

Lake Bemidji State Park Management Plan



**Minnesota Department of Natural Resources
Division of Parks and Recreation
June 18, 2002**

For More Information Contact:

**DNR Information Center
500 Lafayette Road
St. Paul, MN 55155 - 4040
(651) 296-6157 (Metro Area)
1-888-MINNDNR (646-6367)**

TTY

**(651) 296-5484 (Metro Area)
1-800-657-3929**

<http://www.dnr.state.mn.us>

Copyrighted 2001 State of Minnesota, Department of Natural Resources

“Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed or religion, national origin, sex, marital status, status with regard to public assistance, sexual orientation, age or disability. Discrimination inquiries should be sent to the Minnesota Department of Natural Resources, 500 Lafayette



Minnesota Department of Natural Resources

OFFICE OF THE COMMISSIONER

500 Lafayette Road
St. Paul, Minnesota 55155-4037

Department of Natural Resources Approval of Management Plan for Lake Bemidji State Park

Minnesota Statutes 860A.09, Subdivision 1, requires that a master plan be prepared for units of Minnesota's outdoor recreation system, including state parks and state recreation areas. Laws of Minnesota for 1923 (chapt. 444, sec. 16) established Lake Bemidji State Park as part of Minnesota's Outdoor Recreation System (MS 85.013, subd. 20a).

The Minnesota Department of Natural Resources worked in partnership with Minnesota citizens and an interdisciplinary resource team to develop this management plan for Lake Bemidji State Park.

The management plan was approved by the Division of Parks and Recreation management team, and has been approved through the DNR's Statewide Interdisciplinary Review Service/Senior Managers' review process during November, 2001.

A handwritten signature in cursive script, reading "Allen Garber", written over a horizontal line.

Allen Garber, Commissioner
Minnesota Department of Natural Resources

A handwritten date "6/29/02" written over a horizontal line.

Date



Acknowledgments

The individual names of the many people who have contributed to the development of this plan are too numerous to mention here. Many people have participated in the planning meetings held throughout the process. Others have helped write background reports, reviewed documents or offered written and verbal ideas that have been important to the planning process and the final document. We thank all of these individuals for their dedication and willingness to participate in the planning effort.

A warm thank you is extended to the members of the Lake Bemidji State Park Citizens Association for the time that they graciously gave to this project. This group has guided development of this plan throughout the process. Without their assistance, the plan's quality would be substantially diminished.

In addition, several resource management professionals from many federal, state, and local agencies have willingly contributed their time and expertise to this planning project. We also wish to thank these individuals for their efforts.

Finally, a special thank you is extended to: Michael J. Garrett, Ph.D., Professor of Geography and Charles G. Parsons, Ph.D., Professor of Geography, Bemidji State University for completing much of the initial research, writing and geographic information services (G.I.S.) associated with this management plan. Their efforts aided a great deal in production of the final plan.

Table of Contents

Commissioner's Letter	i
Acknowledgments	ii
Table of Contents	iii
List of Figures	viii
List of Tables	viii
Executive Summary	ix
Chapter 1. Introduction	1
Purpose of the Plan	1
The Planning Process	1
Park Description	2
Management Concepts	2
DNR Vision	4
Division of Parks and Recreation Mission	4
Division of Parks and Recreation Vision	4
Lake Bemidji State Park Mission	4
Lake Bemidji State Park Year Vision	5
Chapter 2. Regional analysis	7
Introduction	7
Chippewa Plains Ecological Subsection	7
Socio - Economic Region Description	9
Regional Population Analysis	11
Regional Recreational Opportunities	11
Lake Bemidji State Park's Benefit to the Regions	15
Chapter 3. Management Zoning	17
Introduction	17
General Management Goals	17
Backcountry (Zone 1)	18
Concentrated Use (Zone 2)	18
Chapter 4. Natural Resources	21
Introduction	21
Natural Resource Management Goals	21
Summary of Existing Conditions	22
Climate	22
Geology	22
Soils	23
Vegetation at European Settlement	29
Existing Vegetation	29
Old Growth Forests	31
Fire Management	33
Wildlife	33
Waters/Fisheries	35
Endangered, Threatened, and Special Concern Species	37
Exotic Species and Other Pests	39

Recommendations and Actions	41
Natural Resources Research and Monitoring	46
Chapter 5. Cultural Resource Management	49
Introduction	49
Cultural Resource Management Goals	49
Existing Cultural Resources	49
Archaeological Resources	50
Historical Resources	51
Cultural Landscapes	51
Recommendations and Actions	53
Cultural Resources Research and Monitoring	53
Chapter 6. Interpretive and Environmental Education Services	55
Introduction	55
Statewide Interpretive Services Goals	55
Interpretive and Environmental Education Services Goals	56
Clientele	56
Individuals	56
Groups	56
Interpretive Themes	56
Existing Services	58
Environmental Education	58
Personal Services	58
Non-Personal Services	58
Staff	59
Facilities	59
Recommendations and Actions	59
Interpretive and Environmental Education Research and Monitoring	61
Chapter 7. Recreation Resource Management	63
Introduction	63
Recreation Resource Management Goals	63
Existing Recreation Resources	63
General Day Use	64
Trail Recreation	64
Water Recreation	64
Camping and Group Camps	67
Recommendations and Actions	67
Recreation Research and Monitoring	70
Chapter 8. Buildings and Facility Management	71
Introduction	71
Management Goals	71
ADA Requirements	71
Infrastructure Maintenance	71
Recommendations and Actions	72
Chapter 9. Park Boundary	73
Introduction	73
Recommendations and Actions	73

Chapter 10. Park Operation	75
Current Staffing	75
Future Staffing Needs	75
Park Administration	76
Interpretive and Environmental Education Services	76
Natural and Cultural Resource Management	76
Operations Needs	76
Chapter 11. Plan Modification Process	77
Plan Amendment Criteria	77
Plan Amendment Process	77
Plan Revisions	78
Revisions Related to Physical Development Constraints & Resource Protection	78
Program Revisions	78
References Cited	79

List of Figures

Figure 1. Ecological Classification System Subsection Map of Minnesota with Lake Bemidji State Park	8
Figure 2. Lake Bemidji State Park Ecological and Socio-Economic Regions ...	10
Figure 3. Lake Bemidji State Park Recommended Management Zones	19
Figure 4. Lake Bemidji State Park Soils by Texture	25
Figure 5. Lake Bemidji State Park Soils by Slope	26
Figure 6. Lake Bemidji State Park Soils by Upland Conifer Suitability	27
Figure 7. Lake Bemidji State Park Current Forest Cover Types	32
Figure 8. Lake Bemidji State Park Minor Watersheds	36
Figure 9. Lake Bemidji State Park Proposed Road Realignment	43
Figure 10. Lake Bemidji State Park Archaeological and Historic Sites	52
Figure 11. Lake Bemidji State Park Existing Summer Facilities and Trails	65
Figure 12. Lake Bemidji State Park Existing Winter Trails	66

List of Tables

Table 1. Boat Accesses, Campsites, Beaches and Picnic Areas Within 60 Miles of Lake Bemidji State Park	12
Table 2. Types and Miles of Trails within 50 Miles of Lake Bemidji State Park	13
Table 3. Lake Bemidji State Park Proposed Management Zone Guidelines ...	20
Table 4. Lake Bemidji State Park Soil Characteristics	28
Table 5. Lake Bemidji State Park Rare Animal and Plant Species	38
Table 6. Lake Bemidji State Park Archaeological Sites	50

Executive Summary

Lake Bemidji State Park includes 1,725 acres of very diverse natural and cultural resources. It provides ecological, recreational and economic benefits for the region and the state. This park preserves a diversity of resources including old growth pine stands, bogs, wetlands, and the endangered Bog adder's-mouth orchid. Lake Bemidji State Park provide a variety of recreational opportunities for the over 165,000 visitors in 2001. These visitors had a significant economic impact by spending over four million dollars in the region.

This management plan documents the planning process for Lake Bemidji State Park that involved citizens and resource professionals representing various groups and constituencies. Public meetings were held to address various components of the document. These meetings began with the development of a list of major planning issues and continued until this document was prepared. The recommendations found in this document are the result of these collaborative efforts and represent a general direction for Lake Bemidji State Park for the next 20 years.

The two primary goals of this management plan are to:

- Present an inventory of the major natural, cultural, recreation, and interpretive resources found within Lake Bemidji State Park; and
- Establish a general long-term management direction for Lake Bemidji State Park.

To accomplish these goals, the plan has been divided into four parts. The first part consists of the Introduction and Chapters 1 - 3. These chapters (a) document the planning process used to complete this document; (b) present long - term mission and vision statements for the park, the state park system, and the Minnesota Department of Natural Resources; (c) discuss Lake Bemidji State Park's role in its ecological and socioeconomic regions; and (d) describe a management zoning concept for the park. These chapters define the philosophical direction for developing the management recommendations found in the plan.

Part two of the plan consists of four chapters (Chapters 4 - 7) that inventory existing natural, cultural, recreation, and interpretive services resources and programs, document management recommendations that affect these programs and resources, and identify major research and monitoring needs. These chapters summarize the park's major management responsibilities and identify the following nineteen management recommendations.

Natural Resource Management

- 1: Focus natural resource management activities on ecosystem management rather than single species management.
- 2: Work toward rerouting CSAH 19 away from the center of the park and out of the wetlands. Restore the resulting abandoned sections of CSAH 19 and Big Bass Road. Minimize the impact County State Aid Highway 20 has on park visitors & resources.
- 3: Adopt a comprehensive vegetation management program to maintain healthy ecosystems and reestablish pre-European settlement conditions wherever possible within the park.
- 4: Sustain healthy and diverse animal populations.
- 5: Maintain healthy and diverse aquatic systems.
- 6: Continue to explore ways to involve a variety of people and agencies in natural resource management activities within Lake Bemidji State Park.

Cultural Resource Management

- 7: Continue to identify, document, preserve and interpret Lake Bemidji State Park's archaeological and historical resources.

Interpretive and Environmental Education Services

- 8: Provide a quality learning experience for park visitors.
- 9: Enhance facilities and programming available to interpret the park's wetland communities and geology.
- 10: Integrate interpretive and environmental services and the park's resource management activities.
- 11: Continue to provide interpretation of the park's cultural resources.
- 12: Continue to enhance interpretive program community outreach.

Recreation Resource Management

- 13: Continue to provide visitors with a range of high quality day use experience and benefit opportunities.
- 14: Provide a variety of trail opportunities that also allow for natural and cultural resource protection within the park.
- 15: Continue to maintain a range of water recreation opportunities.
- 16: Continue to provide visitors with quality and safe camping opportunities.
- 17: Continue to explore ways to involve a variety of people and agencies in recreation management actions within Lake Bemidji State Park.

Buildings and Facility Management

- 18: Maintain the basic infrastructure of the park facilities for safe, and convenient public use, provided consistent with the esthetic qualities of the area.

Proposed Boundary Modification

- 19: A revision of the park statutory boundary will be considered at the request of adjacent landowners if the potential boundary changes will help to preserve contiguous natural ecosystems, enhance visitor experiences, or provide expanded recreational opportunities.

Part three of the plan consists of three chapters (Chapters 8 - 10) that address major building, facility, and staffing needs necessary to implement the recommendations found in preceding chapters of the plan.

Finally, part four is a single chapter (Chapter 11) that describes a plan amendment process that should be used to address changes that may be proposed over the life of this plan. Because this plan is a collaborative effort among park professionals, other resource professionals and citizens, the recommendations in this chapter include provisions for public involvement in the amendment process.

Chapter 1. Introduction

Purpose of the Plan

This plan documents the work of a multi-year planning process and sets a general direction for the management of Lake Bemidji State Park for the next 20 years. As such, it does not contain detailed management prescriptions for implementing the recommendations found in each chapter. The plan sets a general direction and allows management staff, in cooperation with Minnesota's citizens, the flexibility to determine specific actions that will be appropriate to carry out the recommendations. In addition, it is expected that some changes in the plan are likely to be necessary during the next 20 years. Proposed changes will be evaluated according the plan amendment processes identified in Chapter 11 of the plan.

The existing park management plan for Lake Bemidji State Park was completed in 1978. Since then, the park has grown in size from slightly over 400 acres to nearly 1,725 acres. This expansion requires a rewrite of the management plan to address all of the land and resources within the park's current boundaries. Other changes in societal attitudes and values, recreational opportunities available to visitors, state laws and park management techniques have also occurred since 1978. This planning project addresses these needs as they pertain to Lake Bemidji State Park.

The Planning Process

The planning process began in the early 1990s with the formation of a technical advisory group and a citizen's advisory committee. Throughout the process, a strong commitment to public involvement, a focus on developing a strategic direction for the park and a desire to actively use new technologies has been an underlying theme.

The technical advisory group, comprised of Minnesota Department of Natural Resources (MNDNR) staff and representatives from the geography department from Bemidji State University (BSU), was organized to complete a base line inventory of park resources, existing physical developments, visitor profiles, patterns and needs. This group was also asked to develop an initial set of management issues facing the park.

A citizen's advisory committee was organized at the beginning of the project to provide citizen input into the process. This group was self-selected as a result of announcements in local media and letters of invitation to numerous organizations soliciting volunteers to participate in the planning process. This advisory group eventually formally organized into the Lake Bemidji State Park Citizens Association (LBSPCA) with a set of organization bylaws and a board of directors. The LBSPCA continues to play an active role in developing management recommendations for Lake Bemidji State Park.

The technical advisory group and the citizen advisory committee met together several times over the course of the project to identify the major management issues facing the park, explore various management alternatives and develop the recommendations contained within this plan. The result of this process was a draft plan that was distributed for public review. Copies of the draft plan were made available to a mailing list of nearly 100 individuals who had expressed interest in receiving a in participating in the planning process. In addition, copies of the draft were placed in the Bemidji Public Library, the Bemidji State University Library and the MNDNR, Bemidji Regional Headquarters. Final MNDNR departmental review and approval by the Commissioner of MNDNR completes the planning process.

A completed park plan and "planning process file" documenting the planning process and pertinent background information was distributed to: Lake Bemidji State Park Office, State Park Regional Manager's Office in the Bemidji Regional DNR Office, and State Park Planning Section in the Division of Parks and Recreation's St. Paul Office.

Park Description

Lake Bemidji State Park is located in Beltrami County, five miles northeast of Bemidji on the north shore of Lake Bemidji. Major roadways serving the park include Trunk Highways 2 and 71 (TH 2 and 71). County State Aid Highway (CSAH) 20 (Birchmont Beach Road) serves as the major access corridor to the park. Existing roadways bisect the main unit of the park into four parcels linked by trail crossings. Two portions of the park are also detached from the main park area. The first portion is located to the west of the main park area and contains the MNDNR's Northwest Regional Headquarters. The second detached parcel is located on the southeast shore of Lake Bemidji, approximately four miles from the main unit and is reached by CSAH 19 (Lavinia Road) from the north or by Co. 12 (Lake Avenue) from the south. The State of Minnesota currently owns and manages approximately 1,650 acres within the park's 1,725 acre statutory boundary for state park purposes.

Lake Bemidji State Park was established in 1923 to conserve a remnant of uncut pine forest and to provide public access to Lake Bemidji. The original land parcels were acquired from 1923 to 1936 from lumberman T.B. Walker through condemnation proceedings. Initial legislation required maintenance of the park by the county. Although the statute assigning management responsibility for the park to Beltrami County was not repealed until 1955, the state legislature began appropriating maintenance funding for the park in 1933 (Meyer, 1991).

The park is situated on rolling glacial topography and contains approximately 20 diverse natural environments, the most prominent of which are original pine remnants, conifer bogs, and second growth stands of hardwoods. Over 300 species of birds, mammals, reptiles, and amphibians reside within or adjacent to the park. This rich diversity of flora and fauna and mixture of habitats provide many opportunities for natural resource based interpretation, recreation and spiritual enjoyment. The park's conifer bogs serve as examples of an ecological feature once common to northern Minnesota. Some of the state's most unusual plant and animal species occur in these bog areas.

Located within an increasingly urbanized setting, the park affords visitors easy access to an enjoyable combination of Minnesota lake country recreation and the natural experiences of the northern forest. Recreation opportunities include a large family unit campground, two group camps, picnic areas and shelter, a marina with boat access to Lake Bemidji, a visitor center and 15 miles of trails open throughout the year for both summer and winter recreation. The park contains a prominent scenic overlook, Rocky Point, overlooking Lake Bemidji. There is a quarter mile long beach along the north end of the lake which is easily accessible from the main visitor use area. Boardwalks provide easy access through the park's bog areas so visitors can observe carnivorous plants (such as pitcher-plants and insect eating sundews), orchids, and other plants without disturbing the bog.

Management Concepts

The Minnesota Department of Natural Resources (MNDNR) has set a goal to manage the state's natural resources in a way that is sustainable for future generations. Ecosystem-based management (EBM) is the approach that MNDNR is using to achieve this goal. The EBM approach takes a broader perspective and addresses entire ecosystems, rather than focusing only on individual plant or animal species or small parts of the ecosystem. This approach shifts management emphasis to the variety of benefits that natural areas provide to the environment, economies, communities, and people. Accomplishing this requires balancing four fundamental outcomes:

- An environment that supports human, animal and plant life;
- An economy that is strong and sustainable;
- A community that provides a high quality of life; and
- Opportunities for visitors to attain their desired experiences and benefits.

Lake Bemidji State Park addresses these four outcomes somewhat now. A major goal of this planning process was to determine how to manage Lake Bemidji's resources to sustain healthy ecosystems into the future. Ecosystems include all the living organisms (plants, animals, microorganisms, people), their physical

surroundings (soil, water, air), and the processes that maintain them. Ecosystems may be small (a rotting log or an isolated pond), medium-sized (a forest stand or watershed), or large (The Pine Moraines and Outwash Plains Landscape Region). When people think about ecosystems, the first things they usually consider are the natural aspects of the environment (e.g., soil, wildlife, and vegetation). However, EBM also recognizes that humans have a unique effect on the ecosystem and are affected by the health of the ecosystem. Healthy ecosystems for Lake Bemidji State Park will provide the setting for experiences people expect from the park: (a) getting away and relieving stress; (b) learning new things; (c) enjoying family activities; (d) viewing beautiful scenery; (e) relaxing while fishing, (f) seeing wildlife, hiking in a variety of natural settings; (g) viewing plant and animal habitat; and (h) learning more about natural systems. A healthy ecosystem in the park also affects neighboring communities, the surrounding landscape, Minnesota, and the nation.

The EBM approach looks at Lake Bemidji State Park not as an island but as an integral and beneficial part of a larger ecosystem and identifies how the park specifically benefits the ecosystem. For example, changes in visitor services provided at the park may affect the economic impact visitors have on neighboring communities or changes in vegetation management within the park can affect the eagle or wolf populations that use the park as part of their habitat. Sustaining a healthy ecosystem within Lake Bemidji State Park helps maintain the ecological, economic and social health of a much broader area.

Minnesota State Parks have been partners in two pilot projects to assess the mix of benefits that park visitors desire and attain from recreation areas. Results from both the visitor and community studies have been incorporated into this management plan. The BBM study results will also be used by park staff to select management activities and techniques that provide opportunities for visitors and communities to benefit from Lake Bemidji State Park. The results of these studies will help decision-makers target the limited funds available for recreation and leisure services toward those services that produce the greatest overall benefit.

Benefits Based Management (BBM) is a framework for guiding recreation management decisions that is one way to address what human expectations can be accommodated within Lake Bemidji State Park on a sustainable basis. This framework balances those human activities that the park's resources can accommodate with visitor expectations of what benefit opportunities the park should provide. BBM also provides a framework to allow managers to understand how characteristics of the setting and activities visitors enjoy in the park help people attain desired benefits. Park management staff is working to better understand what benefits visitors desire, those they attain, and how to maximize opportunities for visitors to attain their desired benefits while preserving the park's resources. At the same time, managers are interested in understanding what long-term impacts that recreating in the park has on visitors, their communities, their environment, and their economic well-being.

Within the BBM framework, a benefit is defined as a "desirable change of state," an improved condition or state for an individual, a group of individuals, a society, or other entities (Driver, Brown, and Peterson, 1991a). The natural environment plays a vital role in what and how benefits are produced. Different activities are conducted in different types of settings, which result in certain kinds of benefits. Many benefits attained from direct participation in activities at Lake Bemidji can lead to other lifelong benefits. For example, a long hike along one of the park's backcountry trails may help a person feel that he or she is escaping life's normal demands and reducing their stress at work. In the longer term, that person may feel mentally relaxed when returning to work and become a more efficient employee. Another example may be related to a more developed area where there are many interpretive signs and exhibits. This interpretive opportunity helps people learn more about nature. A better informed society may result from the fact that many people learned about nature at Lake Bemidji, and those people may treat the natural environment with better care. This change in behavior can benefit the environment and future generations who live in that environment.

DNR Vision

“We will work with the people to manage the state’s diverse natural resources for a sustainable quality of life.”

Division of Parks and Recreation Mission

“We will work with people 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.”

Division of Parks & Recreation Vision

We will continue to work with the people of Minnesota to ensure that the Minnesota State Park System will be sensitive to the needs of current and future generations and guided by the following principles and values:

- A commitment to ensure deliberate and effective natural, cultural, historical, and archaeological resource management;
- A commitment to provide appropriate recreational opportunities;
- A commitment to maintain a proper balance between resource protection and recreational use of state park lands;
- A conscious recognition of our responsibility to the public for wise and prudent acquisition and development of state park lands;
- A recognition of our educational and interpretive roles;
- A conscious and continuous effort to respect the valuable human resources embodied in our employees and the public;
- A continued desire to actively seek and adopt innovative, effective, and efficient management practices;
- A commitment to manage state parks for the benefits that they provide to people, society, the environment, and the economy;
- A realization of our responsibility to secure and maintain the resources necessary to implement our mandates and mission;
- A pledge to provide high quality public service; and
- A promise to consistently seek public involvement and support in decision making.

Lake Bemidji State Park Mission

Lake Bemidji State Park exists to protect and manage the unique resources found within the park, interpret those resources, and provide appropriate outdoor recreational opportunities for the benefits accrued to people, society, the economy, and the environment from the presence of those resources and opportunities.

Lake Bemidji State park Vision

The following vision statement was developed by the Lake Bemidji State Park Advisory Committee and reflects their view of what Lake Bemidji State Park should be in the future. This vision statement is supplemented by several management goals that are found in each of the subsequent chapters of this plan.

We will work with the people of Minnesota to ensure that management decisions and actions for Lake Bemidji State Park are guided by the following principles:

- Lake Bemidji State Park is extremely important to the environmental, social and economic quality of life for the residents of Bemidji, the region and the state, and will continue to become more valuable in the future.
- The ecological integrity of Lake Bemidji State Park's forest and related communities will be preserved and restored as close as possible to their pre-European settlement condition.
- The ecological integrity of Lake Bemidji State Park's critical water resources, particularly the bog communities, and their associated animal and plant communities will be preserved as close as possible to their pre-European settlement condition.
- Lake Bemidji State Park's communities will be restored to contiguous healthy communities that reflect their pre-European settlement condition.
- Lake Bemidji State Park's unique natural communities, historical, cultural, and archaeological resources will be perpetuated.
- Strong interpretation and environmental education programs will continue to be provided within the park and community.
- An active Lake Bemidji State Park Citizens Association will be encouraged and enabled to help integrate the park into the community and region.

Within these parameters, management actions to provide sustainable recreational opportunities for visitors to Lake Bemidji State Park will ensure the following:

- Continue to provide opportunities for visitors to experience the sights and sounds of nature, quiet, and solitude.
- Provision of varied recreational opportunities which are compatible with the fundamental principles identified above.
- Cooperation with neighboring communities, businesses, and other land management entities to meet public desires for recreational opportunities and support services in the Bemidji area and to support the area's economic vitality.

Since its creation, Lake Bemidji State Park has served a dual purpose of providing protection for natural and cultural resources and opportunities for recreation. Over time, a great deal has been learned about Lake Bemidji State Park's natural environment and how people recreate in the park. In recent years, state park staff have begun to document the benefits visitors attain. Many benefits, such as improved health and enhanced family relationships, are attained by individual visitors. Other benefits, such as improved community awareness of environmental issues, are realized by neighboring communities. Still other benefits, such as employment for local residents, are primarily economic. Many of the benefits associated with state parks are also environmental. Among these are increased environmental stewardship and greater awareness of human dependency on the environment.

Lake Bemidji State Park's vision and mission statements focus management actions on providing settings and recreational opportunities for benefit attainment. The vision and mission statements describe what the park should be like in the future, as well as why the park exists today. This plan focuses on presenting recommended management actions that should be taken in the next 20 years to realize the park's vision and mission. In both cases, the driving force is management of Lake Bemidji State Park for the mix of personal, social, economic, and environmental benefits that are accrued from the park. The recommendations found in this plan were developed with the vision statement, and the mission statement in mind.

Chapter 2. Regional Analysis

Introduction

Although Lake Bemidji State Park has statewide influence, it has the greatest impact on the ecological and socioeconomic regions in which it is located. This chapter describes both the ecological and socioeconomic regions and some of the primary relationships between the park and the regions. The ecological region is discussed in terms of the Minnesota Ecological Classification System (ECS) and reflects that system's natural landform boundaries. This region is described in terms of its natural features and human interaction with those features. Although the socioeconomic region partially overlaps the ecological region, its boundaries are defined as that area within a 60 mile radius of the park. The socioeconomic region is described in terms of regional population, recreation patterns, availability of recreation facilities, and other human interactions with the region.

Chippewa Plains Ecological Subsection

Minnesota's ECS is a means of separating and describing units of a landscape. This approach stresses the interrelationships and the result of interactions among components of the ecosystem. These components include climate, geology, geomorphology, parent material, soil, vegetation, hydrology, and land history. The ECS approach handles each component in relation to the others, rather than treating each one separately (Hargrave, 1992).

The ECS approach divides Minnesota into 25 distinct units called subsections (Figure 1). Lake Bemidji State Park is located along the southeastern boundary of the Chippewa Plains Ecological Subsection. The Chippewa Plains Subsection covers about seven percent of the land area in Minnesota. It stretches from Leech Lake to the southern shores of Upper Red Lake. This subsection is composed mainly of ground moraines, a lake plain, stagnation moraines, and an outwash plain. Most of this subsection is covered with thick glacial drift over a bedrock of Precambrian rock (Hargrave, 1992).

