A Management Plan for
Buffalo River
State Park

Prepared by the Minnesota Department of Natural Resources

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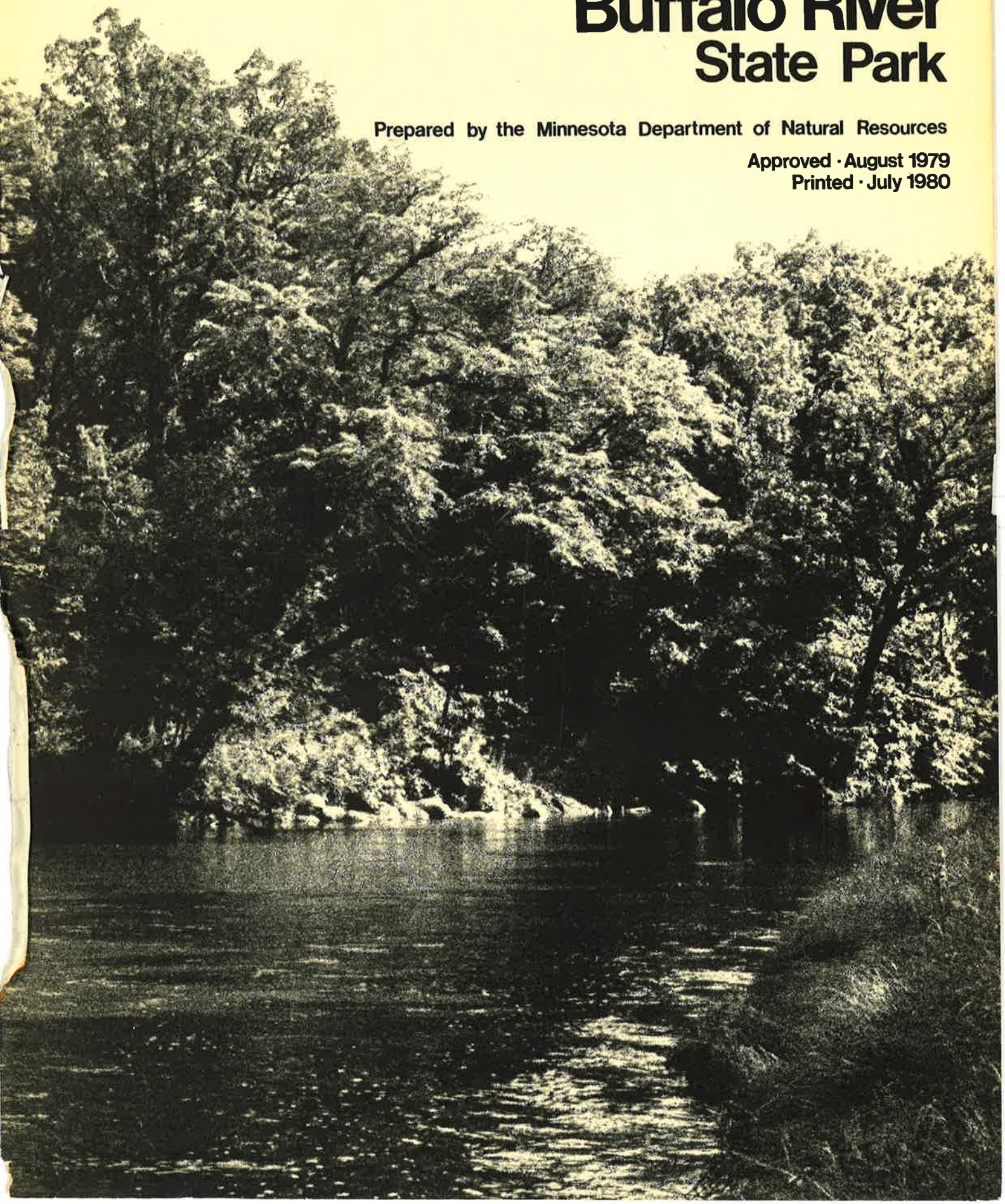

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TABLE OF CONTENTS

LIST OF MAPS

LIST OF ABBREVIATIONS

mi - miles
km - kilometers
in. - inches
cm - centimeters
ft - feet
m - meters
kg - kilogram
l - liter
cfs - cubic feet per second
cms - cubic meters per second
gpm - gallons per minute
l/m - liters per minute
mg/l - milligrams per liter
DNR - Department of Natural Resources
MHS - Minnesota Historical Society
Mn/DOT - Minnesota Department of Transportation
SPA - State Planning Agency
SCORP - Statewide Comprehensive Recreation Plan
GPMP - General Park Management Plan
MPD - Management Plan Details
ORA '75 - Outdoor Recreation Act of 1975
CSAH - County State Aid Highway
TH - Trunk Highway
I - Interstate

PREFACE

The primary concern in the development of the park management plan format for the 1978-79 biennium was the identification of the "audience." For whom are these plans to be written? Eight different audiences were identified.

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

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

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

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

Introduction

AN OVERVIEW OF BUFFALO RIVER STATE PARK

Buffalo River State Park is located in Clay County, 5 mi (8 km) east of Glyndon and 13 mi (21 km) east of Moorhead. It is about 200 mi (320 km) northwest of Minneapolis-St. Paul. Trunk Highway (TH) 10, a quarter mile (400 m) north of the park is the principal access road to the park. Interstate (I)-94 provides interstate access via TH 10 and TH 9.

The existing statutory boundary of the park encompasses 1,240 acres (496 hectares), with 983 acres (393 hectares) in state ownership. Next to and overlapping the statutory boundary on the south is part of the Bluestem Prairie, owned by The Nature Conservancy.

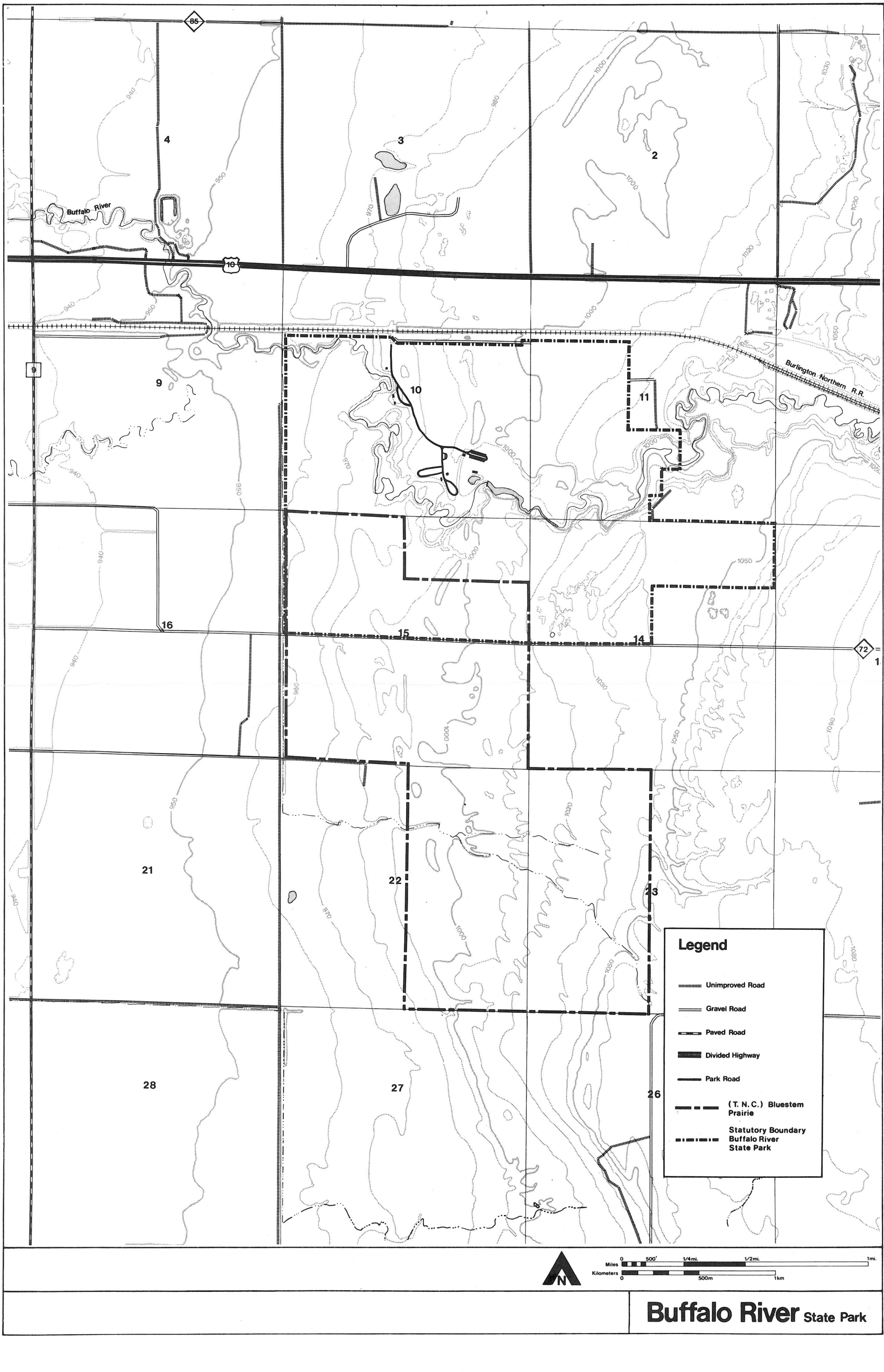
The park lies about 1,000 ft (305 m) above sea level, on the Campbell Beach of glacial Lake Agassiz. In this area, the land tilts from east to west, dropping about 90 ft (28 m) in 2 mi (3.2 km). East of the park the land rises in gently rounded ridges. To the west, the land levels out into the flat, rich farmland of the Red River Valley.

The soil in the park indicates glacial activity. It has a high gravel and clay content and is liberally scattered with large boulders. There are numerous gravel pits in the vicinity, including an abandoned pit in the park.

The northern portion of the park is bordered by a 50 ft (15 m) high railroad grade. The park entrance road cuts through this embankment. Upon entering the park, a visitor finds a quiet, peaceful refuge which is a dramatic contrast to the noise and speed of four-lane TH 10.

The Buffalo River flows over a gravel and boulder bed through the northern portion of the park. It is bordered by a mature forest of basswood, elm, and ash. This riverine forest provides visual relief from the limitless prairie skyline. It also offers welcome shade for picnicking, camping, and other outdoor activities. The interface between prairie and forest also provides diverse habitat for many species of wildlife.

Buffalo River State Park



The Bluestem Prairie, 1,210 acres (484 hectares) of tall grass prairie owned by the Conservancy lies partially within and south of the park's statutory boundary. The sweep of open space evokes the "sea of grass" described by settlers of the 1850's.

More than 569 different species of plants have been identified in the park and the Bluestem Prairie. These include the six-foot-high big bluestem grasses and other prairie plants, such as little bluestem, prairie clover, coneflower, blazing star, lead plant, and blue gramma. Interspersed in the tall grass prairie are lenses of wet prairie and clumps of willow and aspen. At the crest of the riverbank, bur oak cling to the relatively dry ridge. Yucca plants and cacti grow near the southern boundary of the park. Most of the Bluestem Prairie was never plowed, but was used for hay and pasture. With appropriate management, including controlled burning, the prairie can be restored.

Because of their biological diversity, the park and the Bluestem Prairie are visited regularly by biology students from Moorhead State University, Concordia College, and North Dakota Agricultural College.

Recreational facilities include a natural-looking swimming pond with a sand beach and bathhouse. Although there are numerous lakes to the east, this is the closest beach to the Fargo-Moorhead area.

The picnic ground has 53 sites for family and group picnicking and a large open space for group games. There is a campground with 44 spurs, including eight with electric hookups, just north of the picnic ground. There is a community-style eating room in the campground with sanitation facilities. The nearby Coneflower Pioneer Primitive Group Camp, located on a bend in the river provides a separate area for group camping. It has a mowed grass tenting area, pit toilets, water supply, and fire ring. There are 4.5 mi (1.1 km) of hiking trails in the park.

Buffalo River is a "gateway" park. Located near the western border of Minnesota and 150 mi (240 km) from the Canadian border, the park is often the first Minnesota stop for visitors from the Dakotas and Canada enroute to points south and east.

THE PLANNING PROCESS

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

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

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

The planning process consists of five steps:

1. Compilation of an inventory of natural resources and existing facilities. Task forces of specialists from other DNR divisions and sections are mobilized to assist in collecting pertinent data. At this point the first public workshop is held.

2. Identification of alternatives for park management and development. A second public workshop is held to review these alternatives and invite further public comment. These alternatives are then reviewed by the Division of Parks and Recreation.

3. Classification of park, development of park goal, and writing draft plan. This step culminates in the first interdepartmental review, followed by a 30 day public review. Within this 30 day period, the third public workshop is held.

4. Revision of the draft plan according to information received from public and interdepartmental reviews. Plan is then sent to the State Planning Agency for a 60 day reviewal period.

5. Implementation of development plan by the Division of Parks and Recreation.

SUMMARY

A natural state park classification, with a large scientific and natural area, is proposed for Buffalo River State Park. This classification will ensure restoration and perpetuation of an increasingly rare prairie landscape while providing recreational and interpretive facilities which will allow park visitors to enjoy all of the park's resources.

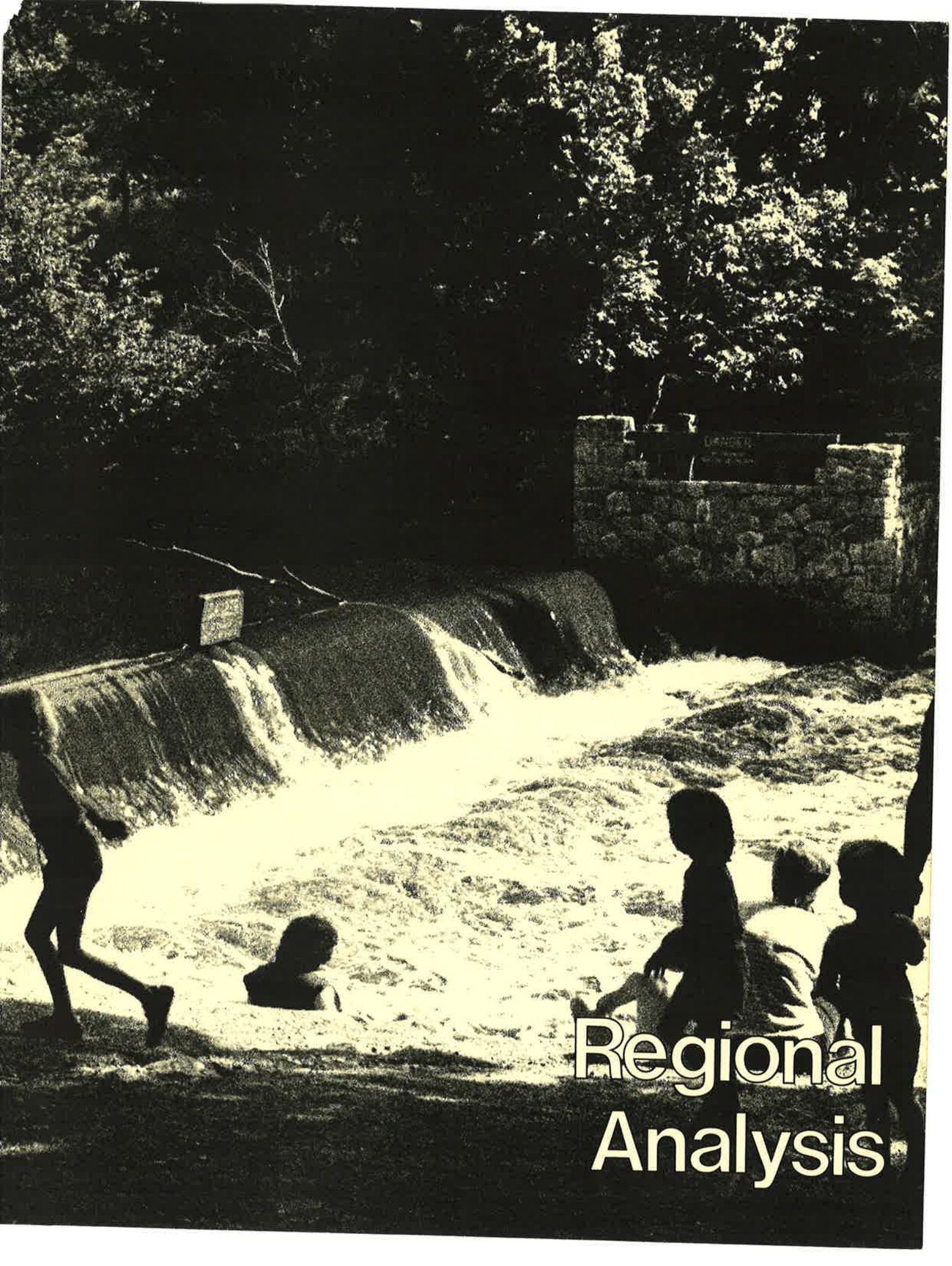
This comprehensive park management plan was prepared under authorization of the Outdoor Recreation Act of 1975 (ORA '75). It will be a general guideline for a 10-year span of resource management and physical development.

