NERSTRAND BIG WOODS STATE PARK

Management Plan

May 20, 1998

Minnesota Department of Natural Resources
Division of Parks and Recreation

Minnesota Department of Natural Resources

OFFICE OF THE COMMISSIONER
500 Lafayette Road
St. Paul, Minnesota 55155-4037

RE: DEPARTMENT OF NATURAL RESOURCES APPROVAL OF MANAGEMENT PLAN FOR MAPLEWOOD STATE PARK

Minnesota Statutes 86A.09 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 1963 established Maplewood State Park.

Over the past year and a half, the Department of Natural Resources (DNR) as worked in partnership with local citizens to develop a management plan for this park. The management plan was approved through the DNR's CTECH/Senior Managers' review process during February, 1998.

Rodney W. Sando
Commissioner

Nerstrand Big Woods State Park Management Plan

State of Minnesota, Department of Natural Resources, 1998

This Management Plan is a cooperative project. For more information please contact any of the following project participants.

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We would like to thank the 71 citizens and dozens of DNR staff who also participated in this management planning process.

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List of Maps

INTRODUCTION

Executive Summary

Nerstrand Big Woods State Park provides a range of recreational opportunities, globally significant vegetation, and relatively preserved natural conditions near the Twin Cities metropolitan area. The park is situated in eastern Rice County and is characterized by extensive hardwood forests, oak savanna, and remnant prairie, with a deep creek valley containing waterfalls. Nerstrand Big Woods State Park is close to Caron County Park, Seven Mile Woods, Cannon River Wilderness Area, River Bend Nature Center, and Falls Creek County Park which provide additional resources and recreational opportunities. The park is situated in a region of southern Minnesota that is currently experiencing one of the most rapid increases in urban development. This growth can be attributed to several factors: the spreading of the Minneapolis-St. Paul metropolitan area; outstanding outdoor recreation opportunities; and increased business traffic. At the same time, there is a renewed awareness of the environment, due largely to the work of private citizens and organizations such as The Nature Conservancy, the Big Woods Project, the Cannon River Watershed Partnership, Seven Mile Woods Association, Friends of the Big Woods and Friends of Cannon River Wilderness Area.

To meet the growing customer needs, the Minnesota Department of Natural Resources (DNR), in cooperation with the Minnesota Riverland Technical College in Faribault, constructed a new 2,852 sq. ft. park visitor center in 1995. The new facility will enable Nerstrand Big Woods State Park to provide additional opportunities for environmental, natural, and cultural interpretation.

Nerstrand Big Woods is the largest remaining example of south central Minnesota Big Woods and harbors one of two Minnesota endemic plants: the Minnesota dwarf trout lily. This species is presently known to occur only in Rice, Goodhue, and Steele counties. With this in mind, the planning participants have been careful to not recommend too much use or too many different uses in the park. The effort has been to choose the most compatible uses for Nerstrand Big Woods. As a result of this planning project, Nerstrand Big Woods State Park will be rehabilitating the existing park trail system. In general, trails will be utilized year round with skiing and hiking trails located in the northern part of the park. Snowmobile and hiking trails will be in the southern areas of the park. The Division of Parks and Recreation is also seeking funding for resource restoration projects in many areas of the park, install walkway lighting in the parking area, and conduct a variety of natural resource management activities and interpretive projects.

Nerstrand Big Woods State Park has an experienced, knowledgeable and dedicated management team and work force that are committed to efficiently and innovatively managing the resources, working with the neighbors and neighboring communities, and serving recreational users. The planning process has resulted in the development of an integrated resource management plan utilizing extensive public involvement.

The following comprehensive management plan presents the mission, vision, goals, and key issues. There is a detailed assessment of resources and recreational opportunities that provide data for use in making management decisions. At the end of each chapter are the recommended future actions. This plan provides the basic management direction for the park and is not intended to provide specific management or development details. The DNR seeks funding to complete trail and facility improvements and to commence the next phases of natural resource management and interpretive services planning.

Park Description

Nerstrand Big Woods State Park is located in southeastern Minnesota in Rice County. The park is approximately 1-1/2 miles west of Nerstrand, 11 miles southeast of Northfield, and 12 miles northeast of Faribault. It is located 45 miles south of Minneapolis and St. Paul. The existing statutory boundary of Nerstrand Big Woods State Park includes approximately 2,882 acres. Included within the boundary are approximately 1,227 acres of privately owned land in 40 parcels, approximately 460 acres of trust fund land and 1,194 acres of state park administered land (this includes 84 acres of SNA land, administered by Division of Parks and managed cooperatively with the Scientific and Natural Areas (SNA) program).

The original park boundary was Section 16 and Section 9 of T 110N, R 19W. The park is divided nearly equally into a north and south unit by County 88. The two portions differ in many regards including the character of the land and the pattern and type of visitor use. The north unit contains the park office, campgrounds, and picnic area and consequently receives more traffic from day use and extended use visitors. The south unit contains the park maintenance area as well as the sewage treatment lagoon. Trail development is about equal in both areas, however, some uses like snowmobiling are restricted to the southern portion only. The south unit has fairly level trails, with very diverse topography in some areas, and contains less disturbed vegetation. In the north unit, Prairie Creek has created a more extensive valley system and the vegetation is relatively more disturbed. The Minnesota dwarf trout lily, one of Minnesota's endemic species, is restricted to the valley slopes and bottoms of the northern area, mainly within a Natural Heritage Registry Site within the park. In 1997, a new population of this species was found in the park, but outside of the Registry area.

Legislation

Early legislative history on Nerstrand Big Woods is long and complicated, partly due to the Depression and World War II. After more than ten years of effort, Nerstrand Big Woods State Park was established on March 28, 1945 when the bill was approved by the legislature and then signed by Governor Edward J. Thye.

History in Review

1934 - The first serious effort to establish the park began in 1934. The first National Park Service inspectors to the site were impressed and reported that no time should be lost in buying up the lands.

1935 - Appraisers with the State Emergency Relief Administration took options on the woodlots, but due to bureaucratic delays, failure to get a Civilian Conservation Corps (CCC) camp, and a lack of legislative action, the first effort to establish Nerstrand as a state park was unsuccessful.

1939 - Bills were again introduced in both houses of the legislature. Neither bill passed.

1941 - Bills were introduced again in 1941, and the House bill passed while the Senate bill failed to make it out of committee. About this time a new approach was tried. State funds were not available to purchase the land, but the federal government did have money for land purchase. An arrangement was made with the U.S. Forest Service (USFS) to acquire lands in the Nerstrand Woods and exchange them for state-owned lands of equal value within the boundaries of the Superior National Forest.

1944 - The USFS acquired more than 70 woodlots covering 460 acres. This was enough to induce the legislature to pass a bill establishing a park.

1945 -The Nerstrand Woods bill, provided that upon receipt of the lands acquired by the USFS, together with tax-forfeited lands, within Section 9 and 16, Wheeling Township, the area should be established and dedicated as Nerstrand Woods State Park. The Commissioner of Conservation was empowered to solve problems in the land titles and to acquire other lands by gift or purchase. A special provision stated that suitable portions of Nerstrand Big Woods State Park be used for scientific purposes and forestry experiments in cooperation with the University of Minnesota. At least 100 hundred acres of the best timbered and most scenic portions, however, should be reserved for public park purposes. The bill included no appropriations, but was passed and signed into law. Land acquisition progressed slowly and by 1968 only 563 acres had been acquired.

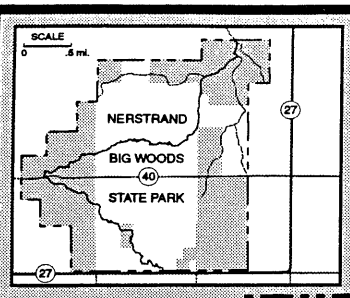
1971 - The legislature passed the "right of eminent domain" for the acquisition of "all land remaining in private ownership within the (Nerstrand State) park boundaries." This is an uncommon piece of legislation, the Division of Parks and Recreation does not normally have the right of eminent domain and usually only purchases land from willing sellers. In fact, eminent domain was never used at Nerstrand Big Woods. However, land acquisition did move faster and by 1976, the park had acquired 896 more acres, at which time the eminent domain law was amended and removed.

1990 - The park name was changed to Nerstrand Big Woods State Park.

1992 - The Minnesota Legislature expanded the park boundaries. The total statutory boundary is now approximately 2,882 acres. The purpose of the boundary expansion was to more accurately reflect the big woods ecosystem, rather than following the section lines.

1996 - The Big Woods Dairy Farm is established and in 1997 is transferred to the park. It is the first working farm in a state park (owned by the state). The demonstration farm is designed to promote sustainable rotational grazing though a lease agreement with the Brossard family. It is a partnership between The DNR, The Nature Conservancy, the Minnesota Department of Agriculture, and the farm family.

Summer Trail Map



NORTH

PARK STATUTORY BOUNDARY

Because lands exist within the boundaries of this park that are not under the jurisdiction of the D.N.R., check with the park manager if you plan to use facilities such as trails and roads other than those shown.

Respect Private Property
Ask First

Prairie Creek

1.0 mi.
1.2 mi.
0.1 mi.
0.1 mi.
Fawn Trail
0.2 mi.
Hope Trail
Fawn Trail
0.2 mi.
0.1 mi.
0.3 mi.
0.3 mi.
White Oak Trail
0.4 mi.
0.1 mi.
0.1 mi.
Hidden Falls
Beaver Trail
0.4 mi.
Oak Bridge
0.3 mi.
Fern Hill
0.2 mi.
0.3 mi.
0.1 mi.
0.1 mi.
0.1 mi.
0.3 mi.
0.1 mi.
0.1 mi.
0.1 mi.
0.3 mi.

88

40
to NERSTRAND, 2 miles

0.2 mi.
Basswood Trail
0.1 mi.
Fox Trail
0.1 mi.
0.6 mi.
0.2 mi.
0.1 mi.
Basswood Trail
0.5 mi.
Maple Trail
0.4 mi.
0.4 mi.
Prairie Creek
0.3 mi.
0.5 mi.
Ironwood Trail
0.6 mi.
Blue Beech Bridge
0.5 mi.
Fox Trail

SUMMER TRAILS

Hiking

FACILITIES

- Visitor Center
- Picnic Area
- Trailer Sanitation Station
- Campground
- Waterfall
- Primitive Group Camp
- Private Property
  Public Use Prohibited
  (except on designated trails)

0 .1 .2 .25 Miles
0 .1 .2 .3 .4 Kilometers

PARK STATUTORY BOUNDARY

27
to FAIRBAULT, 13 miles

27

24

Park Advisory Committee and Planning Process

The Friends of Nerstrand Big Woods State Park Association, Inc. was active in the park when this planning process began. Many of their members were involved throughout the planning process as were members from the Big Woods Project and the Cannon River Watershed Partnership. Altogether, 71 citizens participated in the management planning process, a complete listing is available in the planning process file.

In January 1997 a public news release announced the beginning of the planning process. It noted that there would be several public "open houses" and a Park Planning Citizen Advisory Committee. The initial committee structure included representation from the following:

1. Rice County Board
2. Local farmers
3. Public school teacher
4. Local historian
5. The Nature Conservancy
6. Several area business people
7. Friends of Nerstrand Big Woods State Park
8. Cannon River Watershed Partnership
9. Park volunteers
10. Local environmentalists
11. Big Woods Project
12. Snowmobile clubs/interests
13. Neighbors of the park

The Citizen Advisory Committee often meet jointly with the DNR Integrated Resource Management Team. Meetings were held to discuss major planning issues on the following dates (advertised and open to the public):

January 23, 1997	Park overview, develop "preferred future" statements, develop list of park issues & concerns
February 18, 1997	Natural resource management issues
March 10, 1997	Natural & cultural resource management issues
April 3, 1997	Recreation resources issues
May 22, 1997	Partnerships, community involvement & volunteers
June 23, 1997	Interpretive/visitor services issues
July 28, 1997	Land management & boundary issues
September 10, 1997	Finish camping & day use issues, & the game refuge
October 14, 1997	Finish trail issues

In addition, public "Open Houses" were held on June 1, 1997, November 6, 1997 and March 31, 1998.

The Department of Natural Resources formed an Integrated Resource Management (IRM) team to assist in developing this park plan. This professional team included: personnel from the Division of Forestry, the Area Wildlife Supervisor, the Regional Nongame Wildlife Specialist, the Area Fisheries Supervisor, the Area Conservation Officer, SNA personnel, Division of Minerals personnel, the Area Trails and Waterways Supervisor, the Area Hydrologist, the Big Woods coordinator, Regional Parks and Recreation personnel, and Nerstrand Big Woods State Park personnel.

The IRM team met formally (as part of the Big Woods Project meeting) on January 7, 1997, April 14, 1997, October 1, 1997, and February 2, 1998. There were also several informal meetings with individual team members throughout the process.

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

It should be noted that this is the second comprehensive management plan for Nerstrand Big Woods State Park. In June 1983, the first park plan was completed and approved.

A comprehensive park plan and "planning process file", documenting the 1997 planning process and pertinent background information, will be distributed to the following locations: Nerstrand Big Woods State Park, Area Naturalist office, Region 5 Parks and Recreation Manager, State Park Planning Section (St. Paul), and DNR Engineering (St. Paul). Park plans will also be located in the DNR Library and in the Nerstrand, Faribault and Northfield Libraries.

Nerstrand Big Woods State Park's Mission/Vision/Goal

The following statements were generated by participants of the planning process .

Nerstrand Big Woods State Park Mission and Visitor Experience:

To preserve and manage the diverse natural, scenic, and cultural resources of Nerstrand Big Woods State Park for present and future generations while providing appropriate recreational and educational opportunities.

Enjoy this park on foot, any season of the year. In the spring, the park is a wildflower garden where hepatica, bloodroot, Dutchman's breeches, and the Minnesota dwarf trout lily bloom. This is the only state park where the Minnesota dwarf trout lily is found. Relax by Hidden Falls in the summer or take in a naturalist program, go for a picnic, camp, enjoy bird watching or photography. The autumn brings a burst of red, orange, and gold in the maple-basswood forest, one of the last extensive stands of the "Big Woods." When winter comes ski or snowmobile the trails through picturesque woods.

Nerstrand Big Woods State Park 100 Year Vision:

- The park is an example of the Big Woods Ecosystem connecting other natural communities. Natural communities and native species richness are more fully represented.
- Facilities are located in disturbed areas and are clumped to minimize intrusion and fragmentation of natural communities.
- Lands that are adjacent to the park serve as ecological buffers. Restoration projects by landowners blend with park lands. Biodiversity increases in the park and private lands.
- Educational and interpretive facilities are expanded in a manner that is ecologically sensitive. The new visitor center building will provide a variety of services for customers.
- Restoration efforts inside the park reduce forest fragmentation and provide better quality examples of natural communities (forest types/savanna/prairie/wetland and streams).
- Private landowners in the Big Woods and Oak Savanna Landscapes have strong, compatible land stewardship/conservation practices in place.
- Park management supports natural ecological processes (fire, succession, disease, etc.).
- The park will be free of problem exotic species.
- To balance wildlife populations, and increase interior forest bird and neotropical populations.

Nerstrand Big Woods State Park Goals:

- To improve park facilities to accommodate visitors of all ages and abilities.
- To improve and maintain trails, appropriate to shady, hilly terrain for shared-use. Trails should support ecological goals. If new trails are developed in the new restoration areas, they should be properly aligned.
- To provide camping facilities for a variety of styles of camping that compliment existing private facilities in the area. If camping is expanded, expand to the east.
- To increase "Natural History" interpretive efforts.
- To develop a stronger partnership between the park and area schools. A Big Woods curriculum should be available for use in all area schools.
- To establish a sister/companion park in the southern hemisphere for education on global ecosystem understanding.
- Citizens are active in local decision making and a Big Woods Stewardship group is active.
- Research and monitoring programs are in place. Baseline inventories are completed.
- To continue to seek acquisition of private land within the park boundary from willing sellers and to consider boundary changes as part of the planning process.
- To have camping clientele practice low impact camping techniques.

BEYOND PARK BOUNDARIES

Regional Context and Issues

Nerstrand Big Wood State Park is located 11 miles southeast of Northfield and 12 miles northeast of Faribault. It is approximately 45 miles south of the Twin Cities. The park is a statutory game refuge. The park serves an important role in providing habitat for a wide range of species. Its maple-basswood forests have been identified as one of the best examples in the state of those found in the historic Big Woods, and the Minnesota dwarf trout lily populations represent a global priority. Additionally, small areas of lowland hardwood forest and dry oak savanna represent small examples of rare, and therefore, high priority communities to conserve. The area surrounding the park is primarily farmland with small woodland habitat patches that support a limited number of native species. The nearest large blocks (100+ acres) of high quality natural communities are found in the nearby Seven mile Woods and Cannon River Wilderness Area on the west and in the Little Cannon River area to the east.

The following section describes the regional population, tourism and resort industry, the regional supply and demand of recreational services, and the region's natural resources and landscape. Throughout this chapter, the plan will reference a 50-mile radius. This distance was chosen as the area roughly within a one hour drive of the park. See Fifty-mile Region Map.

This region's economy is based heavily on farming and it is also a commuter area to the Twin Cities. There has been growing support for ecosystem management programs. These environmental concerns have focused upon protecting and improving the Big Woods landscape, water quality, fisheries and wildlife resources, and esthetic qualities of the region.

Regional Environmental Issues:

- Protecting and restoring natural communities and species found in the area.
- Maximizing biological diversity and minimizing fragmentation of habitats.
- Understanding the soil, its limitations and its capabilities.
- Protecting both groundwater and surface water resources, including protection of shoreline/streambank topography, vegetation and bluff impact zones. (Phosphorus loading is a major issue on many of the region's tributaries).
- Identifying and managing unique natural and cultural resources.
- Protecting the region's wetlands and minimizing activities which change drainage patterns.
- Controlling the spread of exotic species.
- Realizing "desired future conditions" where there is a balance between natural resource management and strong local/regional economy.

Regional Landscape, Watershed & Organizations

Ecological Classification System

Minnesota's Ecological Classification System (ECS) is a means of separating and describing units of a landscape. This approach stresses the interrelationships and the results 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 23 distinct units called subsections (see ECS map). Nerstrand Big Woods State Park is located at the intersection of two landscape subsections: the Oak Savanna and the Big Woods.

The Oak Savanna Subsection

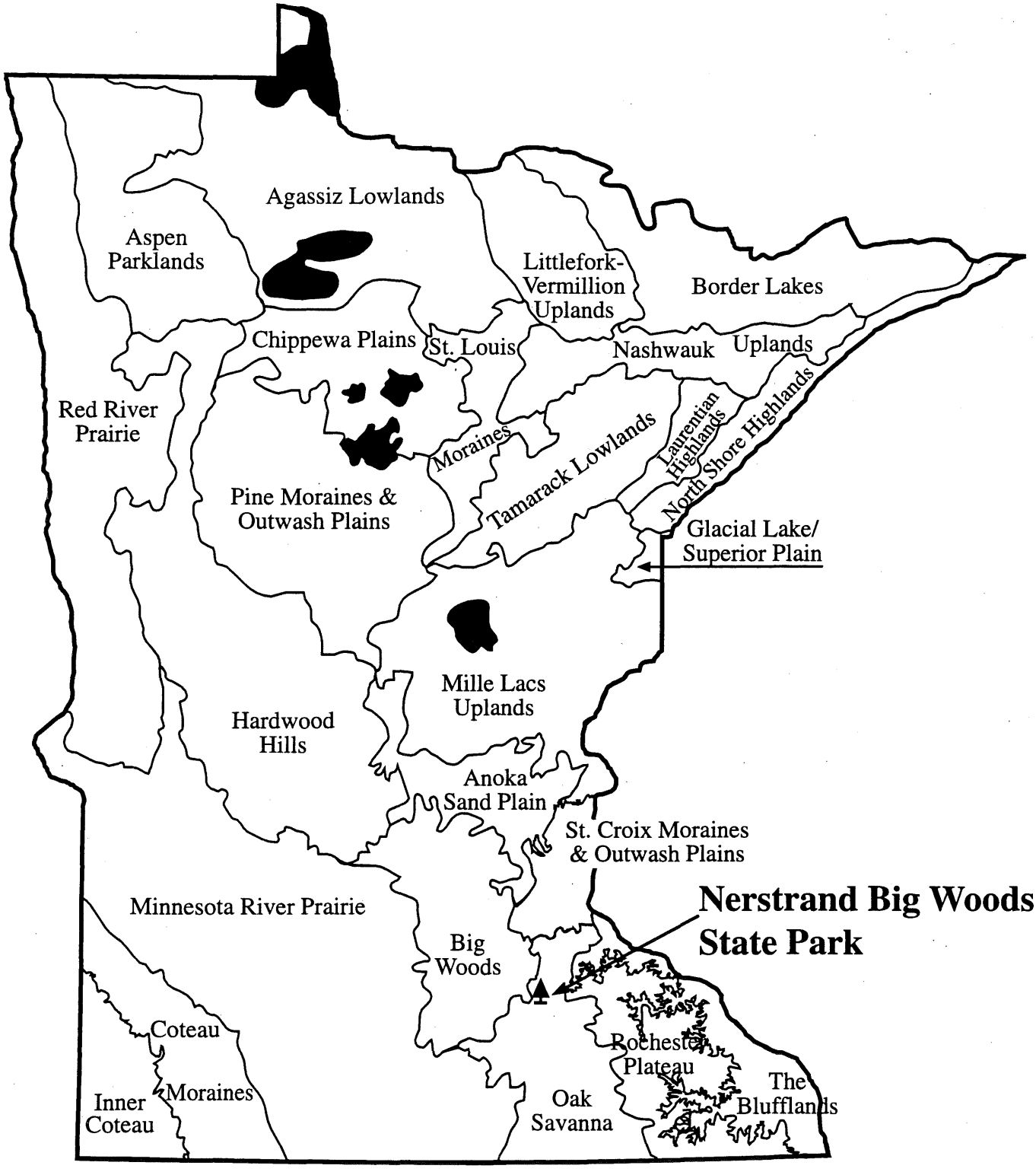
Much of this subsection is rolling loess plain over bedrock or till. At the southwestern edge of the subsection are moraine ridges. They are a continuation of those found in the Big Woods, but smaller. As a result, fires from the surrounding prairies to the south, west, and east burned frequently enough to maintain oak openings rather than forest. The subsection contains few lakes. Slopes are often steep. Bur oak savanna was the primary vegetation community, but areas of tallgrass prairie and maple-basswood forest were common. Tall grass prairie was concentrated on level to gently rolling portions of the landscape, in the center of the subsection. Bur oak savanna grew on rolling moraine ridges at the western edge of the subsection and in dissected ravines at the eastern edge. Maple-basswood was restricted to the portions of the landscape with the greatest fire protection, either in steep, dissected ravines or where stream orientation reduced fire frequency or severity. Presently, most of the area is farmed. Urban development is accelerating along the northern boundary.

The Big Woods Subsection

The topography of this subsection is characterized by gently to moderately rolling hills. The dominant feature is circular, level topped hills bounded by smooth side slopes and a broad lower level. The lower level is dotted with closed depressions containing lakes, marshes, and peat bogs. Soils were formed in thick deposits of gray limy glacial till left by the retreat of the Des Moines lobe. The vegetation at the time of the General Land Office Survey in 1854 consisted primarily of maple-basswood forest in uplands, and emergent marshes, hardwood and tamarack swamps, and lakes in basins. Greater than 75% of present-day use is for croplands, with an additional 5-10% being used for pasture. The remaining 10-15% is either upland forest or wetland.

ECOLOGICAL CLASSIFICATION SYSTEM (ECS)

Subsection Map of Minnesota



Watershed Description

Nerstrand Big Woods State Park is located in the Cannon River Watershed. The watershed consists of parts of six counties in southeastern Minnesota: almost all of Rice County and parts of Dakota, Goodhue, Steele, Waseca, and LeSueur Counties. The Cannon River watershed comprises two distinct physiographic areas that are directly related to the geologic history of southeastern Minnesota. The lower or eastern part of the watershed is a plateau-like surface dissected by deep, picturesque gorges cut into the bedrock by both glacial and recent erosion. The upper part of the watershed, west and south of Northfield, is a rolling hummocky surface with poorly developed drainage and many undrained depressions. The lakes of the watershed were formed in this area. Glacial moraines, which are ranges of hills and ridges composed of glacial drift, form the major topographic divides that define the boundaries of the upper part of the watershed. (See the geology section for more details).

The major rivers in this watershed are the Cannon River and the Straight River. Prairie Creek, Little Cannon River, and Belle Creek are the largest tributary streams. The main stem of the Cannon River is 109.2 miles long. The Cannon River begins in Shields Lake in Rice County, curves into LeSueur County, then curves back into Rice county. It then runs across the county from the southwest to the northeast, eventually meeting the Mississippi River near Red Wing. The watershed is 1,460 square miles in size and is more than 100 miles in length. Nearly 92% of the land is used for human use, whether it be for urban (2%) or agricultural purposes (90%). There are over 102,000 people in the watershed. All drinking water comes from groundwater.

From the northern edge of Faribault to the confluence with the Mississippi River, the Cannon River is designated as a Wild and Scenic River and Outstanding Resource Value Water. The major water quality problems in the river and its lakes and tributaries are high levels of nutrients, sediment, and fecal bacteria. Impacts on water quality include agriculture, non conforming septic systems, urban runoff, and waterwater discharge.

Tributaries of Prairie Creek, which are part of the Cannon River Watershed, run through Nerstrand Big Woods State Park. The last glacier sent enormous amounts of meltwater through the area and cut a deep valley through the park. The cutting of the creekbed stopped when the meltwater encountered limestone bedrock, which is visible at Hidden Falls and along the bed of Prairie Creek.

Landscape Organizations and Partnerships

Ecosystem based management is the process of sustaining ecosystem integrity through partnerships and interdisciplinary teamwork. Ecosystem based management requires that DNR interdisciplinary teams work with the public to develop and implement sustainablity goals for the entire ecosystem. The Big Woods Project and the Cannon River Watershed Partnership are seen as model efforts initiated by local groups and concerned citizens working together to improve the environment. These organizations are recognized statewide and nationwide as outstanding examples of local citizens working with agency partners to create a vision for the landscape.