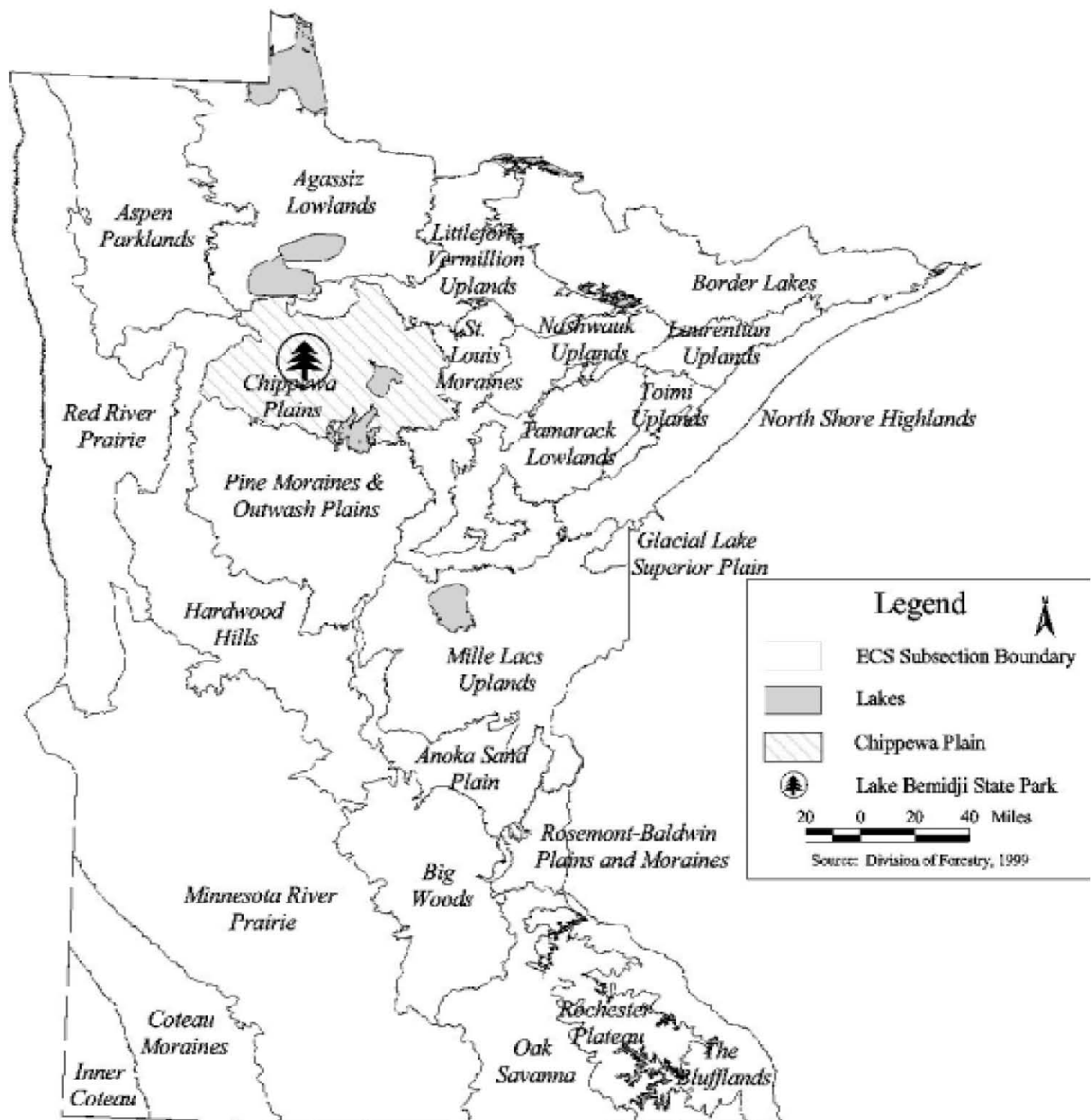
The Pre-European settlement vegetation consisted of a mixture of coniferous and deciduous trees. Red pine (*Pinus resinosa*) and white pine (*Pinus stroba*) thrived on the moraines, while Jack Pine (*Pinus banksiana*) was dominant on outwash plains and the sandy lake plains. Forested lowlands were occupied black spruce (*Picea mariana*), tamarack (*Larix laricina*), white cedar (*Thuja occidentalis*), and black ash (*Fraxinus nigra*). Hardwoods such as basswood (*Tilia americana*), northern red oak (*Quercus rubra*), and sugar maple (*Acer saccharum*) generally grew close to large lakes in sheltered areas of the moraines (Hargrave, 1992).

The present vegetation of this subsection is dominated by Aspen (*Populus tremuloides*) and birch (*Betula papyrifera*) covered forest lands (Asfoor, 1995). This forest cover type is found in both pure and mixed stands with maple, oak, white spruce (*Picea glauca*), jack pine, and red pine.

Lakes, rivers, and streams are also common in the Chippewa Plains ECS region. There are four major bodies of water in this subsection. They are Cass Lake, Leech Lake, Lake Winnibigoshish, and the Mississippi River. Lake Bemidji is also located in this subsection and serves as the northern most point along the Mississippi. The river flows into the lake from the south and exits on the eastern shore before it makes its way across a large section of the region.

The current land uses in this subsection include tourism, forestry, and agriculture. In addition, there are a variety of public lands in this subsection, including the Chippewa National Forest and U.S. Army Corps of Engineer's recreation areas, state forests, state wildlife management areas, state scientific and natural areas, state parks, state trails and county and city parks. Portions of the Leech Lake and Red Lake Indian Reservations are also included in this subsection.

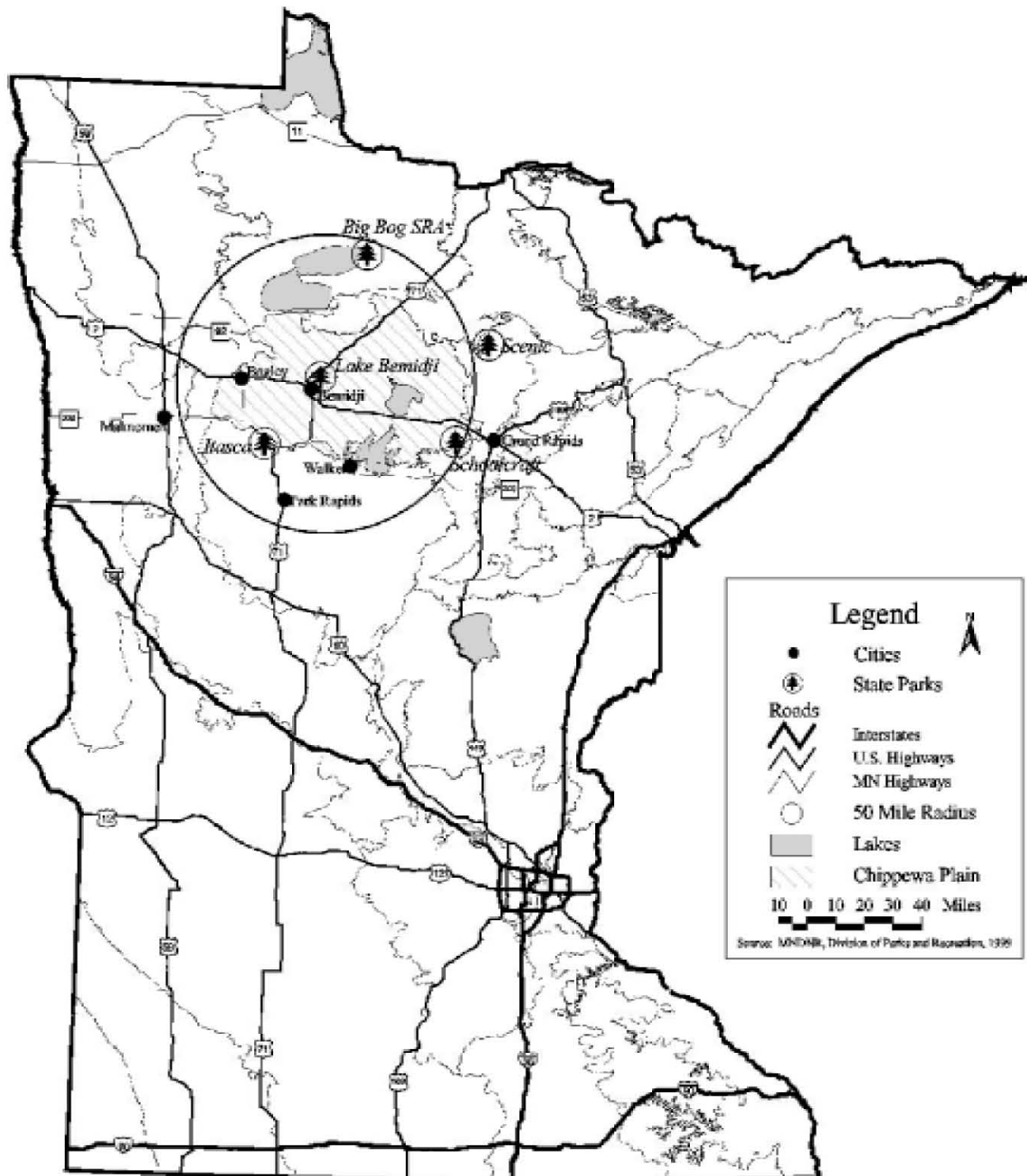
Figure 1. Ecological Classification System (ECS)
Subsection Map of Minnesota with
Lake Bemidji State Park



Socioeconomic Region Description

Lake Bemidji State Park is located within Beltrami County approximately five miles north of the city of Bemidji. Among the cities within a 60 miles radius of Lake Bemidji State Park are Bagley, Blackduck, Cass Lake, Deer River, Fosston, Park Rapids, and Walker (Figure 2). The Lake Bemidji area lays claim to the legendary Paul Bunyan as a major tourist attraction and derives much of its income from recreation and tourism. Forest and lake activities draw large numbers of people into the area. Lake Bemidji State Park's close proximity to the city of Bemidji and the large number of overnight accommodations in the area makes it easily accessible for day visitors (tourists) and local residents, organizations, and educational groups who take advantage of its natural resource interpretive programs and recreational opportunities throughout the year. The Minnesota Department of Trade and Economic Development estimated that the travel industry in Beltrami County employed 1,000 to 5,000 people and generated over \$25 million in gross wages in 1993. Gross receipts from Hotels, Motels, and Resorts in Beltrami County exceeded \$10 million in 1993. Forestry and agriculture are also important to this region's economy. Despite this economic activity, the region's median household income is lower than Minnesota's statewide median income. According to the 1990 census, the median household income for the counties in the 60 mile region surrounding Lake Bemidji State park was less than \$24,500. At the same time, Minnesota's statewide median income was approximately \$31,000 (MN Rural Development Board, 1995).

Figure 2. Lake Bemidji State Park Ecological and Socioeconomic Regions



Regional Population Analysis

The 60 mile region surrounding Lake Bemidji State Park is sparsely populated with the exception of several small cities. In 1990, the combined population of Beltrami, Cass, Clearwater, Hubbard, Itasca and Polk Counties was 152,784 for a density of less than 1 person per square mile (USDC, Bureau of the Census, 1990). The 1990 population for those cities within the region in excess of 1,000 people were:

Bemidji	11,245
Park Rapids	2,863
Fosston	1,529
Bagley	1,388

Other cities within the region with 1990 populations between 500 - 1,000 people were Blackduck, Cass Lake, Clearwater, Deer River, McIntosh, and Walker.

The Minnesota State Demographer's Office projects that the region's overall population will experience only slight changes by the year 2020. The largest projected increases are in Beltrami, Cass, and Hubbard Counties. The largest projected decreases are in Red Lake and Becker Counties (Minnesota State Demographer, 1995).

Regional Recreation Opportunities

A wide range of outdoor recreation opportunities are available in the region surrounding Lake Bemidji State Park. These opportunities exist on both private and public landholdings, and contribute to the economy and livelihood of the region's communities. Other state parks within this region are Itasca, Big Bog, and Schoolcraft State Parks. Lands that are administered by the federal government in this region are the Chippewa National Forest, Leech Lake Recreation Area, and Tamarac National Wildlife Refuge. Several state forests in this area provide recreational opportunities. Those State Forests within a short distance of Lake Bemidji State Park include Blackduck, Buena Vista, Mississippi Headwaters, Paul Bunyan, Welsh Lake, and White Earth. Other state forests that are found in this region are Badoura, Battleground, Big Fork, Foot Hills, Huntersville, Red Lake, Smoky Hills, and Two Inlets. Several state Wildlife Management Areas (WMA) and Scientific and Natural Areas (SNA) are also located in this region. Those that are closest to the park are Morph Meadow WMA, Wolf WMA, and Pennington Bog SNA. The Leech Lake, Red Lake, and White Earth Bands of Chippewa Indians also provide recreational opportunities in this region.

The region around Lake Bemidji State Park offers recreational opportunities for both day and overnight visitors. Among these opportunities are camping, picnicking, swimming, boating, sightseeing, hiking, bicycle touring, mountain biking, cross-country skiing, snowmobiling, horseback riding, and ATV trails. As part of the Statewide Comprehensive Outdoor Recreation Planning (SCORP) process, the MNDNR has maintained a data base of recreational facilities since the early 1970s. However, updates in recent years have been less than regular. While updates for many of the public facilities have been accomplished in recent years, most of the private facility data are out of date. Data presented in this plan were compiled from such sources as MNDNR databases, USDA Forest Service, Minnesota Office of Tourism, various internet sites and printed materials. Although exact numbers of recreational facilities are difficult to assess, Table 1 shows the approximate number of boat accesses, campsites, beaches, and picnic areas found within a 60 mile radius of Lake Bemidji State Park. There are over 300 resort operations, about 50 hotels/motels, 15 bed and breakfasts, 17 golf courses, 14 historic sites or museums, and five nature centers available to visitors to this region. There are also several recreational equipment rental businesses, outfitters, and many launch services in the region.

Table 1. Approximate # of Boat Accesses, Campsites, Beaches and Picnic Areas Within 60 miles of Lake Bemidji State Park

Administrator	Boat Accesses	Campsites	Beaches	Picnic Areas
City	16	201	2	2
County	66	0	7	22
DNR - Fish & Wildlife	16	0	0	0
DNR - Forestry	10	129	7	6
DNR - Parks & Recreation	7	369	3	2
DNR - Trails & Waterways	113	23	3	5
MnDOT	4	0	1	1
Township	6	0	0	0
Tribal	1	10	0	0
U.S. Corps of Engineers	3	75	2	1
U.S. Fish & Wildlife	0	0	0	6
U.S. Forest Service	65	708	17	24
Public Subtotal	307	1515	42	69
Private Subtotal	236	3456	176	27
Total	543	4971	218	96

Overnight Use

Camping - There are about 200 campgrounds within a 60 mile radius of Lake Bemidji State Park. Most of these campgrounds are privately owned (about 70 percent of the total number of campsites in the region). Approximately 25 percent of the campsites are located on state forest, state park, and national forest lands. Included in the state campgrounds are Lake Bemidji State Park and Itasca State Park. About six percent of the campsites available in this region are managed by cities, the U.S. Army Corps of Engineers, or the Leech Lake Band of Chippewa.

Resorts - There are approximately 300 privately-owned resorts located across this region. These resorts provide a range of accommodations from large operations offering condominiums and restaurants on site to smaller operations that offer only rental cabins. Itasca State Park also offers food services and overnight accommodations at the Douglas Lodge Resort and rental cabins in Bear Paw Campground.

Day Use

Boat Accesses - There are approximately 540 publicly and privately owned water accesses that exist within 60 miles of Lake Bemidji State Park. Nearly 60 percent of these accesses are maintained by government agencies. The Trails and Waterways Unit of the MNDNR is responsible for the majority of these accesses. The U.S. Forest Service, county governments, and the MNDNR, Division of Forestry also administer a significant portion of the water accesses in this area. Lake Bemidji State Park provides a developed access to Lake Bemidji. This access includes a harbor with docking facilities. The city of Bemidji also maintains three public accesses to Lake Bemidji. Privately owned accesses in the area are typically managed as part of a resort operation, and are not available to non-customers. There are also developed water accesses to four of the lakes within Itasca State Park (Elk, Itasca, Mary, and Ozawindib). Public accesses to some of Minnesota's largest lakes (e.g., Cass, Leech, Red Lake and Winnibigoshish) are also located within the area.

Picnic Grounds/ Beaches - There are about 100 picnic grounds and 220 beaches distributed across this region. Most of the picnic grounds in the surrounding area are administered by public agencies, with almost half managed by county governments and the U.S. Forest Service. In contrast, over 80 percent of the beaches found in the region are privately maintained by resort and campground operations. Lake Bemidji State Park provides picnicking and swimming opportunities along the shore of Lake Bemidji. Itasca State Park also provides picnicking and swimming opportunities.

Trails

Opportunities to enjoy the region's trails span the four seasons, serve a variety of trails users, and are located throughout the region. Table 2 indicates the miles of trails within the 60 mile region by administrative entity. The figures in the table are based on the best available information and are constantly changing as new trails are developed, old trails are surfaced, and trail use patterns change. These figures represent only designated trails and do not reflect state or national forest roads that might be open for trail activities.

Hiking Trails - There are over 530 miles of hiking trails found within 60 miles of Lake Bemidji State Park. Almost all of these trail opportunities are found to the south of the park, mainly within the Chippewa National Forest. In addition to the National Forest trails, DNR Trails and Waterways Unit manages the Heartland and Paul Bunyan State Trails which provide nearly 125 miles of hiking opportunities to this region. There are also approximately ten miles of hiking trail in Lake Bemidji State Park and 33 miles in Itasca State Park. Also included in this region are 71 miles of the North Country Scenic National Trail, which when completed will extend from Port Henry, New York (on the shores of Lake Champlain) to the Lewis and Clark National Historic Trail in North Dakota.

Horseback Trails - There are nearly 300 miles of horseback trails in this area. Over two-thirds of these trails are found in the Chippewa National Forest. Horseback riding opportunities are also provided in the Foot Hills, Huntersville, and Paul Bunyan State Forests. The Heartland State Trail has nearly 50 miles of trail that extends from Park Rapids to Walker open to horseback riding. In addition, there are several private riding stables within 60 miles of Lake Bemidji State Park.

Table 2. Types and Approximate # of Miles of Trails Within 60 miles of Lake Bemidji State Park

Administrator	Hiking	Horseback	Mt. Biking	Paved Biking	X-C Skiing**	Snowmobiling	ATV
City	0.0	0.0	0.0	0.0	11.4	0.0	0.0
* City GIA	0.0	0.0	0.0	0.0	0.0	18.0	0.0
* County GIA	10.5	0.0	0.0	0.0	81.7	1122.0	0.0
County	44.0	0.0	37.0	0.0	29.9	0.0	0.0
DNR-Forestry	89.3	31.2	0.0	0.0	11.8	146.0	152.0
DNR-Parks & Recreation	43.2	0.0	3.5	16.6	62.2	35.7	0.0
DNR-Trails & Waterways	124.3	49.0	36.1	97.3	0.0	191.2	0.0
U.S. Fish & Wildlife	1.5	0.0	0.0	0.0	14.4	0.0	0.0
U.S. Forest Service	214.1	209.2	2.8	173.8	242.6	16.0	0.0
<i>Public Subtotal</i>	526.9	289.4	79.4	287.7	454.0	1528.9	152.0
<i>Private Subtotal</i>	4.5	7.0	0.0	0.0	27.3	0.0	0.0
Total	531.4	296.4	79.4	287.7	481.3	1528.9	152.0

* Grant-in-aid trails

** Listed in kilometers

Mountain Biking Trails - There are about 80 miles of trail intended for mountain bike use in the region surrounding Lake Bemidji State Park. Nearly half of these trails are administered by county governments. The DNR, Trails and Waterways Unit also provides a substantial portion of the mountain biking opportunities to this area on the Heartland and Paul Bunyan State Trails. Mountain Biking also occurs on the Chippewa National Forest. In Lake Bemidji State Park, there are about 4 miles of trail available for mountain biking.

Surfaced Biking Trails - Approximately 280 miles of surfaced biking trails are located within 60 miles of Lake Bemidji State Park. The Paul Bunyan State Trail begins in the Lake Bemidji State Park day use area, and connects the park to Bemidji and the rest of the region. Many of the bike riding opportunities are located south of the park. About 60 percent of these miles are located within the Chippewa National Forest. The Heartland and Paul Bunyan State Trails offer nearly 100 miles of paved riding surface. In addition, the Minnesota Department of Transportation (MNDOT) has listed some highways in the region as designated bicycle routes. Itasca and Lake Bemidji State Parks also provide surfaced riding opportunities, with about 2.5 miles of surfaced biking trail within Lake Bemidji State Park in addition to the state trail.

Cross - Country Skiing Trails - There are over 480 kilometers of cross-country ski trails located in the area. Approximately 95 percent of these trails exist on public lands. Nearly half of these trails are located in the Chippewa National Forest. The North Country National Scenic Trail provides about 114 kilometers of trail in this region. The State of Minnesota's city and county Grant-in-Aid program provides assistance for over 80 kilometers of trail in this region. Many of these are maintained by the Bemidji Area Cross-Country Ski Club. In addition, local city and county governments provide over 40 kilometers of trails within the region. Cross-country skiing opportunities also exist in Itasca State Park, with about 50 kilometers of trail available. Nearly 13 kilometers of ski trail are also available within Lake Bemidji State Park.

Snowmobile Trails - Over 1,500 miles of snowmobile trail can be found within 60 miles of Lake Bemidji State Park. Almost 75 percent of these trails are funded through the state's Grant-in-Aid program which programs provides grants to local city and county governments for development and maintenance of snowmobile trails. Approximately 200 miles are managed by DNR, Trails and Waterways. Snowmobiling opportunities also exist on the state forests in the region. In addition, Itasca State Park offers over 30 miles of snowmobile trails, and Lake Bemidji State Park provides three miles of groomed trails.

ATV & OHM Trails - About 250 miles of All-Terrain-Vehicle (ATV) trails are available in the Paul Bunyan and Two Inlets state forests. The Martineau Recreation Trails system in the Paul Bunyan State Forest provides 67 miles of Off Highway Motorcycle trails. ATV use is also allowed on roads within all state forest lands and the Chippewa National Forest that are not posted as closed.

Lake Bemidji State Park's Benefit to the Region

Lake Bemidji State Park benefits both the ecological and socioeconomic regions surrounding the park. The 1,725 acre park provides a sanctuary for animal and plant species that include some of Minnesota's endangered, threatened or species of special concern. Among these are the bald eagle, osprey, and various plant species. In addition, the park contains forest and bog communities and their associated animal and plant species that are reflective of the Chippewa Plains Landscape Region. The park also protects lakes, streams, and portions of the Lake Bemidji shoreline. The park's biological diversity and proximity to Bemidji State University has made it the site of scientific research. The park also provides interpretive and environmental education services to local residents and visitors. This mix of natural habitat, research, and educational resources provides a range of environmental benefit attainment opportunities that include increased environmental stewardship, understanding of human dependency on the natural environment, awareness of environmental issues, environmental protection, and environmental ethics.

Beyond these important environmental benefits, Lake Bemidji State Park provides significant benefit attainment opportunities for the communities surrounding the park. Among the most important of the park's community benefits are chances to experience unique outdoor recreation opportunities, a feeling that the community is a special place in which to live, a natural setting in which the community can take great pride, attraction of tourism dollars, preservation/ conservation of various natural ecosystems, a greater understanding of the natural environment, improved health of recreation participants, and a sense of security that the natural environment will be protected.

Minnesota State Parks contribute over 217 million dollars to the Minnesota economy through visitor trip-related spending, and through park operations-related spending. In 2001 state park visitors were surveyed to identify how much money they spent on their trip. Visitors who were on a day trip from home spent \$14.37 per person per day, day visitors who were on an extended trip from home spent \$39.75 per person per day, and state park campers spent \$28.84 per person per day. Using these statewide averages, visitors to Lake Bemidji State Park spent over four million dollars during 2001. This spending includes both new money from out of state travelers, and money redistributed within the state from the metro area to northern Minnesota. Park visitors spend money in association with their park trip, and this spending fuels economic activity in the area of the park. Economic activity translates into jobs and income for Minnesotans.

These benefit opportunities make Lake Bemidji State Park an important component of the local and regional community. In some instances the park takes on a leadership role as in environmental education or sustainable resource management. In other instances, the park is an active participant in cooperative regional tourism promotion, economic development, regional planning or natural and social science research. The park also periodically sponsors or contributes to special community events.

Chapter 3. Management Zoning

Introduction

Management zones are developed to identify the resource management goals, visitor expectations, and level of management activities in various areas of the park. Establishing resource management goals for each zone also allows park management staff to develop resource management programs that are appropriate for each zone. Creating management zones also assists in determining the types of recreation, future development, and environmental education programs that should occur within a given portion of the park. Finally, defining management zones aids in efforts to provide opportunities for visitors to attain the experiences and benefits they most desire from their visits. Management plans completed after this plan use a system called Significant areas mapping (SAM) instead of management zones. SAM is an integrated approach by which the natural and cultural resources in a park are first identified in terms of their regional significance and then assessed in terms of their capability to provide opportunities for visitor experiences.

General Management Goals

The management zone delineations have been guided by the following management goals:

- Adhere to the intent of the state law which mandates that state parks are to be managed to: ... preserve, perpetuate, and interpret natural features that existed in the area of the park prior to settlement and other significant natural, scenic, scientific or historic features that are present.... Park use shall be primarily for aesthetic, cultural, and educational purposes, and shall not be designed to accommodate all forms or unlimited volumes of recreational use (Out Door Recreation Act of 1975).
- Preserve and protect the park's critical natural and cultural resources, particularly the park's old-growth forest and bog ecosystems.
- Provide opportunities for visitors, communities, the economy, and the environment to accrue the range of benefits associated with Lake Bemidji State Park.
- Provide a range of recreational opportunities for visitors to enjoy the natural environment but ensure protection of the critical natural and cultural resources found within the park for future generations to experience.
- Continue to serve as an important recreational and cultural resource while increasing their understanding and appreciation of the park's special role in protecting natural and cultural resources.
- Emphasize interpretation to promote stewardship of the park's natural and cultural resources.
- Focus major facility development in the Concentrated Use Zone. Locate and design facilities to have minimal negative effect on the park's natural and cultural resources throughout the park. Visitors should have opportunities to venture into undeveloped areas of the park to realize desired benefits (e.g., getting away from crowds or stress relief), but facilities should still be available that allow visitors to be with others, experience excitement, and enjoy different experiences.
- Provide opportunities for visitors to experience solitude.
- Maintain the infrastructure to protect the public investment and natural features found within Lake Bemidji State Park. While it is important that current visitors to the park benefit from Lake Bemidji, this use cannot detract from the ability of future generations to benefit from the park.
- Provide facilities for the safe use and enjoyment of the park.

There are two distinct management zones proposed for Lake Bemidji State Park; a Back Country Zone and a Concentrated Use Zone.

Back country (Zone 1):

This zone is the largest of the two zones and contains most of the park's bog and wetland areas. It includes the park's boardwalk trails; the western Arm of Big Bass Lake; and that portion of the Paul Bunyan Trail within the main park and most of the park's hiking, cross-country skiing and snowmobile trails.

This zone will provide visitors with a natural environment that offers opportunities to experience closeness to nature, limited contact with motor vehicles, and opportunities to enjoy a moderate amount of contact with other people. Natural resource management in this zone will focus on preservation or regeneration of native species, protection of natural processes, and protection of the zone's biodiversity. Although manipulation of the natural environment will be necessary in this zone to accomplish resource management goals, evidence of human impacts on the environment should be less extensive in this zone than in the Concentrated Use Zone. Human manipulation of the environment in the Back country Zone should be confined to those activities that are necessary to conduct resource management, provide low-impact visitor access and protect visitor safety.