Vegetation management will emphasize restoration and management of the tall grass prairie, once so prevelant in this part of the state. Natural wildlife habitat will be enhanced by planting food and shelter shrubs in disturbed areas and restoring drained marshes. Wildlife management will focus on enhancing the prairie chicken habitat. There are resident deer in the park, but no special effort will be made either to attract or limit additional numbers.

Physical development in the park will include: adding a camping loop with 20 spurs; constructing a group picnic area with a shelter; constructing an interpretive/trail center; constructing a contact station/park office; installing a network of trails through the prairie which will also serve as fire breaks for prairie management; replacing a pedestrian bridge; and restoring an abandoned gravel pit and drainage ditch.

While some temporary disturbance will occur as the result of some management techniques and development construction, the cumulative result will be a more natural looking landscape.

Recommended boundary adjustments involve expanding the park to include the entire Bluestem Prairie and that part of T139N R46W, Sec 11, south of the Burlington Northern railroad grade (see map, M 1).



Regional Analysis

INTRODUCTION

In order to determine a park's role in protecting and perpetuating natural resources and fulfilling recreational needs, a state park analysis process has been initiated. The analysis is designed to look at a given park's interrelationship with:

the state park system

the biocultural region system

state park use patterns

regional influence/impact factors

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

The State Park System

Minnesotans traditionally have a great appreciation for nature. The variety and everchanging beauty of our 65 state parks testify to the vast natural and historic wealth of our state. The goal of Minnesota's state park system is to protect and perpetuate these natural resources while offering the public a variety of recreational opportunities.

There is a delicate balance which must be maintained when recreational facilities are provided for large numbers of people in areas of outstanding, often sensitive resources. Generally, certain resources are best suited for particular types of recreation. To help ensure this recreation/resource balance, the Minnesota State Legislature outlined in the ORA '75 the components which comprise all state recreational lands. These components are: historic sites; state forests; water access sites; rest areas; state trails; wildlife management areas; scientific and natural areas; wild, scenic, and

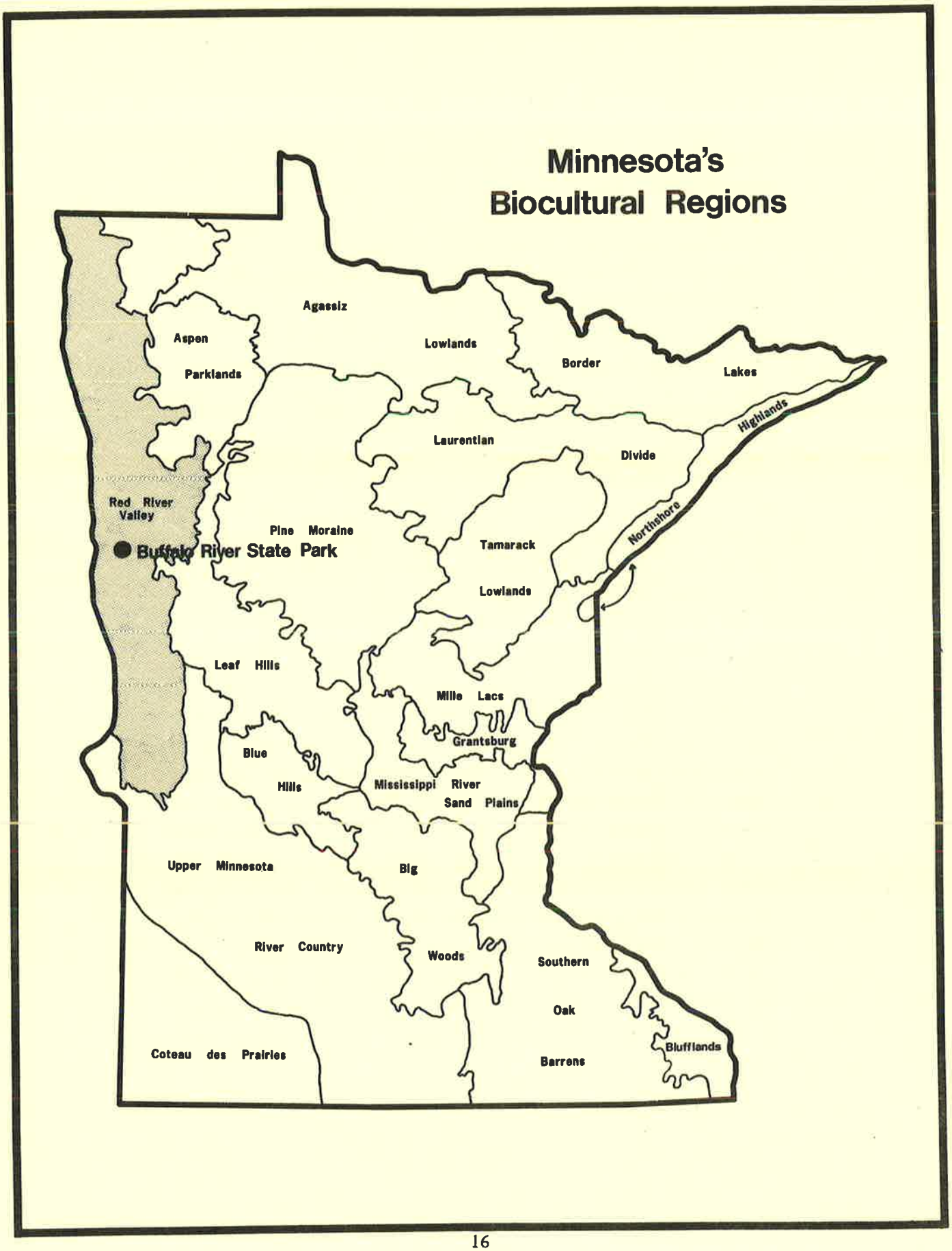
recreational rivers; wilderness areas; and state parks. Also included in this legislation is a classification system which identifies general criteria for planning and management direction. The two primary classifications for state parks are natural or recreational.

A natural state park classification places primary emphasis on perpetuation of the natural resources. Recreational state park classification, while not allowing major disruption of the natural resources, focuses on providing a variety of recreational facilities for large numbers of people. This classification determines each park's role as a unit in the statewide park system. (See Classification Section, pp 24-31 for further discussion.)

Although Buffalo River is located in a part of Minnesota which does not draw large numbers of tourists, it has resources which are of statewide significance. The park manager estimates that 40 percent of the park's visitors are from out-of-state while 20-50 percent are from within a 50 mi (80 km) radius.

Biocultural Region System (Formerly Landscape Region System)

The ORA '75 defines a landscape region as "an identifiable geographic region with generally homogeneous natural characteristics which exemplify the natural processes which formed the geography, geology, topography, and biology of the state." Since 1975, it has become apparent that human impact on the landscape has not be included to a sufficient extent in this system. As a result, several studies have been directed toward amending the system to include the interrelationship of cultural, biological, and geological impacts on the environment. The system has been renamed the biocultural region system. This system divides the state into 18 regions which are differentiated according to the characteristic plant life, animal life, and landforms of presettlement times and the cultural impacts which have altered the landforms since settlement.


Minnesota's
Biocultural Regions
Agassiz
Lowlands
Aspen
Parklands
Border
Lakes
Highlands
Laurentian
Divide
Red River
Valley
Pine Moraine
Buffalo River State Park
Tamarack
Northshore
Lowlands
Leaf Hills
Mille Lacs
Grantsburg
Blue
Hills
Mississippi River
Sand Plains
Upper Minnesota
Big
River Country
Woods
Southern
Oak
Blufflands
Coteau des Prairies
Barrens

M 3

85

10

9

Buffalo River

Burlington Northern R.R.

4 3 2

9 10 11

16 15 14

72 = 1

Proposed Scientific and Natural Area

21 22 23

28 27 26

Legend

- Proposed Scientific and Natural Area
- Potential SNA
- (T. N. C.) Bluestem Prairie
- Statutory Boundary Buffalo River State Park

N

Miles: 0, 500', 1/4mi., 1/2mi., 1mi.

Kilometers: 0, 500m, 1km

Buffalo River State Park

Proposed SNA

Buffalo River State Park is located in the Red River Valley Biocultural Region (see Biocultural Regions Map, p 16). The rich clay and silty soils of this region once comprised the bottom of glacial Lake Agassiz. Prior to European settlement, this area was a seemingly endless expanse of prairie grasses and wildflowers.

Less than 0.1 percent of the prairie biome remains in Minnesota. Buffalo River contains one of the last remnants of this virgin prairie. The park presents one of the best opportunities in the state park system for the development of recreational facilities and interpretive programs to learn about a type of landscape that was not fully appreciated in the past.

State Park Use Patterns

State park users are often classified into two types -- destination and non-destination users. A comparison of the differences and similarities of these users groups will help to clarify the park's role in providing resource and recreation opportunities.

According to the park manager, the majority of Buffalo River day users come to the park to picnic and swim. Approximately 95 percent of these picnickers come from within 50 mi (180 km) of the park. This use pattern clearly demonstrates the park's resource and recreational attraction to local residents. The manager also estimates that the majority of overnight visitors in Buffalo River come from outside a 50 mi (80 km) radius and use the park as a stopover point enroute to a principal destination. This circumscribed area is termed the "influence zone." Its close proximity to I 94 and TH 10 establishes the park as a convenient and desirable camping facility for travelers. In addition, the park is a key gateway stop for people driving east on TH 10 from North Dakota. The park's clean, safe, and well-maintained facilities, as well as its diversified resource and recreational offerings, help to create a positive impression of Minnesota's state park system.

Regional Influence/Impact Factors

Recreational patterns in the region surrounding a state park must be analyzed in order to plan a park. The basis of this analysis is the relationship between a particular facility and the expectation of the user. The user will visit a state park because of: location, natural resources, facilities, and the experience sought. Of these factors, perhaps the most important is location.

The park manager estimates that the influence zone as shown on the Regional Analysis Map, M 2), best illustrates communities most likely to frequent Buffalo River on a regular basis. In addition, the influence zone highlights area recreational facilities which may complement and benefit from park facilities and services.

Recreational facilities within a park's zone may duplicate services. However, some people will consistently choose to frequent one area over another in the pursuit of a particular experience. For example, picnicking is a recreational activity which state parks provide. Municipal and county parks located within the vicinity of a state park may also offer picnicking. People will consistently travel to the state park because of the type of experience it offers, namely, picnicking in a natural setting augmented by other recreational opportunities such as hiking and wildlife observation.

This interrelationship of recreational supply and demand with the experience sought is an integral part of the regional analysis process. The connection can best be analyzed according to the recreational activities available in a park, the experiences people seek by participating in these activities, and the identification of complementing facilities in the park's influence zone.

On the following chart, Buffalo River's activities and experiences are analyzed on the left and influence zone complementing facilities located outside the park are analyzed on the right.

Activity/Experience	Complementing Facilities
Picnicking	Picnicking
A sizeable portion of the park's day use visitors are picnickers. There are 70 picnic tables in the picnic ground. Other outdoor pursuits such as swimming, hiking, and nature and wildlife observation enhance the picnicking experience.	Within a 50 mi (80 km) radius of the park, there are a total of 61 public picnic areas - city parks, county parks, other state parks, Mn/DOT rest areas, and U.S. Army Corps of Engineers sites.
Swimming	Swimming
The park manager estimates that approximately 80 percent of the summer (June-August) day use visitors come to the park to swim. The beach is used largely by the people of the Fargo-Moorhead area.	The park has one of three swimming ponds in Clay County. The others are Blue Eagle Lake Municipal Park, located in Barnesville, approximately 16 mi (25.6 km) south of the park, and Hawley Municipal Park 7 mi (11.2 km) east of the park. Each facility has its own appeal and complements the other in function.
Fishing	Fishing
Fishing in the park is generally supplemental to other park activities. Serious fishermen will often travel to streams and lakes further east. However, many park visitors enjoy fishing in the park because it can be combined with other activities such as swimming and picnicking.	Buffalo River is not generally considered a fishing destination because the Detroit Lakes area, located about 30 mi (48 km) east of the park offers excellent fishing opportunities.

Interpretation

The function of the interpretive program is to orient visitors to the park and its resources through exhibits, campfire programs, brochures, talks, and hikes. Visitors interested in the natural and cultural resources of the park can attend scheduled interpretive programs. A building in the picnic area serves as an interpretive center and a summer naturalist organizes and conducts programs.

Hiking

There are approximately 4 mi (6 km) of hiking trails in the park. These trails pass through both the prairie and riverine forest. The majority of trail mileage is located on the north side of the park.

Camping

There are 44 campsites in Buffalo River State Park. Eight have electrical hookups.

Interpretation

The proposed Red River Valley Historical Society Heritage Interpretive Center in Moorhead will provide an overview of the prairie's environment, but focus on the history of the area.

Hiking

A few miles of hiking trails are found at Gooseberry Mound Municipal Park in Moooread. There are few other trails in Clay County and neighboring Cass County in North Dakota.

Camping

There are nine publicly owned facilities in the park's influence zone which have a total of 15 walk-in campsites and 192 drive-in campsites. Privately owned resorts and campgrounds provide a total of 291 walk-in campsites and 1,140 drive-in campsites.

Ski Touring	Ski Touring
There are no designated ski touring trails in the park. However, people do come to ski, particularly in the wooded area near the river.	Edgewood Golf Course in Fargo, M.B. Johnson Open Space in Moorhead, and public lands along the Red River are the major ski touring areas in the Buffalo River influence zone. There are 700 skiers registered in the Fargo and Moorhead Municipal Parks and Recreation Department.
Snowmobiling	Snowmobiling
Snowmobiling in Buffalo River is not allowed.	At present, there are no designated snowmobile trails in Clay County.

Special Events/Organized Groups

Buffalo River provides special resource and recreational opportunities not found elsewhere in the region. For example, because of the park's historic, geologic, and botanical value, students and educators use park resources for study purposes.

In addition, the park fills a need for large-group activities. Boy Scouts, Girl Scouts, Fargo-Moorhead YMCA and YWCA, and Moorhead State Day Care Center are among the organized groups that consistently use the park for recreational activities.

Buffalo River fills a special need, providing a convenient and scenic location for family reunions, church picnics, and outings for senior citizens, and residents of Fergus Falls State Hospital.

Because organized groups and special events consistently use park picnic facilities during the summer months, a group picnic area (see Proposed Development, p 60) has been proposed.

SURROUNDING LAND USE

Surrounding land use may have a positive or negative impact on a park. Understanding this land use helps to direct future development and landscape management. The Conservancy's Bluestem Prairie, the Ponderosa Golf Course, and Burlington Northern Railroad lands all border the park.

