under cultivation and the mounds are plowed down (but portions may still be visible).

In addition to the records search, a limited amount of field examination of potential development areas was undertaken. Two Native American sites were recorded during the 1991 fieldwork. A small site, yielding a pottery sherd and a burned animal bone fragment was identified immediately south of the lodge complex kitchen building on the northern shoreline of Annie Battle Lake. This site was issued state site number 210T103 and named the Glendalough Lodge site. A rather extensive site area was also identified on the west side of Annie Battle Lake adjacent to the inlet to the lake. Stone tools and flakeage materials were recorded from this site, issued state site number 210T104 and named the Annie Battle Lake site.

In terms of the known cultural resource sites, the initial phase of development at Glendalough has the potential to impact only the Annie Battle Lake site. A proposed trail connection located between the picnic/beach area on Molly Stark Lake and the campground area on the west side of Annie Battle Lake is planned close to the Annie Battle Lake site and will need careful review so that the site can be avoided.

***CULTURAL RESOURCE SURVEY FOR DEVELOPMENT AREAS**

All proposed development areas will receive a cultural resource survey. Initially, the survey should include the park entrance road, picnic/beach area, campground area, carry-in boat access area, bicycle trail, contact station area, canoe-in campsites, and maintenance/service court area. If significant cultural resources are discovered during the survey, facility siting, public use, and possible archaeological mitigation will need to be reviewed to avoid or minimize impacts.

Recreation Management Objectives

- Minimize and concentrate park development in order to preserve the remaining portions of the park (also a resource management objective)
- Emphasize wildlife management and its interpretation (also a resource management objective)
- Implement a "phased management" approach which offers more primitive experiences in the initial phases and considers additional development carefully in the later phases
- Preserve Annie Battle Lake as the centerpiece of the primitive, undeveloped nature of this park
- Whenever possible/practicable, develop facilities that are accessible by persons with disabilities
- Offer and market a "primitive experience" at Glendalough which includes:

Wildlife Management, Observation, and Interpretation

Canoeing through a chain of lakes, including "no motors" on Annie Battle Lake

Heritage Fishery on Annie Battle Lake

Cart-in and Canoe-in Camping

Bicycling around Annie Battle Lake and into the City of Battle Lake

Existing Development

Major Development Areas

There are three major development areas remaining from when Glendalough was used as a game farm and hunting retreat (described below - refer to map on p. 37).

1. Game Farm - The game farm includes 7 buildings and approximately 7 acres of flight pens. This 70-acre area is enclosed by a predator control fence. The buildings include 5 brooder structures, one garage, and a farmhouse.

Recommendation: The game farm area should be developed into the maintenance area (service court) for the park. The fence and flight pens should be removed as well as all buildings which cannot be used to maintain the park.

2. Farmhouse - The main farmhouse includes the farmhouse/office and 4 storage buildings.

Recommendation: The farmhouse area should be used as the carry-in boat access to Annie Battle Lake and serve as the main access to the wildlife and interpretive areas of the park (includes a parking area). There will be future consideration for a combined trail/interpretive center in this area. The farmhouse and related building equipment should be removed; any materials which can serve to maintain the park should be retained and stored in the new service court location (present game farm area).

3. Camp Complex - The camp complex includes 12 buildings: lodge, kitchen, conference center, office, two garages, two storage buildings, and four cabins. There is also a tennis court.

Recommendation: The camp complex area should be used as the focal point for outdoor interpretation of the natural resources at the park. The Interpretive Services section (p. 46) provides further discussion on this area. All buildings and development (including the tennis court) should be removed except for the lodge.

Other Development

Structures/Equipment - There are a number of structures throughout the park which have been sold and are in the process of being removed. The two center-pivot irrigation systems should be evaluated as part of the resource management plan for the park (see p. 24).

Roads - Most of the internal roads and "cartways" will be used for park service roads and trails, however, a new entrance road off of Co. Rd. 16 is proposed (see p.38, and map, p. 45). Roads which will not be used should be abandoned and eventually obliterated/revegetated.