Management actions within this zone should assume that visitors wish to enjoy easy to slightly challenging trails and boardwalks in a natural appearing, but minimally modified environment. A small degree of self-reliance may be needed by visitors in some portions of this zone. On-site visitor management controls (e.g., signs and trail markers) are present and visible along the trails. Interpretive opportunities will emphasize use of self-guided trails, trail maps, brochures, display boards, and field guides. Guided nature hikes and environmental education programs will also occur in this zone. Opportunities to operate motor vehicles on designated roads and trails should also be present. Motorized trail use will be limited to snowmobiles and other motor vehicles as defined by Minnesota State Park Rules and Regulations in those locations currently designated for such use. Although non-paved trails would be common, paved trails, boardwalks and improved roads will also be present.

Concentrated Use (Zone 2):

This zone includes much of the land south of CSAH 20 and west of CSAH 19, the MNDNR regional headquarters site west of the main park, and a strip along the shoreline of the south park. The park's entrance road, campground, group camps, picnic area, boat ramp, swimming beach and rocky point lookout are all within this zone. The shoreline of Lake Bemidji and a bald eagles nest north of Bass Creek is within this zone, and will need special management.

This zone will be managed to provide visitors with exposure to a natural area which requires limited reliance on outdoor skills, minimal challenge, and easily accessible facilities. Natural resource management in this zone should be focused on preserving an aesthetically pleasing representation of native species. Interpretive programs will be more frequent and more structured than in Zone 1 and will include interpretive displays, museums, self-guided tours, naturalist led hikes, and indoor programs. Human manipulation of the natural environment would be commonplace to ensure that visitors have easy access to the park's significant natural features and amenities.

Recommended Management Zones

Legend

Management Zones

- Backcountry Zone (Zone 1)
- Concentrated Use Zone (Zone 2)

Road Symbols

- County Highway
- County Road

Lakes/Rivers

Scale

0.2 0 0.2 0.4 Miles

Source: Minnesota Department of Natural Resources, Division of Parks and Recreation, 1999

Area A Above

Area B Above

Not to Scale

Not to Scale

Table 3. Lake Bemidji State Park Proposed Management Zone Guidelines

Factor	Zone 1 (Backcountry)	Zone 2 (Concentrated Use)
Naturalness of the area	An area that is a modified but natural environment. Evidence of a moderate amount of human impact on the environment is present.	An area that is predominantly modified but appears to be natural. Land use activities such as mowing along roads may be present.
Access to the area	Accessible by designated trails, roads and waterways. A limited number of roads are present within the zone and only visible from some portions of the zone. Trails are predominantly non-motorized but snowmobiling is allowed on designated trails.	Accessible by various motorized and non-motorized means using designated roads, trails and waterways. Roads are present and highly visible within the zone.
Amount and type of physical development	Rustic to paved facilities such as trails, boardwalks, trail signs and roads are present.	Facilities to accommodate users such as developed campsites, picnic tables, parking areas, boat ramps and necessary support systems are common.
Encounters with other people	Moderate degree of contact with other people. Opportunities for both social interaction and solitude are present.	Moderate to high degree of contact with other people. Opportunities for social interaction are quite common.
Amount of visitor management and regulation	On-site visitor management controls are noticeable such as trail signs and access limitations. Regulation of activities is moderately restrictive.	On-site visitor management controls are readily observable. Regulation of activities is present but less restrictive than in zone 1.
Amount and type of onsite interpretation	Rustic interpretive trails and signage are common in this zone. Both self-guided trails and naturalist led hikes are found in this zone.	A range of interpretive activities to serve a moderate number of people are found in this zone. Facilities ranging from self-guided trails to a visitor center and amphitheater are present.

Chapter 4. Natural Resource Management

Introduction

Among the natural resources found within Lake Bemidji State Park are wetlands and associated low land communities and upland forest communities. The central bog complex is a particularly significant and fragile natural resource within the park. This area contains a variety of species and sensitive habitats. Recent activities to preserve and regenerate upland forest communities within the park, have also elevated the relative importance of these communities to the park's resource management program.

This chapter begins with a section which outlines the natural resource management program's goals. The middle section presents an inventory and description of the park's natural history and existing natural resources. A section near the end of the chapter lists the major resource management recommendations and associated actions to accomplish the program goals and provide opportunities. The chapter ends with a section on research and monitoring. This chapter and its associated references serves as the overall natural resource management plan for the park.

Natural Resource Management Goals

DNR, in cooperation with Bemidji State University and the Lake Bemidji State Park Advisory Committee have identified the following long-term resource management goals for Lake Bemidji State Park:

- Consolidate the park's major wetlands and associated lowland communities into one contiguous natural unit to ensure their protection;
- Protect the park's unique, sensitive, rare, or endangered species;
- Restore upland conifer and hardwood forest communities as the predominant vegetative cover type in the park's upland areas;
- Emulate as best as possible the natural setting found in Lake Bemidji State Park prior to European settlement;
- Follow resource management practices that focus on ecosystems rather than single species management;
- Base management of the park's natural resources on the best available scientific knowledge and minimize interference with natural processes;
- Implement visual quality BMPs (Best Management Practices) into resource management plans and management approaches.
- Protect and restore the park's aesthetic qualities;
- Manage for realization of the park's target benefits, and
- Develop an ongoing research and monitoring program.

Although these goals should guide resource management activities throughout the park, translation of the goals into specific management actions will differ by management zone. The zone descriptions and guidelines presented in the management zoning chapter will aid in selecting specific resource management actions for each management zone.

Summary of Existing Conditions

Climate

Lake Bemidji State Park's climate is an important factor in maintaining the park's forest and aquatic ecosystems. The park lies near the intersection of three dominant air masses: (a) an arctic air stream that extends south from Canada into the north-central United States during the winter; (b) a Pacific air wedge that follows the path of strong westerly winds as they move across the northern United States; and (c) a tropical air stream that flows northward from the Gulf of Mexico especially during the summer months. Depending on the season, these air masses characterize the climate of northwestern Minnesota.

The arctic air mass prevails during the winter months and produces extremely cold temperatures. The average daily minimum temperature recorded at Bemidji during January for the 1951 - 1981 period was - 9.4° Fahrenheit (USDA, Natural Resources Conservation Service, 1997). The second common winter weather event is heavy snowfalls caused by the combination of Pacific air masses and moist Gulf air over the area. The average annual snowfall recorded at Bemidji for the 1951 - 1981 period was 38.6 inches (USDA, Natural Resources Conservation Service, 1997). On average, 140 days per year have at least 1 inch of snow on the ground. Incursions of arctic air often closely follow heavy snowfalls.

Summer conditions present a different set of conditions that can often be as extreme as the winter climate. The warm, moist tropical Gulf air mass combines with westerly winds in the summer months to produce warm to hot days. The average maximum daily temperature recorded at Bemidji during July for the 1951 - 1981 period was 79.4° Fahrenheit (USDA, Natural Resources Conservation Service, 1997). When the summer Gulf air combines with a blast of arctic air, heavy rain showers and thunderstorms can result. The average annual rainfall recorded at Bemidji for the 1951 - 1981 period was 22.9 inches (USDA, Natural Resources Conservation Service, 1997).

The result of these seasonal fluctuations is a climate characterized by cold winters and warm summers with significant precipitation and relatively short growing seasons. Bemidji's first frost normally occurs in late September or early October and the park's first frost-free days usually occur in mid-May or early June. In nine years out of ten daily minimum temperatures exceeded 32° Fahrenheit for only 96 days a year (USDA, Natural Resource Conservation Service, 1997).

Geology

The park's bedrock is granitic Precambrian rocks belonging to the Algoman group formed by volcanic activity. Several inactive faults cross these rocks within a few miles of the park. Between the bedrock and the surface landforms are shales deposited by seas which covered the area during the Cretaceous Period. Lake Bemidji State Park's surface landforms cover the bedrock well and are the result of glaciation from the Pleistocene (late Wisconsin) stage of the last Glacier that moved from Canada into Minnesota approximately 75,000 years ago. Rock material collected by the glacier from land to the north was deposited as till as the glacier melted and receded about 10,000 to 12,000 years ago. This till was overlain with minor pockets of sorted outwash carried by meltwater running off the surface of the glacier. The park's wetlands and Lakes Bemidji and Big Bass were formed by ice blocks, which broke off when the receding glacier melted, leaving depressions in the land that filled with water.

The park's current irregular landscape often known as "knob and kettle" topography where the knobs are mounds of debris and the kettles are depressions is the result of this glacial activity. Fine outwash overlying the coarser till can be seen on Rocky Point. Boulders eroded from boulder-clay till remain at the base of the cliff and other large rocks deposited by the glaciers can be seen emerging from Lake Bemidji's shoreline. These rocks are most obvious at Rocky Point and near the golf course adjacent to the park. Some outwash was deposited on a flat plain (Bemidji Outwash Plain) south of the park, a small part of which is now the site of the park's picnic area, campgrounds and waterfront.

In general, the park's land slopes gently toward Lake Bemidji with sharp breaks from shoreline erosion around Rocky Point. Other steep slopes are remnants of a higher, former Lake Bemidji before the Mississippi River lowered the lake with a new outlet to the east. These sites are above the west arm of Big Bass Lake and Bass Creek. Elevations within the park vary about 70 feet in a series of rolling hills from the highest points in the northwestern and northeastern portions of the park to the lower bog and lake areas. Much of the park's trail system is located within the park's rolling upland areas that support upland hardwood and conifer forests. A significant portion of the park's center is a large flat bog complex. This bog complex serves as a major focus of the park, supports the park's bog trail, and offers many educational opportunities for many park visitors, including school groups. The bog complex, assorted wetlands, and upland forests create a mosaic of conditions that make Lake Bemidji State Park a diverse and exciting place to visit.

Soils

The United States Department of Agriculture, Natural Resources Conservation Service has recently completed the Beltrami County soil survey (USDA, Natural Resource Conservation Service and Forest Service, 1997). Soil survey data is collected and mapped in 5 acre plots that are 5 feet deep. The information in this section is based on this soil survey. Copies of the soil surveys can be obtained from the USDA, Natural Resources Conservation Service and Forest Service or local Soil and Water Conservation District staff.

The soils found in Bemidji State Park have been formed through the interaction of five major factors: parent material left by glacial activity; climate; plants and animals living in the area; topography; and the length of time these factors have acted on the parent materials (USDA, Natural Resources Conservation Service and Forest Service, 1997). The parent material for the majority of the park's soils is either glacial till or glacial outwash. Glacial deposits as deep as 300-500 feet cover substantial portions of the county. The park's continental climate characterized by cold winters and warm to humid summers with wide temperature variations throughout the year has subjected the parent material to shrinking and swelling associated with freezing and thawing. These climatic influences have aided in breaking up the parent materials and developing the park's current soil textures. A variety of plant and animal organisms have inhabited the park since the glacial period and left their impact on the soil types through formation of organic material. The park's knob and kettle topography has had a major impact on the formation of soil types found within the park. In level areas, precipitation generally does not run off and is absorbed through the soil profile. This process creates soils that are often permanently or seasonally saturated. In the steeper areas, soils are generally better drained, associated with lower water tables, and brighter in color with thinner soil horizons than soils in level areas. Temporally, the soils in the park are relatively young and have been formed in the last 10,000 - 20,000 years (USDA, Natural Resources Conservation Service, 1997).

Soil Groups

The interaction of these soil formation factors has created a mosaic different soil types within the park. For purposes of this management plan, the park's soil types have been grouped by soil texture (Figure 4) and slope (Figure 5) according to similarities among the various soil types. Because pine regeneration is an important resource management goal for Lake Bemidji State Park, Figure 6 displays those soils with "very poor" to "good" suitability for upland conifer growth based on depth of root zone, surface layer texture, amount of water available, wetness, salinity, and flooding (USDA, Natural Resources Conservation Service and Forest Service, 1997).

Soil texture, slope, and conifer suitability are among the important soil characteristics to consider when making management decisions. These and other soil characteristics make certain soils more suitable for particular resource management activities and recreation facility development than other soil types. Table 8 lists some of the major soil characteristics and facility limitations for each of the park's soil types.

It is important to examine soil characteristics when making land use decisions. For example, if a manager wished to site a new building surrounded by newly planted conifers near the mouth of Bass Creek, an

examination of the soil types would reveal that the soil immediately surrounding the mouth of Bass Creek is a loamy sand (Figure 4). This soil type is relatively flat and has moderate limitations for buildings, roads, landscaping and "fair" conifer suitability (Table 8). However, slightly to the north of the mouth of the creek and along the Lake Bemidji shoreline the soil type shifts to a Graycalm-Menahga Complex (Figure 4) which is slightly elevated, has only low limitations for buildings and roads and "good" conifer suitability. In this case, it might be more appropriate to locate the building slightly removed from the mouth of the creek and over the Graycalm-Menahga Complex. Similar analyses of soil characteristics can be made for the remainder of the park on a case-by-case basis to aid in identifying potential sites for pine regeneration, determining trail alignment, utility placement, and other facility placement.

Most of the park's soils are within the loamy sands and muck texture groups with variable slopes depending upon where the soil is located. However, several smaller pockets of loamy fine sands, sandy loams, and complexes are located throughout the park. Many of the park's soils have "good" potential to support upland conifer growth (conifer suitability). Those soil types that have "fair" to "poor" upland conifer suitability are primarily located in low areas dominated by mucks and sandy loams (Figure 6). A brief description of the park's soil groups follows. More detailed profiles and maps of these soil types are available from the DNR Division of Parks and Recreation and the USDA, Natural Resources Conservation Service and Forest Service data.

Andrusia, Karlstad, Marquette, Meehan and Menahga Loamy Sands

These soils are the most common soils in the park. They cover about three-quarters of the area within the park boundary. These soils are located throughout the park and exist in a range of slopes from 0 - 25 percent. They are well-drained soils with the exception of the Meehan which are poorly drained. These soils are typically found on outwash plains and beaches. They are formed from parent material of sandy, gravelly, and loamy sediments. They have deep soil formations (to 60 inches) with dark loamy sands over single-grained sands to gravelly sands. These soils are well suited for future development.

Epoufette, Lupton, Rifle and Seeleyville Muck

These soils, which comprise about a fifth of the park's area, are scattered throughout the park but mainly concentrated near the bogs and interior lakes. They are very poorly drained and have nearly no slope. All of these soils are found on till-formed glacial lake plains with the exception of the Epoufette, which originates from outwash plains. The parent material for these soils includes highly decomposed woody organic matter. These soils with the exception of the Epoufette have deep (to 60 inches) formations of moderately to highly decomposed organic material. The Epoufette has a deep soil formation with a black muck surface less than 8 inches thick over sandy loam grading to coarse sand. These soils have severe limitations for development.

Cormant and Hiwood Loamy Fine Sand

These soils are not common within the park's boundary but some are located in the southern tip of the park's main area. Hiwood soils have moderate drainage capabilities, while Cormants are poorly drained. Hiwood and Cormant soils are commonly found on glacial till lake plains with slopes of 0 to 3 percent. These soil types are characterized by lacustrine sediment parent material, a sandy loam surface over fine sand, and a very deep soil profile (in excess of 60 inches). The most appropriate development for these soils include roads, landscaping, picnic areas and trails. They are not well-suited for sanitary facilities.

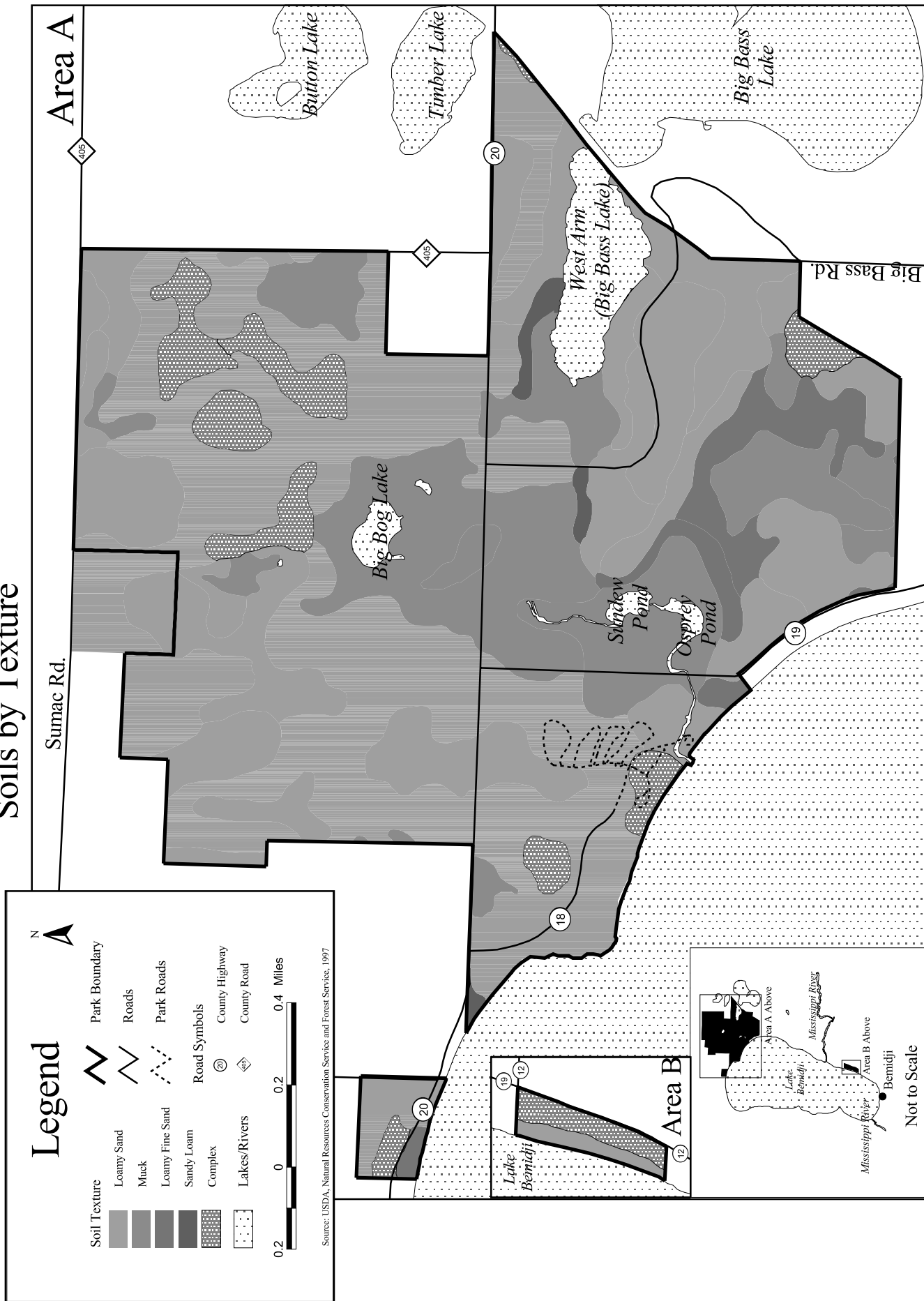
Epoufette Sandy Loam

Only a small amount of this soil is located in the far western tip of the park's main area. This soil is a nearly level and poorly drained soil with a deep profile (to 60 inches). These soils have a parent material of stratified sandy sediments and are typically found on outwash plains. This soil has a black sandy loam surface over sandy loam grading to coarse sand. Development that is suitable on these soils is very limited.

Graycalm-Menahga Complex

These soils make up only a small area in the park. These are generally gently sloping (1-12 percent), excessively drained soils, with deep soil formations of very dark gray loamy sand surface over sand grading to gravelly sand. These soils were formed from sandy sediments on outwash plains. In the flat areas, they are good for development with the exception of sanitation facilities.

Figure 4. Lake Bemidji State Park
Soils by Texture



Source: USDA, Natural Resources Conservation Service and Forest Service, 1997

Figure 5. Lake Bemidji State Park Soils by Slope

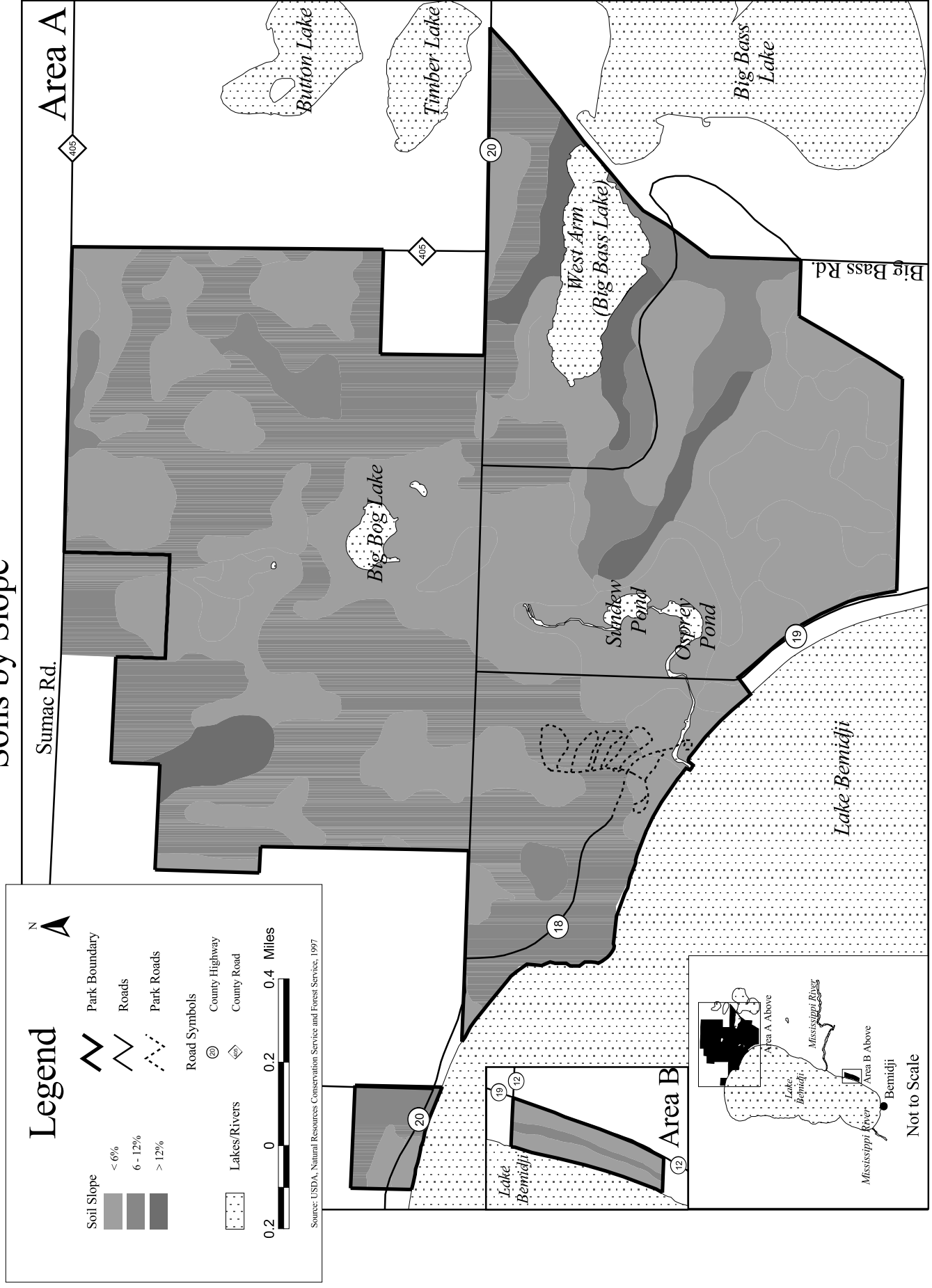


Figure 6. Lake Bemidji State Park
Soils by Upland Conifer Suitability

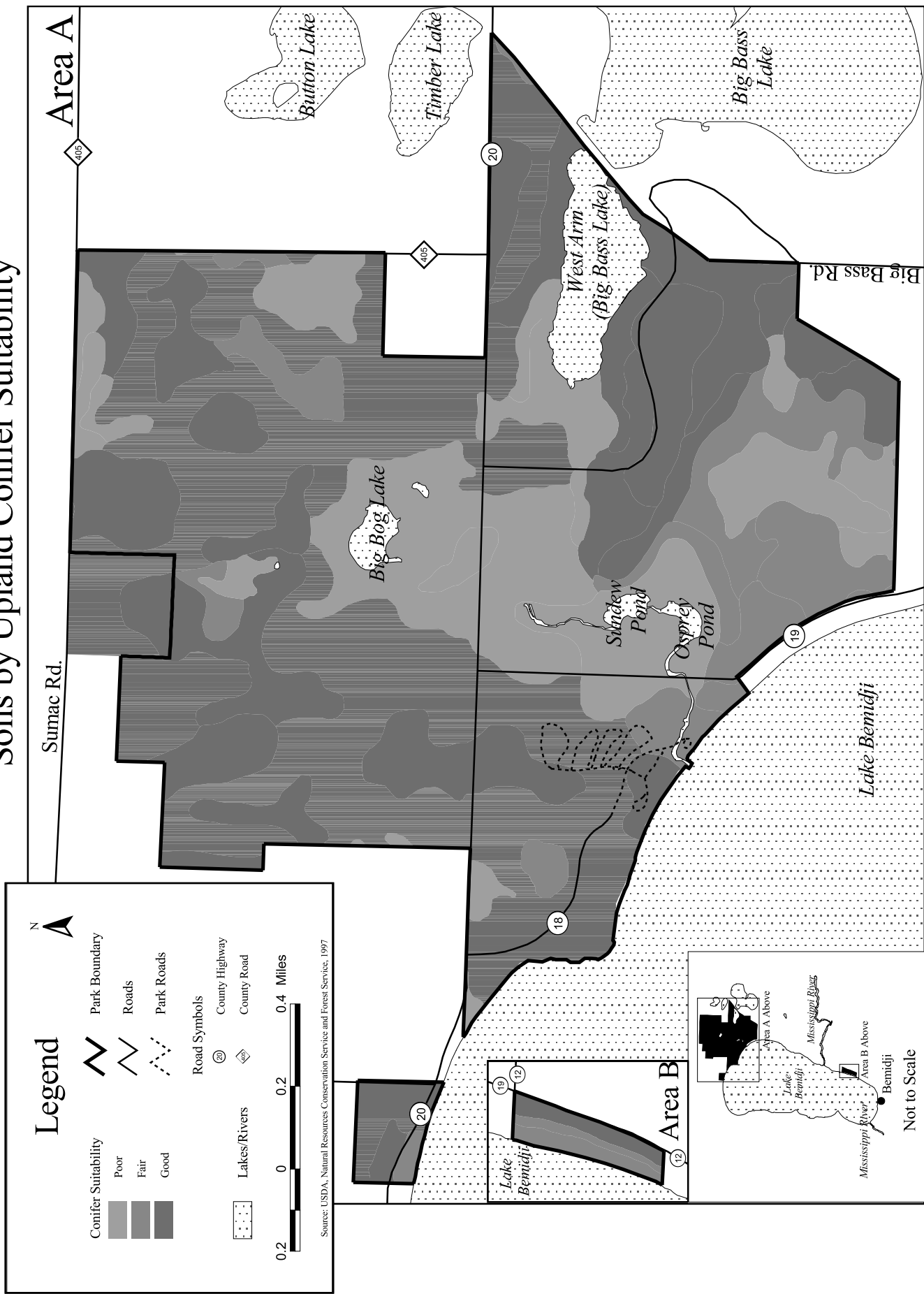


Table 4. Lake Bemidji State Park Soil Characteristics

Soil Number	Slope	Description	Surface Texture	Conifer Suitability										
48	1-3%	Hiwood Loamy Fine Sand	Loamy Fine Sand	Fair	S	S	S	M	M	M	M	M	M	M
117	0-2%	Cormant Loamy Fine Sand	Loamy Fine Sand	Fair	S	S	S	M	M	S	M	S	M	M
191	0-2%	Epoufette Sandy Loam	Sandy Loam	Poor	S	S	S	S	S	S	S	S	S	S
202	0-2%	Meehan Loamy Sand	Loamy Sand	Fair	S	S	S	M	M	S	M	S	M	M
205	1-3%	Karlstad Loamy Sand	Loamy Sand	Fair	S	S	M	M	M	L	L	M	L	L
242 B	1-6%	Marquette Loamy Sand	Loamy Sand	Poor	S	S	L	L	S	L	L	M	L	L
242 C	6-12%	Marquette Loamy Sand	Loamy Sand	Poor	S	S	M	M	S	M	M	S	L	L
458 B	1-6%	Menahga Loamy Sand	Loamy Sand	Fair	S	S	L	L	M	M	M	M	M	M
496 B	1-6%	Andrusia Loamy Sand	Loamy Sand	Good	S	S	L	L	M	M	M	M	M	M
496 C	6-12%	Andrusia Loamy Sand	Loamy Sand	Good	S	S	M	M	M	M	M	S	M	M
496 D	12-25%	Andrusia Loamy Sand	Loamy Sand	Good	S	S	S	S	S	S	S	S	S	M
540	0-1%	Seeleyville Muck	Muck	Poor	S	S	S	S	S	S	S	S	S	S
541	0-1%	Rifle Mucky Peat	Muck	Poor	S	S	S	S	S	S	S	S	S	S
546	0-1%	Lupton Muck	Muck	Poor	S	S	S	S	S	S	S	S	S	S
867 B	1-6%	Graycalm-Menahga Complex	Complex	Good	S	S	L	L	M	M	M	M	M	M
867 C	6-12%	Graycalm-Menahga Complex	Complex	Fair	S	S	M	M	S	M	M	S	M	M
1935	0-1%	Epoufette Muck	Muck	Poor	S	S	S	S	S	S	S	S	S	S
<p><u>Chart Legend - Soils Suitability/Characteristics</u></p> <p>L - (Low) Limitations for a stated use are minor and can be overcome easily.</p> <p>M - (Moderate) Limitations for a stated use can be overcome by special planning, design, or intensive maintenance.</p> <p>S - (Severe) Limitations for a stated use generally require a major soil reclamation, special design, or intensive maintenance.</p> <p>*Based on buildings with a basement or foundation</p> <p>Conifer Suitability - Ability of a soil type to support upland coniferous plants such as red, white and jack pine trees; and prostrate juniper.</p>														

Information for this Soil characteristic table was derived from a report by the U.S.D.A. Natural Resources Conservation Service NRCS Soil Interpretation Records in St. Paul as interpreted by the Clearwater County Soil and Water Conservation District staff, 1997.

