

Great River Bluffs State Park Management Plan



**Minnesota Department of Natural Resources
Division of Parks and Recreation**

August 2005

Minnesota Department of Natural Resources

500 Lafayette Road • St. Paul, MN • 55155-4037



Gene Merriam, Commissioner
651-296-2549

Department of Natural Resources Approval of Management Plan for Great River Bluffs State Park

Minnesota Statutes 86A §09, Subdivision 1, requires that a master plan be prepared for units of Minnesota's outdoor recreation system, including state parks and state recreation areas. The Laws of Minnesota for 1963 established Great River Bluffs State Park, formerly known as O. L. Kipp State Park, as part of Minnesota's Outdoor Recreation System (MS 85.013, Subd. 20a).

The Minnesota Department of Natural Resources worked in partnership with Minnesota citizens and an interdisciplinary resource team to develop a management plan for Great River Bluffs State Park.

The management plan was approved by the Division of Parks and Recreation management team, and was approved through the DNR Regional Interdisciplinary Review Service (RIRS) during February 2005.

A handwritten signature in black ink, appearing to read "Gene Merriam", written over a horizontal line.

Gene Merriam, Commissioner
Minnesota Department of Natural Resources

A handwritten date "8-29-06" in black ink, written over a horizontal line.

Date

Great River Bluffs State Park Management Plan



State of Minnesota Department of Natural Resources Division of Parks & Recreation

This management plan has been prepared as required by 2003 Minnesota Laws Chapter 86A.09 Subdivision 1.

For more information on this management plan please contact any of the following project participants from the Division of Parks and Recreation:

John Wilzbacher, Park Manager	Great River Bluffs State Park Route 4, Winona, Minnesota 55987 (507) 643-6849
Jeanne Daniels, Regional Parks Operations Supervisor	DNR Parks and Recreation 2300 Silver Creek Road NE Rochester, Minnesota 55906 (507) 280-5059
Steve Kirch, Regional Manager Bob Beck, Regional Naturalist Ed Brekke-Kramer, Regional Resource Management Specialist	DNR Parks and Recreation 261 Highway 15 South New Ulm, Minnesota 56073-8915 (507) 359-6060
Nancy Albrecht, Park Planner Senior Patricia Arndt, Planning, Public Affairs & IS Manager Courtland Nelson, Director	DNR Parks and Recreation 500 Lafayette Road St. Paul, Minnesota 55155-4039 (651) 296-9223

The development of this plan was greatly assisted by the members of the Great River Bluffs Citizen Advisory Committee, who donated many hours of their time to help analyze and discuss the current park issues, and make management recommendations.

Copyright 2005, State of Minnesota, Department of Natural Resources.

Printed on recycled paper containing a minimum of 30% post-consumer waste and soy-based ink.

This document is available in alternative formats to individuals with disabilities upon request.

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, status with regard to public assistance, age, sexual orientation, membership or activity in a local commission, or disability. Discrimination inquiries should be sent to MN-DNR, 500 Lafayette Road, St. Paul, MN 55155-4031; or the Equal Opportunity Office, Department of the Interior, Washington, DC 20240

ACKNOWLEDGEMENTS

The individual names of the many citizens who have contributed to the development of this plan are too numerous to mention here. Suffice it to say that many individuals donated their own time and energy to this planning effort by either attending meetings, providing resource information, or by offering written and verbal comments as the plan progressed. We thank all of these individuals for their dedication and for their willingness to sacrifice their free time to contribute to this effort.

In addition, many resource management professionals from a variety of public agencies and non-profit organizations willingly contributed their time and expertise to this planning process. We also wish to thank these individuals for their efforts.

Finally, an acknowledgement should be made to the GIS (Geographic Information Systems) students who produced the variety of maps for this planning document. In addition, Julia Cuchna, formerly a Senior Planner with DNR Division of Parks and Recreation, should be recognized for her talents in facilitating the public meetings.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
I. INTRODUCTION	3
Park Description	3
Legislative History	5
Role of Great River Bluffs State Park in the Minnesota State Parks System	6
Mission and Vision Statements	6
Planning Process	8
II. REGIONAL ANALYSIS	9
Ecological Subsection	9
Regional Population Analysis	9
Regional Recreation and Tourism Opportunities	12
Overnight Recreational Opportunities	12
Trail Opportunities	14
Other Opportunities	15
III. NATURAL RESOURCES	17
Climate	17
Geology and Topography	18
Soils	19
Vegetation	20
Pre-European Settlement Vegetation	20
Current Vegetation	20
Native Plan Restoration and Desired Future Conditions	23
King's and Queen's Bluff Scientific and Natural Areas	27
Wildlife	31
Water Resources	36
Natural Resource Management Recommendations	37
IV. CULTURAL RESOURCES	39
Archaeological and Historical Setting	39
Cultural Resource Management Recommendations	40
V. INTERPRETIVE SERVICES	41
Introduction	41
Division of Parks and Recreation Interpretive Services Goals	41
Goals for Interpretive Services at Great River Bluffs State Park	41
Interpretive Themes	42
Existing Interpretive Services	42
Interpretive Services Recommendations	42
VI. RECREATIONAL USE AND VISITOR SERVICES	45
Introduction	45
Access	45
Visitor Expectations: The 2001 State Park Visitor Survey	45
Existing Recreation Resources and Facilities	46
Attendance	46
Recreational Use & Visitor Services Recommendations	49

VII. PARK BOUNDARY	53
Statutory Boundaries of Minnesota State Parks	53
Land and Water Conservation Fund	53
Existing Park Boundary	53
Park Boundary Recommendations	53
VIII. SIGNIFICANT AREAS MAPPING	57
IX. PARK OPERATIONS	61
Operations Costs and Staffing Issues	61
Enforcement	61
Park Operations Recommendations	61
X. PLAN MODIFICATION PROCESS	63
Plan Amendments	63
Plan Revisions	64
XI. BIBLIOGRAPHY	65
APPENDIX A: LIST OF PARK RECOMMENDATIONS	67
APPENDIX B: BIRD LIST FOR GREAT RIVER BLUFFS STATE PARK	70
APPENDIX C: NOTES ON ORIN L. KIPP	75

LIST OF FIGURES

Figure 1: General Park Location	4
Figure 2: ECS Subsections	10
Figure 3: Great River Bluffs Land Cover & Land Use	11
Figure 4: Fifty-Mile Radius	13
Figure 5: A Cross Section of the Mississippi River Valley	19
Figure 6: Bearing Tree Species	21
Figure 7: Existing Natural Communities	25
Figure 8: Desired Future Conditions	26
Figure 9: King's and Queen's Bluff SNA	28
Figure 10: Existing Summer Recreation	47
Figure 11: Existing Winter Recreation	48
Figure 12: Soil Suitability for Trails	51
Figure 13: Land Ownership	55
Figure 14: Park Boundary and Viewshed Areas	56
Figure 15: Significant Areas	59

LIST OF TABLES

Table 1: Camping within 50-Mile Radius of Great River Bluffs State Park	12
---	----

EXECUTIVE SUMMARY

This plan documents the work of a two-year planning process and sets the general direction for the management of Great River Bluffs State Park for the next 20 years. Specific management prescriptions and operational details may change as new information becomes available or budgets change. It is the responsibility of the park and regional staff, along with Minnesota's citizens, to determine the appropriate priorities and actions needed to implement these recommendations. The following is a summary of major recommendations. For a complete listing of recommendations, please refer to the appropriate section in the plan or to appendix A.

Natural Resource Management Recommendations

- ❖ Maintain the natural diversity of plant communities and animal species in the park by continuing activities such as prescribed burning and problem species control.
- ❖ Restore selected old fields to native vegetation where possible while maintaining the Henslow's sparrow population in the park.
- ❖ Monitor and protect special status species including timber rattlesnakes, Henslow's sparrows, peregrine falcons and rare plant species.
- ❖ Where facilities intersect with rare species habitat, establish a system of species monitoring that will ensure that rare species and their habitats exhibit continued or improved vigor and growth.
- ❖ Establish a park resource advisory committee that consists of State Park and other blufflands resource specialists, academic researchers, and citizens to provide input and assistance with resource management efforts, and to facilitate research project coordination.



Yellow Ladyslippers (Keyler & Oldfield '03)

Cultural Resource Management Recommendations

- ❖ Complete a systematic inventory of the park's cultural resources. At a minimum, conduct surveys for cultural resources prior to the development of park trails and other facilities.

Interpretive Services Recommendations

- ❖ Support creation of a natural resource specialist/interpretive position to provide coordination of natural resource management activities and public information and education for Great River Bluffs State Park and/or the Blufflands Parks.
- ❖ Develop educational materials for park visitors and the local communities that includes information about the importance and rarity of timber rattlesnakes, Henslow's sparrows and peregrine falcons.
- ❖ Interpretive services should be sensitive to the impact of programs on fragile park resources.

Recreational Use and Visitor Services Recommendations

- ❖ Continue current trail use types (hiking, snowshoeing, cross-country skiing).
- ❖ Maintain a variety of trail and overlook opportunities for visitors including those with disabilities.
- ❖ Design and develop new trails in the park only after assessing potential impact(s) to natural and cultural resources.
- ❖ Encourage partnering with neighboring outdoor recreation providers to disperse higher impact uses across the region, and upon less fragile areas.
- ❖ Maintain the current campground's location and size, limiting the number of vehicles per site to one.
- ❖ Retain (non-paved) gravel roads beyond the Visitor Center to reduce potential for snake mortality and to encourage compliance with reduced speeds on park roads.
- ❖ Maintain the existing "park road" character in any redesign of the entrance road to the park.
- ❖ Maintain existing bicycle campground, providing information to users about the park, including access options and natural resource communities.

Park Operations Recommendations

- ❖ Continue enforcement and/or other actions to minimize disturbance to the park's rattlesnake population.
- ❖ Build a new contact center that will provide essential visitor services while maintaining a low profile.

Park Boundary & Viewshed Protection Recommendations

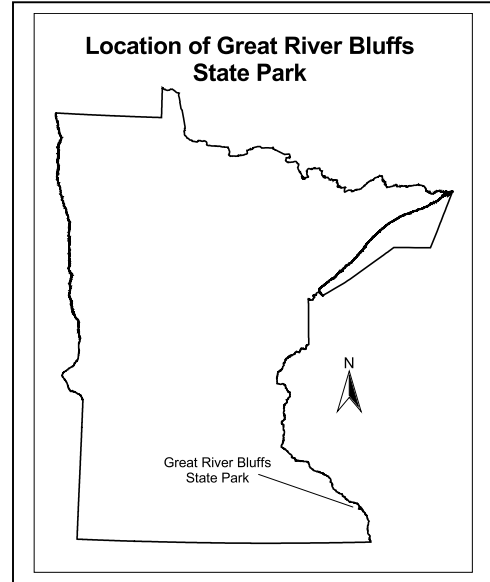
- ❖ Over the long-term, work with park neighbors and local authorities to maintain the natural resources and vistas in the area bounded by Interstate 90, State Highway 61, and Winona County Road 3, including Miller's Valley.

I. INTRODUCTION

Park Description

Great River Bluffs State Park is located in Winona County overlooking the Mississippi River, approximately 15 miles southeast of Winona, Minnesota, at the junction of State Highway 61 and Interstate Highway 90 (Figure 1). Great River Bluffs State Park is 130 miles from Minneapolis-St Paul, 50 miles from Rochester, 35 miles from La Crosse, Wisconsin and 300 miles from Chicago, Illinois or Milwaukee, Wisconsin. (See Figure 1: General Park Location)

O.L. Kipp State Park was originally established by an act of the Minnesota State Legislature in 1963, to be located one mile north of LaCrescent, MN, in response to public demand for parkland along the Mississippi River. In 1971, when no lands had become available for purchase as a park, the park was re-authorized, and relocated to its present location, where approximately 1,000 acres were owned and managed by the DNR Division of Forestry. At that time, administration of these lands was transferred from the DNR Division of Forestry to the DNR Division of Parks and Recreation, and formed the core of the present day park. The first master plan for the park was completed in 1979. In 1997, through an act of the Minnesota State Legislature, the park was renamed Great River Bluffs State Park.

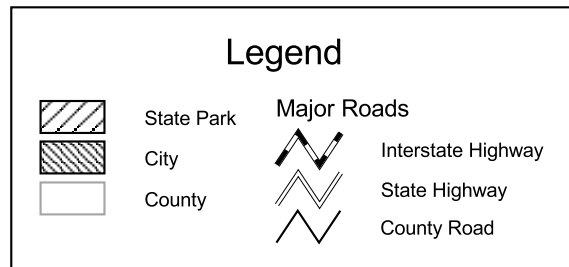
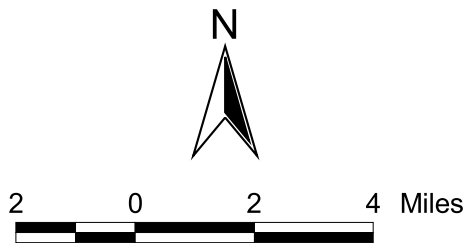
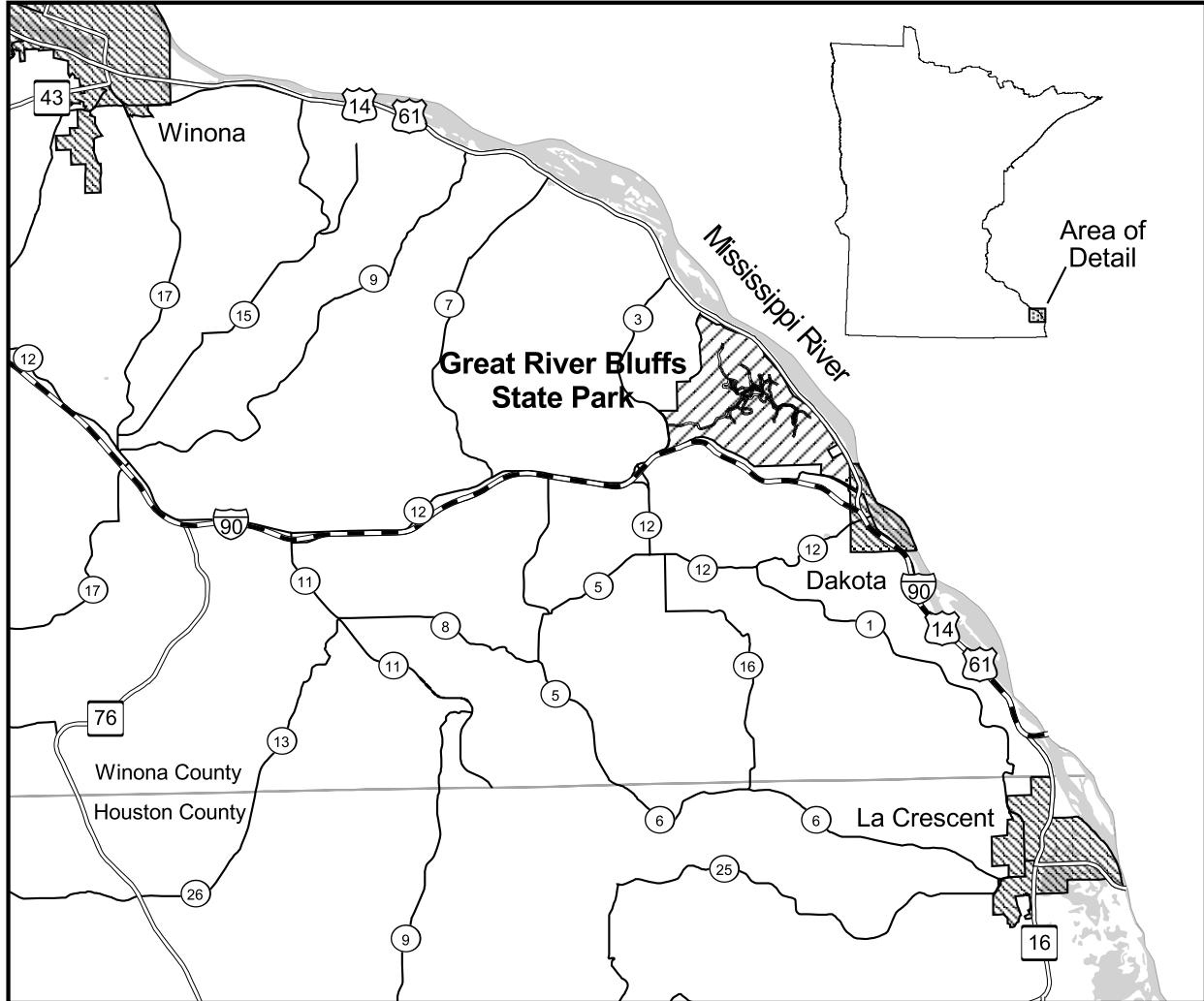


Today, the park consists of a triangle of land roughly bordered by State Highway 61 to the east, Interstate 90 to the south, and private lands and Richard J. Dorer Memorial Hardwood State Forest to the west. The statutory boundary of the park encompasses 3,026 acres of land, of which approximately 2,107 acres are owned by the DNR, 241 acres are owned by the Minnesota Department of Transportation under a management agreement with the DNR, and 677 acres are in private ownership. Great River Bluffs State Park is aptly named, located on bluffs high above the Mississippi River. People have long been aware of the unique character of the bluffland region and particularly of the bluffs now within the park. In 1926, Shelford noted that Gwinn's Bluff (today known as Queen's Bluff) was "one of the most picturesque bluffs on S.E. Winona County rising nearly 500 feet over the Mississippi River" (Shelford 1926). Elevation ranges from 640 feet at the surface of the Mississippi River to just under 1300 feet at the top of King's Bluff. The major topographic features of the park are the steep King and Queen's Bluffs, the ridgelines that lead to them, and the steep valleys that fall away from the blufftops and ridgetops.

Great River Bluffs State Park lies in the midst of the eastern broadleaf forest biome, in the "driftless" blufflands region. The term driftless refers to the absence of glacial "drift" material, generally rocks, gravel, and soil that is usually found in areas once covered by glacial ice. Although the most recent glaciation period in Minnesota did not reach the area, the southeastern portion of Minnesota was none-the-less impacted by previous periods of glaciation. Tremendous volumes of glacial meltwater carved valleys through the old sedimentary rock in this stream-dissected region. When the volumes of meltwater diminished, the remaining landscape consisted of rolling uplands leading to steep valleys with many exposed bluffs, and flat valley floodplains. The region was bounded to the southwest by open prairie, and to the northwest by Big Woods forest, with elements of each found in the bluff region along the Mississippi River. Over the years, these natural communities have been shaped by a number of factors. Initially, wildfires and the river were likely the major agents of change. Since the era of European settlement, human activities such as logging, road and railway building, agriculture and residential development, and fire suppression have drastically altered the natural landscape and communities.

Great River Bluffs State Park

Figure 1: General Park Location



Great River Bluffs State Park is known for providing breathtaking views of the blufflands and the Mississippi River Valley. It also provides a striking diversity of plant and animal life, with dry goat prairies, white cedar trees, and oak and maple basswood forests, all contained in the park. Birdwatchers are familiar with the range of common and uncommon species regularly found at the park, including peregrine falcons and Henslow's sparrows. There are hiking trails that bring visitors along the ridges through the oak forests, opening occasionally near the goat prairies and rock outcrops, and culminating with overlooks at bluff edges. The steepness of the slopes and fragility of the soil and natural communities do not allow for trails to descend the bluffs, and so the park is truly a bluff top park, near the Mississippi River and influenced by it, but not integrated with the river itself. Many of the same trails that hikers and birders enjoy in summer are used by cross-country skiers in winters with adequate snow depth. The park also provides a 31-site campground and primitive group camp area, a picnic area, a 5-site bicycle campground (separated from the blufftop portion of the park, and accessible from Highway 61), and a winter sliding hill.

Popular recreation activities at Great River Bluffs State Park include overnight camping, picnicking, hiking, skiing, birdwatching, photography, and sight seeing. Visitor favorites are the river and valley overlooks, and the peaceful campground setting.

Great River Bluffs is a lightly used state park, although cherished by those who visit it. Visitor comments indicate that many campers are repeat users. In 2001, the park received a total of almost 28,000 visits. Roughly 85% of those users are day users. These figures have remained relatively static over the past ten years. Visitor use at Great River Bluffs occurs across the entire temperate season, with fall colors being particularly busy.

Legislative History

Session Laws of Minnesota for 1963, chapter 790, Article V, section 1, subdivision 1 (12).

Article V. Section 1. [85.185]. Establishment of new parks and additions to existing parks, 1963 omnibus act.

Subdivision 1. The commissioner of administration for the commissioner of conservation is authorized to acquire by gift or purchase for the establishment of new state parks and additions to existing state parks the following described lands:

12. O.L. Kipp State Park, Winona and Houston counties.

Session Laws of Minnesota for 1969, chapter 524, section 2, subdivisions 1 & 46.

Chapter 524. An act relating to state parks and other state owned recreation areas and prescribed duties of the reviser of statutes in connection therewith; repealing Minnesota Statutes 1967, Section 85.03.

Section 2. [85.012] State Parks. Subdivision 1. State parks heretofore established and hereby confirmed as state parks together with the counties in which they are situated are listed in this section and shall hereafter be named as indicated in this section.

Subdivision 46. O.L. Kipp State Park, Winona and Houston counties.

Session Laws of Minnesota for 1971, chapter 859, section 2.

Section 2. Substitution of Lands for O.L. Kipp State Park, Winona County. The following lands are substituted for the lands described in Laws 1963, Chapter 790, Article V, Section 1, Subdivision 1, Paragraph 12 and are included within the boundaries of O.L. Kipp State Park.

Session Laws of Minnesota for 1997, chapter 236, section 1.

Section 1. Minnesota Statutes 1996, section 85.012, is amended by adding a subdivision to read: Subd. 24a. Great River Bluffs State Park, Winona County, which is renamed from O.L. Kipp State Park.

Role of Great River Bluffs State Park in the Minnesota State Park System

A central part of the planning process for Great River Bluffs State Park was the development of mission and vision statements for the park. Both the Citizen Advisory Committee and the Integrated Resource Management Team spent time articulating these statements.

The following mission and vision statements provide a look at the role of the Department of Natural Resources, the Minnesota State Park system, and finally, Great River Bluffs State Park.

Mission and Vision Statements

Department of Natural Resources Mission Statement

Our mission is to work with citizens to protect and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life.

DNR Division of Parks and Recreation Mission

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

Great River Bluffs State Park Mission Statement

To protect and perpetuate the diverse natural, scenic, and cultural resources of the bluffland landscape for low impact use, enjoyment and education of people today and for future generations.

Great River Bluffs State Park Vision Statement

Over the next 100 years, Great River Bluffs State Park will exemplify the very best in natural resource management and preservation for the blufflands ecosystem. It will demonstrate further that management and preservation are compatible with balanced and carefully designed low-impact uses. These uses should complement the physical landscape, maintain biodiversity, and enhance the sense of discovery and learning which defines Great River Bluffs State Park.

Great River Bluffs' ecosystems, habitats, natural features, flora, and fauna should be managed to ensure:

- Preservation of Great River Bluffs State Park as a remarkable example of the driftless area of Minnesota.
- Preservation and management of special status species throughout the park, such as timber rattlesnakes (*Crotalus horridus*), Henslow's sparrows (*Ammodramus henslowii*), white cedar (*Thuja occidentalis*), and cliff goldenrod (*Solidago sciaphila*).
- Preservation of a diversity of other wildlife, including birds, animals, insects and others.

- Preservation of a diversity of plants, including white cedar (*Thuja occidentalis*), blazing star (*Liatris spp.*), compass plant (*Silphium laciniatum*) and many others.
- Preservation of unique features of the park such as the goat prairies, and the Scientific and Natural Area identified within Queen's Bluff and King's Bluff.
- Retention of the qualities and characteristics of the blufflands region, including opportunities for solitude and for bluffland views.
- Preservation of cultural features.

In addition, access to low-impact recreational uses (such as photography, snowshoeing, birdwatching, camping, hiking and cross country skiing) should be provided so that Great River Bluffs:

- Promotes awareness of low impact recreation/visitation;
- Serves as a model for bluffland conservation in facility development and construction;
- Is preserved as a natural state park providing opportunities for visitors to experience wildness, quiet and solitude; and
- Provides access to some park resources for people of varying abilities.