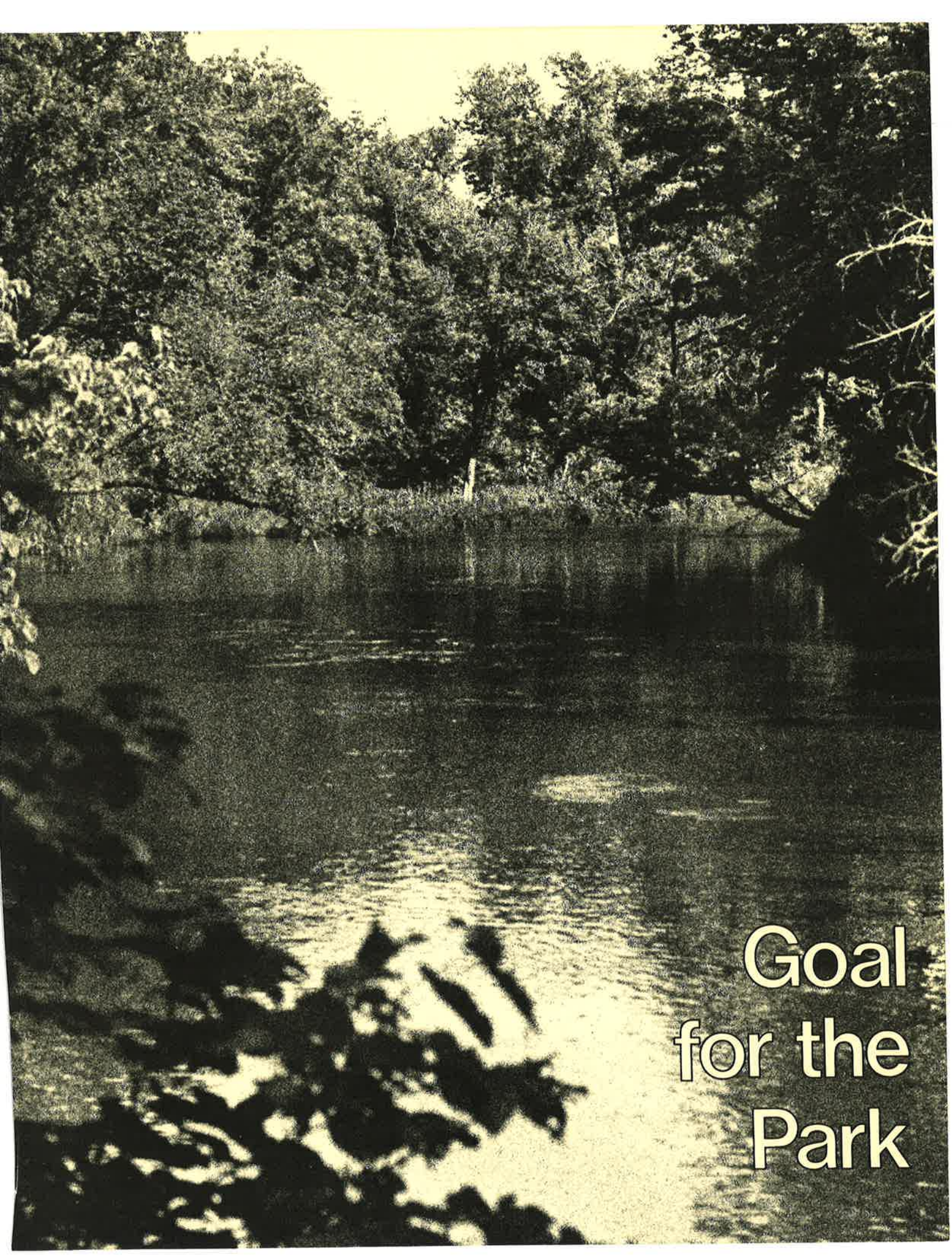
The Bluestem Prairie is a scenic focal point of the park. The Conservancy purchased this tall grass prairie to ensure its protection and perpetuation. Conservancy land outside the park is recommended for inclusion in the park boundary. The Conservancy will lease it to the state, provided that it is managed as a scientific and natural area (see Scientific and Natural Areas, M 3, for further discussion).

The Ponderosa Golf Course is located east of the park and buffers the park from adjacent development. The abandoned back nine of the 18 hole golf course borders the state park boundary. This tract of land has been recommended for inclusion in the park and, if acquired, would be reestablished as tall grass prairie (see Boundary Adjustments, p 72).

On the north, the Burlington Northern Railroad grade borders the park. The elevated railroad right-of-way provides both a well-defined boundary for the park and a buffer from the constant noise and visual impact of TH 10. However, the 27 trains that daily pass over the grade are a negative and sound impact. The Minnesota Coal Study advises that 33 trains per day will be needed by 1985, increasing the impact on the park.

The remaining land adjacent to Buffalo River State Park is primarily crop and pasture land. A turkey farm is located northwest of the park.

The Clay County Board of County Commissioners and the Clay County Zoning Board have approved land use zoning of single-family units on 40-acre (16-hectare) parcels of land adjacent to the park. This zoning favorably affects the park in two ways. It will reduce the noise and visual impacts which would result from intensive development.



Goal for the Park

CLASSIFICATION

Purpose

The purpose of the classification process as stated in the ORA '75 is to establish "an outdoor recreation system which will (1) preserve an accurate representation of Minnesota's natural and historical heritage for public understanding and enjoyment and (2) provide an adequate supply of scenic, accessible, and usable lands and waters to accommodate the outdoor recreational needs of Minnesota's citizens."

Process

In accordance with the ORA '75, the park planning staff has reviewed the classification of each park under study this biennium. After the park resource inventory was completed for each unit, the planning staff determined:

A. Which of the 11 classifications from ORA '75 was most appropriate for the unit.

B. Whether sub-units (e.g., scientific and natural areas or other sub-units authorized in ORA '75) should be considered to deal with special areas within the unit.

C. Whether administration of the unit should be reassigned to other governmental bodies (e.g., other state agencies, county, or local governments).

Each park has been recommended for classification according to its resources and use potential and will be managed and developed according to the nature of those resources and their ability to tolerate visitor use.

The classification alternatives considered for Buffalo River State Park were natural or recreational state park, with a scientific and natural area.

The extent to which Buffalo River State Park fulfills the criteria, as defined by the ORA '75, is summarized below.

Natural State Park Alternative

ORA Criterion # 1

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

Buffalo River State Park is located in the Red River Valley Biocultural Region. This region was originally covered by uninterrupted tall grass prairie. Today, almost the entire region has been converted to cropland, except for the glacial beach ridges, which have been mined for gravel.

Buffalo River State Park is located on two of these glacial beach ridges. The park and the overlapping Bluestem Prairie exemplify the Red River Valley Biocultural Region and are among only a few areas in the state which have potential for perpetuation and interpretation of the mid and tall prairie.

ORA Criterion # 2

> "Contains natural resources sufficiently diverse to attract people from throughout the state."

There are few remnants of native prairie in Minnesota. The more than 300 native prairie species in and near the park provide an unparalleled opportunity to study the plants of the mid and tall grass prairie. This aspect of the park has statewide significance and has the potential for drawing visitors from throughout the state. The transition between forest and prairie provides a unique opportunity for study and interpretation.

Wildlife native to the prairie, including prairie chickens and prairie waterfowl, can be observed here.

ORA Criterion # 3

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

Buffalo River State Park now includes 900 acres (364.2 hectares). Combined with the Bluestem Prairie, there will be about 2400 acres (971.2 hectares) of continuous open space. This area is large enough to perpetuate a variety of prairie vegetation communities and wildlife populations, while providing recreational facilities for a large number of visitors.

Recreational State Park Alternative

ORA Criterion # 1

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

Buffalo River State Park currently attracts a large number of users (70,259 in 1978). Many come from beyond the local area. The park's swimming pond and beach are popular during the warm summer months. The campgrounds are filled 70 percent of the time during the summer and provide a convenient stopping place for travelers. The existing and proposed trail system will provide a unique opportunity for park users to experience the prairie.

ORA Criterion # 2

> "Contains resources which permit intensive recreational use by large numbers of people."

If recreational uses are routed away from sensitive plant communities and wildlife habitat, intensive recreational use by large numbers of people can be accommodated.

There are sufficient areas of soils suitable for recreational development. The soil, a mixture of sand and clay, generally tolerates a large amount of pedestrian traffic. The swimming pond is a popular facility during the hot, dry summers.

ORA Criterion # 3

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

With the exception of ski touring trails and swimming facilities, adequate municipal and county facilities are available in the vicinity. See the Activity/Facility Analysis, pp 19-21, for a further discussion of nearby public outdoor recreational facilities.

Scientific and Natural Areas

A scientific and natural area (SNA) designation is proposed for the 1,210 acre (484-hectare) area outlined on the Proposed SNA Map, M 3.

The Nature Conservancy will lease the Bluestem Prairie to the state, if it is designated as a SNA. This area meets the criteria for a SNA defined by the ORA '75.

Following are the criteria for SNA designation as outlined in the ORA '75 and a discussion of how the area meets those criteria.

> (a) A state scientific and natural area shall be established to protect and perpetuate in an undisturbed natural state those natural features which possess exceptional scientific or educational value.

(b) No unit shall be authorized as a scientific and natural area unless its proposed location substantially satisfies the following criteria:

(1) Embraces natural features of exceptional scientific and educational value, including but not limited to any of the following:

(i) natural formations or features which significantly illustrate geological processes;

The beach ridges of glacial Lake Agassiz show the retreat of the last glacier and the effect of the meltwater on the landscape.

(ii) significant fossil evidence of the development of life on earth;

Fossilized bison bones can be found along the banks of the Buffalo River.

(iii) an undisturbed plant community maintaining itself under prevailing natural conditions typical of Minnesota;

An excellent example of bluestem prairie exists here.

(iv) an ecological community significantly illustrating the process of succession and restoration to natural condition following disruptive change;

Some of the prairie has been disturbed by haying, grazing, and cultivation. This area presents an excellent opportunity to learn more about restoration of native prairie by various management techniques.

M 2

50 Mile Radius

CLEARWATER

NORMAN

MAHNOMEN

WHITE EARTH INDIAN RESERVATION

HUBBARD

BECKER

Little Elbow Lake State Park

Georgetown

Felton

Zone of Greatest Influence

Tamarac National Wildlife Refuge

Fargo

Moorhead

Dilworth

Glyndon

Hawley

Buffalo River State Park

Hubbel Pond Wildlife Area

Detroit Lakes

Barnesville Wildlife Area

Barnesville

Zone of Greatest Influence

Western Prairie Scientific and Natural Area

Morrison Mounds Historic Site

Pelican Rapids

WADENA

Maplewood State Park

Rothsay Wildlife Area

Dead Wildlife Management Area

10

WILKIN

OTTER TAIL

Fergus Falls

Orwell Wildlife Area

Legend

- Public Campground
- Private Campground
- Water Access
- County Park
- Principal Community

50 Mile Radius

9

94

GRANT

DOUGLAS

TODD

TRAVERSE

STEVENS

POPE

STEARNS

Buffalo River State Park | Regional Analysis

(v) a habitat supporting a vanishing, rare, endangered, or restricted species of plant and animal;

Prairie chickens, a species uncommon in Minnesota, live and breed in this area (see Wildlife, p 46 , for further discussion).

(vi) a relict flora or fauna persisting from an earlier period; or

Not applicable.

(vii) a seasonal haven for concentrations of birds and animals, or a vantage point for observing concentrated populations, such as a constricted migration route;

Many species of prairie waterfowl can be observed during migration. A number of songbirds also nest in the area.

(2) Embraces an area large enough to permit effective research or educational functions and to preserve the inherent natural values of the area.

This is one of the largest tracts of prairie in the state. Its 1,210 acres (484 hectares) offer an excellent opportunity for research, education, and interpretation.

The following excerpt from the ORA '75 discusses the administration and use of an SNA.

(c) State scientific and natural areas shall be administered by the commissioner of natural resources, in consultation with qualified persons, in a manner which is consistent with the purposes of this subdivision to preserve, perpetuate, and protect from unnatural influences the scientific and educational resources within them. Interpretive studies may be provided for the general public. Physical development shall be limited to the facilities absolutely necessary for protection, research, and educational projects, and where appropriate, for interpretive services. An area designated as

a state scientific and natural area shall not be altered in designation or use without holding a public hearing on the matter at a time and place designated in the notice of the hearing, which shall be published once in a legal newspaper in each county in which the lands are situated at least seven days in advance of the hearing. At the hearing the commissioner shall provide an opportunity for any person to be heard.

(d) At the descretion of the managing agency, each scientific and natural area shall be designated as one of the following types:

(i) Research unit. Use is limited to programs conducted by qualified scientists and college graduate and post graduate students.

(ii) Educational unit. Permitted uses include all activities specified in paragraph (i) above and primary, secondary, and college undergraduate programs.

(iii) Public use unit. Permitted uses include all uses permitted in paragraphs (i) and (ii) above and interpretive programs for the benefit of the general public.

A public use unit designation is recommended for this area. Its proximity to the state park's intensive use areas, an interpretive center, and a major population center would allow it to fulfill an important and necessary educational function.

The resources of Buffalo River State Park and the SNA will be managed as one unit. In the following section, the resource inventory and subsequent management recommendations apply to both the park and the SNA.

The DNR, Division of Parks and Recreation concurs with the designation of the proposed public use scientific and natural area as shaded on the map, M 3. The cross-hatched area that lies south of

Buffalo River in the NE 1/4 of Section 15 and SE 1/4 of Section 10, T139N R46W, is a potential SNA expansion within the park because it incorporates some of the riverine forest in the SNA.

The SNA advisory committee recommended that all of the park south of the river be designated SNA. The DNR, Division of Parks and Recreation is reluctant to agree to this large inclusion. They wish to reserve that portion lying west of the river in Section 10 for possible future park expansion.

Recommended Classification

A natural state park classification with a public use scientific and natural area is recommended for Buffalo River State Park because:

It is the best representative example of mid and tall grass prairie in the state park system;

It is the only state park with a nesting population of prairie chickens;

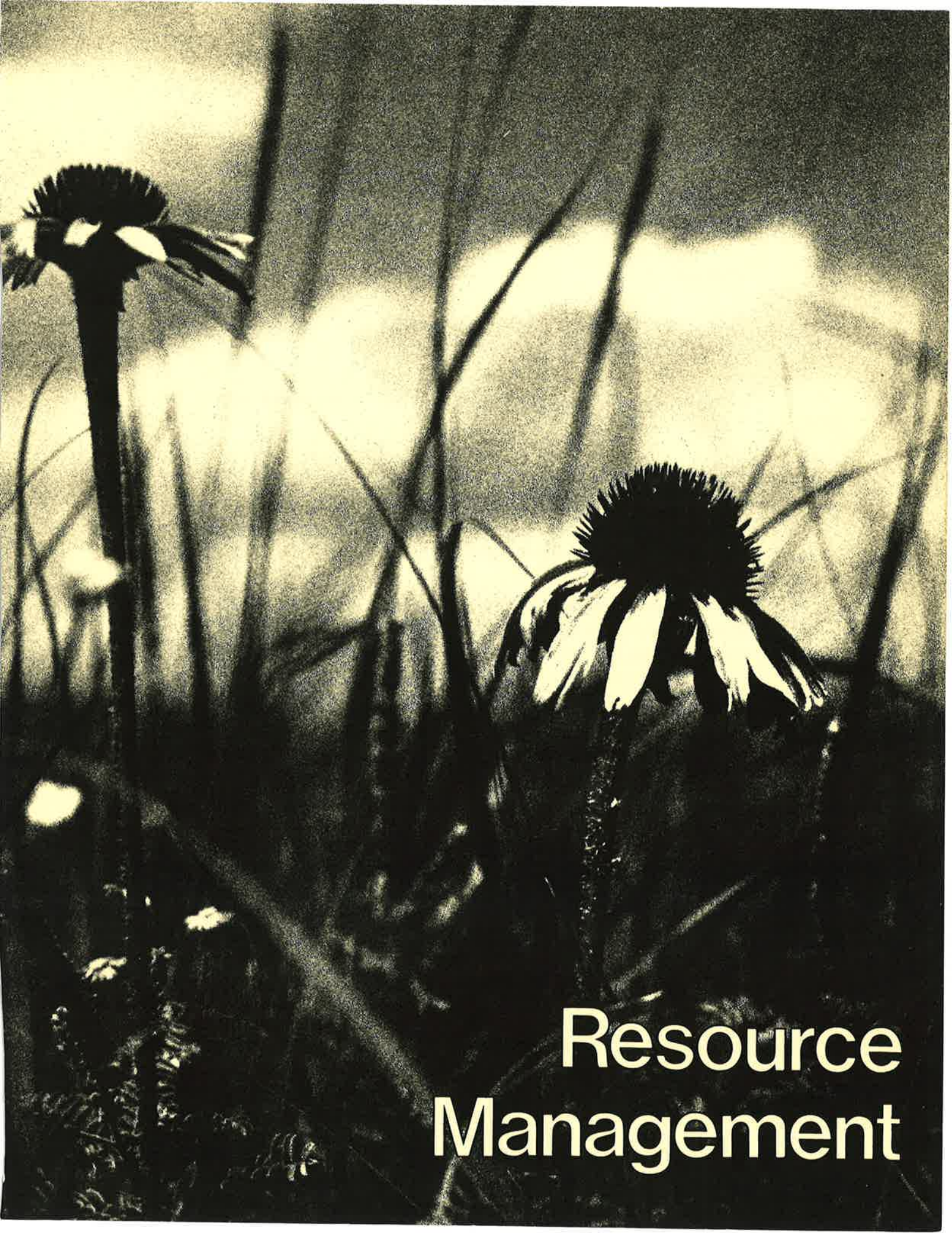
It presents one of the few opportunities to interpret a forest/prairie transition zone in a state park; and

It best represents the Red River Valley Biocultural Region.

THE GOAL OF BUFFALO RIVER STATE PARK

The goal for Buffalo River was developed after completing an inventory and analysis of the park's resources, looking at park user needs, evaluating the alternative classifications, and applying the goal for all natural state parks.