Big Woods Project

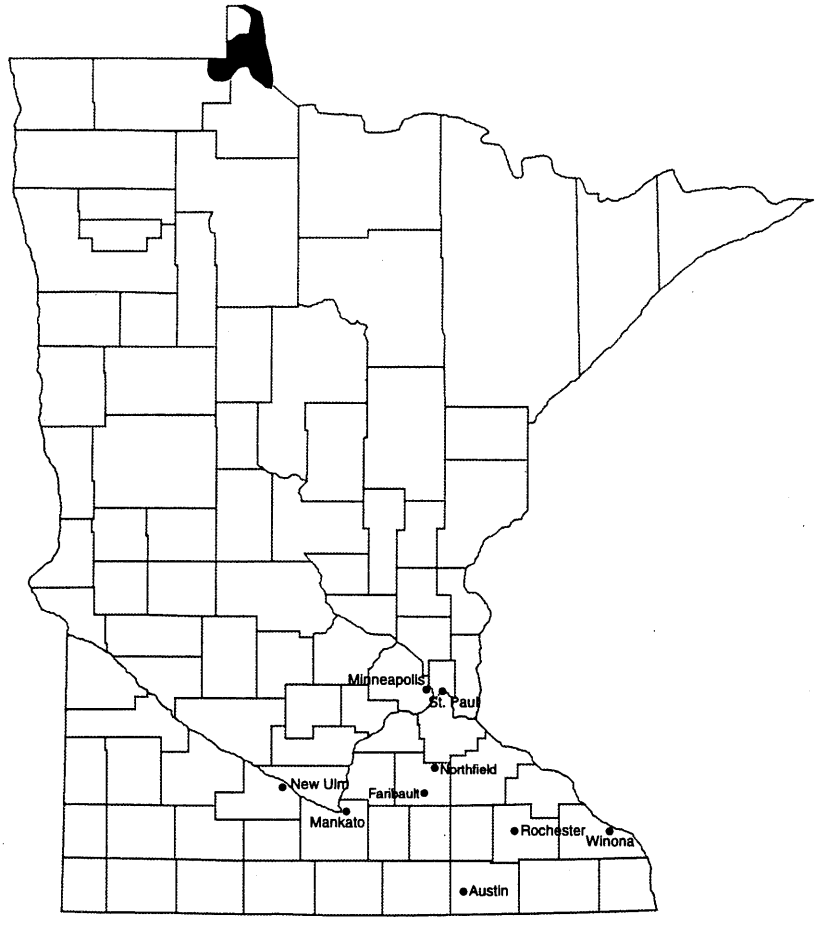
Part of the vision statement of the Big Woods Project reads: Within the upper Prairie Creek watershed and adjacent areas of the Cannon River watershed are several high quality natural areas including Nerstrand Big Woods State Park, Cannon River Wilderness Area, and Seven Mile Woods. Together with other primarily forested areas, woodlands, wetlands, grasslands, and croplands in the surrounding areas, these key Big Woods fragments represent an excellent opportunity to sustain a functioning Big Woods ecosystem.

A new conservation district is being proposed for the Big Woods Project area. The group is now in the process of forming an ad hoc committee. The district will consist of an area that surrounds the Cannon Wilderness, Seven Mile Woods, and Nerstrand Big Woods State Park. The district would have special zoning to try and protect the woods, and support conservation efforts on agricultural lands, especially marginal lands. The group will work with township boards to reach agreements that would benefit farmers and homeowners as well as the environment. This might include transfer of development rights, purchase of development rights, cluster development, etc. The goal is to provide a buffer zone around wooded areas. Tax incentive programs may become available to compliment this program.

Cannon River Watershed Partnership

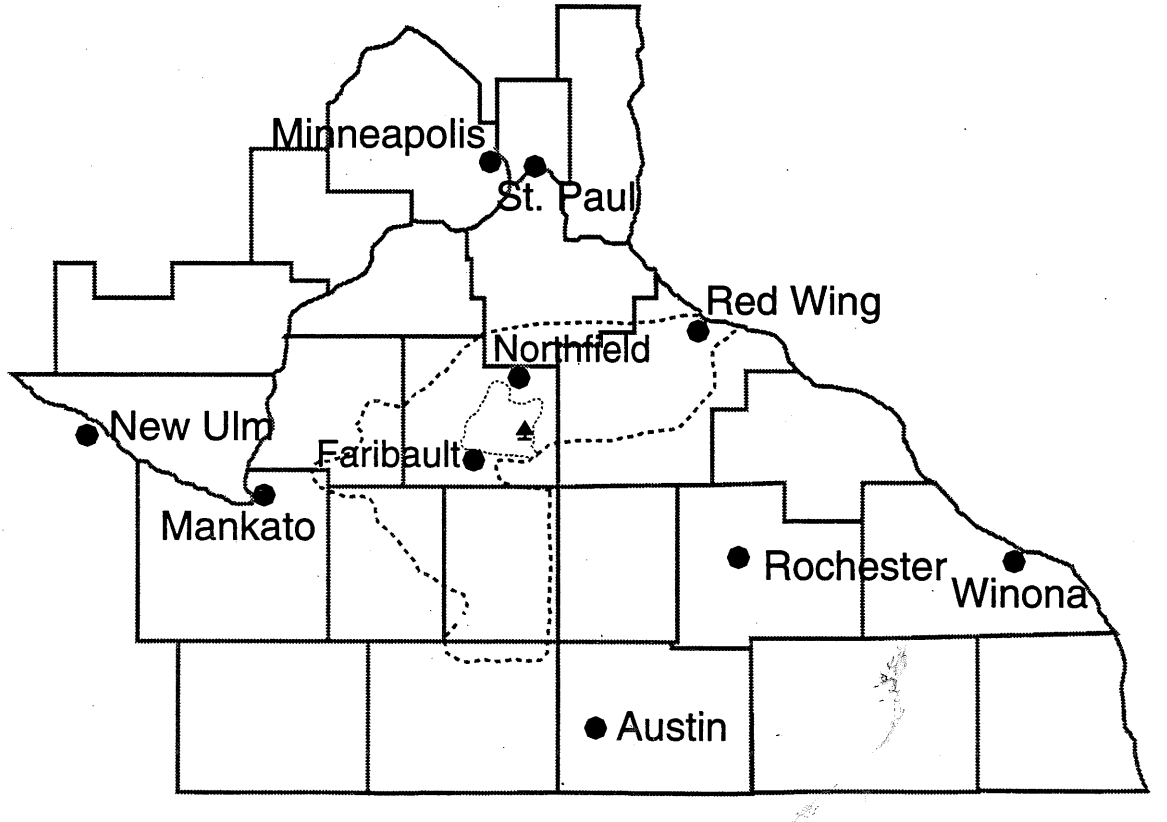
The Cannon River Watershed Partnership was formed in 1990 "to protect and improve the surface and groundwater resources and the natural systems of the Cannon River Watershed." It is a non-profit membership organization that works with citizens, agencies, and organizations on long term protection strategies and the promotion of stewardship of the land and water resources within its 1,460 square mile area. CRWP has administered the LCMR funding for forest stewardship plans, restoration, and other efforts of the Big Woods Project, along with other major initiatives in the six county watershed area.

Nerstrand Big Woods State Park
Area Ecosystem Projects



Legend

- Cannon River Watershed
- Big Woods Project
- Nerstrand Big Woods State Park



Regional Population

Nerstrand Big Woods State Park is located in Rice county. According to the 1996 estimate, (provided by the Minnesota State Demographer's Office) Rice county has a population of 52,821. Faribault, the largest city in Rice county along with being the county seat, has a population of approximately 19,000. Northfield has an approximate population of 16,000 (including students).

The following table lists major cities within a 50 mile radius with a population over 5,000.

Cities Over 5,000	1996 Population Estimate
Seven County Metro Area	2.4 million
Rochester	77,209
Mankato	31,985
Owatonna	20,577
Faribault	18,838
Red Wing	15,770
Northfield	15,376
St. Peter	9,789

The fifty mile radius surrounding Nerstrand Big Woods contains the seven county metro area and other various heavily populated cities. Due to the location of the park, it is heavily used by the surrounding metro population.

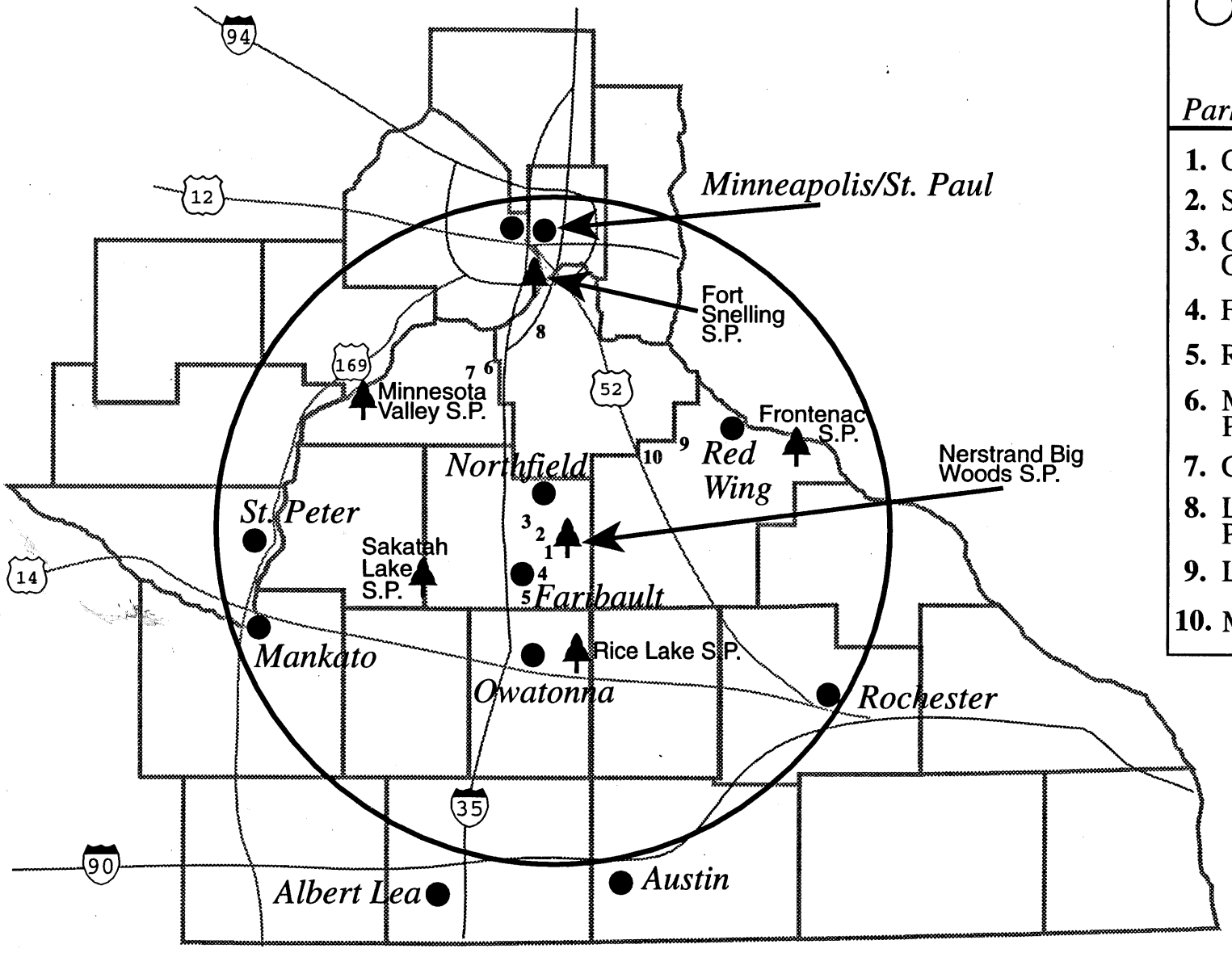
The Rural Investment Guide projects the Rice county population to increase to 55,030 by year 2020. This is a projected increase of 11.9% from 1990 to 2020.

The median age of Rice county is 30.2. and Minnesota's median age is 33.2. This follows a nationwide trend of aging of the "baby boom" generation.

According to the Minnesota Legislative District Data Book, the district where Nerstrand Big Woods is located has minority population that is approximately 2% of the total population. The largest groups of minorities are Asian and Hispanic. In the district, approximately 54% of the population is urban and 46% is rural, according to the 1990 census. This district ranks sixth in the state for the percentage of population in institutions. Institutions include an array of group quarters, including correctional facilities; nursing homes; hospitals for the chronically ill; schools; hospitals or wards for the mentally or physically handicapped; and military hospitals. Non-institutional group quarters include people who live in special group homes, half-way houses, and college dormitories. Institutions located in Faribault include: The Minnesota State Academy for the Blind, The Minnesota State Academy for the Deaf, and a major Minnesota Department of Corrections facility. In Northfield, non-institutional facilities include: Carlton College and St. Olaf College.

The legislative district where Nerstrand Big Woods is located has a slightly higher percentage of households that are married couples with children than the statewide average (32% vs. 28%). This district has a per capita income of $11,773 compared to the statewide average of $14,389 (1990). Statewide the per capita income by district ranged from a high of $30,876 to a low of $7,727. The percentage of persons who are below the poverty level in this district is approximately 9% which is lower than the statewide average of 10%.

Nerstrand Big Woods State Park
Fifty-mile Region



Legend

- Regional Cities
- State Parks
- Interstate
- U.S. Highways
- 50 mile radius Used for Socio-Economic Regional Analysis

Parks & other natural areas

1. Caron County Park
2. Seven Mile Woods
3. Cannon Wilderness County Park
4. Fall Creek County Park
5. Riverbend Nature Center
6. Murphy Hanrahan Regional Park
7. Cleary Lake Regional Park
8. Lebanon Hills Regional Park
9. Little Cannon River Area
10. Miesville Ravine

NOTE: Not all parks, SNA's, or WMA's are shown on this map. Those shown are recreational based.

Tourism and Marketing

Sample tourism-related statistics for 1994 (Several other nearby counties, with state parks, are given for comparison):

- Total tourism receipts (including direct, indirect, and induced spending).

Rice Co.	$21 million
Scott Co.	$38 million
Steele Co.	$16 million
Goodhue Co.	$82 million
Statewide Total	$7 billion

- Estimated number of jobs in the travel and tourism industry.

Rice Co.	406 jobs
Scott Co.	738 jobs
Steele Co.	301 jobs
Goodhue Co.	1,583 jobs
Statewide Total	136,123 jobs

- Wages earned in tourism and travel.

Rice Co.	$8 million
Scott Co.	$15 million
Steele Co.	$6 million
Goodhue Co.	$32 million
Statewide Total	$2.8 billion

Recreation Trends and Tourism Potential

In 1994, a survey conducted by the Minnesota Office of Tourism asked resident and nonresident tourists to list their principal reasons for vacationing in Minnesota. People surveyed were asked to list their top five interests from a list of 24 offerings. Here are the results of the top 10 interests.

Vacationers in Minnesota

	Minnesota Tourists			**Non-Minnesota Tourists**	
1.	Natural Scenery	75%	1.	Natural Scenery	70%
2.	State/National Parks	49	2.	State/National Parks	48
3.	Camping	43	3.	Historic Sites	43
4.	Historic Sites	41	4.	Shopping	43
5.	Fairs & Festivals	37	5.	Fishing	32
6.	Fishing	35	6.	Camping	30
7.	Visit Friends	28	7.	Fairs & Festivals	29
8.	Hiking	23	8.	Visit Friends	26
9.	Shopping	22	9.	City Sights	23
10.	Museums	20	10.	Museums	23

It is interesting to note that the top five interests are readily available in the Nerstrand Big Woods area. Compared with a 1993 survey, camping moved up in the ranking, while fishing moved down slightly but still remains very high and visiting friends and relatives moved down. Tourism is one of the fastest growing economic activities. Nationally, one in fifteen people work in travel related industries. Particularly in rural areas this will intensify. The challenge is to have tourism at the level that is acceptable to the local communities. Authenticity, heritage and preserving the resources are important elements to keep in rural tourism. These are what people are looking for. Word of mouth continues to be the most important way to transmit information.

Birding is Big Business

Another outdoor activity that continues to grow in popularity at Nerstrand Big Woods and nationwide is bird watching. A survey in 1996 put the number of active bird-watchers at more than 20%, according to Paul Kerlinger, a New York ecotourism consultant who tracks birders and their spending habits. Backyard bird-watchers and traveling birders spent about $14.4 billion on trips, equipment, birding magazines, membership dues and birdseed in 1991. It is about the same as anglers and more than hunters. There are almost 10 times as many bird-watchers as hunters, according to the American Birding Association.

In another study by Kerlinger and David Wiedner, they found that on birding trips away from home 26% of respondents stayed in campgrounds, 45% stayed in hotels or motels, and 27% reported using both types of accommodations. During birding travel 82% patronized restaurants.

The 1991 Fish and Wildlife Service study, "The Economic Contribution of Bird and Waterfowl Recreation in the United States During 1991," shows that birders' spending creates 234,000 jobs. One in three American adults feeds or watches birds and many people go on long trips to see birds.

Supply and Demand of Recreational Facilities

Supply

As part of the Statewide Comprehensive Outdoor Recreation Planning (SCORP) process, the DNR has maintained a data base of recreational facilities since the early 1970s. While the data for most of the public facilities have been updated in recent years, some of the private facility data are out of date. Private facility information in this plan is supplemented by information from the Office of Tourism, local publications and phone books (1997).

The following table shows an estimate of selected recreational facilities within a 50 mile radius of Nerstrand Big Woods State Park. Fifty miles is a one-hour drive from the park. This chart primarily shows Federal, State, and County level amenities. The source of data for most of the chart are Public Recreation Information Maps (PRIM). Data from the Albert Lea area has not been compiled yet.

Day Use

Source: PRIM Maps

Albert Lea PRIM map not published therefore that data is missing.

Area	Forest	Parks and Rec	Major Trails	Wildlife and Waterfowl	Scientific/Natural areas
Metro South	2	61	5	23	9
Rochester	3	7	1	13	0
Fairbault	0	33	1	45	5
New Ulm	0	5	0	4	0
Austin	0	2	0	12	2
Totals	5	108	7	97	16

Area	Public Water Access	Fishing Piers	Fishing	Hunting	Swimming	Picnic areas
Metro South	136	54	220	30	18	57
Rochester	13	2	45	15	0	7
Fairbault	95	15	100	57	11	11
New Ulm	5	0	10	4	0	5
Austin	0	1	0	12	2	5
Totals	249	72	375	118	31	85

Camping

Area	Vehicle	Horseback	Canoe	Group	Other (Not defined)
Metro South	13	1	15	10	5
Rochester	4	1	5	1	0
Fairbault	11	1	9	1	3
New Ulm	2	0	0	1	0
Austin	0	0	1	0	0
Totals	30	3	30	13	8

Number of Trails

Area	Hiking	Biking	Horseback	Snowmobile	Skiing	ATV
Metro South	45	29	17	15	33	1
Rochester	8	1	3	3	4	0
Fairbault	66	3	3	6	14	0
New Ulm	2	1	1	0	1	0
Austin	2	0	0	0	1	0
Totals	123	34	24	24	53	1

Boat Accesses & Water Recreation- There are approximately 249 public boat accesses within 50 miles of Nerstrand Big Woods State Park (In Rice County there are 16 public lake accesses, 8 river accesses). The Cannon River and 16 of the lakes in Rice County are actively managed for game fish. The Cannon River is a state-designated canoe and boating route from the western Rice County line to Faribault and has been designated as a Wild and Scenic River from Faribault to the eastern county line. The Straight River is also designated as a canoe and boating route from just south of Owatonna to Faribault. Hunting and trapping are popular activities in wetlands.

Picnic Grounds/Beaches - There are over 85 public picnic areas and approximately 31 public swimming areas within 50 miles of Nerstrand Big Woods State Park.

Campgrounds & Resorts- There are at least 30 public campgrounds within 50 miles of Nerstrand Big Woods State Park. The DNR - Trails and Waterways Unit also administers 30 individual boat-in campsites. State park campgrounds within 50 miles of Nerstrand Big Woods State Park are listed in the table below. Approximately 12 resorts are located in Rice County.

State Park Campgrounds in a 50 Mile Radius

Park	Drive-In Sites	Electric Sites
Carley	20	0
Frontenac	58	19
Minnesota Valley	25	0
Myre Big Island	99	32
Nerstrand Big Woods	**54**	**28**
Rice Lake	42	16
Sakatah	63	14

Camping Cabins - Of the 12 Camping Cabins available for rent in Minnesota State Parks, only one, at Sakatah Lake State Park, is available within 50 miles of Nerstrand Big Woods State Park. The cabin at Sakatah was built in 1996 and has an attached screened porch, but no electricity.

Hiking Trails - There are over 123 hiking trails of a variety of lengths within 50 miles of Nerstrand Big Woods State Park. More details will be available after the SCORP data is compiled.

Scientific and Natural Areas - There are a number of SNAs within 50 miles of Nerstrand Big Woods State Parks. Although there are usually no trails in these areas, hiking is permitted in most areas.

Bike Trails - The Sakatah Singing Hills State Trail, the Minnesota Valley Trail, Cannon Valley Trail, Fort Snelling State Park bike trails and approximately 30 other surfaced bike trails are within 50 miles of Nerstrand Big Woods State Park. Myre Big Island State Park offers 7 miles of mountain bike trails. Mountain biking is permitted on most state forest roads and trails, unless posted closed.

Cross County Ski Trails - There are over 53 cross country ski trails of a variety of lengths within 50 miles of Nerstrand Big Woods State Park. More details will be available after the SCORP data is compiled. County governments and cities in the area as well as DNR divisions offer a significant amount of cross country ski trail miles.

Horse Trails - There are approximately 24 horse trails of a variety of lengths within 50 miles of Nerstrand Big Woods State Park. The closest horse trails are the Sakatah Singing Hills State Trail, Minnesota Valley Trail, and the Cannon Wilderness County Park trails. None of the state parks within 50 miles have a horse camp. More details will be available after the SCORP data is compiled.

Snowmobile Trails - There are at least 24 Grant-In-Aid (GIA) snowmobile trails of a variety of lengths within 50 miles of Nerstrand Big Woods State Park. GIA trails are funded by snowmobile registration and unrefunded gas taxes through the Minnesota DNR to local units of government who in turn distribute the funds to local snowmobile clubs for trail development and maintenance. Most of the snowmobile trails are owned and operated by the individual counties. Nerstrand Big Woods State Park has 5 miles of snowmobile trails, Rice Lake and Sakatah State Parks also have snowmobile trails. Other areas nearby that offer snowmobile trails include Courthouse County Park, Sakatah Singing Hills State Trail, and Minnesota Valley Trail. More details will be available after the SCORP data is compiled.

Demand

There are seven state parks within 50 miles of Nerstrand Big Woods State Park. Although these state parks offer contrasting recreation experiences, attendance at these parks is still a good indicator of existing, expressed demand for natural resource based outdoor recreation experiences in the Nerstrand Big Woods area.

Attendance at state parks within 50 miles of Nerstrand Big Woods State Park.

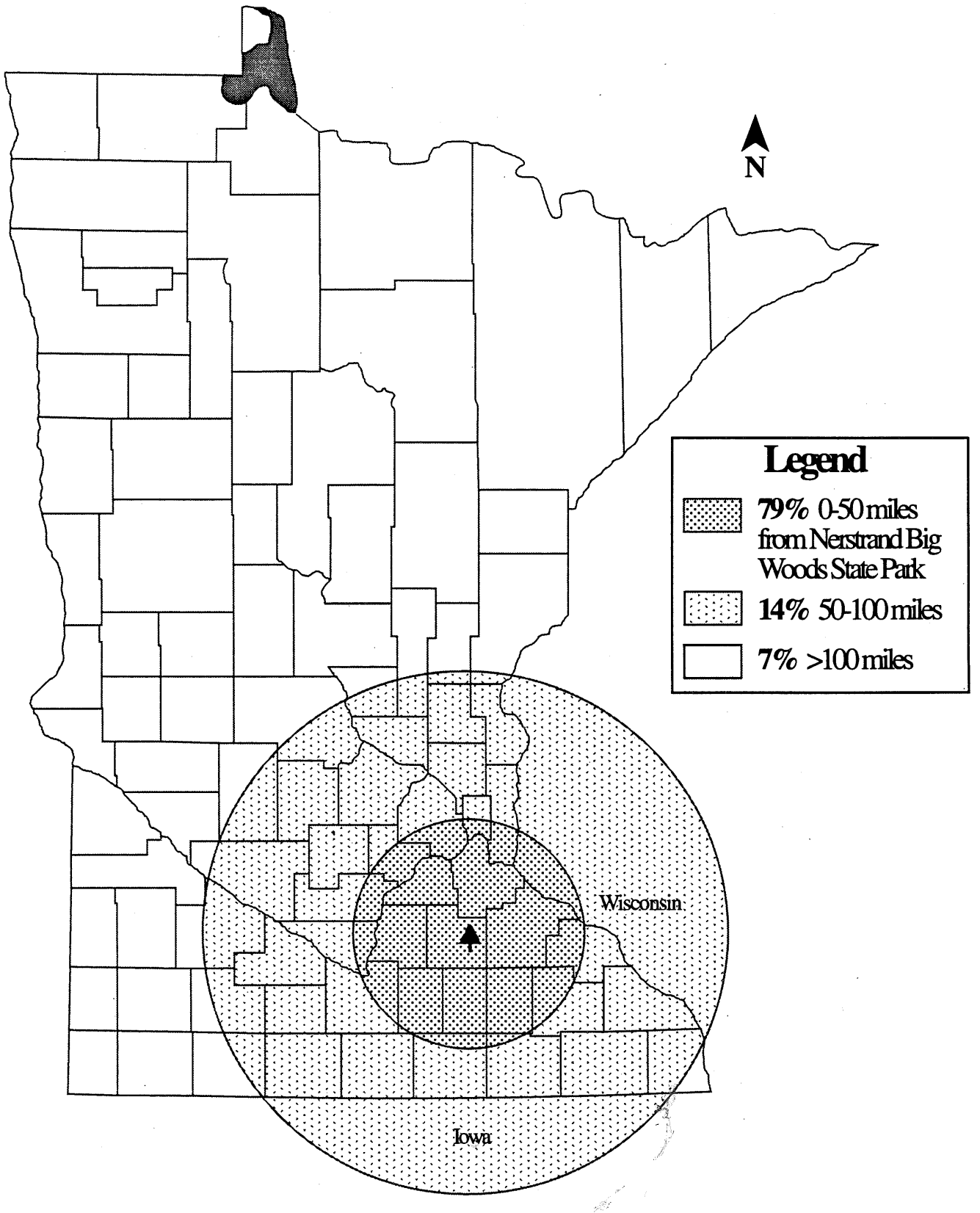
Park	1996 Day Use	1996 All Camping	92-94 Summer Weekend Occupancy	1996 Total Visitors
Carley	27,426	2,295	39%	29,721
Fort Snelling	621,274	5,356*	NA	626,630
Frontenac	85,652	14,497	86%	100,149
Minnesota Valley	167,518	3,488	29%	171,006
Myre Big Island	110,303	12,507	43%	122,810
Nerstrand Big Woods	**75,379**	**14,111**	**74%**	**89,490**
Rice Lake	38,283	6,266	50%	39,549
Sakatah	111,564	13,767	80%	125,331

* AIM Pow Wow

Nerstrand Big Woods Drive-In Camping Data 1992-1996
(Does not include group camp numbers)

	No. Campers	Campsites Occupied
1992	8,848	2,986
1993	9,252	3,179
1994	11,408	3,869
1995	10,706	3,667
1996	12,242	4,027

Nerstrand Big Woods State Park
Origin of Campers



Source: DNR-Division of Parks and Recreation, 12/97

Park Visitor Analysis & Volunteers

Day Use

In 1997, Nerstrand Big Woods State Park use increased significantly, with the greatest increase early in the summer. Weekday use continued to increase throughout the year. An increasing amount of new users are from the Twin Cities Metropolitan Area. In a three year average of total visitor attendance, Nerstrand Big Woods State Park ranked 33rd out of the 64 Minnesota State Parks.

Nerstrand Big Woods State Park Attendance

1994 Total Visitors	90,885
1995 Total Visitors	80,492
1996 Total Visitors	89,486
1997 Total Visitors	95,746

Overnight Use

Camping is a major activity at Nerstrand Big Woods State Park. Overnight use has increased over the past three years. The semi-modern campground is usually filled to capacity on holiday weekends and near to capacity during mid-May to mid-October weekends. The three year average of May - August weekend campground occupancy is 74%. During the week 10-15 campsites are typically occupied or about 12% weekday occupancy.