Citizen and staff should cooperate on local and statewide initiatives in support of Great River Bluffs State Park and Minnesota's state parks in general by:

- Implementing an outreach program to the local communities and the general public.
- Promoting volunteer programs in the park and encouraging students and adults to participate in these programs.
- Nurturing awareness and sensitivity in the public and policy makers of Minnesota about the uniqueness of Great River Bluffs State Park as a wildlife preserve in order to assure the park has adequate funding and the park plan can be fully implemented.

Great River Bluffs State Park should provide education that is geared to:

- Creating a deeper understanding and discovery of self and place in order that future generations can enjoy its beauty and appreciate that Great River Bluffs State Park is a historical representation of the Upper Mississippi River Valley.
- Fostering cultural and natural resource stewardship at a personal and community level.
- Fostering collaborations with higher education facilities including universities and adult education providers to provide blufflands research and learning opportunities.

Planning Process

The Great River Bluffs State Park planning effort began in early April of 1999. Two planning teams were established to provide input into the process:

Great River Bluffs Citizens Advisory Committee (CAC)

This group consisted of representatives from academic institutions, county and local governments, area tourism providers, various stakeholder groups, and the general public. This team met monthly to discuss management direction for the park. Team members were self-selected according to their personal and professional interests in the planning effort. Collectively, the team members represented a wide array of perspectives, volunteered their time throughout the planning effort, debated policy, and helped formulate the management goals, objectives, strategies, and recommendations presented in this plan.

Integrated Resource Management Team (IRM)

In addition to the citizens committee, an *Integrated Resource Management* team of Minnesota Department of Natural Resources staff met periodically to assist in the development of this management plan. The membership of this committee consisted primarily of the DNR Blufflands Area Team.

The result of numerous planning team meetings was a draft plan that was made available for public review during a 30-day review period in September of 2004. Notice of the public review period was distributed to a mailing list of nearly 200 individuals. Draft plans were also distributed at an open house which was held on the campus of Winona State University in August of 2004.

Following public review, the draft plan was revised and submitted for Minnesota Department of Natural Resources staff review. The Great River Bluffs State Park Management Plan was approved by the Commissioner of Natural Resources in 2005.

A copy of the completed park plan and a “planning process file” which documents the planning effort was placed at the park office as well as at the DNR Regional Office in New Ulm and DNR central office in St. Paul after the plan’s approval.



II. REGIONAL ANALYSIS

Although Great River Bluffs State Park has statewide and national influence, it has the greatest impact on the ecological and socioeconomic regions in which it is located. This section of the plan describes both the ecological and socioeconomic regions in which the park resides and the primary relationships between the park and these regions. The ecological region is discussed in terms of the Minnesota Ecological Classification (ECS) system. The socioeconomic region is described in terms of a regional population analysis and a description of regional recreation and tourism opportunities.

Ecological Subsection

Minnesota's ECS is part of a national classification system that separates and describes units of different landscapes. The approach stresses the interrelationships and the results of interactions among components of the ecosystem including climate, geology, geomorphology, parent material, soil, vegetation, hydrology, and land history. The ECS is a management tool that: (1) describes the extent and content of various ecosystems; (2) improves resource managers' abilities to predict how landscapes will change over time; and (3) allows resource managers to communicate more effectively with one another.

The ECS approach divides Minnesota into distinct units called subsections. Great River Bluffs State Park is located in the Blufflands ECS subsection, located directly east of the Rochester Plateau. (See Figure 2: ECS Subsections).

About 30 percent of this subsection is cropped, 20 percent is in pasture and 50 percent is in woodland. In Minnesota, Wheeler et al. found species characteristic of oak openings and barrens to be abundant (as cited in MN DNR 2003). People are finding good recreational opportunities in this subsection. (See Figure 3: Land Cover & Land Use).

Regional Population Analysis

Population Trends

According to the 2000 Census (Minnesota Planning 2003), the total population in Winona County is approximately 50,000 residents. The population is scattered in small communities and rural residences across the county, although over half of the county's population, over 25,000 people, reside in the city of Winona, the county seat. By the year 2025, it is estimated that there will be a small, but significant increase in the Winona County population, to a total of just over 50,000 residents.

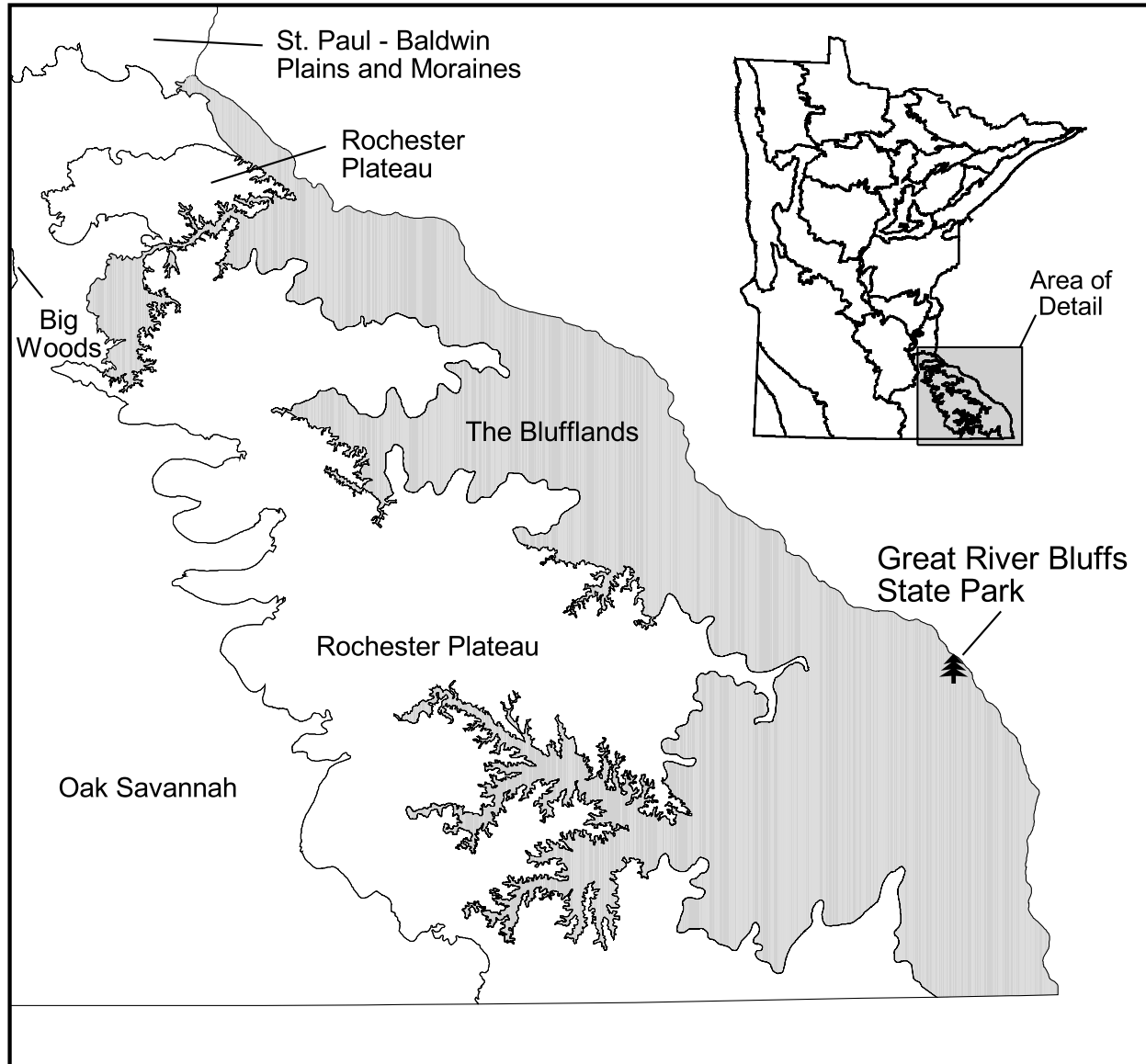
Directly to the east of Winona County is the state of Wisconsin, with the nearest bridges across the Mississippi River at the cities of Winona and LaCrosse. It is likely that Wisconsin demographics and recreational opportunities impact Great River Bluffs State Park area and the park itself. However, it has been difficult to measure this impact directly.

Sprawl Issues

There is an ever-increasing demand for residences that afford rural quality of life but allow access to more urban benefits, and this is leading to development pressures in traditional open space areas. People are becoming more willing to commute to urban jobs, traveling daily to Winona, LaCrosse, and even Rochester. This "sprawl" effect traditionally leads to controversy as open space diminishes, natural communities are fragmented, property values rise and long-time residents are impacted. In Winona County, the bluff topography compounds these concerns as the new residences and developments can be highly visible atop bluff terrain, and have the potential to greatly alter viewsheds in the region.

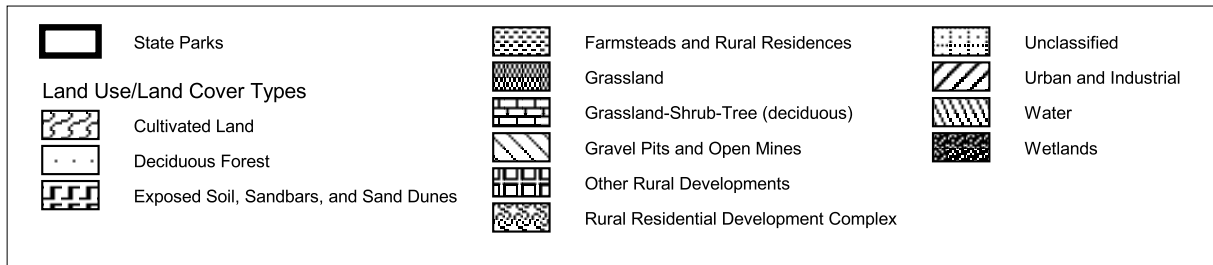
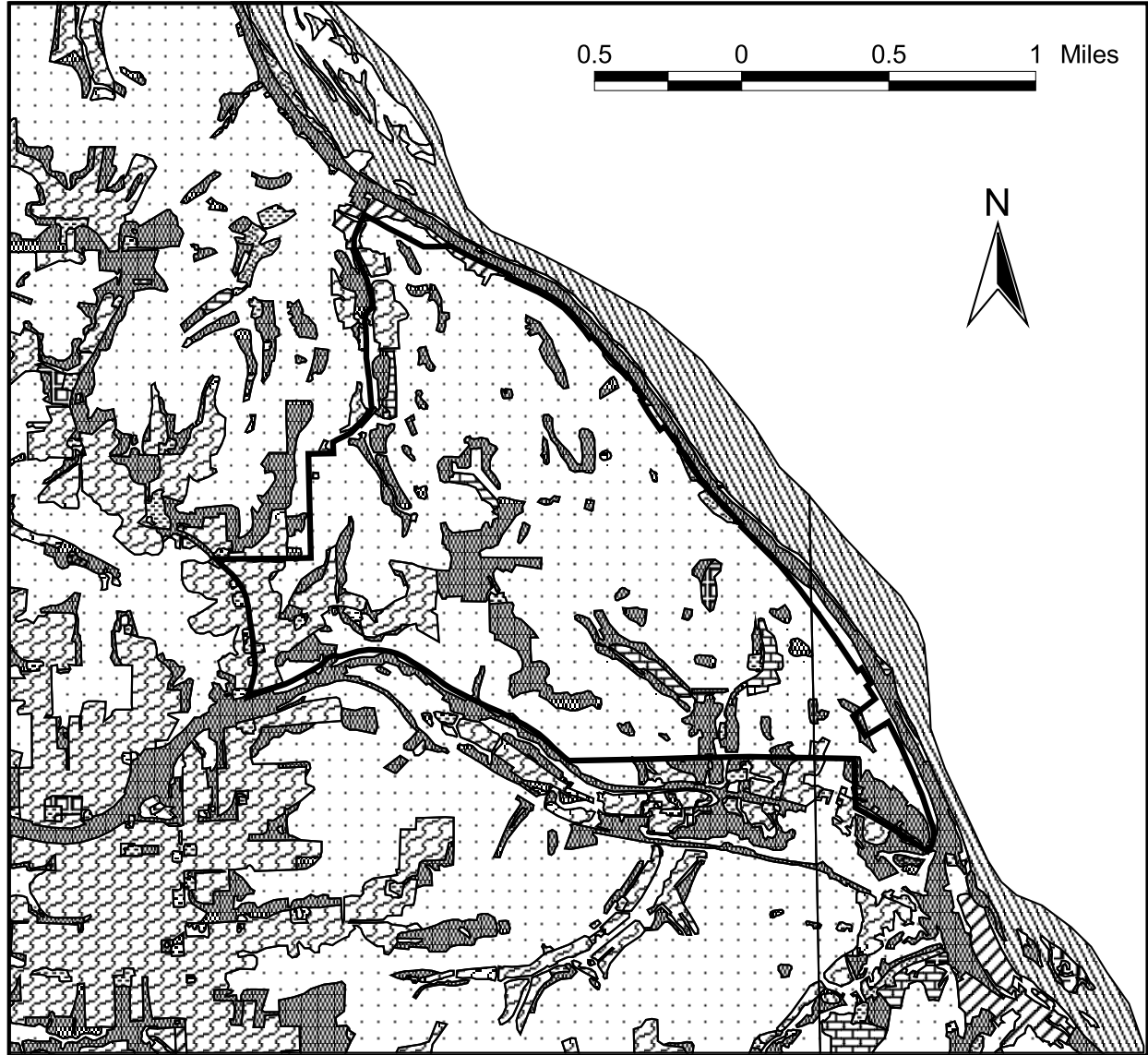
Great River Bluffs State Park

Figure 2: ECS Subsections



Great River Bluffs State Park

Figure 3: Land Cover and Land Use



Socio-Economic Region Description

Historically, the region’s economy has been based on agriculture and river-related industries. In recent years, tourism has gained attention, with efforts to promote the bluff country promoted by local residents, local chambers of commerce, and the Minnesota Department of Tourism. According to the Minnesota Department of Economic Security, the greatest areas of absolute growth in Winona County over the last decade were in the wholesale trade of durable goods, the sale of general merchandise, and in agriculture. Correspondingly, the service industry employs a high percentage of county residents, although not at a high wage. Currently, over 96 percent of the total Winona County workforce is employed, in the service sector, manufacturing, health care and education.

In 1999, Minnesota Planning reported the average income per capita in Winona County was slightly more than \$24,000 per year, although the median income for the city of Winona itself is closer to \$50,000 per year. Average total household income in the county is in the mid-to-high range for the state as a whole (MN Planning 1999).

Regional Recreation and Tourism Opportunities

The Blufflands area offers numerous outdoor recreation and tourism opportunities, provided by both public and private entities. These opportunities attract visitors to the area, who in turn contribute to the region’s economy. (See Figure 4: 50-Mile Radius around Great River Bluffs State Park). A brief synopsis of those opportunities follows.

Overnight Recreation Opportunities

Camping - There are 78 developed campgrounds located within a 50-mile radius of Great River Bluffs State Park. Eight of these are Minnesota State Park campgrounds, accounting for 6 percent of the total number campsites in the area. Private campgrounds provide by far the majority of camping opportunities within the region---67 percent of Minnesota’s total and 75 percent of Wisconsin’s total. Typically, the camping experience provided by the state agencies is more rustic and nature-oriented than the experience provided by the private facilities. Although there are camping opportunities available in Iowa as well, they were not included in the study area.

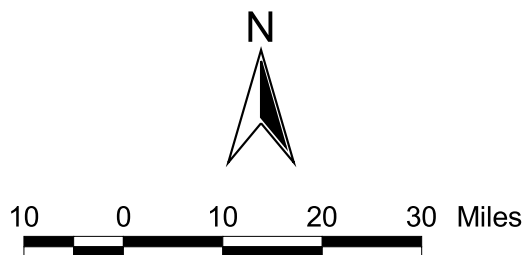
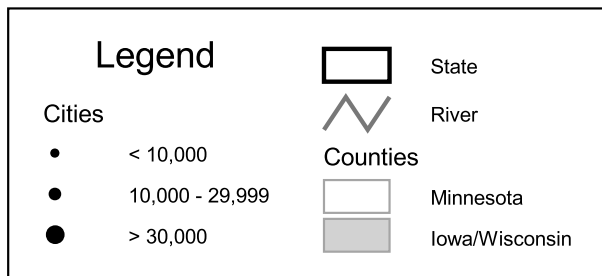
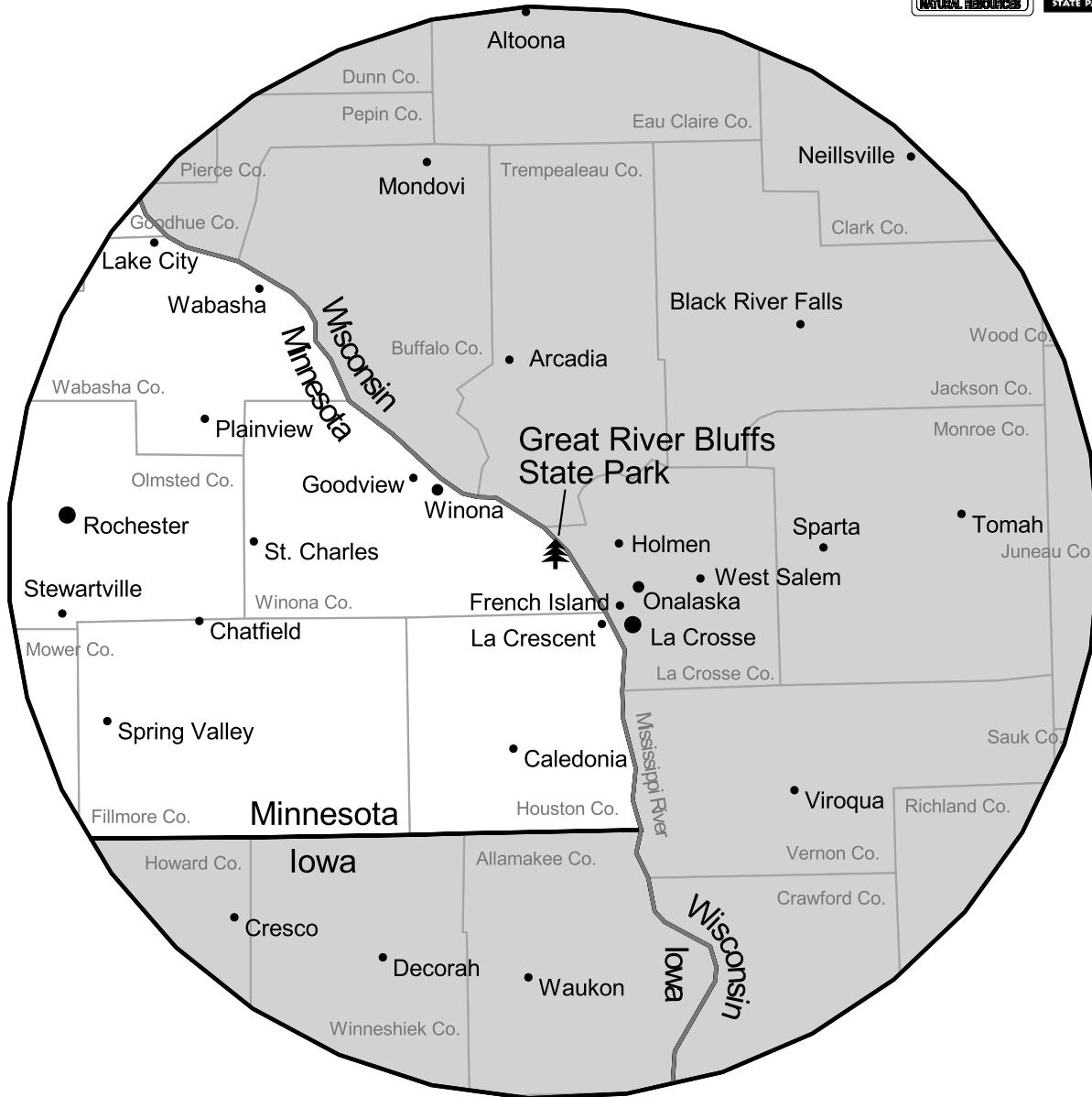
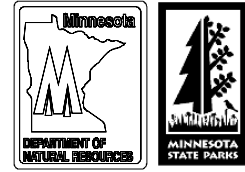
Table 1: Camping within a 50-mile radius of Great River Bluffs State Park

Managing Agency	Minnesota		Wisconsin	
	# Campground	# Campsites	# Campground	# Campsites
State Parks (including Great River Bluffs)	8	352	5	233
State Forests	6	67	2	113
State Trails & Waterways*	10	17	--	--
County	1	52	3	552
Municipal	3	203	2	200
Private Ownership	23	1640	22	2260
STATE TOTALS	51	2331	34	3358
GRAND TOTALS			85	5689

*MN DNR Division of Trails and Waterways manages dispersed backpack/canoe-in campsites along designated canoe routes in the region.

Great River Bluffs State Park

Figure 4: 50-Mile Radius



Non-Camping (Hotels/ Motels/ Resorts/Bed & Breakfast) - There are many privately owned businesses that provide overnight accommodations in the vicinity of Great River Bluffs State Park. Facilities ranging from rustic cabins to hotel accommodations and can be found in communities and developments across the bluffland region. For example, the nearby cities of Winona and LaCrosse offer numerous lodging accommodations.

Trail Opportunities

Hiking - There are over 400 miles of hiking trails within a 50-mile radius of Great River Bluffs State Park, not including facilities in Iowa. Many of these trails occur on state park or on state forest land. These are primarily day-use trails, consisting of loop systems within park or forest lands, with only occasional opportunity for walk-in style camping from points along the trails.

Horseback – There are 186 miles of horse trail within a 50-mile radius of Great River Bluffs State Park. Again, nearly all of these trail miles are on state lands, either in Minnesota State Forests or in Forestville/Mystery Cave State Park. The highly erodible terrain in the Blufflands region has made many areas unsuitable for higher impact uses such as horseback riding. There is no designated horseback riding in Great River Bluffs State Park.

Cross-Country Skiing - There are over 290 miles of cross-country ski trails within 50 miles of Great River Bluffs State park. With variable snow conditions in the southeastern portion of Minnesota, some years these trails are only open for limited windows of time, if at all. Grooming also depends on snow conditions, with a majority of the trails set for classic/traditional skiing in the region, and relatively few trails groomed for skate skiing. The trails are provided by a cross section of government agencies and local organizations. A total of 8.7 miles of cross-country skiing trails are provided within Great River Bluffs State Park.

Bicycling (Surfaced Trail or Road Shoulder) - The primary surfaced bicycling facilities within 50 miles of Great River Bluffs are found on the Root River State Trail and the Harmony-Preston Valley State Trail on the Minnesota side of the Mississippi River and the Great River State Trail, along the Mississippi River in Wisconsin. The paved Root River State Trail is very popular, drawing users from a broad area of the Upper Midwest. Local communities along the Root River State Trail, such as Lanesboro, have capitalized on the trail's attraction and offer trail users a range of amenities and facilities. The Great River State Trail, with a crushed limestone surface, is also popular, although without the attraction of an associated small community network.

In addition, the shoulder along scenic Highway 61 near Great River Bluffs receives frequent use by bicyclists. Highway 61 is designated as a portion of the Great River Road, with the shoulder officially designated for bicycling. There are several efforts underway to provide connections for bicyclists between Winona and LaCrosse, Wisconsin, through pathways other than Highway 61, and to offer scenic loop routes along existing roadways. The nearest section of the proposed Mississippi River Trail will follow the Apple Blossom Trail to avoid the junction of I-90 and TH 6, bringing cyclists to the main entrance of the park. No surfaced trail biking opportunities currently exist in Great River Bluffs State Park, although bicycles are allowed on park roads. In addition, the park maintains a 5-site bicycle campground just off southbound Highway 61/14 for cyclists riding along the Great River Road bicycle route.

Off-Road Bicycling (Mountain Biking) - There are over 280 miles of off-road bicycling trails within a 50-mile radius of Great River Bluffs, excluding Iowa. Many of these miles are found on multi-use trails on state lands in both Minnesota and Wisconsin. No off-road biking opportunities exist in Great River Bluffs State Park.