Vegetation at European Settlement

Lake Bemidji State Park is located in the Chippewa Plains Ecological Subsection as defined by the DNR Ecological Classification System Committee (Figure 1). Additional description of the Chippewa Plains Subsection is found in the Beyond Park Boundaries chapter (Chapter 1). The vegetation cover within the park has changed over time as natural systems have evolved and humans have interacted with the natural systems. Like all forests, the park's forest communities are the result of complex interactions between the life histories of different tree species, shrubs and herbs, and the environment. The environment includes climate, soils, slope and aspect, plant competitors, insect outbreaks, diseases, herbivores, weather, aerial deposition, and fire. Although all of these factors are periodically present, none are constant. In addition, these interactions occur on spatial scales that range from square inches to hundreds of square miles and time scales that range from hours to centuries.

Land survey data from the mid-1800s indicate that the park's vegetation at the time of European settlement was a mixture of upland forests, lowland and coniferous swamp forests. The upland forests consisted largely of red pine, white pine, jack pine, aspen-birch, and mixed hardwoods and their associated shrub and ground layer communities. Scattered hardwoods occurred in the western portion of the park with some spruce-fir in the eastern portion. Scattered forest openings and glades dominated by prairie grasses and forbs were also present in the uplands.

The upland forested areas were interspersed with marshes, bog lakes, and other wetlands and their associated lowland forests. The park's lowland forests included black ash, elm, and balsam poplar. Coniferous swamp forests composed of white cedar, black spruce, and tamarack stands were also associated with many of the wetlands.

Natural disturbances (fire and wind-felled trees) also occurred periodically in the park. Such disturbances played an important role in maintaining healthy natural communities. Fires set by lightning strikes, Native American activity, or windblown prairie fires moving through the area were, the most common disturbances prior to European settlement. Tester, Starfield and Frelich (1997) estimate that northern Minnesota's forests experienced light surface fires at intervals of 13 - 38 years and intense standing killing fires at intervals of 150 - 200 years in a given stand prior to European settlement. Native Americans used fire as a tool to improve berry production and game habitat, and to clear brush for improved hunting (Stewart, 1956). Native American communities also stored cooking or heating fire in smoldering coals or peat until their return from hunting or trapping. These stored fires occasionally escaped and developed into larger conflagrations (Frissell, 1973).

Existing Vegetation

Although vegetation naturally changes over time, Lake Bemidji State Park continues to contain significant forest resources whose protection and management is very important to the park's ecological integrity and to the protection of Minnesota's natural heritage. Natural changes occur in vegetative types as a result of disturbances, climate, animal populations, weather, and succession. In addition, three major factors have significantly influenced the vegetation found within Lake Bemidji State Park today. These were (a) suppression of wild fires; (b) logging and settlement activities; and (c) growth of the park's white-tailed deer population.

Fires occurred in the park with regularity prior to the early 1900s. Fire suppression activities have eliminated wildfires in the park since this time. Logging primarily occurred in the park during the late 1800s and early 1900s and was ended as land was acquired for the park. The effects of these logging operations are visible in the current vegetative cover types. Most of the original pine stands were logged off and some of the cleared parcels were converted to agricultural lands. A pioneer forest composed primarily of quaking and bigtoothed aspen and birch replaced the pine forest in many of the logged areas. Several smaller stands of older pine do remain, primarily in the older sections of the park. The detached, southern portion of the park contains a designated old growth stand and an eagle's nest. Several portions of the park have also been replanted in pine plantations following logging or as a result of efforts to convert former agricultural land to pine stands.

The elimination of fire and increased white-tailed deer populations have also been contributing factors to the lack of red, white, and jack pine regeneration in the park. Fire is important to natural pine regeneration because it enables early successional pine species to seed themselves, and it opens the forest floor and canopy for new trees to grow. Pine regeneration is affected by larger than optimal deer populations because deer browse on young pine seedlings and either stunt or completely prevent growth of the seedlings into mature trees.

As a result of logging, fire suppression, deer population growth and other factors, few new stands of pine have grown to replace mature pines as they are lost through disease, windstorms, and old age. Today, Lake Bemidji State Park contains representations of several different ecological communities ranging from conifer and deciduous forests to wetland communities. The Current Forest Cover Types Map (Figure 8) on page 34 is based on the Division of Forestry Comprehensive Stand Assessment maps. The indication that the communities change in straight lines at section or former ownership lines may be the result of the survey technique rather than actual community changes. The most dominant forest communities are aspen-birch forests, jack-pine forests, mixed pine-hardwood forests, and bogs. A brief description of each of the major forest types follows.

Aspen-Birch Forests

Quaking aspen, bigtoothed aspen and paper birch are the dominant species in this community's canopy. The tall-shrub layer of the community is usually dense and typically consists of beaked hazel, American hazel, burr oak, and saplings of late-successional tree species. The ground layer tends to be very diverse in this community (DNR, Natural Heritage Program, 1993). This type of forest is an early successional hardwood forest that grew in the park following catastrophic disturbances such as fire, weather events, and logging. This community is found primarily in upland areas that were once dominated by conifer-hardwood forests. Major portions of the park that were once dominated by pines and mixed hardwood forests are now dominated by aspen-birch communities that grew in logged areas. This is arguably the most dominant upland forest community found within the park today.

Jack Pine Forest

Jack pine is the dominant species in this community but oaks, birch, aspen and red pines may be found as codominant species within jack pine forests. The understory and ground layers for jack pine forests are variable depending on location. In Lake Bemidji State Park, this community generally has an understory of shrubs like beaked hazel and a lower layer of blueberries and evergreen shrubs. The ground layer tends to be composed of *danthonia*, sedges, spring flowers, and occasional mosses. This type of forest is an early successional upland forest dependent on fire for regeneration. On outwash plains, jack pines are closed coned with some cones eventually opening up for regeneration with age and hot weather. However, most regeneration in these stands still occurs immediately following fires. As a result, most jack pine stands tend to be even aged. Aspens and birch may establish themselves in areas where jack pine regeneration is poor following fires. This community is often found on sandy soils (DNR, Natural Heritage Program, 1993). Approximately 20 percent of the park is jack pine forest.

Mixed Pine-Hardwood Forests

A mixture of jack pine, red pine, or white pine with oak, aspen or paper birch dominate this community's canopy. This type of forest is an early to mid-successional forest that generally occurs on dry to wet-mesic sites with evidence of fire and other disturbances evident. The mixed pine-hardwood forest is an upland forest community usually found on sites with coarse-textured soils such as outwash plains and some moraines (DNR, Natural Heritage Program, 1993). Lake Bemidji State Park's upland forests also contain open areas of prairie that meld into the forest understory in some locations.

Bogs

There are two types of bogs found within Lake Bemidji State Park; forested bogs and open bogs. The forested bog is characterized by a canopy dominated by stunted (<10m tall) black spruce trees and scattered tamaracks. Tall shrubs are often absent, but when they are present include willow and alder. The ground layer is dominated by short evergreen shrubs (e.g., labrador tea, swamp laurel, and bog-rosemary). The ground layer also contains a carpet of sphagnum mosses that form hummocks and hollows. Feather mosses tend to be abundant at the base of the trees. This community is a late-successional community that forms on drier spots within bog complexes (DNR, Natural Heritage Program, 1993).

Open bogs are characterized by less than 30 percent tree cover. The trees present in this type of bog are often scattered and stunted black spruce and tamarack. The ground layer in this community is dominated by similar shrubs and grasses to those found in forested bogs and shade intolerant shrubs and grasses. A carpet of sphagnum moss is also present in open bogs. This community usually develops in areas of forested bog that become too wet to support trees.

Although the two types of bogs can occur adjacent to each other, they are separable by the number of shade-tolerant and shade-intolerant species present. Lake Bemidji State Park's bogs form a bog complex that constitutes a significant portion of the park's interior space.

Other Vegetative Communities

The park's major forest cover types are interspersed with isolated stands of other forest types, upland grasses, lowland grasses and wetlands. Among these other types include white pine, and balsam fir. In addition, sedge meadow and wetland fringe communities are found intermixed with the park's other vegetative cover types.

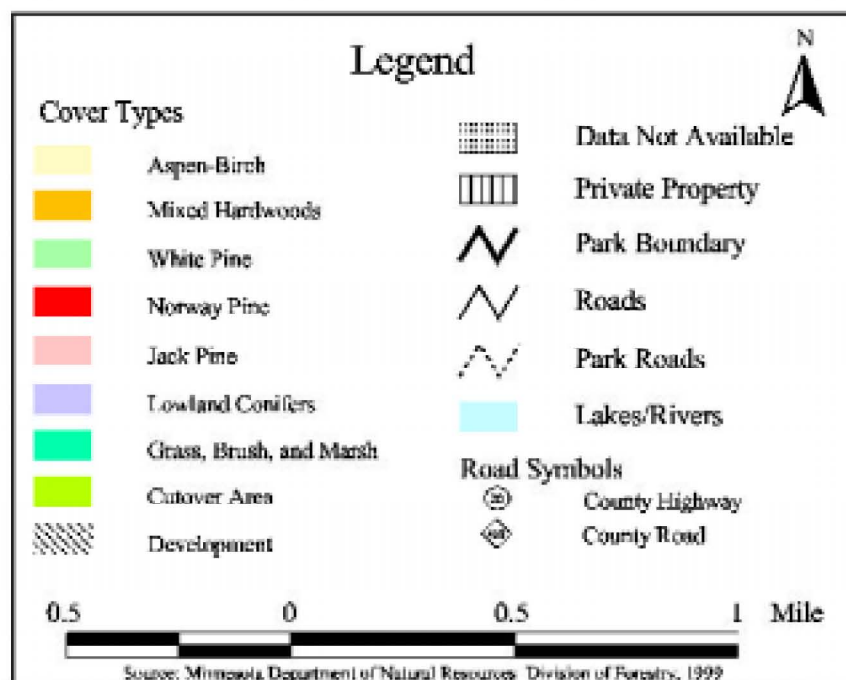
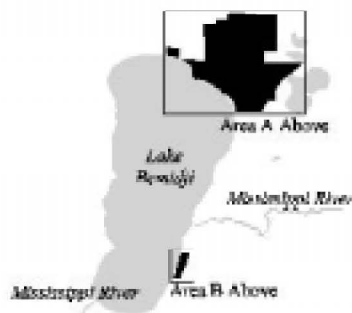
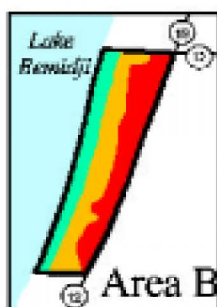
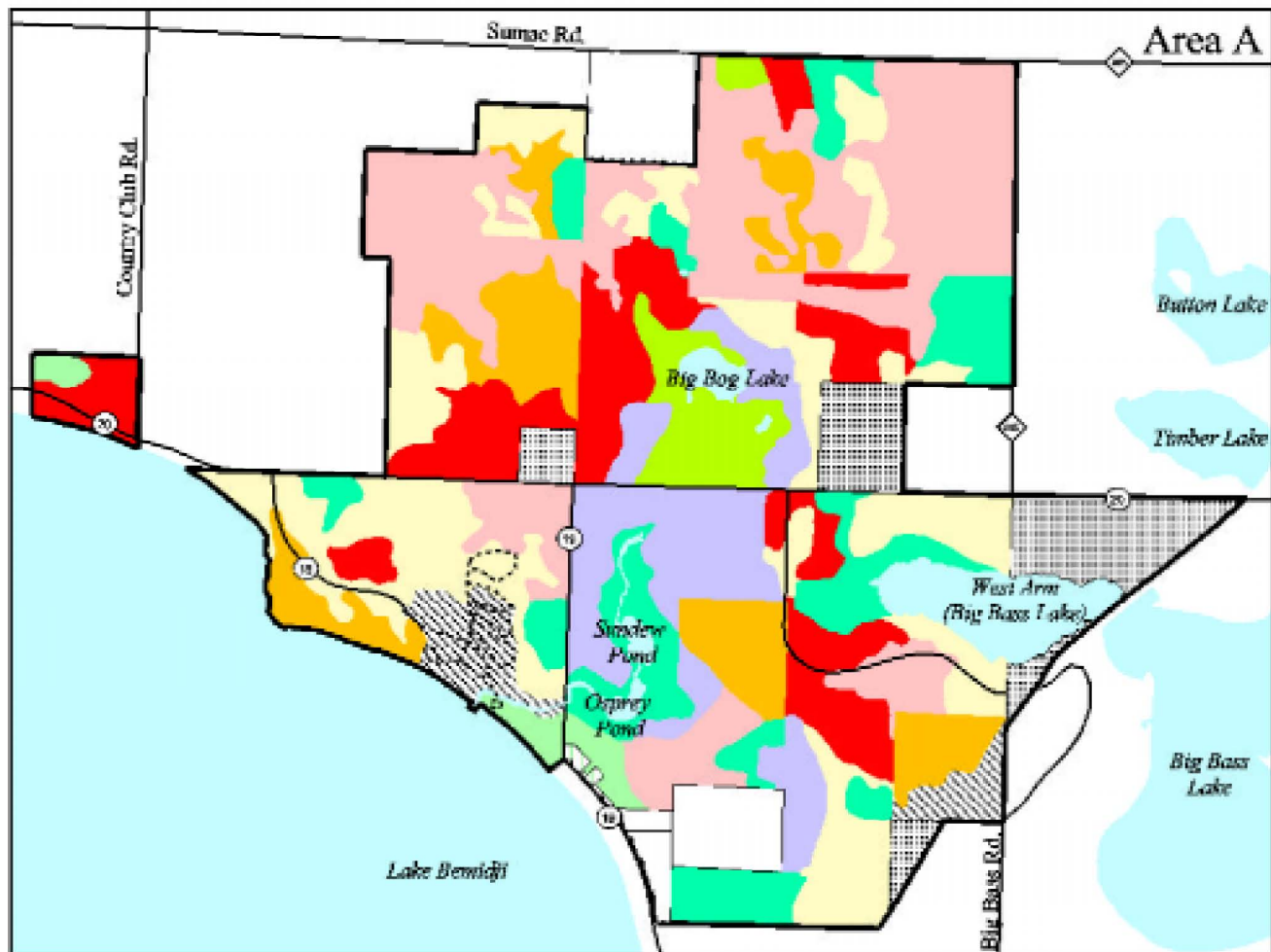
Old-Growth Forests

Although old-growth forests are not dominant in Lake Bemidji State Park, some old growth stands do exist. In particular, the southeastern section of the park located approximately 5 miles from the main park is an old-growth pine stand (the only designated old growth in the Chippewa Plains subsection), the area surrounding the DNR regional headquarters and several old growth stands in the park's Concentrated Use Zone. The DNR is in the process of identifying current old growth stands, candidate old-growth stands and potential future old-growth stands on DNR administered lands throughout the state. This project is in various stages of completion, but old-growth forest guidelines have been developed. Among the characteristics that distinguish old-growth forests from non-old-growth forests are the presence of standing dead trees, logs in various states of decay, and complex understory communities of shrubs, herbs, and saplings.

DNR's Old-Growth Forests Guideline states that stands designated as old-growth candidates are to be protected from future harvest, salvage, or timber stand improvements aimed at timber production. Important to the old-growth guidelines is the concept that evidence of human impacts on the stands will be minimal. Such stands will also be protected from use of chemicals except when necessary to protect them from exotic threats. In addition, new trail and road construction is not permitted for designated old-growth stands (Minnesota Department of Natural Resources, 1994). The guidelines consider use of fire to be an acceptable management technique in old-growth forests. The specific criteria used for designation of old-growth stands and additional recommendations for old-growth management are found in the DNR's Old-Growth Forests Guideline.

Many other conifer and hardwood stands within the park that may not meet the DNR's criteria for old-growth designation are reaching the age where they are developing characteristics that typify older forests. Changes in current species composition for these stands will also continue to occur over the next few years as the older trees are replaced by the next generation of growth. The specific changes depend on the specific tree species present in the stand, the extent of disturbances that might cause loss of trees, and the extent to which older trees die.

Figure 7. Lake Bemidji State Park
Current Forest Cover Types



Not to Scale

Fire Management

Fire has historically played an important role in forest ecosystem health. Wildfires were a natural occurrence in northern Minnesota's pine forests prior to European settlement. These fires reduced the amount of forest floor litter, aided in germination of some forest species, and opened the forest canopy so younger trees could grow to replace older trees as they were removed from the canopy by disease, fire, windstorms, drought, cold weather, insect infestations, fire and other natural disturbances. When Lake Bemidji State Park was created, managers followed appropriate management techniques of their time and excluded fires, logging, hunting, and other land clearing practices within the park to preserve and protect the old-growth pine forest ecosystem in existence at the time.

The removal of fire from the ecosystem set the park up for potentially catastrophic fires with the likely loss of much of the pine component and its associated species, and for succession to a hardwood dominated system. At the same time, increased human activity and conversion of forests to other land uses in the area surrounding the park made the park an isolated relict of the contiguous forest ecosystem that once existed in the area.

Over time, managers have recognized the need to reintroduce understory fires to Lake Bemidji State Park to aid in restoration of the park's pine forest ecosystem to a more natural and healthy system. Today, fire management at Lake Bemidji State Park involves two major processes; (a) suppression of wildfire and (b) use of prescribed burns to aid in forest management. Wildfire is suppressed in cooperation with the DNR, Division of Forestry and other fire fighting resources in areas of the park that contain visitor facilities, buildings, important historic sites, and critical species habitats.

In recent years, the Division of Parks and Recreation has increasingly used prescribed burning at Lake Bemidji State Park to aid in forest management activities such as pine regeneration, reduction of dry fuel loads, management of the effects of wind disturbances, and reduction of understory density. Reduction of dry fuel loads and understory density reduces the chance of catastrophic wildfires and increases the probability of successful pine regeneration. Specific sites are selected and annual prescribed burn plans are developed for those areas to be burned. Prescribed burns are administered in cooperation with the DNR, Division of Forestry, the DNR, United States Forest Service and local fire fighting officials. Fire has become a major component of the forest management activities conducted in the park and is expected to grow in size and scope in the coming years.

Wildlife

Lake Bemidji State Park provides habitat for a variety of plant and animal species. Many species make the park their permanent homes and others are only seasonal inhabitants. A variety of plant and animal species such as songbirds, deer, birds of prey, foxes, and beaver live within the park's forests. Brief discussions of some of the park's wildlife species follow. Comprehensive surveys of the park's flora and fauna have not been completed, so the following discussions are general.

Mammals

A wide variety of mammals live in or near Lake Bemidji State Park, ranging in size from tiny insect-eating shrews to large carnivores and herbivores such as wolves, black bears, and white-tailed deer. Feral cats and dogs are an ongoing problem. Although a complete inventory of mammals present in the park has not been completed, a list of specific species that have been spotted within the park is available from park staff. Among the mammals found in the park, white-tailed deer and beaver have required special management attention in the past and are expected to continue to be of management concern in the future.

White-tailed deer are common throughout most of Minnesota, including the area surrounding Lake Bemidji State Park. The park's deer population experienced dramatic increases during the 1930s and 1940s as improved transportation systems brought increased human activity to the area. Increased human activity that created additional open spaces also increased deer habitat in the area surrounding the park. Lake Bemidji State Park is located within the Bemidji State Game Refuge. As such, management of the park's deer herd should be coordinated with efforts to manage deer within the entire refuge.

Beaver are also abundant in Lake Bemidji State Park. Although exact beaver counts are not available, evidence of their activity is readily observable throughout the park. A native species to northwestern Minnesota, the beaver had been trapped and nearly extirpated in this part of the state by the late 1800s. Beaver were reintroduced into northern Minnesota in the early 1900s and eventually returned to the Bemidji area. Since their return, the park's streams, lakes, ponds, and forest communities have provided habitat for a growing beaver population. Beaver have historically constructed dams on the park's lakes and streams creating highly productive ponds and locations for peat deposits. Beaver use trees from the park's forest communities as both food and construction material for their lodges. Beaver activity has also caused flooding, redirection of stream flows, and infrastructure damage in some locations. The beaver population will be managed to maintain a healthy population, and minimize resource and facility destruction.

Birds

Birds are a major component of the biological diversity in northwestern Minnesota. The U.S. Fish and Wildlife Service research on bird species has documented that Minnesota is in the middle of a region that spans an area from the Adirondack Mountains in New York, across the upper Great Lakes and into the prairie provinces of Canada that supports the highest richness of bird species north of Mexico (Green, 1995). Bemidji State Park is a featured site in the "Travelers Guide to Wildlife in Minnesota", one of 120 premier wildlife viewing locations in Minnesota.

Two hundred and seventy two species of birds have been reported in Beltrami County. Of these, an estimated 125 species breed in Lake Bemidji State Park (Haws 2001.) Maxson (1992) observed 37 bird species just in the vicinity of the park's bogwalk. Some neo-tropical migratory birds breed in the park. The species diversity in the park and the national importance of the bird habitat in this portion of Minnesota makes bird habitat conservation at Lake Bemidji very important.

Reptiles and Amphibians

A comprehensive survey of reptiles and amphibians has not been completed for the park, but several reptiles and amphibians are known to inhabit Lake Bemidji State Park's forests and wetlands. These species include various turtles, salamanders, skinks, snakes, toads, and frogs that provide important habitat for forest birds. A list of individual species that have been sighted in the park is available from park staff.

Insects

A comprehensive inventory of invertebrates has not been undertaken. In recent years limited information on butterfly and dragonfly species in the park is available as a result of two different surveys. Both surveys note the value of the undisturbed nature of the bog and park wetlands as important habitat for baseline regional survey information. Since 1996 an annual "4th of July" butterfly count has been organized by volunteer Mr. John Weber. This count is done during the same summer period each year, as a result this is not a comprehensive survey but likely to detect trends. Of the twenty nine species found in the park to date notable species include *Lycaena dorcus*, (Dorcus copper), *Boloria selene* (Silver-bordered Fritillary), and *Polygonia faunus*, (Green comma). These have been seen along the boardwalk in the bog. This is the only site where tamarack bog is accessible. Survey results are available from park staff.

Overall, Lake Bemidji State Park is an extremely diverse "habitat island" for dragonflies. In both species number (27 species have been identified) and species diversity it is second only to Itasca State Park, and exceeds the diversity even of many of the excellent habitat areas along the wild section of the Mississippi River and in the Chippewa National Forest. In northern Minnesota, greater species diversity tends to occur in association with quality habitats that have mature, diverse forest, good water quality, and a wide buffer zone adjacent to the shoreline. Fragmentation of adjacent terrestrial habitat seems to have an impact on overall species diversity, and on presence or absence of certain species. For example, the presence of many of the bog species, seem to occur more often and in greater numbers at sites where the surrounding forest is not fragmented.

Waters/Fisheries

Water Resources

Lake Bemidji State Park's water resources are important components of the park's ecological communities. The park is located on the shores of Lake Bemidji and Bass Lake and contains smaller lakes, ponds and wetlands. Although the majority of the shoreline for both lakes is outside the park's boundary, actions taken within the park have an impact on the water quality in the lakes. Similarly, activity on these lakes outside the park boundary impact the park's water resources. The groundwater resources beneath the park's surface vary from fairly deep to very close to the surface. The Mississippi River also flows through Lake Bemidji near the park. This mixture of water resources support a variety of aquatic species including plants, animals, reptiles, and amphibians and support the park's wetland communities. Given this breadth of significant water resources, protection and management of the park's water resources is very important to the park's ecological integrity and to the protection of Minnesota's natural heritage.