As shown in the table below, camping attendance continues to increase at Nerstrand Big Woods State Park. The average group size per camper unit has remained fairly constant at approximately 3.2 people per semi-modern site (camper registration statistics).

Nerstrand Big Woods State Park Overnight Use

1994 overnight use	12,972
1995 overnight use	12,164
1996 overnight use	14,111

Group Camp

There are 13 sites in the group camp of varying sizes. Group camp occupancy has increased slightly in recent years. Group camp visitors tend to be scout groups and church groups often from the Twin Cities, Northfield, Faribault area, and some from Albert Lea. The group camp is primarily for scout, schools, and church groups. However, when the group camp is not full, the remaining sites are used for overflow at the rustic camping rate.

Number of Group Campers 1994-1996

1994	1,564
1995	1,458
1996	1,869

Volunteers at Nerstrand Big Wood State Park

Nerstrand Big Woods State Park has hundreds of hours of volunteer time contributed to the park each year. Some of the key, ongoing, volunteer programs include the following groups: Friends of Nerstrand Big Woods who help with fundraising and clean-up projects. Nerstrand School and local volunteers have been doing landscaping projects around the new visitor center and some prairie restoration. Scout troops complete approximately six service projects per year in the park

including several Eagle Scout projects. A volunteer naturalist has conducted weekend programs 12 weeks per year. The Big Woods Project and area schools have been planting trees in the park since 1994. The Nature Conservancy has assisted with land acquisition and legislative assistance. School Nature Area Project (SNAP) conducts environmental education projects and has compiled a conservation directory. Service clubs, such as the American Legion, have donated flag poles and other projects. Research volunteers have completed many projects in the park. In addition to these groups, there are numerous individuals who volunteer throughout the year and for special events.

Tourism, Volunteers, and Partnership Actions

Note: Some tourism, partnership and volunteer recommendations are located in other chapters, such as interpretive services, resource management, recreation, and park boundaries. These are not in priority order.

Tourism

- **Action 1: Private facilities should be promoted to help meet visitor needs for a variety of recreational activities**. The staff will recommend private facilities, especially when the park is full and find ways of cooperating with and complementing private facilities in the area. County parks can also be promoted for trail use.

- **Action 2: Need to plan for increased use, because it is inevitable**. There are two theories - 1) Concentrate use in a sacrifice zone. 2) Disperse use. At Nerstrand Big Woods, it is recommended to continue to concentrate use to minimize ecosystem fragmentation.

- **Action 3: Seek opportunities to promote bird watching in the park and the area and provide educational materials.** (See Interpretive Services recommendations for additional actions).

- **Action 4: Develop a Merchandise Plan for the park.**

- **Action 5: Cooperate with area chambers and other area tourism groups to promote the area.**

Volunteers

- **Action 6: A volunteer manual for the park will be developed. The unit plan and annual work plans will set directions for volunteer projects**. The general process for working with volunteers will be as follows:

  a) *Identification of volunteer appropriate projects.* A list of projects will be available that volunteers can choose from. Groups or volunteers may approach the park manager with new volunteer ideas at any time. If the project is appropriate, and funding and staff time are available, the park manager will OK the project. If the project is not appropriate, the park manager will work with the volunteer(s) to modify the project if possible.

  b) *Reviews, resource assessments, and funding.* The park will utilize volunteers and partnerships as much as possible. It is a valuable service to the park, allowing many extra projects to be completed that could not be done by park staff alone and this can produce long term benefits to the resources and the park. Occasionally the park manager may need to turn down a partnership proposal due to limited time, conflict with dates, funding, conflict with union contracts, or inappropriateness of the proposal. Volunteers and park staff will need to be flexible. Most volunteer project requests will be approved on a first come, first serve basis.

  c) *Volunteer Application Process.* When someone or a group has volunteered, a letter will be sent to them explaining the Nerstrand Big Woods Volunteer Program. A Volunteer Application will need to be completed to ensure that volunteers are covered by workman's

compensation while working in the park. Volunteers can receive a special work permit for their vehicle if needed.

d) *Project Responsibilities.* When volunteers arrive in the park for a project, the park manager or staff person will take time to explain the project and give the necessary training on how to complete the project. Volunteers will need to sign-in every day and record the number of hours they have worked each day. At the end of the project/day volunteers and park staff should again meet to determine the status of the project. Park staff will help volunteers to be more self-sufficient once they are regular participants. There may be times when the park will need to send a volunteer to special training, or park staff will need to provide background reading material, information or training.

e) *Recognition.* The DNR Volunteer Program has a well established set of rewards (pins, cups, caps, and plaques, etc.). These should be presented to the volunteers as they earn them or at an annual Volunteer Recognition Event.

f) *Future Volunteer Coordination.* As the volunteer program at Nerstrand Big Woods continues to grow, new schedules or routines may need to be adapted. It may be useful to have monthly volunteer meetings. These could be working meetings, or just time to meet with the park manager to discuss upcoming projects, training or provide information. There may need to be volunteer coordinators. For example, one volunteer may be in charge of helping with all trail projects and another volunteer may oversee all tree planting projects. The park may want to have a "Volunteer Opportunities Notebook" where park visitors can look through the book at upcoming projects and sign up to volunteer for specific projects.

- **Action 7: A long range plan for volunteer projects and local school projects is needed**. As much as possible, schools will be involved year round on an ongoing basis so that students can see the whole process. There should be a shared vision between the park staff and the schools. The cost of equipment is a factor in working with large groups (i.e. shovels). The unit plan and work plans will set the direction for these projects.

Partnerships

- **Action 8: Utilize and encourage partnerships** and sustainable farming options with park neighbors, area landowners, and the immediate Big Woods Project area. Work with wildlife associations, conservation groups, lake associations, and others to promote ecosystem management on private property for wildlife habitat and watershed protection. Provide educational materials and encourage partnerships. The priority is to work with landowners within the park boundary and in adjacent areas so that land is managed to protect water quality, woodlands, wetland, and prairie habitat. Some of the options and easements that are currently available for private landowners include:

  1. Conservation easements (MN Land Trust);
  2. Land retirement programs (RIM Reserve and Conservation Reserve Program, Wildlife Habitat Incentives Program (WHIP), Wetland Reserve Program);
  3. Property tax relief programs (for native prairie, wetlands, agriculture preserves, Green Acres, Metropolitan Agricultural Preserve program);
  4. Restoration cost-share programs (Partners for Wildlife, Pheasant Habitat Improvement, Stewardship Incentives Program);
  5. Registry programs;
  6. Deed restrictions (MN Land Trust);
  7. Mutual covenants;

8. Leases;
9. Management agreements;
10. Sustainable Farming Options (EQUIP, Pilot Projects);
11. Conservation District Option;
12. Voluntary implementation of conservation practices (private decisions to not harvest a timber stand, or drain a wetland, or sell to a developer). Although often unrecognized, this is perhaps one of the most important stewardship efforts taking place.

Additional information is available on the above programs through the "Land Protection Options - A Handbook for Minnesota Landowners", published by The Nature Conservancy, the Minnesota Department of Natural Resources, The Trust for Public Land, and the Minnesota Land Trust (1996) and "Natural Areas: Protecting A Vital Community Asset. A Sourcebook for Minnesota Local Governments and Citizens" published by the DNR 1997.

- **Action 9: Park staff should participate in local and regional planning efforts to sustain healthy ecosystems.** Planning should begin at the landscape level to determine where opportunities are in the landscape to promote interior forest habitat and other natural community efforts.

- **Action 10: The park should participate in groups active in water related issues for the watershed** - Cannon River Watershed Partnership, county working group for EQIP, water plan, etc.

- **Action 11: Establish a sister/companion park in the southern hemisphere for education on global ecosystem understanding.**

NATURAL AND CULTURAL RESOURCES

Archaeology/Early History

Although archaeological sites dating back to 5000 B.C. have been found within 20 miles, few sites in close proximity to the park have been found. In 1974, archaeologists from the University of Minnesota field surveyed Nerstrand Big Woods State Park for the presence of prehistoric archaeological sites. The survey found no significant prehistoric archaeological sites in the park. Prior to the construction of the new contact station in 1993, archaeologists from the Minnesota Historical Society conducted a reconnaissance survey of the development area and no artifacts were located. At that time the archaeologists verified an archaeological site reported in 1991 by a park visitor (a municipal-county highway archaeologist). The site is located near Hidden Falls where stone artifacts were found. Potential burial mounds have recently been reported on newly acquired lands east of the sewage system. These have not been verified by the archaeologists.

There has been only limited archaeological research done in the park. Although little archaeological evidence has been found in the park, it is likely that the area was used by prehistoric and historic people. Dakota used the Cannon River valley for hunting grounds and village sites until the mid-1800s. Occupation sites occurred more often on terraces adjacent to the streams rather than on the floodplains. In 1851 the Dakota ceded the vast majority of their land in western and southern Minnesota to the United States. By 1854, Rice County had been surveyed and intensive European settlement began.

Management Considerations for Archaeology

Any ground disturbing activities could adversely impact the cultural resource. Conduct cultural resource surveys prior to any development due to the limited archaeological surveys that have been done in the park.

European Settlement

The first European settlers to this area arrived in 1854, the same year that the area was surveyed by the General Land Office (GLO). The people were primarily of German and Norwegian descent. An "island" of big woods existed in the northwest part of Wheeling Township that was about 5,000 acres in size. The first settlers lived in the prairie areas and along the edges of the woods. Section 16 was a State Trust Fund Section, granted to the state by Congress to support the school trust fund. In 1862, it was sold by the state and subdivided to 53 individual owners. Section 9 was subdivided by the GLO and individual buyers at a later date, and eventually had 62 parcels by 1941. Parcels in both sections were mainly 5 - 10 acres in size and ranged from 1-40 acres. Most of the early owners managed their woodlots for fuel wood and building supplies, with some maple syrup operations.

Intensive harvesting of the woodlots, including much clearcutting, began in the 1930s and prompted many efforts to protect the woods and preserve it as a state park. Aerial photos taken in 1935, 1938,1940, 1951, and 1958 give a good indication of the extent of cutting over the years. Generally, the central and south portion of Section 9 and a number of separated parcels in Section 16 were clear-cut during the late 1930s and 1940s. Many parcels in both sections have been selectively cut during the last half of the century. By this time the 5,000 acre wooded area that had existed prior to settlement had been reduced to the two sections and along the tributary to Prairie Creek.

Park History

At the same time that the most extensive cutting was occurring within the park, many people were working to protect the area and preserve it as a state park. Hilman Mielke, a Kenyon Jaycee's

member, Dr. Harvey Stork, a botany professor from Carlton College in Northfield, and the Minnesota Academy of Science were instrumental in organizing this effort. The National Park Service and the State Emergency Relief Administration conducted the initial analysis of the area in the early to mid-1930s. Nerstrand Woods State Park was established in 1945, however, some of the small woodlots had been purchased from owners beginning in early 1942. Because so many landowners were involved, it was difficult to obtain title for all of the land in the two sections. Through a series of long and complicated negotiations an arrangement was worked out to acquire the lands. The land was obtained by the U.S. Forest Service and was then transferred to the state through a land exchange, with the U.S. Forest Service accepting state trust fund land within the national forests in northern Minnesota. The land that the U.S. Forest Service transferred to the state became trust fund land within the newly established Nerstrand Woods State Park.

At the initial development of the park, citizens of Nerstrand and vicinity assisted in clearing stumps from the cut-over tract which has been designated as the picnic area. Most of the development has been on the north side of the park. After the improvement of the picnic area, fireplaces and picnic tables were provided. A shelter was built in 1962 which includes a fireplace, running water, indoor toilets and electricity. To the east of the picnic grounds, in a wooded area, just enough clearing has been done to provide space for 54 campsites.

Today, the existing state park boundary encompasses 2,825 acres, 1,592 acres of which is owned by the state, and the park has been renamed Nerstrand Big Woods State Park. An area in the northeast part of the park, Prairie Creek Woods Scientific and Natural Area, has been acquired to protect Minnesota dwarf trout lily populations and the contiguous oak forest community.

In 1992, the statutory boundary of the park was nearly doubled. This was a cooperative effort between The Nature Conservancy (TNC) and the Division of Parks and Recreation. The boundary expansion was based on an ecological study that was conducted by TNC.

A 75 acre pilot sustainable agricultural demonstration farm was established in the park in 1996. It is a cooperative project between the DNR, The Nature Conservancy and the MN Department of Agriculture and area farmers. The land was purchased by the TNC in December 1994 and transferred to Nerstrand Big Woods State Park in September 1997. Due to the good condition of the dairy farm, the growing interest in sustainable agriculture, and the rapid expansion of urban sprawl in the area, the short-term goal of the site is to a promote grassland based dairy operation. The state park will not be subsidizing the farm operation, one of the primary purposes of this project is to show that sustainable agriculture can be economically viable. A local oversight management team has been set up to help establish overall principles and goals, and make sure that the operation is compatible with the park ecologically and aesthetically. The farm family are currently milking 55 cows and the farm has reached production goals. Interpretive efforts will be part of the dairy farm project beginning in the summer of 1998.

The farm will be used to demonstrate more sustainable forms of agriculture to students, park visitors, and other through scheduled farm tours. No other public access to the farm will be permitted.

Under an agreement with the Brossard family, they could lease Big Woods Dairy until December 31, 2006. They also have the option to terminate the lease prior to that date if they wish. At the end of the lease, the farm buildings and house will be removed and the land will be returned to native vegetation. The Brossard's are not employees of the state of Minnesota.

In 1997, a project was completed in the park to survey and permanently mark woodlot corners to preserve history and aid in future restoration efforts.

Climate and Seasons

Nerstrand Big Woods State Park is subject to the same continental weather patterns that influence all of Minnesota. The climate is influenced by cold arctic air during winter months and is frequently dominated by hot air masses from the Gulf of Mexico during summer months. However, because Nerstrand Big Woods lies in southeastern Minnesota, the spring season starts earlier and the fall season continues later that in most areas of the state.

In southeastern Minnesota, the mean high temperature in July is 81.8° F while the mean low temperature is 60.1° F. Because of the heavy shade in the park, campers and hikers often note how much cooler it is in the park, than outside the park, even on a hot summer day. In January, in this part of Minnesota, the mean high temperature is 20.2° F while the mean low temperature is 2.1° F. There has been a recorded high of 102° F and a recorded low of -33° F. The average annual precipitation in southeastern Minnesota is 29.7 inches.

The mean annual snowfall is 48.4 inches. During the winter of 1978-1979, total snowfall was about 64 inches. Climatically, this area has a short growing season because the low-lying area forms a frost pocket with late spring frosts and early fall frosts. While this has an impact on the surrounding farms, it has not been documented to cause problems in the park. Further information on annual precipitation is available from the weather recording station in Faribault.

Management considerations for climate.
This weather pattern means that the park has a longer season for campers and day users than most Minnesota parks. Spring wildflowers and bird migration bring large crowds in very early April. Hepatica has bloomed as early as March 22nd in several years. The fall color season can last well into late October. This long "busy" season has implications for maintenance, interpretive services and enforcement staffing needs. Snowfall is usually adequate in the park for grooming ski and snowmobile trails from December through early March. Many Iowan's take advantage of this fact, and head to this part of southern Minnesota for winter recreation.

Geology

One of the more dramatic landscape changes in the state occurs near Nerstrand Big Woods, for example between the park and Faribault. This is where the boundary occurred between glaciation and no glaciation during the last (or Late-Wisconsinan) glacial event in Minnesota. The Late-Wisconsinan glaciers covered all of Minnesota except the southeastern portion of the state including the Nerstrand Big Woods State Park (See Minnesota Geological Survey - Rice County Geological Atlas, 1995). Thus, those latest glaciers did not bury the old, erosional landscape of the park. At Nerstrand Big Woods State Park, there has been a relatively longer time frame of erosion caused by rainfall, which created an extensive stream network that dissects the land. As a result, there are few large peatlands, or low poorly drained areas, or wide expanses of flat land, because nearly everywhere the land slopes into a nearby stream. This is in sharp contrast to the landscape west or north of Faribault, where Late-Wisconsinan glaciers buried such features under new layers of glacial deposits.

The geological units at the park could be lumped into three general categories - Paleozoic bedrock, old glacial drift that is much older than the Late-Wisconsinan deposits covering most of the rest of the state, and post glacial alluvium in the Prairie Creek valley system.

Bedrock

The region is underlain by nearly level sedimentary bedrock (mainly dolostone, sandstone, limestone, and thin shale layers) laid down when the area was part of a vast shallow sea. This sedimentary bedrock stretches from a little north of the Twin Cities into Iowa, and from east central

Minnesota into central Wisconsin. Because of the extreme age of this land surface and its solubility, the bedrock is highly eroded and an extensive dendritic (highly branched) drainage network has developed in the region over millions of years. At various times, most or all of the landscape has been covered by glacial, fluvial, and eolian deposits, but the drainage network is still observable.

Looking at the park in a more detailed scale, the Platteville formation of limestone or dolostone is exposed in outcrop and underlies the glacial drift in much of the park. The St. Peter sandstone underlies the glacial drift in the eastern edge of the park.

The underlying limestone and sandstone appear in outcrops that were quarried even before the Civil War. Limestone quarries are found along the bluffs. One is now located in the far northeastern corner of the park, when the statutory boundaries were expanded. One of the old quarries was near Hidden Falls and from this quarry, stone was used for several homes in Nerstrand as well as for the first Valley Grove Church a few miles north of the park.

Glacial History

All of the Big Woods region has been glaciated in the past. However, it was not glaciated during the last two (Wisconsinan and Illinoian) glacial periods, although much of the area, including Nerstrand Big Woods State Park, was affected by glacial meltwaters. The region was glaciated by a number (exact number unknown, but probably 20 or more) of unnamed glacial events that occurred prior to the Illinoian. The Pre-Illinoian tills are collectively termed the "old gray tills".

There are erosional channel scarps evident along the valley of Prairie Creek. These formed when large volumes of rushing meltwaters from the nearby, melting Late-Wisconsinan glaciers flowed into this stream system. Outwash deposits from this event occur in the floor of the Prairie Creek valley, in the eastern edge of the park. Post glacial alluvium, or flood deposits, occurs up to 15 feet thick, in much of the Prairie Creek valley in the park. The meltwater from the glaciers cut through the park and exposed the bedrock which is evident throughout Prairie Creek and at Hidden Falls.

The glacial drift is generally thicker (100 to 150 feet) in the southern part of the park, and thins northward where, within the Prairie Creek valley, it is only 1 to 50 feet thick. In contrast, the glacial drift thickness in northwestern Rice county is much thicker than in the park.

Soils

Area Soil Formation

Soils developed on these bedrock and glacial materials during the interglacial periods, both before the Illinoian and between the Illinoian and the Wisconsinan glacial periods. The majority of these soils were extensively eroded during the Wisconsinan period, often losing the upper horizons or even the entire solum (all surface and subsurface horizons). Because the Late-Wisconsinan ice sheets were very close to this region, soil formation was affected by extreme cold, high winds, blowing sand and silts, and often extreme dryness. These conditions added to soil erosion in the region, and also produced characteristic features (such as ice wedge casts, frost-shattered horizons, and horizon disruption) in the soils that remain. These conditions are clearly observable in many parts of the region when soil profiles are exposed.

At the end of the Wisconsinan glacial period the region was subjected to intense blowing of sand and silt. Most of the exposed, finer-grained rocks in the region show abrasion by wind-blown sands. The region was also covered with a thin layer of loess (wind-blown silt) deposited during the Late-Wisconsinan. This silty or silt-loam textured material constitutes the upper mantle (0.25 to 1.0 m) of most soils in the region and is responsible for the high fertility, but also the high potential erodibility, of these soils. If the loess is protected by the presence of vegetative cover or

agricultural residue, then it is not very erodible; removal of that cover by plowing, burning, or forest clear-cutting dramatically increases the susceptibility of the soils to erosion.

Nerstrand Big Woods Soils

Soils in the general area of Nerstrand Big Woods State Park give a picture of how the park fits into the broader landscape region. The Oak Savanna ecological subsection is a mosaic of Mollisols (soils developed under upland or wetland prairie vegetation); Alfisols (soils developed under savanna and forest vegetation); and Entisol in the floodplains.

There are a variety of soil types in Nerstrand Big Woods State Park. The northern portion of the park is underlain by soils of the Racine-Littleton-Lindstrom association, and the southern part of the park is of the Kenyon-Klinger-Maxfield association. Eleven different soil series are represented within the park boundary.

Roughly one-half of the park is covered by soils of the Renova series. About 75 percent of section 9 is underlain by Renova soils. These well drained, loamy soils have moderate permeability, high water capacity, and medium natural fertility. These soils were formed under deciduous trees. Many areas which are covered by Renova soils outside of the park were cleared for crop production. Renova soils occur on gently rolling to very steep lands with slopes varying from 2 percent to 30 percent. As the degree of slope increases, erosion hazard becomes more severe and recreational development becomes less desirable. The campground and shop area are located on Renova soils.

Another major series of soils in the park are the moderately well drained Kasson soils. This upland loamy series has moderately low permeability, high water capacity, and medium natural fertility. Kasson soils were formed under deciduous trees.

Soils of the Maxfield series are scattered throughout the park. These poorly-drained, silty soils are located on broad upland flat areas, depressions, and drainageways. Maxfield soils have high natural fertility. Water capacity is high, with depth to water table commonly only zero to two feet beneath the surface. The native vegetation in Maxfield soil areas were principally water tolerant prairie grasses, however, Maxfield areas in the park are now covered by deciduous trees.

Soils of the Sargeant series cover about one-fourth of section 16. These poorly-drained, loamy upland soils have high water capacity and medium natural fertility. These soils were formed under deciduous trees.

Rushriver (alluvial) soils are in the floodplains and are comprised of loam and sandy material recently deposited by streams. Within the park, alluvial soils are adjacent to Prairie Creek. Other minor soils within the park area include Epsom, Brodale-Eyota, Lindstrom, Littleton, Nerwoods soils. Native vegetation on these soils were tall prairie grasses.

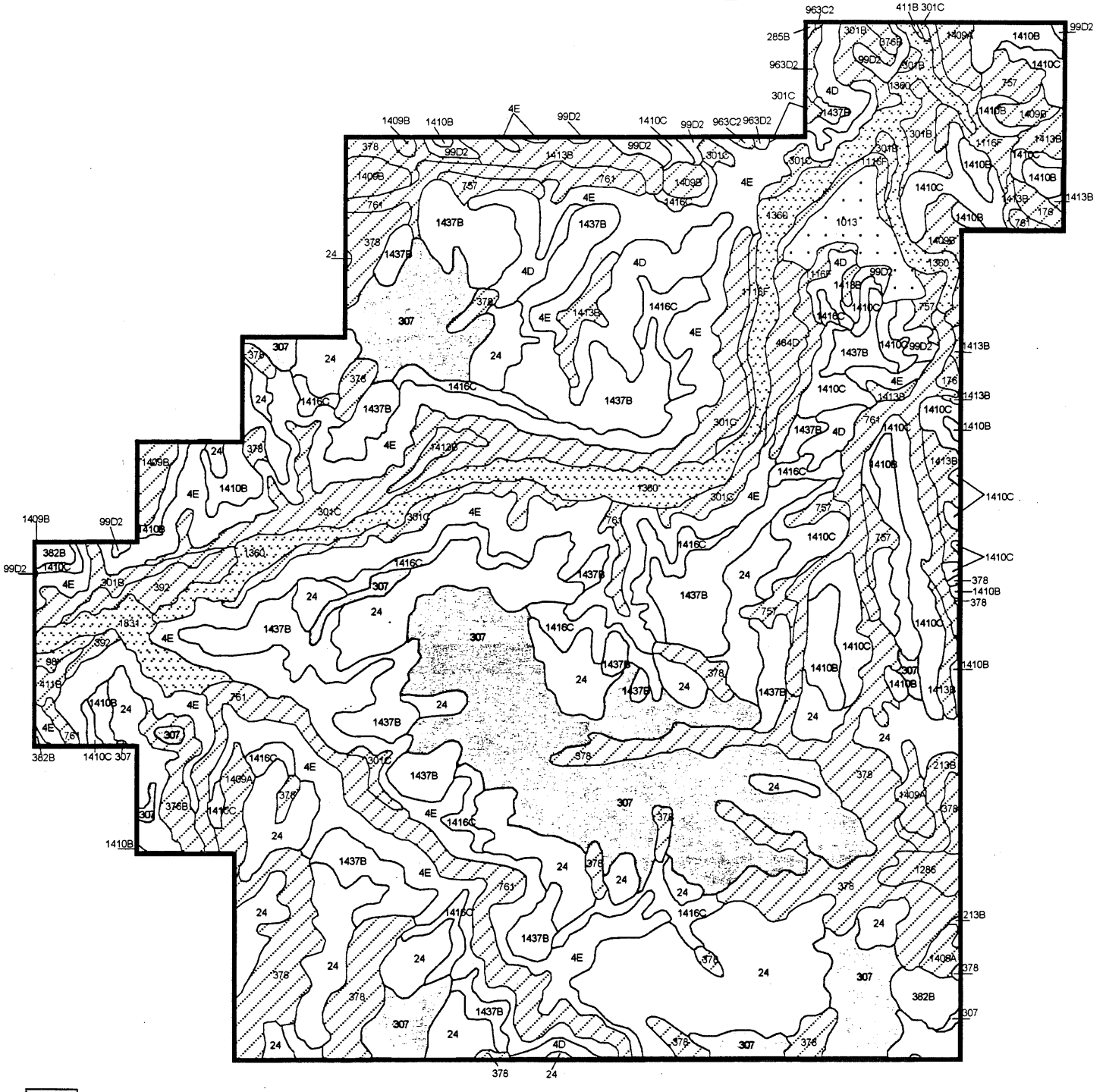
The chart on the next page summarizes soils in Nerstrand Big Woods State Park.

Management considerations for soils.
The significance of these soil types is that they reflect the kinds of vegetation that were present at the time the soils were developed. Landscape position plays an important role in determining the soil profile. Soils develop over time and are not static. The structure and organic matter of the soils is an important indicator of natural communities and vegetation, in the past and for future restoration efforts. Some soils in the park were transitional between prairie and forest. Agriculture and tree removal have mixed soil layers in some areas of the park. Soils also are indicators of soil capabilities and what types of recreation are suitable or unsuitable on various types of soils. For example, the soils in the picnic grounds have low permeability and a clay layer. Because of the heavy use in this area, management may need to consider tiling the picnic grounds. Other management considerations include evaluating which soils are prone to erosion. Of special concern are the soils behind the campgrounds where sheet erosion is occurring on the hillside and transporting sediment down the hill to where the trout lily community is located.