Other Opportunities

Pickwick Mill - The Pickwick Mill, established in 1854, is located about 10 minutes from the park on Lake LaBelle in Pickwick.

Great River Road National Scenic Byway & Apple Blossom Trail State Scenic Byway - The Great River Road National Scenic Byway includes the section of TH 61 immediately east of Great River Bluffs State Park. In addition, the Apple Blossom Trail Scenic Byway is immediately east of the park and includes 19 miles along county and township roads.

Historic Bluff Country - Historic Bluff Country is just southwest of Great River Bluffs State Park and includes the communities of Brownsville, Caledonia, Canton, Chatfield, Dexter, Eitzen, Fountain, Grand Meadow, Harmony, Hokah, Houston, LaCrescent, Lanesboro, Mabel, Preston, Peterson, Rushford, Spring Grove, Spring Valley, Whalan and Wykoff. These communities offer numerous recreational opportunities, especially associated with the Root River State Trail, as well as historic sites, shopping, and special events such as community theatre.

Lake Pepin Circle Tour - The Lake Pepin Circle Tour includes the communities of Red Wing, Frontenac, Lake City, Reads Landing and Wabasha on the Minnesota side, and Pepin, Stockholm, and Maiden Rock on the Wisconsin side. These communities offer numerous historic sites, recreational and shopping opportunities.

LaCrosse, Wisconsin - The city of LaCrosse offers riverboat and sightseeing tours, festivals, historic sites and antique shopping.

Winona, Minnesota - The city of Winona offers natural beauty, shopping amenities and over 100 sites on the National Register of Historic Places.

III. NATURAL RESOURCES

The DNR Division of Parks and Recreation Resource Management Program has three primary objectives for protecting state park resources:

Keeping what we have by preserving natural communities, archaeological and historic sites, rare and endangered plants and animals;

Restoring what we've lost by recreating examples of original Minnesota landscape prior to European settlement; and

Striking the balance between use and protection by minimizing the impact of public use and facility development on natural and cultural resources. It also requires enhancing the natural and historical setting in which outdoor recreation and interpretation occurs.

The following pages present an overview of what is currently understood about the natural features and resources of the Great River Bluffs State Park area and the management recommendations for them. The amount of information available for different segments of the park resources varies, with some aspects of the natural community studied and documented extensively, and others only generally.

Since its establishment as a state park in 1963, the natural resources in the park have been actively managed. Early in its history, the park was managed by the DNR Division of Forestry. From the 1970s on, the DNR Division of Parks and Recreation has been actively managing the park's natural communities. Techniques such as prescribed burning and the removal of problem woody species have been used on the park's goat prairies, for example. In addition, the park has hosted several studies to inventory and monitor its rare species. Due to its large number of sensitive species and plant communities, the park continues to attract the interest of resource professionals including entomologists, ornithologists, plant ecologists and herpetologists.

Climate

The Blufflands subsection has a continental climate. Annual normal precipitation ranges from 29 inches in the western portion to 34 inches in the southeast. Growing season precipitation ranges roughly from 11 to 16 inches and growing season length ranges from 136 to 156 days (Midwest Climate Center 1992).

Blazing Star



Geology and Topography

Great River Bluffs is part of the Blufflands ECS Subsection in Minnesota and also part of what is referred to regionally as the “driftless” area.

The Blufflands ECS Subsection in Minnesota is bounded on the west side by the Rochester Plateau and on the east side by the Mississippi River. This subsection is situated on loess-capped plateaus, and is deeply dissected by river and stream valleys. The greatest amount of relief occurs along the Mississippi River, where the elevation change from the river to the top of the nearby bluffs can be 600 ft. In the east, loess lies directly on bedrock. In the southeast, loess overlies red clayey residuum that was formed directly from limestone and/or sandstone. Paleozoic sedimentary rocks crop out in valley walls, but are generally mantled with colluvium or loess. In the east, topography is largely bedrock controlled. Sinkholes are common in the southwestern portion of the subsection. (See Figure 5: Geology of Great River Bluffs State Park).

In general, sediment thickness varies by landscape position. Large exposures of bedrock occur in the steep ravines. These exposures are primarily Ordovician dolomite, limestone, and sandstone with Cambrian sandstone, shale, and dolomite exposed along the valley walls of the Mississippi River. Devonian dolomite and limestone are more locally exposed along the western edge of the subsection (MN DNR 2003).

The so-called driftless area, including parts of Minnesota, Wisconsin, Iowa, and Illinois is thought by some to have escaped glacial cover completely. More likely, much of this area was ice-free only during the last glacial event, the Wisconsin glaciation. Evidence of earlier glaciations in this area has mostly been removed by subsequent erosion and weathering. However, the accumulation of glacial drift in the form of loess bears witness to the effects of glacial events in the area (Ojakangas and Matsch 1982).

Great River Bluffs State Park is located in the very eastern edge of the Blufflands subsection where the topography is largely bedrock controlled. The unique geology of the blufflands in this area is critical to most of the rare species and plant communities found in the park today. Species such as peregrine falcons and timber rattlesnakes, for example, are dependent on the exposed rock outcrops that the park offers.

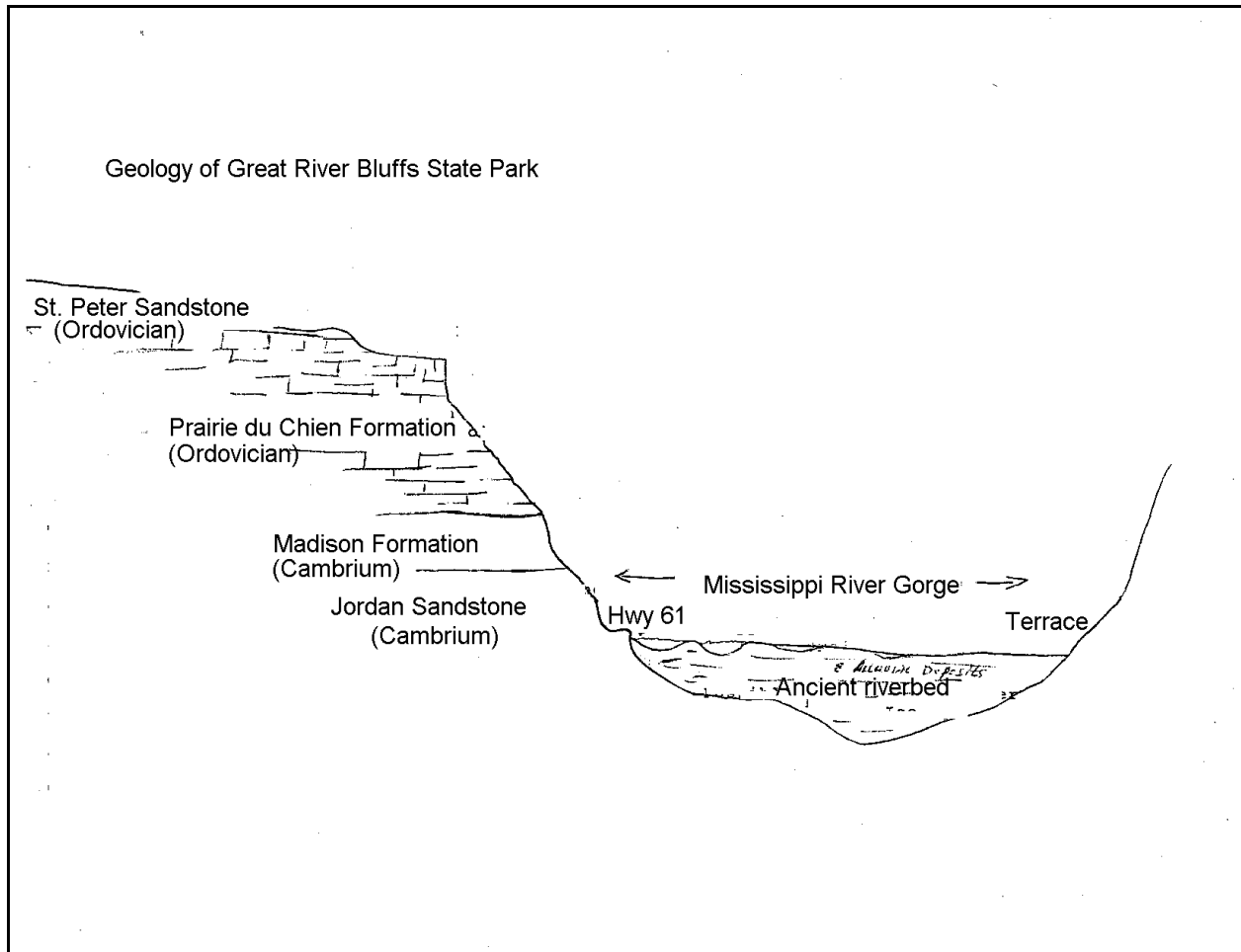
Soils

Due to its steep topography, a good deal of Great River Bluffs State Park has minimal soil development. Most existing soils are silt loams of one type or another, ranging from more mesic silt loams in the maple-basswood old growth areas, to thin silt loams overlying sandstone bedrock in the prairie areas. Exposed outcrops of Oneota dolomite and Jordan sandstone are common. Consequently, the soils in the park are considered highly erodible and generally not conducive to extensive recreational development.

For specific details regarding the soils of Great River Bluffs State Park and Winona County, readers should refer to maps derived from the Soil Survey Information System (ISIS), Department of Soil, Water, and Climate, University of Minnesota, which are based on county soil surveys published by the Natural Resources Conservation Service (NRCS). The Winona County survey is from 1986 and was published in 1994. This information is available in digital format from Minnesota’s Land Management Information Center (LMIC).

Great River Bluffs State Park

Figure 5: A Cross Section of the Mississippi River Valley



Note of Explanation: The Mississippi River Gorge was carved by the Glacial River Warren which was much larger than the present Mississippi River. Although this locality is in the "driftless area", mile-thick ice persisted nearby for thousands of years. The valley, cut wide and deep as the ice melted, became choked with silt, sand and gravel as the floods dwindled. Later, the present Mississippi River settled in its current course and began to exhume the old valley.

The sedimentary rocks of the bluffs of Great River Bluffs State Park are much older than the Ice Age valley. They were deposited under ancient seas that covered this area over 450 million years ago. Remains of shellfish that lived in these waters during the Cambrium and Ordovician times became fossils as the layers slowly turned to stone.

Vegetation

Pre-European Settlement Vegetation

The best information describing vegetation in Minnesota at about the time of European settlement is that collected by the original land survey in the mid-1800s. (See Figure 6: Bearing Tree Species). Surveyors described part of the park as “forest” and other parts as “scattering oak/scattering timber”. Undergrowth was noted as mostly hazel and vines. Bearing trees recorded included paper birch, bur oak, black oak, white oak, butternut, elm and hickory. Curtiss-Wedge (1913) noted that transition areas existed between timber and prairies in the region, and they were “often grub or brushland of small growth red and white oak”. Shelford (1926) noted that the lower slopes of Gwinn’s Bluff (Queen’s Bluff) were covered with a dense hardwood forest, the summit was composed of dolomite, and white cedar grew among the dolomite outcrops at its summit (as cited in MN DNR 1996).

Current Vegetation

Today, much of the park supports natural communities similar to the vegetation present on the landscape prior to European settlement. Important factors determining where the natural communities in the park occur include topographic position, slope, aspect, hydrology, and fire history. On bluffs that are too steep to support soil development, dry and moist cliffs occur; the latter are kept moist by heavy shade and/or the presence of constant seepage. On Queen’s Bluff, just below the dry cliffs at the top of the bluff, a disjunct population of white cedar occurs in the rock crevices. The drier slopes that do support some soil development support dry oak forests and oak woodland-brushland, the latter probably present in areas that burned more frequently or were more heavily grazed in the past. On the driest knobs near the tops of these slopes, bedrock bluff prairies occur in association with frequent rock outcrops. The moist north to east-facing are covered by mesic oak forest and maple-basswood forest; fires would have occurred less frequently in these sites. Maple-basswood forest also occupies some narrow benches along streams in the lowland parts of the park. Where there is continual seepage at the base of bluffs, mixed hardwood seepage swamp occurs (MN DNR 1996).

Results from the Minnesota County Biological Survey indicate that the large size of the complex of high-quality natural communities in the park, together with the high concentration of rare species, makes it one of 13 sites in Winona County ranked high in biodiversity significance. Over 260 species of plants were identified in the park as part of the survey (MN DNR 1996).

Natural communities identified by the Minnesota County Biological Survey include:

Maple-Basswood Forest

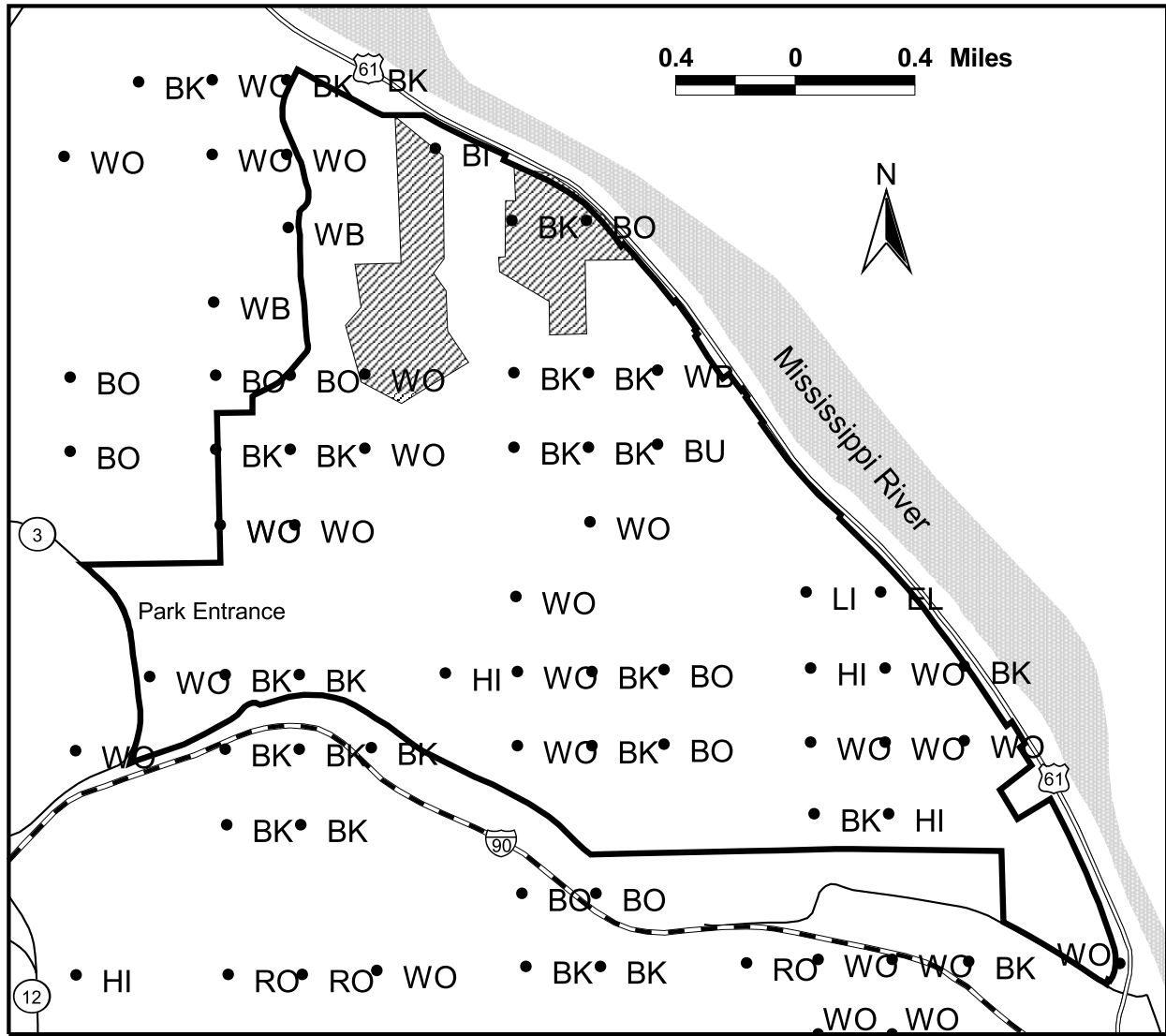
Maple-basswood forest occurs in the park on moist north- to east-facing steep slopes and along a narrow strip along the intermittent stream in the valley between Queen’s Bluff and King’s Bluff. These stands are over 120 years old and are therefore considered old growth in Minnesota. Although they were logged earlier in the 1800’s, they have maintained a diverse assemblage of native species and are now considered relatively undisturbed (compared to other maple-basswood stands in SE Minnesota). Outside of the park, this community is increasingly threatened by intensive logging and housing development pressures. Six rare plant species occur in maple-basswood forests in the park including squirrel-corn, Goldie’s fern, white baneberry, witch hazel, ginseng and black snakeroot. Due to the topography (steep slopes) and rare species, disturbance to these areas should be minimized.

Oak Forest (Mesic Subtype)

This forest subtype occurs on two northeast-facing bluffs in the park. It is dominated by red oak and includes white oak, black oak, and paper birch in the canopy, with basswood, shagbark hickory, box elder, elm, and ironwood in the subcanopy. These forests were disturbed by past logging, but in the absence of further disturbance, are likely to succeed to maple-basswood forest for the most part. This forest subtype provides potential habitat for white baneberry, witch hazel, ginseng and black snakeroot. Mesic oak forest is becoming increasingly rare in southeast Minnesota.

Great River Bluffs State Park

Figure 6: Bearing Tree Species



Tree Species		Other Features	
BK	Black Oak	LI	Basswood
WO	White Oak	EL	Elm
BO	Bur Oak	HI	Hickory
RO	Red Oak	BI, WB	Birch
			Park Boundary
			Interstate Highway

Oak Forest (Dry Subtype)

Dry oak forest is the most common natural community in the park. Canopies are dominated by black oak, with bur oak, red oak, white oak, shagbark hickory and big-toothed aspen. Most of the areas in the park were lightly grazed and probably burned in the past, but because they are large and diverse, provide significant habitat for snakes and other animals. In addition, the rare autumn coral root occurs in these forests. Bedrock bluff prairies occur as openings on the driest knobs within the matrix of dry oak forest. High quality dry oak forests are sparse in southeast Minnesota due to logging and housing development pressures. Prescribed burning will be needed to maintain these forests. In the absence of fire, these communities will likely succeed to maple-basswood forest.

Oak Woodland/Brushland

Occurring in the park on the driest south- to west-facing slopes, oak woodland/brushlands are similar to dry oak forest in species composition, but have more open canopies (less than 80% cover), more shrub cover, and scattered prairie openings. These areas were grazed and probably burned in the past, possibly more frequently or more recently than the slopes with more canopy cover. They are dominated by black oak and white oak. Northern pin oak, red elm, American elm, black cherry, ironwood, and red oak are less common. Bedrock bluff prairies occur as openings on the driest knobs within the matrix of oak woodland/brushland. High quality occurrences of oak woodland/brushland are relatively rare in southeast Minnesota, due to disturbance by heavy grazing, logging, and invasive exotic species. Prescribed burning will be needed to maintain these forests. Without fire, these areas will eventually become closed canopies and will succeed to dry oak forest and possibly eventually to maple-basswood forest. In addition, problem species such as European buckthorn and Tatarian honeysuckle should be controlled.

Dry Prairie (bedrock bluff subtype)

Also known as “goat prairies” or “bluff prairies”, these areas are important as habitat for rare species and are threatened in Minnesota. Confined in the state to the bluffs of southeast Minnesota and a few rocky slopes along the St. Croix River north of the Twin Cities, these areas are threatened by encroaching woody vegetation in the absence of fire and grazing, and increasingly by invasions of problem plant species.

Thirty bedrock bluff prairies were identified in the park by MCBS; quality varies from high to low. These prairies are primarily located on south- to west-facing dry slopes, and include outcrops of Oneota dolomite and Jordan sandstone. Problem species that require management include Canada bluegrass, crown vetch, and a variety of woody species including sumac.

Three rare plant species occur in these prairies: valerian, small white lady’s slipper and silverleaf grape. The former two species are particularly rare in southeastern Minnesota and are confined to either calcareous wetlands or this type of bedrock bluff prairie where there are seasonal calcareous seepage areas. In addition, several rare animal species are dependent on the prairie and prairie-forest edges in the park including the Ottoe skipper and several snake species. In order to maintain relatively open prairie conditions, management techniques such as woody species removal and prescribed burning will have to continue in the park.

Mixed Hardwood Swamp (seepage subtype)

There are only four known occurrences in southeastern Minnesota of this natural community, which is threatened in the state. One small area of mixed hardwood swamp occurs in the park, in a narrow strip at the base of Queen’s Bluff’s northeast-facing slope, adjacent to Highway 61. The canopy of basswood and black ash, the presence of alder in the shrub layer, and the groundlayer species, skunk cabbage and marsh marigold, all reflect the influence of the groundwater seeps that originate from the sandstone cliffs just above the swamp. This community type was more common on the pre-European settlement landscape, but many former of the former seepage areas at the bases of slopes have been disturbed by the development of roads and houses.

Upland White Cedar Forest

The park retains one of two documented sites of upland white cedar forest in southeast Minnesota. These two sites are about 160 miles away from the nearest other natural occurrence of northern white cedar and represent relict stands of a community that was probably much more common in the area in preglacial times. The northern white cedar occupies the edge of the dry cliff at the top of Queen's Bluff and occurs as a component of the forest on the northeast-facing steep slope immediately below the cliff. This community should be protected.

Moist Cliff

The moist cliffs in the park occur on north- to northeast-facing slopes above the Mississippi River. There may be additional moist cliffs along this slope; a more intensive field survey is needed. The cliffs receive moisture from seepages, and are topographically positioned to maintain continuous cool moist conditions. Two very rare state-listed plants (*Reniform sullivantia* and *Montia chamissoi*) occur in the park on these moist cliffs with seeps. These cliffs and the maple-basswood forest surrounding them are high priority areas for protection from disturbance or development of any kind. Maintenance of natural hydrologic cycles in the park is necessary for this community.

Dry Cliff

Small dolomite and sandstone outcrops are present throughout the park. They are especially prevalent just below ridgetops and within bedrock bluff prairies. Where there are large notable rock exposures and no seepage, they are mapped as dry cliff communities. Two rare plants are associated with several dry cliffs in the park (jeweled shooting star and cliff goldenrod). Creeping juniper is a rare plant documented on the north-facing cliff on Queen's Bluff. Animals in the park that are dependent on this type of habitat include several snake species and the peregrine falcon. These areas are high priorities for protection from disturbance or development of any kind.

Old Growth Forest

There are currently 191.1 acres of designated old growth forest in Great River Bluffs State Park. Included in this are 154.7 acres of oak forest, 33.3 acres of northern hardwoods, and two stands of white cedar (0.5 acres and 2.6 acres). Management of these areas should follow MN DNR old growth management guidelines.

Native Plant Restoration and Desired Future Conditions

In addition to the protection and management of existing natural communities, the park will be working on restoring those areas that are currently devoid of native species (or relatively disturbed). Overall, there are approximately 535 acres of land at Great River Bluffs that are in need of native plant community restoration. Of that, about 66% will be reconstructed to oak savanna or prairie, and 30% will be restored to oak woodland-brushland. Small areas (less than 10 acres each) will be restored to maple-basswood forest or oak forest. (See Figure 7: Existing Natural Communities and Figure 8: Desired Future Conditions).

Old Fields/Grasslands

There are approximately 189 acres of old field currently in Great River Bluffs State Park. Of that, about 80 acres is currently in the process of reconstruction to prairie/savanna. Native plant community restoration efforts will be carefully conducted so as to ensure the continued presence of Henslow's sparrow in the park.

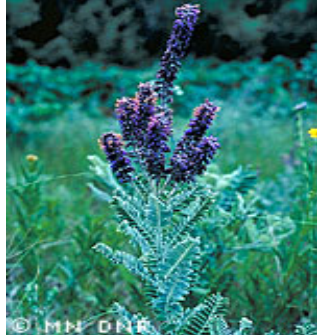
Planted Stands

The park has several areas of pine plantations and planted deciduous trees that date to the years of park establishment. These stands are gradually being removed or managed to replicate more natural stands as appropriate.