Groundwater

Water for human consumption in Lake Bemidji State Park is drawn primarily from wells drilled into an artesian aquifer formed by glacial drift or glacial outwash. The glacial drift consists of loamy glacial till located as deep as 400 - 450 feet in this area. Much of the groundwater from the aquifer has a content of dissolved minerals that come mainly from calcium and magnesium carbonates. Some wells also have a high concentration of iron and manganese that create some maintenance challenges. Some of the park's older and less productive wells have also been abandoned over time. Abandoned wells within the park are being inventoried and sealed to prevent groundwater contamination in accordance with the DNR and the Minnesota Pollution Control Agency (MPCA) policy governing the sealing of abandoned wells.

In addition to the areas of the park where the aquifer is deep, the park's central bog complex has a very shallow water table which reaches the surface in the open water areas. The seeps and springs that occur in the park's bog areas maintain the water level and flow within the bog and marsh systems. These waters tend to be basic to very basic (ph of 7.3 - 8.4) with high concentrations of calcium and iron. Exposed seeps along Lake Bemidji tend to be iron stained as well.

Surface Water

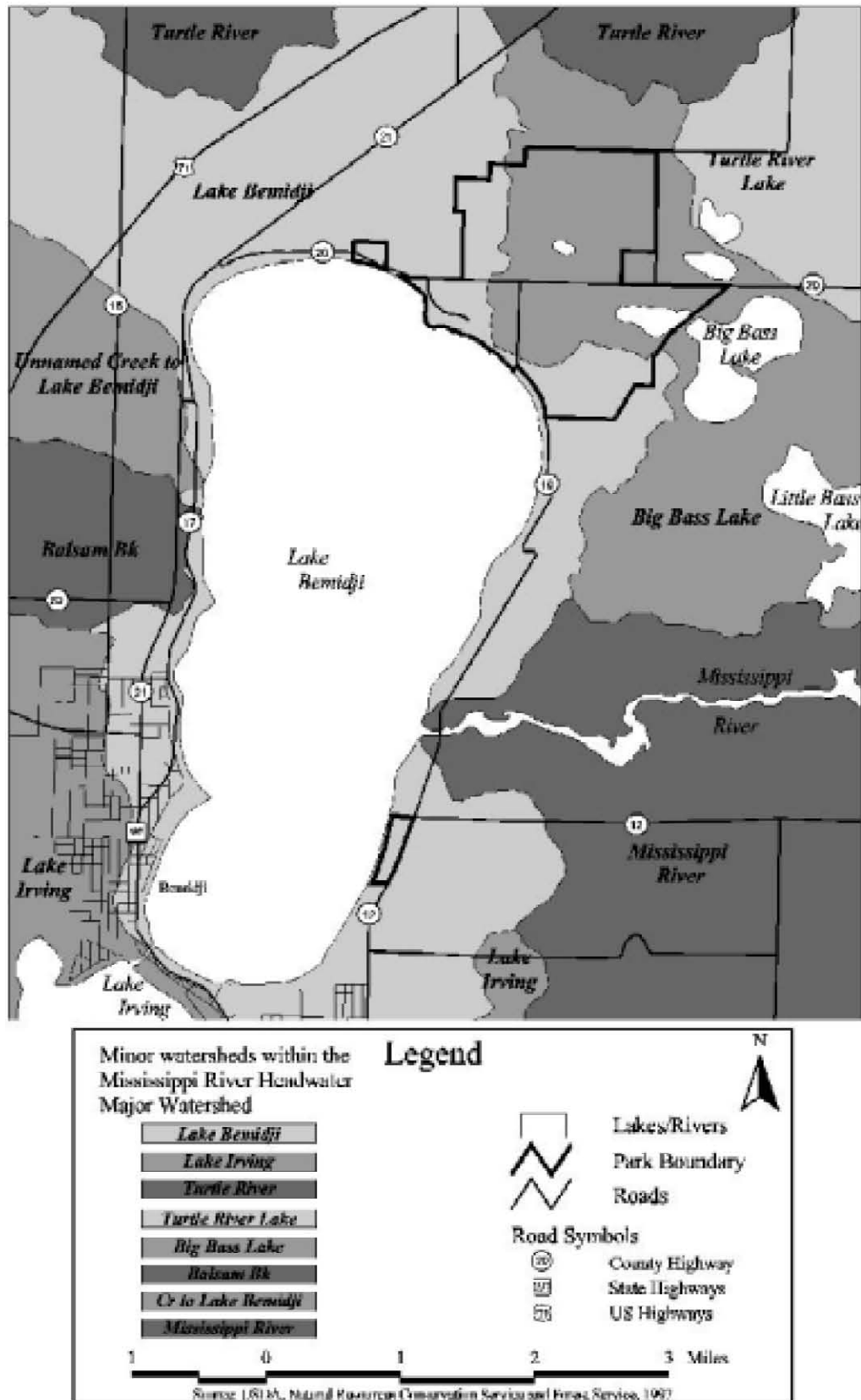
The entire park is situated near the northeastern edge of the Mississippi River Headwaters Major Watershed. The watershed includes the Headwaters of the Mississippi River at Lake Itasca, approximately 200 miles of rivers and streams and 21,000 acres of lakes with drainage northeastward toward Lake Bemidji (Figure 9). The park is also within two minor watersheds that drain into the Mississippi Headwaters Major Watershed. Most of the eastern two-thirds of the park are within the Bass Lake Minor Watershed, while the western and southern portions of the park are within the Lake Bemidji Minor Watershed.

In addition to portions of Lake Bemidji and the west arm of Big Bass Lake, five other small lakes and several small ponds are within the park boundary. The largest stream in the park is Bass Creek which flows from Big Bass Lake to Lake Bemidji and drains much of the park's central bog complex. A heavily used boat harbor and public access to Lake Bemidji have also been constructed near the mouth of Bass Creek. A short boardwalk and observation deck near the campground and along Bass Creek make the creek one of the focal points of the park's interpretive program.

Research conducted on Lake Bemidji's water chemistry over the past several years indicate that the lake is in good condition. The Lake Bemidji (Upper Mississippi River) Watershed Project has identified monitoring and maintenance of low phosphorous levels as a major goal for the control of non-point source pollution and its effect on lake quality.

A central component of Lake Bemidji State Park's surface water system is the park's 500 acre central bog complex. The central bog includes Big Bog Lake, ponds, streams and marshes. This area also has saturated soil and is partially flooded most of the time. Water in the bog tends to be acidic to very acidic with some areas basic due to groundwater recharge through the bog's mat. Seeps and springs

Figure 8. Lake Bemidji State Park
Minor watersheds



occur where groundwater reaches the surface. These flows maintain the water level within the bog system. The central bog is of particular importance because of its rich and complex assemblage of wetland biota. As many as 140 vascular and 35 nonvascular species were recorded. The findings regarding other forms of wildlife were equally impressive (Maxson, 1992). Most of these plants have dense root systems making them important to wildlife. The central bog is arguably one of the most important attractions in the park. Visitors currently have access to the bog via trails and a boardwalk to Big Bog Lake near the center of the bog complex. A second boardwalk provides access to Sundew Pond in the southern portion of the bog complex. The bog complex also plays a prominent role in the park's interpretive program.

One major issue that has a direct impact on the future of the bog complex's ecological integrity is the artificial segmentation of the bog caused by the current alignments of CSAHs 19 & 20. These two county roads divide the bog complex into three distinct parts and obstruct the exchange of water and artificially alter the bog's water levels that are essential to maintaining a healthy bog complex. Slight fluctuations in water level are natural for a bog and are part of the gradual changes related to succession. However, major or sudden changes can be detrimental. For example, several acres of tamarack on the north side of CSAH 20 have suffered dieout as a result of altered water flow patterns. Minimizing the effect that the two roads have on the bog complex is of major importance to the future health of the park's ecological systems.

Fisheries

Fish are present in most of Lake Bemidji State Park's lakes, ponds and Bass Creek. The DNR, Division of Fish and Wildlife periodically conducts lake surveys on Lake Bemidji and Big Bass Lake, additional survey information was collected by Konrad Schmidt in 1992. Results of these surveys are available from DNR staff. Game fish are predominantly found in Lake Bemidji, the Western Arm of Big Bass Lake and Bass Creek. Lake Bemidji (6,420 acres) has above average yellow perch (*Perca flavescens*) and walleye (*Stizostedion vitreum*) populations with all sizes of fish present throughout the lake. Northern pike (*Esox lucius*) and muskellunge (*Esox masquinongy*) are also prominent game fish sought by anglers on this lake. Big Bass Lake (380 acres) contains several species of fish that include Black crappies (*Pomoxis nigronaculatus*), bluegills (*Lepomis macrochirus*), northern pike (*Esox lucius*), walleye (*Stizostedion vitreum*), yellow perch (*Perca flavescens*), and largemouth bass (*Micropterus salmoides*). Bass Creek is an important spawning area for northern pike. Spawning runs occur every spring in the creek with spawning in the grassy areas above CSAH 19. Fingerlings then return to Lake Bemidji in late spring. Walleye have also been seen in Bass Creek and there is at least anecdotal evidence that walleye spawning has occurred in the creek.

In addition to the game fish, several other species of minnows, mudminnows, trouts, sunfishes, catfishes, and miscellaneous fish species are found in the park's lakes. A list indicating the fish species that have been observed within the park are available from park staff. The bog lakes have resident populations of bullheads. Even though these are winter kill lakes, seasonal fish populations of other species are maintained by streams flowing in from springs higher in the basin.

Endangered, Threatened, and Special Concern Species

The Minnesota Natural Heritage & Nongame Research (NHNGR), Nongame Wildlife Program and the Minnesota County Biological Survey document locations of rare features, including plants and animals, natural communities, and selected animal aggregations and geologic features. Each entity is termed an "element." Statewide locations of these elements are stored in a geographic computerized database, known as the Natural Heritage Information System. Both state and federally listed species are represented in the database. Although the Beltrami County Biological Survey has not been completed, the Rare Features Database does include some features found within Lake Bemidji State Park.

The state rare and endangered species list classifies species into one of three categories; endangered, threatened, or species of special concern. Endangered species are those threatened with extinction throughout all or a significant portion of its range in Minnesota. Threatened species are those that are likely to become endangered within the foreseeable future. And, species of special concern are those that, although not endangered or threatened, are uncommon in Minnesota or have unique or highly specific habitat requirements that deserve careful monitoring of their status (Coffin and Pfannmuller, 1988).

Table 5. Lake Bemidji State Park Rare Animal and Plant Species¹

		Federal	MN
Common Name	Species Name	Legal Status	Legal Status
Animals			
Bald eagle	<i>Haliaeetus leucocephalus</i>	THR	SPC
Osprey	<i>Haliaeetus pandion</i>	NFL	NON
Gray Wolf	<i>Cains lupus</i> Linnaeus	THR	SPC
Plants			
White adder's-mouth	<i>Malaxis monophyllos var. brachypoda</i>	NFL	SPC
Bog adder's-mouth	<i>Malaxis paludosa</i>	NFL	END

Legal Status Legend

END Endangered

THR Threatened

SPC Special Concern

NON No Legal Status (elements that are being monitored for possible future listing on state list)

NFL No Federal Listing

¹Adapted from: Minnesota DNR, Natural Heritage and Nongame Research Program (1998), Minnesota Natural Heritage Database.

St. Paul, MN: Minnesota Department of Natural Resources

Animals

Two rare animal species have been identified within Lake Bemidji State Park (Table 9). The bald eagle is listed as a species of special concern on the state list and the osprey is identified as a species that is being monitored for possible future listing. The bald eagle is also listed as a threatened species on the federal list.

Bald eagle

The bald eagle is listed as a species of special concern on the State of Minnesota's list and threatened on the federal list for Minnesota, Wisconsin, Michigan, Oregon, and Washington. In the other states within the lower 48 states, it remains endangered on the federal endangered species list. Although the exact number of bald eagle nests within Lake Bemidji State Park is unknown, at least two bald eagle nesting sites have been documented in the park. It is also quite common for visitors to observe the birds in flight within the park. Bald eagles select lakes and rivers in forested areas where large trees are available for nesting. In Minnesota, nests are often found in the upper canopy of red and white pines. Areas around the nesting trees should be protected from disturbances, especially during nesting season (Coffin and Pfannmuller, 1988).

Osprey

The osprey is found in many locations around the world. In the United States, its current populations are mainly found along the Atlantic Coast, the northern Great Lakes and the Pacific Northwest. Smaller populations are scattered throughout the country, mostly near large reservoirs. At least two osprey nests have been identified in Lake Bemidji State Park. Ospreys establish their nests in the top of large trees near lakes, large rivers, and coastal bays. They also will construct nests a top utility poles or other tall structures near water. The osprey is a raptor that feeds exclusively on fish. As such, it is susceptible to environmental contaminants such as DDT and mercury found in fish species (Coffin and Pfannmuller, 1988.)

Plants

Although there are no known federally listed plant species within Lake Bemidji State Park, the Bog adder's-mouth is identified as an endangered species on the state list and the White adder's-mouth is identified as a species of special concern on the state list (Table 9). Brief descriptions of the Bog adder's-mouth habitat follows. Habitat descriptions for the White adder's-mouth can be obtained from state park staff, the NHNCR program staff or from Coffin and Pfannmuller (1988).

Bog adder's - mouth

This orchid is extremely rare in North America and is identified as an endangered species on Minnesota's List of Endangered, Threatened, and Special Concern Species (Table 9). Fewer than 30 sites have been identified in the United States, six of these are in Minnesota. Of these, only three sites are known to remain in Minnesota. A small number of sites have also been discovered in Canada. For this reason, bog adder's - mouth is considered to be the rarest orchid in North America and its populations often consist of only a few plants. Bog adder's - mouth is also the smallest orchid known to exist in Minnesota. Its stems are only a few centimeters in length, it has only 2-5 leaves per stem, and it usually has between 10 - 29 minute greenish yellow flowers per plant. This species grows perched on hummocks of sphagnum moss in swamps (Smith, 1993). The three known populations in Minnesota all occur in coniferous swamps.

Exotic Species and Other Pests

Exotic species are those species that are introduced into ecosystems where they are not native. Introduction can occur accidentally, intentionally, or through natural phenomena (e.g., invasion of pest species following a major natural disturbance). Invasive species can be extremely disruptive to native ecosystems. Freed from natural predators, parasites, pathogens, and competitors that control them in their native environments, exotic species often become dominant in their new environments and displace native species. Because Lake Bemidji State Park is located within the Upper Mississippi Headwaters Watershed the introduction of harmful exotic species in Lake Bemidji State Park is of national concern. Exotic species introduced to the park could spread downstream throughout the state, as well as the Mississippi River watershed that drains much of the nation. For this reason, prevention of new introductions and management of existing exotic species are important resource management activities within the park.

Although exotic species are not yet a major threat in Lake Bemidji State Park, some exotic species do currently exist in the park. The size of individual species populations and the extent to which individual species pose future threats to the park's natural systems varies by species. Plant species such as spotted knapweed (*Centaurea maculosa*), smooth brome (*Bromus inermis*), and quackgrass (*Agropyron repens*), have relatively large populations in the park and appear to be spreading and out competing native species. These species pose the greatest threat to the park's natural communities. For example, spotted knapweed is found in the park's road ditches and is creeping into upland areas, particularly where light sandy and droughty soils are present. This particular species is an aggressive invasive that needs to be closely monitored and controlled. Other plant species, such as Siberian pea-tree (*Caragana arborescens*) and bull thistle (*Cirsium vulgare*) are present in the park but appear not to be spreading much beyond their existing locations. Still other plant species, such as Common lilacs (*Syringa vulgaris*) and day lillies (*Hemerocallis fulva*) are currently small and localized.

Several highly invasive exotic plant species that are not yet present in the park, have been found in areas near the park. Many of these species have been found to be invasive to other forested ecosystems in Minnesota and nearby states. Among these are Eurasian buckthorn (*Rhamnus cathartica*) and crown vetch (*Coronilla varia*).

Aquatic exotic species do not currently present problems within Lake Bemidji State Park. However, an assortment of aquatic exotic species that are currently not present in the park could survive in the park's lakes and wetlands. Purple loosestrife (*Lythrum salicaria*), is located in wetlands adjacent to the park and at the nearby outlet from Lake Bemidji to the Mississippi River and could establish itself in the park's wetlands or shorelines. Other aquatic plant and animal species, such as ruffe (*Gymnocephalus cernuus*), round goby

(*Neogobius melanostomus*), Eurasian watermilfoil (*Myriophyllum spicatum*), spiny water flea (*Bythotrephes cederstroemi*), and zebra mussels (*Dreissena polymorpha*) could be transported to the park on trailered boats and equipment or in bait containers.

Lake Bemidji State Park also has some land-based exotic animal or worm species that are not known to present major problems in the park at this time. As a result, no major plans have been developed to control or eradicate these particular species. It is also probable that other exotic species and diseases will eventually threaten the native species. Among these are the gypsy moth (*Lymantria dispar*), Asia longhorned woodborer (*Anoplophora glabripennis*), common pine shoot beetle (*Tomicus piniperda*) and Dutch elm disease (*Ophiostoma ulmi*).

Currently exotic species management within the park focuses on monitoring and containment of existing exotic species and dissemination of information regarding exotic species to help prevent introduction of new species. Exotic species signs are posted at the park's boat access, brochures are distributed to visitors at the park's contact station, park interpretive and resource management staff discuss exotic species management with visitors when opportunities arise, and visitors are encouraged to report questionable species to park personnel for identification.

Recommendations and Actions

Lake Bemidji State Park's natural resource management program should focus on attainment of the natural resource management goals and target benefits identified earlier in this chapter and realization of the vision and mission statements found in Chapter 1. Resource management actions should adhere to the management zoning concepts presented in Chapter 3 and be consistent with the park's overall target benefits identified in Chapter 3. It is also important to recognize that Lake Bemidji State Park is located within a growing urban area. Resource management techniques such as prescribed burns that are applied within both of the park's management zones might be adapted to accommodate the urban interface.

The recommendations and management actions that follow are intended to provide a general direction for natural resource management activities in the park for the next 15 - 20 years. Annual work planning meetings will use these recommendations to determine short-term goals, priorities, and actions. Many of the management actions listed below are, therefore fairly broad and will become more specific through the development of annual work plans.

Recommendation 1: Focus natural resource management activities on ecosystem management rather than single species management.

Discussion: The ecosystem management approach is generally described as giving first priority to protecting and restoring the native diversity (including species and communities), and the ecological patterns and processes needed to maintain that diversity. Each species within a given community fills a niche that is interconnected to many other species. Therefore management actions taken to manage for one species, impact many other species in the system. Ecosystem management recognizes these interconnections and challenges managers to look at the broader systemic picture. For example, regeneration of a pine forest includes consideration of the particular pine species found within the forest but also the flora and fauna, soil characteristics, and other environmental conditions associated with a healthy pine forest ecosystem. The Minnesota Department of Natural Resources has established a long-term goal of managing the State's natural resources in a way that is sustainable for future generations. Ecosystem management is the approach that has been identified to accomplish this goal. One of the primary goals of this planning process was to determine how to manage Lake Bemidji State Park from an ecosystem management perspective.

Actions to Implement this Recommendation:

- A. Inventory and monitor species and communities found within the park on a regular basis.
- B. Complete periodic resource management project plans that incorporate the management direction established in this management plan.
- C. Continue to examine community structures and relationships between species to determine indicators of overall ecosystem health.
- D. Minimize habitat fragmentation to protect the park's biological diversity, given the management constraints found within the park.
- E. Work with BSU and others to use modern technology to identify and map existing communities and aid in planning future natural resource management activities.
- F. Participate in local and regional planning efforts to sustain healthy ecosystems.
- G. Interpret why and how specific management activities are chosen for the park, and concepts of biodiversity, ecosystem management, and watershed/ landscape management.
- H. Monitor and evaluate overall ecosystem health within the park.

Recommendation 2: Work toward rerouting CSAH 19 away from the center of the park and out of the wetlands. Restore the resulting abandoned sections of CSAH 19 and Big Bass Road. Minimize the impact County State Aid Highway 20 has on park visitors & resources.

County State Aid Highways 19 and 20 and Big Bass Road dissect Lake Bemidji State Park and fragment the park lands. With the growth of the Bemidji area in the past ten years, the use of these roads have increased dramatically, and are projected to increase further. There are resource management, visitor experience and safety issues with the present alignment of these roads through the interior of the park.

Reducing fragmentation by consolidating the ecosystems within the park is an important component of the park's vision statement. Generally, a fragmented landscape results in the loss of function and species from natural plant and animal communities. The fragmented remnants can become either too small or too isolated to support the full diversity of native species, especially those adapted to interiors of ecosystems. Fragmentation also causes natural communities to be more vulnerable to exotic species invasions.

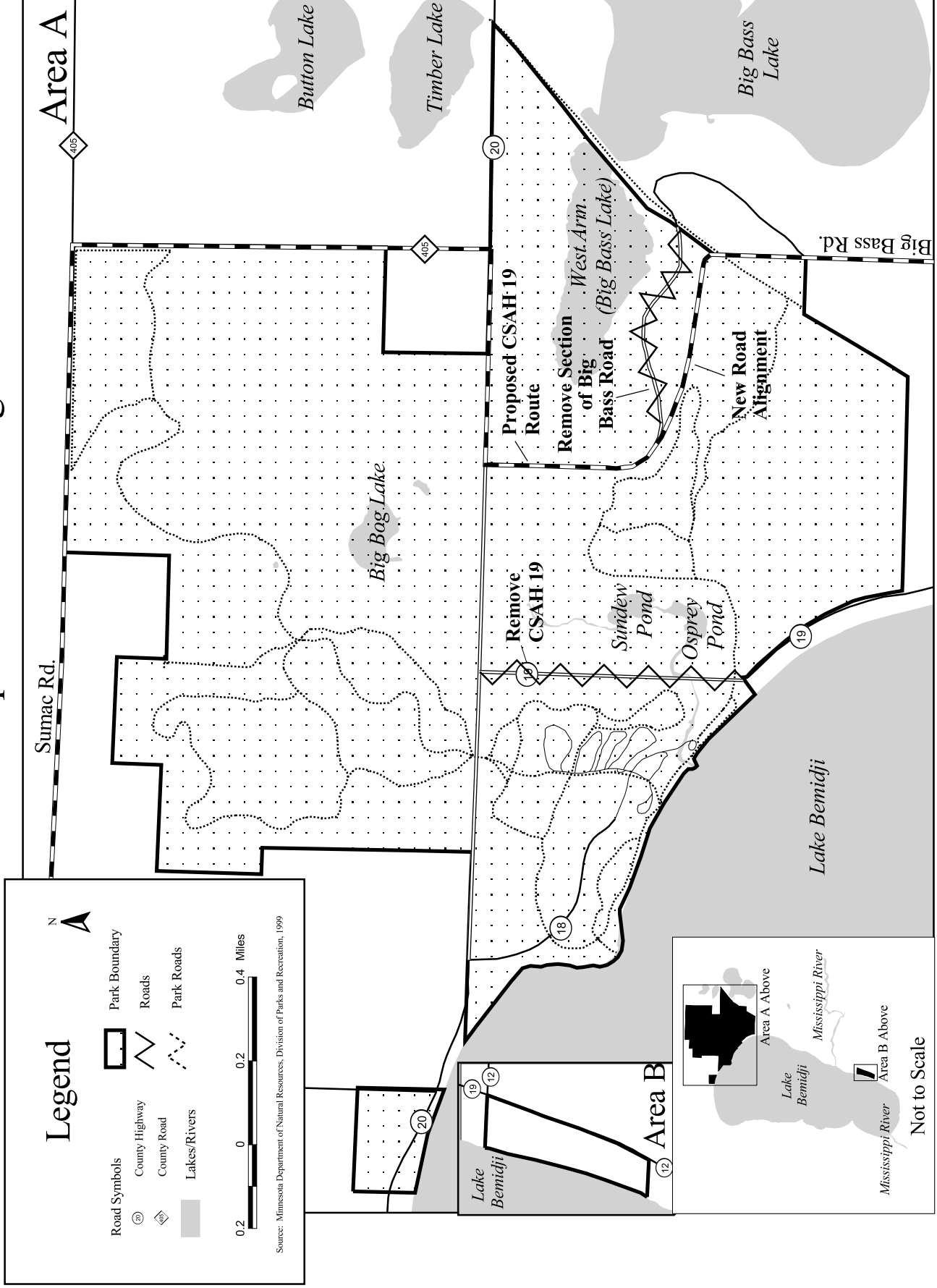
Trail crossings with CSAH 19 & 20 are a public safety issue because trail users must cross increasingly busier traffic roads with poor sight lines. The park's bog walk and most of the park's hiking and skiing trails are separated from the park's picnic ground, campground, interpretive center, beach, boat access, office and parking lots by the county roads. Through traffic roads located in the interior of the park also affect visitor experience by the sight and sound of traffic in a natural area.

The wetland communities within the park are particularly vulnerable to impacts by roads and ditches crossing them and should be given first priority for restoration. CSAH 19 and 20 obstruct the natural flow of surface and groundwater within the bog and affect the function of the associated wetlands that are a part of the Lake Bemidji watershed. Abandonment of CSAH 19 and restoration of the former road corridor will allow for restoration of wetlands and safer recreational access to parts of the park. The present alignment of CSAH 20 through Lake Bemidji State Park will not be expanded, but changes will be made to slow and reduce the traffic through the middle of the park. Bog Adder's-mouth (*Malaxis paludosa*) is an endangered orchid found near CSAH 20 and expansion of the highway would likely affect this plant species. In the future a CSAH 20 bypass around Lake Bemidji State Park should be considered. Figure 10 presents the current and proposed road alignments for CSAHs 19, 20 and Bass Lake Road recommended by this management plan. Implementation of this recommendation depends on collaboration with the Beltrami County Highway Department.

Actions to Implement this Recommendation:

- A. Work to reroute County State Aid Highway 19 and restore the abandoned road corridor to a natural condition. This will include restoration of wetlands, hydrology and restoration of Bass Creek to improve natural fish movement and reproduction.
- B. Work with Beltrami County to provide an alternative route for County State Aid Highway 19, that is esthetically pleasing and has minimum impact on park resources while adequately serving regional transportation needs.
- C. Work to minimize the impact of County State Aid Highway 20 on park resources and park visitors by design changes that: allow adequate water flow, maintain a narrow corridor, restrict traffic to slow speed and lower volume to blend with the park character of the area.
- D. Provide for safer trail crossings of the county roads as part of the highway reconstruction projects.
- E. Work on the abandoned section of Big Bass Road that is within the park boundaries and restore it to a natural condition.

Figure 9. Lake Bemidji State Park Proposed Road Realignment



Recommendation 3: Adopt a comprehensive vegetation management program to maintain healthy ecosystems and reestablish pre-European settlement conditions wherever possible within the park.