Map Unit	Description	Slope	Or. Veg.	Permeability*	Water Table
378	Maxfield silty clay loam	0-2%	Prairie	0.6-2.0"/hr	0.5'-1.5'
761	Epsom silty clay loam	0-2%	Prairie	0.6-2.0 (upper part)	1' above surface
				.06-0.2 (lower part)	to 0.5' below
98	Colo silty clay loam	0-2%	Floodplain	0.6-2.0	0.0'-1.0'
99D2	Racine loam	12-18%	Broadleaf	0.6-2.0	>6'
176	Garwin silt loam	0-2%	Prairie	0.6-2.0	1.0'-2.0'
213B	Klinger silty clay loam	1-4%	Prairie	0.6-2.0	2.0'-4.0'
1437B	Renova silt loam, moderately wet	2-6%	Broadleaf	0.6-2.0	3.5'-6'
285B	Port Byron	2-6%	Prairie	0.6-2.0	>6'
301B	Lindstrom silt loam	2-6%	Prairie	0.6-2.0	>6'
376B	Moland silt loam	1-4%	Prairie	0.6-2.0	>6'
382B	Blooming silt loam	2-6%	Broadleaf	0.6-2.0	>6'
392	Biscay loam	0-2%	Prairie	0.6-2.0 (upper part)	0.5'-1.5'
				2.0-20 (lower part)	
411B	Waukegan silt loam	2-6%	Prairie	0.6-2.0 (upper part)	>6'
				6.0-20 (lower part)	
484D	Eyota fine sandy loam	12-18%	Prairie	2.0-6.0 (upper part)	>6'
				0.6-2.0 (lower part)	
963D2	Timula-Bold complex	12-18%	Prairie	0.6-2.0	>6'
1013	Pits, Quarry				
1286	Prinsburg silty clay loam	0-2%	Prairie	0.6-2.0	0.5'-1.5'
24	Kasson silt loam	1-3%	Broadleaf	0.6-2.0	2.5'-3.5'
4D	Renova loam	12-18%	Broadleaf	0.6-2.0	>6'
4E	Renova loam	18-30%	Broadleaf	0.6-2.0	>6'
1116F	Brodale-Eyota complex	12-35%	Prairie	0.6-2.0	>6'
301C	Lindstrom silt loam	6-12%	Prairie	0.6-2.0	>6'
1409A	Kenyon silt loam, moderately wet	0-3%	Prairie	0.6-2.0 (upper part)	2.5'-3.5'
				0.2-0.6 (lower part)	
1409B	Kenyon silt loam, moderately wet	3-6%	Prairie	0.6-2.0	2.5'-3.5'
1410B	Racine silt loam, moderately wet	2-6%	Broadleaf	0.6-2.0	3.5'-6.0'
1410C	Racine silt loam, moderately wet	6-12%	Broadleaf	0.6-2.0	3.5'-6.0'
1416C	Renova loam, moderately wet	6-12%	Broadleaf	0.6-2.0	3'-6'
1413B	Littleton silt loam	1-4%	Prairie	0.6-2.0	1.5'-2.5'
1831	Colo silt loam, channeled	0-2%	Floodplain	0.6-2.0	0.0'-1.0'
307	Sargeant silt loam	0-2%	Hardwood	0.6-2.0	1.5'-2.5'
1360	Rushriver fine sandy loam	0-1%	Floodplain	2.0-20	0.5'-1.5'
757	Nerwoods loam	2-6%	Prairie	0.6-2.0 (upper part)	1.5'-2.5'
				0.06-0.2 (lower part)	

Chart Legend-Soils Suitability/Characteristics
*Permeability measure in inches per hour.

Nerstrand Big Woods State Park
Soil Types and the Vegetation present at the time of Soil Development



Hardwood

Broadleaf (transitional soil with a broadleaf influence)

Prairie

Floodplain

Quarry

N
W
E
S

0 0.25 0.5 0.75 1 Miles

Vegetation

Nerstrand Big Woods State Park is one of the most biologically rich sites in east-central Minnesota. The Minnesota County Biological Survey (1995) found that the park is one of the largest natural areas in the county and includes some of the highest quality natural communities. Its proximity to several other natural areas (Cannon River Wilderness Area, Caron County Park and the Cannon River Wild and Scenic Riverway) adds to its value. The park is especially significant in that only 4% of the land area of Rice County supports natural communities (Minnesota County Biological Survey 1995), and in the Big Woods Ecological Subsection, only 2% of the land supports Maple-Basswood, Oak and Lowland Hardwood Forest natural communities (Fred Harris, pers. comm.). In addition, there are four rare plant species in the park, including the state and federally listed Minnesota dwarf trout lily.

Vegetation History

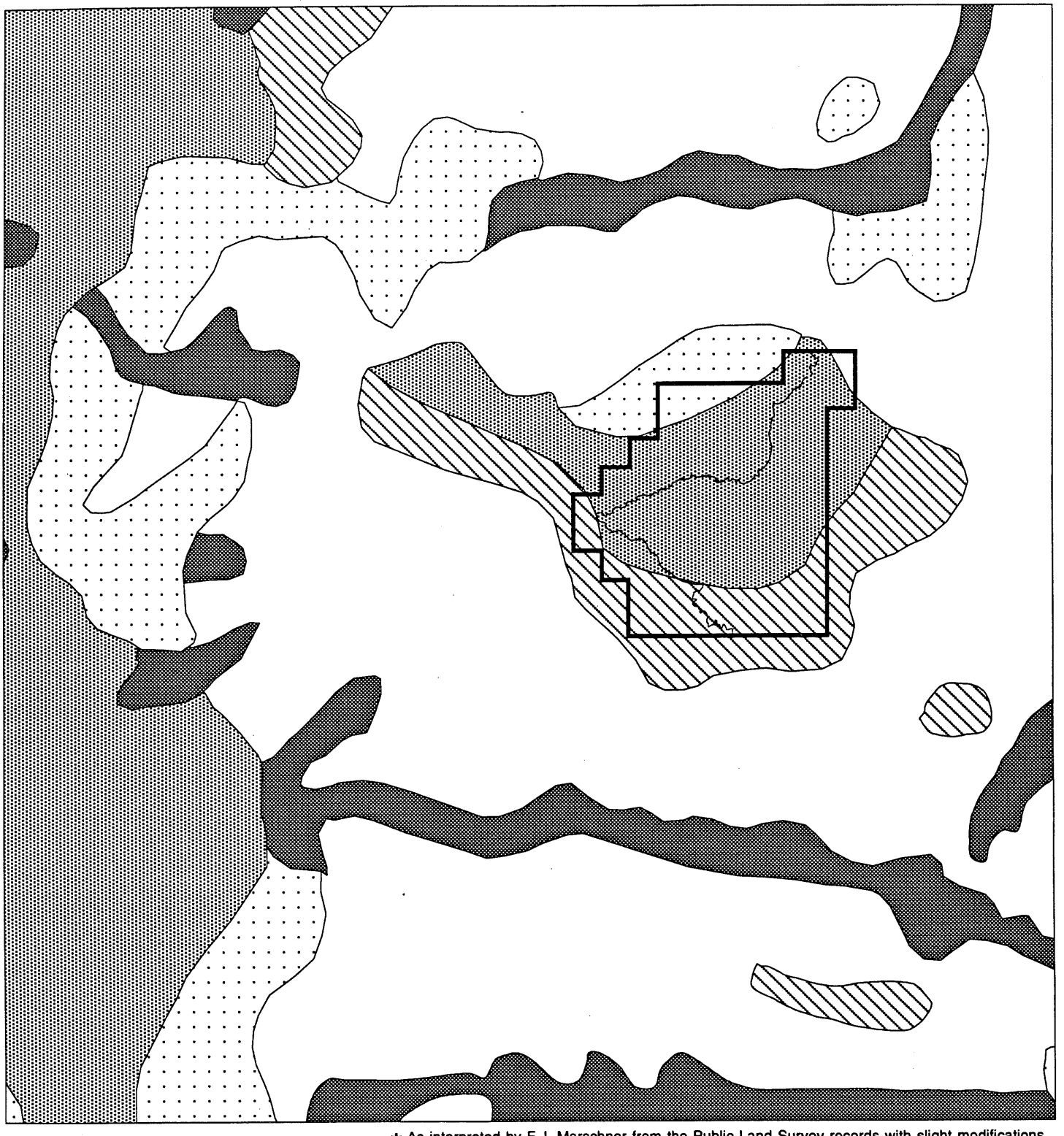
The best information we have about vegetation in Minnesota prior to Euro-American settlement is that collected by the original land survey in the middle 1800s. The vegetation in the area of Nerstrand Big Woods State Park when the original land survey was conducted can be determined by studying and interpreting the surveyors' notes (U.S. Surveyor General 1854, Marschner 1974) and by examining topography, soils, and present-day vegetation. Marschner (1974) interpreted the surveyors' notes and depicted the area that is now the park as a core of Big Woods vegetation surrounded by a band of Oak Openings and Barrens and Aspen-Oak Land, which was in turn surrounded by Prairie. (See Original Vegetation Map). This area of Big Woods was a few miles east of a 3,000 square mile continuous expanse of Big Woods. The surveyors described Wheeling Township as a prairie township with a good body of timber near its center. A closer look at the bearing trees recorded by the surveyors in the area that is now the park indicates that in 1854, there appeared to be a relatively narrow core area of Big Woods vegetation along Prairie Creek, and Oak Openings and Barrens in much of the rest of the park. (See Bearing Tree Map).

Marschner (1974) provided brief descriptions of the vegetation types documented by the surveyors. The Big Woods was dominated by elm, sugar maple, and basswood, and also included bur oak, white oak, red oak, northern pin oak, ash, hornbeam, aspen, and birch. Aspen-Oak Land was described as aspen, generally dense, and small in most places, with scattered oaks and few elms, ash and basswood. Oak Openings and Barrens was described as scattered trees and groves of oaks of scrubby form with some brush and thickets.

The primary factor governing the vegetation of the Big Woods and surrounding areas prior to Euro-American settlement was fire (Grimm 1984). Fires occurred frequently, including those set by lightning and those set by indigenous people, who used fires to make walking easier, to drive animals being hunted, to attract animals to new regrowth, and to increase seed production. Where fire was frequent, prairie was the predominant vegetation type. Less frequent fires led to Aspen-Oak Land and Oak Openings and Barrens, and places that burned very infrequently gave rise to Big Woods vegetation, which, because it produced little fuel, helped to perpetuate itself. Firebreaks such as lakes, rivers, and steep topography largely determined vegetation types by stopping or slowing fires. Hence in Nerstrand Big Woods State Park, Big Woods vegetation occurred near Prairie Creek, which served as a fire break, while more fire tolerant vegetation occurred on flatter land where no rivers or lakes stopped the spread of fire.

Many changes in the time period between 1854 and 1998 have occurred in the park. Factors that have had major impacts to the vegetation include Dutch elm disease, cessation of fire, subdivision of ownership, and logging. Dutch elm disease has had a dramatic impact on the composition of the forest. Elm was a dominant species in the Big Woods in 1854, but most mature elms died after Dutch elm disease became prevalent in Minnesota in the 1970s (French 1993), and it is now uncommon among mature trees in the area. The much lower frequency of fire following

Original Vegetation of Nerstrand Big Woods State Park*



* As interpreted by F.J. Marschner from the Public Land Survey records with slight modifications.

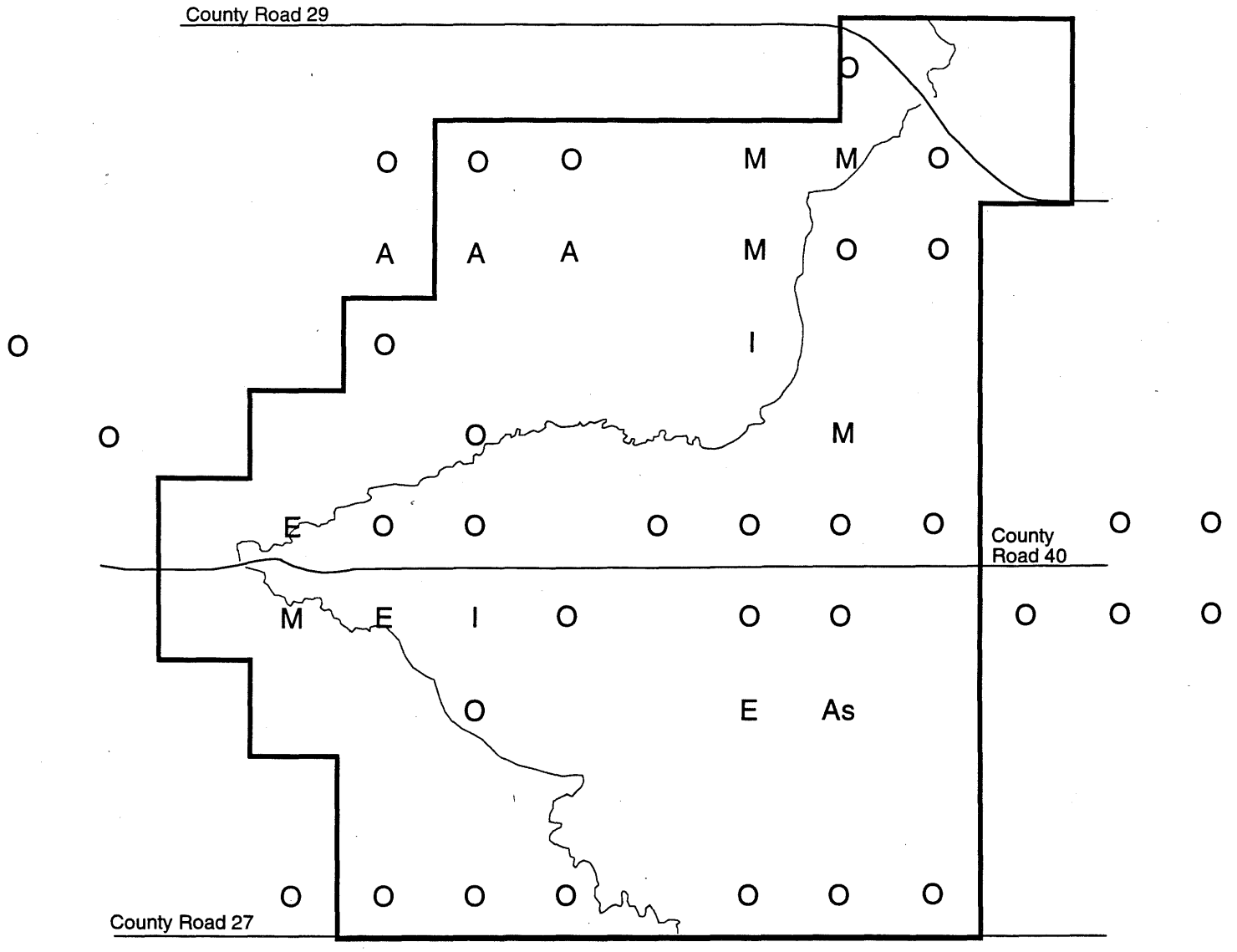
Legend
- Prairie Creek
- Park Boundary
- Aspen-Oak Land
- Big Woods
- Oak Openings and Barrens
- Wet Prairies, Marshes and Sloughs
- Prairie

NOTE: This map cannot be used for precise locations. It may be distorted due to cartographic enlargement.

N

0 0.5 1 1.5 2 Miles

Nerstrand Big Woods State Park
General Land Office (GLO) Survey of Bearing Trees



Legend

O = Oak (White, Red, Bur, Jack)
M = Maple
A = Aspen
I = Ironwood
E = Elm
As = Ash
Prairie Creek
Park Boundary

0 0.25 0.5 0.75 1 Miles

Euro-American settlement also changed the forest composition by allowing succession of some Aspen-Oak Land and Oak Openings and Barrens to Maple-Basswood and Oak Forests.

The area that is now the park was divided into many small ownership parcels for many years, mostly in five and ten acre woodlots. These areas provided a constant source of firewood, wood building materials, and maple sugar for early settlers. The 1941 Ownership Subdivision map compiled by the Forestry Division of the Department of Conservation indicates that in 1941 there were 139 subdivisions, with parcel sizes ranging from 1 to 40 acres. Over the years, each parcel had several owners with differing woodlot practices. While most of the parcels were selectively logged to sustain a constant timber yield, many parcels were clear-cut. Aerial photos from 1938, 1949, 1951, 1958, and a photo index map from 1935, available at the University of Minnesota map library, help complete the historical picture. Section 16 had a patchwork of small selectively cut and clear-cut areas. From 1939-1958, most of section 16 was either selectively cut or not disturbed, and there was little clearcutting. Section 9, however, was clear-cut on a large scale, with the majority of the woods in the central and south central portion of the section being cleared. Even today, this past logging pattern is clearly visible in infrared aerial photographs.

Present Day Vegetation

The present day vegetation in Nerstrand Big Woods State Park can be divided into two main categories. *Natural communities* are groups of native plants and animals that interact with each other and their abiotic (nonliving) environment in ways not greatly altered by modern human activity or by introduced organisms (Allmann 1997). *Disturbed vegetation* includes vegetation types that have been altered by modern human activities enough that they can no longer be classified as natural communities, such as croplands, old fields, and plantations.

The vegetation descriptions below are compiled from data collected in Nerstrand Big Woods State Park by the Minnesota County Biological Survey (1995) and by Area Forestry Staff in a vegetation inventory project conducted between October 1997 and January 1998. More comprehensive description of natural communities in Minnesota can be found in *Minnesota's Native Vegetation: A Key to Natural Communities* (Minnesota Natural Heritage Program 1993).

Natural Communities

Maple-Basswood Forest (Big Woods section)
Forests occupy about 57% of the of the land area within the statutory boundary of the park. These forests include four natural community types which encompass a great deal of species diversity. In 82 vegetation plots in deciduous forests in the park, 270 plant species were documented (Table --). Maple-Basswood Forest is the most common natural community type in the park today, covering approximately 40% of the current state owned land. The dense canopy is dominated by red oak, sugar maple, and basswood. Other common canopy trees include red elm, American elm, green ash, black ash, white ash, bur oak, white oak, hackberry, and black cherry. Subcanopy and shrub layers are generally dominated by sugar maple, and also include ironwood, bitternut hickory, bladdernut, pagoda dogwood, red-berried elder, and gooseberries. The ground layer includes many spring ephemeral wildflowers and other herbs adapted to deep shade.

Oak Forest (Mesic Subtype)
Oak Forests differ from Maple-Basswood Forests in that they are dominated by one or more oak species, although the distinctions between the types are not always as sharp as the lines on the map might imply. Most Oak Forests in the park are dominated by red oak, often contain patches of big tooth aspen, and are usually the result of clear-cut harvesting 50-70 years ago. In these areas, red oaks are almost always found in multistemmed clumps. Oak Forests dominated by white oak occur in two areas, one just west of the park office on the east side of the slope and the other west of the Hope pasture. Basswood, hickory, and ironwood are common associates, with sugar maple less

common. Bur oak is rarely dominant in any oak type, although it is relatively abundant at the base of the slope of the large area of oak forest in Section 9. Small patches of northern pin oak-dominated forest are occur in the southwest corner of the park. Shrubs in Oak Forests are relatively dense, with prickly ash, grey dogwood, and chokecherry all common. Herbaceous plants include many species that occur in Maple-Basswood Forests as well as some that are adapted to more open canopy conditions.

Lowland Hardwood Forest
Lowland Hardwood Forests occur on floodplains and on terraces above normal flood levels along Prairie Creek. Canopies vary from dense to open, with basswood, black ash, and green ash generally dominant. Other canopy trees include American elm, red elm, box elder, bitternut hickory, and sugar maple. Shrub cover is variable; buckthorn and honeysuckle, both exotic species, are relatively common in these forests in the park.

Oak Savanna and Oak Woodland-Brushland
Around the perimeter of deciduous forest in many places in the park, a mix of Oak Woodland-Brushland and Oak Savanna communities occurs. These communities were maintained on the pre-settlement landscape by fire, and are characterized by the presence of oaks in groves or as scattered individuals, patches of aspen, some area of dense shrubs, and an understory of species that includes prairie species. The Oak Savanna in the southwest part of the park on the south side of the stream is the most diverse in the park with a mixture of open-grown white and bur oaks often surrounded by dense patches of shrubs and oak or aspen seedlings/saplings. Interspersed along this edge are more densely canopied areas of Oak Woodland-Brushland, where northern pin oak is dominant. Saplings and shrubs have apparently increased in this area in the absence of fire and grazing. In formerly pastured areas of the park, open grown bur oaks dominate the Oak Savanna communities.

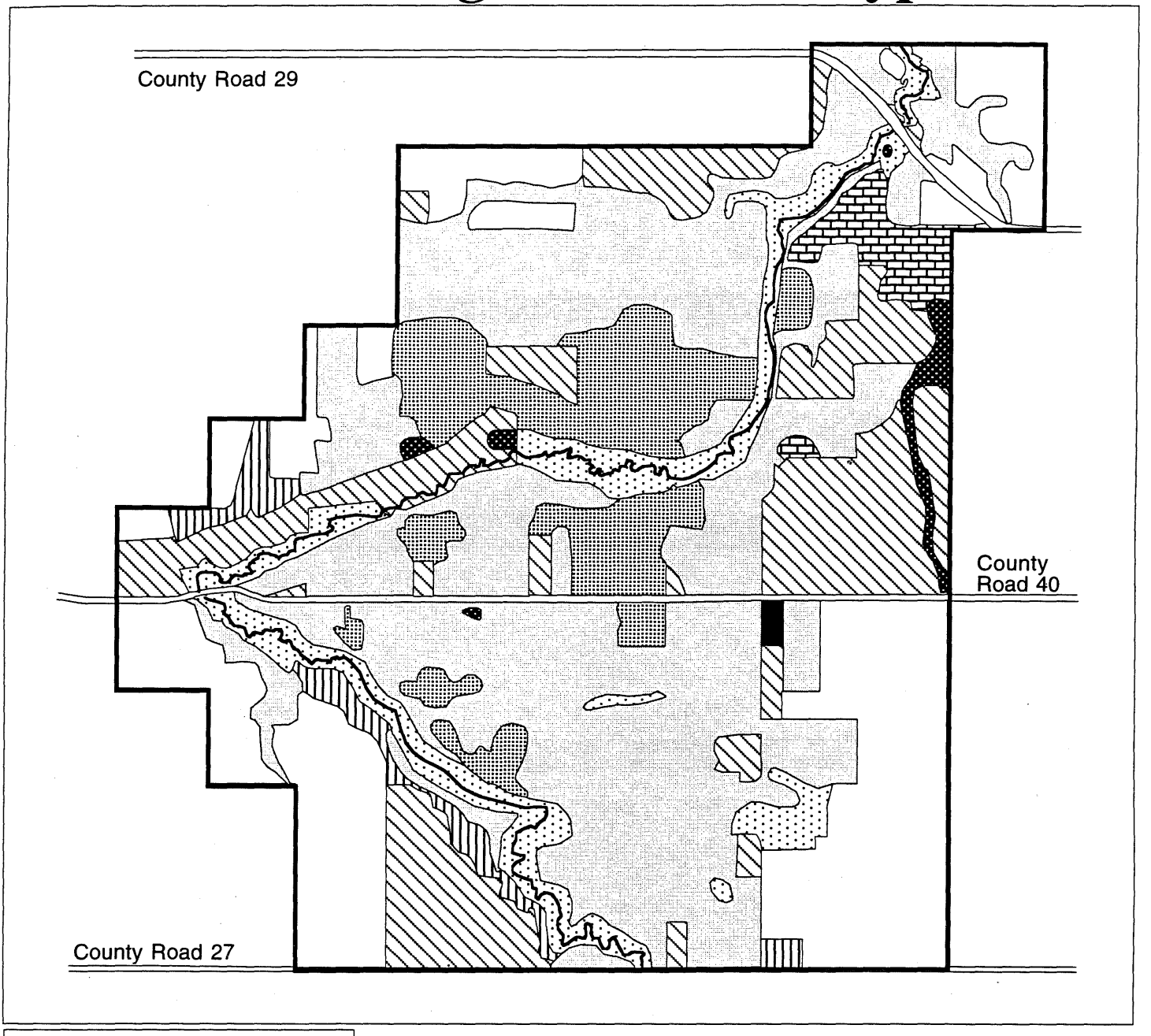
Hardwood Swamp
Small areas of Hardwood Swamp are located in the park in wet areas where there are sources of continual seepage. Canopies generally include black ash, green ash, basswood and American elm. Characteristic herbaceous species include marsh marigold, and a number of sedges. There is a small Hardwood Swamp located on a narrow terrace above Prairie Creek approximately 300 feet northeast of the waterfalls area at the base. Another occurs on private land just southeast of the park sewage lagoon.

Wet meadow
A small wet meadow is located in the SNA in the northeast corner of the park. There are other small areas of wet meadow along Prairie Creek, but these were not mapped separately from the disturbed lowland meadows described below. No detailed inventories of wet meadows have been done in the park. In general, wet meadows are open shallow-water wetlands with standing water present only seasonally. They are usually dominated by tussock sedge or lake-bank sedge, and common species include spotted Joe-pye weed, common boneset, great water dock, blue-joint grass, and northern marsh fern.

Management Considerations for Natural Communities

Soil erosion, sedimentation, and polluted water from within and outside the park all have the potential to destroy plant populations and encourage the growth of weeds. One special concern is the sheet erosion occurring on the hillside below the campground may be negatively impacting the forest communities and Minnesota dwarf trout lilies near the boardwalk area. Invasive alien plant species throughout the park should be monitored and eliminated from natural communities in the park as much as possible. Canopies of Maple-Basswood, Oak, and Lowland Hardwood Forests should be kept intact to protect herbaceous ground layers and rare plants and provide habitat for forest birds. In Oak Savannas, Oak Woodland-Brushlands, and restored Prairies, the

Nerstrand Big Woods State Park
Current Vegetation Covertypes



Park Boundary
Prairie Creek
Roads

Vegetation Types

- Agriculture
- Lowland Grass
- Upland Grass
- Oak Woodland-Savanna
- Lowland Hardwood Forest
- Maple-Basswood Forest
- Oak Forest
- Pine-Spruce Plantation
- Mining Land

* This data compiled by Richard Peterson, Faribault Area Forester. MN DNR - January 1998.

N
W E
S

0 0.25 0.5 0.75 Miles

reintroduction of fire should be considered, and possibly some brush clearing where fire is not enough to restore more open conditions. Where quarrying is taking place adjacent to natural communities, the potential disturbance of hydrologic systems should be monitored and steps taken to restore any disruptions that may occur.

Non-Native Vegetation

Conifer Plantations
A small plantation of spruce and pine occurs in one small area within the park boundaries. This area contains two small plantings of pine and spruce of approximately 2 acres each. These plantings are mostly pure stands planted in rows.

Disturbed Wet Meadow
A number of areas of open wetlands dominated by reed canary grass (an invasive species) occur along drainage ways and interspersed with Lowland Hardwood Forests along Prairie Creek.

Upland Grasslands
There are over 400 acres of upland grass within the park boundaries. These acres include old fields, agricultural fields enrolled in the Conservation Reserve Program and grass pastures. The existing vegetation on these areas is variable. Brome grass and/or bluegrass are characteristic of these sites although small areas of reed canary grass are often present. Clover, alfalfa, goldenrod and other species may also be found. Additionally, several acres of native prairie grasses and wildflowers have been established in the eastern portion of the southwest corner of Section 16. Several sites (see restoration map) have been planted to native trees. Native trees and shrubs such as ash and boxelder have also naturally seeded into most of the old field sites, especially along forest edges. The old field in the southwestern portion of Section 16 was inventoried in 1997 by Applied Ecological Services, Inc. They observed 40-50 native plant species, including several relatively uncommon species such as turk's cap lily, great St. Johns wort, and cream gentian, and large areas dominated by native sedges and forbs. They recommended the area be restored to vegetation representing a continuum of mesic to wet prairie, oak savanna, and deciduous forest.