The goal for all natural state parks is to protect and perpetuate, as components of the outdoor recreation system, extensive areas of the state possessing those resources which illustrate and exemplify Minnesota's natural phenomena and to provide, without resource impairment, for the use, enjoyment, and understanding of such resources by all citizens of Minnesota now and in the future.


Resource
Management

OBJECTIVES

The following general objectives are designed to give direction to the management of all the park's resources. In order to ensure consistent management throughout the state park system, comprehensive objectives have been formulated for all natural state parks.

They are:

To maintain or reestablish plant and animal life which represent pre-European settlement biotic communities

To utilize resource management techniques that will harmonize with the park's natural systems

The natural resources are the most outstanding aspect of Buffalo River State Park and the Bluestem Prairie. Restoring and maintaining the prairie environment was a major consideration in all resource management and physical development recommendations.

Since the resources of Buffalo River State Park and The Nature Conservancy's Bluestem Prairie will be managed as one unit, a resource inventory and analysis of both was required. This is acceptable to the Conservancy. For simplicity, the combination of Buffalo River State Park and the Bluestem Prairie will be referred to as Buffalo River/Bluestem Prairie throughout the plan.

ELEVATION AND SLOPE

Buffalo River/Bluestem Prairie spans two of the major beaches of glacial Lake Agassiz. The topography of these ancient beaches is characterized by gently rolling areas of 80 or more acres (32 hectares) of fairly level land, alternating with sandy ridges several meters in height.

There is a general decrease in elevation from east to west. The elevation drops from 1,060 ft (323 m) on the extreme eastern edge to 960 ft (293 m) at the extreme western edge of the park. The greatest relief occurs where the Buffalo River flows through the park. The down-cutting of the river as it flows from east to west across the old beachlines has created steep, sandy, and unstable banks. In places the banks are nearly 30 ft (9.2 m) high (see Slope Map, M 4).

CLIMATE

The regional climate of Buffalo River/Bluestem Prairie is subhumid, midcontinental, and characterized by wide variations in temperature from summer to winter.

Winter Temperatures

The winters in this region are long and cold, with soils frozen to a depth of about 3 ft (1 m) for approximately five months of the year. The coldest month is January, with a mean temperature of 5.9°F (-14.5°C). Winter lows may reach -40°F (-40°C). Cold waves are usually of short duration.

Summer Temperatures

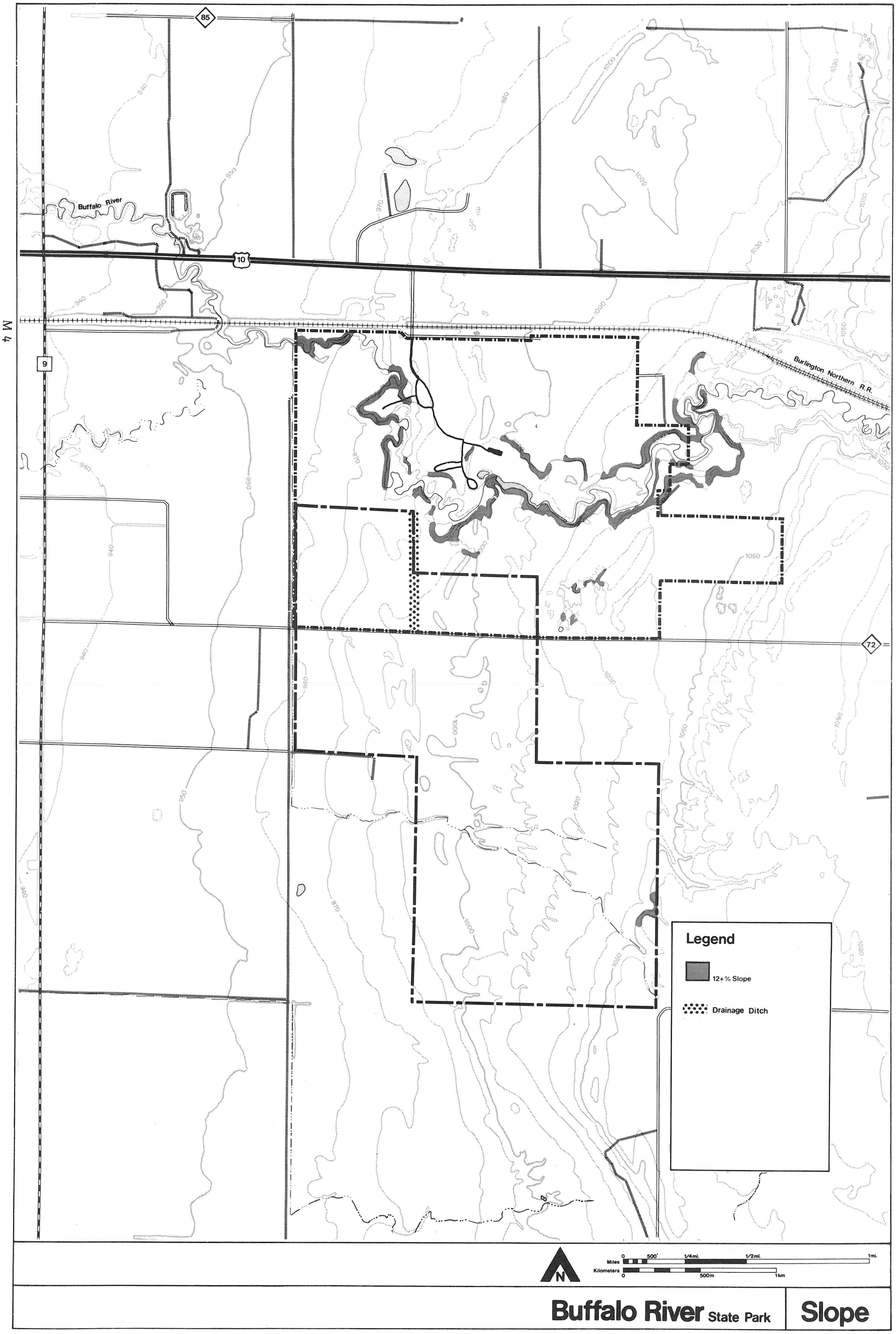
The summers are short and relatively hot. The warmest month is July, with a mean temperature of 70°F (21°C). The average difference between the normal temperatures of the coldest and warmest periods is 64 degrees, but the difference between the highest and lowest recorded temperatures is 160 degrees. Occasionally, summer temperatures reach 100°F (38°C) or higher for several days. Heat waves are usually of short duration. The average length of the growing season is about 120 days.

Precipitation

The first measurable snowfall of the season generally occurs in November and the last occurs in late March or early April. Severe blizzards are infrequent. Snow depth in sheltered areas seldom exceeds 7 in (18 cm). Snow drifts build to 10 ft (3 m) high, higher in openings between hills and scattered woods. The mean annual precipitation is about 20 in. (50 cm), compared to 27 in. (67 cm) in the Twin Cities area. The greatest amount of precipitation occurs during the early summer, when southerly winds bring up the low-level moist air from the Gulf of Mexico. Nearly 75 percent, or about 15.5 in. (39 cm) of the annual precipitation falls from April through September. Droughts, ranging in length from one month to 23 months, occurred four times between 1931 and 1963.

GEOLOGY

The landscape of Buffalo River/Bluestem Prairie is the result of glacial activity. The area was covered several times by glacial ice. The last ice sheet to cover the park, the Grantsburg-Des Moines lobe of the Wisconsin glacial stage, melted about 10,000 years ago and formed glacial Lake Agassiz. This vast lake of 110,000 sq mi (284,900 sq km) covered much of northwestern Minnesota and the Canadian provinces of Manitoba and Ontario.



M 4

Buffalo River State Park

Slope

Lake Agassiz was originally drained on the south by the glacial River Warren, which carved out the Minnesota River Valley. The Minnesota River is a remnant of this once giantic river. As the glacier retreated northward into Canada, the drainage of Lake Agassiz shifted first east, then north into Hudson Bay. As most of the lake drained, the Red River was left flowing across the silt-laden lake bed. The formation and subsequent drainage of Lake Agassiz are responsible for the flatness of the landscape and the rich soils which have made Red River Valley crop production famous.

Old beach ridges, once the shorelines of glacial Lake Agassiz, can be found throughout the area. These low ridges of sand and gravel were formed by waves beating against the shore. Each time the lake receded, another beach ridge was formed. Buffalo River State Park is situated near one of these, the Campbell Beach ridge. Southeast of the park, within the Bluestem Prairie, is the Norcross Beach ridge. A third, the Herman Beach ridge, is located between the park and the community of Hawley.

Another remnant of the glacier, a large boulder called a glacial erratic, was deposited near the park entrance as the glacier melted. This boulder bears a plaque which discusses the Campbell Beach ridge.

There are no rock outcrops in the area because of the extensive deposits of silt on the bottom of Lake Agassiz. Beneath these deposits which are 250-500 ft (76-153 m) deep, thin layers of shale lie atop deposits of granite, slate, and schist.

SOILS

Inventory

The group of soils which comprise the park is known as the Beardon-Glyndon association. These soils are coarse to fine textured prairie and organic soils of glacial lake plains. (See the Soils Map, M 5 for a complete inventory of park soils.

The Soil Conservation Service (SCS) has established recommended limitations for development based on soil suitability. The Soils Map (M 5) and the Soils Suitability Chart in the Management Plan Details (MPD)* inventory park soils and delinate their limitations.

The soil limitation ratings are only guidelines for the location of developments and should not be viewed as absolute criteria. When there are severe limitations to development and no alternative location exists, specific design adjustments can overcome the limitations imposed by soil suitability.

Management

Objectives:

To locate development in areas which can withstand the intended use

To minimize erosion

- Detailed Recommendations

Action #1. Identify erosion problems on the banks of the Buffalo River and stabilize the soil.

In some locations, erosion has cut gullies into the banks of the river. One of the most severely eroded areas is on the south bank of Buffalo River just upstream from the dam. These areas should be filled or graded, stabilized with fabric mesh, rocks, or logs, and revegetated with native species.

Cost. See Surface Water, p 50.

*See note on p vi regarding the availability of the MPD.

VEGETATION

Presettlement Vegetation

The area around Buffalo River/Bluestem Prairie was characterized by dry, mesic, and wet prairie and forest along the river. The prairie was characterized primarily by big and little bluestem with scattered forbes such as: coneflower, blazing star, and prairie colver. The riverine forest was characterized by basswood, cottonwood, elm, and ash.

Even though the prairie was largely undisturbed by the plow, it was used extensively for grazing and haying. This use reduced the number and variety of prairie species.

Existing Vegetation

More than 300 native prairie species can still be found in Buffalo River/Bluestem Prairie. Among the most outstanding of these is the small white lady slipper, which grows in the park, is on the DNR's list of species of special interest. This list identifies:

> species that merit special consideration in Minnesota, and in some places at some times, merit special management because of unusual or unique values, special public interest, or vulnerability of habitat. They are not presently endangered or threatened, nor apt to become so in the near future. They should be watched however.[1]

Twelve species which The Nature Conservancy considers rare in Minnesota grow in Buffalo River/Bluestem Prairie. Forty-one species which occur infrequently in Minnesota are found here as well. Lists of these species compiled by the Conservancy are included in the MPD.

[1]Moyle, John B., The Uncommon Ones, (St. Paul: Minnesota Department of Natural Resources, 1975) p 7.

The riverine forest is still largely comprised of basswood, cottonwood, elm, and ash, with an understory of young basswood, ash, elm, boxelder, hazel, and gooseberry. Willow, aspen, and boxelder are located in areas of poor drainage and can be found in scattered patches throughout the park and prairie.

Management

Fire played an essential role in the maintenance of the natural prairie ecosystem. It revitalized prairie grasses and forbes and consequently benefited wildlife. The fire-blackened land absorbed more heat from the sun, which in turn encouraged plant growth. The freshly burned prairie also seemed to have an increased attraction for booming prairie chickens. The fire control policy of immediate fire suppression which has prevailed since the beginning of this century has prevented the prairie from flourishing naturally. Fire must be reintroduced under carefully controlled conditions if the prairie is to be fully restored.

Objectives:

To restore the prairie vegetation to a condition similar to the tall grass prairie of pre-European settlement times

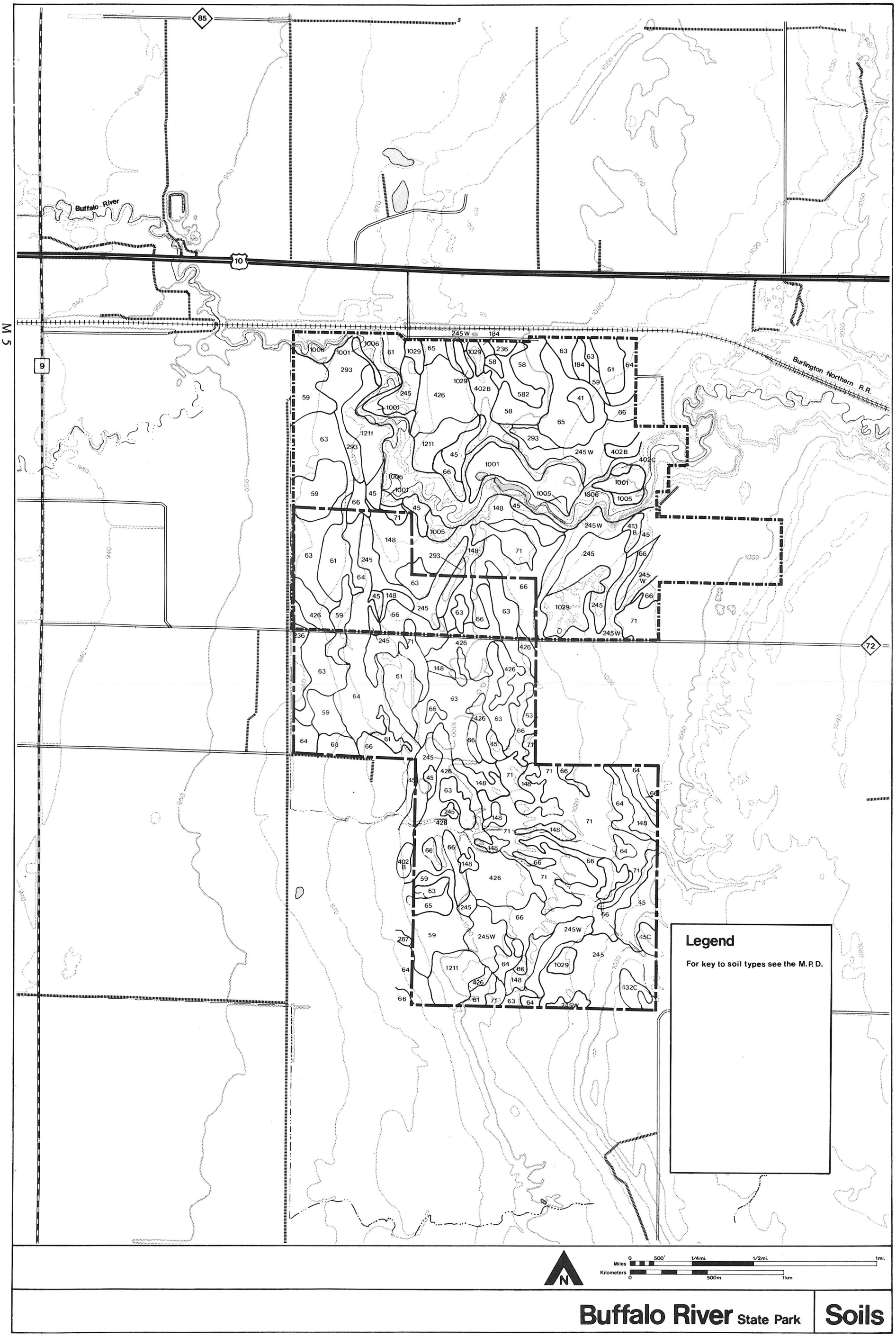
To maintain a healthy and aesthetically pleasing forest

- Detailed Recommendations

Action #1. Implement a program of controlled burning.

Buffalo River/Bluestem Prairie has been divided into eight approximately 20 acre (80 hectare) burn units, based on soil types and plant species, (see Burn Units Map, M 7). These units are delinated by 8 ft (2.4 m) mowed firebreaks. These breaks will be cut on high, dry ground to minimize impact on the soils and to maximize control of the burn.

Beginning in 1981, a flexible controlled burn schedule such as the one on p 41 will be implemented. This schedule may be modified at the descretion of the director of the DNR, Division of Parks and



Buffalo River State Park

Soils

M 6

85

Buffalo River

10

9

Burlington Northern R.R.