Powerline - A 230,000-volt alternating current powerline owned by Otter Tail Power passes through the park between Molly Stark and Annie Battle Lakes. This high voltage line would be extremely expensive to bury and maintain as a buried line. To move the line along County Road 16 would be much less expensive, however, estimates for relocation are still at least \$600,000. In the long run, these alternatives can continue to be investigated. In the immediate future, however, the park manager and resource specialist should coordinate management of the powerline right-of-way. This management should consider the following: elimination of pesticide applications within the park; the planting of low-growing native plants; coordination during controlled burns (including protection for powerline poles); and wildlife management projects (e.g. placement of raptor nests on poles).

Boat Accesses - Two boat accesses exist in the park. The access on Annie Battle Lake will be closed to public use as part of the Heritage Fishery management plan. The road to this access should be gated at County Road 16; the road should be maintained as a "service road" for DNR, Fisheries personnel to reach the boat access and for park maintenance vehicles to reach the canoe-in campsites and toilet. The Molly Stark Lake boat launch will remain in its present location, but will be accessed from the new park entrance road (see proposed development p. 39, and map, p. 45).

Private Lands - There are four private parcels within the park boundary totalling approximately 48 acres. These parcels will be acquired when their owners offer them for sale and funds are available (see map, p. 37).

11

PARK BOUNDARY

LAKE BLANCHE

PARK BOUNDARY

LAKE EMMA

CAMP COMPLEX

14

FARMHOUSE

SUNSET LAKE

PROPERTY ENTRANCE

ANNE BATTLE LAKE

GAME FARM

23

PARK BOUNDARY

MOLLY STARK LAKE

19



NORTH

SCALE: 1 INCH = 2000 FEET

1.29 ACRES

R. 40 W.

R. 39 W.

3.26 ACRES

1.70 ACRES

41.47 ACRES

	POWERLINE
	ROADS
	BOAT LAUNCH
	PRIVATE PROPERTY

GLENDALOUGH STATE PARK

EXISTING DEVELOPMENT

OTTER TAIL COUNTY - NEAR BATTLE LAKE

TWP. RD.

CO. RD. #16

CO. RD. #18

WEST BATTLE LAKE

The law which established Glendalough State Park (see p. 4) provided that emphasis be given to the management of wildlife within the park and the interpretation of these management activities. It also states that "...Glendalough State Park shall be administered in the same manner as provided for other state parks..."

Considering this mandate, those areas of the park with the most important wildlife values were identified before development concepts were generated. Essentially, the area defined as having the most wildlife value included the Sunset Lake wetland complex (and all areas to the north); the entire Lake Emma wetland, and the connecting corridor between these two areas (between Annie Battle and Blanche Lakes). Five development concept options were discussed during the planning process, including options with major development situated either in the western or eastern portions of the park (see Planning Process File). The proposed development in this plan (see Proposed Development Map, p. 45) is based on the option referred to in the planning process as "West Option 2."

Some of the major reasons for recommending this development option are outlined below.

1. This option preserves Annie Battle Lake by focusing the majority of day use in the southern half of the park (and works well with the "Heritage Fishery").
2. The park design flows from the most active uses in the south to the most preserved wildlife management/interpretation area in the north.
3. Interpretive facilities are in a prime central location for interpreting wildlife and related management activities.
4. The most important natural resource areas are preserved.

***ENTRANCE ROAD**

Realign the park entrance road off of County Road 16 just west of Molly Stark Lake. This entrance will be easy to find and will provide an immediate sense of being in a State Park. This entrance road follows disturbed areas (old fields, agricultural land, and along an existing road through an oak woods), yet winds through areas of varied vegetation and topography. The proposed alignment provides a much more aesthetic experience than the existing straight entrance road. Preliminary estimates by the DNR, Bureau of Engineering indicate it will be less expensive to construct and pave 0.85 miles of new entrance road from County Road 16 than to pave the 2.25 mile existing entrance road. In the Sunset Lake area, the new entrance road includes a realignment of the existing road (realign to the south side of two wildlife dugouts southeast of the lake).

As part of this development, the existing township road within the statutory boundary (continuing east from property entrance) may be abandoned and re-designated along the new entrance road (requires Township Board action).

***CONTACT STATION/OFFICE**

Construct a contact station/park office along the entrance road west of Molly Stark Lake. The building should include park administrative offices, a public toilet, and adequate space for handling all park rentals. Rental bikes and other equipment may be stored at this location; boats/canoes would be stored near the carry-in boat access on Annie Battle Lake.