Croplands
Agricultural fields are mostly associated with private lands within the park boundaries. These lands include areas devoted to row crops (either corn or soybeans) as well as a few sites used for annual hay crops. Some agricultural fields have been acquired recently and are identified as future restoration sites.

Hardwood Forest Plantings
From the fall of 1993, to the fall of 1997, over 31,150 tree seedlings have been planted in Nerstrand Big Woods State Park. Seeds and acorns have been collected locally and germinated in cooperation with the DNR Nursery in Badoura (99%) and Baileys Nursery (1%). DNR Forestry maintains a list of trees planted in all parts of the park and adjacent areas.

The current vegetation is summarized on the Current Vegetation Covertypes Map as well as by the table below.

Current vegetation within statutory boundaries of Nerstrand Big Woods State Park.

COVER TYPE	% OF TOTAL AREA APPROX	ACREAGE (APPROX)
OAK FOREST	9%	260 *
LOWLAND HARDWOOD FOREST	8%	230
MAPLE/BASSWOOD FOREST	40%	1152
PINE/SPRUCE PLANTATION	LESS THAN 1%	4
ASH SWAMP (not mapped)	LESS THAN 0.1%	0.5
OAK WOODLAND/SAVANNA	2%	57
LOWLAND GRASS	1%	38
PASTURE/OLD FIELDS	14%	403
MINELAND	2%	56
AGRICULTURE	23%	663
WATER (not mapped)	LESS THAN 1%	2
ROADS	1%	17

*Acres interpreted by Richard Peterson, DNR Area Forester, Faribault based on vegetation map on the next page.

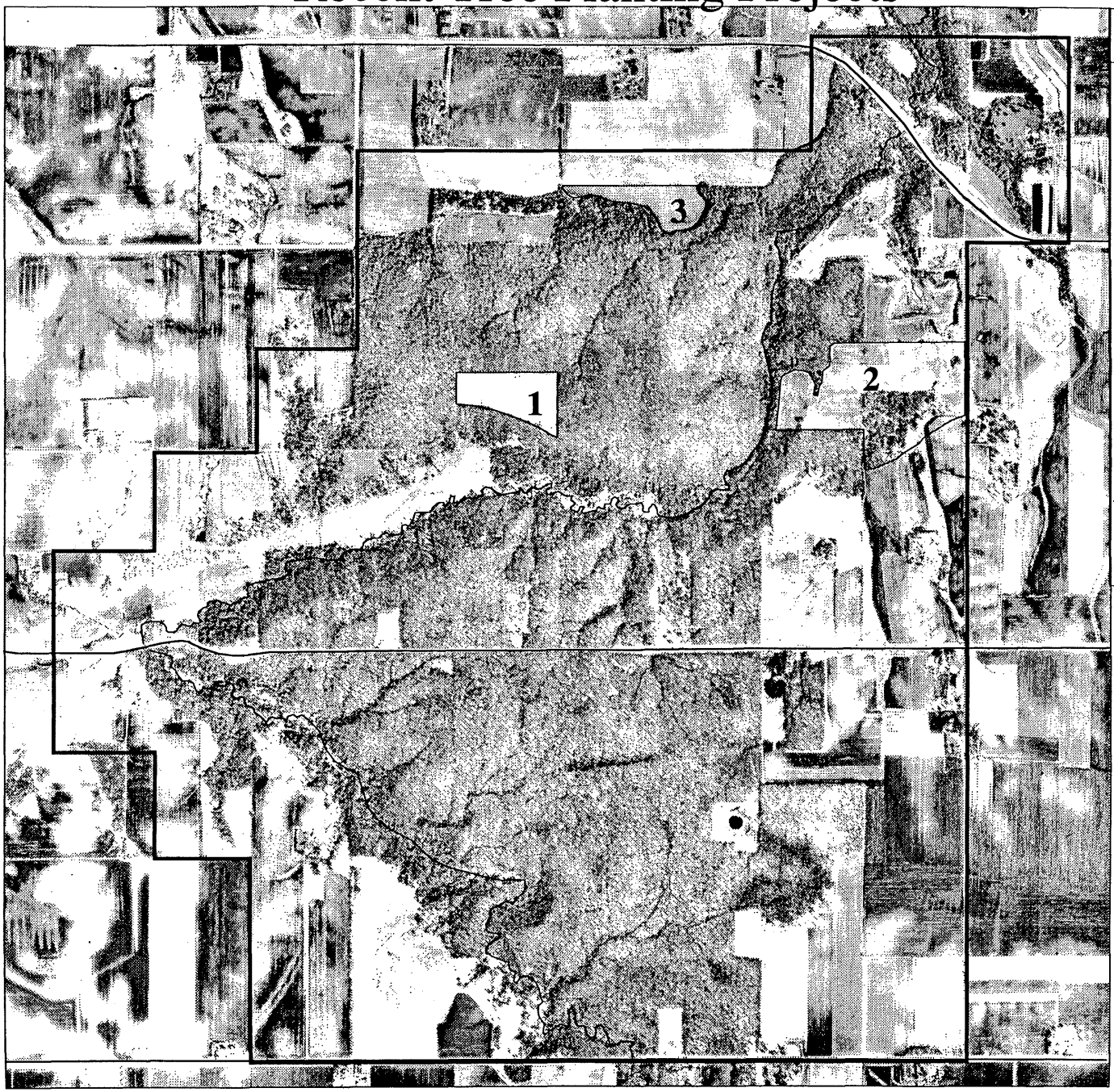
Recent Tree Planting and Restoration Efforts

From the fall of 1993, to the fall of 1997, over 31,150 tree seedlings have been planted in Nerstrand Big Woods State Park. Seeds and acorns have been collected locally and germinated in cooperation with the DNR Nursery in Badoura (99%) and Baileys Nursery (1%). DNR Forestry maintains a list of other area tree planting projects. The following record lists only planting projects in Nerstrand Big Woods State Park.

- Fall 1993 - Planted 500 red oak, 50 butternut at Hope pasture. DNR Parks, Forestry, TNC, and other volunteers did the planting.
- Spring 1994 - Planted 8,500 red oak and butternut seedlings at Bongers. A Big Woods Project.
- Fall 1994 - Planted 200-300 red oak in Hope pasture. Work done by Nerstrand School, DNR Parks, and Forestry. Planted 1,000 bur and red oak at Bongers. SAF.
- Spring 1995 - Planted 5,000 red and bur oak, and hickory at Bongers. A Big Woods Project.
- Spring 1996 - 9,000 red oak, bur oak, sugar maple, black cherry were planted at Prairie Creek Woods SNA as a Big Woods Project.
- Spring 1997 - Planted 5,000 red oak, bur oak, basswood, hickory, American elm, and quaking aspen at Bongers. A Big Woods Project. Also, 1,800 red oak, bur oak, basswood, hickory, American elm, and quaking aspen were planted at Prairie Creek Woods SNA as a Big Woods Project.

Locally grown trees were also planted around the new visitor center as part of the landscaping project. In a cooperative partnership, the prison in Faribault multiplied the tree stock in their five greenhouses. All 165 children from the Nerstrand Elementary school have been involved in planting trees, shrubs, and wildflowers. The Horticulture class in Faribault High Schools, the Braille School, and the Deaf School have also participated in the landscaping process.

Nerstrand Big Woods State Park
Recent Tree Planting Projects



Legend

1. Hope Tract
   1993: 500 trees planted
   1994: 250 trees planted

2. Bonger I Tract
   Spring 1994: 8,500 trees planted
   Fall 1994: 1,000 trees planted
   Spring 1995: 5,000 trees planted
   1997: 5,000 trees planted

3. Spring 1996: 9,000 trees planted
   Spring 1997: 1,800 trees planted

Roads

Prairie Creek

Park Boundary

N

Wildlife

Since the time that Europeans first came to this area, the number and species of wildlife found in the vicinity has changed. Bear, cougar, bison, elk, sandhill crane, bobwhite, swallowtail kites, prairie chickens, sharptail grouse, various fish and mussels were a part of pre-settlement fauna. The extinction of passenger pigeons is well documented, they were birds that fed on acorns. Deer were wiped out by the early 1900s. Loss of habitat, cultivation, fencing, and uncontrolled hunting were responsible for the reduction in number and elimination of some animals from the Nerstrand Big Woods vicinity. Physical changes in the landscape also affected wildlife. For example, row crops lead to faster runoff of rainwater, and also lead to increased siltation and nutrient runoff.

Today, mammals and birds from the deciduous forest and grassland biomes contribute to the diversity of the area. The predominant land use in Rice County is agricultural. Only a small percentage of the land is covered by forest which means many wildlife species that prefer forested areas are attracted to areas similar to Nerstrand Big Woods State Park. The forested land provides suitable food and cover for many species. There is also a State Game Refuge that bounds the park on the east, west, and north sides. There are close to 1,600 contiguous acres within the refuge. Nerstrand Big Woods State Park is in the center of this large wildlife habitat.

Mammals

Because small mammals are inconspicuous, their distribution and abundance is difficult to assess. The most common small mammals include: white-footed mouse, deer mouse, shorttailed shrew, meadow vole, prairie vole, masked shrew, and redbacked-vole. Other species including raccoon, red and gray fox, coyote, red and gray squirrel, weasels, skunks, and eastern cottontail rabbit are known to inhabit the park.

Nerstrand Big Woods and the nearby Prairie Creek areas support a population of beaver. Old beaver cuttings indicate that this population has been established for many years. The Prairie Creek areas in the park provide good habitat for beaver and the location of their dams pose little threat to park roads or trails.

White-tailed Deer History and Research

The park also supports a year round population of white-tailed deer. Deer were extirpated by 1900 from the area because they were heavily harvested for sustenance and commercial purposes. Gradually Minnesota implemented game laws allowing deer to reoccupy their native range. When Nerstrand Big Woods was being logged, it created a mosaic of openings and forest that provided excellent habitat for deer. With protection provided by the refuges, the deer densities built up quickly. The first hunts in the refuge (but not in the park) were held in 1958-59. They were archery hunts held in October. The area was not hunted again until 1969. Since then, regular managed hunts have been held in the park and refuge. The primary reason for having a special hunt in a state park is to help the manage the park based on: 1) what are the deer doing to the neighbors crops? and 2) what are the deer doing to the park vegetation? Resource specialists consider deer damage to park vegetation or to adjacent agricultural crop depredation. These are not the only criteria in determining a special hunt. The goal of the special hunts are to 1) Break up deer refuging behavior and 2) reduce deer damage . Deer hunts are needed in this area of Minnesota because there are no longer any predators and they have benefited from management and agricultural practices. Presently, managers will consider a special hunt if there are over 70-100 deer during the winter census of the Nerstrand refuge area.

David Augustine, from the University of Minnesota, (College of Natural Resources, Department of Fisheries and Wildlife) has been conducting research on the impacts of deer in Nerstrand Big Woods and other areas. His research has focused on areas with mature forests and the Big Woods landscape which is now highly fragmented. His research has found that in old mature forests, deer do not significantly affect canopy tree regeneration. They mainly feed on understory

vegetation/forbes. Deer especially feed on trillium and false rue anemone. In the early spring the most preferred vegetation in the woods are a variety of lily family species and bloodroot. (Augustine also counted 430 dwarf trout lily in the park, however, he found no indications of deer feeding on trout lily, at low post-hunt deer population densities). In late spring/summer deer prefer wood nettle, woodland goldenrod, jewelweed and trillium.

Augustine also compared woodlands with high deer populations (Riverbend Nature Center) vs. low deer density (at Seven Mile Woods). He found noticeable impacts on the vegetation where there is high deer densities and little noticeable impacts where there are low densities. The density of Nerstrand Big Woods State Park deer population is intermediate between that of River Bend and Seven Mile Woods.

Another aspect of his research compared vegetation inside a deer exclosure vs. vegetation outside the exclosure, before the 1995 deer hunt and after the hunt in 1996. Outside the exclosure, before the 1995 hunt: 30% of the plants in the study area had been grazed. After the hunt, only 7.6% of the plants had been grazed in the same area. Flowering/reproduction of vegetation also more than doubled after the hunt. Plant populations that flowered inside the exclosure were much higher. His research shows that special deer hunts in the park do have measurable impacts on the wildflower population in the park woodlands.

Management Consideration for mammals
The impact of deer on vegetation should be monitored. State Parks are wildlife refuges. However, in managing populations, there may be biological reasons for having a special hunt (such as when the deer population exceeds the carrying capacity, or when there is damage to agricultural crops or forests, etc.). Management hunts and wildlife removal projects will be conducted as necessary in cooperation with area wildlife staff.

Birds

In the state of Minnesota there are 305 regular bird species and the 1993 bird checklist for the state has 413 species reported in the state. The bird list for Nerstrand Big Woods State Park shows 169 species identified in the park (Chase Davies, March, 1992). This includes numerous observations of warblers, vireos, and hawks. Wildlife conservation issues in the park range from local to global; from chickadees to American neotropical migratory birds. The park was originally an island in a region of prairie and brush land. Currently the park sits in a predominantly agricultural ecosystem. Breeding bird population surveys tend to resemble those found in farmland habitat. Neotropical migratory birds also use the maple-basswood and lowland hardwood forests.

Breeding Birds

Breeding species include representatives of the deciduous forest, grassland and wetland ecosystems. The park provides a small island of forest, however, the edge effect impacts nesting birds. Some birds, such as oven birds, are intolerant of edges. In southern and central Minnesota, most of the large forest tracts have been eliminated. Today's forest are also much younger because of logging, and they lack a variety of successional stages. Changes in vegetation caused changes in species composition. For example, barred owls have often been replaced by great horned owls and red shouldered hawks have been replaced by red tailed hawks.

The park provides nesting habitat for neotropical migratory songbirds. In Minnesota, 43% of the forest bird species are Neotropical migrants (birds such as flycatchers, vireos, and warblers that migrate south to central Mexico, Cuba, and into northern South America). The floodplain forests provide especially important habitat for these birds. However, grasslands are also very important to ground-nesting Neotropical migrant birds which are dependent on grasslands for safe nesting. Populations of grassland-dependent birds, as a group, are declining at a greater rate over a more extensive area than any other group of birds, including those who utilize the tropical rain forests in the winter. Upland sandpiper, which usually nests in relatively undisturbed, extensive grassland,

was recorded in the southwestern corner of the park by the Minnesota Ornithologist Union in June 1990 and has not been documented since.

Woodpeckers are common in this park, favoring the habitat which has many standing dead and downed trees. Except for the lowland hardwood areas, shrubs are rare in this park and therefore shrub nesting birds are scarce. The shrub nesting bird community in the lowland hardwood areas provides excellent birding, especially in Section 9 where the lowland area is easily accessible by trail.

Pheasants and other introduced animals and plants also have ramifications on species composition. There are no good records of whether wild turkey are native to Minnesota. Cardinals and house finches have made range extensions into the park.

In cooperation with the Department's Division of Fish and Wildlife and the Natural Resources Research Institute, University of Minnesota, several census points were established in the park in 1995 as part of a long-term monitoring program for forest songbirds throughout the state.

Management considerations for birds.
1) Wild turkey have been released outside the park and also occur inside the park at times.
2) Many bird species are highly sensitive to the edge effect, created by roads, trails, or other development. For example, these edges act as corridors for predatory species such as fox, skunk, raccoon, cats, crows, and jays and brood parasitism from brown-headed cowbirds. 3) Any proposed development and uses will need to consider potential impacts to breeding and migratory bird species.

Reptiles and Amphibians

Dr. Eric S. Cole from St. Olaf College conducted an amphibian survey in Nerstrand Big Woods and Cannon River Watershed in 1996 and 1997. Rocky outcroppings and other dry areas provide habitat for reptiles, while floodplain forests and streams provide habitat for a variety of amphibians.

The following is a list of species for Rice County.

Turtles

Wood Turtle	Western Painted Turtle
Eastern Spiny Softshell	Blanding Turtle
Snapping Turtle	

Lizards
Northern Prairie Skink

Snakes
Eastern Plains Garter Snake
Eastern Milk Snake

Salamanders
Eastern Tiger Salamander

Frogs (All found in Nerstrand Big Woods State Park)

American Toad	Tree Frog
Chorus Frog	Western Chorus Frog
Northern Leopard Frog	Green Frog
Wood Frog	

Endangered, Threatened, and Special Concern Species

The Minnesota Natural Heritage Nongame Research (NHNGR), Nongame Wildlife Program, and Minnesota County Biological Survey document locations of rare features, including rare plants and animals, natural communities, and selected animal aggregations and geologic features. Each entity is termed an "element" and is included on an official register maintained by the NHNGR program. Statewide locations of these elements are stored in a geographic computerized database, known as the Rare Features Database.

Known Elements Within Park Boundary

Plants:

Minnesota dwarf trout lily *(Erythronium propullans)* - Current Status: Endangered
This is one of two higher plants endemic to Minnesota, known nowhere else on earth. It was discovered in 1870 by Mary Hedges, a botany professor at St. Mary's School in Faribault. Since that time, extensive searches by botanists have located approximately 40 locations for the plant in three counties: Rice, Goodhue, and Steele. The species' preferred habitat appears to be maple-basswood forests on slopes and ravines or floodplain forests adjoining the Straight, Cannon, Little Cannon, and Zumbro Rivers and Prairie Creek. The population in Nerstrand Big Woods State Park is one of two sites with on-site interpretive facilities and accessible photo opportunities. The species is protected as endangered by the federal and state endangered species acts because of its limited geographic range, small number of known populations, and past and present threats to its environment associated with agricultural use, increased urbanization and suburbanization of its habitat, housing developments, and associated demands for recreational opportunities. Rip-rapping work was done along the banks of Prairie Creek to prevent continuation of documented erosion of Minnesota dwarf trout lily colonies into the creek. Large sections of the adjoining slope were being undercut taking whole colonies downstream.

American Ginseng *(Panax quinquefolius)* - Current Status: Special Concern
American ginseng was formerly a widespread species of eastern North American hardwood forests, but natural populations have been nearly decimated by commercial harvest since colonial times. The species was reported in the park prior to 1947, but has not been seen since that time.

Wood's sedge (*Carex woodii*) - Current Status: Special Concern
This small woodland sedge occurs in deeply shaded forests and is easily overlooked. In addition to the population found in Nerstrand Big Woods, extensive populations occur in nearby protected areas including Rice Lake State Park, Beaver Creek Valley State Park, and Whitewater Wildlife Management Area.

Moschatel (*Adoxa moschatellina*) - Current Status: Special Concern
Moschatel is a very unusual species. It is the only member of its family in North America and appears uncommon over most of its range. In Minnesota it occurs along the North Shore and in north-facing, wooded slopes in the southeastern counties. The single clump of plants known at Nerstrand Big Woods State Park is growing in association with the Minnesota dwarf trout lily and other spring ephemerals.

Animals:

Acadian Flycatcher *(Empidonax virescens)* - Current Status: Special Concern
An Acadian Flycatcher and three downy young were observed Nerstrand Big Woods State Park in 1979. Acadian Flycaters were also reported singing at two sample points in the park during the 1997 breeding season. The Acadian flycatcher is closely associated with riparian habitats.

Management considerations for endangered species.
The Minnesota dwarf trout lily populations within park statutory boundaries are the only populations of this species known in the watershed of Prairie Creek. Because of the species small size and short blooming period, only small portions of the area within park statutory boundaries have been searched for this federally-endangered plant. All maple-basswood, floodplain forests, and lowland hardwood forests within park statutory boundaries are potential habitat for this species. No new developments should be conducted in maple-basswood forests or floodplains without explicit searches of the areas proposed for development during the species blooming season.

Efforts should be made to diminish sheet erosion associated with the main campground, which lies upslope of the main known trout lily population.

Areas known to be of special concern include campground expansions, new foot trails and ski trails near the campground, any development between the campground and Hidden Falls, and development of overlooks, trails, or observation areas near Hidden Falls. There should be no development between the campground and known population of Minnesota dwarf trout lilies near the boardwalk.

The rip-rapping along the east side of Prairie Creek adjacent to the boardwalk should be retained to prevent erosion of Minnesota dwarf trout lily colonies into the stream. Foot traffic in the vicinity of the boardwalk should be monitored to assess potential overflow, especially on the east side at the top and bottom of the boardwalk and additional railings installed if necessary. A marked location for placement of tripods should be established on the boardwalk to enable photographers to obtain close-up photos of the species without leaving the boardwalk.

A second known area of concern is in the vicinity of the Oak Bridge, especially on the south side of Prairie Creek. Present foot traffic patterns in the vicinity should be ascertained and railings or postings erected as necessary to protect trout lily plants in this area. A complete survey of the area should be conducted before planning any upgrading or re-routing of trails in this area.

Waters/Fisheries

Groundwater and Wells

Groundwater supplies are adequate for domestic or farm use at relatively shallow depths throughout the Cannon River watershed. For municipal supplies or industrial use, there are several possible sources in the bedrock. The St. Peter sandstone, Shakopee and Oneota dolomite, Jordan sandstone, and Ironton-Galesville sandstone are the principal aquifers capable of yielding large supplies of groundwater. In the legislative district where Nerstrand Big Woods is located over 37% of the houses get their water from individual wells. This is considerably higher than the statewide average of 26% of the households. However, there has been a statewide trend over the last decade of an increase in the proportion of housing units that receive water from individual wells.

Currently, Nerstrand Big Woods State Park has three active wells that are used continuously or seasonally. The oldest one, drilled in 1958, is 282 feet deep. This well obtains water from the St. Peter sandstone aquifer, from which moderate amounts of water are usually available. The two other wells were drilled in 1968 and 1969 and are 248 feet and 277 feet, respectively.

In August 1995, a DNR hydrologist searched all known or suspected abandoned wells in the park. Five sites were searched in the park using a proton magnetometer to survey the sites. Significant magnetic anomalies were sketched, located using a Trimble GPS receiver, then dug using a shovel. No evidence of any well was found at any of the five sites. It is speculated that some of these homesteads and the old sawmill site may have had dug wells, dry wells, or cisterns.

Management Considerations for groundwater and wells

At this time there is no need to search further in the park for abandoned wells. Information from the search for abandoned wells is kept on file in St. Paul, with the Division of Waters, Well Sealing program. Active well information is maintained by the DNR Field Services Bureau.

Surface Water and Streams

Rice County contains 65 lakes, over 300 miles of streams, and roughly 3,000 wetlands. These surface waters serve many recreational uses. The only surface water in the park is a tributary to Prairie Creek. Prairie Creek and its tributaries are tributary to the Cannon River. Two natural waterfalls occur in the northern section of the park. The larger of the two falls (Hidden Falls) is one of the most popular attractions in the park. The smaller falls is adjacent to the northern park boundary near the existing northern loop trail. This falls is not accessible by foot trail and should remain "off the beaten path." No trail is proposed to be developed to this falls.

Streamflow characteristics of the Cannon River and its tributaries are directly related to the nature of the precipitation, evapotranspiration, topography, and geology. Many streams in the region flow through valleys incised into the bedrock. For the most part, these valleys have very little sediment in the bottom, although that was not always the case. During the Late-Wisconsinan, glacial outwash (sandy-to-gravely sediments produced during glacial melting) filled many of the largest streams in the region (such as the Zumbro, Cannon, and others). Remnants of these deposits can still be seen in many stream valleys. The large sand-and-gravel deposits in the Zumbro River valley just west of Zumbro Falls are good examples. Due to the large volume of sediments produced during the retreat of the glaciers, most of the streams in the region (including the Mississippi) were aggrading (filling with sediments) during the Late-Wisconsinan.

During the last stage of the Wisconsinan glacier a large lake (Glacial Lake Agassiz) formed in the northwestern part of Minnesota and eastern North Dakota, a result of glacial melting and retreat. This region drains to the north (the Red River flows into Hudson Bay), but at that time its drainage was blocked by the presence of the ice sheet which still covered most of Canada. The waters rose

in the region, forming Glacial Lake Agassiz until they finally overtopped the north-south continental divide at Browns Valley, Minnesota. The cataclysmic floods that occurred during the drainage of Glacial Lake Agassiz carved out the Minnesota River Valley and drastically downcut the Mississippi River in its hurried flow to the Gulf of Mexico. This downcutting steepened the gradient of all the rivers draining into the Mississippi below the Twin Cities.

Streams with steepened gradients become erosive and start downcutting. In this instance, the downcutting of the streams advanced headward from the Mississippi River Valley, removing most of the sediments deposited in the steams by glacial outwash and sands and silts blown from the uplands during the periglacial stages. By the time of European settlement, most of the streams in the region had lost nearly all of the sediments deposited during the Late-Wisconsinan, with the result that their valleys had essentially the same contours as they had prior to the beginning of the Wisconsinan glacial.

The high erodibility of the silty surface soils in the region led to the last great change in the landscape. The clearing of the original forests for timber or agriculture caused a number of very intense erosional events in the region. In extreme instances, small towns situated in valleys were buried by erosional sediments and many smaller valleys in the region were filled with several meters of silty surface soils eroded from the surrounding hillsides. Many of these small valleys still contain significant sediment deposits, although stream downcutting has removed sediments from some of them. This current downcutting process is certainly of concern to many individuals in the region, but it is actually a normal consequence of the streams attempting to re-attain the stream gradients that existed prior to European settlement.

High flows on Prairie Creek are caused by intense storms which occur frequently during the summer and by spring snow melt which generally occurs in March. The magnitude of the peak flows caused by summer storms is largely dependent on the duration, intensity, and geographic location of the storm. For example, if the storm occurs on the upper part of the Cannon River watershed, the lakes and depressions partly retain the runoff. However, below Northfield, the natural drainage pattern tends to accelerate runoff, resulting in high, short duration, peak flows. Accordingly, intense precipitation on the upper parts of the watershed causes less flooding in the valleys than equally intense precipitation on the lower part of the watershed. The Cannon River is the major watershed of the region and like many agricultural watersheds has water quality problems.

Management Considerations for Streams

The park contributes to the water quality principally from erosion that occurs on trails and from bank erosion, especially along Prairie Creek in the park. Most of the water quality problems of Prairie Creek occur upstream of Nerstrand Woods and the park has no direct influence on those activities that produce the problems. Improvement of water quality and flowage will occur primarily through activities on private land upstream. The Cannon River Watershed Partnership has focused on conservation and cleanup efforts that may result in improved water quality and flowage in the park.

Fisheries

Agricultural based land use within the Prairie Creek watershed has impacted the stream in a typical fashion. High stream flow fluctuation increases erosion, causing higher turbidity and instream sedimentation. Fisheries habitat diversity is thereby decreased. From the mouth to stream mile 5.9, Prairie Creek does provide habitat for warmwater gamefish, such as smallmouth bass. From this point upstream to the source however, the stream is classified as a warmwater feeder, with non-game fish and forage species common.

Past electrofishing surveys have collected 25 or more species of fish including gamefish such as smallmouth bass, largemouth bass, black crappie, white crappie, northern pike, and walleye.

Most of these were probably migrants from Lake Byllesby. Gamefish are generally in very low abundance and do not provide a significant fishery.

Presently, management on Prairie Creek is limited to fisheries habitat protection through the DNR Environmental Review Program. No stocking is recommended at this time.