72

Legend

- Northern Hardwoods
- Oak Savanna
- Dry Prairie
- Old Field
- Willow·Aspen Brush
- Wet Prairie

N

Miles 0 500' 1/4mi. 1/2mi. 1mi.

Kilometers 0 500m 1km

Buffalo River State Park

Vegetation

Controlled Burn Schedule

	Area							
	I	II	III	IV	V	VI	VII	VIII
1979								May
1980		May		May				May
1981		May		May				May
1982		May		May				May
1983	May	May		May				
1984	May		May			May		
1985	May		May			May		April
1986		April	May	April	May	May		
1987					May		May	April
1988	October	April			May		May	
1989			October			April	May	April
1990	October	April		April				
1991			October		October			April
1992	October	April					October	
1993			October			April		April
1994	October	April		April				
1995			October		October			April
1996	October	April					October	

Recreation, contingent upon the results of initial burns or new data. May burns will be done for three or four consecutive years. They will suppress undesirable species such as blue grass and sweet clover, while encouraging big bluestem. These are called "established burns" because they establish the prairie plants. Subsequent April/October burns on alternate years, called "maintenance burns" will encourage species diversity. This program, carried out in consultation with The Nature Cconservancy, updates their current program.

Concern about DNR's policy for prescribed burning and publicity of scheduled burns was expressed by local citizens at the public meetings. There is uniform policy and procedure to be followed by all DNR personnel when prescribed burning is used as a resource management tool. A copy of the DNR's prescribed burning policy is found in the Vegetation Section of the MPD.*

Briefly, this policy states that "pre-burning planning must provide for sufficient manpower, equipment, and precautions to ensure the safety of personnel and adjoining property."

This policy also states that "advance publicity on a local level shall be undertaken in order that the prescribed burn is not mistaken for a wildfire." This public notification includes contacting the local fire department. Most rural fire departments are volunteer groups and many are under contract with the DNR for wildfire suppression.

Prescribed burning is only one of the methods of prairie management and the model schedule is only one possible timing scheme. This plan is subject to modification as new data on prairie management become available.

Reintroducing buffalo is one possible alternative method of prairie management. Buffalo, whose grazing helped maintained the prairie species, were an integral part of the prairie ecosystem before European settlement.

*See p vi for information on the availability of the MPD.

Buffalo are used in the prairie management program in Blue Mounds State Park. If the results from Blue Mounds indicate that it is a viable management technique, its use should be considered in Buffalo River/Bluestem Prairie. However, the reintroduction of buffalo is not recommended at this time.

Cost. $10,000

Action #2. Contract a local fire department to assist in the suppression of wildfires.

At present there are no local fire departments under contract with the DNR for wildfire suppression in Buffalo River/Bluestem Prairie. The procedure for letting such a contract is included in the Vegetation Section of the MPD.

Cost. Contingent

Action #3. Develop and maintain firebreaks around the prairie to control wildfire and protect adjacent property.

The firebreaks around the boundary of Buffalo River/Bluestem Prairie will consist of:

1. A plowed firebreak 8-16 ft (2.4-4.8 m) wide around the Big Bluestem Prairie.
2. An additional firebreak 8-10 ft (2.4-3 m) wide will be mowed 90 ft (27.5 m) inside of the plowed break.
3. Every year, the intervening 90-ft (27.5-m) strip between the plowed break and the mowed break will be burned.

This method has been effective in controlling wildfires on western prairies. This firebreak would also serve as additional protection for the controlled burns.

Cost. $2,000

Action #4. Develop a prairie vegetation nursery on the site of the abandoned nine-hole golf course which is proposed for inclusion in the statutory boundary.

The existing golf course water system could be used to supplement annual rainfall to ensure production of desirable prairie species in a prairie seed nursery. Such a nursery could supply seed for this and other priarie areas in Minnesota.

Cost. Contingent on land acquisition

Action #5. Cut and remove dead and dying elms along the river which present a safety hazard to park users.

Cost. $7,000

Action #6. Identify and map the fens in Buffalo River/Bluestem Prairie.

A fen is a wet grassland with an internal flow of water rich in calcium and magnesium bicarbonates. Generally, all facilities, including trails and firebreaks, should be located away from the fens because plants associated with them are sensitive and unusual. Trail spurs to selected fens will be developed for interpretive purposes.

Cost. SNA project

Action #7. Plant a shelter belt of trees in a natural pattern to screen the railroad grade.

The elevated railroad grade is an intrusion on the prairie landscape. Its visual effect could be minimized by a screen of trees. Species native to the area, such as oak and basswood, should be used.

Cost. $10,000

Source:

Curtis, John T., Vegetation of Wisconsin (Madison: University of Wisconsin Press, 1959).

WILDLIFE

Inventory

Buffalo River State Park is a prime location to observe and study prairie wildlife. The greater prairie chicken, an uncommon species in Minnesota, can be observed here. Other rare or interesting wildlife species include birds such as the marbled godwit and amphibians such as the plains toad.

Mima mounds up to 4 ft (1 m) high are interesting features of the park. They are the result of the activities of animals such as pocket gophers, ground squirrels, badgers, and toads.

Management

Objectives:

To increase the number and diversity of wildlife species which inhabit Buffalo River State Park

To establish and maintain native prairie vegetation to provide habitat essential for the survival and reproduction of prairie wildlife

To locate development in areas which will have minimal impact on wildlife habitat

• Detailed Recommendations

Action #1. Implement a controlled burning program.

Burning the prairie will improve habitat for prairie wildlife.

Cost. See Vegetation Management, p 40.

Action #2. Identify and map prairie chicken booming grounds.

A booming ground is an area where prairie chickens display during mating season. Developments should not be located in these areas. Access via trails and firebreaks should be restricted in spring. If prairie chickens are disturbed on the booming grounds in spring, they may not return. Protection of these areas will help ensure that prairie chickens continue to reproduce in the area.

Cost. SNA project

Action #3. Develop nesting sites for a variety of birds.

The area wildlife manager and other authorities should be consulted for recommendations for the best methods of encouraging wood ducks, kestrels, flickers, and other species of waterfowl and birds to nest in the park.

Cost. $2,000

Action #4. Construct observation blinds at selected locations.

Blinds will allow park visitors to observe wildlife without disturbing them. The area wildlife manager, the park naturalist, and the park manager should determine which locations would have the least impact on wildlife.

Cost. $3,000

Action #5. Modify the gravel pit area to provide better habitat for waterfowl.

The spoil piles and ponds should be reshaped to reduce the severity of the slopes and to provide more open water and nesting islands for waterfowl. Prairie potholes, which are part of the natural prairie landscape, should be recreated. The area should then be seeded with native grasses which will stabilize the slopes and provide food and cover for wildlife.

Cost. $10,000

Action #6. Plant native tree species such as crabapple and hawthorne near the park manager's residence and shop.

This will provide food and shelter for wildlife and screen the shop area from the entrance road.

Cost. $2,000

Action #7. Identify and map mima mounds.

These unusual formations have interpretive and scientific research value. They should be protected from all types of development. A trail spur will be constructed to make one of these areas accessible to hikers for the interpretive program.

Cost. SNA project

Sources:

Moyle, John B., The Uncommon Ones. (St. Paul: Minnesota Department of Natural Resources, 1975).

Ross, B. A., Tester, J. R., and Breckenridge, J., "Ecology of Mima Mounds in Northwestern Minnesota," Ecology, Vol. 49, No. 1, Winter 1968.

SURFACE WATER

Inventory

The Buffalo River flows through the park, creating a forested break in the prairie landscape. The river is the most significant water resource in the park and attracts a variety of users.

Originating in Becker County, the Buffalo River flows westward to the Red River Valley. The South Branch Buffalo River begins near Rothsay in Wilkin County and flows north until it converges with the main stream near Glyndon. The river then empties into the Red River near Georgetown.

The following data describe discharge for Buffalo River at Hawley, 10 mi (16 km) upstream from the park, and Dilworth, 15 mi (24 km) downstream from the park.

Hawley	
Drainage Area	322 sq mi (934 sq km)
Maximum Discharge	1,590 cfs (45 cms)
Minimum Discharge	6.8 cfs (0.2 cms)
Average Discharge	71.7 cfs (2.0 cms)
Average Annual Runoff	3.02 in. (1.1 cm)

Dilworth	
Drainage Area	1,040 sq mi (2,693 sq km)
Maximum Discharge	6,140 cfs (173 cms)
Minimum Discharge	No flow
Average Discharge	119 cfs (3.4 cms)
Average Annual Runoff	1.55 in. (4 cm)

Water Quality

The following fecal coliform counts indicate the water quality of the swimming pond and the river. A beach is considered hazardous if 1,000 fecal coliform bacteria are found per 100 ml.

June 23, 1978
Beach 200/100 ml (acceptable)
River 600/100 ml (acceptable)

July 13, 1978
Beach 700/100 ml (acceptable)
River 3,200/100 ml (not acceptable)

The scope of the water quality problem goes beyond the boundary of Buffalo River State Park and encompasses the entire watershed. If the water quality is to be improved, changes in land use practices must occur throughout the entire watershed.

Floods

Most floods are the result of snow melt and spring rains. The area's flatness, small-capacity channels, and low gradients contribute to flooding. Major floods occurred in 1978 and 1979.

Ditches

Drainage ditches cross the prairie in Sec 15 and between Secs 15 and 22 T139N R46W. These ditches feed into a large ditch which empties into the Buffalo River.

Management

Objectives:

To continue to provide swimming facilities

To improve the water quality and aesthetic appearance of the Buffalo River

To protect and perpetuate the fen areas

To restore natural drainage

• Detailed Recommendations

Action #1. Drill a well to provide a replacement water source for the swimming pond.

The present water quality in the pond is barely acceptable. There is a possibility that the beach will have to be closed unless water quality is improved.

Cost. $5,000

Action #2. Stabilize the riverbanks.

Eroded areas on the riverbanks should be repaired and planted with suitable vegetative cover in order to reduce siltation. This problem is particularly acute just upstream from the dam. Here, rock riprap should be installed during low water and the channel pool upstream from the dam should be straightened. Without this channel improvement, the dam could be washed out.

Cost. $20,000

Action #3. Identify and map fens.

Fens are unusually sensitive and should be protected from recreational development. A trail spur will make one of the fen areas accessible for interpretive purposes. (See Action #6, p 44.)

Cost. SNA project

Action #4. Fill the north-south ditch shown on the Slope Map, M 4, and remove the bordering trees to restore the original landscape south of the river.

Subsequent prairie management will then encourage restoration of native vegetation.

Cost. $3,000

GROUNDWATER

Inventory

There are glacial till and beach ridge aquifers in the park. The glacial till aquifer is a mixture of silt and clay with some sand, gravel, and boulders. The beach ridge aquifer consists of fine to medium sand with some gravel.

Recharge/Discharge

The groundwater originates in the hill moraine area east of the park. Much of this water is discharged as springs and seeps and be evapotranspiration.

Water Quality

Groundwater in the park area is hard to very hard. It contains dissolved solids ranging from 400 to more that 1,000 ppm.

Management

Objectives:

To provide high quality drinking water for park users

To maintain high quality groundwater

• Detailed Recommendation

Action #1. Institute regular testing of water quality.

The Board of Health periodically tests the water in state parks. A regular testing program must be continued to ensure safe drinking water for park users.

Cost. Operational Budget

FISHERIES

Inventory

The following list of fish found in Buffalo River State Park was prepared by Professor Tom Collins, Moorhead State University:

Chestnut Lamprey	Longnose Dace	Trout Perch
Bowfin	Creek Chub	Burbot
Goldeye	Bullhead	Banded Killfish
Northern Pike	Black Bullhead	Rockbase
Central Mud Minnow	Yellow Bullhead	Pumpkinseed
White Sucker	Channel Catfish	Bluegill
Largemouth Buffalofish	Stonecat	Black Crappie
Northern Redhorse	Tadpole Madtom	Iowa Darter
Quillback Carpsucker	Blacknose Shiner	Johnny Darter
Northern Redbelly Dace	Spottail Shiner	Least Darter
Carp	Spotfin Shiner	Yellow Perch
Hornyhead Chub	Bigmouth Shiner	Logperch
Golden Shiner	Rosyface Shiner	Blackside Darter
Emerald Shiner	Blutnose Minnow	Sauger
Common Shiner	Fathead Minnow	Walleye
Sand Shiner	Blacknose Dace	Freshwater Drum
Blackchin Shiner	Brook Stickleback	

Management

Objectives:

To maintain an environment which supports the native fish population

To maintain fishing opportunities for park visitors

Since there are a number of popular fishing lakes in the vicinity, the portion of Buffalo River within the park is not intensively fished. Therefore, no actions are needed for fisheries management.

HISTORY/ARCHAEOLOGY

Inventory

Prehistory

There has been very little official archaeological investigation in Clay County. The Minnesota Historical Society suggests that there is considerable potential for archaeological sites here. Beach ridges which served as travel corridors for prehistoric Indians and the ford across the Buffalo River are sites of possible significance.

History

The Red River Oxcart Trail stretched for a distance of 900 mi (1440 km) between St. Paul and Pembina, North Dakota. The carts were constructed entirely of wood and leather and were noted for their creaks and groans which could be heard from miles away. The carts weighed between 600-700 lbs (723-318 kg) and travelled 20 mi (32 km) a day. They carried goods such as furs, hides, and tallow.

A portion of the Red River Oxcart Trail paralleled the Buffalo River in the vicinity of the park.

Management

Objectives:

To preserve the historical resources which document significant historical events

To restore and interpret prehistoric and historic sites so that the public can gain a further understanding of Minnesota's heritage

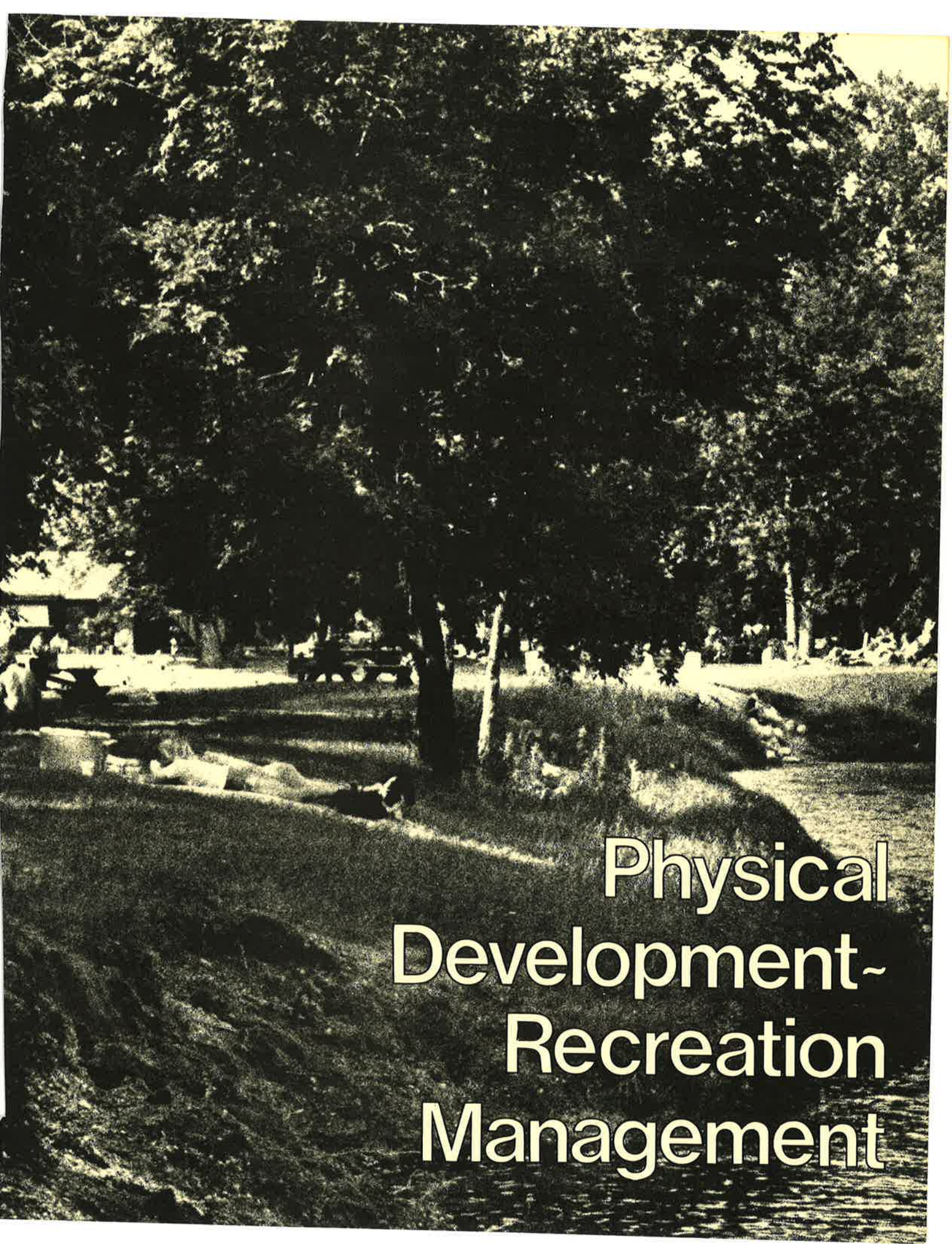
- Detailed Recommendations

Action #1. Contract with a qualified agency or firm to do an archaeological analysis of the prehistoric and historic resources of the park.