Other

The following is a complete listing of the restoration needs in Great River Bluffs State Park:

Current Land Cover	Acres	DFC Land Cover
Administrative Area	6.6	Administrative Area
Assoc. w/ Mining Activities	9.4	Oak Woodland-Brushland
Dry Prairie	15.0	Dry Prairie
Oak Forest (Dry Subtype)	95.0	Oak Woodland-Brushland
Oak Woodland-Brushland	5.0	Oak Woodland-Brushland
Old field	189.0	Oak savanna or Oak Forest
Planted (coniferous)	28.4	Oak savanna (& Woodland) or Maple-Basswood
Planted (deciduous)	106.0	Oak savanna
Prairie/savanna reconstruction	79.0	Oak savanna
Roads/trails buffered	15.6	Roads/trails buffered
Young forest	7.8	Oak Woodland-Brushland
Campground	0.0	Campground
Hayfield	0.4	NA < 1 acre
Maple-basswood	0.3	NA < 1 acre
Picnic area	0.9	Picnic area
Total acres	558.4	
Total restoration acres	535	



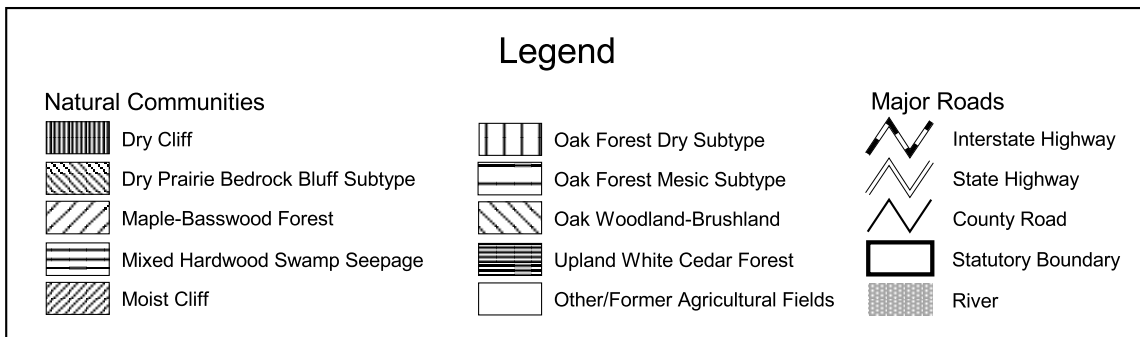
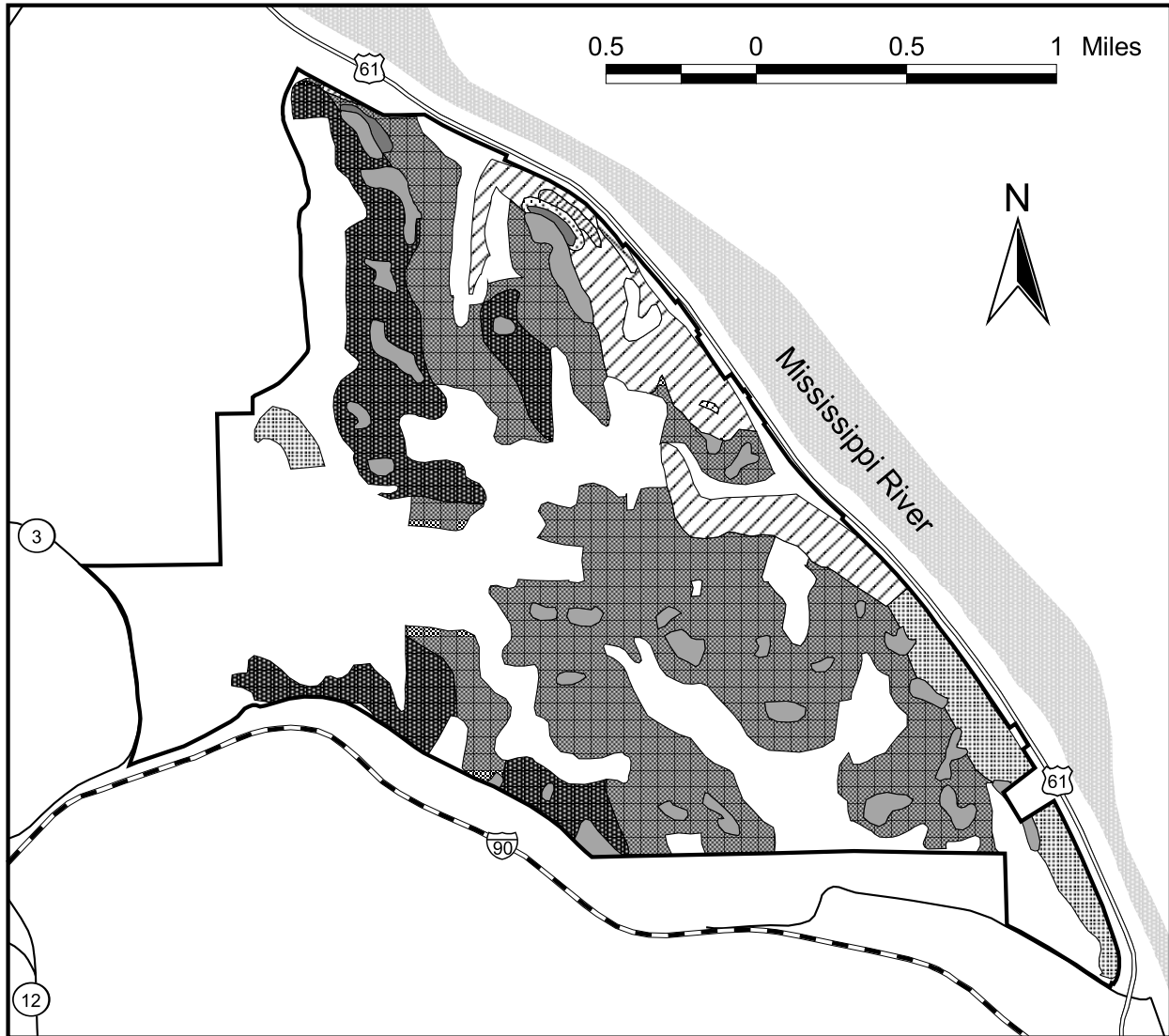
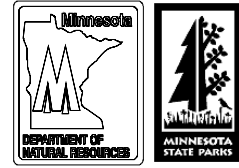
Leadplant



Puccoon

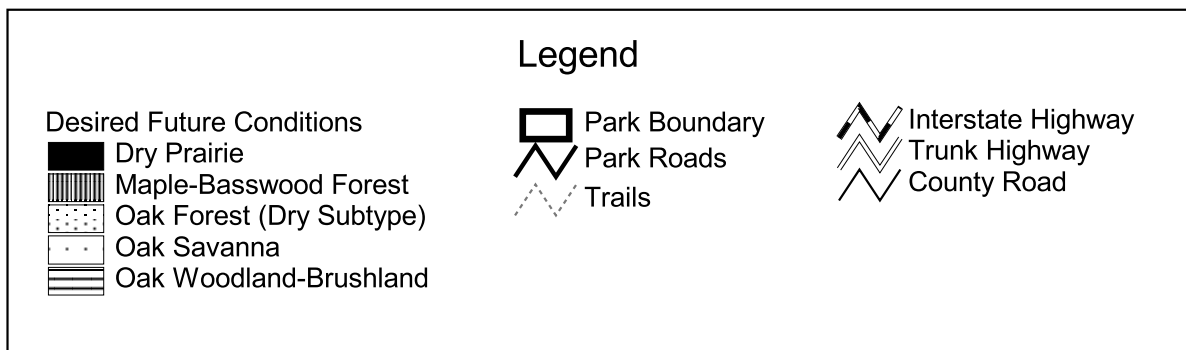
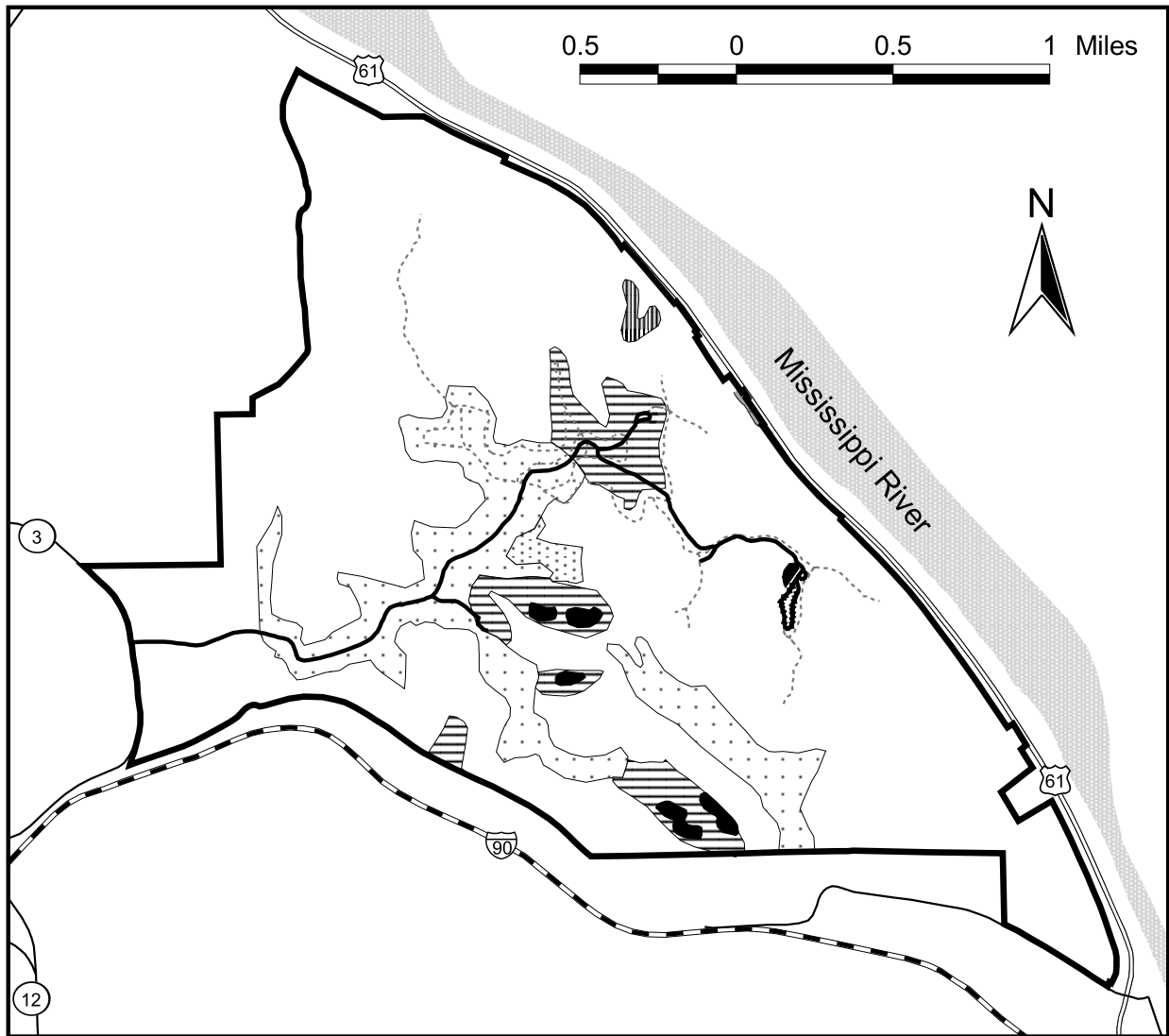
Great River Bluffs State Park

Figure 7: Existing Natural Communities



Great River Bluffs State Park

Figure 8: Desired Future Conditions



King's and Queen's Bluff Scientific and Natural Area

The King's and Queen's Bluff Scientific and Natural Area (SNA) consists of 178 acres in the northern portion of Great River Bluffs State Park. The preserve consists of two separate units, each of which is dominated by 500-foot high cliffs affording spectacular views of the Mississippi River Valley. The SNA's location in the driftless area and its highly dissected topography provide conditions which support several plant communities and species unique to the southeastern portion of the state (MN DNR 1996). In addition, several rare animals have been recorded in the SNA.

Queen's Bluff harbors several natural features that are especially sensitive to human disturbance. For this reason, this unit is designated as an educational unit, in which only permitted research and educational uses are allowed. An interpretive trail is available on King's Bluff for the general public. Both of these units are managed cooperatively with the DNR Scientific and Natural Areas program. (See Figure 9: King's and Queen's Bluff Scientific and Natural Area).

Rare Natural Communities in GRB State Park

State Endangerment Rank¹

Dry Cliff (Southeast); 8 acres	3
Dry Prairie (Southeast) Bedrock Bluff Subtype; 127 acres	3
Maple-Basswood forest (Southeast); 204 acres	2
Mixed Harwood Swamp Seepage Subtype; 5 acres	3
Moist Cliff (Southeast); 9 acres	3
Oak Forest (Southeast) Dry Subtype; 865 acres	2
Oak Forest (Southeast) Mesic Subtype; 125 acres	2
Oak Woodland-brushland (Southeast); 314 acres	4
Upland White Cedar Forest Bluff Subtype; 5 acres	2

Rare Plants

State Endangerment Rank²

Wild indigo (<i>Baptisia bracteata</i> var. <i>glabrescens</i>)	State special concern
Small white lady's-slipper (<i>Cypripedium candidum</i>)	State special concern
Squirrel-corn (<i>Dicentra canadensis</i>)	State special concern
Goldie's fern (<i>Dryopteris goldiana</i>)	State special concern
Witch-hazel (<i>Hamamelis virginiana</i>)	State special concern
Creeping juniper (<i>Juniperus horizontalis</i>)	State special concern
A species of purslane (<i>Montia chamissoi</i>)	State endangered
Ginseng (<i>Panax quinquefolium</i>)	State special concern
Black snakeroot (<i>Sanicula trifoliata</i>)	State special concern
Cliff goldenrod (<i>Solidago sciaphila</i>)	State special concern
Reniform sullivantia (<i>Sullivantia renifolia</i>)	State threatened
Valerian (<i>Valeriana edulis</i> ssp. <i>Ciliata</i>)	State threatened
Silverleaf grape (<i>Vitis aestivalis</i> var. <i>argentifolia</i>)	State special concern
Illinois tick-trefoil (<i>Desmodium illinoiense</i>)	State special concern

¹ State endangerment ranks for natural communities range from 1 to 5, with those ranked "1" considered critically endangered in Minnesota, and those ranked "5" considered secure under present conditions. These natural communities, however, have no legal status for protection in Minnesota.

² State endangerment ranks for species:

A species is considered **endangered** if the species is threatened with extinction throughout all or a significant portion of its range in Minnesota.

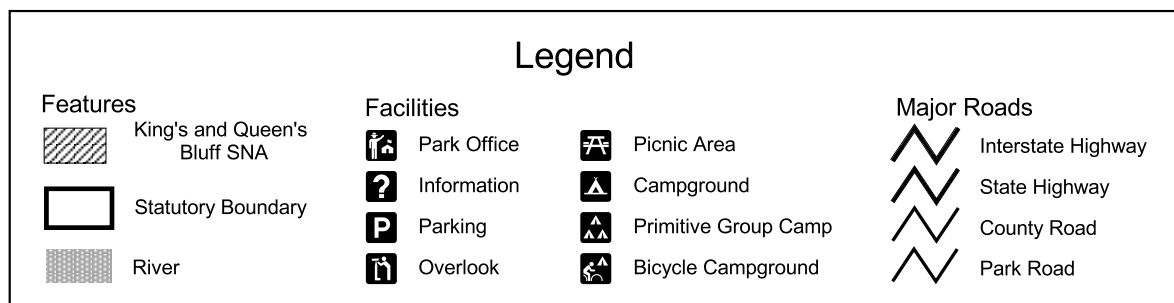
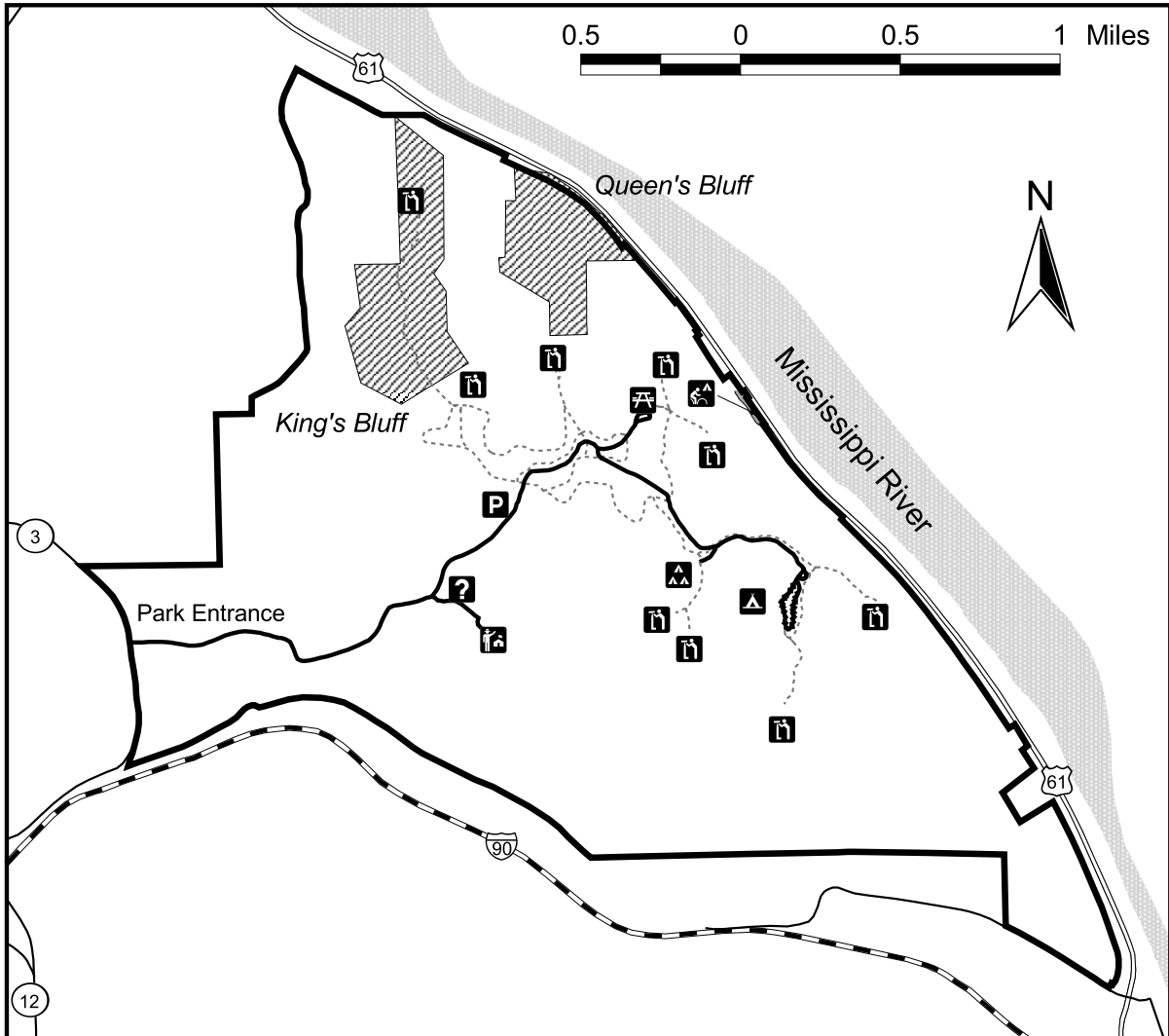
A species is considered **threatened** if the species is likely to become endangered within the foreseeable future through out all or a significant portion of its range within Minnesota.

A species is considered a **species of special concern** if, although the species is not endangered or threatened, it is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status.

Species on the periphery of their range that are not listed as threatened or endangered may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.

Great River Bluffs State Park

Figure 9: King's and Queen's Bluff SNA



Montia (A species of purslane): State Endangered

(Montia chamissoi)

The Queen's Bluff area population of this species is the only known occurrence of montia in the Midwest, occurring at least 800 miles from its main range in the Rocky Mountains. This relict of Minnesota's Pleistocene flora is believed to have survived the most recent glacial advances in the driftless region of the state. Montia occurs on moist, shaded cliffs of stream banks.

Reniform sullivantia: State Threatened

(Sullivantia renifolia)

Sullivantia is found only on northeast-facing sedimentary cliffs in the driftless region of the state. Two of the three known populations in Minnesota occur within the statutory boundaries of Great River Bluffs State Park.

Valerian: State Threatened

(Valeriana edulis ssp. ciliata)

This species' distribution in the state is limited to the prairie remnants of southeastern Minnesota. It occurs on shallow soil at the base of exposed limestone bedrock near goat prairie areas on King's and Queen's Bluffs.

Illinois tick-trefoil: State Special Concern

(Desmodium illinoiense)

Illinois tick-trefoil is limited to only a few prairie sites in southeastern Minnesota. In Great River Bluffs State Park, it was discovered in small prairie openings in former woodlands that had been cleared and grazed prior to 1920, near mixed oak woods on Queen's Bluff's western slope.

White lady's slipper: State Special Concern

(Cypripedium candidum)

This species occurs sparsely in calcareous soils of wet and mesic prairies and other moist, open habitats throughout much of the state. In Great River Bluffs State Park, it is typically found on the bluff prairies.

Witch-hazel: State Special Concern

(Hamamelis virginiana)

This species is widely distributed in much of the northeastern United States and in southern Canada, and occurs south to Florida and Texas. In Minnesota, however, witch hazel is limited to ravines and a few wooded slopes in the extreme southeastern corner of the state. It occurs infrequently on Queen's Bluff's northern slope in mixed oak forests.

Black Snakeroot: State Special Concern

(Sanicula trifoliata)

This species is similarly confined in Minnesota to wooded slopes in the southeastern corner of the state. It occurs in the SNA on Queen's Bluff's north-facing lower slopes in deciduous woods.

Squirrel-corn: State Special Concern

(Dicentra canadensis)

Confined in Minnesota to the southeastern corner of the state, squirrel corn is found in mesic northern hardwood forests. It occurs at the base of Queen's Bluff on a northeast-facing wooded slope.

Goldie's fern: State Special Concern

(Dryopteris goldiana)

This species is found in the understory of mesic northern hardwood forests in southeastern Minnesota, generally on north-facing slopes. It occurs on the SNA under maple/elm canopies on the lower north slopes of Queen's Bluffs.

Cliff goldenrod: State Special Concern

(*Solidago sciaphila*)

This goldenrod species occurs primarily in the driftless region on calcareous or sandy cliffs, and in Minnesota is confined to the southeastern part of the state. It occurs in the SNA on north-facing cliffs of Queen's Bluff, and is found on private property within the state park statutory boundary on the north face of King's Bluff.

Wild indigo: State Special Concern

(*Baptisia bracteata* var. *glabrescens*)

In Minnesota, wild indigo is generally found in prairies and savannas in the southeast. However, in Great River Bluffs, the Minnesota County Biological Survey found it in the park in sandy openings associated with cliffs and in old fields. It may also exist in bedrock bluff prairies in the park, but was not documented there in the early 1990s.

Creeping juniper: State Special Concern

(*Juniperus horizontalis*)

Creeping juniper occurs primarily along the dry north-facing cliff of Queen's Bluff. Further searches in the park may locate additional occurrences of this plant.

Ginseng: State Special Concern

(*Panax quinquefolium*)

This plant occurs infrequently in maple-basswood forests and generally prefers mesic soil conditions and relatively high canopy coverage. Ginseng in the park is threatened by illegal harvesting.

Silverleaf grape: State Special Concern

(*Vitis aestivalis* var. *argentifolia*)

Silverleaf grape occurs rarely in the state in dry sandy habitats. In Great River Bluffs State Park it has been documented on one bedrock bluff prairie as well as on a sandy roadside.

Eastern White Cedar



Wildlife

Because Great River Bluffs State Park is a mosaic of natural and disturbed community types, it provides habitat for a variety of wildlife as well. Today the park hosts a minimum of 35 species of mammals, over 17 species of reptiles and amphibians and, due to it being located on a major flyway, over 150 species of birds. In addition, it is likely that the park serves as an important refuge for prairie-dependent butterflies. Refer to Appendix B for a bird list for the park.