***MOLLY STARK BOAT ACCESS**

The Molly Stark boat access was donated to the State of Minnesota in 1961. This 4.7-acre parcel was included in the statutory boundary of the state park when it was established by the legislature in 1991. Minnesota Statutes (Chapter 85.053, Subd. 2) state that motor vehicles may not enter a state park without a state park permit. Although there was no charge to use the boat access from 1961 to 1991, a state park vehicle permit to use this area as part of the state park is now required. Prior to enforcing this requirement, the Molly Stark Access will be posted to inform the public using the access that the permit requirement will be enforced as of a specified date. The area will be posted one year (or summer use season) prior to enforcing the permit requirement, and an area news release will be issued.

***PICNIC/BEACH AREA**

A swimming beach and picnic area should be constructed on the north shore of Molly Stark Lake. A large open area near the powerline may be suitable for parking. An initial beach of up to 500 lineal feet is proposed, with an adjacent picnic area. A solid sand bottom exists in the shallow portions of this area, but supplemental sand may be needed as the water depth reaches four to five feet. Toilet facilities should be provided in this area. The park's main bicycle trail will pass through the picnic/beach area, connecting this major day use area to other park facilities.

***CAMPGROUND**

Overnight camping is an integral part of the recreational experience at most state parks. The advantages and disadvantages of offering many different types of camping were thoroughly discussed as part of the planning process for Glendalough State Park. Camping options discussed included canoe-in, walk-in, cart-in, rustic drive-in, and semi-modern drive-in sites.

The recreation management objectives for Glendalough (see p. 34) emphasize a primitive experience and offer a "package" of opportunities which are aligned with this primitive philosophy. A lakeside cart-in campground is recommended as an initial camping development for this park. The rationale related to this recommendation includes the following considerations.

1. There are many public and private campgrounds offering drive-in campsites in close proximity to the park, (see Regional Analysis, p. 7 and 8) including Lake Carlos and Maplewood State Parks (which collectively offer 188 drive-in campsites).
2. The cart-in facility fits well with the overall park theme and marketing "package," which emphasizes wildlife observation/interpretation, canoeing, the Heritage Fishery on Annie Battle Lake, and bicycling.
3. The cart-in facility should include a modern sanitation building (showers, flush toilets) in order to provide better service and a broader attraction capability.

While there are many sound reasons for recommending a cart-in campground, it is recognized there is considerable demand for drive-in camping. Drive-in campsites provide for use by a broader spectrum of campers, including many elderly citizens who may prefer not to camp in tents. The overall population is aging and there is a high proportion of elderly persons residing in the Glendalough area (see p. 6). The recommendation to provide a cart-in facility includes future consideration for either additional cart-in sites or drive-in sites.

Including some of the land just south of the "Farmhouse," there is a total of between 40 and 50 acres available for a camping facility. The alignment of the entrance road and location of the carry-in boat access should take into consideration maximizing the available campground area.

Although only cart-in camping (up to 20 sites) and a modern sanitation building are recommended initially, the design for the campground area should designate and "set-aside" an area for future campground expansion. Depending on how popular the cart-in sites are as well as a re-evaluation of camping demands, either additional cart-in or drive-in campsites should be provided.

If possible, the campground should be designed with the following considerations in mind.

1. Place some of the cart-in sites in the lower shoreline areas so campers with canoes can "pull-up" into their campsites.

2. Reserve some of the "set-aside" campground expansion area along the shoreline of the lake for future campsites.
3. The central portion of the campground area is on a steep bank; consider a central stairway access to the lake to keep users off of the erodible bank.
4. The bicycle trail will pass through the campground area. Consider aligning the trail west of the campground rather than along the lake's edge.
5. Separate the cart-in area from the expansion area as much as possible.

***CANOE-IN CAMPSITES**

Three to five canoe-in campsites should be constructed on the southeast shore of Annie Battle Lake. Initially, consider developing two or three sites to assess demand. The sites should be well spaced yet have reasonable access to a centrally located toilet. A truck used to pump vault toilets can access this area from the old Annie Battle Lake boat access road off of County Road 16. The location of the sites should minimize disruption to the emergent vegetation (mostly bulrush) and take advantage of natural openings in this vegetation as much as possible. The sites should be located between the existing boat access and the Bald Eagle protection zone (at least 1320 feet from nest, see Wildlife Section, p. 27). Hardening of the shoreline (e.g. steps, retaining walls, etc.) may be required at each site to control erosion. Backpackers may also use these sites.