Management Consideration for Fisheries.
Upland management and erosion inside and outside the park of the stream banks could lead to diminished water quality due to siltation. The presence of trails in inappropriate locations could also increase sedimentation.

Research History

Nerstrand Big Woods State Park has been a site for research studies for many years. Minnesota State Parks have required research permits since the 1970s. Listed below are the approved inventory and research that have been conducted in the park up until 1997. The Division of Parks and Recreation has received reports on some, but not all, of these studies. There have been other studies conducted in the Big Woods/Cannon Valley area that may be relevant to the park.

1997 - Survival Patterns of Red Oak Seedlings Planted on the Bonger Tract - The Big Woods Project by Dr. Kathleen L. Shea, St. Olaf College.

1997 - Land-Use History and Wood Nettle (Laportea canadensis) Colonization in the Big Woods Ecoregion by Ms. Lori A. Biederman, University of Minnesota.

1996 - 1997 - Amphibian Survey - Nerstrand Big Woods and the Cannon River Watershed by Dr. Eric S. Cole, St. Olaf College.

1994 - 1997 - Seasonal Impacts of White-tailed Deer on the Herbaceous Plant Community of the Big Woods Ecosystem by Dr. Peter Jordan, Dr. Lee Frelich, and Mr. David Augustine, University of Minnesota.

1994 - 1997 - Minnesota dwarf trout lily monitoring by the MDNR Natural Heritage Program and state parks. (Data from 1986,1987,1988,1989, 1990, and 1992).

1996 - Ongoing - Minnesota Forest Bird Diversity Initiative by Ms. Carol Pearson and Dr. Jerry Niemi, Natural Resources Research Institute (NRRI).

1992 - 1995 - Factors Influencing Forest Regeneration in Nerstrand Big Woods State Park by Dr. Timothy Sipe, Gustavus Adolphus College.

1993 - Qualitative and Quantitative Descriptions of Old Growth Forests Through Indicators by Ms. Cindy Hale, Natural Resource Research Institute.

1988, 1992 - Minnesota dwarf Trout Lily Studies by Dr. John M. Pleasants, Iowa State University.

1979 - 1985 - Plant Collections and Forest Management by Dr. Harriet Mason, Gustavus Adolphus College.

1990 - ongoing - Lichen Collections by Mr. James P. Schuster, Mahtomedi.

1988 - Minnesota dwarf Trout Lily Study by Dr. John M. Pleasants and Dr. Jonathan F, Wendel, Iowa State University.

Research and Information Needs

Effective management and educational programs require adequate and accurate information and knowledge. Natural systems are dynamic, being changed by natural succession, climate fluctuations, pest cycles, and human disturbance, to name a few factors. To effectively manage the park, research, inventory, and monitoring programs will be required to document existing resources, develop and evaluate management strategies, monitor impacts of human activity, particularly recreational use, and other factors impacting the park's resources. Research is needed to better understand ecological conditions and processes that existed prior to Euro-American impact. Studies can help the park's success in ecological restoration efforts. Listed below are some specific needs as recommended by a variety of Department of Natural Resources personnel and other resource professionals. (They are not in priority order).

a) Incorporate appropriate new management and ecological restoration techniques as recommended by research and evaluation.
b) Develop and maintain a database and geographic information system of natural and cultural resource information to guide planning and monitoring activities.
c) Map and maintain a database of all restoration and tree planting projects. Monitor site performance, seedling survival, erosion control, seed bank response, and forest growth.
d) Map and further inventory existing plants and concentrations of native plants worthy of protection.
e) Map and maintain a database of noxious weed populations.
f) Complete an inventory of biological features.
g) Study the effects of fragmentation.
h) Establish a monitoring program of interior forest songbird nesters including numbers, reproductive success, species composition, and impacts on nesting habitat.
i) Monitor the diversity and abundance of nesting prairie birds.
j) Study deer population dynamics 1) impacts of hunting pressure and timing of harvest on population composition and recruitment 2) impact of the park on surrounding area's deer population and on hunting opportunities.
k) Develop and monitor biological indicators of ecosystem health.
l) Continue to assess and inventory fish populations on an infrequent basis.

Resource Objectives

These objectives will guide the park management decisions toward sustainable natural and economic resources and the protection of cultural resources.

Environmental

- Maintain and restore examples of natural communities and species found in the park. State parks provide for essential habitat for the native species of Minnesota.
- Sustain functioning ecosystems and maintain the integrity of biological diversity at all levels: ecosystem, community, species, and genetic.
- Identify degraded natural communities and ecosystems and work toward their restoration through management.
- Protect and enhance habitats for plant and animal species that are listed as endangered, threatened or special concern.
- Identify, monitor and control invasive exotic species including plants, insects, diseases, and animals.
- Protect existing wetlands and identify former wetlands under our jurisdiction for restoration where feasible.
- Protect known cultural resource sites.

Community

- Raise the level of understanding of cultural and environmental issues. Communities come together and learn to work together through cultural and environmental activities.
- Maintain natural communities that offer opportunities for solitude. Stress is a serious issue in modern society. All of the popular solutions highlight the role of leisure and relaxation.
- Manage natural resources on a landscape and ecosystem basis. The provision of parks, open spaces, and protected natural environments contribute to the environmental health of our communities.
- Identify, monitor, and manage historical and cultural resources in cooperation with the Minnesota Historical Society.

Economic

- Park development should be completed in a manner compatible with resource management and protection. Many studies have shown that financial investment in recreation projects pay dividends throughout the community--the return is always greater than the original outlay. (Benefits of Parks Catalogue).
- Use natural resources and public funds efficiently. Direct growth towards areas in the park with existing capacity in infrastructure and services. Use land efficiently and appropriately. Habitat protection and recreation is often the highest and best use of lands that are too fragile for development (slope, floodways, etc.).

Resource Management Actions

This plan provides the basic management direction for the park and is not intended to provide specific management or development details. The Minnesota Department of Natural Resources (DNR) has a goal of managing resources in a way that is sustainable for future generations. Ecosystem-based management (EBM) is the approach DNR is using to achieve this goal. The way this goal is approached is by taking a broader perspective and addressing ecosystem management rather than focusing only on individual plant or animal species. The goal of this planning process is to decide how to manage Nerstrand Big Woods State Park to sustain healthy ecosystems into the future. This EBM perspective forces us to look at Nerstrand Big Woods State Park not as an island, but as an integral part of a larger ecosystem.

Management actions for Nerstrand Big Woods State Park revolve around the concepts of: 1) working towards restoring native vegetation systems and on restoring natural processes (not just communities), 2) ecosystem-based management and 3) using current and future technology (GIS, ECS and others). This plan outlines a few basic prairie and forest restoration areas. Soil surveys and subsequent interpretation of soils through ECS will be important in determining management strategies for sites. Interpretation is an important component of effective resource management. See the Interpretive Services section for details.

There is a delicate balance in bringing people and nature together. People need access to open space and natural areas for recreation and leisure in an ever increasingly complex world. County biological surveys indicate that only four to eight percent of most Minnesota counties remain in natural communities. The original expanse of forest has been highly fragmented and even in remaining tracts, such as Nerstrand Big Woods, there are disturbances that can negatively impact native species. Care should be taken to avoid unnecessary disturbance. The little bits of natural communities that are left are unbalanced and we continue to push them for recreational use. This is true in many of our state parks, especially the smaller ones and the parks that are near the Twin Cities metropolitan area. As time goes by, it may be necessary to relocate recreational uses in the parks to less high quality natural communities.

The major concerns at this time are: 1) Maintaining biodiversity; 2) Avoiding fragmentation of habitat; 3) Reestablishing ecological processes; 4) Protection of listed species; 5) Maintaining old growth forests; 6) Avoiding introduction of exotic species, monitoring for new introductions, and eliminating exotic species when feasible. 7) Developing the Ecological Classification System. 8) Restoring old fields and other disturbed areas as time and funding allow.
(Note: although the actions are numbered, they are NOT in priority order.)

Maintaining Biological Integrity and Ecological Restoration

Nerstrand Big Woods State Park contains a mix of forest, oak savanna, and prairie habitat. A holistic approach is the foundation of ecosystem-based management. The goal is a viable population of all native species, varying within sustainable limits. All efforts should be made to avoid habitat fragmentation and protect biodiversity. Biodiversity considerations include composition, structure, and function relating to species. Composition includes the species and genetic diversity that constitute the communities and ecosystems. Structural diversity pertains to how the ingredients of diversity are arranged relative to each other in time and space. Functional diversity applies to ecological processes and many interactions that occur in an ecosystem (Crow, Haney, Waller, '94). Effort should be made to maintain minimum levels of each successional stage. Reserves should be large enough to offset catastrophic events (Vora '94).

Restoration decisions should be guided by a number of considerations including:

- Existing communities and patterns of communities currently represented on the site.
- Pre-settlement vegetation.
- Regional and Departmental priorities.
- Site factors such as soils, slope, and aspects.
- Cost/practicality of restoration. Funding and availability of staff.
- Representation of full spectrum of communities that were typical of the area.
- Rare elements.
- Recreational development.
- Exotic species.

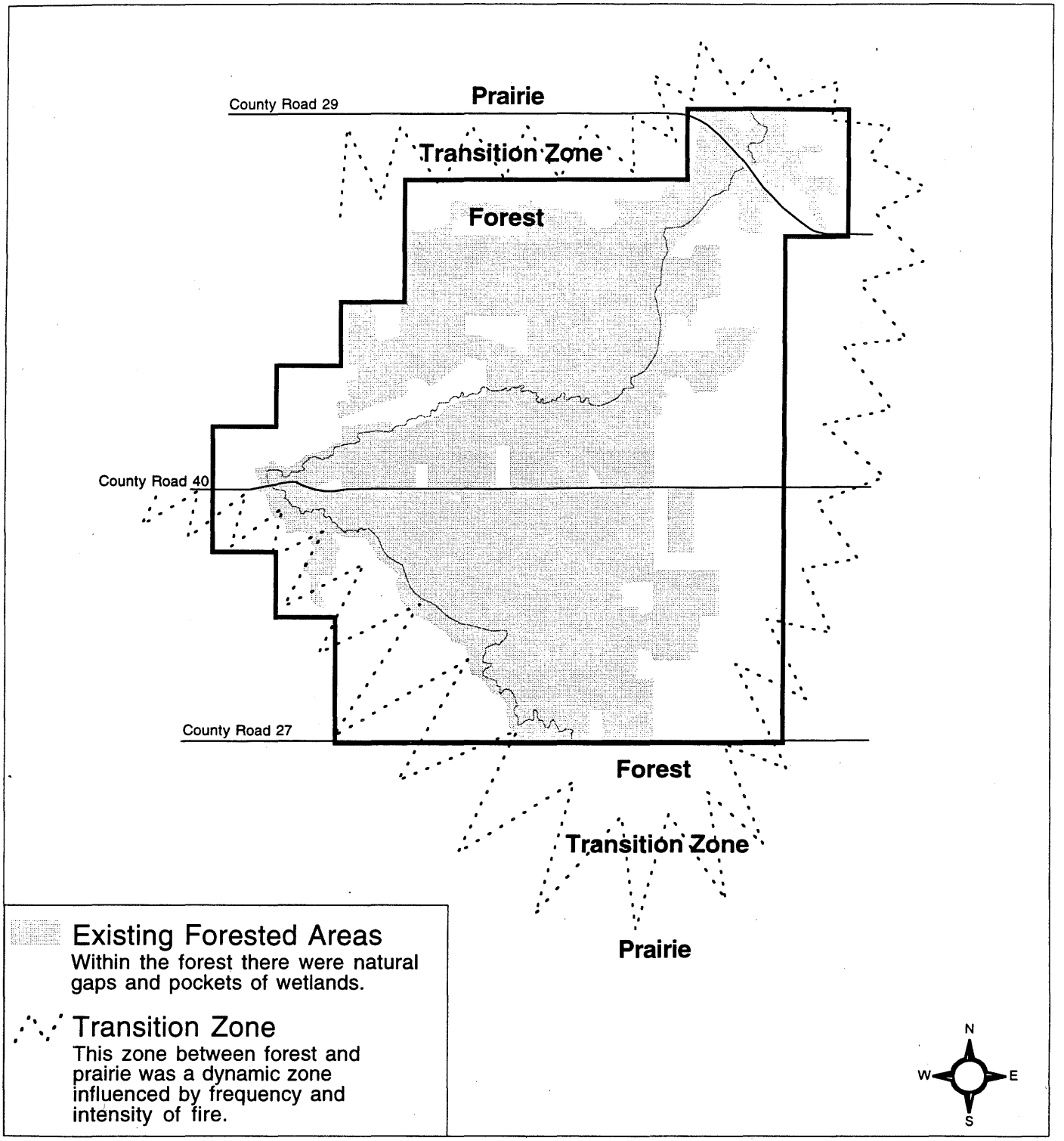
- **Action 1: Implement management towards native vegetation patterns.** (See General Restoration Pattern Map). The highest priority for conservation should be to maintain and restore the existing array and pattern of natural communities and species currently found in the park. The existing communities include the dominant maple-basswood forests as well as lowland hardwood forests, hardwood swamp, and dry oak savanna. Maintaining these communities essentially means maintaining their natural processes in ways that keep their populations of dependent species intact. Make restoration decisions based on what will uphold the integrity of a given habitat. Development of an Ecological Classification System (ECS) will help obtain accurate and useful information with which to determine the most appropriate ecological communities. Restoration is the goal in degraded natural communities, such as old fields. Examples of communities to be restored include wet meadow, mesic prairie, oak forest, oak and aspen woodland/ brushland, etc. (See Recent and Proposed Restoration Map). The decision making process should begin with a consideration of the ECS landscape.

- **Action 2: Create a long term vegetation management plan for Nerstrand Big Woods looking 50-100 years from now**. The current vegetation of Nerstrand Big Woods reflects the land ownership history of the park. It is a mosaic of hardwoods, old fields and homesteads, oak savanna, and lowland hardwood forests. Update and intensify the biological inventory of the park to determine priorities and directions.

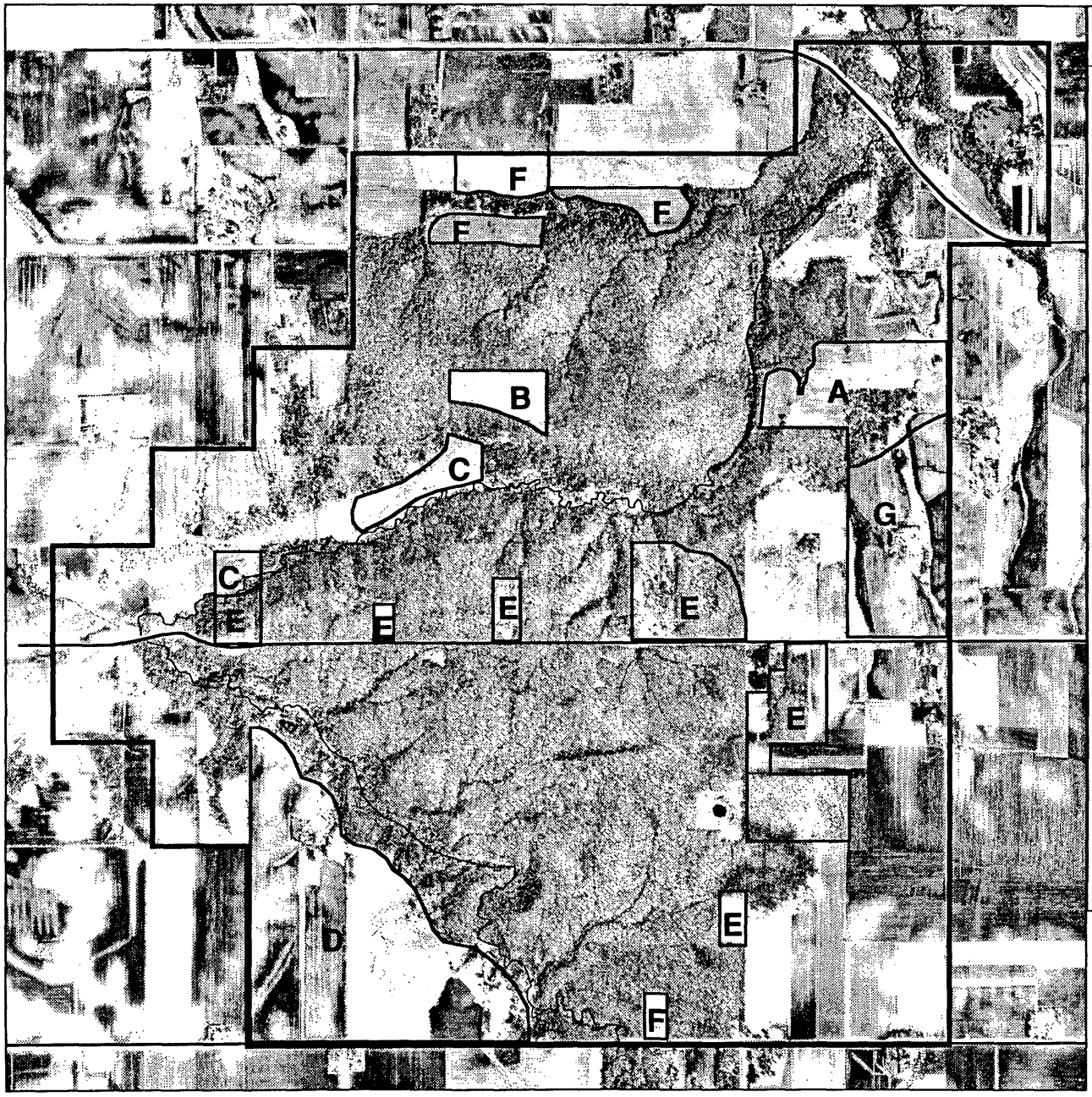
- **Action 3: Determine areas for old growth, future old growth, prairie/savanna restoration, and young hardwoods growth**. Old fields should be prioritized and restored to young hardwoods or prairie. Fill in gaps in forest canopy where appropriate. Reduce hard edge effect on plant/animal communities; oak savanna and prairie restoration and fire management plans will play an important role. A mix of hardwoods, oak savanna, and prairie can be restored and maintained in the park (See Restoration Map).

- **Action 4: Minimize forest fragmentation to protect interior forest species habitat.** There is a critical need for forest habitat, and most of Nerstrand Big Woods could be managed primarily for hardwood forest. An increasing body of research shows that many forest bird species are declining due in part to fragmentation and reduction in patch size of forests within their nesting ranges. As forests are broken into smaller and smaller fragments, forest interior habitat is diminished at a much faster rate than the loss of the forest acreage itself. As a result, those species dependent on the forest interior must nest in marginal forest edge areas which expose their nests to nest predators such as skunks, raccoons, blue jays, and crows, as well as to the nest parasitism of the brown-headed cowbird. What constitutes "forest interior" from "forest edge" varies from species to species. The general rule should be "the more contiguous forest the better."

General Restoration Pattern for Nerstrand Big Woods State Park



Nerstrand Big Woods State Park
Recent Restoration & Proposed Restoration



Legend

A = Bonger I tract - propose to continue closing canopy

B = Hope tract - propose to continue closing canopy

C = Prairie Creek - floodplain meadows and some hardwoods

D = Restore remnant Mesic Prairie/ Oak Savanna

E = Proposed plantings to close canopy with appropriate native trees (likely Maple-Basswood mix)

F = Proposed plantings to close canopy with appropriate native trees (possible Oak-Aspen mix)

G = Big Woods Dairy Farm - Within 10 years, begin restoration to Oak Woodland / Oak Openings

Roads

Prairie Creek

N

NOTE: This map only shows restoration for currently-owned state land.

- **Action 5: Protect Federal and State listed species and manage their habitats for optimum sustainability.** The MN County Biological Survey has completed an initial evaluation of natural communities and the survey of rare plants in Rice County. Despite the fact that MCBS completed its county wide survey of natural communities and rare species in Rice County, the scale of the survey effort and the short flowering season of the Minnesota dwarf trout lily precluded thorough survey of every acre of potential habitat for that species within the park statutory boundaries. Future actions to protect the Minnesota dwarf trout lily should include a) site specific searches in areas proposed for development; b) monitoring impacts of visitor use on species and; c) collaboration with SNA and NGNHR in continuing to provide adaptive management for the Minnesota dwarf trout lily.

- **Action 6: Old growth areas will be delineated by the Regional Old Growth Delineation Team working with Nerstrand Big Woods State Park and regional staff**. Once the old-growth management zones have been delineated, encourage and allow natural processes to dictate the composition and structure of these areas.

- **Action 7: Actively and aggressively monitor and control invasive exotic species**. Work with other agencies to identify problem species in Rice County. Evaluate the impact on the park. Prevent activities that exacerbate present problems with aggressive exotic species. Problem species, such as non-native (exotic) European buckthorn and honeysuckle's can displace native species and degrade natural communities. In managing exotic species, exotics should be eliminated and replaced with native species whenever possible. Herbicides will be managed to use the appropriate type and minimum amount needed to accomplish exotic species control and prairie restoration. Other methods of weed control will be used whenever possible. All recommended safety precautions will be used when and if herbicides are used.

- **Action 8: Resource management practices will be interpreted for public interest and education**. Incorporate concepts of biodiversity, ecosystem management and watershed/landscape management into park interpretive programs and displays.

- **Action 9: Monitor species and natural communities** for indications that reflect changes in populations and biological health. Continue participation in species inventories. Recommend: a) A comprehensive inventory of vegetation (i.e. natural community assessment); b) More intensive surveys needed for wildlife, especially reptiles and amphibians, breeding birds, small mammals, deer, insects, fish; c) Use a and b to make well-informed management decisions; d) Indicator species should be identified.

- **Action 10: Need to develop a fire management plan**. Reintroduce fire as an active part of the system. As savanna and prairie areas are restored or established, prescribed burning will be used as a tool to maintain and enhance these areas. Maintain a diversity of forest types in the park by managing oak forests, oak woodlands, and other fire dependent communities with an appropriate fire management plan. Manage the edges where possible with fire to create natural transitions from forest to non-forest; if fire is not possible, consider other cultural methods to mimic fire effects. Reintroducing disturbances is often vital to restoring ecosystems in state parks. Historically, fire was a major force in the shaping of the park's vegetation. Since it has been effectively removed from the system, those communities dependent on it have decreased. Fire disturbance should mimic natural events as closely as possible.

- **Action 11: The park will manage deer, raccoon, and other wildlife populations to meet balanced ecosystem goals**. Conduct periodic deer population surveys and special deer hunts to control deer overbrowse on vegetation. Consideration should be given to allow special hunts using bow and arrow. Participants should complete the Minnesota Bow Hunters Education Program.

- **Action 12: The park supports the elimination of the refuge status of Nerstrand Game Refuge** (that surrounds the park) because it is no longer necessary for game protection and it will help reduce the overpopulation of deer and raccoons in the area. In order for the refuge to be eliminated there will need to be a citizen's petition and a public hearing. The park itself, like all state parks, would remain a game refuge, however, in managing populations, there may be biological reasons for having special hunts.

- **Action 13: Monitor the effects of turkeys on vegetation, especially Minnesota dwarf trout lilies**. Consider a turkey hunt if damage is discovered.

- **Action 14: Non-native evergreen trees should be addressed according to site and scope**.

Landscaping Use Areas

- **Action 15: Utilize native vegetation and plantings to aid in guiding people to trails, buildings, etc**.

- **Action 16: Design a plan to reduce soil compaction in the picnic area, campgrounds, and on trails**.

- **Action 17: Plant native trees and shrubs in campgrounds and picnic area to replace hazard trees, as well as to maintain shade, and forest canopy**. Plant shrubs between campsites. There should be a variety of vegetation types at various campsites (some should be more primitive/wooded and others should be more open).

- **Action 18: Contact station should be more visible, the native vegetation landscaping in the front should be kept trimmed and maintained**.

- **Action 19: Work with an engineer to establish a plan for restoration in the Hidden Falls area**. As much as possible, use natural material of local origin for restoration.

- **Action 20: Keep the tree canopy on County Road 88 maintained**. Investigate the feasibility of having Co. Rd. 88 be designated as a Scenic Road.

Land and Water Resources

The major goal is to protect surface and ground water against further degradation of water quality and to prevent soil erosion and compaction problems. In general, natural drainage patterns should be maintained and preserved whenever possible.

- **Action 21: Areas with gullies and erosion problems should be inventoried and prioritized for restoration**. It is also recommended to work with upstream neighbors and to promote native vegetation planting upstream along the riparian buffer zone.

- **Action 22: Inventory what fish and invertebrates** live now, or might have historically existed, in the Prairie Creek tributary. Monitor for ongoing water quality and indicator species, especially during flooding events.

Cultural Resource Management

- **Action 23: Protect archaeological sites as needed**. Little archaeological work has been done in this park due to minimal development.

- **Action 24: Identify location of old septic tanks** and determine what should be done.

- **Action 25: Old farmsteads should be located and evaluated.**

- **Action 26: Insure that archaeological exams are done before any earth work is done in the park**. As is the Division of Parks policy, if significant cultural resources are discovered during surveys, facility siting, design, use, and possible archaeological mitigation may need to be reviewed to avoid or minimize impacts.

RECREATION RESOURCES

Recreation Management Objectives

This set of objectives will guide the park plan and its recommendations toward the sustainable use of natural and economic resources.

Community

- Provide reasonable access and accommodations for persons with disabilities.

- Offer and market a package of opportunities which include:
  Excellent example of the Big Woods landscape
  Globally significant population of Minnesota dwarf trout lily
  Camping and picnicking
  Candidate old Growth Forest complex
  A variety of trail opportunities including hiking, skiing, and snowmobiling.
  Scenic Hidden Falls and other unique geological features
  Outstanding spring ephemeral wildflowers
  A diversity of wildlife and birds.

- Promote the safety and security of park users.

- Complement the character and economic vitality of the neighboring communities.

- Promote increased understanding, appreciation, and enjoyment of natural and cultural resources in the park by providing interpretive services.

Economy

- Consider the long-term social, economic, and environmental costs of growth and development. Base decisions on whether or not they are sustainable over the long term.

- Use natural resources and public funds efficiently. Direct growth toward areas with existing capacity in infrastructure and services. Use land efficiently and appropriately.

Environmental

- Respect the limitation of the natural environment to support growth and development.

- Preserve and interpret the park's natural scenic beauty and old growth hardwood communities.

- Minimize and concentrate park development in order to preserve the remaining portions of the park and reduce fragmentation.

Existing Park Facilities

Nerstrand Big Woods State Park provides visitors with the following facilities:

Camping

- 54 semi-modern campsites (1962)
- 28 electrical campsites (1988)
- Showers and flush toilets (1963)
- 13 rustic campsites
- One group camp (capacity 125)

Trails

- 14 miles of hiking trails
- 8 miles of cross-country ski trails
- 5 miles of snowmobile trails

Day Use

- Visitor Center/Contact Station (1995)
- Picnic tables and fire rings
- Picnic shelter (1962)
- 1 Playground
- 1 Volleyball Court
- 2 Horseshoe Pits

Park Administration

- Trailer Sanitation Dump station
- Sewage Lagoon (1968 & rebuilt in 1982)
- 1 Lift Station
- 4 Septic Tanks
- Park service garage and shop area
- Active wells: 3
- Roads: .25 mile blacktop; 1 mile gravel.