Because of its unique habitat, Great River Bluffs State Park is home to a number of rare animal species.

The following rare birds, reptiles, and insects are known to exist in the park:

Rare Animals

Henslow's Sparrow (*Ammodramus henslowii*)

Racer snake (*Coluber constrictor*)

Timber rattlesnake (*Crotalus horridus*)

Peregrine falcon (*Falco peregrinus*)

Ottoo skipper butterfly (*Hesperia ottoe*)

Gopher snake (*Pituophis catenifer*)

State Endangerment Rank

State endangered &
Federally special concern

State special concern

State threatened

State threatened

State threatened

State special concern



Freshly hatched turkey eggs (Keyler & Oldfield '03)

Due to their special habitat needs and status, the following species merit more specific discussion:

Henslow's Sparrow (State Endangered & Federally Special Concern)

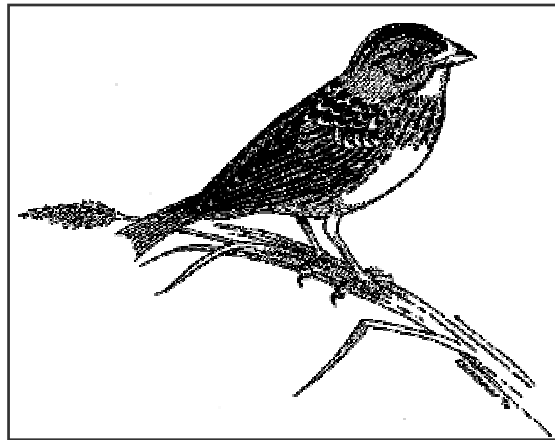
(*Ammodramus henslowii*)

Discussion: Prior to European settlement, Henslow's sparrow bred primarily in native prairie habitat across the Midwest and New England south to North Carolina³. There are historic breeding records for this species in several states including Illinois, northern Indiana, Iowa, southern Minnesota, Missouri, Texas, Ohio, Wisconsin, Kentucky, North Carolina, Connecticut, Delaware, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont (Pruitt 1996). Prior to 1900, for example, the Henslow's sparrow was considered abundant in Illinois and was probably widespread in Iowa. However, with the loss of native prairie, Henslow's sparrow has completely lost its breeding habitat in some states, and in others, has adapted to breeding in secondary grassland habitats, particularly hayfields and pastures, when available.

³ For a discussion of wintering habitat and range, refer to Pruitt 1996.

In Minnesota, Henslow's sparrow is thought to have been formerly widespread but uncommon in the southern half of the state. Because of its sporadic occurrence in the state, the extent of its former range is difficult to delineate (Coffin and Pfannmuller 1988). Currently, Great River Bluffs State Park is the only location in the state where a breeding population has persisted. As many as 23 birds have been documented in the park's old fields during the breeding season, however, the numbers seem to fluctuate from year-to-year. Currently, there appears to be at least 12 territorial males in two different fields in the park (Faber 2003; Faber 1999). Only scattered occurrences of singing males have been observed in other areas of the state.

Henslow's sparrow has relatively specific breeding habitat requirements, and therefore the species' population trends have mirrored trends in availability of suitable habitat. On a national basis, current habitat conditions for Henslow's sparrow are probably worse than at any other time in history due to the loss of 99.9% of this country's native prairie (Pruitt 1996). In the Midwest, less than 1% of the region's original native prairie remains intact (Herkert et al. 1995). Furthermore, the availability of secondary agricultural habitats has also declined as pastures and hayfields are developed, converted to row crops, or reforested.



Henslow's Sparrow
Courtesy of Wisconsin DNR

Grasslands that provide Henslow's sparrow breeding habitat are generally characterized by tall, dense grass with a well-developed litter layer and a relatively high coverage of standing dead vegetation. The grasslands frequently support sparse woody vegetation, but extensive woody invasion will eventually preclude use by this species. Henslow's sparrow is probably more area-sensitive than most other species of grassland birds (Pruitt 1996). Usually only large grasslands support persistent populations.

Maintenance of grasslands in conditions suitable to Henslow's sparrows is essential to their continued existence in the park. The presence of a litter layer of dead grass for nest material and concealment and tall forbs that are used as song perches are important components of the sparrow's breeding habitat (Hanson 1994). Recent habitat work at Great River Bluffs State Park has included the removal of encroaching sumac and the use of fire to stimulate grass growth. Future work should include the restoration and management of additional native prairie where possible⁴.

It is strongly recommended that research and monitoring of the Henslow's sparrow population be continued in the park. It should be noted that the park's mandate to restore pre-European settlement vegetation (i.e., native prairie) may conflict with the mandate to protect this rare species. Given this, native prairie restoration should be done with the goal of maintaining (or even increasing) the park's population of Henslow's sparrows. For example, native seed mixes might include cool season grass

⁴ For a discussion on grassland management techniques and Henslow's sparrow see Pruitt 1996.

species that will attract Henslow's sparrows. All of these efforts will require continuous monitoring protocols to ensure the continued presence of Henslow's sparrow in the park.

In addition, interpretive information about this species should be provided to the park visitors. Care should be taken so that the nesting activities of the birds are not disturbed between mid-May and mid-August.

Peregrine Falcon (State Threatened)

(Falco peregrinus)

The peregrine falcon is a widely ranging species and can be found worldwide. In Minnesota, the peregrine falcon nested historically on the bluffs along the Mississippi River and its tributaries south of Red Wing and into Iowa, along the St. Croix River, on the cliffs of the North Shore, and in the Boundary Waters Canoe area. Prior to the 1960's peregrine pairs were observed nesting on Queen's Bluff in 1939, 1953, 1954, and 1955.

However, by 1962 the entire population in the United States and southern Canada, east of the Rocky Mountains, was extirpated due to indiscriminant pesticide (DDT) use. In addition, the species declined precipitously in many other parts of its range (Coffin and Pfanmuller 1988).

Following this, extensive efforts to re-establish peregrine falcon populations were initiated in the United States in the 1980's. For example, the Midwest Peregrine Project hacked and subsequently released about 40 fledgling falcons near Kellogg, Minnesota, between 1982 and 1985. This effort resulted in a number of unsuccessful nesting attempts between 1986 and 1988 along the Mississippi River. At that time, the project switched focus to the North Shore of Lake Superior and urban areas.



Peregrine falcon
The Raptor Center

Restoration of the falcons to the Mississippi River bluffs became successful following the addition of nest boxes on power plants along the river in 1989. By 1990, a nest box at the NSP King Plant near Stillwater was being used by a pair of peregrines and later, as power plants in the bluff country put the boxes on their stacks, the peregrines eventually returned to the Mississippi River valley in the Winona area.

The first pair of falcons to return to Queen's Bluff fledged one male chick in 2000. Since then, peregrines have returned to the area every spring. The following is a summary of recent falcon nesting activity on Queen's Bluff:

In 2000, a two-year old male, hacked from a cliff at Effigy Mounds National Monument, Iowa, paired with a two-year old female, hacked from Mason City, Iowa. One male chick was fledged successfully (Pfister 2000).

In 2001, the same pair returned and nested again. No chicks were fledged (Tordoff et al. 2001).

In 2002, a new pair, consisting of a 2-year old male who fledged in 2000 at the Dairyland Cooperative, Genoa, Wisconsin and an unidentified banded one-year old female nested and fledged 3 young, two males and one female (Tordoff et al. 2002).

In 2003, an unidentified pair of peregrines nested and fledged four young---three females and one male (Tordoff 2003).

Management considerations for peregrine falcons in the park are outlined in the peregrine falcon site management plan for Great River Bluffs State Park. Since that plan was adopted prior to the re-establishment of peregrines in the Mississippi River valley, it should be revisited and revised as necessary. The Raptor Center publishes an annual report on the peregrines of Minnesota.

Timber Rattlesnake (state threatened)

(Crotalus horridus)

History & Discussion: The timber rattlesnake is restricted primarily to the east-central United States and portions of southern New England. On the northwestern periphery of its range, a small finger extends northward along the Mississippi River into northeastern Iowa, southeastern Minnesota and southwestern Wisconsin. In Minnesota, the rattler is restricted entirely to eight southeastern and east-central counties that border the Mississippi River where its distribution is spotty and localized (Coffin and Pfannmuller 1988).

The first study of the distribution and status of the timber rattlesnake in Great River Bluffs State Park was initiated in 1990 by Drs. Daniel Keyler and Barney Oldfield. Results of the two-year study showed that the park contained the largest viable timber rattlesnake population on state-owned land in Minnesota, most likely due to the abundance of favorable habitat (Keyler & Oldfield 1992). During that survey, 85 snakes were found within the park in 185.5 field hours. In contrast, a 1998 survey of this species on its peripheral range in Minnesota indicated that it was nearly extinct in Goodhue, Olmsted and Wabasha Counties (Fuller 2000).

However, periodic surveys in Great River Bluffs State Park since the early 1990s have documented a substantial decline in observed snakes (approximately 90%). The most recent survey conducted by Keyler and Oldfield (June 2003) resulted in only four snakes after an intensive search of 108 field hours (Keyler & Oldfield 2003). Correlated with this, there has been substantial evidence of den disturbance on Queen's Bluff during the same time period including vegetation destruction, dislodged rocks and broken rattles. In 1992, for example, individuals were observed on the bluff and later admitted to having taken four marked timber rattlesnakes from the site. Other possibilities for this decline including natural population cycles, loss of habitat, snake predation by other animals and natural diseases are thought to be insignificant at this point in time. Destructive human activities appear to be the primary threat to the timber rattlesnakes at Great River Bluffs State Park.

Recovery of the timber rattlesnake populations at Great River Bluffs State Park will take many years and a concerted effort on the part of the Department of Natural Resources to exclude humans who intend to further damage this rare resource. Critical actions include the signing and patrol of restricted areas (initiated in 2002) and continued field surveys by experienced individuals. Other suggested actions include the avoidance of resource management activities during spring emergence and late summer/early fall birthing, careful consideration of all new park development (vis-à-vis snake habitat), and the development of educational materials for park visitors and local communities that include information

about the importance and rarity of this species.



Timber Rattlesnake, photo courtesy of Keyler & Oldfield '03

Ottoe Skipper Butterfly (state threatened)
(*Hesperia ottoe*)

The Ottoe skipper has an extensive range throughout the central North American grassland biome, from southern Michigan west to eastern Montana and Colorado, south to northern Texas. The skipper is strongly local and generally uncommon to rare throughout its range. The Ottoe skipper occurs in the southern one-fourth of Minnesota, where it has been collected from ten sites in eight counties since its discovery in 1965 (Coffman and Pfannmuller 1988). In Great River Bluffs State Park, the Ottoe skipper has been documented from the bluff prairie at King's Bluff and may well occur on similar habitat at Queen's Bluff and elsewhere in the park. This species was not targeted during the MCBS animal surveys in 1993. Additional surveys for this species are warranted.

The following management recommendations are based on discussions with Robert Dana about this species at the park (as cited in MN DNR 1996). Maintenance of open, native prairies and elimination of invasive nonnative grasses is important for the Ottoe skipper. Larval forms are closely associated with bunchgrasses, such as little bluestem, whose dense cluster of erect blades and mass of persistent basal material provide important shelter and food for developing or overwintering larvae. Disturbed upland grasslands, such as the old fields in the park, are not suitable as habitat for Ottoe skippers.

Prescribed burning in early spring or late fall plus the removal of encroaching shrubs is the most effective means of maintaining the open character of the bluff prairies at the park. In addition, the division of the prairies into several management units that are burned in rotation would ensure that part of the population remains unexposed to fire during any given year. Early spring burns appear to impact Ottoe skippers less than fall burns. During spring, cooler soil temperatures and higher soil moisture buffer the impact of fire on the larvae that overwinter in the basal mass of the grasses. However, fuel levels should be low at the time of burning. Burns made in situations of high fuel levels have resulted in nearly total mortality of larvae, despite favorable soil temperature and moisture levels. Manual removal of excess woody debris or litter and frequent burn rotations can reduce the intensity of the burns. These same management practices are also beneficial to the rare snakes that inhabit the bluff prairies.

Bell's vireo (Not currently listed)

(*Vireo bellii*)

Bell's vireo's current range includes parts of the central United States south to the gulf coast of Texas and west to eastern California. It has been considered for federal listing due to its uncommon nature. In Minnesota, the species is a rare summer resident in Minnesota. Bell's vireo was found in three locations in the park in the early 1990s by MCBS ecologists, all of which were located at the brushy edges of the extensive old fields north and northeast of the contact station. This edge habitat is fairly typical for Bell's vireos. Elsewhere in southeastern Minnesota, they have been found in wetter habitats, such as open shrub swamps. Great River Bluffs State Park was the only place where Bell's vireos were found during the 1993 surveys of Houston and Winona counties. However, this species is regularly found at Kellogg-Weaver Dunes SNA and at McCarthy Lake WMA, in southeastern Wabasha County. Surveys for this species should continue.

Racer Snake (state special concern)

(*Coluber constrictor*)

Racers are known to occur in the park and typically occupy grasslands and bluff prairies.

Gopher Snake (state special concern)

(*Pituophis catenifer*)

Gopher snakes are also known to occur in the park and have been documented in both Winona and Houston Counties. This species occupies grasslands and bluff prairies.

Milk Snake (not currently listed)

(*Lampropeltis triangulum*)

This species has been noted increasingly in Winona and Houston Counties. It is usually found in rock outcrops on bluff prairies and in quarries, but also is known to occur in pastures, woodlots and other grasslands. During the MCBS surveys of Great River Bluffs State Park, one milk snake was captured as it crossed a railroad track along the eastern border of the park.

Water Resources

Surface Water - Major rivers in the Blufflands area include the Mississippi (which forms the eastern boundary), the Root River, the Whitewater River, the Zumbro River, and the Cannon River. The area is known for its numerous coldwater trout streams as well. There are no lakes in this subsection

Water quality remains an issue in both the major rivers and the trout streams due to a variety of factors including soil erosion and chemical use (fertilizers and pesticides).

Ground Water - The drainage network in the Blufflands subsection is well developed and dendritic in nature. Groundwater quality is a major concern due to high amounts of nitrates and phosphates. These pollutants are mainly the result of agricultural activities. Sinkholes are common in the southwest portion of the subsection.

Of significance to the park, groundwater seepages are common and create the cool, moist environments that are essential to a variety of plant and animal species that inhabit it.

Maintenance of these hydrologic cycles is critical to the preservation of the park's sensitive natural communities and species.

Natural Resource Management Recommendations

Recommendation: Maintain the natural diversity of plant communities and animal species in the park by continuing activities such as prescribed burning and problem species control.

Recommendation: Restore selected old fields to native vegetation where possible while maintaining the Henslow's sparrow population in the park

Recommendation: Continue to minimize human interference with rattlesnake areas through actions such as the use of signs and patrols

Recommendation: Continue to use the talents of experienced resource professionals to monitor the park's snake population periodically.

Recommendation: Continue habitat enhancement efforts for the timber rattlesnake.

Recommendation: When managing the park's prairies, avoid spring rattlesnake emergence and late summer/early fall birthing.

Recommendation: Retain (non-paved) gravel roads beyond Visitor Center to reduce potential for snake mortality and to encourage compliance with reduced speeds on park roads.

Recommendation: Maintain and restore grasslands in the park that provide suitable habitat for Henslow's sparrows. Expand grassland habitat as appropriate.

Recommendation: Care should be taken so that the nesting activities of the Henslow's are not disturbed unnecessarily between mid-May and mid-August.

Recommendation: Continue research and monitoring of the Henslow sparrow population(s) in the park.

Recommendation: Follow the existing site management plan for the Queen's bluff peregrine aerie, specifically:

Monitor and enforce restrictions on visitor use of the blufftop during the critical periods of falcon activity (March through May 1 and May 15 through July 15). Note: Currently the SNA program and/or Park Manager issues permits to enter the Queen's Bluff portion of the SNA; no permits will be issued to the public between February 1 and September 1.

Maintain restricted access signs at both ends of the former trail to the Queen's bluff portion of the SNA.

No vehicle traffic should be allowed on the road leading to the former Boy Scout cabins

Monitor peregrine activity when managing blufftop prairies and adapt as needed to prevent interference with nesting and foraging activities (relocate or postpone, for example)

Cooperate with The Raptor Center and other partners with the annual monitoring of the aerie

Develop interpretive materials for park visitors on the aerie and the Midwest Peregrine Falcon Restoration Project

Recommendation: Continue to use on-the-ground resource management techniques such as prescribed burning to manage rare natural communities and hence maintain their respective rare plant species as well.

Recommendation: Continue to monitor rare plant populations.

Recommendation: Where facilities intersect with rare species habitat, establish a system of species monitoring that will ensure rare species and habitats exhibit continued or improved vigor and growth.

Recommendation: Establish a park resource advisory committee that consists of State Park and other blufflands resource specialists, academic researchers, and citizens to provide input and assistance with resource management efforts, and to facilitate research project coordination.

IV. CULTURAL RESOURCES

Archaeological and Historical Setting

Human occupation of the blufflands in Minnesota is thought to have begun approximately 8,000 years ago, after the last glaciers retreated from the area. By 1,000 B.C. to 1,000 A.D. the Woodland cultures, distinguished by their pottery and burial mounds, lived in the Mississippi River Valley. During the next 800 years, Mississippian groups lived in large villages and raised corn, beans, squash and tobacco on the terraces above the river.

By about 1800, the Mdewakanton and Wahpekute branch ancestors of the present-day Dakota people were living in the area. Led by Chief Wapasha, they established summer camps along the Mississippi River near the present site of Winona. The Dakota were dependent on the natural resources of the area and moved seasonally in order to procure food, shelter and clothing. Seasonal activities included maple syruping; hunting and trapping; planting and harvesting corn; harvesting wild berries, nuts and other edible plants; and wild ricing, for example. In general, the Dakota people did not have an enormous influence on the land itself, since their activities were seasonal and sustainable in nature.

By the 1850s, active European settlement began in the Mississippi River valley. European settlers rapidly expanded into the area and brought with them different practices of resource utilization. Farmers shifted from initially growing wheat to raising livestock and growing corn. In addition, timber was harvested in much larger quantities and shipped downriver to other growing Midwestern communities. Many hillsides were cultivated or grazed, leading to erosion and flooding events. By the late 1900's, new farming practices such as crop rotation, contour tillage, strip cropping and terracing became more commonplace on many farms to reduce soil erosion and to protect water quality.

Identified cultural resource sites in the park area include:

Archaic Tradition: LeMoille Rock Shelter (8000 BP – 2500 BP)

The remains of this site are located at the south end of LaMoille. In 1939, archaeologists at the University of Minnesota excavated the site and habitation remains were recovered from the lower levels. Later, the site was impacted by the construction of T.H. 61.

Archaic Tradition: Voight Site

This site is located on sloping terraces of the Mississippi River two miles north of the City of LaCrescent. The site includes habitation and human burial remains.

Early Woodland Tradition: LaMoille Rock Shelter (2500 BP – 1700 BP)

Evidence of the early Woodland cultures includes a ceramic vessel recovered by the University of Minnesota in 1939. This artifact is significant because it is the oldest identified ceramic in Minnesota and shows links to ceramics in Illinois and Ohio suggesting that ceramic making came into northeast Iowa, southwest Wisconsin and southeast Minnesota from the area to the south and east.

Post – Early Woodland Tradition: Effigy Mounds (1700 BP – 350 BP)

During this period, sites, including burial mounds, become more frequent in southeastern Minnesota. Approximately 120 mounds and several effigy mounds are located in Winona County, for example. The effigy mounds are attributed to both the Middle and Late Woodland periods and may represent remains of Oneota peoples reliant on maize horticulture and hunting and gathering. This Oneota culture may have continued on in time to become the historic Ioway and Chiwere Siouan populations. One recently re-identified mound site in the park, first found in the 1880s, is near the current picnic area.

Oneota Tradition Sites: (1000 BP – 350 BP)

The Oneota Tradition is a regional cultural tradition (Minnesota, Wisconsin, Iowa) that appears to

have developed within indigenous Woodland peoples, possibly through contact with and adaptation of nearby Mississippian culture. This culture is defined by increased reliance on maize horticulture, more permanent habitation, and burials as mounds and as larger cemeteries. Sites include evidence of this tradition includes fortified sites in Houston County and trade materials of French and European continent origin.

Mississippian Tradition Sites: (1000 BP – 350 BP)

The Mississippian Tradition spread northward along the Mississippi River valley and its major tributaries. This culture is characterized by having had large villages, many of them fortified, adjacent large mound cemeteries and a sedentary lifestyle. Significant amounts of trade goods in sites further to the south indicate that this culture had contact with French traders.

Note: The original earthwork surveys conducted by T. H. Lewis in the 1800's located four mound groups within or near the boundaries of the park, and several more adjacent to the park. The sites are referenced by Winchell (1911) and Curtis-Wedge's History of Winona County (1913). It is unknown whether these mounds still exist. Three additional precontact lithic sites have been recorded along the eastern edge of the park.

Cultural Resource Management Recommendations

Recommendation: Complete a systematic inventory of the park's cultural resources. At a minimum, conduct surveys for cultural resources prior to the development of park trails and other facilities.

V. INTERPRETIVE SERVICES

Introduction

DNR Division of Parks and Recreation, as part of its core mission, seeks to increase public understanding, appreciation and enjoyment of natural and cultural resources in Minnesota's state parks. It does this by providing interpretive services that focus on each park's unique story and resources. State park interpretation also focuses on visitor and resource management in order to help protect park resources. By working with other DNR divisions, educational institutions and local communities, interpreters increase their effectiveness in providing outdoor education and recreation. The result of interpretation in a local state park area can increase public awareness of critical environmental issues on a much greater scale. State Park Interpretive Services can thus provide significant recreational and natural resource based educational experiences that influence peoples' understanding and behavior in such a way that they themselves become stewards of Minnesota's cultural and ecological treasures.

Division of Parks Interpretive Services Goals

The DNR Division of Parks and Recreation views interpretation as a site specific, DNR sponsored, communication process using recreational and environmental experiences to reveal the meanings and relationships of our natural and cultural heritage. To fulfill the DNR's legislated obligation to provide environmental education and interpretation in state parks, the DNR Division of Parks and Recreation's interpretive programs aim at four goals:

- To promote increased understanding, appreciation and enjoyment of natural and cultural resources in Minnesota;
- To assist in protecting each state park's resources;
- To promote public understanding of, 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, worldwide scope.

The DNR Division of Parks and Recreation Mission Statement for Interpretive Services 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.

Goals for Interpretive Services at Great River Bluffs State Park

The Citizens Advisory Committee recommended the following goals for interpretation in Great River Bluffs State Park:

To create a deeper understanding and discovery of self and place in order that future generations can enjoy and appreciate the beauty that the park offers.

To foster environmental stewardship at a personal and community level.

To foster collaborations with higher education facilities including universities and adult education providers.

To provide blufflands research and learning opportunities in and around the park.

To feature education specific to the blufflands of the Upper Mississippi River Valley (as opposed to general environmental classes).

To provide on-site educational opportunities and facilities that have low impacts to the surrounding natural environment.

Interpretive Themes

Sample interpretive themes developed during the planning process include:

Great River Bluffs State Park preserves a diversity of high quality natural communities including bedrock bluff prairies, dry and mesic oak forests, maple-basswood forests, dry and moist cliff habitats and white cedar.

Great River Bluffs State Park is home to a variety of special status wildlife species including timber rattlesnakes, Henslow sparrows and peregrine falcons.

The size & complexity of high quality natural communities in the park, along with its high concentration of rare species, makes Great River Bluffs State Park one of the highest biodiversity sites in Winona County.

Despite its grandeur and seeming invulnerability, the blufflands are fragile and easily changed by natural and human forces.

Long-term planning and cutting edge science is needed to manage and preserve bluffland resources.

Because more than 90 percent of the blufflands are privately owned, private landowners play a significant role in maintaining the blufflands' unique resources.

There are many tools to protect bluffland resources including: conservation easements, conservancy districts, performance standards, property tax credits, land stewardships, sensitive developments, community planning and land trusts.