***CARRY-IN BOAT ACCESS AND INTERPRETIVE AREA**

The existing "Farmhouse" area just south of the Annie Battle Lake outlet will be the terminus of the park entrance road. A carry-in boat access (no trailer "ramp") and boat rental area should be developed in this area. These two uses should be combined if possible. Potential locations include 1) the riprapped shoreline just south of the lake outlet (consider removing the riprap), 2) an area approximately 500+ feet south of this location, or 3) the low bank adjacent to the outlet stream north and west of the existing bridge crossing. Rental canoes and boats should be stored away from the lake's shoreline. If one of the first two locations described above is selected, consideration should be given to a storage system that includes a "trolley" or sliding apparatus to maneuver the boats to the lake (rather than creating a visual impact by storing boats on the lake shore).

A parking lot and toilet facility will be needed in this area and the overall design should include an area set aside for a future trail/interpretive center. Parking area will be needed to accommodate the carry-in boat access, boat rentals, and visitors attending interpretive programs (includes self-guided interpretation and general access to the northern portion of the park-wildlife areas). Parking lot design should consider a "series" of individual parking areas if possible. See Interpretive Services, p. 46, for further discussion.

***SERVICE COURT**

The existing game farm area should be converted to the park's maintenance area and "service court". A service court provides an area for park maintenance vehicles, equipment, and supplies to be stored and maintained. This location would be accessible from the existing Township park entrance road. When the new entrance on County Road 16 is constructed, the only portion of the existing entrance road that should be retained would be for access to the service court and future group camp (see p. 44).

***BICYCLE AND HIKING TRAIL**

Approximately four miles of surfaced trail are proposed in the park. The proposed alignment includes about three miles around Annie Battle Lake which connects all of the major use areas in the park. Another mile of trail from the park entrance to the picnic/beach area should be a separated treadway but parallel to the park entrance road to minimize disturbance and construction costs.

From the proposed park entrance, four miles of surfaced trail will be provided into the City of Battle Lake (cooperative city/county and state highway project). Along this city-owned route, the city should consider adopting rules consistent with those along trails in state parks (in order to provide consistency for the eight mile trail system). The segment along State Highway 78 will be completed during 1992-93, and the segment along County Road 16 will be completed between 1993-95. A 12-foot box culvert should be provided under County Road 16 near the proposed park entrance to provide a separate grade crossing for bicyclists. A twelve-foot culvert is the minimum size recommended because it will allow light into the culvert and a fill layer can be added to the base of the culvert to allow for water drainage. This culvert will also allow future trail access to the 40-acre parcel on West Battle Lake (now under private ownership).

Along the north and east shores of Annie Battle Lake, the alignment should follow the existing "cartway." One area in which the alignment should deviate from the cartway is along the northeast shore of the lake (otherwise an inverted "V" shaped trail would essentially break the wildlife corridor between Annie Battle and Blanche Lakes). Care must also be taken in an area where the trail is approximately 1000 feet from a Bald Eagle nest (see p. 27).

The proposed trail alignment which is not along an existing road must be shovel-tested for archaeological artifacts (see p. 32 for further discussion on potentially sensitive areas).

Whenever possible, the trail treadway should be twelve feet wide (10 feet minimum). This width is recommended because relatively high use levels are anticipated, including bikes and in-line skating. In addition, the 8-foot wide bicycle

trails at other State Parks are inadequate at times of heavy use. The total 8-mile bicycle trail system at Glendalough State Park connects major park amenities to the City of Battle Lake and will likely be very popular (used by both city/area residents and park visitors). The wide treadway will also allow consideration for the use of golf carts in the future (see p. 44).

Two water crossings will be needed to complete the trail loop around Annie Battle Lake. One will be in the vicinity of the existing bridge at the Annie Battle Lake outlet and the other will be across the stream between Molly Stark and Annie Battle Lakes. Both will require permits from the DNR, Division of Waters. Both bridges will be part of the bicycle trail system, but should be built to support crossings by park maintenance vehicles (the Molly Stark - Annie Battle stream crossing may be an exception to this because there is a park service road in this area). The bridges provided should allow canoes and boats to pass beneath them.

***HIKING/SKI TRAILS**

Hiking trails should follow existing informal roads as shown on the Proposed Development map, p. 45. Use restrictions will apply on portions of these trails for wildlife protection purposes during the fall months (and also at other times of year depending on the circumstances).