Proposed Development Actions

This plan provides the basic management direction for the park and is not intended to provide specific management or development details. The proposed development in this plan is generally conceptual. Site-specific, detailed development plans will be completed based on the concepts outlined in this plan. The proposed development map shows the location of major proposed developments. Also, refer to the proposed trail rehabilitation map and the Interpretive Service chapter.

Proposed developments outlined in this plan were generated after reviewing available information on park resources. Development recommendations are made after careful consideration of the natural and cultural resources, and the recreation management objectives outlined in this plan. Plans often need to be altered as more data become available.

Each recommended development proposal (e.g. buildings, trails) is contingent on a detailed site analysis prior to implementation. Development will only take place after a detailed physical analysis (e.g. soils) and resource assessment (e.g. impact on soils, wetlands, geological features, rare plants, and/or animals, or archaeological sites) have been conducted, considered, and mitigated.

Trails

Trail locations and conditions were seen as major issues in the planning process. With 14 miles of trails in a river valley area with diverse topography, maintenance concerns are inevitable. With shrinking maintenance budgets and greater emphasis on efficiency, every existing trail was evaluated for its ability to provide multiple use and ease of maintenance. Trail signing needs ongoing evaluation.

Winter Trails (Snowmobile and Cross Country Skiing)

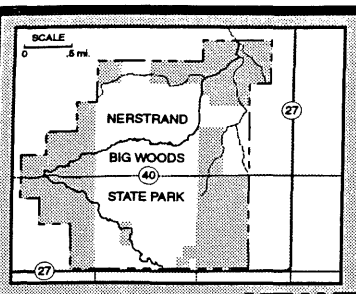
Several factors were considered in redesigning the winter park trails. 1) To minimize the interaction between snowmobile trails and ski trails. 2) Snowmobile use has changed over the past 20 years and fewer people utilize short snowmobile loops. They tend to prefer longer corridor trails that take them from town to town. 3) Minimize maintenance. Overall, the ski trail mileage will increase slightly, while snowmobile trails will remain the same.

- **Action 1: Create an easy ski trail loop by grooming an area around the campgrounds and picnic area**. Or an easy ski trail could be made along the proposed interpretive trail, if no boardwalks are needed. From the contact station, follow the existing trail north and create a loop using existing trails and/or open grassy areas. Before any trail work is initiated between the campgrounds and the known Minnesota dwarf trout lily area, a species search should be conducted in the proposed disturbance area.

- **Action 2: More reassurance markers and arrows are needed for snowmobile trails, and cross-country ski signage needs to be better marked with maps and mileage.** Since many snowmobilers are from out-of-state, informational signs are important in directing users. Put a state park "entrance" sign on the south end of the park where the snowmobile trail enters the park. Post signs that indicate "Narrow Trails."

- **Action 3: Consider developing a park ski patrol** or other volunteer program to assist with informing people about no dogs on winter trails, hiking to the side of ski trails, and generally assisting winter trails users.

Proposed Winter Trail Map



NORTH

PARK STATUTORY BOUNDARY

Because lands exist within the boundaries of this park that are not under the jurisdiction of the D.N.R., check with the park manager if you plan to use facilities such as trails and roads other than those shown.

Hope Trail
1.2 mi.
0.1 mi.
0.1 mi.
0.2 mi.
Fawn Trail
1.0 mi.
Fawn Trail
0.2 mi.
0.1 mi.
0.3 mi.
0.3 mi.
White Oak Trail
0.4 mi.
0.1 mi.
0.1 mi.
Beaver Trail
0.4 mi.
Hidden Falls
Oak Bridge
Creek
Prairie
Fern Hill
0.2 mi.
0.3 mi.
0.3 mi.
0.1 mi.
0.1 mi.
0.3 mi.
0.1 mi.
0.1 mi.
0.1 mi.
0.1 mi.
0.3 mi.
Develop easy ski trail
88
40
to NERSTRAND, 2 miles
0.2 mi.
Basswood Trail
0.1 mi.
Fox Trail
0.1 mi.
0.6 mi.
0.2 mi.
0.1 mi.
Basswood Trail
0.5 mi.
Maple Trail
0.4 mi.
0.4 mi.
Prairie
Creek
0.5 mi.
Ironwood Trail
0.3 mi.
0.6 mi.
Blue Beech Bridge
0.5 mi.
Grant-In-Aid snowmobile trail
Fox Trail
PARK STATUTORY BOUNDARY
27
to FAIRIBAULT, 13 miles
27
24

WINTER TRAILS

- Ski Trails
- Snowmobile Trails
- Ungroomed Trail

FACILITIES

- Visitor Center
- Picnic Area
- Trailer Sanitation Station
- Campground
- Waterfall
- Primitive Group Camp
- Private Property
  Public Use Prohibited
  (except on designated trails)

0 .1 .2 .25 Miles

0 .1 .2 .3 .4 Kilometers

- **Action 4: Consider grooming half the Hidden Falls trail for skiers and half for snowshoers/hikers.**

- **Action 5: Focus snowmobile trail maintenance efforts on the main corridor trails.** The small Maple Trail loop no longer needs to be groomed for snowmobiles. Inspect existing snowmobile trails to determine if any maintenance is needed. Snowmobile trails through the woods will be maintained at a width for an 8' groomed trail. Keep tree removal at an absolute minimum. Keep all existing snowmobile trails two-way for safety reasons. The bridge on south end should be improved. Snowmobile access (from south) to the park has a ditch and driveway that should be improved.

- **Action 6: Review Grant-In-Aid agreements, particularly regarding the Big Woods Dairy Farm and the southwest corner of the park.**

Summer Trails

The summer trails allow access to major park attractions and facilities and connect many of the areas together in a network of trails. Hillside erosion and mucky soils are the major concerns in many areas of the park.

- **Action 6: Look at and evaluate existing trails, and prioritize restoration needs based on use and resources.** It may be necessary to relocate existing trails where they prove to be causing problems due to their siting. Concern for soil and hydrology should be a high priority with all trail projects. Look for areas less prone to wash out and avoid areas that will need excessive maintenance. A hydrologic engineer and/or a soils specialist is needed to review various trail problems, gullies, and sheet erosion sites. See map for inventory of trail rehab needs. Recognized trail problem areas are: 1) North of the parking lot; 2) Hope Trail; 3) Fawn Trail; 4) Fern Hill area; 5) Hidden Falls. Before any trail work is initiated between the campgrounds and the known Minnesota dwarf trout lily areas, a species search should be conducted in the proposed disturbance area. This also applies to the area south of Oak Bridge. Any time trail work is proposed on sloped land, or in a ravine or floodplain, or is adjacent to a tributary or to Prairie Creek, it will be important to double-check for the presence of Minnesota dwarf trout lily.

- **Action 7: Redesign the trails, stream crossing, and overlook areas at Hidden Falls.** An observation point should be designed downstream from Hidden Falls to allow for photography and a scenic view of the falls. Some of the facilities above the falls could be removed to enhance the downstream view of the falls. The cement blocks should be removed and replaced with some other kind of crossing (bridge etc.), possibly at a slightly different location. Any disturbance in this area will need to avoid impacting the very small clump of Minnesota dwarf trout lily along the bank below the falls.

- **Action 8: Improve signage, especially where trails cross roads.** More clarification is needed of rules of the trail. Additional "you are here" signs should be located on trails.

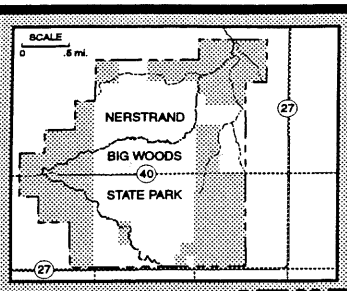
- **Action 9: Work with the DNR grant programs to have a bike trail connect from the park to Northfield and Faribault.** When visitors inquire about off-road biking opportunities, suggested areas include: Myre Big Island, River Bend Nature Center and the regional parks in the south metro area. Demand for bike trails is very high and growing. Bikes

are not allowed on the Nerstrand Big Woods park trail system. The possibility of mountain bike trails in Nerstrand Big Woods State Park was discussed at several group meetings. It was decided that the problems of erosion, safety and user conflict would outweigh the advantages of providing this new day use activity in the park. There are already mountain biking opportunities near the park at places such as River Bend, Hanrahan Regional Park, and Lebonon Hills Regional Park.

- **Action 10: Volunteers may be available to help maintain trails** - like the Adopt-A-Trail program at River Bend.

- **Action 11: Develop an accessible interpretive trail around the campground and picnic area, leaving from the visitor center**. An interpretive loop trail and hard surfaced accessible trail is proposed leaving from the visitor center and heading north along the existing trail. Trail work in this area may involve some kind of elevated trail or tiling system. There are several possible routes it could take. These routes are level enough for accessible trails. Due to the sensitive hydrology in the area, an accessible trail will need to be carefully analyzed before trail preparation, surfacing, and route are determined. If the interpretive trail cannot be made wheelchair accessible, it is still recommended that it be made appropriate for blind and/or deaf visitors who come to the park from the Faribault schools. Possibly have ropes along the trails, Braille guides, or tape recorders that can be checked out. Before any trail work is initiated between the campgrounds and the known Minnesota dwarf trout lily area, a species search should be conducted in the proposed disturbance area.

Proposed Trail Rehabilitation Needs



NORTH

PARK STATUTORY BOUNDARY

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Trail Rehabilitation Key *

- Low Spot
- Steep Slope
- Culvert Needed
- Sheet Erosion
- Bridge Needed
- Undercutting of trail & bridge by River

SUMMER TRAILS

- Hiking

FACILITIES

- Visitor Center
- Picnic Area
- Trailer Sanitation Station
- Campground
- Waterfall
- Primitive Group Camp
- Private Property
  Public Use Prohibited
  (except on designated trails)

0 .1 .2 .25 Miles

0 .1 .2 .3 .4 Kilometers

Prairie Creek

1.2 mi.
0.1 mi.
0.1 mi.
1.0 mi.
Fawn Trail
0.2 mi.
Hope Trail
Fawn Trail
0.2 mi.
0.1 mi.
0.3 mi.
0.3 mi.
White Oak Trail
0.4 mi.
0.1 mi.
0.1 mi.
Hidden Falls
Beaver Trail
0.4 mi.
Oak Bridge
0.3 mi.
Fern Hill
0.2 mi.
0.3 mi.
0.1 mi.
0.1 mi.
0.1 mi.
0.3 mi.
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0.1 mi.
0.1 mi.
0.3 mi.
88
40
to NERSTRAND, 2 miles
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0.5 mi.
Maple Trail
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0.4 mi.
0.3 mi.
0.5 mi.
Ironwood Trail
0.6 mi.
Blue Beech Bridge
0.5 mi.
Fox Trail
PARK STATUTORY BOUNDARY
27
to FAIRIBAULT, 13 miles
* Needs identified in 1995-1997 by MCC crew and Park Staff
24

Camping

The main campground at Nerstrand Big Woods State Park offers scenic, woodland camping and electric hook-ups with one shower building. The Group Camp offer sites with greater privacy and a more rustic camping experience. The drive-in campsites are nearly full on late spring, summer, and fall weekends with some midweek use. The group camp offers a large, pleasant field surrounded by woods, with several smaller rustic sites in the woods for smaller groups these sites also serves as overflow camping on a rustic basis. The group camp is fairly large (about 125 person capacity). The south side of the park is the least developed, and should remain so in the future. Currently the number of campsites is sufficient. A diversity of camping experiences should be offered without fragmenting the park.

- **Action 16: Add electricity to some existing camp sites** so long as it does not impact the environment; this needs to be carefully designed to minimize tree root damage.

- **Action 17: Campsite rehabilitation is needed on some sites.** Existing campsites are showing signs of overuse, especially from network of paths between sites.

- **Action 18: If future development is needed, it should be located to the east of the existing semi-modern campground**, in a compact manner (if the land becomes available).

- **Action 19: In the group camp, begin planting trees, as determined by vegetation management plan**, with the goal of closing the forest canopy to reduce forest fragmentation. Long-term, if the land to the east becomes available, relocate the group camp to that area. Landscape the new facility with a combination of grassy areas and native trees and shrubs. Try to replicate a similar campground style. If a new group camp is developed, include a picnic shelter.

- **Action 20: Modernize and remodel the campground sanitation building** including accessibility for physically challenged users.

Day Use and Other Park Facilities

- **Action 21: Priority buildings for bringing up to accessibility codes are: the group camp outhouse, and picnic shelter.**

- **Action 22: Install parking lot lighting for evening meetings.** Box type light fixtures that aim straight down with appropriate wattage (on poles no more that 13-15 feet) are recommended, or walkway lights that can be turned off after meetings (tall, bright security lights are seen as undesirable). It may be necessary to have a combination of walkway lights and a few pole lights.

- **Action 23: The county road through the park should remain open**. A traffic study on the county road is recommended, to determine if the speed limit should be lowered.

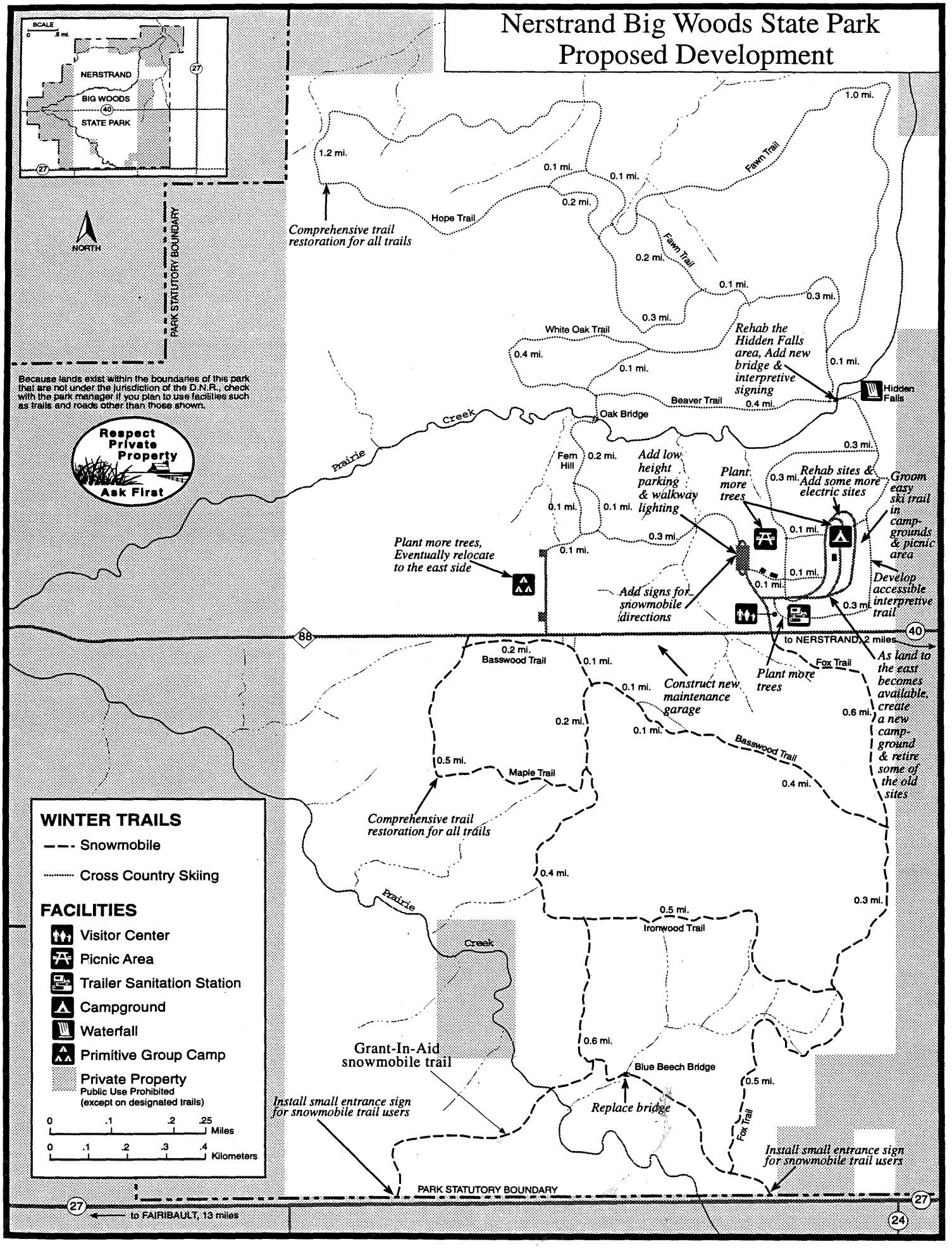
- **Action 24: Tree plantings should be done along the blacktop road coming into the park to close the canopy**.

- **Action 25: Parking areas are adequate, however, increased use may require more parking in the next 10 years**. A snowmobile trailer parking area may need to be developed over in the maintenance area or perhaps skiers could park in the campground area. Park signs should be higher, for winter visibility.

- **Action 26: Construct a new maintenance garage/shop facility (including cold storage) to replace the existing facility**.

- **Action 27: Rehabilitate the picnic shelter; the foundation needs repair or replacement.**

Nerstrand Big Woods State Park
Proposed Development



PARK BOUNDARY

Land History

The existing statutory boundary of Nerstrand Big Woods State Park includes approximately 2,825 acres. Included within the boundary are approximately 1,233 acres of privately owned land in 40 parcels, approximately 460 acres of trust fund land and 1,132 acres of state park administered land (this includes 84 acres of SNA land, administered by the Division of Parks in conjunction with DNR Fish and Wildlife).

Boundary modifications were discussed at several planning meetings. The 1983 Management Plan of Nerstrand State Park recommended retaining the existing boundary of the park. The boundaries were modified in 1992 as a result of a local citizen's initiative.

Trust Fund Land

In 1849, when Minnesota was established as a territory, section 16 and 36 of every township were granted in trust to the state to support education. Proceeds from the sale and management of these lands were placed in a trust fund called the Permanent School Trust Fund. The trust fund supports the public schools (K-12). Revenue is generated by timber sales, mining, lease, or sale of the land. The federal government granted 2,900,000 acres to Minnesota through these acts. In many townships, sections 16 and 36 did not exist, were under water, or already homesteaded. Under such circumstances, the state was allowed to select land from the federal domain in lieu of lands that were not available . Indemnity school trust lands are often referred to as "in-lieu" lands. (DNR Administered lands, 1989).

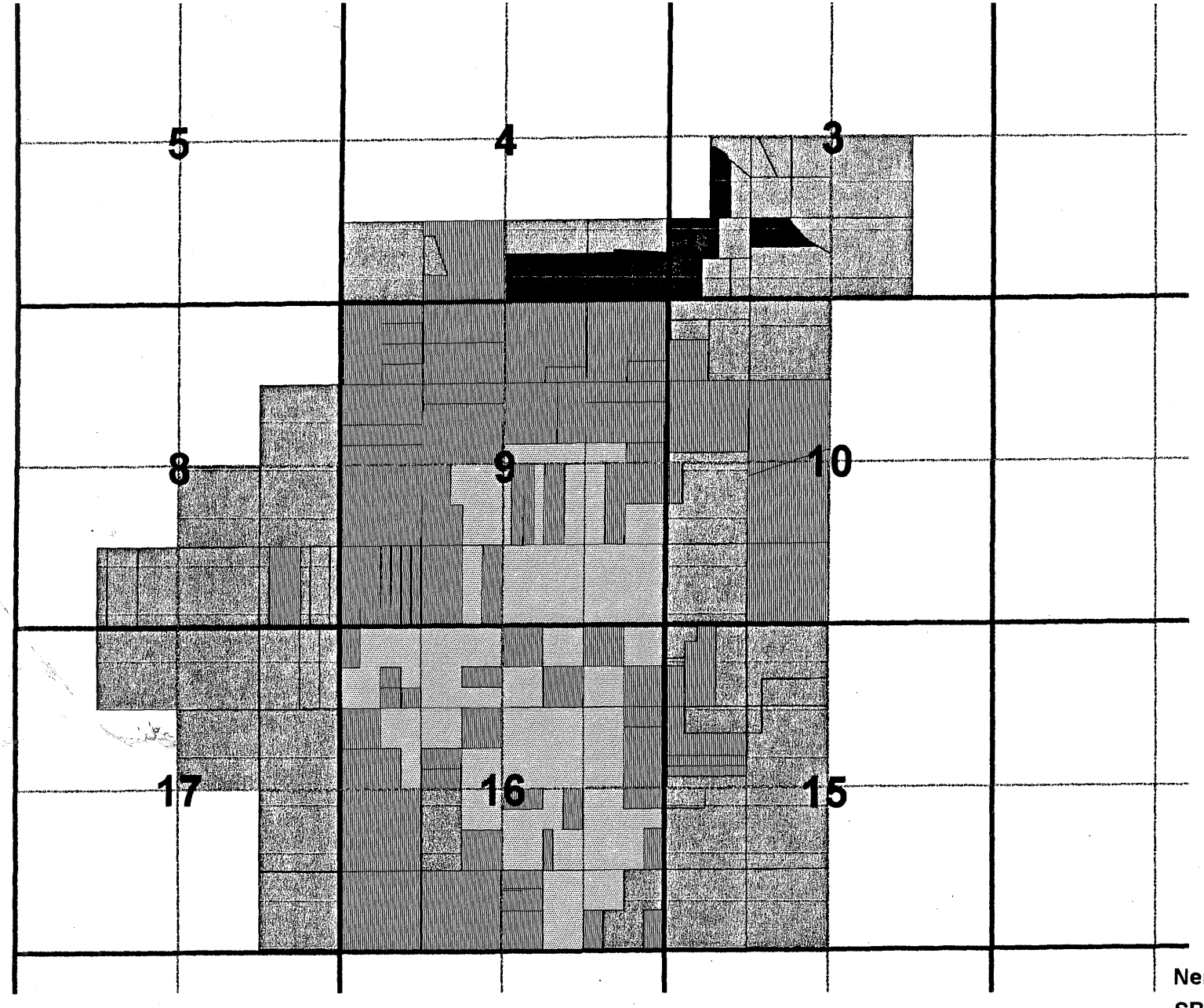
In the past, the state also administered over 4.7 million acres of Swamp Trust. Swamp land, granted to the state by Congress in 1860, could be sold to support drainage projects. The state also used the land for railroads. Receipts from swamp lands were later allocated to the Permanent School Trust Fund through a constitutional amendment. Today there is still over 1.5 million acres of Swamp Trust Land and it has been combined with the School Trust Fund Land and is treated in the same manner. As of 1996, there is a combined total of approximately 2.5 million acres of Trust Fund Land. The DNR administers these lands and the proceeds are apportioned to the schools. (See the following section on Payment-In-Lieu-of-taxes; PILT).

At one time Minnesota state parks had many acres of trust fund land. Through the State Park School Trust exchange project 6,750 acres of this land was removed from parks. Seven state parks still have trust fund land: Savanna Portage, Nerstrand Big Woods, Hill Annex, Itasca, Schoolcraft, Cuyuna, and Tettegouche. Of these, Savanna has the most acreage in trust fund lands, however, Nerstrand Big Woods has the most valuable timber. As of 1997, the rough estimated value the 460 acres of trust fund land in Nerstrand Big Woods is approximately $1.7 million (factoring in timber value).

The 460 acres of trust fund land are scattered throughout the original part of Nerstrand Big Woods State Park (See Ownership Map). These 460 acres have a long and complicated history. The original section 16 in Wheeling Township was subdivided and sold off to 53 individuals in 1862 and was no longer School Trust Fund Land. However, in the process of creating Nerstrand Woods State Park, part of section 16 and 9 became Trust Fund Land in 1951.

Briefly, the state did not have money to buy land to create Nerstrand Woods State Park; however, the federal government did have money for land acquisition. In 1939, tax delinquent lands were under the jurisdiction of the county. While there were very few tax delinquent lands in Rice County, there were a lot of tax delinquent lands in St. Louis county. The federal government was interested in acquiring some tax delinquent land in the Superior and Chippewa National Forests.

Nerstrand Big Woods State Park Ownership 1997



N
W E
S

Legend

- *Quarter Lines*
- *Section Lines*
- *State Owned*
- *Private Property*
- *Trust Fund*
- *SNA Land*

Mapping Notes:
This map was prepared using information from a variety of sources. Not all of these sources meet Federal Map Accuracy Standards.

Questions regarding the accuracy of this map should be addressed to the DNR Bureau of Engineering. 612-296-2119.

1 0 1 Miles

Nerstrand Big Woods State Park

SPK00241

Prepared by:
DNR Bureau of Engineering
Oct. 1997

The State of Minnesota already owned approximately 400,000 acres in the Superior Forest and 350,000 acres in the Chippewa Forest. So, for the first time ever, a land exchange was worked out between the state and the federal government. This process began in 1938 and title to the park was not complete with the Register of Deeds in Rice County until 1950. It is a credit to the perseverance of all those involved, that it occurred at all. Similar exchanges failed with two other parks.

In 1942, the Land Exchange Commission adopted a resolution to exchange 257.31 acres in Nerstrand Big Woods for 5,691.29 acres in Lake County. The difference in acreage was attributed to the value of the land based on salability, agricultural value, and because no revenue could be obtained on the Lake County land because it was trust-fund land. A "Second Deal" was worked out in 1944, exchanging 34 tracts in Rice County containing 217.27 acres for 3,526.56 acres of state trust fund lands in Lake County. By this time the value of land in the Nerstrand Big Woods area had appreciated. Title examination was completed in 1947, however, acreage on the First Land Exchange Deal had to be revised in 1948 and examined again. There were still more legal proceedings to be completed, but the land transfer was completed in 1950. In 1951, the Minnesota Land Exchange Commission gave their approval to the determination of trust fund status of land received in the exchange. (The two preceding paragraph are further documented in Dr. Harriet Mason's thesis - June 1994).

The Problem. Ideally, there should not be trust fund land in state parks, because it does not generate revenue for the fund (parks are precluded from paying). Typically revenues are generated from trust fund land through timber harvest, gravel mining, or mineral leases. However, there are other areas in the state where trust fund land is not generating revenue (i.e. swamps).

Payment In Lieu of Taxes (PILT)

The impact of public land ownership on the local tax base has long been a concern to local governments. Since 1979, the State of Minnesota has been reimbursing counties for lost tax revenue through the Payment In Lieu of Taxes (PILT) program. Determination of payments in lieu of taxes is currently governed by statutes that prescribe general rates to be paid for different land classes. For Nerstrand Big Woods State Park the following rates currently apply (1996):

In-Lieu Land Class	Payment to County
1. Purchased Land, Condemned Land, and Gift Land.	$3.00/ac or 0.75% appraised value (0.75% of appraised value is used in Rice Co.)
2. County administered tax-forfeit land	$.75/acre
3. Trust Land, Con Con Land, and Exempt acquired land.	$.375/acre

For Nerstrand Big Woods State Park, most of the DNR administered land base is currently in category #1 at the $0.75% appraised value since over 1,194 acres is acquired land. The 460 acres of Trust Land are paid at the $.375/acre rate to the county. In Rice County, Nerstrand Big Woods State Park accounts for approximately 35% of the state in lieu land (there are approximately 4,688 acres of state land in Rice County in 1995). In fiscal year 1995 (payable 1996), Rice County received in lieu tax payment of $29,266.