Lake Bemidji State Park contains a diversity of vegetative species ranging from pine forest communities to Tamarack bog communities that is representative of the landscape found in the area at the time of European settlement. Because the park is located in a growing urban area, it is increasingly important to protect those communities that currently exist and to attempt to restore portions of the communities that have been altered by human intervention over time. Three major vegetation management goals have been established for the park: (a) to maintain the diversity of vegetation found within the park; (b) to reestablish pre-European settlement conditions wherever possible; (c) to maintain healthy communities; and (d) to maintain a natural environment that enables visitors to attain the experiences and benefits they desire while protecting the park's resources. Restoration efforts should recognize that a variety of communities existed within the park prior to European settlement. As such, resource management plans should seek to restore a mixture of upland and lowland forests interspersed with marshes, bog lakes and other wetlands. Management techniques to accomplish restoration and maintenance of the parks natural communities should mimic natural processes when possible, and natural processes should be allowed to occur where possible.

Native to the area species should be encouraged where possible. For purposes of this management plan, native species are generally considered to be those known to be present in the park prior to European settlement of the Bemidji area. Species that might have been common to the Bemidji area but were not found in the park, are generally not considered to be native species for the park. When completed, the County Biological Survey and the Ecological Classification System will help obtain accurate and useful information with which to determine the most appropriate ecological communities for the park.

It is also important to recognize that Lake Bemidji State Park contains two smaller units that are separated from the main park. The site of the MNDNR Bemidji Regional Headquarters is located to the west of the park and approximately 41 acres is located south of the main park. Both of these sites contain old growth pine forests that are under pressure from human activity. Although the regional headquarters site continues to support large old pines, the site has been significantly impacted by the construction of the headquarters and its associated roads, parking lots and ancillary buildings. The southern section of the park is located along the future Paul Bunyan Trail corridor, adjacent to a county road and adjacent to private and city-owned property undergoing development pressures. This site contains old growth red pines and an eagle's nest.

Actions to Implement this Recommendation:

- A. Work with the County Biological Survey to ensure appropriate level of detail and scheduling for Beltrami County.
- B. Continue use of appropriate active management techniques such as cutting, planting, seeding, removal of hazardous trees, construction of deer exclosures, other methods of population management, and controlled burning to aid in regeneration and maintenance of healthy communities.
- C. Maintain lowland and upland plant communities as part of the mosaic of vegetative cover found within the park.
- D. Maintain and enhance the park's nursery area to aid in regeneration of tree species found within the park from locally obtained seeds.
- E. Continue forest restoration and management of the park's former agricultural fields and pine plantations, to blend with surrounding stands and to emulate pre-European settlement vegetation.

Recommendation 4: Sustain healthy and diverse animal populations.

Managing for ecosystems at Bemidji State Park includes identifying and conserving viable populations of native animal species and increasing native species diversity in the park. The wildlife management goals for the park are to: (a) maintain the diversity of wildlife found within Lake Bemidji State Park; (b) protect species habitat for both game and non-game species; and (c) maintain viewing opportunities for the public without causing undue stress on the animals.

Actions to Implement this Recommendation:

- A. Work toward more accurate inventories of animal species within the park, including insects, amphibians and other species.
- B. Protect endangered species habitats within the park.
- C. Maintain productive habitats for the park animal species at healthy population levels, including mammals, birds, insects, reptiles and amphibians.
- D. Manage deer population to allow restoration of white red and jack pine and reduce impacts on other vegetation such as orchids.

Recommendation 5: Maintain healthy and diverse aquatic systems.

Lake Bemidji State Park's water resources are very important to the overall health of the ecosystems found within the park. The presence of lakes, bogs and other wetlands within the park make these resources unique in the Bemidji area. In addition, the park's location on the shorelines of Lake Bemidji and Big Bass Lake heightens the importance of being involved with efforts to protect the water resources associated with these lakes. Since most of the park's lands drain into Lake Bemidji, water management practices within the park affect the water quality in Lake Bemidji and the Mississippi River. The park also contains several streams and creeks, including Bass Creek. The major goals of water management in the park are to: (a) protection of water quality throughout the park; (b) Maintenance of present water levels to protect spawning in Bass Creek and lessen damage to aquatic vegetation associated with the park's water bodies; (c) continue to provide interpretation and education about the importance of water protection; and (d) ensure protection of spawning areas within the park. Maintenance of good water quality is important to species, including aquatic insect species, that are dependent on these waters for survival and reproduction.

Water management goals, objectives and actions established for the park should reflect the management zone guidelines developed for the park and the target benefits identified for each of the management zones. These goals, objectives, and actions should work toward restoring and maintaining sustainable ecosystems within the park's water resources. Water management goals, objectives, and actions should also be sensitive to the cultural significance of the park's water bodies. Specific water management actions should seek to restore or mimic natural processes wherever possible and move toward the long-term goal of managing for sustainability of all native flora, fauna, game, and non-game species.

Actions to Implement this Recommendation:

- A. Restore historic surficial water flow through the park by removing culverts, roads, etc. as appropriate.
- B. Work toward more accurate inventories of aquatic species found within the park.
- C. Monitor and manage beach and soil erosion along the Lake Bemidji shoreline to preserve park natural and cultural resources, and maintain quality visitor recreational opportunities.
- D. Monitor water quality, erosion, and fishing pressure associated with the public access and marina to identify management actions that will provide a quality fishing experience and help maintain healthy aquatic systems within the lake.
- E. Improve fishing access for non-boaters to Lake Bemidji.
- F. Protect the spawning areas in Bass Creek during spawning season and restrict disruptive use of the upper reaches of Bass Creek, Sundew Pond, and Osprey Pond.
- G. Remove surface litter from former dump site locations within the park and install ground water monitoring wells to determine the impact of the former dump sites on groundwater quality.

Recommendation 6: Continue to explore ways to involve a variety of people and agencies in natural resource management activities within Lake Bemidji State Park.

Lake Bemidji State Park has a long history of citizen involvement in its management activities. The park was originally created in 1923 as the result of actions by a local citizen's group, the Bemidji Commercial Club. Various units of the State University System have been active in the park helping to expand the information on the park's resources while enhancing students understanding of the park and its environs. Development of this management plan has been the result of a public involvement effort that included many people. The energy and commitment that these people brought to the process is an incredible resource that is available to the park's management team for use in other resource management activities. The Lake Bemidji State Park Citizen's Association was formed as a result of this process. This association has taken an active interest in management activities at Lake Bemidji State Park through participation in volunteer resource management activities and other commitments of time. These efforts have been very successful and a strong cadre of citizen volunteers has evolved to aid in implementing the resource management program's objectives. The success of the Citizen's Association and the quality of this management plan are testimonials to the effectiveness of the work accomplished by the park's volunteers. It is important that this energy continue to be harnessed for future projects and that efforts continue to be made to instill a sense of citizen ownership of the park.

Actions to Implement this recommendation:

- A. Develop and maintain partnerships with local and area recreation providers to ensure that the needs of park visitors are met as best as possible.
- B. Develop partnerships and cooperative agreements to enhance research, environmental education, resource management and regional tourism consistent with the park's management goals.
- C. Establish and maintain a process of information exchange within the community and region;
- D. Provide opportunities for local residents to become involved in park planning, plan implementation, interpretive programming, and other activities which support the park's mission.
- E. Work cooperatively with regional tourism providers to promote the park and the region in a way that is consistent with the park's resource management goals.
- F. Continue to work with the Lake Bemidji State Park Citizens Association to discuss resource management issues, develop strategies for addressing them, and enlist volunteers to aid in accomplishing the necessary resource management tasks.
- G. Continue to publicize volunteer successes and opportunities for public participation.
- H. Continue to work with neighboring public and private land owners to aid in ensuring protection of the park's critical natural resources.
- I. Work to ensure that research projects conducted in Lake Bemidji State Park further our understanding of the park resources.

Natural Resources Research and Monitoring

Periodic research and monitoring of Lake Bemidji State Park's natural systems is important in measuring system dynamics, changes in those systems, overall ecosystem health, and the effectiveness of efforts to implement the recommendations contained in this chapter. Although research on the behavior patterns, evolutionary changes, or habitat requirements for some species found within the park exists, basic species inventory and community level data are limited or nonexistent. Data sets such as the County Biological Survey, surficial geology survey, delineation of candidate old-growth stands, deer census, water quality, creel census, aquatic species inventories, and forest flora and fauna inventories do not exist or are in need of update. These baseline data are needed to establish an effective research and monitoring program for the park's natural resource management activity and to protect the park's resources from degradation associated with resource management actions and human use. In addition, research evaluating the impact

of specific management techniques, human impacts on the resource, or changes related to natural phenomena is minimal. Baseline research on the environmental benefits attained from the park is nonexistent.

Clear, specific, quantifiable, and measurable management objectives should be developed for the natural resource management program to aid in monitoring and evaluating natural system health and the effectiveness of particular natural resource management actions taken in the park. Standards and indicators for ecosystem health, species diversity, and species health should be developed to provide specific measures for monitoring and evaluation. Similar objectives, standards, and indicators should be established for measuring the program's effectiveness at realizing its target benefits. Appropriate modifications in management techniques and direction should be made based on research results.

Chapter 5. Cultural Resource Management

Introduction

The area surrounding Lake Bemidji State Park has a long history of human activity dating as far back as nomadic American Indian people. Woodland Period American Indian archaeological sites have been found within the park as old as 1,200 years. The park also contains historical logging and homestead sites. The Lake Bemidji State Park CCC/ NYA/ Rustic Style Historic District is also located in the beach and picnic areas of the park.

This chapter begins with a section which outlines the cultural resource management program goals. The next section of the chapter identifies the target benefits associated with cultural resource management in the park. The middle section presents an inventory and description of the park's cultural history and existing resources. A section near the end of the chapter lists the major cultural resource management recommendations and actions to accomplish the program goals and provide opportunities for realization of the target benefits. The chapter ends with a section on research and monitoring. This chapter and its associated references serves as the overall cultural resources management plan for the park.

Cultural Resource Management Goals

For purposes of this management plan, cultural resources are defined as those archaeological sites, cemeteries, historic structures, historic areas, cultural landscapes or traditional use areas that are of cultural or scientific value to the park, region, or nation. The following goals have been identified to guide cultural resource management in Lake Bemidji State Park:

- Preserve, restore and protect the park's significant cultural resources;
- Adhere to appropriate state and federal laws governing cultural resource management;
- Provide interpretive opportunities for the park's cultural resources;
- Manage for realization of the park's target benefits as they relate to cultural resources; and
- Develop an ongoing research and monitoring program.

Although these goals should guide cultural resource management activities throughout the park, translation of the goals into specific management actions will differ to some extent by management zone and the specific cultural resource in question. Lake Bemidji State Park's cultural resource management effort is part of both the park's resource management program and the statewide state parks cultural resource management program. As a result, continued cooperation with the Minnesota Historical Society, the Minnesota Indian Affairs Council, the Office of the State Archaeologist, and local tribal governments will be essential to effective cultural resource management in the park and maintaining compliance with state and federal laws governing cultural resource management.

Existing Cultural Resources

Lake Bemidji State Park is an important cultural resource for Minnesota. Human activity has occurred in the park for thousands of years but we have evidence of use for the past 1200 years. This activity spans several historical periods from the Late Woodland period (2500 to 250 years before present) to the present and includes early European settlers, loggers, and depression era workers. The Mississippi River also runs into Lake Bemidji approximately five miles south of the park.

Archaeological work has been done in the Lake Bemidji area since 1889, when Jacob Brower noted the presence of ancient villages and burial mounds on the southern and eastern parts of the lake. Despite these early examinations, archaeological survey work was not begun in Lake Bemidji State Park until 1978, when development projects to expand the campground and construct a new park interpretive center were being planned.

Most of the archaeological finds within the park's boundary are located in the Concentrated Use Zone. However, archaeological surveys have not been completed for most of the park. The majority of the existing survey work has been related to development projects within the park. Much of the campground has been surveyed and found not to contain archaeological deposits. The Paul Bunyan State Trail corridor was also surveyed. Two sites were identified during this survey by the MNDNR, Trails and Waterways Archaeology Program staff. A lithic site was avoided during trail construction. The condition of this site should be monitored over time.

Additional sites are likely to exist in the large areas of the park that have not been surveyed. Management of the park's cultural resources should be consistent with the resource management objectives established for the two management zones.

Archaeological Resources

There are four known archaeological sites located within Lake Bemidji State Park (Table 9 and Figure 11). Early chroniclers also recorded a number of archaeological sites in the Bemidji area that have never been verified, or which may have been destroyed. One of these unrecorded sights was an American Indian portage within Lake Bemidji State Park, between the north end of Lake Bemidji and Turtle River (Vernon, 1979). The amount of available exploration and documentation for each of the known sites varies among individual sites. A brief description of the park's four known archaeological sites follows. Additional information including complete records, field notes, and further documentation is available from the Minnesota Historical Society or Minnesota State Park staff.

Table 6. Lake Bemidji State Park Archaeological Sites

Figure 11 Site Number	Site Name	MHS Site Number
1	MNDNR Pines Site	21BL51
2	Rocky Point Site	NA
3	Boat Harbor Site	21BL35
4	Lithic Site	NA

NA = Not Available

¹ Source: Minnesota Historical Society, 1999

The MNDNR Pines Site (21BL51)

It was discovered in 1988 during a Beltrami County Highway Department project to relieve flooding from a segment of CSAH 20. The survey work unearthed a possible campsite or special use area that has been dated to the Late Woodland-Early Blackduck period (800-1200 years ago). The area contained approximately 500 items, the majority (98%) of them were pre-contact ceramics. Several lithic items including scrapers, chert biface edge fragments, chert flakes, tools, bone fragments, and quartz chips were found on the site. The majority of this site has been eroded into Lake Bemidji. The remainder of the site has been surveyed and excavated. When this project was completed, the site was severely disturbed from the construction of the road and no further survey work has been done (Anfinson and Peterson, 1989).

Boat Harbor Site (21BL35)

The site was discovered in 1982. The original survey work done produced 1,006 ceramic fragments. Other material recovered included lithic artifacts and animal bone (Alan P. Brew, personal communication, July 12, 1983). A 1992 survey produced 236 more items, including ceramics and lithics. Animal bones and a fire hearth with an animal scapula (cervid related, possibly elk or caribou) were also recovered during this survey. The ceramics were Blackduck, Brainerd and St. Croix reflecting early to middle Woodland occupations (Radford and George, 1992). Many pieces of the rim, neck and body portions of what is thought to be a single vessel were also found on this site. Residue scrapings from this vessel were dated to 705 A.D. (1290 B.P.). A phytolith analysis of the residue indicated the vessel was used for wild rice and maize.

Rocky Point Site (NA)

Rocky Point is located along the shoreline of Lake Bemidji in the southwest corner of the park. Survey work produced a white/grey chert core fragment and a crude drilling tool made of grey chert. Neither of these items were in their original contexts. This and other evidence leads to the conclusion that the area has been disturbed for some time.

Historical Resources

The historical resources of Lake Bemidji State Park are significant for their association to the social, political and economic impacts of early settlement and the Great Depression eras. During the late 1800s into the early 1900s the area that is now Lake Bemidji State Park was a base for logging operations in the area. In 1923 lumberman T.B. Walker sold acres of his land to the state to protect an old growth pine stand. This became the first land purchased for Lake Bemidji State Park. The park's early historical sites are spread throughout the park and include remains of logging camps and their associated elements such as a logging canal and portions of building foundations that are linked to previous homesteads. These sites exist mainly in the interior of the park.

The park's depression era historical resources consist of the Lake Bemidji State Park CCC/NYA Rustic Style Historic District. Covering eight acres on the north shore of Lake Bemidji, the historic district contains 2 contributing elements, a shelter building and a sanitation building. These buildings are especially significant because they are the only buildings in the state park system that were constructed by the National Youth Administration (NYA). The district also includes the beach house which is not a historic building. These buildings are examples of typical National Park Service rustic architecture which utilized stone foundations and log walls, that attempted to be unintrusive and environmentally sensitive. Buildings constructed within the park since the NYA buildings have emulated these important historic architectural themes.

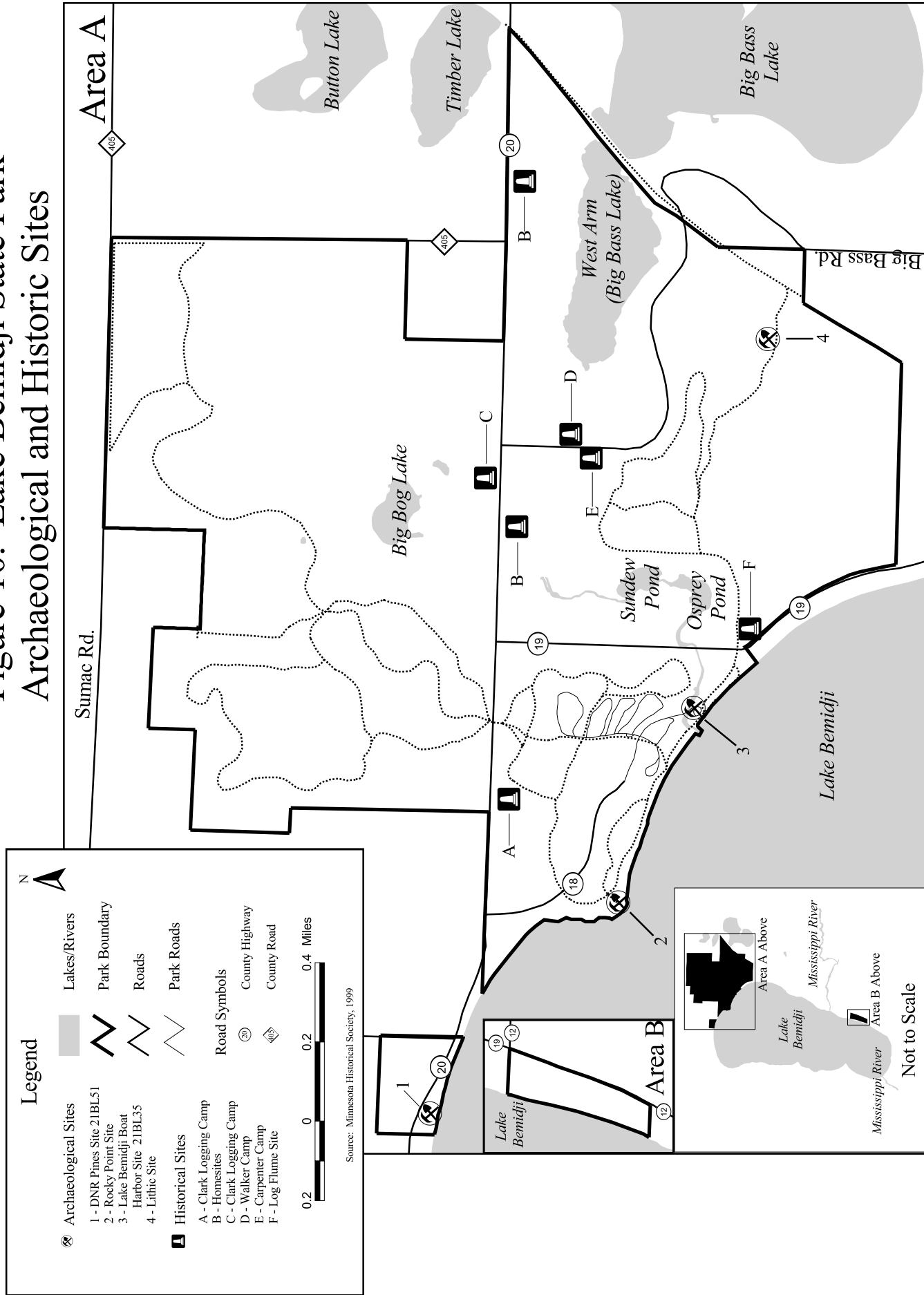
Cultural Landscapes

One component of a comprehensive cultural resource management program for Lake Bemidji State Park is consideration of the cultural landscapes found within the park. Cultural landscapes, as a resource type, were identified in the Lake Bemidji State Park CCC/NYA Rustic Style Historic District nomination. Birnbaum (1995) provides a synopsis of the National Park Service guidelines for managing cultural landscapes. He defines a cultural landscape as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values." Application of this definition suggests a need to consider the spatial organization and patterns of the landscape (e.g., relationships between buildings and fences) and the character defining features of the landscapes (i.e., topography; vegetation; vistas; circulation patterns; aesthetic/ functioning water features; and structures, site furnishings and objects) associated with specific cultural resources (USDI, National Park Service, 1996). Consideration should also be given to how a landscape has changed over time and the role that the specific resources played in defining the landscape. In effect, specific cultural resources are treated within the context of the natural surroundings and as part of a whole story that links past use to present use, rather than as island-like monuments to the past.

Management of cultural landscapes is a relatively new endeavor for Minnesota State Parks that presents some challenges for management of Lake Bemidji State Park's cultural resources. The National Register focuses on specific buildings. The supporting documentation does not provide much assistance in evaluating the cultural landscapes within which the resources are located. There is little discussion of how the individual rustic style structures relate to each other or how they relate to the vegetation, walkways, and vehicle access routes within the park.

The park's cultural landscapes also include traditional use areas. A traditional use area is a location which has been historically used by one or more groups of people for some type of activity, very often related to vegetation of the area. Examples of traditional use areas include wild rice beds, berry gathering areas, and locations where plant materials were gathered for craftwork or medicinal purposes. Good documentation

Figure 10. Lake Bemidji State Park
Archaeological and Historic Sites



Recommendations and Actions

Recommendation 7: Continue to identify, document, preserve and interpret Lake Bemidji State Park's archaeological and historical resources.

Discussion: Lake Bemidji State Park contains some significant cultural and historical resources that represent human habitation of the area for several hundred years. Although some archaeological research has been conducted in the park, much of the work has focused on those areas immediately adjacent to proposed park development projects. Much of the park remains unstudied.

In addition, as facilities are provided for visitor enjoyment of the park and basic park infrastructure is maintained, a need exists to continue archaeological survey work at potential construction sites. The importance of continued work in this area is underscored by the number and extent of the archaeological sites that have already been discovered in the park during recent surveys for construction or maintenance projects.

Finally, the park's archaeological resources offer windows to the past and opportunities to tell the park's story that are important components of the park's interpretive and environmental education program. Continued work to understand and interpret the park's archaeological resources is important.

Actions to Implement Recommendation:

- A. Complete a park wide archaeological survey to identify and describe the park's archaeological resources. Priority should be given to existing use areas such as the Concentrated Use Zone and proposed development sites that have not been inventoried.
- B. Adaptively reuse, restore, and interpret the Works Progress Administration (WPA) / National Youth Administration (NYA) rustic style structures and cultural landscape within the park.
- C. Develop interpretive and education materials that help park visitors understand and protect the park's archaeological and historical resources.
- D. Archaeological and historical resource management will continue to be integrated with other resource, recreation, facility, and visitor management programs in the park.
- E. Work with the American Indian Tribal governments to document traditional use areas within the park, and develop American Indian history interpretive materials.

Cultural Resources Research and Monitoring

Periodic research and monitoring of Lake Bemidji State Park's cultural resources is important to learning about those resources, the effectiveness of preservation efforts, the health of the resources, and efforts to implement the recommendations contained in this chapter. Although archaeological and historical research exists on some of the specific sites within the park, a comprehensive archaeological survey has not been completed and new information regarding the park's historical resources is periodically discovered. In addition, the knowledge base for how to effectively manage cultural resources continues to expand and federal guidelines governing the management of cultural resources continue to evolve. Baseline data on existing conditions of these resources is needed to establish an effective research and monitoring program. In particular, research monitoring the impact of lake shore erosion along Lake Bemidji on the park's cultural resources is very important. In addition, research evaluating the impact of specific management techniques, human impacts on the resource, and changes in resource health caused by natural or human phenomena is periodically needed. Continued research on the benefits attained from the park's cultural resources is also necessary to monitor and evaluate the cultural resource management program's effectiveness at managing for the particular set of experiences and benefits associated with those resources.

Chapter 6. Interpretive and Environmental Education Services

Introduction

Lake Bemidji State Park's interpretive program is a crucial component of efforts to manage the park's natural and cultural resources. Interpretive services also serves as an important link between park management activities and visitor experiences. The growing emphasis on environmental awareness and ecotourism have heightened the importance of interpretive programming in realizing the park's vision and mission. Interpretation is also a key component of the park's integrated resource management program which includes the provision of appropriate visitor services. The principal role of the interpretive program is to introduce the park to the visitors and to interpret its resources. From its earliest days as a park, informal naturalist led programs followed later by established seasonal and then year round naturalist positions have played a major role in the park's popularity as a unique and special attraction. Over 8,500 visitors to the park participate in one of the park's naturalist led interpretive programs annually. In addition, there are several self-guided learning opportunities available to park visitors.

This chapter serves as Lake Bemidji State Park's interpretive plan and basically follows the format developed by the Division of Parks and Recreation between 1992 - 1995. Individual park interpretive plans are intended to be working documents that clearly describe the level of interpretation at the park, and reflect the goals, objectives, and recommendations found in the Division of Parks and Recreation's statewide Interpretive Plan (MNDNR, 1995).

This chapter identifies (a) the statewide interpretive services goals, (b) the target benefits guiding the park's interpretive and environmental education effort, (c) the park's interpretive and environmental education clientele, and (d) the park's primary interpretive and environmental education themes. In addition, this chapter presents an inventory of the interpretive services currently offered at Lake Bemidji State Park and recommendations for improvements to existing interpretive services. Throughout this chapter, the terms "interpretive and environmental education services" and "interpretive services" are used interchangeably to mean the entire collection of personal and non-personal interpretation and visitor information services provided to park visitors.

Statewide Interpretive Services Goals

The Division of Parks and Recreation's statewide interpretive plan views interpretation as a park-specific effort responsible for conveying the meaning of our natural and cultural heritage to state park visitors and examining the relationships that exist between each park's natural and cultural heritage. The Division of Parks and Recreation's statewide interpretive plan views interpretation as a park-specific effort responsible for conveying the meaning of our natural and cultural heritage to state park visitors and examining the relationships that exist between each park's natural and cultural heritage. The statewide interpretive plan identifies the primary statewide goals for meeting these responsibilities. Among these are:

- To promote understanding, appreciation, and enjoyment of natural and cultural resources in Minnesota;
- To assist in protecting each state park's resources; and
- To increase public awareness of critical environmental problems on a local, state, national, and worldwide scope (MNDNR, 1995).

Interpretive and Environmental Education Goals

The following management goals have been identified to guide the interpretive and environmental education services at Lake Bemidji State Park:

- Maintain a focus on the park's relationship to its landscape region when developing and delivering interpretive and environmental education programs;
- Introduce visitors to the principles of sound environmental stewardship practices;
- Maximize use of printed materials, displays, exhibits and trail signs to deliver informational materials to visitors;
- Integrate interpretive programming at the park with other multi-disciplinary efforts in environmental education both on and off site;
- Integrate interpretive programming into the resource and visitor management activities; and
- Provide high quality information services regarding the park and the surrounding region that are responsive to visitor needs.