Portions of the hiking trail system may also be designated for cross-country skiing during the winter months.

Wildlife blinds/overlooks that are linked to the trail system in the Lake Emma and Sunset Lake areas should be developed in consultation with resource specialists and the Area Wildlife Manager (alignment and locations not shown on Proposed Development map, page 45).

***SUMMARY OF FUTURE CONSIDERATIONS**

1. **CAMPGROUND** - Future campground expansion will include consideration for additional cart-in or drive-in campsites.

2. **GROUP CAMP** - Future consideration will be given to developing a primitive group camp southwest of the service court near the park boundary (NW 1/4 of the NE 1/4 of Section 23). Sections are shown on the Existing Development Map, p. 37. During the planning process, several sites were considered for a future primitive group camp. The site proposed is buffered from other park development areas and offers the privacy needed for group activities.

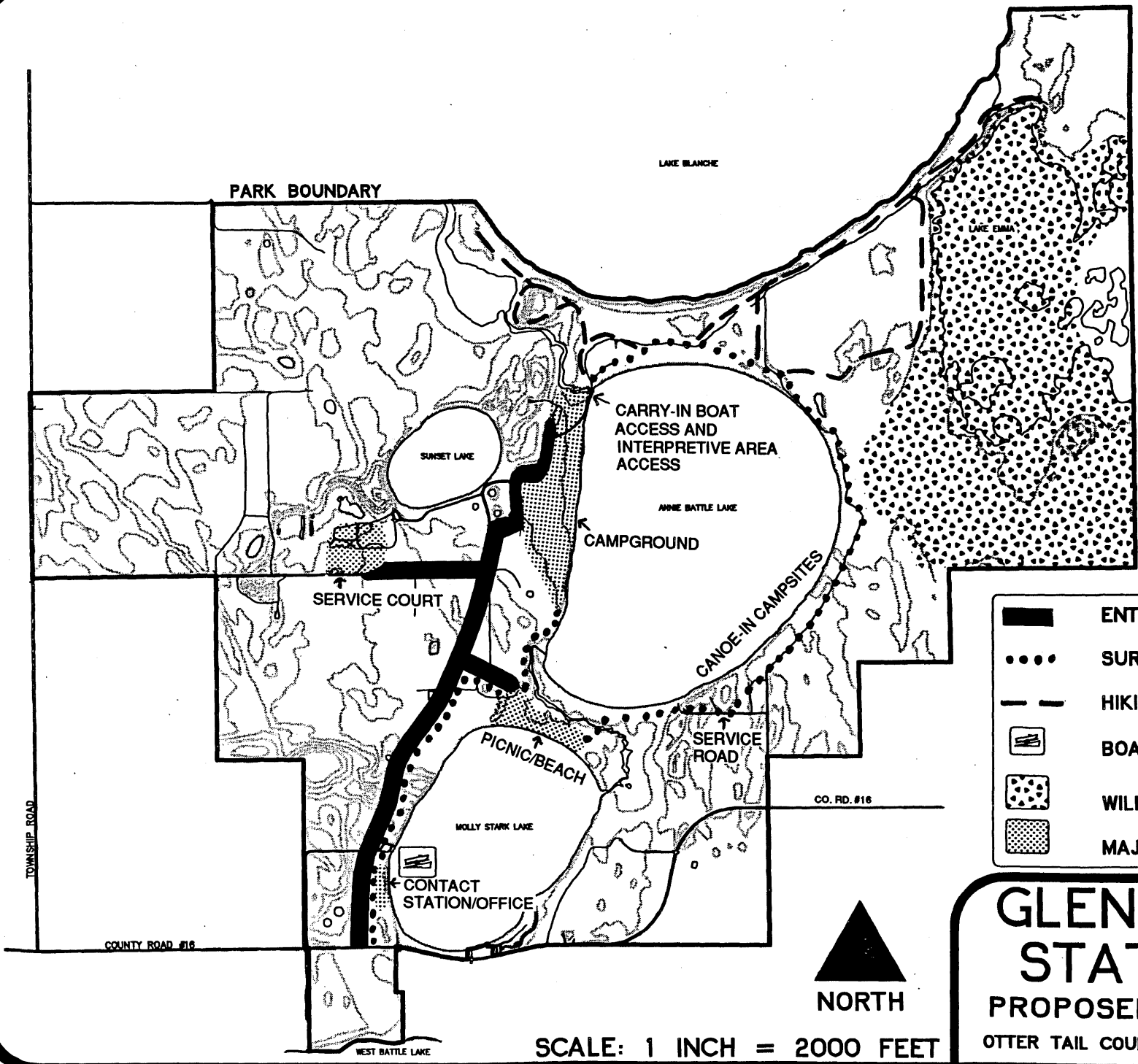
3. **INTERPRETIVE/TRAIL CENTER** - Future consideration will be given to constructing a combined interpretive/trail center in the existing "Farmhouse" area. This consideration will follow an evaluation of how well the lodge building in the camp complex area is meeting the park's interpretive needs (see Interpretive Services, p. 46).