Existing Interpretive Services

Current interpretive services in Great River Bluff State Park include 2.5 miles of self-guiding hiking trails. There are no naturalists on staff at Great River Bluffs State Park.

Interpretive Services Recommendations

Recommendation: Support creation of a natural resource specialist/interpretive position to provide coordination of natural resource management activities and public information and education for Great River Bluffs State Park and/or the Blufflands Parks.

Discussion: According the Minnesota State Park System Interpretive Services Plan, Great River Bluffs State Park falls into Interpretive Services Group 3. Parks in this category typically have medium-to-high resource significance and high visitor use with seasonal peaks. Parks in this category generally merit programming 4 to 7 days a week during the peak season, a seasonal interpretive center, indoor displays/exhibits, audio-visual programming, self-guided trails and wayside exhibits. However, the specific plan for Great River Bluffs State Park deviates from these guidelines and recommends upgraded and

increased nonpersonal efforts (self-guiding trails and exhibits) and occasional programming from nearby Whitewater State Park or by a newly created Blufflands area naturalist (MN DNR 1995).

Despite this, the Citizens Advisory Committee for Great River Bluffs strongly recommended that a seasonal naturalist should be based at the park. This person could provide visitors and the community with information and education about the park, the blufflands ecosystem and the unique elements contained there. This position could be combined with a (new) blufflands area resource management specialist position.

Recommendation: In lieu of a new interpretive/resource position, nonpersonal interpretive services at the park should be upgraded and expanded to include the development of:

Educational materials for park visitors and local communities that includes information about the importance and rarity of timber rattlesnakes.

Interpretive information about the significance of Henslow's sparrows for park visitors.

Interpretive materials for park visitors about the peregrine falcon aerie and the Midwest Peregrine Falcon Restoration Project.

Interpretive materials in cooperation with the Mississippi River Parkway Commission to more actively engage Great River Road Byway travelers, attracting them to the park, telling the story of the park and fostering stewardship of the area's resources.

Discussion: Nonpersonal interpretive services such as self-guided trails; wayside signs and exhibits; and brochures and booklets can help visitors learn about the park on their own time and at their own pace. The park should consider developing interpretive signs or kiosks at the major parking lots and trailheads. Information could also be provided at the various vistas and overlooks. Moreover, interpretive information on the park's significant natural resources will help visitors understand why the park has chosen to remain relatively undeveloped. For example, visitors should be able to understand why the park has chosen to retain gravel roads (instead of asphalt) if they are provided with information on rattlesnake habits.

Interpretive services should be sensitive to the potential impacts of programming on fragile park resources. Ideally, the seasonal naturalist should be able to limit the effects that visitors have on the sensitive communities in the park by designing low impact educational and recreational experiences. Large school groups and introductory bluffland programs should be accommodated through cooperative programming with neighboring bluffland facilities that are less fragile.

VI. RECREATIONAL USE AND VISITOR SERVICES

Introduction

Providing a spectrum of recreational opportunities is central to the mission of the DNR Division of Parks and Recreation. A major portion of the park planning process is to define what type of recreational opportunities people want to have and then to evaluate whether these desired opportunities are appropriate for the park, given its natural setting and what is already available in the surrounding community.

Access

State and local governments may not discriminate on the basis of disability (Americans With Disabilities Act of 1990 and 28 CFR Part 36). Access must be provided to park services, programs, and activities. All services, when viewed in their entirety, must be useable by individuals with disabilities. This includes facilities such as parking, pedestrian access routes, restrooms, drinking water and recreation facilities. Pedestrian access routes are a continuous unobstructed path that connects accessible elements within a picnic area, camping area, or designated trailhead, such as the paths connecting parking spaces to a picnic or camp unit, a picnic unit to a toilet building, or connecting accessible picnic tables to other accessible camping elements.

The Americans with Disabilities Act (ADA) provides guidance for accommodating the natural environment's variable character when providing accessibility. ADA delineates modifications and exceptions that can be applied when necessary to maintain the integrity of an outdoor recreation setting, accommodating such elements as hydrology, terrain, surface characteristics and vegetation. Information regarding accessibility will be available in brochures and on the DNR website to guide visitor expectations.

Visitor Expectations: The 2001 Minnesota State Park Visitor Survey

What we know about State Park visitors in general is that when people visit state parks they want to attain experiences that add value to their lives. The experiences visitors seek are to enjoy nature, to escape the pressures of daily life, to bond with family and friends, to learn and to explore new things and to get some exercise. The activities that appear to be most important to them include hiking, sightseeing, and nature observation. In addition, learning-related activities are an important part of their experiences.

Visitors generally support management actions that support the park system's core mission including expanding opportunities for wildlife viewing, quiet & solitude, hiking, education and interpretation. At the same time, visitors do not support expanding development in state parks if it degrades the remaining natural and cultural resources.

Who the Visitors Are:

Visitors to Minnesota State Parks come from all parts of the state, from all age classes, genders and socioeconomic levels. However, we also know that state parks are visited less frequently by people of color and are visited more frequently by middle-aged adults and children. The majority of state park visitors are college-educated and are from middle-income economic groups.

Attendance and Type of Use:

Although annual attendance at Minnesota State Parks varies depending on the seasonal availability of camping and the weather, attendance is increasing gradually overall. This trend is likely to continue in the future.

Throughout the Minnesota State Park system, the majority of the use is due to day users (89%). Campers make up just 11% of the overall park use.

Existing Recreation Resources and Facilities

Day Use & Trail Recreation

Great River Bluffs State Park currently offers a picnic area with 12 individual picnic sites and a variety of trail opportunities. During the summer season, the park offers 2.5 miles of self-guided interpretive trails and 6.5 miles of trails with scenic overlooks of the Mississippi River Valley. During the winter season, the park offers 9.2 miles of groomed cross-country ski trails, 1 mile of skate-skiing trail, a winter sliding hill and the opportunity to snowshoe anywhere in the park where terrain permits. (See Figure 10: Existing Summer Recreation and Figure 11: Existing Winter Recreation).

Camping

Great River Bluffs State Park offers a traditional single loop campground with 31 sites, including a modern sanitation building that is open year 'round. Each site has the typical state park amenities including a picnic table and fire ring. Two sites are handicapped accessible; all sites are non-electric.

In addition, the park offers a 5-site bicycle campground that is accessed just off of southbound U.S. Highway 61/14 at mile marker 12. This campground was built to serve cyclists riding along the Great River Road bicycle route.

Group Camp

The park's group camp is available for organized groups of up to 80 people (scouts, church groups, etc.) who wish to camp. A council ring and water is available.

Contact Station/Park Office

The park currently uses a former residence as the park office. Immediately behind the office is the park's shop and maintenance area. Most visitor contacts are made at a small contact station located near the entrance of the park.

Picnic Shelter/Visitor Center

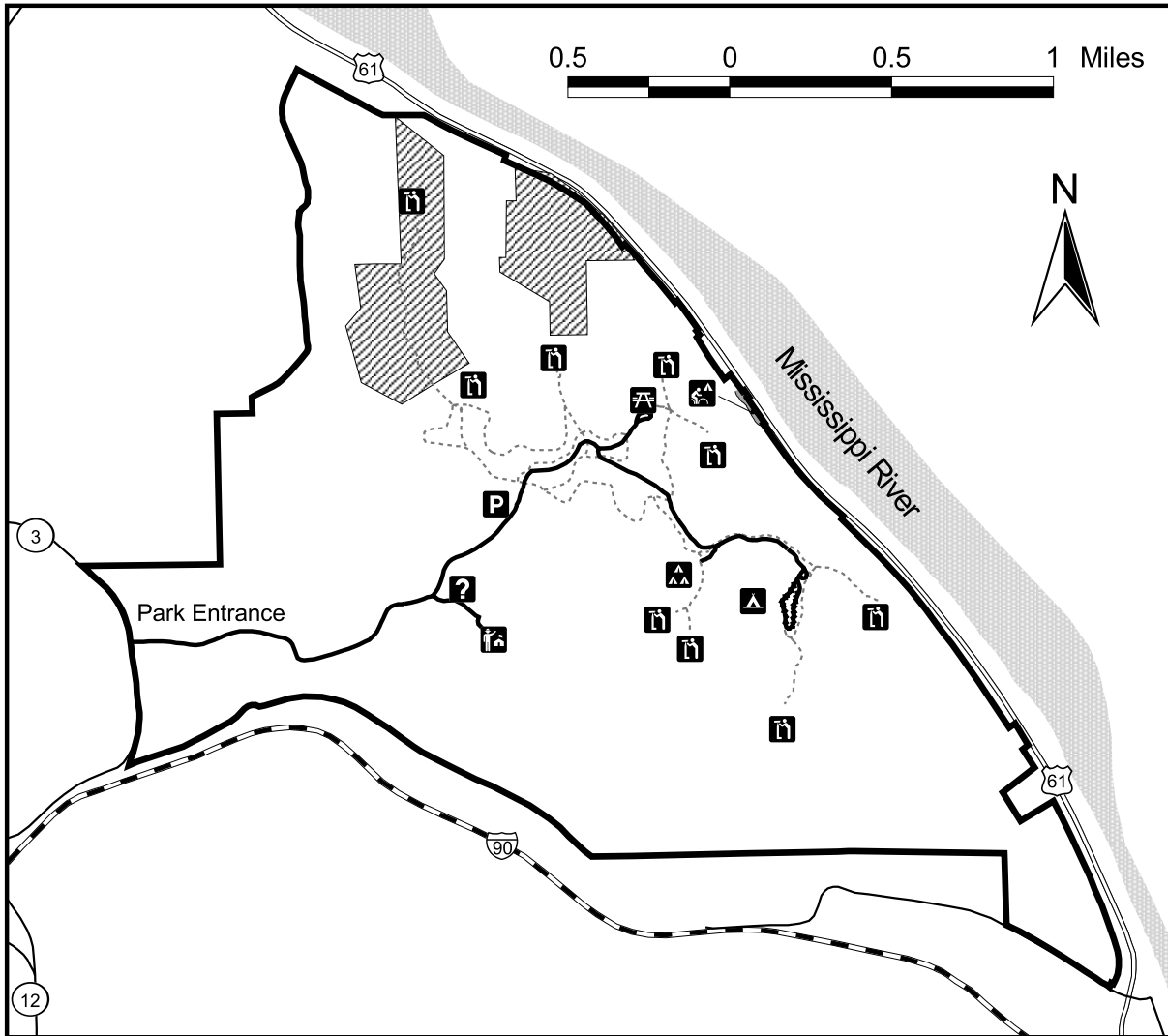
The park currently does not have a picnic shelter or visitor center.

Attendance

Year	1984	1987	1989	1990	1991	1995	1997	1998	1999	2000	2001	2002	2004
Total Attendance In 1,000's	18.7	26.1	20.8	27.5	29.4	28.4	16.3	17.0	19.3	25.0	29.0	29.4	28.4

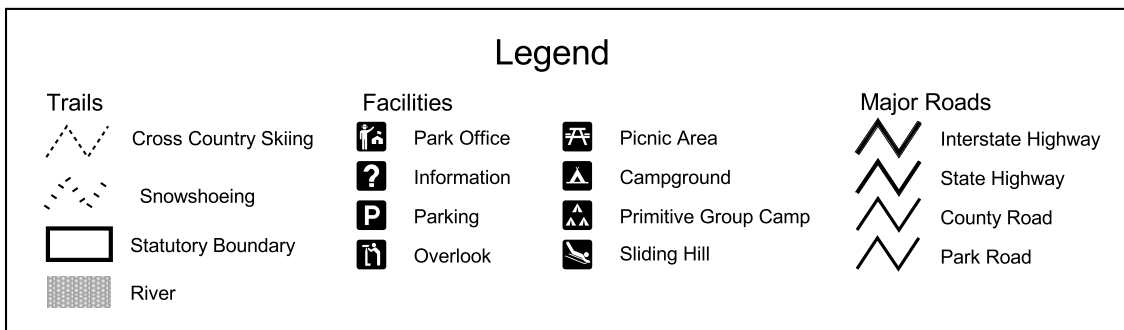
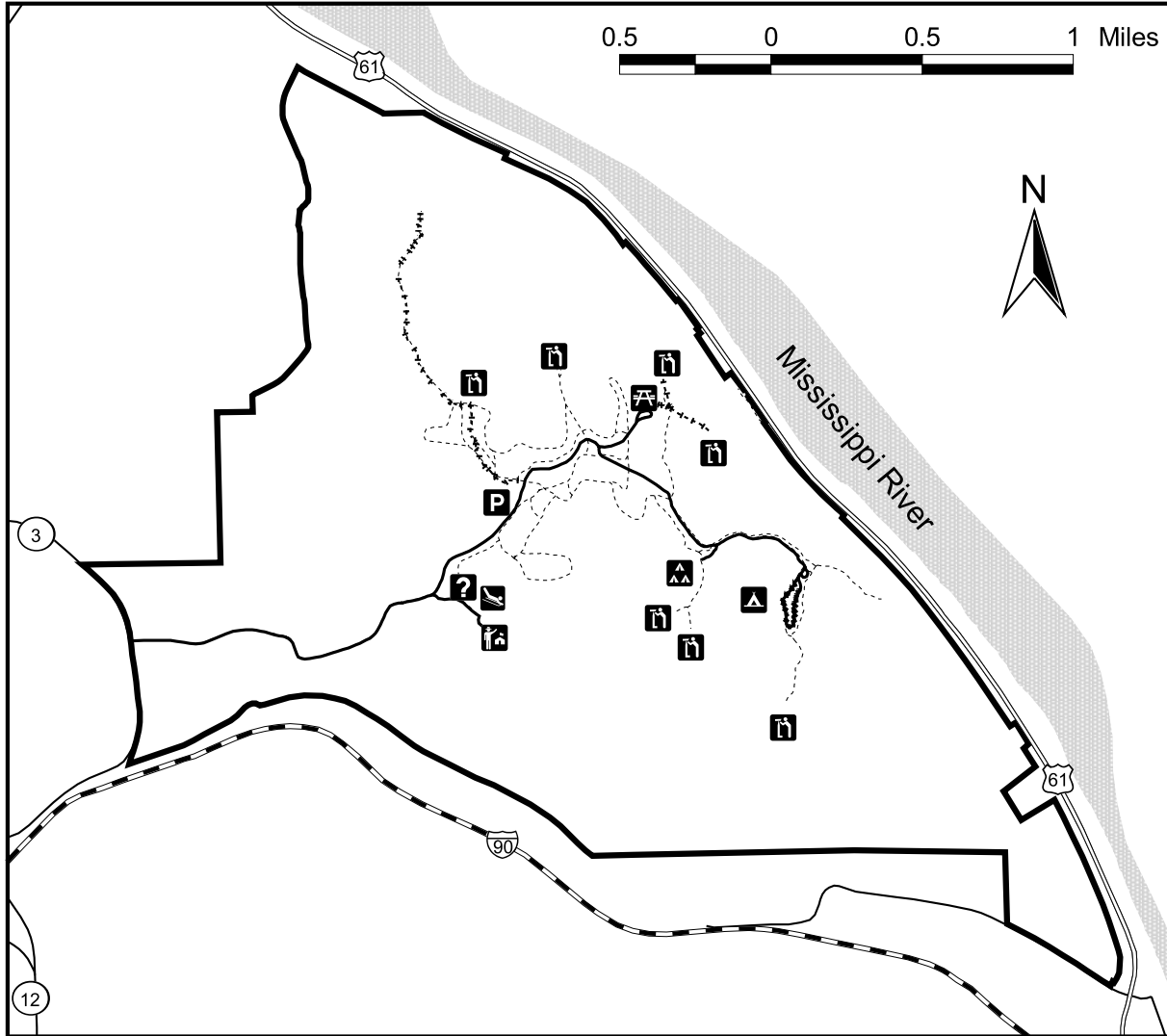
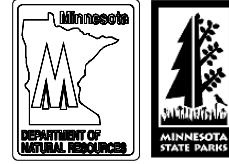
Great River Bluffs State Park

Figure 10: Existing Summer Recreation



Great River Bluffs State Park

Figure 11: Existing Winter Recreation



Recreational Use and Visitor Services Recommendations

General Discussion: The current level of park development is generally acceptable to the citizen's group. Although some citizen members would like to see an increase in number of users, others express concern that any increase in use numbers could be detrimental to rare species survivability. All members support increased efforts to inform park users about the significance of parklands and park elements within the blufflands community. The following statements represent citizen opinions on Great River Bluffs State Park facility and recreation topics.

Trails

Recommendation: The current trail use types are acceptable (hiking, snowshoeing, cross-country skiing). Visitors should continue to expect limited human contact on the trails in order to bird, photograph, and hike in relative solitude. Current trails may be narrowed to minimize the footprint in the park landscape. However, maintain appropriate width for 2-way cross-country skiing traffic, or make sure ski loops are one-way.

Recommendation: Trail and overlook opportunities for persons with disabilities should be provided where feasible.

Recommendation: Design and develop new trails in the park only after assessing potential impact(s) to natural and cultural resources.

Recommendation: Encourage partnering with neighboring outdoor recreation providers to disperse higher impact uses across the region, and upon less fragile areas.

Discussion: As summarized in the Regional Analysis, there are several other recreation providers in the vicinity of Great River Bluffs State Park, including those in the state of Wisconsin. Large school groups, for example, might be better accommodated at facilities with less fragile natural resources.

Campgrounds

Recommendation: Maintain the current campground's location and size, limiting the number of vehicles per site to one. Consider reducing camping to tent only camping with parking spurs limited to one car length.

Discussion: Most visitors to Great River Bluffs prefer a quiet, relatively undeveloped camping experience. Opportunities for camping with the amenities that large recreational vehicles require (such as electricity) already exist in the local area in private campgrounds. For visitors who wish a nearby Minnesota State Park experience, both Forestville/Mystery Cave State Park and Whitewater State Park offer more campground amenities.

Recommendation: Retain (non-paved) gravel roads beyond Visitor Center to reduce potential for snake mortality and to encourage compliance with reduced speeds on park roads.

Discussion: Provide information for park visitors explaining this decision, and the benefit it provides to visitors and to wildlife.

Recommendation: Maintain the existing "park road" character in any redesign of the entrance road to the park.

Discussion: If an improved surface is needed for the park entrance road, consider an alternative to asphalt.

Recommendation: Maintain existing bicycle campground, providing information to users about the park,

including access options and natural resource communities.

Discussion: Include information at the campground and at the park office about the Great River Interstate Trail and the proposed Mississippi River Trail. (See Figure 12: Soil Suitability for Trails).

Contact Station/Visitor Center

Recommendation: Build a multipurpose facility that will serve as a visitor center, office, and contact station. Locate the facility in a disturbed area along the main park road & overlooking Lake Onalaska (east).

Discussion: This facility should serve as a contact center and as an exhibit area for educating park users about blufflands, and the unique challenges at high quality sites such as GRB. Consider providing a trail from the facility that connects to the existing trail system on King's Bluff. The facility's location, design and landscaping should be a model for blufftop development and should minimize visual impacts.

Picnic Area

Recommendation: In the short-term, retain the existing picnic area. As the red pines are removed on the south side of the picnic area parking lot, expand the picnic area with a traditional open design to provide for the opportunity to play catch, throw Frisbees and to facilitate accessible opportunities.

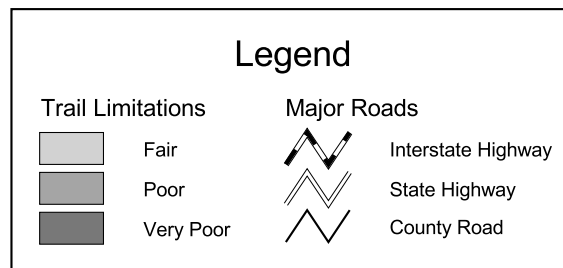
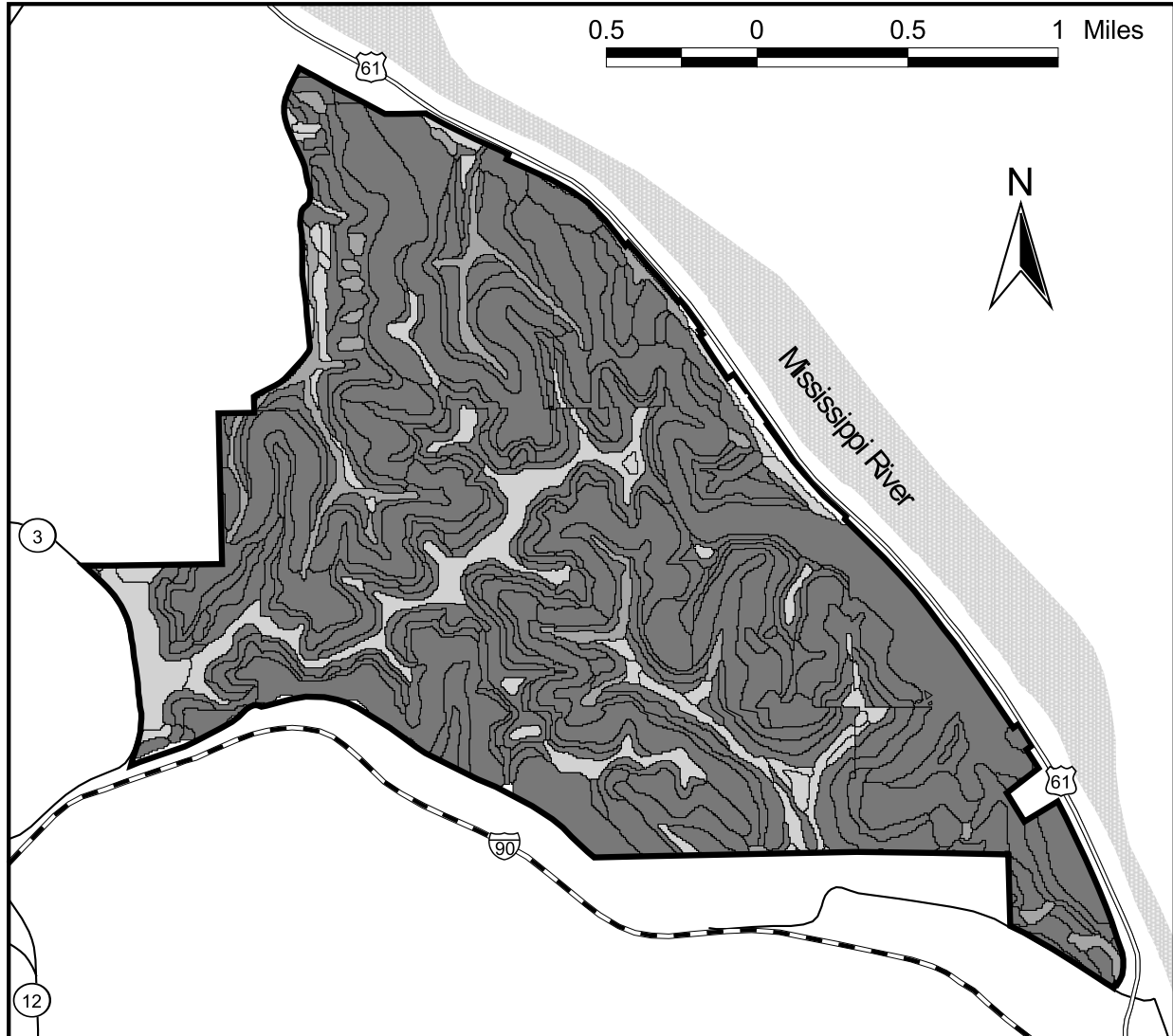
Current Office Area

Recommendation: Remove the current office once a new facility has been located and developed.

Discussion: Priority should be given to minimizing the impact and footprint of the buildings in the park. All new locations for facilities should be assessed for potential impacts to special status species and natural communities.

Great River Bluffs State Park

Figure 12: Soil Suitability for Trails



VII. PARK BOUNDARY

Statutory Boundaries of Minnesota State Parks

The Minnesota State Legislature establishes state park boundaries. A legal park boundary defined in Minnesota Statutes provides staff, citizens and policy makers with a common understanding of which lands are appropriate for inclusion in the park. It is the current policy of state parks to include within a statutory boundary only those lands where the landowner has requested inclusion. The DNR is then authorized to negotiate with willing sellers for acquisition of lands contained within that statutory boundary. Being within a park boundary does not have any impact on the landowner. He or she retains full ownership and rights to the land unless he or she decides to sell to the park.