Clientele

Lake Bemidji State Park's interpretive and environmental education programming takes place throughout the park and serves individuals to large groups. These include school groups, special interest groups, residents of all parts of Minnesota, visitors from other states, and international travelers. Interpretive programs must be designed to accommodate this range of visitors while fulfilling the target benefits. Both personal and non-personal services are offered to individuals and groups.

Individuals

Interpretive and environmental education services should be designed to reach a range of participants. This range includes those whose primary purpose for visiting the park is to participate in a program and those whose involvement in interpretive programs is coincidental to their visit. Many of the people who participate in interpretive and environmental education programs who are not associated with an organized group are hikers, bikers, sightseers, picnickers, boaters, anglers, campers, researchers, and those individuals and families engaged in other educational and recreational activities.

Groups

The park's interpretive programs should also serve a variety of organized groups ranging in size from a few people to several hundred. These groups participate in programs developed and carried out by park naturalists, volunteers, and group leaders. Most of these groups also sample the park's multiple non-personal interpretive opportunities. Many of the groups who come to the park for interpretation and environmental education fall into one of the following categories:

- School and other youth groups/ clubs;
- Overnight visitors to one of the park's two group camps;
- Senior citizen groups/ clubs;
- Special interest groups;
- Groups with special needs (e.g., mentally and physically challenged students and at risk youth);
- Environmental/ conservation groups;
- Public and private environmental education providers; and
- Civic organizations.

Interpretive Themes

Four Primary themes have been identified for Lake Bemidji's interpretive and education programs. Each primary theme is accompanied by several supporting themes. Together the primary and supporting themes represent the how, why, when, and where of Lake Bemidji State Park's past, present, and future, and serve as the foundation for the park's interpretive and education programs. Some of the supporting themes logically fall under more than one primary theme, but are listed under only one, to avoid unnecessary repetition.

Primary Theme: *Lake Bemidji State Park's aquatic ecosystems are unique and should be protected and restored where possible.*

Supporting Themes:

- The park's aquatic resources are important to both the individual bogs and wetlands within the park and to the Mississippi Headwaters Major Watershed;
- The park's bog forests provide a unique mixture of animal and plant habitats;
- The exchange of water within the bog and the park's other water bodies is important to maintaining the park's wetland communities;
- Flow of water from Lake Bemidji State Park to Lake Bemidji and West Bass lake has an impact on the water quality in those two lakes, and
- Bass Creek provides important habitat and spawning areas for fish species who inhabit Lake Bemidji.

Primary Theme: *Lake Bemidji State Park's upland forest ecosystems are unique and should be protected and restored where possible.*

Supporting Themes:

- The park includes important old growth forests that provide habitat for a variety of plant and animal species;
- Lake Bemidji's forest ecosystems are representative of the forests found in the Chippewa Plains Landscape Region;
- Restoration of upland forests within the park is important to overall ecosystem health; and
- The park's forests have played an important role in human activity in the region for thousands of years.

Primary Theme: *Lake Bemidji State Park's landscape was shaped by glaciers.*

Supporting Themes:

- Glacial landscape features of the St. Louis Moraine complex and the Bemidji Outwash Plain are important components of the park;
- The park's rolling hills, marshes and bogs were formed by glacial activity spanning several thousand years; and
- Lake Bemidji State Park's water systems are part of the larger Mississippi Headwaters Major Watershed that includes a significant portion of the Mississippi River.

Primary Theme: *Diverse peoples have inhabited and used this landscape over time.*

Supporting Themes:

- Lake Bemidji State Park's cultural heritage spans approximately from the Woodland Indian period to the present and provides visitors with an opportunity to learn about Minnesota's human inhabitants and how they lived;
- Pioneer settlement and logging are an important part of the region's history because of their impact on the environment and the region's economy;
- Lake Bemidji State Park contains archaeological and historical resources that help explain the area's human history;
- History of visitor use within the context of the changing landscape has played an important role in the park's development;
- Lake Bemidji State Park's creation was closely connected to the growth and development of the region; and
- Human activity within and near the park continues to affect the park's natural, cultural and historical resources.

Existing Services

Interpretive services have been provided in Minnesota State Parks since the Works Progress Administration (WPA) began offering guide services in the 1940s. Over time, the program has grown from this humble beginning to be a major component of park operations. Today, interpretive services are offered in some form at all of Minnesota's state parks. From the 1973 until 1980 the Lake Bemidji State Park hired seasonal naturalists to conduct interpretive programming. Year round programming began at the park in 1981. Today, Lake Bemidji State Park is one of 16 state parks in Minnesota with a full-time year round naturalist.

Environmental Education

Lake Bemidji State Park is easily accessible to several neighboring school districts wishing to conduct environmental education activities. School districts from around the region have used the park for environmental education programming, but the largest number of school groups come from districts within a few miles of the park. In addition to K-12 public schools, other organizations such as colleges, private schools, special education programs, social service programs, scouting organizations, 4-H, private clubs, church groups, and public and private day camps make use of the facilities and services in the park for environmental education. Red Lake and Leech Lake Tribal schools also use the park as a site for environmental education programs.

The park has unique features which make it a desirable place for environmental education. Bog areas, old-growth forests, lakes, streams, trails, cultural resources, natural areas, biodiversity, and an wildlife offer diverse study opportunities. At the same time, the park has examples of the pressures on natural areas and systems caused by human habitation of landscapes. Runoff and erosion along park roads and trails, noise pollution along the road system, compaction of campsites in the campgrounds, loss of vegetation and habitats from overuse of some trails are all talked about as part of the environmental education program.

Students can also study significant segments of Minnesota's history and the relationship between people and the environment through time at the park. Important components of the cultural and historic education program conducted at the park include; (a) early American Indian cultures, (b) early pioneer settlement in northwestern Minnesota, and (c) conflicts over protection of pine forests from logging.

The park's naturalists assist many groups with environmental education programming to explore these issues. Staff also provides service-learning opportunities and projects for youth and adult organizations who would like to put into action their goals of learning about ecosystems and the effects that humans have on those ecosystems. Student interns working in the park's interpretive program also enhance their own understanding of the park's resources while earning valuable work experience. This range of environmental education programs requires a continued integration of the resource management and interpretive services programs found within the park.

Personal Services

The park offers naturalist-led programs (personal services) year round. Typically, six to nine programs per week are offered between Memorial Day and Labor Day. Several special programs or workshops are offered each fall. Volunteers are encouraged to assist with special events throughout the year. Winter program services include assisting with coordination of community wide school based environmental education resources. The spring season is dominated by special programs for school groups and weekend programs.

Non-Personal Services

Over the last 10 years, the number of non-personal interpretive opportunities available at the park has increased. A self-guided trail to Rocky Point focuses on life in the old growth maple-basswood forest and the region's geology using interpretive signs along the trail. A boardwalk into the spruce-tamarack bog has become a major attraction and provides interpretation of Lake Bemidji State Park's most unique and well

preserved wetland community. A planning guide for bog walk trip leaders focuses on the bog and other significant wetland communities in the park. The Old Logging Trail provides signs to aid in identifying some of the park's tree species. Among those interpreted on the trail are aspen, red pine, white pine, and jack pine. Seasonal trail guides are provided during spring and fall for teachers to use with classes.

The park's interpretive staff also distributes information regarding interpretive programs at the park throughout the region. Seasonal schedules are prepared for winter and spring program services and mailed to park supporters as well as posted at many local locations. Weekly new releases, schedules that include programs and park information are handed out as well as schedule posting are done during the winter. News releases and schedules are sent to local Chambers of Commerce, newspapers, and broadcast media.

Staff

Since 1981, the park has had one year-round park naturalist. Most summers since 1982, the full-time naturalist has been assisted by one to three interpretive interns and some volunteers. The summer interns provide program assistance, resource assessment, and research. Volunteers are also used for the following programs and events: 15 to 20 for each candlelight ski tour; 20 to 25 for the citizens ski race/tour; 20 for the citizens run/walk; and, 15 to 20 for other special programs.

Facilities

The park has a combination office, contact station, trail center, and interpretive center. It is often filled to the capacity (100 people) during popular summer program offerings. An amphitheater (150 person capacity) is located behind the interpretive center. The park also has interpretive boardwalks, observation decks, and display boards in other locations. In addition to the bog walk, there are observation decks overlooking Bass Creek, Sundew Pond, and Lake Bemidji. Information boards and kiosks are located at the campground, picnic area, boat landing, and on the trail to the bog.

Recommendations and Actions

Interpretive opportunities offered within the park should (a) provide opportunities for attainment of the target benefits; (b) adhere to the management zone guidelines detailed in Chapter 3; (c) reflect the natural, cultural, and historical character of their surroundings; and (d) focus on the themes identified above. Within this context, interpretive facilities and programs developed to implement the recommendations in this plan should be tailored to the management zone where they will be provided. Although the existing interpretive effort generally reflects this direction, some improvements are recommended. Program improvement also requires additional staff, facilities, and equipment.

The following recommendations address some of the major areas where current interpretive and environmental education efforts can be improved. Some of these recommendations speak to personal interpretation, some speak to non-personal services and others speak to both types of services. As the recommendations are implemented, it is important to maintain a balance between personal and non-personal services. While it is desirable to increase non-personal interpretation, it should not be accomplished at the expense of personal interpretation.

Recommendation 8: Provide a quality learning experience for park visitors.

Discussion: Much of Lake Bemidji State Park's personal programming is focused around the park's visitor center and its associated amphitheater, park trails and pontoon boat tours. The visitor center also provides non-personal interpretation through brochures, displays and exhibits. This year round facility also houses interpretive and park staff offices. Currently, the facility is often filled to capacity during the summer season with park visitors and during the spring and fall with school groups. Additional facilities space is needed to accommodate the growing demand for interpretive programming through the visitor center.

Actions to Implement Recommendation:

- A. Provide a interpretative program that is consistent with the State Wide Interpretative Plan by strengthening staff and programming.
- B. Implement the visitor center plan to maintain quality and up to date information and displays.
- C. Maintain quality and up to date kiosks, information boards, and interpretive trails.
- D. Provide orientation information on park resources and recreational opportunities.

Recommendation 9: Enhance facilities and programming available to interpret the park's wetland communities and geology.

Discussion: One of the major features of Lake Bemidji State Park is its wetland resources, particularly the central bog complex. A long-range plan for expansion of the existing bog walk trail was developed in 1992. Resolving the CSAH 19 and 20 alignment (as discussed in Natural Resource Management Chapt. 4, Recommendation 2) will result in increased interpretive opportunities within the bog complex.

Actions to Implement Recommendation:

- A. Revise the 1992 bog walk plan after Highway 19 is removed to show the best way to provide access to the aquatic areas of the park for visitor enjoyment and education, with minimal impact on the bog and its inhabitants.
- B. Develop interpretive programing on watershed, wetland and lake management for the park and surrounding area.
- C. Enhance efforts to interpret the park's geology.
- D. Promote interaction of park visitors with lake interpretation using such resources as pontoon boats and ice houses.

Recommendation 10: Integrate interpretive and environmental services and the park's resource management activities.

Discussion: The interpretive program interprets the park's resources for visitors while promoting good stewardship practices. Resource management and restoration projects are important components of environmental education programs. It is important that the two efforts are integrated.

Actions to Implement Recommendation:

- A. Maintain current interpretive materials that explain the park's deer and vegetative management activities, prescribed burning and wetland and woodland restoration projects.
- B. Continue to develop news release, brochures, signs and other public information pieces to disseminate information regarding the park's resource management efforts.
- C. Continue to develop materials to interpret and minimize visitor impacts in the park and to encourage good stewardship.

Recommendation 11: Continue to provide interpretation of the park's cultural resources.

Discussion: The cultural resources described in the Cultural Resources chapter (Chapter 5) provide a window into the cultural history of the Bemidji area. The interpretive and environmental education services programs play an important role in protecting and interpreting these important resources. As additional cultural resources are discovered in the park, this role will increase.

Actions to Implement Recommendation:

- A. Continue to provide interpretation of the park's cultural history through presentations, brochures, maps, signs and other printed materials.
- B. Expand interpretation of American Indian culture through involvement of American Indians in program design and implementation.

- C. Develop appropriate materials to acknowledge contributions of the National Youth Administration (NYA) and other organizations to the development of Lake Bemidji State Park.
- D. Continue to document the change in park development and land use through photographs and oral histories.

Recommendation 12: Continue to enhance interpretive program community outreach.

Discussion: An important function of Lake Bemidji State Park's interpretive and environmental education program is sharing information about the park with local citizens, businesses, media, and visitors. The park is also one of many locations in the landscape region where visitors can find interpretive and environmental education opportunities. It is important that efforts to work with local communities and other providers continue to expand as the diversity of opportunities in the region increases and information technology improves.

Actions to Implement Recommendation:

- A. Continue to build better and stronger partnerships with local colleges and universities, environmental education centers, and other agencies.
- C. Continue to develop media releases that talk about current events, activities, opportunities and issues at Lake Bemidji State Park.
- D. Continue to improve the system used to disseminate information about the park and its interpretive programs to media and local businesses.
- E. Continue to target audiences to effectively accommodate their program and information needs.
- F. Meet regularly and collaborate with other environmental education providers.
- G. Expand social and natural science research efforts to increase understanding of the park and the people who interact with it.
- H. Continue to foster special events that enhance peoples understanding of environmental issues and are compatible with park resource and recreation management goals.

Interpretive and Environmental Education Research and Monitoring

Evaluation of the interpretive and environmental education recommendations and actions outlined in this chapter will be performed on an ongoing basis by the park management team, regional naturalist, and the Division of Parks and Recreation's interpretive operations coordinator. This chapter is intended to be a guide for planning and implementing interpretive and environmental education services at Lake Bemidji State Park. A comprehensive research and monitoring effort will be necessary to (a) evaluate progress toward implementation of these recommendations; (b) continuously improve program delivery; and (c) better understand the park's natural, cultural and historical resources. Periodic revisions of position descriptions and individual work plans for park staff will be necessary as the recommendations and actions are implemented and monitoring efforts continue.

Chapter 7. Recreation Resource Management

Introduction

Lake Bemidji State Park is an integral part of a broad spectrum of public agencies and private businesses responsible for recreation resources and tourism in the region. Both day use and overnight opportunities (camping) are available in the park. The park's proximity to the city of Bemidji and a growing residential community surrounding Lake Bemidji, draws local visitors and school groups to the park year round. The park also attracts visitors who come for a weekend or longer and incorporate their park stay into a broader visit that might include participation in the region's tourism, recreation, shopping opportunities.

This chapter summarizes some of the park's major opportunities and presents recommendations for future recreation resource management actions within the park. The chapter begins with a section which outlines the park's recreation resource management goals. The next section of the chapter identifies the target benefits associated with recreation management in the park. The middle section presents an inventory and description of the park's major recreational opportunities. A section near the end of the chapter lists the major recreation resource management recommendations and actions to accomplish the program goals and provide opportunities for realization of the target benefits. The chapter ends with a section on research and monitoring.

Recreation Resource Management Goals

The Following management goals have been identified to guide recreation resource management at Lake Bemidji State Park:

- Provide an appropriate supply of recreational opportunities that are consistent with park's natural and cultural resource management goals;
- Provide visitor services and recreation opportunities that are consistent with the park's management zoning concepts and target benefits described in Chapter 3 (Management Zoning);
- Provide facilities to support opportunities for quality and safe recreation experiences;
- Provide recreation opportunities for visitors with variable needs, abilities, interests, and experience levels; and
- Continue to work cooperatively with other recreation providers to identify appropriate and compatible roles of each in supplying recreation opportunities in the region.

Existing Recreation Resources

The recreational opportunities available to visitors of Lake Bemidji State Park are numerous and diverse. The park's Backcountry Zone offers users the opportunity to hike, walk, and witness the unique flora of a northern Minnesota bog. The park's Concentrated Use Zone affords users the opportunity to engage in a variety of recreational activities. Among these are hiking, biking, playing volleyball, camping, swimming, fishing, boating or enjoying an evening interpretive program (Figure 3).

The facilities available in the park vary between the two zones. The Backcountry Zone consists of only traditional non-paved hiking trails and boardwalk trails that allow users to enjoy the park's bog areas without disturbing this sensitive resource. The Concentrated Use Zone offers visitors both electric and nonelectric campsites, two group camps, a picnic area with shelter, a swimming beach, docking facilities, several sanitation buildings, paved trails, and a visitor center.

There are also many winter opportunities available at Lake Bemidji State Park. In the Backcountry Zone, visitors can take advantage of groomed cross-country ski trails of varying levels of difficulty, a snowmobile trail and snowshoeing (Figure 3). The Concentrated Use Zone has more opportunities for snowshoeing, cross-country skiing, and winter fishing. The park's snowmobile trail also originates in the Concentrated Use Zone.

For the purposes of this plan, these opportunities have been grouped into four general categories. These categories include general day use, camping and group camps, trail recreation, and water recreation. A brief description of the types of recreational opportunities that might be found in each of these categories follows. Recreation opportunities that exist through the park's interpretive program are discussed in the Interpretive and Environmental Education Chapter (Chapter 7).

Figure 12 shows the major recreational facilities available for visitor use during the summer season. Many of these facilities are closed during the winter months, but several of them remain open year round. Among the winter facilities are cross-country and snowmobiling trails, the visitor center, and the park's administrative office (Figure 13).

General Day Use

Nearly 90 percent of Lake Bemidji State Park's annual visitors are day users. This suggests that the park's day use facilities are very important to its users. Lake Bemidji State Park provides facilities that are available for day use activities such as hiking, swimming, volleyball, picnicking, walking, interpretive programming, fishing, boating, biking and roller blading. The majority of these facilities are located in the Concentrated Use Zone.

Trail Recreation

Much of the use in Lake Bemidji State Park is directed toward the Concentrated Use Zone, but the park's trail system gives visitors the opportunity to experience the interior of the park as well. There are a total of eight summer trails that exist in the park, ranging from one-third of a mile to 2.5 miles (Figure 12). Lake Bemidji State Park offers 15 miles of designated hiking trail, five miles of mountain bike trail, six miles of surfaced bicycle trail, and one mile of self-guided interpretive trail. Among these trails is the park's bog walk trail which allows visitors to enjoy a boardwalk through the central bog complex to Big Bog Lake. The majority of the park's trails are found in the Backcountry Zone, provide access to the park's major features and connect the Concentrated Use and Backcountry Zones.

The park's trails serve many different user interests from taking a short walk along the shores of Lake Bemidji to mountain biking in the park's pine forests. A paved spur of the Paul Bunyan State Trail originates at the park's marina and travels east to the park's southeastern border where it joins the main Paul Bunyan State Trail. From this intersection, the Paul Bunyan State Trail is paved south to Lake Bemidji's outlet to the Mississippi River and north to CSAH 20. Plans for completion of the trail to the city of Bemidji are underway. Eventually, users will be able to travel 110 miles from Lake Bemidji State Park south to Crow Wing State Park, south of Brainerd.

There are also several winter opportunities within Lake Bemidji State Park. About nine miles (14.4 kilometers) of the park's summer hiking trails are groomed for cross-country ski trails (Figure 13). These trails range from easy to difficult to accommodate a range skill levels. Three miles of snowmobile trail also exist within the park. The snowmobile trail originates at the picnic area's parking lot and travels north to meet with the North Country Snow Trail outside the park's boundary. On average, over 5,000 cross country skiers and 3,000 snowmobilers use the park annually. In addition, snowshoeing is allowed anywhere in the park, except on the groomed cross-country ski trails. The park's visitor center also offers snowshoe rentals.

Water Recreation

There are many opportunities for water recreation in Lake Bemidji State Park. A developed boat access to Lake Bemidji is located on the southside of the park. The mouth of Bass Creek has been dredged as a safe-harbor with docking facilities and a stone breakwater that extends out into Lake Bemidji. The water access is available for both motorized and non-motorized users. Boat rentals are available at the park for

Figure 11. Lake Bemidji State Park Archaeological and Historic Sites

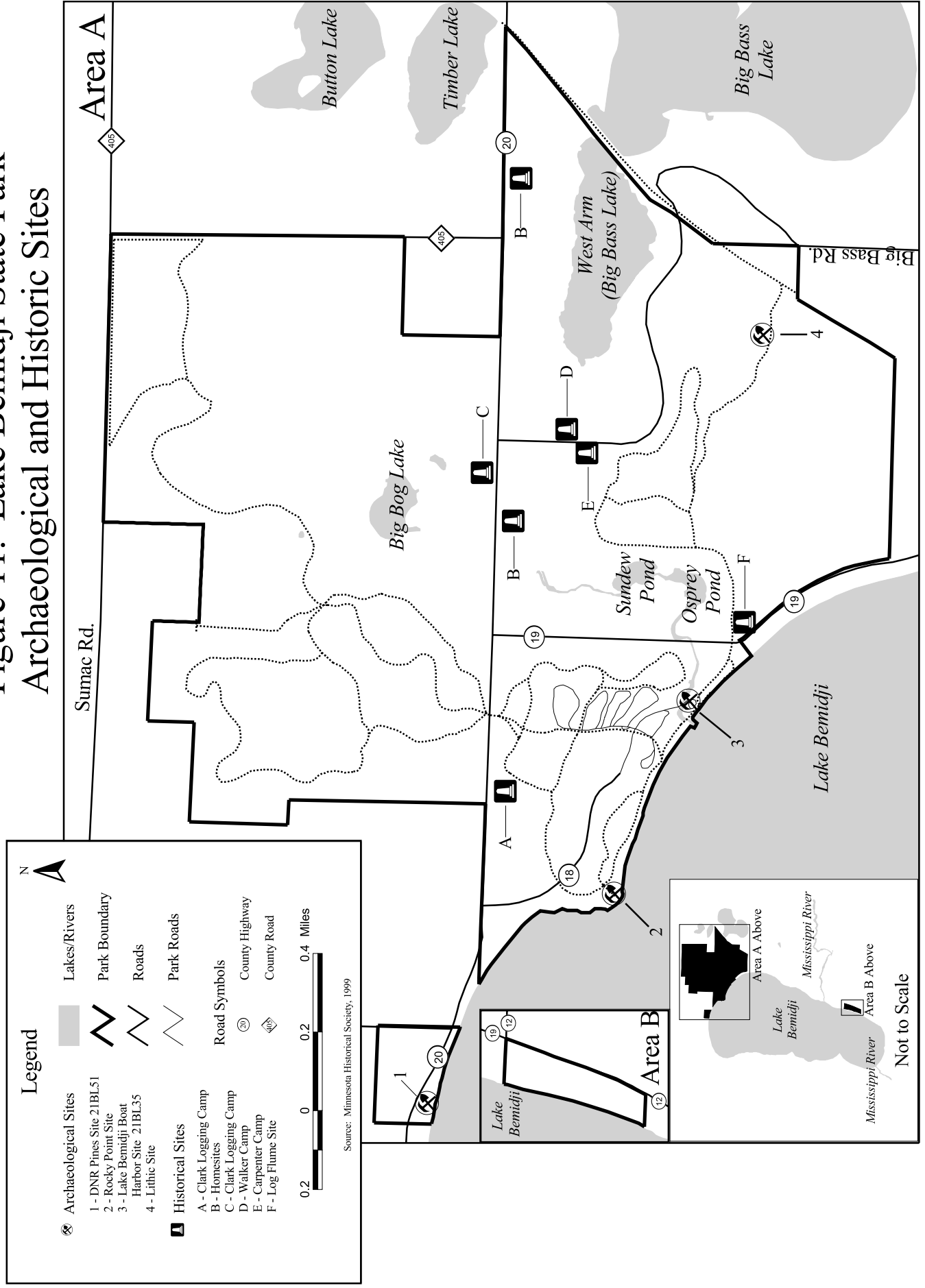
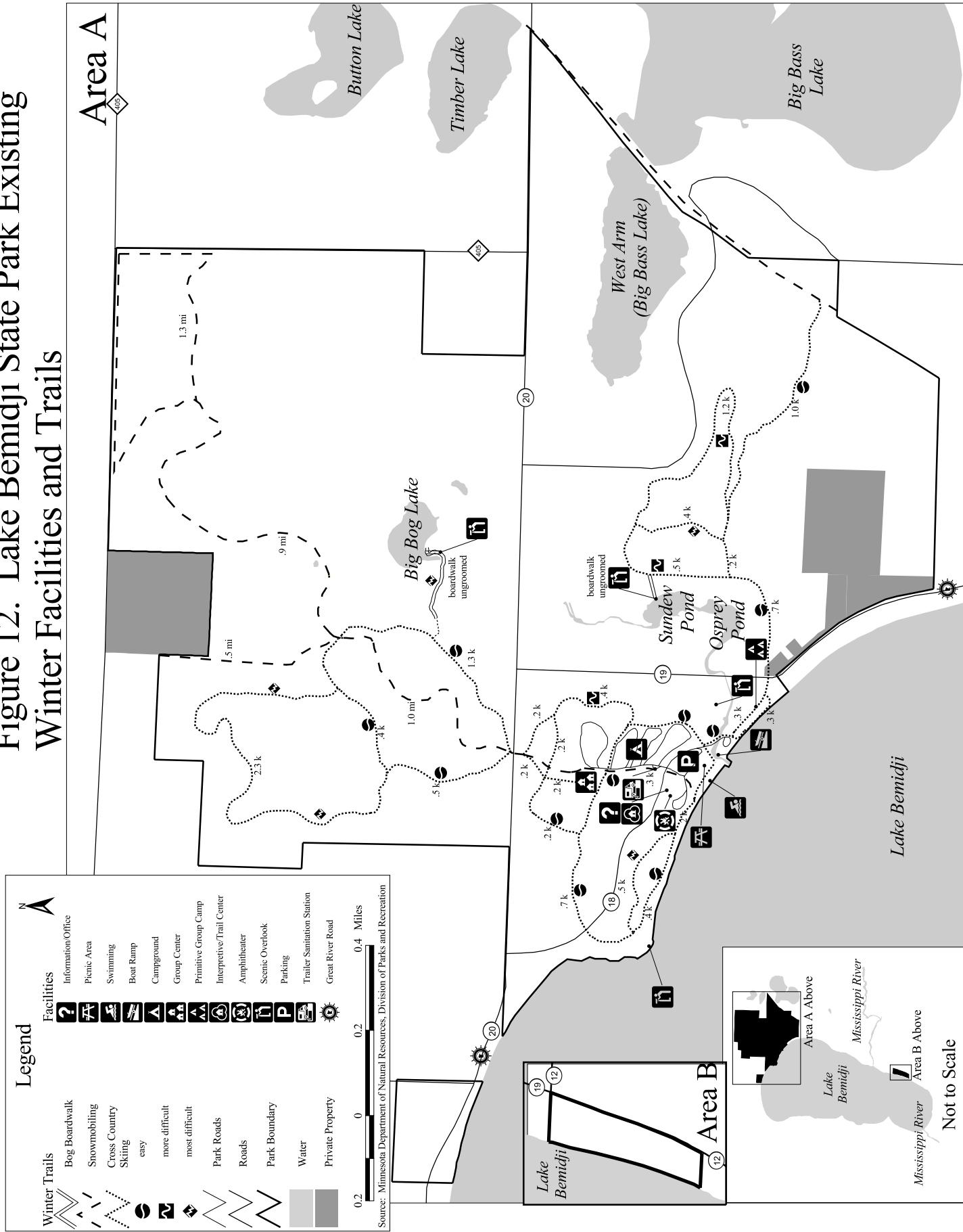


Figure 12. Lake Bemidji State Park Existing Winter Facilities and Trails



visitors who would like to enjoy Lake Bemidji on the water. Canoeists, kayakers, windsurfers and sailboaters are commonly found using the park's harbor and beach area. The park's small lakes and Bass Creek are also viewable from some of the hiking trails. In addition to the boating opportunities, fishing opportunities are available on Lake Bemidji and from the breakwater. Shore fishing in the park could be enhanced. A swimming beach exists on Lake Bemidji. Ice fishing occurs on Lake Bemidji and the park's lakes during the winter.