Cost. $10,000

Action #2. Survey all proposed development sites for historic and archaeological significance.

Cost. Included in the cost of each development.



Physical Development- Recreation Management

OBJECTIVES

These objectives are all designed to conform to the park's recommended classification as a natural state park.

To construct facilities necessary for the park visitor to gain access to the park resources

To integrate development into the surrounding landscape as much as possible by using native materials and the topography to their best advantage

To locate development in areas which can accommodate use with minimal impact on the resources

To keep the amount of development to a minimum because of the sensitivity of the park's resources

EXISTING DEVELOPMENT

Surrounding Roads

Access to Buffalo River State Park from surrounding population centers and travel corridors is good. TH 10 provides access from Fargo-Moorhead to the west and from Detroit Lakes and the surrounding resort area to the east. Traffic turning into the park is not a problem because of turning lanes on TH 10.

Access to the park from I 94 is good. The entrance to the park is 10 mi (16 km) north of I 94 via TH 9. A sign on TH 9 indicating the park and its distance from I 94 would be helpful.

County Road (Cty Rd) 72, on the southern boundary of the park, divides the Bluestem Prairie into two parcels. This road serves as a firebreak and provides access for park management, maintenance, and control purposes. One private residence is served by this road. There is some concern that this uncontrolled access makes supervision of the south side of the park difficult. However, the problem is not severe enough to warrant closing the road or taking any other actions.

A north-south township road located between Secs 10 and 11 T139N R46W, once served as an entrance road to the park. It is currently not used and serves as a firebreak. This road is not needed for access to any portion of the park or for maintenance. It should be removed and native vegetation should be reestablished.

An east-west township road is located along the north border of the park. It serves as a firebreak and is not in conflict with the park.

There are three development areas in the park -- the administrative area, the picnic ground, and the campground.

Administrative Area

There is a small contact station and a manager's residence/park office at the park entrance. Immediately south of the manager's residence is a double garage and west of the residence is the maintenance shop.

Picnic Area

Three and a half ft (1 m) of water is backed up by an 80 ft (128 m) wide dam on the river. Water from behind the dam is piped to the swimming pond. There are 53 picnic tables surrounding the swimming pool. The main building in this area is a bathhouse with changing rooms, toilet facilities, and space for fast food service. This food service area is used for storage. Just north of the bathhouse is a small storage shed.

Campground Area

The park has two campground loops with a total of 44 spurs. One loop lies south of the entrance road in a heavily wooded area, and the other is southwest of the entrance road in open prairie. Eight of the 44 spurs have electrical hook-ups. Between the two spurs is a large picnic shelter with sanitation facilities including toilets, sinks, and showers. There is a small storage building east of the campground loops. A primitive group camp, Coneflower Campground, is located west of the administrative area.

Trail System

There are currently 4 mi (6.4 km) of hiking trails in the park. The majority of these trails are north of Buffalo River and meander through the prairie and along the river. A short .5 mi (0.8 km) loop is located south of the river. See the Existing Trails Map, M 9, for the location of these trails.

There are no designated ski touring trails in the park. However, skiers use the area.

Currently, snowmobilers are not allowed in the park. See p 63 for a discussion of future snowmobile trail development.

M 7

85

10

9

72

Buffalo River

Burlington Northern R.R.

I

II

III

IV

V

VI

VII

VIII

Legend

- Northern Hardwoods
- Oak Savanna
- Dry Prairie
- Old Field
- Willow·Aspen Brush
- Wet Prairie

N

Miles 0 500' 1/4mi. 1/2mi. 1mi.

Kilometers 0 500m 1km

Buffalo River State Park

Burn Units

Legend

- Contact Station
- Administration Area
- Primitive Group Camp
- Interpretive Center
- Campground
- Parking
- Restrooms
- Trailer Sanitary Station
- Beach
- Picnic Area

960

10

11

1000

1040

960

N

Miles 0 1/4mi. 1/2mi.

Kilometers 250m 1/2km

Buffalo River State Park

Existing Development

PROPOSED DEVELOPMENT

Visitor Contact, Roads, and Parking

Objectives:

To provide safe, slow-paced, vehicular access, which has minimal impact on the resources, to all major facilities within the park

To provide readily available information and orientation to park visitors

To provide efficient, effective facilities for park management

Action #1. Construct a new contact station/park office at the present location.

The existing building is too small. It has no running water and no indoor toilet.

Cost. $90,000

Action #2. Construct two new parking lots east of the existing picnic/beach parking lot.

The present parking lot, constructed in the late 1930s, is too small for present use at the swimming beach/picnic ground. Adding two additional 60 car parking lots will solve this problem. One of these parking lots will also serve the interpretive/trail center.

Cost. $60,000

Action #3. Explore the feasibility of weekend bus service from Moorhead to the park.

Cost. None

Picnicking

Objective:

To provide an open location with a shelter building to serve group picnic activities

Action #1. Construct a 1,800 sq ft (167 sq m) picnic pavilion with tables and grills to accommodate 120 people.

The existing picnic area has no roofed shelter. Since a number of people may set aside the day for a group picnic, a shelter permits the activity to continue in spite of bad weather. The proposed location for this shelter is east of the existing parking lot near the bathhouse. The heavy use of the existing picnic area has resulted in compaction, root damage, and erosion. This facility will relieve the pressure on the existing picnic area downstream from the bathhouse, facilitating regeneration of the resources.

Cost. $90,000

Action #2. Clear the level area near the group picnic shelter for group activities.

The group picnic area will need a level grassy area for informal group activities. The proposed site north of the old entrance road is in an abandoned gravel pit area.

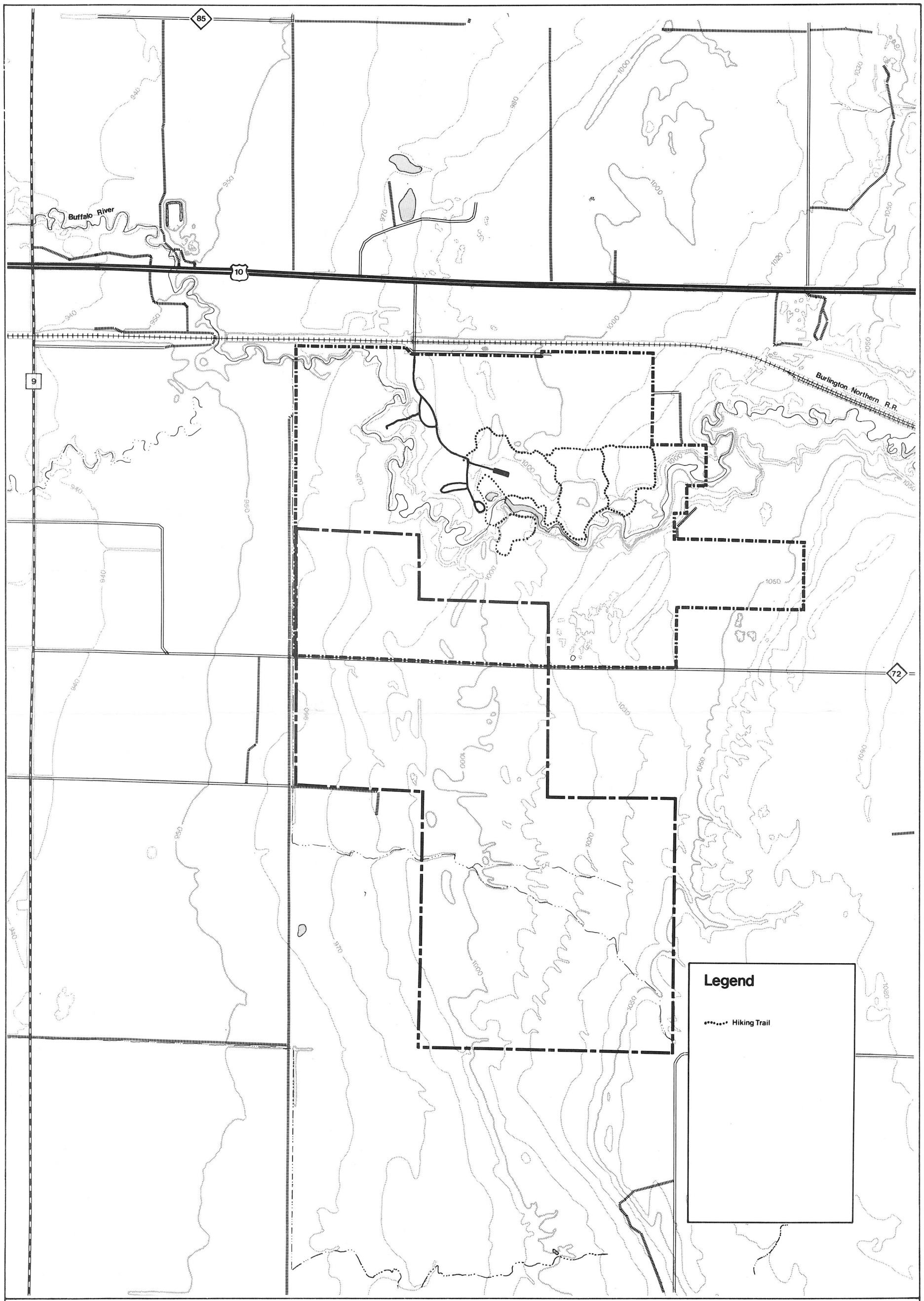
Cost. $5,000

Trails

Objectives:

To provide a trail center for year-round use

To provide access to the outstanding features of the park

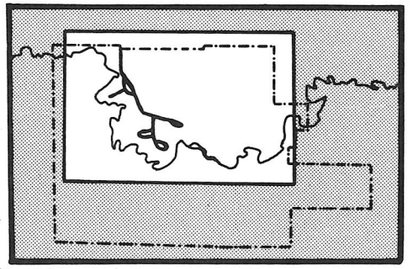


Buffalo River State Park

Existing Trails

Legend

- Contact Station
- Administration Area
- Primitive Group Camp
- P Interpretive Center
- P Campground
- P P Parking
- Restrooms
- Picnic Area
- Trailer Sanitary Station
- Beach
- P Walk-in Camping
- P Scenic View
- P Trail Shelter
- P Picnic Shelter
- P Proposed



N

Miles 0 1/4mi. 1/2mi.

Kilometers 0 250m 1/2km

Buffalo River State Park

Proposed Development

M 11

85

Buffalo River

10

9

Burlington Northern R.R.

72

Legend

- Hiking Trail
- Bridge
- Hiking and Cross Country Skiing Trail
- Trails for the Handicapped

N

Miles 500' 1/4mi. 1/2mi. 1mi.

Kilometers 0 500m 1km

Buffalo River State Park

Proposed Trails

To develop a trail system which has minimal impact on the resources and avoids sensitive areas

To develop a trail system of sufficient length to provide a satisfying experience for the trail user

Hiking

Action #1. Integrate the existing hiking trails, shown on the Existing Trails Map, M 9, with a system of mowed firebreaks.

These trails will provide park visitors an opportunity to experience the prairie and the other outstanding features of the park. Trails will also serve as firebreaks for controlled burns and the control of wildfires. All firebreaks will serve as hiking and ski touring trails. The ski touring trails will be signed and groomed north of Cty Rd 72. The ski touring trails may be groomed south of Cty Rd 72 only if use warrants it. New "you are here" pictorial signs will be installed at appropriate intersections.

Cost. See Vegetation, p 43

Action #2. Develop a hard-surfaced trail, 1.25 mi 2 km) long (see Proposed Trails Map, M 11), to provide the handicapped and elderly with access to the prairie on the north side of the Buffalo River.

This trail, which would be aligned along the riverbank, would provide a connection to the proposed trail/interpretive center and provide a view of the prairie north of the river. The trail would go past the old surfaced access road and up the hill from the existing parking lot.

Cost. $25,000

Action #3. Construct at least three observation decks or blinds for interpretive purposes.

A trail spur with an observation deck/blind should be constructed at areas of special interest such as prairie chicken booming grounds, fen areas, and mima mounds.

Cost. $4,000

Action #4. Replace the flood-damaged foot bridge downstream from the dam (see Proposed Trails Map, M 11).

There are no bridges in the park. A pedestrian bridge installed in 1977 was severely damaged by the 1978 flood waters. This bridge was designed to permit water to flow over it. The spring flood of 1978 pushed an enormous pile of debris against the bridge, wrenching it from its piers. The replacement bridge will be a floating bridge that permits the river to displace it during high water. This bridge will be built with matching federal flood damage funds.

Cost. $10,000

Action #5. Construct a clear-span bridge near the foot bridge which is capable of supporting maintenance vehicles.

This bridge would provide access to the acreage south of the river, facilitating control and maintenance. This is particularly important when control of fire is considered. See the Proposed Development Section of the MPD for possible design.*

Cost. $30,000

Ski Touring

Action #6. Develop a system of ski touring trails, as illustrated on the Proposed Trails Map, M 11

*See p vi for information on the availability of the MPD.

There is a demand for ski touring trails in the area. This action would provide about 15 mi (24 km) of ski touring trails. A large snowmobile drag unit is now available to maintain these trails.

Cost. $3,750

Action #7. Construct a self-guided interpretive trail.

This trail would have descriptive materials that highlight the special features of the park. It would be designed to accommodate special populations such as the physically handicapped. A descriptive brochure which highlights unusual features will be developed and made readily available for hikers. Initially, the handicapped accessibility trail along the river would be used as the self-guided interpretive trail. As the interpretive program is developed, it may be appropriate to relocate the interpretive trail.

Cost. $5,000

Snowmobiling

Currently, snowmobiling is not allowed in the park. The park is too small to provide a long enough trail for a good user experience. There would be too few miles to justify the expense of development. Also snowmobiles are prohibited in scientific and natural areas.

If a grant-in-aid snowmobile trail is developed in the vicinity of Buffalo River State Park, a connecting link to the trail/interpretive center would be considered, provided sensitive areas are avoided.

Water Activities

Objective:

To continue to provide a swimming facility

Action #1. Drill a well to supplement the water supply to the swimming pond.

Samples of the river water, now the main source of pond water, have a coliform count above a satisfactory level for public swimming. However, similar tests have indicated that the water quality in the swimming pond is higher than in the river. This suggests a certain amount of higher quality groundwater must be seeping into the swimming pond. This is supported by the fact that there are flowing (artesian) wells nearby. Drilling a well will increase the amount of groundwater in the pool, increasing the water quality.

Cost. See Surface Water, Action # 1

Camping

Objectives:

To allow visitors to enjoy the park resources 24 hours a day

To provide well-screened campsites accessible by car, located in a natural setting

Action #1. Develop an additional loop with 20 spurs north of the present loop, as use warrants.

Although present use shows 80 percent occupancy on busy weekends, increase in the demand for camping is expected. Most of the existing campsites are in an open area with little shade. There are nine sites in "C" loop which are shaded by mature trees, especially oak. These trees suffer from soil compaction caused by overuse. This portion of

the campground should be phased out to allow resource recovery. Additional trees and shrubs should be planted to screen campsites from the entrance road. The proposed campground area is relatively open. Some young deciduous trees planted at the edge of the prairie will in time provide shade to the proposed campground expansion.

Cost. $100,000

Action #2. Develop six walk-in campsites in two separate clusters.

These campsites will be widely spaced, well-screened, and located in a natural setting. A fire ring, picnic table, and a level area for a tent will be provided at each site. A pit toilet and water supply will be provided in the vicinity. The proposed location is near the river on the east end of the park. (See Proposed Development Map, M 10) These campsites would be about 1.5 mi (2.4 km) east of the swimming pond/picnic area. Service vehicles could use the trail for maintenance purposes.

At present, all campers tend to stay near their vehicles and close to other campers. Walk-in/bike-in campsites provide an alternative camping experience.

Cost. $3,000

Action #3. Build an 8' x 16' (2.4 m x 4.8 m) adirondack lean-to to serve as an auxiliary trail shelter.