As a part of the planning process, the citizen advisory group reviews the existing state park land base, and considers what boundary alteration should be considered to ensure that the natural features, recreational and educational opportunities consistent with the park's mission can be provided. This is only a recommendation, and at such time as a boundary modification would be made, the DNR will contact landowners affected and ask for documented support. Local units of government will also be contacted for support.

Land and Water Conservation Fund

Federal funds from the Land and Water Conservation Fund (L&WCF) have been used to acquire land or construct recreational facilities in this park. L&WCF grants have contributed to outdoor recreation throughout the US since 1966. By using these funds, the state has agreed to maintain recreational facilities in a manner that promotes safe use and invites public use, and to retain the land in this park solely for outdoor recreation and related support facilities. If the DNR decides that it is essential that lands that were part of a L&WCF project be used for another purpose, it may be possible to replace those lands with other lands that have at least the same fair market value and provide equivalent recreational opportunities. This conversion can only be done with the approval of the National Park Service (NPS) Regional Director (pursuant to Section 6(f)(3) of the L&WCF Act and 36 CFR Part 59). Conversions are coordinated through the Minnesota State Liaison Officer to the NPS. The NPS Regional Director has authority to approve or disapprove conversion requests and/or to reject proposed property substitutions. The Minnesota State Liaison Officer who administers the L&WCF program should review all actions that would cause a significant change of use or park boundary change.

Existing Park Boundary

Great River Bluffs State Park includes 3,026.66 acres within its statutory boundary. Of that acreage, 2,107.34 acres are administered by the DNR. An additional 241.49 acres is owned by the Minnesota Department of Transportation under a management agreement with the DNR. The remaining 677.83 acres are in private ownership. (See Figure 13: Land Ownership).

Park Boundary Recommendations

Several areas within the existing park statutory boundary have already been developed for residential or other private use. Located primarily along State Highway 61, these areas consist mainly of small, shallow lots with homes. Purchase of these small, developed lots may provide minimal benefit to the state park at a relatively high cost. These parcels should be evaluated to determine if there are natural or cultural resource, recreational or administrative reasons that they should be retained within the park statutory boundary.

The Citizens Advisory Committee spent a significant amount of time discussing boundary issues for Great River Bluffs State Park. Members were very concerned about maintaining the open character of the land surrounding the park. In particular, the CAC was interested in maintaining the natural resources and vistas in the area bounded by Interstate 90, State Highway 61, and Co. 3, including Miller Valley. (See Figure 14: Park Boundary and Viewshed Areas). The CAC was supportive of using a range of conservation tools in working with neighboring property owners including conservation easements, cooperative resource management projects, and expansion of the park statutory boundary for acquiring lands to be added to the state park.

Within the areas described above, the Department will seek to work cooperatively with neighboring landowners to preserve natural resources and viewsheds. Conservation easements, coordinated resource management efforts and other actions will be investigated for achieving Department goals in cooperation with continued private ownership. The Department would focus any acquisition efforts on undeveloped lands and parcels with important natural resource qualities or restoration potential. The Department will seek to avoid or minimize purchase of homes or other development that would increase acquisition costs.

At the time of the planning process (fall 2000), members of the Richmond Township Board of Supervisors stated that the board did not support expansion of the park, citing the possible loss of tax base and funding for road and other township services. The CAC remained supportive of the possibility for a future expansion of the state park to protect the natural resources and viewshed surrounding the park.

Recommendation: Consider park statutory boundary changes to remove homes and other development located on small parcels with no resource, recreation, or administrative value to the state park.

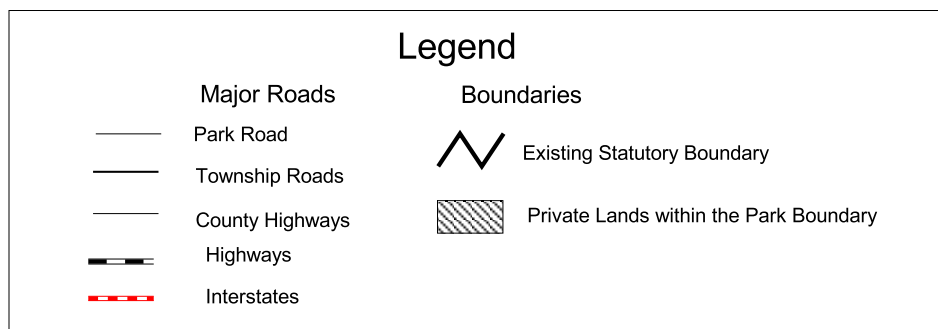
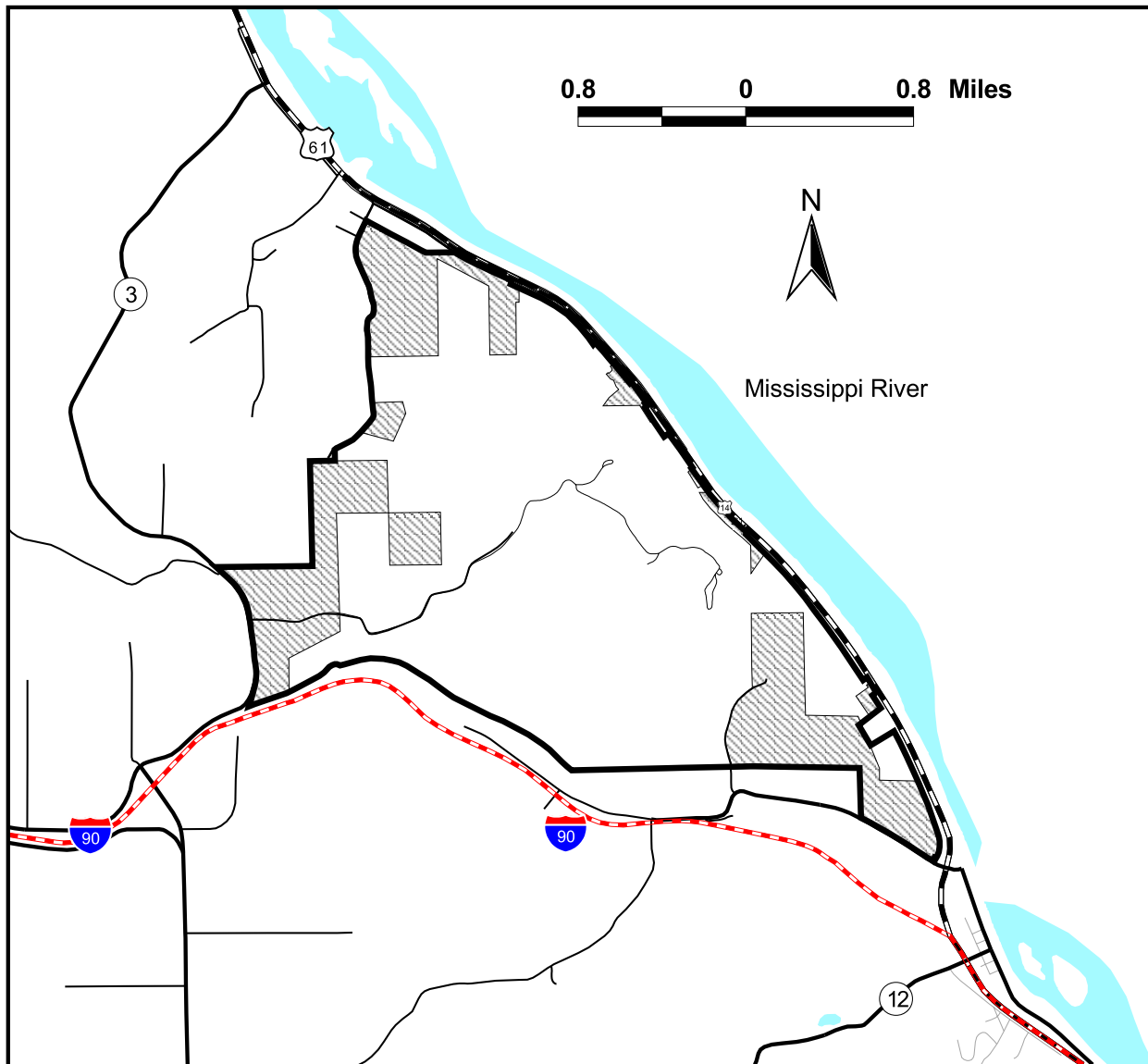
Recommendation: Continue to pursue acquisition of private lands within the existing park statutory boundary that support the state park's mission to protect and perpetuate the diverse natural, scenic, and cultural resources of the bluffland landscape for low impact use, enjoyment and education of park visitors.

Recommendation: Over the long-term, work with park neighbors and local authorities to maintain the natural resources and vistas in the area bounded by highways I-90, State Highway 61, and Winona County Road 3, including Miller's Valley.

Recommendation: Consider park statutory boundary changes and acquisition of parcels within the viewshed protection areas if supported by the property owner. The Department will inform local units of government when a statutory boundary change is proposed.

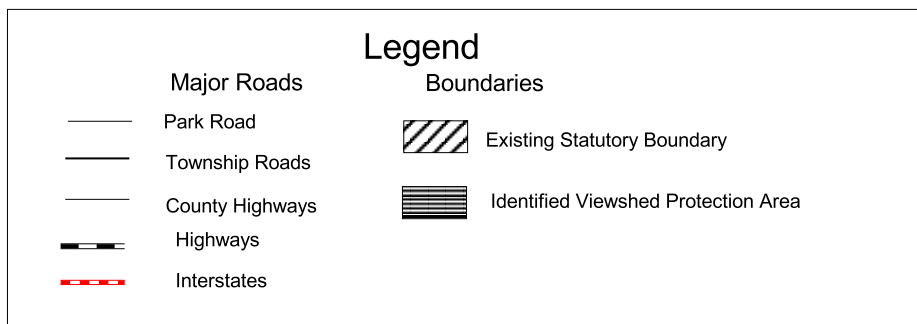
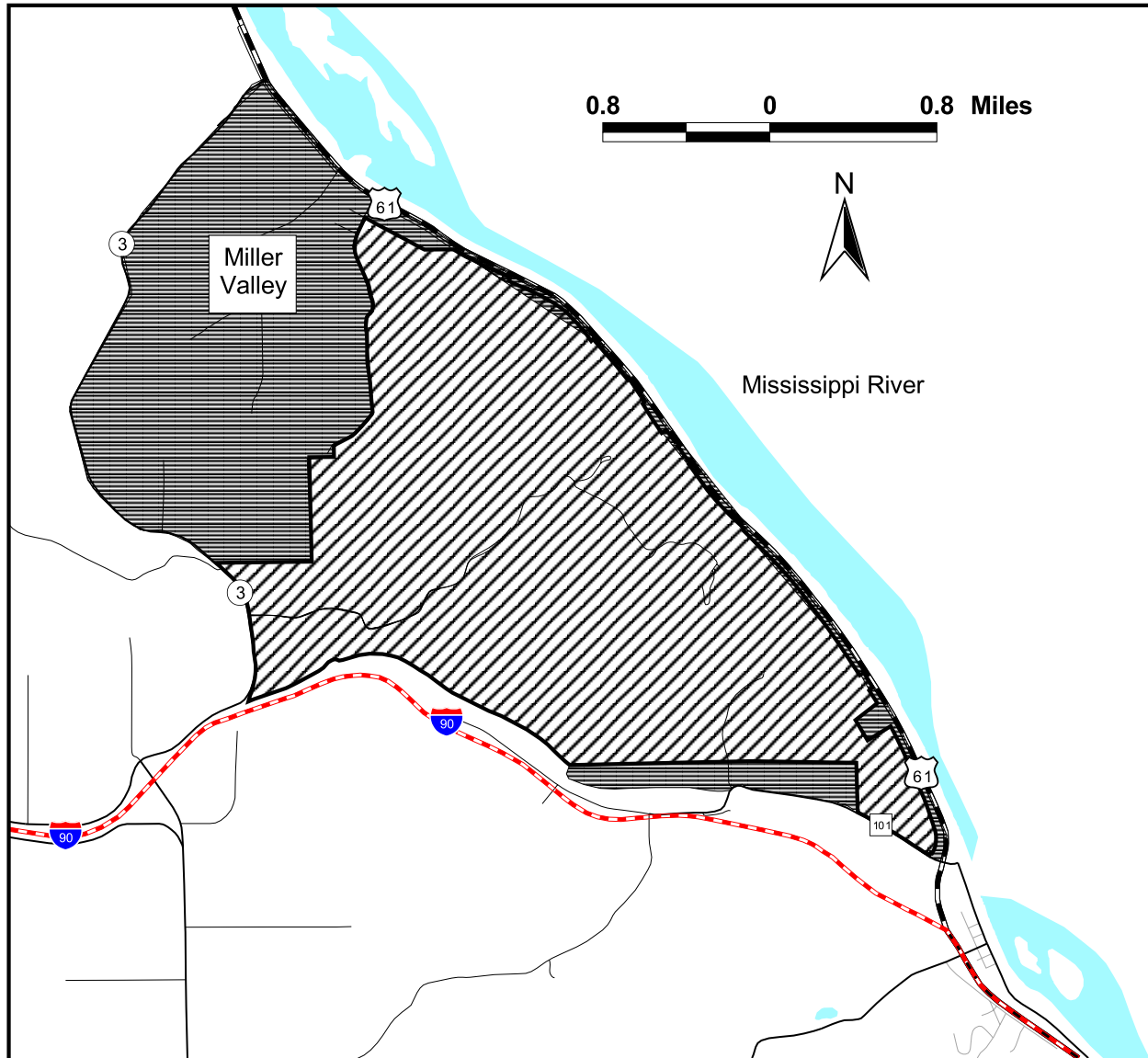
Great River Bluffs State Park

Figure 13: Land Ownership



Great River Bluffs State Park

Figure 14: Park Boundary and Viewshed Areas



VIII. SIGNIFICANT AREAS MAPPING (SAM)

Significant Areas Mapping (SAM) is an integrated approach by which the natural and cultural resources in a park are first identified in terms of their significance and then assessed in terms of their capability to provide opportunities for visitor experiences.

The SAM process has two parts - assessing present conditions and assessing future conditions. In each part there are three steps - identifying significant natural and cultural resources, identifying levels of visitor use and experience, and overlaying the first two steps to assess opportunities and conflicts related to park resources and park visitors. Future conditions are those anticipated at the end of the twenty-year lifetime of the management plan. Visitor use and experience is defined on a park-specific scale of low, medium, and high use based on the number and density of visitors using the area.

The purpose of the SAM process is to help identify areas for improvement in the way the DNR manages how resources and people interact in state parks. It will aid in addressing existing problems as well as in planning to avoid new ones. It also can help point out how to take better advantage of the places where the interaction between people and the resources are positive - through interpretation and education.

With input from the public, the SAM process can lead to a discussion of how to resolve conflicts between resource protection and visitor use - possibly by relocating (or modifying) visitor use, or by monitoring resource impact and defining impact management strategies. Appropriate strategies for managing impacts can be determined using the SAM analysis along with the park's mission as guides. Specific management strategies may include:

- Site management (facility design, site hardening, site closure, vegetation barriers, etc.)
- Rationing and allocation (reservations, queuing, pricing)
- Regulation (the number of people, the location or timing of visitors, visitor behavior)
- Deterrence and enforcement (signs, sanctions)
- Visitor education (interpretation that promotes appropriate behavior or provides information regarding use conditions)

At the time that the Citizen Advisory Committee for Great River Bluffs State Park was meeting, the SAM process was not finalized. Discussions at that time focused on park "zoning". The committee members described the following three zones. (See Figure 15: Significant Areas).

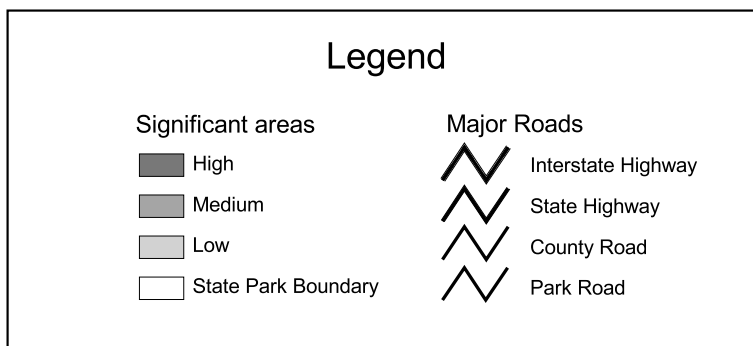
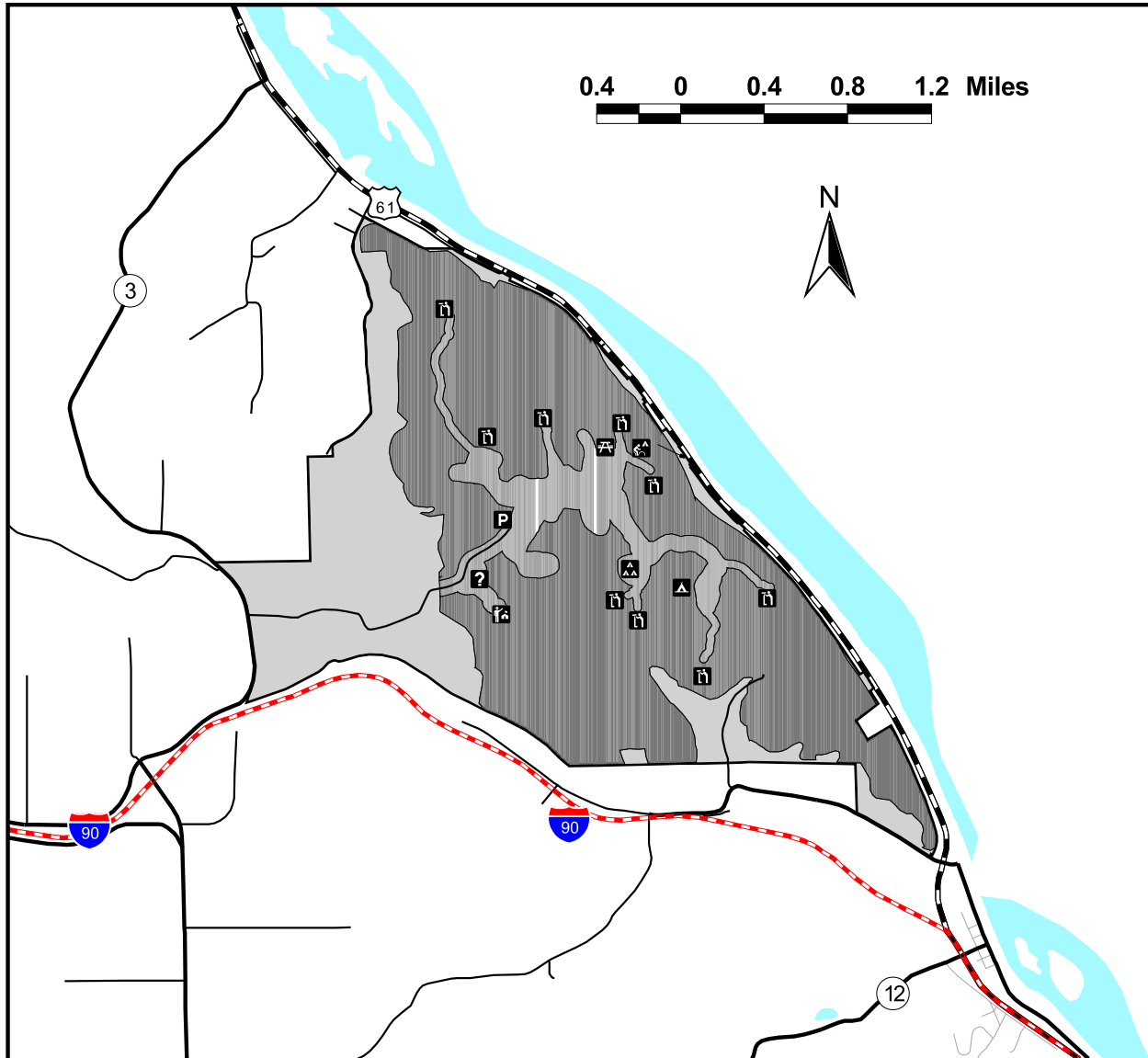
Zone 1: This zone encompasses the majority of the park and includes the King's and Queen's Bluff Scientific and Natural Area, white cedar communities, old growth forest, and habitat for species such as peregrine falcons and timber rattlesnakes. It should be managed as an undisturbed natural environment for the protection and promulgation of these and other indigenous bluffland communities and species. Very limited development will be encouraged in these areas; visitor impacts should be minimized. This zone is generally accessible only by foot on hiking or cross-country ski trails and includes only those structures necessary for the protection, research, and interpretation of the resources. Some areas are currently not open to the public in order to protect sensitive habitat.

Zone 2: This zone currently includes the picnic area, campground, group camp and trail areas in the park. It is accessible by both foot and vehicular traffic. Management for low impact recreation is a priority. Roads should continue to be unpaved and relatively rustic in appearance. The campground should continue as a moderate use facility with consideration given to redesign as a tent only facility. The number of sites in the existing picnic area should be reduced due to its historic lack of use (lower site area to be reclaimed as woods). Moderate signing and interpretation should be continued in order to complement the current visitor use. Consideration will be provided for Henslow's sparrow and timber rattlesnake habitat as recommended.

Zone 3: This zone includes the entrance road, the current contact station and park maintenance facilities. Future plans include the development of a new visitor center, office, and service area. The focus in this area should be to provide information and education to the visitors about the park in general and about its sensitive habitats and species.

Great River Bluffs State Park

Figure 15: Significant Areas



IX. PARK OPERATIONS

Operations Costs and Staffing Issues

Current staffing at Great River Bluffs includes one full-time Park Manager, one part-time Buildings and Grounds worker (April-October), one part-time Parks Worker (April-October), one seasonal Natural Resource Worker (May-August) and one part-time seasonal Buildings and Grounds Worker (60%; May-September).

Enforcement

Until fairly recently, enforcement issues at Great River Bluffs State Park have been minimal. Typically, visitors to the park are interested in low impact recreational activities and relatively quiet experiences. The park enjoys a good working relationship with Winona County enforcement officials as well as with MN DNR Conservation Officers.

However, during the 1990s it became apparent that significant vandalism to rattlesnake dens, including poaching of the snakes themselves, was occurring. Enforcement efforts to reduce this illegal behavior have since included the posting of rattlesnake habitat as a restricted area and the implementation of resource management security patrols. These efforts should be continued.

Park Operations Recommendations

Recommendation: Support creation of a natural resource specialist/interpretive position to provide coordination of natural resource management activities and public information and education for Great River Bluffs State Park and/or the Blufflands Parks.

Recommendation: Continue enforcement actions to minimize disturbance to the park's rattlesnake population.

X. PLAN MODIFICATION PROCESS

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

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

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

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

Plan Amendments

Plan Amendment Criteria

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

The proposed change:

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

Plan Amendment Process

The plan amendment process as a series of steps.

1. Review the proposed change at the park and regional level. Determine which stakeholders potentially have a major concern and how those concerns should be addressed. If the major concerns are within the DNR Division of Parks and Recreation, the issue should be resolved within the Division, with input from the public. The proposed change is then reviewed with the DNR Division of Parks and Recreation Management Team.
2. If the proposed change involves other DNR divisions, the issues should be resolved by staff and approved by the affected Division Directors. This may require one of two area/regional integrated resource management team meetings. The proposed change will be reviewed through the DNR Regional Interdisciplinary Review Service (RIRS).

3. If the proposed change issue involves other state agencies, the issue should be resolved by staff and approved by the DNR Division of Parks and Recreation Management Team – with input from the public – and reviewed by RIRS.
4. If the proposed change is potentially controversial among elected boards, park user groups, adjacent landowners or the public, an open house will be held that is advertised in the local and regional area.
5. All plan amendments should be coordinated, documented, and distributed by the DNR Division of Parks and Recreation planning staff.

Plan Revisions

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

Revisions related to Physical Development Constraints and Resource Protection

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

Program Revisions

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

XI. BIBLIOGRAPHY

Coffin, Barbara and Lee Pfannmuller. 1988. *Minnesota's endangered flora and fauna*. University of Minnesota Press, Minneapolis. 473 pp.