Camping and Group Camps

Only one campground exists within Lake Bemidji State Park. Located in the Concentrated Use Zone, this campground is in the southwest corner of the park and set back slightly from Lake Bemidji. There are four loops (Aspen, Birch, Pine, Oak) which provide 96 drive-in campsites including four drive-through site, 43 of which are electric sites. The campground also offers two restroom and shower facilities, one in the Aspen Lane and one in the Pine Lane loops. There is also one restroom-only building located directly to the south of the campground, and two sets of pit toilets at the group center and across from the Birch Lane Loop. Bass Creek Trail connects Birch Lane and Oak Lane loops to each other. The Homestead Trail also runs parallel to the campground and leads to the picnic area and swimming beach.

Lake Bemidji State Park's campground has served on average, nearly 1,725 campers a year over the last five years. This puts Lake Bemidji in the top 25 percent of Minnesota State Parks in terms of the total number of campers per year. Although approximately 50 percent of the park's campers are from Minnesota, visitors come from around the United States and Canada to camp in the park. Almost all of the park's campers visit during the summer months, with the majority visiting during July and August. The average occupancy rate over the past three years during the period of May 1 to August 31 for the park's campground was 40 percent overall. The park's campground is, however frequently filled to capacity on weekends during the summer months.

A semi-modern group camp (North Group Camp) and a rustic group camp (Bass Creek Group Camp) are also available at Lake Bemidji State Park (Figure 12). These group camps provide overnight accommodations to large groups of visitors during the spring, summer, and fall months. North Group Camp is located adjacent to the campground and provides picnic tables, fire rings, flush toilets, and showers for up to 50 tent or RV campers. An adjacent dining hall and kitchen is also available for rental through the park office. Bass Creek Group Camp is located east of the boat dock and marina and provides picnic tables, fire rings, and pit toilets to accommodate approximately 100 tent campers.

Recommendations and Actions

Lake Bemidji State Park's recreation resource management efforts should focus on providing opportunities for attainment of the recreation resource management goals and target benefits identified earlier in this chapter and realization of the vision and mission statements in Chapter 1. Recreation management actions should adhere to the management zoning concepts presented in Chapter 3 and applicable state and federal laws and be consistent with the park's overall target benefits identified in Chapter 3 and the natural and cultural resource management goals identified in Chapters 4 & 5. Because the quality of the experiences and benefits associated with the park are directly related to the quality of the natural and cultural resources found within the park, it is necessary that recreation management actions taken within the park protect the park's natural and cultural resources. In addition, design of specific facilities to implement these recommendations should adhere to the facility and building management recommendations presented in Chapter 8. Within this context, recreation management activities undertaken to implement the following recommendations should be tailored to the management zone where they will occur according to the management guidelines for each zone presented in Chapter 3.

Although the park's recreation management program generally reflects the program goals outlined earlier in this chapter and the management zone delineations found in Chapter 3, some improvements are recommended. Some of the program improvements may require increased operations and maintenance funding or development funding. A number of these recommendations involve facility modifications which should be conducted in accordance with the guidelines outlined in the facility management chapter (Chapter

8) of this plan. Continued cooperation with the park's resource management and interpretive programs will be essential to a ongoing and successful recreation management program.

The recommendations and management actions that follow are intended to provide a general direction for recreation management activities in the park. Annual work planning meetings will use these recommendations to determine short-term goals, priorities, and actions. Many of the management actions listed below are, therefore broad, and will become more specific through the work planning process.

Recommendation 13: Continue to provide visitors with a range of quality day use experience and benefit opportunities

Discussion: The park has an important role to play in providing sustainable recreational opportunities to its visitors. Clearly defined limits of use and development are necessary to protect the park's natural and cultural resources for future generations. While it is necessary to limit both the types and amounts of recreational opportunities, a range of high quality opportunities should be provided. Visitors come to the park to enjoy nature, learn about nature, improve their relations with their families, and participate in different activities than those they experience at home. Opportunities for solitude, escape from crowds, and relaxation should continue to be provided for visitors. Day use facilities should also provide opportunities for visitors of varying ages, abilities, experience levels, and cultural needs.

Actions to Implement Recommendation:

- A. Rehabilitate the areas and structures. The park's two picnic areas have been used heavily and continuously since the park was established in 1923. The areas are near cultural resource sites that must be preserved during the rehabilitation process.
- B. Provide a play area and facilities in the Concentrated Use Zone for families and children. The play area should be constructed of rustic style recreational equipment and located near the park's campground and picnic area.
- C. Rehabilitate the fish cleaning house near Lake Bemidji to make it more functional, accessible and to minimize environmental effects.
- D. Actively manage turf in the high use areas of the park.

Recommendation 14: Provide a variety of trail opportunities that also allow for natural and cultural resource protection within the park.

Discussion: Visitors come to Lake Bemidji State Park seeking a range of trail opportunities from short hiking and interpretive trails, remote hiking trails, and paved bicycle trails during the non-winter months and cross-country ski and snowshoe trails to snowmobile trails during the winter months. Lake Bemidji State Park serves as the trail head for the Blue Ox and Paul Bunyan State Trail, providing parking and year-round access. Visitors who engage in different trail activities also seek somewhat different experiences and settings. The park should continue to provide a range of recreational trail opportunities. This range should include opportunities for natural surfaces and paved surfaces, flat terrain and rugged terrain, short hikes and long hikes, pedestrians and bicyclists, snowmobilers and cross - country skiers, and visitors with disabilities. The ability to provide opportunities for attainment of the target benefits associated with recreational trails requires protection of the significant natural and cultural resources found within the park. Protection of the park's natural and cultural resources is more important than trail access, use, or development options throughout the park. Trail management actions should be consistent with both the park's natural and cultural resource management goals.

Actions to Implement Recommendation:

- A. Support the effort to provide a hard surface trail that is safe, esthetically pleasing, and with adequate access around Lake Bemidji.
- B. Work with interpretive and natural/ cultural resource management staff to design additional appropriate trail opportunities within the park. Special attention should be given to revising and implementing the Bog Walk trail plan.

- C. Rehabilitate the existing trail system and realign trails where necessary to minimize resource impacts, safety hazards, use conflicts, and increase access where feasible. Paving the Rocky Point Trail to the overlook, realigning the bicycle trail to remove safety hazards on Rocky Point Trail and the waterfront are among proposed rehabilitation projects.
- D. Realign the Paul Bunyan State Trail to separate it from the Bass Creek Group Camp access road to enhance visitor safety.
- E. Continue to provide winter trail opportunities that include cross-country skiing, and snowmobiling. Cross-country ski and hiking trails will be stand alone trail systems within the park, and the snowmobile trails will be connected through the park to other area trail systems. Some of the lightly used snowmobile trails in the park may be closed.
- F. Rehabilitate and surface the main picnic area parking lot so it can be used by both park day users and Paul Bunyan State Trail users.
- G. Periodically monitor trail use patterns, impacts of trail uses on natural and cultural resources, and quality of visitor experiences.

Recommendation 15: Continue to maintain a range of water recreation opportunities.

Discussion: With nearly 20 percent of the park's land surface classified as wetlands (lakes, streams, marshes, swamps, etc.), water resources are abundant at Lake Bemidji State Park. The park's location on the shores of Lake Bemidji and near the city of Bemidji also make it a popular attraction for local residents seeking access to water recreation opportunities. Many visitors come to the park to engage in water recreation activities ranging from swimming and boating to fishing and sightseeing. It is important that the park offer opportunities for those water recreation activities that are consistent with sound resource management principles, the park's management zoning concepts, and the park's target benefits.

Actions to Implement Recommendation:

- A. Continue to provide quality opportunities for visitors to enjoy Lake Bemidji by swimming, boating and fishing. These must be provided with a sensitivity to minimizing shoreline erosion, and visitor's potential impact on significant natural and cultural resources.
- B. Consider the aesthetic impacts to boaters, sightseers, and hikers when projects are undertaken that modify the park's shorelines including the impact of lighting;
- C. Construct a fishing pier that provides good access for shore fishing off the west jetty.

Recommendation 16: Continue to provide visitors with quality and safe camping opportunities.

Discussion: Lake Bemidji State Park's camping opportunities are important to visitors and attract a range of visitors from those seeking flush toilets and electricity to those seeking tent sites. Included in the mix, are people arriving in larger groups. The park's high weekend campground occupancy rate underscores the importance of camping opportunities to the park's visitors. At the same time, the impact of camping facilities on the park's natural and cultural resources is an important consideration when determining the appropriate size and location of camping opportunities.

Actions to Implement Recommendation:

- A. Redesign and reconstruct the existing campground to address several site rehabilitation needs and changing use patterns. Three of the campground's four loops have been in use since the early 1960s. The fourth loop was added in 1978. High density and frequency of use have resulted in problems of erosion, crowding, compacting, turf loss, and deforestation. The existing utility infrastructure is incomplete, insufficient and in need of replacement. Resource damage and degradation is evident throughout the campground. Vegetation damage should be addressed with tree planting and proper landscaping. Existing campsites should be evaluated to determine if they should be reconstructed or relocated. Redesign should consider ways to increase resource protection, privacy, and

- distance between sites. Alternatives to the current dirt and gravel campground road surfaces should be considered to reduce erosion after rehabilitation.
- B. Consider expanding the number of electrical sites available in the campground to more adequately accommodate visitor demand.
 - C. Continue to monitor vegetation within the campgrounds and take appropriate actions, such as tree planting and site rotation to ensure that impacts of visitor use on vegetation is minimized.
 - D. Improve group camping experience by providing shelters and easy access to potable water.

Recommendation 17: Continue to explore ways to involve a variety of people and agencies in recreation management actions within Lake Bemidji State Park.

Discussion: Development of this management plan has been the result of a cooperative public involvement effort. Many of the people participated in the task of developing the recommendations found in this chapter. The energy and commitment that these people brought to the process is an incredible resource that is available to the park's management team for use in other recreation management actions.

Actions to Implement this Recommendation:

- A. Promote volunteer activities by: developing lists of projects that volunteers can accomplish, increase staff assistance to organize, supervise, and guide volunteers, and recognize volunteers efforts on the wall of honor in the visitor center.
- B. Continue to work with neighboring public and private land owners and recreation providers to ensure that appropriate and coordinated recreational opportunities are provided within the park and region.
- C. Park staff and the Lake Bemidji State Park Citizens Association will continue to coordinate and promote special recreational activities and events.

Recreation Research and Monitoring

Periodic research and monitoring of the park's recreation management efforts is important to measuring the quality of visitor experiences, impacts on natural resources, and general effectiveness of management efforts to respect the management zoning concepts and realize the park's target benefits. Although some research exists on visitor behavior, no systematic approach to conducting social science research in the park has been adopted. Attendance data and trail counts have been collected on an annual basis. This research should continue to provide basic information on specific facilities that visitors use. Baseline research on the benefits that visitors and communities attain from the park has been conducted. Follow-up experience and benefits research should be conducted on a regular basis to evaluate progress toward meeting visitor expectations and to identify changes in expectations. This line of research examines the psychological experiences and benefits that visitors find important to and attain from their visits. This line of research also assesses the relationships that exist between the park and local communities by examining the value that the park's resources have to communities. Social science research should be coordinated with natural science research conducted in the park to examine relationships between social and natural phenomena.

Chapter 8. Buildings and Facility Management

Introduction

Several of the recommendations found in this management plan involve modifications to existing buildings and facilities or construction of new buildings and facilities. In order to maintain the park and to insure high quality visitor experiences, certain facility/infrastructure needs must be addressed and certain operational requirements must be met. This chapter (a) presents the major goals of the park's buildings and facilities management efforts, (b) highlights some of the major buildings and facilities recommendations found in other chapters, and (c) presents infrastructure maintenance needs not found in other chapters.

Management Goals

- Consider regional needs for recreational opportunities when designing and constructing facilities within the park;
- Provide buildings and facilities that are compatible with the park's natural and cultural environment;
- Provide buildings and facilities (including roads and trails) that aid in experience and benefit attainment at the park;
- Consolidate building, road and facility development to protect visitor safety and minimize impact to the park's larger natural areas;
- Provide for preservation and restoration of cultural and historical resources; and
- Include facility and infrastructure needs in the ongoing park planning and budgeting process.

ADA Requirements

The Department of Natural Resources follows the Americans with Disabilities Act of 1992 to make public facilities accessible. All MNDNR development follows the buildings and facilities guidelines presented by the US Architectural and Transportation Barriers Compliance Board and the US Department of Transportation (1994). In addition, recreational development accomplished by MNDNR follows the recommendations and guidelines presented by the US Architectural and Transportation Barriers Compliance Board (1994) to address those outdoor facilities that are not adequately covered in the general building and facilities guidelines. Although the recreational guidelines have not been approved, MNDNR follows them as though they have been approved. As changes or revisions are made in the federal guidelines, they will be incorporated into MNDNR's development projects.

Infrastructure Maintenance

In addition to the building and facility recommendations found elsewhere in this management plan, it is important that the park's basic infrastructure be maintained. This includes maintenance of the park's road system that provides access to the campground, picnic area and harbor area. This road system is the major transportation route for most of the park's visitors. In recent years, erosion, increased vehicular traffic, and age have created some weaknesses in the system that should be addressed.

Maintenance and upgrade of sewer, power, telephone, electrical and water lines as necessary is also an important component of the park's overall building and facility management efforts. The utility systems require constant maintenance and examination for current code compliance. Periodic upgrades are necessary to address changing infrastructure, codes, and technology.

Recommendations and Actions

Recommendation 18 : Maintain the basic infrastructure of the park facilities for safe, and convenient public use, provided consistent with the esthetic qualities of the area.

Actions to Implement Recommendation:

- A. Provide adequate staff to meet public expectations in the operation and maintenance of the park in accordance with park standards.
- B. Maintain and rehabilitate the park's road system that provides access to the campground, picnic area and harbor area. This road system is the major transportation route for most of the park's visitors. In recent years, erosion, increased vehicular traffic, and age have created some weaknesses in the system that should be addressed.
- C. Maintain and rehabilitate sewer, power, telephone, electrical and water lines as necessary. This is an important component of the park's overall building and facility management efforts. The utility systems require constant maintenance and examination for current code compliance. Periodic upgrades are necessary to address changing infrastructure, codes, and technology.
- D. Maintain and rehabilitate park buildings and small structures. These are critical facilities for visitor enjoyment of the park. Continued care is needed to provide for quality visitor experiences and to avoid costly replacements.
- E. Provide adequate equipment and equipment maintenance for park operation.

Chapter 9. Park Boundary

Introduction

State Park boundaries are established by the Minnesota Legislature. Statutory boundaries serve to identify lands appropriate for inclusion in the park. All boundaries are legally described in Minnesota Statutes. State parks are authorized to negotiate acquisition of land only within the statutory boundary. The state does not have the authority to acquire park land except from willing sellers nor can landowners be required to sell to the state. Inclusion in a park boundary does not limit what private landowners can do with their property.

Boundary modifications are considered during all state park management planning processes. Although this plan can recommend boundary changes, only the Minnesota Legislature can change park boundaries. All boundaries are legally described in Minnesota Statutes. When an additional to a park is considered, the DNR Division of Parks and Recreation will contact private landowners that would be within a proposed boundary and ask for their documented support. Without the support of the community, the Division of Parks and Recreation will not request boundary changes from the Minnesota Legislature.

Recommendations and Actions

Recommendation 19: A revision of the park statutory boundary will be considered at the request of adjacent landowners if the potential boundary changes will help to preserve contiguous natural ecosystems, enhance visitor experiences, or provide expanded recreational opportunities.

Chapter 10. Park Operations

Current Staffing

Lake Bemidji State Park's staff currently includes four full-time employees (i.e., a park manager, assistant manager, naturalist and general repair worker), a part-time clerk and several seasonal employees (Figure 16). These positions provide general park administration, resource management, interpretative services, public safety and general building and facility maintenance. The regular full-time and seasonal staff is supplemented with Minnesota Conservation Corps summer youth workers, student interns, Federal summer youth program workers, Greenview, Inc. employees, Sentence-to-Service workers, and volunteers when available.

The park manager have received enforcement training and are qualified to issue citations to enforce state park rules within the park's boundary. They call on other law enforcement agencies, particularly MNDNR Conservation Officers as necessary to assist with law enforcement within Lake Bemidji State Park. MNDNR

Lake Bemidji State Park Existing Staff Organizational Chart FY 2002



Conservation Officers primarily help enforce fishing, hunting and trail use rules and regulations within the park.

In addition the park manager supervises three staff (a full-time Building and Grounds Worker, part-time Laborer General, and a part-time Security Ranger) that manage 96 forest campsites that were formerly managed by the Division of Forestry.

Assistance from other divisions and bureaus within the Department of Natural Resources is also provided to accomplish specific management actions. For example, the Division of Forestry provides technical assistance and staff support for forest management activities; the Division of Fish and Wildlife assists with wildlife management, and fish management; and the Bureau of Engineering assists with building and facility

modification projects. Minnesota Conservation Corps work crews also provide assistance to the park's trail maintenance and resource management efforts.

Future Staff Needs

The MNDNR, Division of Parks and Recreation estimates that some of the recommendations contained within this plan will result in increased staffing needs for Lake Bemidji State Park. Other MNDNR disciplines may also experience some increased work load in the implementation of certain recommendations and actions. For example, the Division of Enforcement may experience increased work loads as a result of increased or modified recreational opportunities within the park. The level or amount of this increase is difficult to estimate because many of the recommendations are too general to base estimates on at this time. However, the following reflect an initial analysis of major future staffing needs. These needs are above and beyond those currently identified for Lake Bemidji State Park under the Division of Parks and Recreation's Minimum Operating Standards and should be implemented as funding for staff expansion becomes available.

Park Administration

Funding for general park administration at Lake Bemidji State Park is well below the Division of Parks and Recreation's Minimum Operating Standards. As this plan is implemented, the plan will experience increases in use. This related to all park plan improvements, including the campground rehabilitation, completion of the recommended bog walk, and completion of the Paul Bunyan trail through the park. To meet these needs, this plan recommends that the park be funded its current minimum operating standard and that its minimum operating standard be reviewed for accuracy as the plan is implemented.

Interpretive and Environmental Education Services

The Interpretive and Environmental Education Services chapter (Chapter 7) recommends that the park's interpretive staff be expanded by one seasonal person to comply with the Division of Parks and Recreation's Statewide Interpretive Plan recommendations for Lake Bemidji State Park. This additional staff would assist with personal program delivery, display and publication design, community outreach and assist in developing non-personal programs.

Natural and Cultural Resource Management

Currently resource management activities within the park are primarily conducted by the Division of Parks and Recreation's Regional Resource Management Specialist with assistance of other MNDNR staff. Because of the volume, intensity and complexity of resource pressures at Lake Bemidji State Park and the growing demands on the Regional Resource Management Specialist's time by other state parks within the region, additional resource management assistance will be needed in the park as this management plan is implemented. Among these needs include, wetland restoration and management, pine regeneration and aquatic systems management.

Operations Needs

If all of the recommendations and actions in this plan were implemented, the park's annual operational costs would increase. The level or amount of this increase is difficult to estimate because many of the recommendations are too general to base estimates on at this time. However, the increase in staffing outlined in the previous section combined with a review of the building and facility modification projects discussed in other chapters of the plan, suggests the park's annual operating budget will need to increase significantly over time.

Chapter 11. Plan Modification Process

State Park Management plans document a partnership-based planning process, and the recommended actions resulting from that process. These comprehensive plans recognize that all aspects of park management are interrelated, and that management recommendations should also be interrelated.

Over time, however, conditions change that effect some of the plan recommendations or even an entire plan. Plans need to acknowledge changing conditions, and be flexible enough to allow for modifications as needed.

There are two scales or types of plan modifications: plan revisions and plan amendments. Minor plan revisions concern less controversial issues and can generally be made within the Division of Parks and Recreation as plan modifications. Larger issues that represent changes in management direction or involve other portions of the Department or other state agencies are addressed as plan amendments. The Division of Parks and Recreation Planning Manager will make the decision of whether a plan amendment or plan revision is appropriate

To maintain consistency between plans and processes, all revisions and amendments will be coordinated through the Division of Parks and Recreation planning section. Requests for planning assistance should be directed to the Division of Parks and Recreation Planning Manager in the Central Office, St. Paul.

Plan Amendments

Plan Amendment Criteria

The criteria outlined below will be used to determine whether the proposed change warrants a plan amendment:

The proposed change:

- Alters the park mission, vision, goals, specific management objectives, or proposed development plans outlined in the plan;
- Is controversial between elected officials and boards, park user groups, the public, adjacent landowners, other DNR divisions or state agencies; or
- Directly affects other state agencies (e.g., Minnesota Historical Society).

Plan Amendment Process

The plan amendment process has a series of steps.

1. Review the proposed change at the park and regional level. Determine which stakeholders potentially have a major concern and how those concerns should be addressed. If the major concerns are within the Division of Parks and Recreation, the issue should be resolved within the Division, with input from the public. The proposed change is then reviewed with the Division Central Office Management Team
2. If the proposed change involves other DNR Divisions, the issue should be resolved by staff and approved by the affected Division Directors. This may require one or two area/regional integrated resource management team meetings. The proposed change will be reviewed through the Department's review process (Statewide Interdisciplinary Review Service or SIRS).
3. If the proposed change issue involves other state agencies, the issue should be resolved by staff and approved by the Division Central Office Management Team - with input from the public - and reviewed by SIRS.
4. If the proposed change is potentially controversial among elected boards, park user groups, adjacent landowners or the public, an open house will be held that is advertised in the local and regional area.

5. All plan amendments should be coordinated, documented, and distributed by the Division of Parks and Recreation planning staff.

Plan Revisions

If a plan change is recommended that does not meet the amendment criteria above, and generally follows the intent of the park management plan (through mission, vision, goals, and objectives), the Division of Parks and Recreation has the discretion to modify the plan without a major planning process.

Revisions related to Physical Development Constraints and Resource Protection

Detailed engineering and design work may not allow the development to be completed exactly as it is outlined in the plan. A relatively minor modification, such as moving a proposed building site to accommodate various physical concerns, is common. Plans should outline a general direction and document the general “areas” for development rather than specific locations. For the most part, plans are conceptual, not detail-oriented. Prior to development, proposed development sites are examined for the presence of protected Minnesota Natural Heritage Program elements and historical/archeological artifacts. If any are found, the planned project may have to be revised to accommodate the protection of these resources.

Program Revisions

The resource management and interpretive services plan sections should be updated periodically as needed. The Division of Parks and Recreation’s Resource Management and Interpretive staff will determine when an update is needed, and coordinate the revision with the park planning section. Program sections should be rewritten in a format consistent with the plan as originally approved by the DNR. To retain consistency, Division of Parks and Recreation planning staff will be involved in the revision review, editing and distribution.

References Cited

- Anfinson, Scott F. and Peterson, Randy J. (1989). Minnesota Municipal and County Highway Archaeological Reconnaissance, 1988 Annual Report. St. Paul, MN: Minnesota Historical Society.
- Coffin, B. and Pfannmuller, L. (1988). Minnesota's endangered flora and fauna. Minneapolis, MN: University of Minnesota Press.
- Driver, B.L., Brown, P.J. and Peterson., G. L. (Eds.) (1991b). Benefits of leisure. State College, PA: Venture.
- Frissell, S.S. (1973). The importance of fire as a natural ecological factor in Itasca State Park, Minnesota. *Quaternary Research* 3: 397 - 407.
- Green, J. C. (1995). Birds and forests: A management and conservation guide. St. Paul, MN: Minnesota Department of Natural Resources.
- Haws, Katie (2001) DNR Nongame Specialist, Lake Bemidji State Park Plan Review, Personal Communication. Bemidji, MN: Minnesota Department of Natural Resources.
- Hazard, E. B. (1982). The mammals of Minnesota. Minneapolis: University of Minnesota Press.
- Maxoson, G (1992). A survey of the Lake Bemidji bogwalk. Unpublished report. Bemidji, MN: Minnesota Department of Natural Resources.
- Meyer, R. W. (1991). Everyone's country estate: A history of Minnesota's state parks. St. Paul: Minnesota Historical Society Press.
- Minnesota Department of Natural Resources, Division of Parks and Recreation (1995). Minnesota state park system: Interpretive services plan. St. Paul, MN: Minnesota Department of Natural Resources.
- Minnesota Department of Natural Resources, Natural Heritage Program (1993). Minnesota's native vegetation: A key to natural communities. Biological Report No. 20. St. Paul, MN: Minnesota Department of Natural Resources, Section of Wildlife.
- Minnesota Department of Natural Resources (1994). Old-growth forests guideline. St. Paul, MN: Minnesota Department of Natural Resources.
- Schmidt, Konrad P.(1993) Minnesota State Parks Fish Species Lists. Unpublished report, North American Native Fishes Association, pp 33-34
- Smith, W. R. (1993). Orchids of Minnesota. Minneapolis: University of Minnesota Press.
- Stein, T.V. and Anderson, D. H. (1998). Community benefits study: Itasca and Tettegouche State Parks (Final technical report). St. Paul, MN: University of Minnesota, Department of Forest Resources.
- Stewart, O.C. (1956). Fire as the first great force employed by man. In *Man's role in changing the face of the earth*. Chicago, Ill.: University of Chicago Press, 115 - 133.
- Streiff, Jan E. (1982). Lake Bemidji: A Minnesota State Park Development Project Reconnaissance Survey. Minneapolis, MN: University of Minnesota, Department of Anthropology.

Tester, J. R., Starfield, A.M. & Frelich, L. E. (1997). Modeling for ecosystem management in Minnesota pine forests. Biological Conservation (80), 313 -324.

United States Department of Agriculture, Natural Resources Conservation Service and Forest Service (1997). Soil survey of Beltrami County, Minnesota. Washington, D.C.: U.S. Government Printing Office.

Vernon, Robert, Susan Queripel and Michael Budak. (1979). A Cultural Resources Survey for the Minnesota Department of Natural Resources. Minnesota Historical Society, St. Paul.