This lean-to would be equipped with a reflector-style fire ring to be used as a supplementary warming area on the ski touring trail. Its recommended location is in the general vicinity of the walk-in campsites near the east end of the park boundary (see Proposed Development Map,M 10).

Cost. $3,000

Utilities

Objective:

To minimize unnatural visual intrusions in the park

Action #1. Move the high-voltage power distribution line to the north edge of the park along the base of the railroad grade.

This action would reduce the visual impact of the line. It would also provide better access to the line for power company employees.

Cost. $20,000

ARCHITECTURAL THEME

The park buildings are fairly simple in design. The cut granite of the 1930s buildings is topped by gabled roofs and generous overhangs. Newer buildings, while lacking cut stone, also are simply designed with gabled roofs. All building exteriors, except for masonry walls, are painted brown.

The design of all new buildings should relate to the prairie vistas and the riverine woods. They should also be energy efficient. The consideration of sod roofs, earth bank, wind shelters, and both passive and active solar collection suggests a building reflecting the low silhouette of a pioneer sod hut. Since all existing development is north of the river, it is recommended that additional development also be located there. This would efficiently use existing roads and parking lots and leave the prairie south of the river undisturbed.

VISITOR SERVICES

Objectives:

To orient the park visitor to the park facilities

To interpret the park's natural resources for visitors

To allow the public to become aware of an environment which differs from their everyday surroundings

To interpret the Red River Valley Biocultural Region which Buffalo River exemplifies

To provide a place for interpretive programs, displays, and classroom-like facilities

To provide a gathering place to orient the park visitor before starting out into prairie habitat

Visitor Information/Orientation

The visitor's first contact with park personnel is at the contact station located 0.5 mi (0.8 km) from the park entrance sign. Here the visitor pays entrance and camping fees and obtains information.

Additional signing on major travel routes is needed to inform passersby of the existence and location of the park. This need is the greatest on TH 9 and I 94.

Interpretive Program

A volunteer naturalist has conducted interpretive programs in the park during the summer months. Nature hikes and slide presentations are the mainstay of the interpretive program. The shelter building in the campground and the stone shed in the picnic area are nature centers for interpretive programs.

Interpretive Themes

Buffalo River/Bluestem Prairie can play a vital role in interpreting the Red River Valley Biocultural Region. This park encompasses some of Minnesota's last and best native tall grass prairie.

Because Buffalo River is the best representative sample of the Red River Valley Biocultural Region, (see map, p 16), it may be identified as a "nodal" park. One other park in the same biocultural region, Old Mill State Park, has some prairie, but not to the extent in Buffalo River. Old Mill will serve as a "satellite" or auxiliary prairie demonstration area.

Thematic emphasis at Buffalo River/Bluestem Prairie should focus on the aesthetic experience of the prairie environment - the flat expanses broken by slightly elevated beach ridges or wooded, meandering watercourses; the color, variety, and dynamics of prairie biotic communities; and the human-impact on the prairie.

The prairie is not well understood by most people. Interpretive programs will allow the public to become familiar with the interesting plant and animal species that inhabit the prairie, and the effectiveness of fire as a management tool.

The following list highlights the resources which can be effectively interpreted.

<u>Biology</u>

- Prairie plant communities
  - Dry, mesic, and wet
- Riverine forest
  - Interaction on prairie/forest edges
- Fens
- Stream life
- Prairie wildlife

Geology

Lake Agassiz and its beach ridges
Channel deposits exposed by erosion
Fossil bones exposed by erosion

Prehistory

Prehistoric travel routes and cultures of this area

History

Prairie settlement and pioneer lifestyles of this area
Red River Oxcart Trail which connected Pembina, North Dakota to St. Paul

Interpretive Facilities

The existing shelter building in the campground and the stone shed in the prairie area have been used for interpretive programs and displays. Neither of these facilities functions satisfactorily in this capacity.

The physical developments necessary to carry out an interpretive program include: development of a trail/interpretive center with permanent displays, self-guided trails, interpretive brochures, and field exhibits.

Action #1. Construct an energy efficient solar heated interpretive/trail center, with an auxiliary heating system for year-round use.

The center would serve a dual purpose as an interpretive/trail center. It would provide visitors with shelter and orientation before they go out on the trail. There would be display areas for interpretive programs, a preparation room for education programs, and a large room that could be divided into two classrooms. The building would be designed for energy efficiency, with an active solar collector. It would have a backup fossil fuel heating system. Its proximity to the campground will encourage use by campers. In winter, this building can be used for snowshoe hiking and ski touring.

Cost. $300,000

Environmental Education

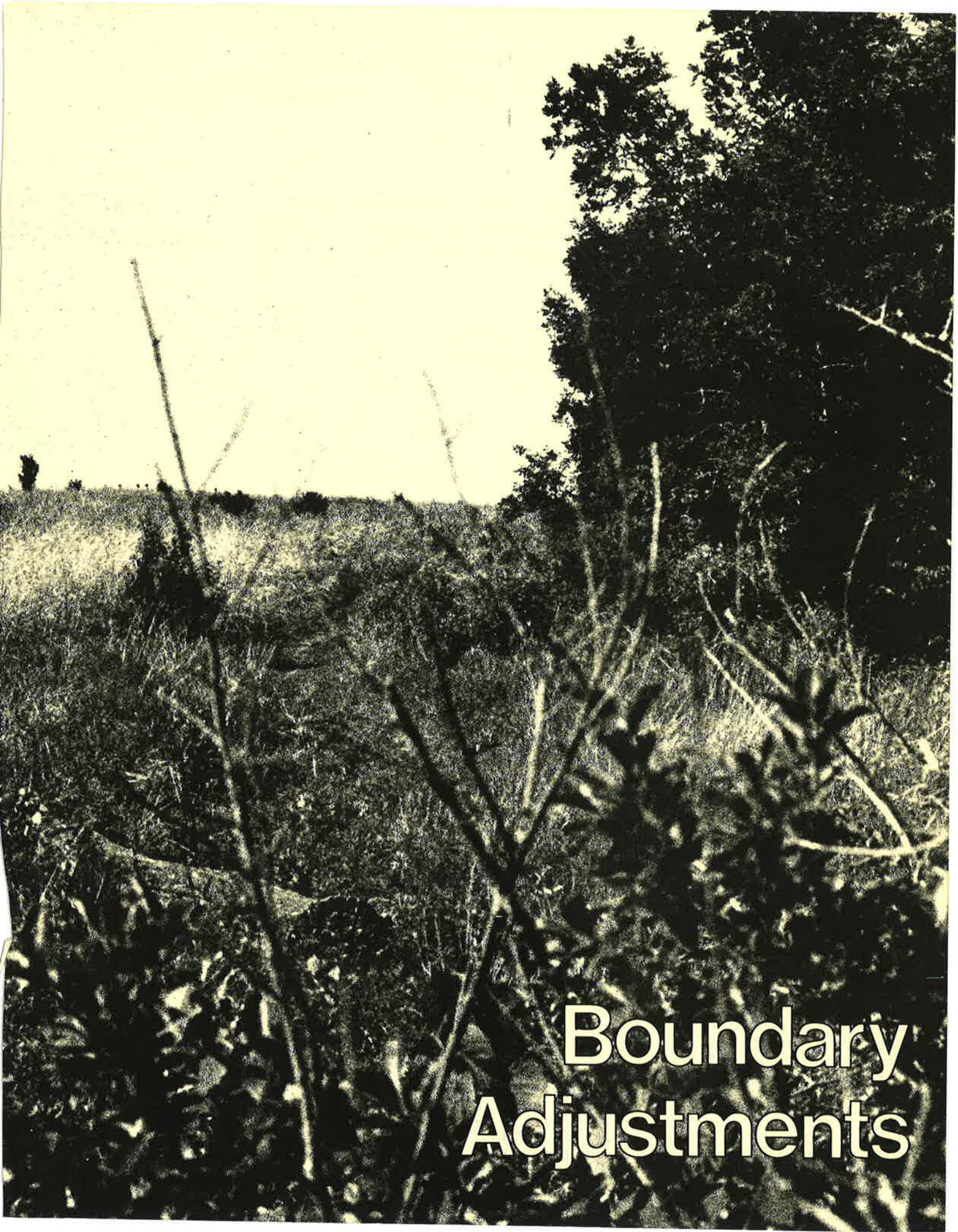
The nearby location of a major population center and the existence of three colleges and universities within a short distance of Buffalo River/Bluestem Prairie ensures an adequate clientele for an environmental education program. Some possible ways to promote environmental education include:

1. Teacher training on how to use the park for environmental education.
2. Worskshops and special seminars.
3. College courses offered at the interpretive center.
4. Detailed lesson plans developed by DNR staff and distributed to educators.
5. DNR staff-conducted programs.

Nearby Interpretive Programs

The Red River Valley Historical Society Heritage Interpretive Center has plans for a system of interpretive centers which will focus on providing a comprehensive overview of valley history. The proposed main center in Moorhead will provide a general overview of the history of the entire Red River Valley. Satellite centers, located in other communities in the valley, will focus on more specific historical themes, such as the farm homestead and the Pembina border experience.

This program will not duplicate the interpretive program at Buffalo River/Bluestem Prairie, but will complement it. One exhibit among many in the Moorhead interpretive center will serve as a general introduction to the prairie, prairie vegetation, wildlife, prairie management, and the prairie's impact on man. Thus Buffalo River/Bluestem Prairie will serve as a satellite interpretive center to the Historical Society's interpretive center at Moorhead.


Boundary
Adjustments

BOUNDARY ADJUSTMENTS

Present Statutory Boundary

Buffalo River State Park had five boundary adjustments between 1937 and 1968. The original park encompassed 241.36 acres (97.7 hectares). Expansions during the 1960s brought the park up to its present total of 1,248 acres (505 hectares). Of this, the state of Minnesota owns 998 acres (403 hectares). The Conservancy owns 210 acres (84 hectares) within the statutory boundary. An additional 40 acres (16 hectares) is privately owned (see Boundary Adjustments Map, M 12).

Proposed Expansion

Objectives:

To provide sufficient park acreage to protect and perpetuate the natural resources

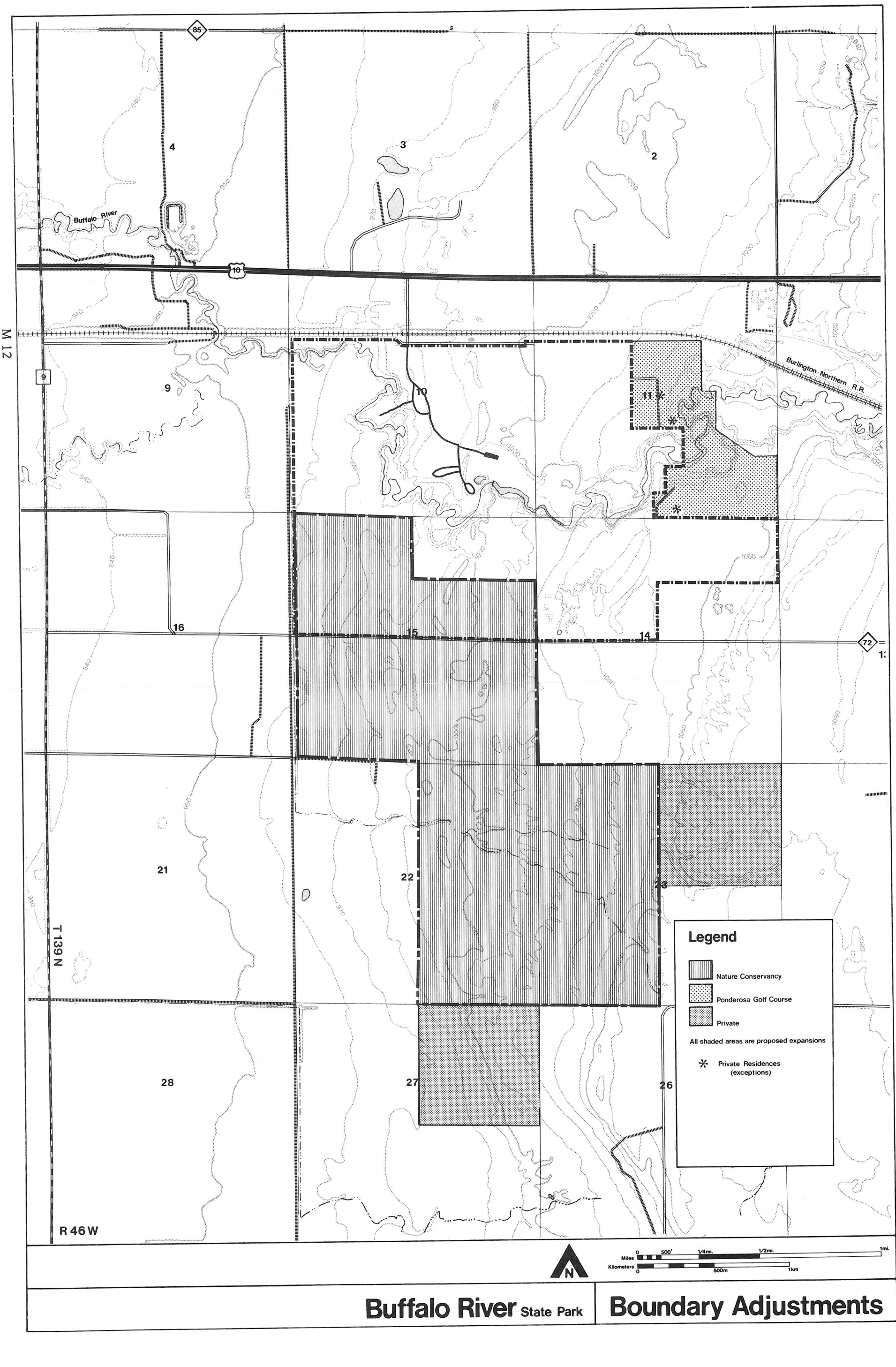
To provide the necessary recreational facilities

To interpret and enjoy these resources without including acreage that would be unnecessary or unreasonable to purchase

Northeast of the park in Sec 11 T139N R46W, are 200 acres (81 hectares) owned by the Moorhead State University Alumni Association which are developed into an 18 hole golf course. The back nine holes are no longer in use.

It is the recommendation of this plan that the statutory boundary of the park be adjusted to include all of Sec 11 south of the Burlington Northern Railroad right-of-way. There is one large, modern home on the south side of the river included in this expansion.

By such action, the boundary will include land which can be reestablished as native prairie and which can provide additional outdoor recreational facilities.



Buffalo River State Park

Boundary Adjustments

This inclusion would permit the state to negotiate for all or part of the Ponderosa Golf Course. Acquisition of an 80 acre (32.3 hectares) parcel between the present eastern park boundary and the active nine-hole golf course on the north side of the river is advisable. This acquisition would not include the active nine hole golf course, clubhouse, service area, golf driving range, the residence north of the Buffalo River, or the parking lot. It would include 1 mi (1.6 km) of a stream bed.

A second priority acquisition is the inactive nine holes of the golf course south of the river that is reverting to mid-grass prairie.

At the public meeting, May 8, 1979, there was a petition to reopen the back nine circulated by some of the golfers. This petition will be forwarded to the Moorhead State University Alumni Association for consideration. The alumni association is also considering expansion of facilities at this location into a convention center.

The golf course land would serve as an excellent buffer between the prairie area and any nearby future development to the east. If the trail system is extended as shown on the Proposed Trails Map, M 11, the golf course clubhouse could serve as a ski touring center privately operated by the alumni association. This trail could connect the Buffalo River State Park trail system. At such time as The Nature Conservancy Bluestem Prairie becomes a scientific and natural area, it may be prudent to consider including it within the statutory boundary.

Operations and Staffing

OPERATIONS

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

The task of providing services to the public and security for park facilities and resources 24 hours a day, 12 months of the year is monumental. During the busy season, full-time operation is necessary 98 hours per week (8:00 to 10:00 p.m., seven days a week). The remaining hours are covered by the resident manager. During other seasons, there is only part-time operation 98 hours per week, however, maintenance, repair, and park security accounts for many extra work-hours. If these responsibilities are to be met, competent trained personnel is essential.

There are four basic aspects to maintenance and operations:

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

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

STAFFING

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

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

Existing Staff

	Staff Months
Management One full time park manager	12
Contact Station	8
Maintenance	16
Lifeguard	4

Future Staffing Needs

Some actions proposed in the plan, when implemented, will require additional park staff. Some of the most significant potential staff changes are as follows.