Land Management and Boundary Recommendation

Park Boundary and Trust Fund Land

- **Action 1: Seek legislation to expand the park boundaries to include the NE quarter of Section 21 (approximately 160 acres).** This land has high quality woodland and also contains an important section of Prairie Creek tributary and at this time is not highly developed. It would provide additional wildlife habitat, especially for forest songbirds. It is recommended that the area be inventoried and a report be compiled, documenting the impacts such an addition would have on the local property tax base, the anticipated revenues generated by additional park area, and potential conflicts with private enterprise resulting from such an expansion. All affected landowners should be contacted and their interest in being included in the park boundary should be indicated in the report.

- **Action 2: Consider requesting special appropriation, beyond the capital budget, to acquire the Trust Fund Land in the park (approximately 460 acres).** Other options such as exchanges and transfers were discussed and explored; however, acquisition would seem to be the most practical in the case of Nerstrand Big Woods State Park.

- **Action 3: Initiate a complete boundary survey including newly acquired lands.** Boundaries need to be surveyed, posted, and maintained to avoid possible encroachment issues.

Land Management

- **Action 4: Seek funding to purchase private and other publicly owned land within the park.** These projects will be placed in priority order with other state park acquisition projects. Private lands are acquired only from willing sellers.

- **Action 5: Work with landowners within park boundary so that land is managed to protect water quality, woodland, wetland, and prairie habitat.** Model Best Management Practices for land management (in addition to the Big Woods Dairy Farm).

- **Action 6: It is recommended that the DNR work with landowners to develop a mineland reclamation plan for the limestone mine in the NE corner of the new park boundary.**

- **Action 7: As lands are acquired, there needs to be evaluations of best usage.** Types of recreation that would be appropriate should be foot based recreation. For example: picnicking, camping, hiking, and photography.

- **Action 8: Work with the county and townships to develop a Conservation District** around Nerstrand Big Woods and other area Big Woods ecosystems.

- **Action 9: SNA land will be administered by the Division of Parks and Recreation, now that the Prairie Creek SNA is within the park boundary.** Continue to have the goals of the park and SNA compatible. Currently, there are no management issues, however, park staff will work with SNA staff to develop a management

plan. It is open to limited uses, but recreational development is not allowed. When a park hunt is deemed necessary, the SNA will be open too (state parks and SNAs are listed separately in the hunting regulations book).

WMA & Other Ownership

- **Action 10: The park supports WMA expansion in the area** that would provide additional quality woodland, prairie, and wetland habitat. The Minnesota legislature has recently asked the Division of Fish and Wildlife to look at expanding WMA lands, especially in the Metro growth corridor (St. Cloud to Rochester).

- **Action 11: Work cooperatively with other state, federal, and county agencies to protect and enhance land and water quality in the watershed**, including waterfowl production areas, trail corridors, and possibly state forest land (legislation would be needed for forest land).

Future Management of the Big Woods Dairy Farm

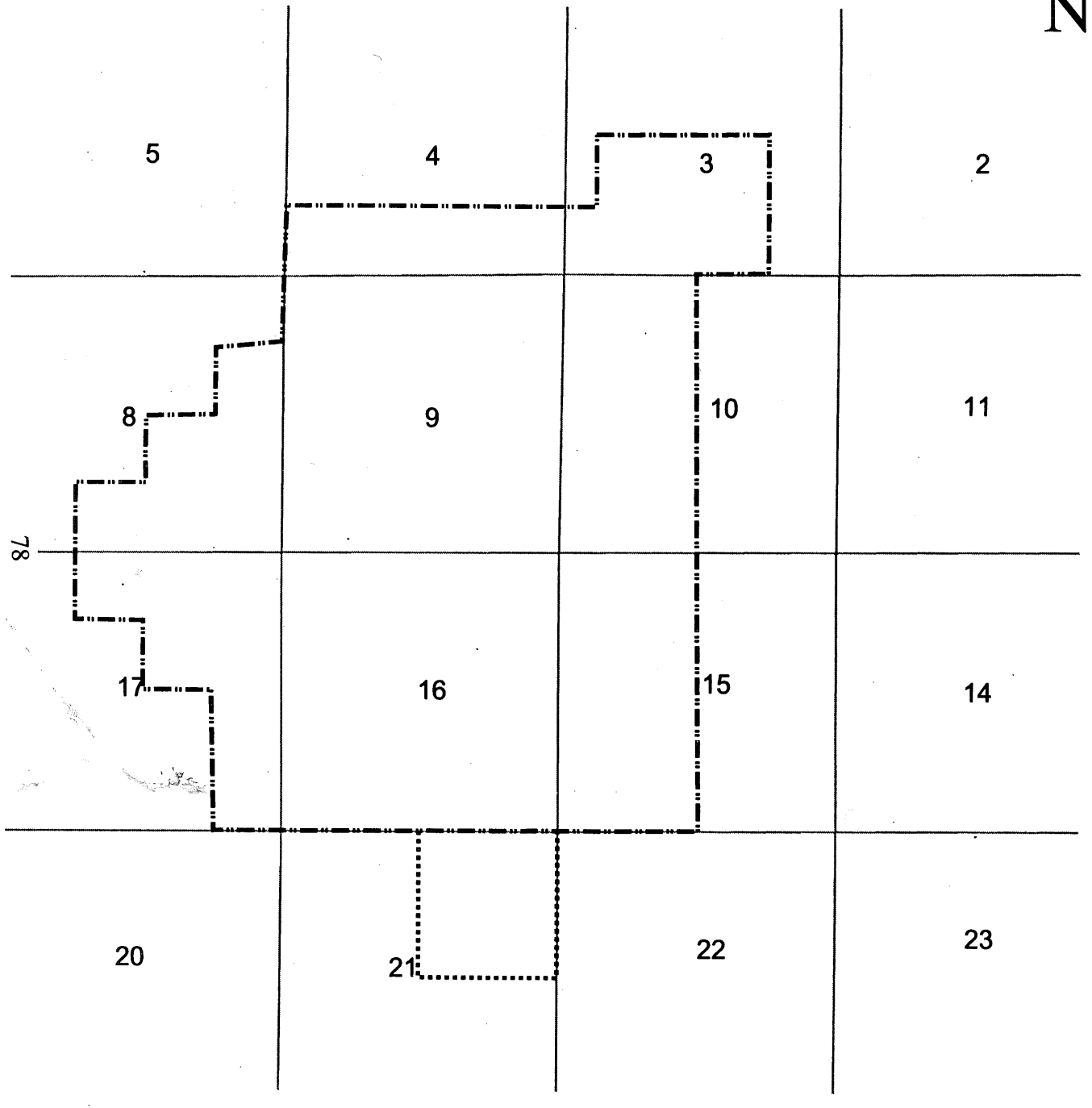
- **Action 12: A conservation plan will be developed** in cooperation with the Natural Resources Conservation Service and the local Soil and Water Conservation District.

- **Action 13: Education and interpretation opportunities will be key aspects of the project**. A "monitoring tool box" could be developed that could be used as a monitoring tool and as a method of acquiring information for education and interpretation.

- **Action 14: A restoration plan for the Big Woods Dairy land will be developed prior to 2006**.

- **Action 15: It is recommended, as per language in the lease**: The lease shall continue through November 30, 2000...and...may be extended through December 31, 2003, ...and the term of this lease may be extended through December 31, 2006. The parties acknowledge that under no circumstances will the term of this lease be extended beyond December 31, 2006, and that it is the intention of TNC and DNR **that at the end of the lease term the Tract will be planted into natural vegetation and managed as a natural element of Nerstrand Big Woods**.

Nerstrand State Park
Proposed and Statutory Boundaries



Legend

Proposed Boundary
Nerstrand State Park Boundary

0.25 0 0.25 0.5 0.75 1 Miles

Source: DNR, Division of Parks and Recreation, 4/1998

INTERPRETIVE SERVICES

The interpretive services program in Minnesota State Parks began in 1941 through the WPA program when guide services were offered at Itasca. The program lasted for one summer and was shut down due to World War II. In 1947, Walter Breckenridge, from the Bell Museum, met with the state parks director and worked out an agreement to run interpretive programs in several state parks. In 1972, Minnesota State Parks began their own interpretive services program.

The Minnesota State Park and Recreation's interpretive mission is:

> "to provide accessible interpretive services which create a sense of stewardship for Minnesota's natural and cultural heritage by illuminating the changing relationships between people and landscapes over time."

As a division of the Minnesota Department of Natural Resources, the Minnesota State Park system seeks to promote increased understanding, appreciation, and enjoyment of natural and cultural resources in Minnesota; assist in protecting each state park's resources; promote public understanding of, involvement in, and support for the Minnesota Department of Natural Resources and its Division of Parks and Recreation; and to increase public awareness of critical environmental problems on a local, state, national, and worldwide scope, as a major provider of environmental educational experiences.

The park Interpretive Services chapter of this plan identifies and describes interpretive themes (or stories) that should be told about Nerstrand Big Woods State Park based on its natural, cultural, and recreational resources. The chapter recommends ways for the state park staff, park interest groups, and volunteers to interpret and tell those stories to the park's stakeholders. The resources and themes listed in this chapter reflect the importance of those stories as they fit with the Minnesota State Park System's Interpretive Services Plan (1995).

The State Park Interpretive Plan was completed in 1995 and is scheduled to be updated soon. In this plan all state parks are evaluated by resources, audiences, and park use. The results are then tabulated into a rating for each park. Of the 68 state parks, 13 have year round naturalists. Ten other parks have summer only naturalist programs.

Nerstrand Big Woods is rated a 3 out of a possible 5 in the overall analysis. Nerstrand Big Woods State Park received the highest ranking possible in representing the resource characteristics of the Big Wood Landscape Region. This means that the park comes close to depicting what the original native vegetation of this area looked like.

Landscape Regions provide one reference point in time to interpret what resources were here when Europeans arrived, how interactions between people and the land affect each other, and why the landscapes look the way they do today. The natural and cultural resources of Nerstrand Big Woods State Park contribute significantly to telling the stories of the local area, landscape region and the state.

The statewide plan recommendations for Nerstrand Big Woods State Park are:

- a year round naturalist to be shared with Sakatah Lake and Rice Lake;
- upgrade the amphitheater; and
- increase nonpersonal efforts (self-guided interpretation such as exhibits or brochures).

Most of the recommended interpretive efforts for Nerstrand Big Woods have already been completed. In the revision of the statewide plan, new recommendations will be made for Nerstrand Big Woods.

Interpretive Clientele

An analysis of park use has been used to measure the present and potential audiences for interpretation in all Minnesota State Parks in the Interpretive Services Plan. This was based on the number of day use visitors, the number of campers, and the population within a 25-mile radius. The criterion to document additional potential users of the park's interpretive services includes environmental education opportunities for local schools. Nerstrand Big Woods State Park ranked mid-range for number of campers, low for number of day users, and high for population base within 25 miles, when compared to other state parks.

Summary of Existing Interpretive Services

Nerstrand Big Woods shares a year around Area Naturalist position with Sakatah Lake and Rice Lake State Parks. There is one seasonal intern naturalist shared by the three parks. Staff positions have been available since 1995 and are stationed at Sakatah Lake State Park. Nerstrand Big Woods also has volunteers who provide programs.

Interpretive Facilities

The visitor center was constructed in 1994/1995. An exhibit mural was completed in July, 1997 and the supporting exhibits have been funded. A plan for the new displays in the visitor center and the schematic design have been developed. The building has a programming/meeting room that seats 40.

An amphitheater located in the north end of the picnic area which is used for outdoor events. Electricity, seating for 150, a stage, and backdrop are at this location. The Friends of the Big Woods assisted in upgrading the amphitheater as a project in 1996. The picnic shelter, located in the center of the picnic grounds, is also used by various groups for environmental education and interpretive programming.

Programs and Activities

During the peak season, programs are offered at the visitor center or amphitheater by staff and volunteers. Personal programming includes evening campfire programs, slideshows or films, hikes and activities primarily on the weekends. Two to three seasonal programs are provided during spring wildflower and fall color weekends.

Special events and programs include involvement with Friends of the Big Woods, The Nature Conservancy, The Big Woods Project, and the Cannon River Watershed Partnership. Special events have included: the Storytelling Festival, 50th Anniversary event, Volksmarch, Holiday in the Big Woods, and the All in the Big Woods Program Series.

Teacher training and other school related programming include: Project WET, Leopold Project training, and the School Nature Area Program (SNAP) training. Through a SNAP grant at Nerstrand Elementary School, a curriculum for K-6 was developed for the park. Northfield middle school conducts an orienteering event each spring. Many other schools, colleges, and universities visit for spring wildflower field trips, bird surveys, and general study of the woods.

Although Nerstrand Big Woods is an important environmental education site in the region, staffing limitations do not allow for naturalist lead programming for schools. Interpretive efforts are focused on teacher training, general group orientation, and nonpersonal materials. River Bend Nature Center, in Faribault, is recommended for schools that want supervised environmental education experiences. Limited off-site programs or bus tours have been lead by park interpretive staff, however, several volunteer programs go into the area schools for tree planting orientation and pre-field trip visits.

Trails, Exhibits, AV Materials and Publications

No interpretive trails exist at this time, however, it has been identified as a follow-up to the exhibit currently in progress at the visitor center.

A kiosk of spring and summer plants is located in the picnic area. There is also a sign identifying a lightning strike on a tree, and a prairie restoration sign in the southwest corner of the park.

Park specific publications include: a Minnesota dwarf trout lily brochure, Wildflowers of the Big Woods, and Birds of the Big Woods.

A new brochure has been funded by a Learn and Serve America grant acquired by Nerstrand School. The brochure interprets the native landscaping around the new visitor center and the participation by local students. It is also designed to recruit new students to the local Nerstrand School.

Like all Minnesota state parks, Nerstrand Big Woods offers the Junior Naturalist Program and offers the series of Explorer Activity books for children through the Nature Store.

Area Interpretive Opportunities

There are several organizations in the area that provide environmental education or historical and cultural education facilities or programs. Some of the area opportunities include: the River Bend Nature Center, The Nature Conservancy, Division of Forestry, The Big Woods Project, Rice County Extension Service, Department of Agriculture, Cannon River Watershed Partnership, and the Rice County Historical Society.

The city of Faribault, River Bend Nature Center, provides environmental education programs for about 5,000 students each year. The 600 acre facility also offers family programs 3 out of 4 weekends each month and is located approximately 15 miles from Nerstrand Big Woods State Park.

The Nature Conservancy offers three large field trips each year and several smaller tours in the park and surrounding area. They have also worked together with park staff to put on program series and special events.

School groups and park visitors also tour many of the area historical interpretive facilities. The Northfield Historical Society has a museum and gallery interpreting the history of the Jesse James gang and its role in Northfield. The Rice County Historical Society Museum is located in Faribault and is open Monday through Friday for visitors. The historic Alexander Faribault House, located in Faribault, is open for tours by appointment.

Interpretive Themes

Primary Themes

Primary themes are the main stories of the park. Some primary themes are listed below; park specific themes are at the top of each category and statewide themes are toward the bottom of each section. * Denotes higher priority themes.

Cultural

* * How does woodlot management and logging play a part in park history?
- How are sustainable farming methods being used for the Big Woods Dairy Farm Project?
- Who were the earliest people to live in the Big Woods?
- European settlers and agricultural development changed the Big Woods.
- Why was Nerstrand Big Woods State Park begun?
- What is the mission of Nerstrand Big Woods State Park?
- How big woods environmental groups work together to protect the landscape. (Cannon River Watershed, Friends of Seven mile Woods, Friends of Nerstrand Big Woods State Park, Friends of the Cannon River Wilderness Park, the Big Woods Project group, etc.)
- How are plants used for medicines, today and in the past?
- The inspirational qualities of nature, solitude, and open places are vividly portrayed in poetry, literature, and art.
- Have our views of natural resources and state parks changed?

Geologic and Hydrologic

* * Rock derived from ancient inland seas can be seen in exposed bedrock in Nerstrand Big Woods (Platteville limestone, Shakopee dolomite, St. Peter sandstone, and Galena limestone).
- Did glacier meltwaters shape the Big Woods area?
- How was Prairie Creek formed?
- Fossils found in Nerstrand Big Woods chronicle past environment and events.
- What role does groundwater levels play in providing water supplies? (they vary from 100-150 feet deep in the park to 200-300 feet outside the park).
- How geology affects stream characteristics and water quality?

Biologic

* * What is the Big Woods ecosystem?
* * Why is it important to protect rare species and natural communities in the area?
* * How are Old Growth Forests managed at Nerstrand Big Woods?
* * How are spring ephemeral wildflowers adapted to take advantage of conditions in Nerstrand Big Woods?
- What is the significance of the Minnesota dwarf trout lily?
- What do we know about the pre-European vegetation and how does it affect park management decisions.
- How will the park be managing restoration?

- How do activities outside of the park affect the park (and vise-versa)?
- Are white-tailed deer and other wildlife managed at Nerstrand Big Woods?
- There is connection between Nerstrand Big Woods and tropical rain forests.
- Why is Nerstrand Big Woods important to forest bird conservation in southeastern Minnesota?
- The park is a place to view and learn about wildlife.
- Many different species of trees live in the park and show a diversity of colors in the fall.
- Seven species of frogs and toads can be found in the park.
- Micro environments: a critical component for species survival.
- What is Oak Savanna?
- What is Prairie?
- What do we know about songbird and butterfly migration?
- Alien plants degrade native ecosystems.
- Research has played an important role in protecting the environment.
- State parks provide bluebird habitat.
- How does wildlife adapt to changing seasons?
- How important is recycling in nature?
- Insects and big invertebrates play an important role in the food chain.
- What is the importance of a "bigger" Big Woods?

Recreation

- Young people can enjoy the out-of-doors at Nerstrand Big Woods.
- Nerstrand Big Woods provides some of the best areas for watching forest interior birds.
- Nerstrand Big Woods wildflowers offer great photo opportunities.
- Tips for hiking at Nerstrand Big Woods State Park.
- Skiing and snowmobiling in the park and surrounding area.
- How to be a courteous and responsible camper.
- How does recreation affect the environment?

Interpretive Service Actions

Note: The following action recommendations are not in priority order.

Facilities and Self-guided Trails

- **Action 1: Develop interpretive displays that include historical aspects.**

- **Action 2: Provide a bulletin board/display in the visitor center for information and projects relevant to the park.**

- **Action 3: Develop a self-guided trail near the visitor center**. The self-guided trail should be part of a "package" that comprehensively tells the story of the visitor center, the landscaping and the big woods. Include maintenance needs in the plan.

Brochures, Guides and AV materials

- **Action 4: Provide interpretive materials for a variety of interpretive themes.** Many interpretive themes were developed for the park, see the list on preceding pages. To interpret the themes a variety of techniques could be used including having binoculars, wildflower books, and bird song tapes available for check out in backpacks with interpretive materials inside. The bird and wildflower brochures need updating.

- **Action 5: Create teacher guides on various topics.**

Exhibits and Kiosks

- **Action 6: Develop an exhibit or other non-personal interpretive material to explain the Big Woods Dairy Farm.**

- **Action 7: Redesign Hidden Falls observation area to enhance visitor experience, reduce negative impacts to vegetation, and erosion, and include interpretation of the geologic feature.**

- **Action 8: Install interpretive signs in the landscaping around the visitor center that connect themes from the indoor exhibit and self-guided trail.**

- **Action 9: Other signs to included: resource management practices or natural occurrence on a season or semi-permanent basis.**

Naturalist Staff and Programs

- **Action 10: Develop a Park Interpretive Plan.**

- **Action 11: The need for a seasonal interpretive support position will be reviewed over the next ten years, as part of the statewide interpretive plan.**

- **Action 12: Special events developed through partnerships with other groups need to be considered: wildlife census, wildflowers, trees, music, recreational themes.**

- **Action 13: Naturalist staff will work with park managers to seek a volunteer coordinator(s).**

- **Action 14: In cooperation with the dairy farm family, make use of this unique interpretive opportunity.**

OPERATIONS, STAFFING, & COSTS

Operations and Staffing

Nerstrand Big Woods State Park operations are minimally implemented with present staff levels. Resource degradation from minimal maintenance is occurring in some area; for example building maintenance and trail maintenance. Several actions in the plan would require additional staffing.

There are a number of recommendations which will result in the need for additional staff, mainly maintenance hours, for trail restoration projects and resource management activities. Resource management staff time, both regional and park level, will need to be expanded if the resource management recommendations are to be implemented. Currently, enforcement problems are minimal in the park. Future enforcement efforts should be focused on heavy use weekends. Enforcement and interpretive efforts (personal and non-personal) should emphasize ways to protect the park's natural and cultural resources and reduce impacts on resources. This could become increasingly important if future unauthorized bike trail use increases significantly. Interpretive staffing needs are likely to increase as attendance and visitor center use increases.

Many of the development proposals would have initial start-up expenses with additional long term maintenance expenses. Some of the proposals could be developed with minimal expenses using alternative labor, for example:

Friends of Nerstrand Big Woods State Park group
Sentence to Service (STS)
Minnesota Conservation Corps (MCC)
Other Volunteers

For example, the STS crews could assist in completing construction on the proposed trail changes. This would result in minimal impact on the park operating budget for construction, however, there would still be ongoing maintenance costs.

The Division of Parks and Recreation will experience increased staffing needs and work loads as a result of plan implementation. Other DNR disciplines may also experience some increased work load in the implementation of certain recommended actions. For example; the Division of Enforcement, the Division of Forestry, the Division of Trails and Waterways, the Division of Fish and Wildlife, the Division of Waters, the Bureau of Engineering, and the Bureau of Real Estate Management, may experience increased work loads as a result of increased recreational and resource management opportunities and resolution of land issues. Local representatives of these disciplines participated in the planning process and are familiar with what their role may be in the future.

Costs

Operational Costs

If all the actions and recommendations in this park plan were implemented, the park's annual operational costs would need to be significantly increased. 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 sections (seasonal maintenance buildings and grounds worker, approximately $13,000; and interpretive and resource management seasonal and/or shared part-time, approximately $19,000) combined with a review of the development projects outlined below, suggests the park's annual operating budget would be increased by 15 to 25%.

Development Costs

The following list represents those actions which have development cost implications. The total cost to implement these actions is estimated at $1.5 million, in 1998 dollars. This estimate was generated as part of the planning process and has a significant margin of error because a variety of assumptions were made related to unknown variables (site specific soil conditions, decisions related to site design, septic system selection, distance to electrical service etc.).

1. Develop 3-5 park specific brochures on natural and cultural resource themes of the park.
2. Conduct and interpret biological surveys and monitoring programs (including erosion prone sites).
3. Restore and interpret degraded natural communities and remove undesirable exotic species.
4. Restore and interpret vegetation in old fields and homesteads.
5. Develop park database and GIS of natural and cultural resources.
6. Develop and implement a fire management plan.
7. Develop and interpret a long term vegetation management plan, looking 50-100 years ahead.
8. Plant native trees and shrubs in all of the campgrounds and in the picnic area.
9. Conduct cultural resource surveys, especially in proposed development areas.
10. Continue planting native plants for landscaping.
11. Work with archaeologists to determine if mitigation is needed for identified cultural sites.
12. Design and implement a plan to reduce compaction in the picnic grounds.
13. Develop a restoration plan for the Big Woods Dairy.
14. At the end of the lease, plant natural vegetation at the Big Woods Dairy.
15. Restore or eliminate degraded campsites in the main campgrounds.
16. Relocate and improve the river crossing (bridge), trails and overlooks at Hidden Falls.
17. Implement recommended trail changes and trail restoration projects .
18. Install parking lot light (and/or low level walkway lights).
19. Improve trail signage and assurance markers.
20. Construct a hard surfaced accessible interpretive trail near visitor center.
21. Relocate the group campground to the east if land becomes available.
22. Construct a new shelter in the group camp if it is relocated.
23. Provide additional electrical hook-ups in the campground.
24. Remodel and bring campground sanitation building and picnic shelter up to accessibility code.
25. Construct a new maintenance garage/shop facility.
26. Develop a display area to exhibit projects by schools and other partnerships
27. Develop interpretive sign near Hidden Falls.
28. Create teachers guides.
29. Develop interpretive trail materials beginning at the visitor center/ native landscaping project.
30. Develop interpretive exhibits on the park's cultural resource themes.
31. Hold several special events each year.
32. Develop a park specific Interpretive Plan and Resource Management Plan.

Acquisition

All acquisition projects will be placed in priority order with other state park acquisition projects. The total cost to complete this acquisition is estimated at $ 4 million (1998 values; no appraisal work done).

1. Purchase private, county, and federal land (approximately 1,228 acres at approximately $2 million) in existing statutory boundary.
2. Purchase the Trust Fund Land (approximately 460 acres, plus timber value, at approximately $1.7 million).
3. Purchase private, county, and federal land (approximately 160 acres at approximately $320,000) in proposed statutory boundary.

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.

Planning is an ongoing process and the written plan must be regularly revised if it is going to have continuing value. Over time, conditions change that affect some of the plan recommendations or, in extreme cases, an entire plan. Plans need to recognize changing conditions and be flexible enough to allow for modifications as needed.

For the purpose of this plan we will differentiate between less controversial plan revisions and major plan amendments. Minor plan revisions can generally be made within the Division of Parks and Recreation. If a proposed change to a management plan meets any of the criteria below, it must follow the Plan Amendment Process. To maintain consistency among the plans and processes, all revisions and amendments should be coordinated through the Division of Parks and Recreation planning section. Requests for modifications should be directed to the Division of Parks and Recreation Planning Manager at the central office.

Major Plan Amendments

Proposed Plan Change Amendment Process Criteria

If a proposed change meets any of the following criteria, it must be approved through the amendment process below.

The proposed change:

1. Alters the park mission, vision, goals, or specific management objectives outlined in the plan; or
2. Is controversial among elected officials and boards, park user groups, the public, other DNR divisions, or state agencies.

Management Plan Amendment Process

1. Division of Parks and Recreation Initial Step: Review plan amendment at 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. Review proposed approach with central office managers.

2. If the proposed change issue is between DNR Divisions, the issue should be resolved by staff and approved by the Division Directors. This may require one or two area/regional integrated resources management team meetings. The Division Directors will determine whether the proposed changes should go through the departmental (CTECH/Senior Manager) review process.

3. If the proposed change issue is between state agencies, the issue should be resolved by staff from both agencies and approved by the Division of Parks Director.

4. If the proposed change is potentially controversial among elected boards, park user groups, or the public, should discuss the proposed change and hold an open house/forum which is advertised

in the local and regional area. Following the open house, the Division of Parks Director will determine whether the proposed change should be reviewed by the department.

5. All plan amendments should be coordinated, documented, and distributed by the Division of Parks 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 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 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 not uncommon. Plans should outline a general direction and document general "area" for development rather than specific locations. For the most part, plans are conceptual, not detailed-oriented. Prior to development, proposed development sites are examined for the presence of protected Minnesota Natural Heritage Program elements and historical/archaeological sites. If any are found, the planned project may have to be revised to accommodate the protection of these resources.

Program Chapter Revisions

The resource management section (Natural and Cultural Resource Objectives and Integrated Management page 61) and Interpretive Services chapter should be updated periodically as needed. Division of Parks and Recreation Resource Management and Interpretive staff will determine when an update is needed and coordinate the revision with the park planning section. Program chapters should be rewritten in a format consistent with the plan as originally approved by the DNR. To retain consistency, park planning staff should be involved in chapter revision review, editing and distribution. These chapters can be used as a basis for developing a more detailed resource management plan and an interpretive plan.

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