4. **GOLF CARTS** - Portions of the existing dirt road around the north and east shores of Annie Battle Lake were historically used as an automobile tour of the Glendalough property. This type of use cannot be accommodated at Glendalough State Park. During the planning process, however, one suggestion to allow persons to continue non-bicycle access to this area was to allow electric golf carts on the main bicycle trail. If allowed, this type of use would have to be carefully managed, including a limited number of rental cars (no private cars allowed) and restrictions on cart operation (consider elderly/persons with disabilities use only).

Future consideration should be given to allowing rented golf carts at the park. However, the bicycle trail should be used for at least 3 -5 years by "traditional" trail uses prior to this consideration (to assess traditional use demand). Changes in State Park Rules and Policy may be needed to allow golf cart use.

NOTE: The costs associated with these "future considerations" are not included in the development cost estimate on page 49.

57



	ENTRANCE ROAD
	SURFACED TRAIL
	HIKING TRAIL
	BOAT ACCESS
	WILDLIFE PROTECTION ZONE
	MAJOR DEVELOPMENT AREAS

**GLENDALOUGH
STATE PARK**
 PROPOSED DEVELOPMENT
 OTTER TAIL COUNTY - NEAR BATTLE LAKE

SCALE: 1 INCH = 2000 FEET

Interpreting park resources is an important and integral part of Minnesota State Parks. The importance of environmental education is reflected in the Division of Parks and Recreation's mission statement (November, 1992):

"We will work with the people of Minnesota to provide a state park system which preserves and manages Minnesota's natural, scenic and cultural resources for present and future generations while providing appropriate recreational and educational opportunities."

At Glendalough, interpretation of wildlife management activities is mandated in the law which established the park. Interpretation in general was considered a very important criterion in selecting an overall park design. The recommended design terminates road access to the park south of the Annie Battle Lake outlet, and preserves the northernmost portion of the park for wildlife management and interpretation. This includes the north shore of Annie Battle Lake, the Sunset Lake Wetland Complex, and Lake Emma. The north shore of Annie Battle Lake is in a prime central location and will be easily accessible from the parking area south of the Annie Battle Lake Outlet.

As the plan for Glendalough evolved, a preservation theme emerged with Annie Battle Lake as the park's "centerpiece" reflecting this philosophy. The camp complex area on the north shore of Annie Battle Lake is a prime aesthetic location to conduct organized group interpretive programming and for quiet contemplation of the undeveloped lakeshore by all park visitors. This area should serve as a "commons" at the heart of the park.

The removal of all camp complex development except for the lodge (see p. 35) will remove the presence of a "resort" on the lake, yet still preserve some of the recent history of the property (on an interim basis). The lodge can be used for meeting space and limited interpretive purposes. The lodge should be evaluated for its long-term usefulness. When the assessment of the usefulness of the lodge is conducted, consideration should be given to constructing a combination interpretive/trail center in the existing "Farmhouse" area south of the Annie Battle Lake outlet. If an interpretive/trail center is constructed, the lodge should be removed (unless it is determined it has significant historical or interpretive value).

The bicycle trail around Annie Battle Lake will pass through the "commons" area on the lake's north shore.

***CAMP COMPLEX AREA RECOMMENDATIONS**

As discussed above, the removal of all buildings/development except for the lodge is recommended. The Minnesota Historical Society will be consulted prior to the removal of the buildings. Minor improvements to the first floor of the lodge will

be needed (persons with disabilities access, possible electrical upgrade, etc.). The septic system in the lodge should be closed and a new toilet facility should be provided in the existing "farmhouse" area south of the Annie Battle Lake outlet (see "Carry-in Boat Access recommendation, page 41). Costs to upgrade and maintain the lodge should be minimized.