Assistant Park Manager

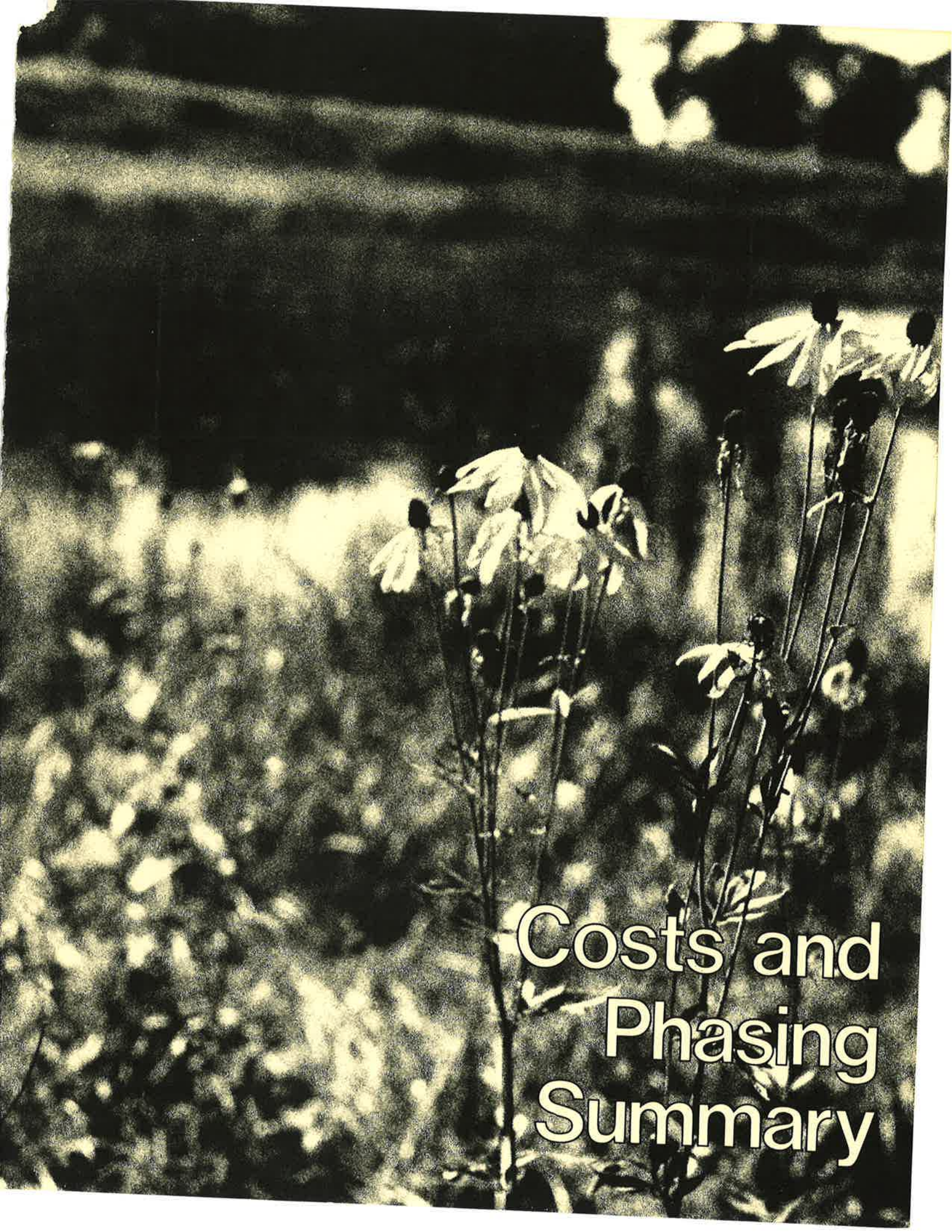
Because of the increase in acreage and number of recreational developments, a nine month assistant park manager is needed.

Interpretive/Trail Center

The interpretive center will require a full time naturalist in the park, particularly during the initial stages of development. Supervision of the trail center will also require additional staff.

Additional Maintenance

Additional trail mileage, walk-in campsites, and firebreak maintenance will require additional staff hours.



Costs and Phasing Summary

The following cost estimates were generated in January, 1979. These cost estimates are based on current prices and available information. As new information is made available and as new or modified programs are initiated, revised cost estimates will be prepared to more realistically represent costs at that time. This plan is intended to be implemented in 10 years. The phases noted suggest the level of funding to be requested each biennium. However, there is no guarantee that this amount of funding will be received from the Legislature. Therefore, some change to these phases can be expected.

Action		Phase / Biennium	1 82-83	2 84-85	3 86-87	4 88-89	5 90-91	Total
RESOURCE MANAGEMENT								
Vegetation Action #1	Implement a program of controlled burning.		$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 10,000
Action #3	Develop and maintain fire-breaks around the prairie to control wildlife and protect property.		1,000	1,000				2,000
Action #5	Cut and remove dead, dying, and unhealthy elms.		1,000	2,000	2,000	1,000	1,000	7,000
Action #6	Identify and map the fens.		SNA Project					
Action #7	Plant a shelter belt of trees in a natural pattern to screen the railroad bed.			5,000	5,000			10,000
Wildlife Action #1	Implement a controlled burning program.		See Vegetation, Action #1					
Action #2	Identify and map prairie chicken booming grounds.		SNA Project					
Action #3	Develop nesting sites for a variety of birds.			1,000		1,000		2,000
Action #4	Construct observation blinds at selected locations.					3,000		3,000
Action #5	Modify the gravel pit area to provide habitat for waterfowl.		5,000	5,000				10,000

Action		Phase Biennium	1 82-83	2 84-85	3 86-87	4 88-89	5 90-91	Total
Action #6	Plant native crabapple and hawthorne near the park manager's residence and shop.				$ 2,000			$ 2,000
Surface Water								
Action #1	Drill a well to provide a replacement water source for the swimming pond.		$ 5,000					5,000
Action #2	Stabilize the river banks.		20,000					20,000
Action #3	Identify and map fens.		SNA Project					
Action #4	Fill north-south ditch and remove trees that border it to restore the original landform.		3,000					3,000
Groundwater								
Action #1	Institute regular testing of water quality.		Operational Budget					
History/Archaeology								
Action #1	Contract out an archaeological survey of the park.				5,000	$ 5,000		10,000
TOTAL RESOURCE MANAGEMENT			$37,000	$16,000	$16,000	$12,000	$ 3,000	$84,000

Action		Phase / Biennium	1 82-83	2 84-85	3 86-87	4 88-89	5 90-91	Total
PHYSICAL DEVELOPMENT								
Visitor Contact, Roads, and Parking								
Action #1	Construct a new contact station/park office at the present location.				$ 90,000			$ 90,000
Action #2	Construct two new parking lots east of the existing parking lot.					$ 60,000		60,000
Picnicking								
Action #1	Construct a picnic pavilion with tables and grill to accommodate 120 people.					90,000		90,000
Action #2	Clear adjacent level area near group picnic shelter for group activities.					5,000		5,000
Trails								
Action #1	Develop a system of mowed firebreaks to supplement the existing hiking trails.		See Vegetation, Action #3					
Action #2	Develop 1 1/4 mi (2 km) limestone-surfaced trail loop north of the river.						$ 25,000	25,000
Action #3	Construct at least three observation decks or blinds for interpretive purposes.		See Wildlife, Action #4					

Action		Phase Biennium	1 82-83	2 84-85	3 86-87	4 88-89	5 90-91	Total
Action #4	Replace the flood damaged bridge downstream from the dam.		$ 10,000					$ 10,000
Action #5	Construct a clear-span foot bridge.			$ 30,000				30,000
Action #6	Develop a system of ski touring trails.		3,750					3,750
Action #7	Construct a self-guided interpretive trail.				$ 5,000			5,000
Water Activities								
Action #1	Drill a well to supplement the water supply to the swimming pond.		See Surface Water, Action #1					
Camping								
Action #1	Develop an additional loop with 20 spurs north of the present loop as use warrants.					$100,000		$100,000
Action #2	Develop six walk-in camp-sites in two separate clusters accessible only by a short hike or by bicycle.		$ 3,000					3,000
Action #3	Build an adirondack style shelter to serve as an auxiliary trail shelter.		3,000					3,000
Utilities								
Action #1	Move the high-voltage distribution line.				20,000			20,000

Action	Phase Biennium	1 82-83	2 84-85	3 86-87	4 88-89	5 90-91	Total
Visitor Services							
Action #1	Construct an energy efficient interpretive/ trail center that has auxiliary heat for year-round use.					$300,000	$300,000
TOTAL PHYSICAL DEVELOPMENT		$ 19,750	$ 30,000	$115,000	$255,000	$325,000	$744,750
TOTAL RESOURCE MANAGEMENT		37,000	16,000	16,000	12,000	3,000	84,000
TOTAL MANAGEMENT BUDGET		$ 56,750	$ 46,000	$131,000	$267,000	$328,000	$828,750

Implementation

AUTHORITY

Division of Parks and Recreation

Once a management plan has been completed and approved, it will become the responsibility of the director of the Division of Parks and Recreation (hereafter referred to as the director) to ensure proper implementation of the recommendations of the plan. As such, the director will act as the coordinator and liaison between the planning staff, regional staff, local officials, and the general public to ensure that the plan is implemented correctly.

In order to ensure the accomplishment of this cooperative planning and implementation effort, the following responsibilities have been established.

The director and staff will:

1) Coordinate and administer field operations as delegated by the deputy commissioner.
2) Develop and administer programs necessary to accomplish plan goals and objectives. Programs include those necessary to implement management plans and to maintain and operate parks and other programs assigned to the Division of Parks and Recreation (hereafter referred to as the division). Specific program responsibilities at this time are: acquisition, development, resource management, maintenance and service operations, interpretive services, and accessibility.
3) Prepare policies, guidelines, procedures, and standards necessary to implement programs established in this plan (e.g., responsibilities related to letting contracts and initiating force account projects).
4) Prepare legislation necessary to provide program funding, boundary changes, and operational authorities.
5) Review and approve all detailed plans, specifications, and project proposals prepared by the DNR, Bureau of Engineering (BOE) or field staff. Coordinate on-site field staking and site layouts with BOE and regional staff.

6) Coordinate divisional administrative functions with other DNR administrative offices.

7) Work with the DNR's federal grant specialists to obtain maximum federal funding (e.g., LAWCON) for all division programs.

8) Recommend modifications and provide information necessary to update the management plan. All major modifications to the recommendations of an approved plan will be processed through the Office of Planning. The director will submit requests for modifications in writing, stating justification for change and what impact the change would have on the overall management plan. If comments and rationale for opposing a proposed change are not received within 25 working days, agreement is implied. In the event that significant change in the direction of the plan is proposed (e.g., altering goals and/or objectives of the plan), it will be necessary to follow the same procedures established in developing the original plan. If the director and the Office of Planning cannot come to an agreement on the requested change, the director will then submit the request to the commissioner's Planning and Environmental Review Team (PERT) which will formulate the final recommendation to be submitted to the commissioner's executive council. If a recommended modification is minor and follows the intent of the plan, the director has the discretion to make the change without following these procedures, provided informal written agreement is reached with the Park Planning section.

9) Assign responsibilities and funding for implementation of the development program to BOE for letting contracts and to the regional staff for initiating force account projects. In addition, the director shall coordinate the implementation of resource management programs.

10) Make recommendations which will expedite the park planning process and evaluate progress toward the achievement of goals and objectives stated in the plan.

11) Forward BOE requisitions and field project proposals in summary form to the Office of Planning so that the progress of implementation can be monitored.

Regional Office

The regional park supervisor will supervise the physical implementation programs as recommended in this plan.

The regional park supervisor will:

1) Coordinate with the regional administrator and other discipline supervisors to obtain qualified staff to implement this management plan. The district forester, wildlife managers, and other specialists should be consulted on specific aspects of the resource management of the plan.
2) Supervise and direct the park manager to ensure that the management plan is implemented correctly.
3) Regularly field inspect all development in the park.
4) Submit written reports on the progress of development programs to the director with copies to the regional administrator.
5) Submit information to faciliate plan updates and changes. All recommendations for change will be submitted in writing to the director. Rationale and analyses of the impact a requested change might have on the plan must be included in this request.
6) Submit project proposals to the director for review and approval. The director and staff will review all project proposals verifying compliance with the intent of the plan.

The region may implement approved project proposals after detailed specifications have been prepared and funding has been provided.

Park Manager

It will be the responsibility of the park manager, under the direct supervision of the regional park supervisor, to coordinate the physical implementation of assigned sections of the management plan. The manager will inform the regional supervisor concerning the progress of the implementation through project proposals and written progress reports.

The park manager will:

1) Seek the assistance of the regional park supervisor in the resolution of any major implementation problems.
2) Consult with the regional park supervisor if there is uncertainity, concern, or opposition to a recommendation of this plan.
3) Assist and give direction to park field personnel.
4) Maintain records on the progress of development projects to ensure continuity and reference for future updating and revision.
5) Work with the regional park supervisor in initiating project proposals to be submitted to the director for review and approval.
6) Submit to the regional park supervisor information to aid in the updating and revision of the plan.

Office of Planning

The Office of Planning and Research will evaluate implementation of the management plan and make recommendations to the director if it appears revisions are necessary.

The Office of Planning will:

1) Review BOE requisitions.
2) Process all modifications to the approved management plan.
3) Provide additional information and justification for specific recommendations of this plan when requested by the division.
4) Maintain contact with the public, local officials, legislators, and DNR staff regarding the updating of the plan.

IMPLEMENTATION OF RESOURCE MANAGEMENT PROJECTS

There are two procedures for the division to follow in the implementation of resource management projects: contract and force account.

Contract

Director initiates a project by preparing the management program, in compliance with this plan.

Director distributes copies of the preliminary program and drawings to the regional staff for review.

Director approves project and initiates bidding process through the Department of Administration, Division of Procurement.

Director supervises and monitors the program.

Consultant or contractor, in coordination with divisional and regional staff, completes this project.

Director approves the completed project.

Force Account

Director initiates a project by preparing the management program, in compliance with this plan.

Director distributes copies of the preliminary program and drawings to regional staff for review.

Director assigns funds to the regional park supervisor.

Regional park supervisor and resource staff prepare a detailed resource management program.

Detailed resource management program is submitted to the director for approval.

Once approved, the regional park supervisor and resource manager may:

Assign the park manager and field personnel to implement the program

Prepare contracts to be let to local contractors or consultants

Regional staff supervises project.

Director and staff monitor the overall progress of the resource management program.

Regional park supervisor notifies the division that the project has been completed as planned.

IMPLEMENTATION OF DEVELOPMENT PROJECTS

There are two procedures for the division to follow in the implementation of development projects: contract and force accounts.

Contract

Director initiates project by preparing a development program which complies with this plan.

Director distributes copies of preliminary program and drawings to the regional staff for review.

Director requests BOE to prepare detailed drawings and specifications in accordance with the approved program.

BOE submits drawings and specifications to the director.

Director approves drawings and specifications, ensuring compliance with the objectives and goals of this plan.

Force Account

Director initiates a project by preparing a development program which complies with this management plan.

Director distributes copies of the preliminary program and drawings to regional staff for review.

Director assigns funds to the regional park supervisor.

Regional park supervisor may:

Request that BOE prepare detailed drawings and specifications for review by the director

BOE processes contract documents through the Department of Administration, Division of Procurement for bidding and contract award procedures.

BOE provides direction to the contractor and establishes site location and field staking.

BOE supervises construction and approves completed work according to contract documents.

Director and staff monitor the progress, funding, and necessary coordination between other state agencies and funding sources.

Assign the park manager to complete the project with field personnel

Assign park manager, in cooperation with the regional staff, to let bids to local contractors

Regional, divisional, or BOE staff will supervise the project depending on the complexity of the specific project.

Regional park supervisor will certify the director that the project has been completed as planned.

Director and staff will monitor the progress of the development program.

MAINTENANCE AND OPERATIONS

The division will provide the regional staff with necessary direction to maintain and operate state parks in a statewide system. Training courses and policy manuals will be prepared by the division on park operations, maintenance, enforcement, signing, and construction standards. If necessary, special operational orders will be prepared by the commissioner for specific problem areas.

General Procedures

The director, in cooperation with the deputy commissioner, will establish policies, guidelines, and statewide procedures for maintenance and operations of all state park facilities.

The regional park supervisors will follow the policies, guidelines, and statewide procedures of the division, as well as commissioner's orders.

The regional park supervisor will supervise and direct the park managers to ensure that park maintenance and operation policies, guidelines, and procedures are followed.

The park manager, under the supervision of the regional park supervisor, will maintain and operate all park facilities.

The director and staff will inspect and review operations of state parks on a regular basis to ensure that statewide procedures are being implemented and followed correctly.