Curtiss-Wedge, F., ed. 1913. *History of Winona County*. H.C. Cooper, Jr. and Co., Chicago.

Faber, R.A. 2003. Personal communication with Nancy Albrecht.

_____. 1999. *An abbreviated primer on the Henslow's sparrow*. One-page report prepared for the Great River Bluffs Citizens Advisory Committee.

Fuller, Kimberly. 2000. 1999 *Timber rattlesnake (Crotalus horridus) blufflands habitat site assessments field report*. Prepared for the MN DNR, January 2000.

Hanson, L.G. 1994. *The Henslow's sparrow (Ammodramus henslowii) of Minnesota: population status and breeding habitat analysis*. M.S. Thesis, Central Michigan University, Mt. Pleasant, Michigan.

Herkert, J.R. 1994. *Status and habitat selection of the Henslow's sparrow in Illinois*. Wilson Bulletin 106:35-45.

Keyler, D.E. & B.L. Oldfield 2003. *Timber rattlesnake field survey: Great River Bluffs State Park, Winona County, Minnesota*. Report prepared for MN DNR, June 2003.

_____. 1992. *Timber rattlesnake field survey on southeastern Minnesota state lands (1990-1991)*. Report to the Minnesota Department of Natural Resources Nongame Program, St. Paul, 31 pp.

Midwest Climate Center, 1992.

MN DNR, 2003. www.dnr.state.mn.us/ecological_services/ecs/broadleaf/ecs_x.html.

MN DNR 1996. *Inventory of biological features in O.L. Kipp State Park*. Biological Report Number 55. Prepared for the Division of Parks and Recreation by the Minnesota County Biological Survey, August 1996.

MN DNR 1995. *Minnesota State Park System Interpretive Services Plan*. State of Minnesota, Department of Natural Resources, St. Paul. 38 pp.

MN Planning 1999. www.mnplan.state.mn.us

MN Planning. 2003. Census 2000 statistics. www.mnplan.state.mn.us/demography

Pfister, Darlene. 2000. *Peregrine falcons return to ancestral home*. Article published in the Star Tribune, Minneapolis, April 2, 2000.

Pruitt, Lori. 1996. *Henslow's sparrow status assessment*. Report prepared for the USFWS, Bloomington, Indiana.

Shelford, V.E. ed. 1926. *Naturalist's Guide to the Americas*. Prepared by the Committee on the Preservation of Natural Conditions, Ecological Society of America. The Williams & Wilkins Co., Baltimore, Maryland.

Tordoff, Harrison B. 2003. *Midwest Peregrine Falcon Restoration 2003 Report*. Available at: www.raptor.cvm.umn.edu

Tordoff, Harrison B., Mark S. Martell & John S. Castrale. 2002. *Midwest Peregrine Falcon Restoration, 2002 Report*. Available at: www.raptor.cvm.umn.edu

Tordoff, Harrison B., Mark S. Martell, Patrick T. Redig & Matthew J. Solensky. 2001. *Midwest Peregrine Falcon Restoration, 2001 Report*. Available at: www.raptor.cvm.umn.edu

Winchell, 1911. *The Aborigines of Minnesota*. Minnesota Historical Society Press.

APPENDIX A -- MANAGEMENT RECOMMENDATIONS

The following is a list of the actions recommended in this plan:

Natural Resources Management Recommendations

Recommendation: Maintain the natural diversity of plant communities and animal species in the park by continuing activities such as prescribed burning and problem species control.

Recommendation: Restore selected old fields to native vegetation where possible while maintaining the Henslow's sparrow population in the park

Recommendation: Continue to minimize human interference with rattlesnake areas through actions such as the use of signs and patrols

Recommendation: Continue to use the talents of experienced resource professionals to monitor the park's snake population periodically

Recommendation: Continue habitat enhancement efforts for the timber rattlesnake.

Recommendation: When managing the park's prairies, avoid spring rattlesnake emergence and late summer/early fall birthing.

Recommendation: Retain (non-paved) gravel roads beyond Visitor Center to reduce potential for snake mortality and to encourage compliance with reduced speeds on park roads.

Recommendation: Maintain and restore grasslands in the park that provide suitable habitat for Henslow's sparrows.

Recommendation: Care should be taken so that the nesting activities of the Henslow's are not disturbed unnecessarily between mid-May and mid-August.

Recommendation: Continue research and monitoring of the Henslow sparrow population(s) in the park

Recommendation: Follow the existing site management plan for the Queen's bluff peregrine aerie, specifically:

Monitor and enforce restrictions on visitor use of the blufftop during the critical periods of falcon activity (March through May 1 and May 15 through July 15). Note: Currently the SNA program and/or Park Manager issues permits to enter the Queen's Bluff portion of the SNA; no permits will be issued to the public between February 1 and September 1.

Maintain restricted access signs at both ends of the former trail to the Queen's bluff portion of the SNA.

No vehicle traffic should be allowed on the road leading to the former Boy Scout cabins

Monitor peregrine activity when managing blufftop prairies and adapt as needed to prevent interference with nesting and foraging activities (relocate or postpone, for example)

Cooperate with The Raptor Center and other partners with the annual monitoring of the aerie

Develop interpretive materials for park visitors on the aerie and the Midwest Peregrine Falcon Restoration Project

Recommendation: Continue to use on-the-ground resource management techniques such as prescribed burning to manage rare natural communities and hence maintain their respective rare plant species as well.

Recommendation: Continue to monitor rare plant populations.

Recommendation: Where facilities intersect with rare species habitat, establish a system of species monitoring that will ensure rare species and habitats exhibit continued or improved vigor and growth.

Recommendation: Establish a park resource advisory committee that consists of State Park and other blufflands resource specialists, academic researchers, and citizens to provide input and assistance with resource management efforts, and to facilitate research project coordination.

Cultural Resources Management Recommendations

Recommendation: Complete a systematic inventory of the park's cultural resources. At a minimum, conduct surveys for cultural resources prior to the development of park trails and other facilities.

Interpretive Services Recommendations

Recommendation: Support creation of a natural resource specialist/interpretive position to provide coordination of natural resource management activities and public information and education for Great River Bluffs State Park and/or the Blufflands Parks.

Recommendation: In lieu of a new interpretive/resource position, nonpersonal interpretive services at the park should be upgraded and expanded to include the development of:

Educational materials for park visitors and local communities that includes information about the importance and rarity of timber rattlesnakes.

Interpretive information about the significance of Henslow's sparrows for park visitors.

Interpretive materials for park visitors about the peregrine falcon aerie and the Midwest Peregrine Falcon Restoration Project.

Recreational Use and Visitor Services Recommendations

Recommendation: The current trail use types are acceptable (hiking, snowshoeing, cross-country skiing). Visitors should continue to expect limited human contact on the trails in order to bird, photograph, and hike in relative solitude. Current trails may be narrowed to minimize the footprint in the park landscape. However, maintain appropriate width for 2-way cross-country skiing traffic, or make sure ski loops are one-way.

Recommendation: Trail and overlook opportunities for persons with disabilities should be provided where feasible.

Recommendation: Design and develop new trails in the park only after assessing potential impact(s) to natural and cultural resources.

Recommendation: Encourage partnering with neighboring outdoor recreation providers to disperse higher impact uses across the region, and upon less fragile areas.

Recommendation: Maintain the current campground's location and size, limiting the number of vehicles per site to one. Consider reducing camping to tent only camping with parking spurs limited to one car length.

Recommendation: Retain (non-paved) gravel roads beyond Visitor Center to reduce potential for snake mortality and to encourage compliance with reduced speeds on park roads.

Recommendation: Maintain the existing "park road" character in any redesign of the entrance road to the park.

Recommendation: Maintain existing bicycle campground, providing information to users about the park, including access options and natural resource communities.

Recommendation: Build a multipurpose facility that will serve as a visitor center, office, and contact station. Locate the facility in a disturbed area along the main park road & overlooking Lake Onalaska (east).

Recommendation: In the short-term, retain the existing picnic area. As the red pines are removed on the south side of the picnic area parking lot, expand the picnic area with a traditional open design to provide for the opportunity to play catch, throw Frisbees and to facilitate accessible opportunities.

Recommendation: Remove the current office once a new facility has been located and developed.

Park Boundary Recommendations

Recommendation: Consider park statutory boundary changes to remove homes and other development located on small parcels with no resource, recreation, or administrative value to the state park.

Recommendation: Continue to pursue acquisition of private lands within the existing park statutory boundary that support the state park's mission to protect and perpetuate the diverse natural, scenic, and cultural resources of the bluffland landscape for low impact use, enjoyment and education of park visitors.

Recommendation: Over the long-term, work with park neighbors and local authorities to maintain the natural resources and vistas in the area bounded by highways I-90, State Highway 61, and Winona County Road 3, including Miller's Valley.

Recommendation: Consider park statutory boundary changes and acquisition of private parcels within the viewshed protection areas if supported by the property owner. The Department will inform local units of government when a statutory boundary change is proposed.

Park Operations Recommendations

Recommendation: Support creation of a natural resource specialist/interpretive position to provide coordination of natural resource management activities and public information and education for Great River Bluffs State Park and/or the Blufflands Parks.

Recommendation: Continue enforcement actions to minimize disturbance to the park's rattlesnake population.

APPENDIX B: BIRD LIST FOR GREAT RIVER BLUFFS STATE PARK

For ease of use by the general public, the species list below is arranged in alphabetical order by common name. The species list in taxonomic arrangement is available at Great River Bluffs State Park and the DNR Division of Parks and Recreation.

Common Name	Scientific Name
American Black Duck	(<i>Anas rubripes</i>)
American Coot	(<i>Fulica americana</i>)
American Crow	(<i>Corvus brachyrhynchos</i>)
American Golden-Plover	(<i>Pluvialis dominica</i>)
American Goldfinch	(<i>Carduelis tristis</i>)
American Kestrel	(<i>Falco sparverius</i>)
American Redstart	(<i>Setophaga ruticilla</i>)
American Robin	(<i>Turdus migratorius</i>)
American Tree Sparrow	(<i>Spizella arborea</i>)
American Wigeon	(<i>Anas americana</i>)
American Woodcock	(<i>Scolopax minor</i>)
Bald Eagle	(<i>Haliaeetus leucocephalus</i>)
Baltimore Oriole	(<i>Icterus galbula</i>)
Bank Swallow	(<i>Riparia riparia</i>)
Barn Swallow	(<i>Hirundo rustica</i>)
Barred Owl	(<i>Strix varia</i>)
Bay-breasted Warbler	(<i>Dendroica castanea</i>)
Bell's Vireo	(<i>Vireo bellii</i>)
Belted Kingfisher	(<i>Ceryle alcyon</i>)
Black Tern	(<i>Chlidonias niger</i>)
Black-and-white Warbler	(<i>Mniotilta varia</i>)
Black-bellied Plover	(<i>Pluvialis squatarola</i>)
Black-billed Cuckoo	(<i>Coccyzus erythrophthalmus</i>)
Blackburnian Warbler	(<i>Dendroica fusca</i>)
Black-capped Chickadee	(<i>Poecile atricapilla</i>)
Blackpoll Warbler	(<i>Dendroica striata</i>)
Black-throated Green Warbler	(<i>Dendroica virens</i>)
Blue Jay	(<i>Cyanocitta cristata</i>)
Blue-gray Gnatcatcher	(<i>Polioptila caerulea</i>)
Blue-headed Vireo	(<i>Vireo solitarius</i>)
Blue-winged Teal	(<i>Anas discors</i>)
Blue-winged Warbler	(<i>Vermivora pinus</i>)
Bobolink	(<i>Dolichonyx oryzivorus</i>)
Bohemian Waxwing	(<i>Bombycilla garrulus</i>)
Bonaparte's Gull	(<i>Larus philadelphia</i>)
Broad-winged Hawk	(<i>Buteo platypterus</i>)
Brown Creeper	(<i>Certhia americana</i>)
Brown Thrasher	(<i>Toxostoma rufum</i>)

Common Name	Scientific Name
Brown-headed Cowbird	(<i>Molothrus ater</i>)
Bufflehead	(<i>Bucephala albeola</i>)
Canada Goose	(<i>Branta canadensis</i>)
Canada Warbler	(<i>Wilsonia canadensis</i>)
Canvasback	(<i>Aythya valisineria</i>)
Cape May Warbler	(<i>Dendroica tigrina</i>)
Carolina Wren	(<i>Thryothorus ludovicianus</i>)
Caspian Tern	(<i>Sterna caspia</i>)
Cedar Waxwing	(<i>Bombycilla cedrorum</i>)
Cerulean Warbler	(<i>Dendroica cerulea</i>)
Chestnut-sided Warbler	(<i>Dendroica pensylvanica</i>)
Chimney Swift	(<i>Chaetura pelagica</i>)
Chipping Sparrow	(<i>Spizella passerina</i>)
Clay-colored Sparrow	(<i>Spizella pallida</i>)
Cliff Swallow	(<i>Petrochelidon pyrrhonota</i>)
Common Goldeneye	(<i>Bucephala clangula</i>)
Common Grackle	(<i>Quiscalus quiscula</i>)
Common Merganser	(<i>Mergus merganser</i>)
Common Nighthawk	(<i>Chordeiles minor</i>)
Common Redpoll	(<i>Carduelis flammea</i>)
Common Tern	(<i>Sterna hirundo</i>)
Common Yellowthroat	(<i>Geothlypis trichas</i>)
Cooper's Hawk	(<i>Accipiter cooperii</i>)
Dark-eyed Junco	(<i>Junco hyemalis</i>)
Dickcissel	(<i>Spiza americana</i>)
Downy Woodpecker	(<i>Picoides pubescens</i>)
Eastern Bluebird	(<i>Sialia sialis</i>)
Eastern Kingbird	(<i>Tyrannus tyrannus</i>)
Eastern Meadowlark	(<i>Sturnella magna</i>)
Eastern Phoebe	(<i>Sayornis phoebe</i>)
Eastern Screech-Owl	(<i>Otus asio</i>)
Eastern Towhee	(<i>Pipilo erythrophthalmus</i>)
Eastern Wood-Pewee	(<i>Contopus virens</i>)
European Starling	(<i>Sturnus vulgaris</i>)
Evening Grosbeak	(<i>Coccothraustes vespertinus</i>)
Field Sparrow	(<i>Spizella pusilla</i>)
Forster's Tern	(<i>Sterna forsteri</i>)
Fox Sparrow	(<i>Passerella iliaca</i>)
Franklin's Gull	(<i>Larus pipixcan</i>)
Gadwall	(<i>Anas strepera</i>)
Golden Eagle	(<i>Aquila chrysaetos</i>)
Golden-crowned Kinglet	(<i>Regulus satrapa</i>)
Golden-winged Warbler	(<i>Vermivora chrysoptera</i>)
Gray Catbird	(<i>Dumetella carolinensis</i>)
Gray-cheeked Thrush	(<i>Catharus minimus</i>)
Great Blue Heron	(<i>Ardea herodias</i>)
Great Crested Flycatcher	(<i>Myiarchus crinitus</i>)

Common Name	Scientific Name
Great Egret	(<i>Ardea alba</i>)
Great Horned Owl	(<i>Bubo virginianus</i>)
Greater Yellowlegs	(<i>Tringa melanoleuca</i>)
Green Heron	(<i>Butorides virescens</i>)
Green-winged Teal	(<i>Anas crecca</i>)
Hairy Woodpecker	(<i>Picoides villosus</i>)
Harris's Sparrow	(<i>Zonotrichia querula</i>)
Henslow's Sparrow	(<i>Ammodramus henslowii</i>)
Hermit Thrush	(<i>Catharus guttatus</i>)
Herring Gull	(<i>Larus argentatus</i>)
Hooded Merganser	(<i>Lophodytes cucullatus</i>)
Horned Lark	(<i>Eremophila alpestris</i>)
House Finch	(<i>Carpodacus mexicanus</i>)
House Sparrow	(<i>Passer domesticus</i>)
House Wren	(<i>Troglodytes aedon</i>)
Indigo Bunting	(<i>Passerina cyanea</i>)
Killdeer	(<i>Charadrius vociferus</i>)
Least Flycatcher	(<i>Empidonax minimus</i>)
Lesser Scaup	(<i>Aythya affinis</i>)
Lesser Yellowlegs	(<i>Tringa flavipes</i>)
Lincoln's Sparrow	(<i>Melospiza lincolni</i>)
Loggerhead Shrike	(<i>Lanius ludovicianus</i>)
Louisiana Waterthrush	(<i>Seiurus motacilla</i>)
Magnolia Warbler	(<i>Dendroica magnolia</i>)
Mallard	(<i>Anas platyrhynchos</i>)
Merlin	(<i>Falco columbarius</i>)
Mourning Dove	(<i>Zenaida macroura</i>)
Mourning Warbler	(<i>Oporornis philadelphia</i>)
Nashville Warbler	(<i>Vermivora ruficapilla</i>)
Northern Bobwhite	(<i>Colinus virginianus</i>)
Northern Cardinal	(<i>Cardinalis cardinalis</i>)
Northern Flicker	(<i>Colaptes auratus</i>)
Northern Goshawk	(<i>Accipiter gentilis</i>)
Northern Harrier	(<i>Circus cyaneus</i>)
Northern Mockingbird	(<i>Mimus polyglottos</i>)
Northern Parula	(<i>Parula americana</i>)
Northern Pintail	(<i>Anas acuta</i>)
Northern Rough-winged Swallow	(<i>Stelgidopteryx serripennis</i>)
Northern Saw-whet Owl	(<i>Aegolius acadicus</i>)
Northern Shoveler	(<i>Anas clypeata</i>)
Northern Shrike	(<i>Lanius excubitor</i>)
Northern Waterthrush	(<i>Seiurus noveboracensis</i>)
Olive-sided Flycatcher	(<i>Contopus cooperi</i>)
Orange-crowned Warbler	(<i>Vermivora celata</i>)
Orchard Oriole	(<i>Icterus spurius</i>)
Osprey	(<i>Pandion haliaetus</i>)
Ovenbird	(<i>Seiurus aurocapillus</i>)

Common Name	Scientific Name
Palm Warbler	(<i>Dendroica palmarum</i>)
Peregrine Falcon	(<i>Falco peregrinus</i>)
Philadelphia Vireo	(<i>Vireo philadelphicus</i>)
Pileated Woodpecker	(<i>Dryocopus pileatus</i>)
Pine Grosbeak	(<i>Pinicola enucleator</i>)
Pine Siskin	(<i>Carduelis pinus</i>)
Purple Finch	(<i>Carpodacus purpureus</i>)
Purple Martin	(<i>Progne subis</i>)
Red Crossbill	(<i>Loxia curvirostra</i>)
Red-bellied Woodpecker	(<i>Melanerpes carolinus</i>)
Red-breasted Merganser	(<i>Mergus serrator</i>)
Red-breasted Nuthatch	(<i>Sitta canadensis</i>)
Red-eyed Vireo	(<i>Vireo olivaceus</i>)
Redhead	(<i>Aythya americana</i>)
Red-headed Woodpecker	(<i>Melanerpes erythrocephalus</i>)
Red-shouldered Hawk	(<i>Buteo lineatus</i>)
Red-tailed Hawk	(<i>Buteo jamaicensis</i>)
Red-winged Blackbird	(<i>Agelaius phoeniceus</i>)
Ring-billed Gull	(<i>Larus delawarensis</i>)
Ring-necked Duck	(<i>Aythya collaris</i>)
Ring-necked Pheasant	(<i>Phasianus colchicus</i>)
Rock Dove	(<i>Columba livia</i>)
Rose-breasted Grosbeak	(<i>Pheucticus ludovicianus</i>)
Rough-legged Hawk	(<i>Buteo lagopus</i>)
Ruby-crowned Kinglet	(<i>Regulus calendula</i>)
Ruby-throated Hummingbird	(<i>Archilochus colubris</i>)
Ruffed Grouse	(<i>Bonasa umbellus</i>)
Rusty Blackbird	(<i>Euphagus carolinus</i>)
Sandhill Crane	(<i>Grus canadensis</i>)
Savannah Sparrow	(<i>Passerculus sandwichensis</i>)
Scarlet Tanager	(<i>Piranga olivacea</i>)
Sedge Wren	(<i>Cistothorus platensis</i>)
Sharp-shinned Hawk	(<i>Accipiter striatus</i>)
Short-eared Owl	(<i>Asio flammeus</i>)
Snow Goose	(<i>Chen caerulescens</i>)
Snowy Owl	(<i>Nyctea scandiaca</i>)
Song Sparrow	(<i>Melospiza melodia</i>)
Swainson's Thrush	(<i>Catharus ustulatus</i>)
Swamp Sparrow	(<i>Melospiza georgiana</i>)
Tennessee Warbler	(<i>Vermivora peregrina</i>)
Tree Swallow	(<i>Tachycineta bicolor</i>)
Tufted Titmouse	(<i>Baeolophus bicolor</i>)
Tundra Swan	(<i>Cygnus columbianus</i>)
Turkey Vulture	(<i>Cathartes aura</i>)
Veery	(<i>Catharus fuscescens</i>)
Vesper Sparrow	(<i>Pooecetes gramineus</i>)
Warbling Vireo	(<i>Vireo gilvus</i>)

Common Name	Scientific Name
Western Meadowlark	(<i>Sturnella neglecta</i>)
Whip-poor-will	(<i>Caprimulgus vociferus</i>)
White-breasted Nuthatch	(<i>Sitta carolinensis</i>)
White-crowned Sparrow	(<i>Zonotrichia leucophrys</i>)
White-eyed Vireo	(<i>Vireo griseus</i>)
White-throated Sparrow	(<i>Zonotrichia albicollis</i>)
White-winged Crossbill	(<i>Loxia leucoptera</i>)
Wild Turkey	(<i>Meleagris gallopavo</i>)
Willow Flycatcher	(<i>Empidonax traillii</i>)
Wilson's Warbler	(<i>Wilsonia pusilla</i>)
Winter Wren	(<i>Troglodytes troglodytes</i>)
Wood Duck	(<i>Aix sponsa</i>)
Wood Thrush	(<i>Hylocichla mustelina</i>)
Yellow Warbler	(<i>Dendroica petechia</i>)
Yellow-bellied Sapsucker	(<i>Sphyrapicus varius</i>)
Yellow-billed Cuckoo	(<i>Coccyzus americanus</i>)
Yellow-breasted Chat	(<i>Icteria virens</i>)
Yellow-rumped Warbler	(<i>Dendroica coronata</i>)
Yellow-throated Vireo	(<i>Vireo flavifrons</i>)

APPENDIX C: INFORMATION ON O. L. KIPP

Orin L. Kipp

Originally written February 17, 1955 (from original O.L. Kipp State Park planning file; MN DNR, St. Paul)

Orin L. Kipp, the "Mr. Highways of Minnesota", completed 50 years in the engineering profession while serving as a consultant to the Minnesota Highway Department in the location and design of interstate highways in the Twin City metropolitan area.

A member of the Minnesota Highway Department since 1917, he served until his retirement in 1955 in various capacities, as construction engineer, chief engineer, and finally as assistant commissioner.

He came to the department prior to the establishment of the present trunk highway system, and until his retirement, every set of engineering plans for every construction project undertaken by the state throughout the entire history of the department, bore his signature and stamp of approval. No other living person has been so intimately familiar with all of the thousands of construction projects that have gone into the development of the Minnesota trunk highway system.

He was an active member of the Committee on Road Design and the operating Association of State Highway Officials, and has also been a member of the subcommittees of that organization on Administrative Practices and Highway Finances. He was a long-time member of the National Highway Research Board and served on that organization's Committees on Highway Costs, Highway Design, Rigid Pavement Design and the subcommittee on Parking of the Committee on Traffic and Operations.

His activities also included membership on the American Public Works Association's Committee on Street and Highway Traffic, and was selected for an A.P.W.A. Service Award for 1950 in recognition of his long and distinguished record in public service. He was also a member of the Committee on Pedestrian Problems of the American Association of Motor Vehicle Administrators.

Until his death on February 17, 1955, he served for many years as a member of the Mississippi Valley Conference of State Highway Departments and served that Parkway Planning Commission.