***INTERPRETIVE PLAN**

A detailed interpretive plan should be completed for the park. The detailed interpretive plan will be an addendum to this Management Plan. An "interpretive unit plan process" was recently developed for Minnesota State Parks. The following items should be included in the interpretive plan.

1. Development of an Interpretive Theme - This process began during the planning process for the park. Several potential interpretive themes were developed by the regional naturalist (see Planning Process File), including wildlife management techniques, history of game farm operations, lake ecology, the Heritage Fishery on Annie Battle Lake, and Archaeology-related concepts.
2. An Assessment of Interpretive Services in This Area - A "regional analysis" should be conducted which reviews programs at Lake Carlos and Maplewood State Parks as well as other private and public environmental learning centers. The assessment should include the proposed Prairie Wetland Learning Center in Fergus Falls (by the U.S. Fish and Wildlife Service).
3. An Analysis of Potential Users - This analysis would include working with local K-12 school systems, Moorhead State University, and schools which emphasize curriculums in wildlife management techniques.
4. A Review of the lodge and the Interpretive/Trail Center Proposal (discussed above).
5. Interpretive Media and Programming Recommendations - Indoor exhibits, outdoor informational signage, self-guided trails, literature/brochure development, and direct contact programs (outdoor hikes, canoe "caravans," evening programs, etc.).

Operations and Staffing

A Park Manager position is recommended to oversee interim operation of the park and initial park development. When the major developments outlined in this plan are constructed, additional staff will be needed, including an Assistant Park Manager and appropriate seasonal personnel.

The establishment of Glendalough State Park is unique in its emphasis of wildlife management and interpretation. The resource management and interpretive plans for Glendalough should address staffing needs. At this time, however, it is reasonable to assume specific staff will be needed to carry out this mandate. It is recommended that a naturalist position and a resource manager position be established to meet the interpretive and resource management needs in the Glendalough State Park area (these positions will provide services at Glendalough, Maplewood and Lake Carlos State Parks).

Assuming the above staffing levels (and the levels of development outlined in this plan), estimated annual operation costs for Glendalough State Park are approximately \$240,000. In addition, a one-time start up cost for equipment and supplies (tractor, pick-up trucks, tools, etc.) is estimated at \$120,000. A breakdown of these cost estimates is available in the Planning Process File.

Although many DNR disciplines will be involved in the implementation of this plan, those most involved (besides the Division of Parks and Recreation) will be the Division of Fish and Wildlife, the Division of Enforcement, and the Bureau of Engineering. DNR disciplines are likely to experience increased workloads as this new state park is developed.

Development Cost Estimate

The following actions were recommended in the Management Plan for Glendalough State Park. The actions are not in priority order; they are listed in the order discussed in the plan. The cost to implement these actions is estimated at \$2,450,000 (in 1993 dollars). This estimate was generated as part of the planning process and has a significant margin of error because a variety of assumptions were made related to unknown variables (e.g. use of existing wells vs. new wells, site specific soil conditions, decisions related to site design, septic system selection, distance to electrical service, etc.).

1. Resource Inventory and Management Plan
2. Wildlife Management (includes plan and initial wildlife management activities such as deer exclosures)
3. Seal Unneeded (Abandoned) Wells
4. Cultural Resource Survey for Development Areas
5. Entrance Road (includes parking lots)
6. Contact Station/Office
7. Molly Stark Lake Boat Access (improvements and surfacing)
8. Picnic/Beach (includes beach and grounds construction, toilet building, picnic tables)
9. Campground (includes pathways, campsites, modern sanitation building, shoreline hardening)
10. Canoe-in Campsites (site construction and shoreline hardening, central toilet)
11. Carry-in Boat Access and Interpretive Area Access (remove farmhouse; construct boat access area, parking lot, and toilet facility)
12. Service Court (remove unneeded buildings and construct new facilities)
13. Bicycle and Hiking Trail (treadway preparation, bituminous surface, 2 bridges)
14. Hiking/Ski Trail (treadway hardening, overlooks)
15. Camp Complex (building removal, minimum upgrade for lodge building)
16. Interpretive Plan (includes initial implementation)

A breakdown of the development cost estimate is available in the Planning Process File.

