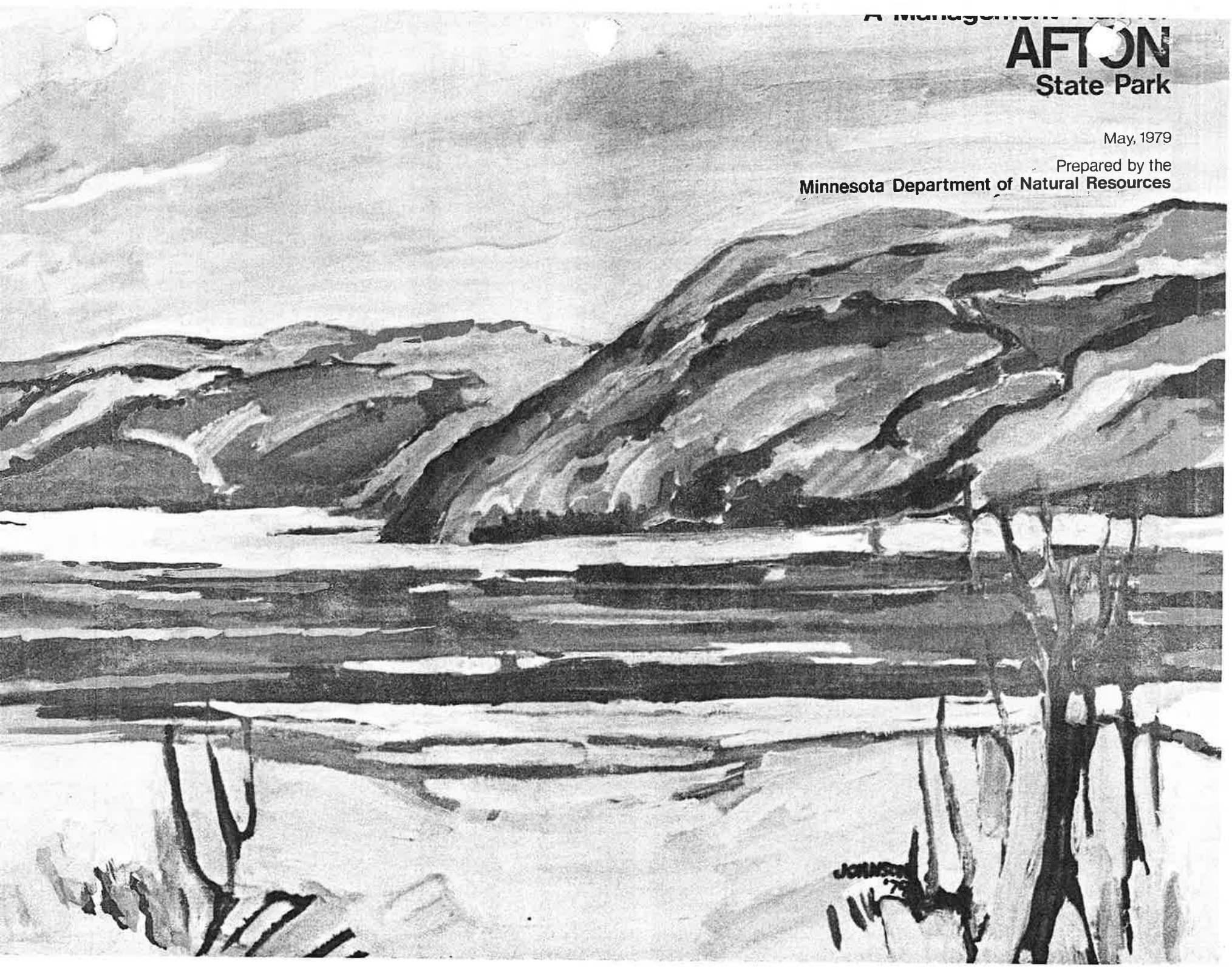


A Management Plan for

AFTON
State Park

May, 1979

Prepared by the
Minnesota Department of Natural Resources

Credits

Prepared for the citizens of the State of Minnesota under the aegis of the Outdoor Recreation Act of 1975. This plan was prepared by the Division of Parks and Recreation, Park Planning Section.

James Dustrude - Recreation Resource Project Leader
Franklin Svoboda - Recreation Resource Project Assistant
Wayland Porter - Recreation Planner Coordinator
John Winter - Park Specialist
Otto Christensen - Park Planning Supervisor
Merle DeBoer - Operations Specialist
Linda Magozzi - Editor
Norm Holmberg - Graphic Specialist
Greg Rosenow - Graphic Specialist
Gail Deery - Word Processor Technician
Lori Anthonsen - Word Processor Technician
Nancy Wright - Clerk Stenographer
Joan Bieniek - Clerk Stenographer
Judy Johnson - Illustrator, Photographer, Para-Professional
Wendy Stone - Para-Professional
Pat Ivory - Para-Professional
Jim Dosedel - Para-Professional
Douglas Benson - Para-Professional
Greg Decker - Para-Professional
Jeff Harmes - Para-Professional

Technical Support and data for this plan was provided by DNR Region IV staff.

Calvin Kontola - Park Manager, Afton State Park
Bill Weir - Regional Park Supervisor
Lucy Seaver - Regional Park Naturalist
Lawrence Westerberg - District Forester
Lloyd Knudson - Area Wildlife Manager
Ron Harnack - Regional Hydrologist
Roy Schultz - Hydrologist
Ed Feiler - Area Fisheries Manager
Kermit Piper - Area Conservation Officer

Various other agencies provided supporting data and assistance. Funds for the planning efforts were made available by the Legislature through the State Planning Agency which also reviewed completed plans.

Minnesota Historical Society
Minnesota Department of Transportation

Table of Contents

All the cost estimates in this plan are based on 1976 dollars.

The appendices to this management plan are available upon request from:

Park Planning
Minnesota Department of Natural Resources
Space Center, 2nd floor
444 Lafayette
St. Paul, MN 55101

Purpose of Plan

MANAGEMENT AND DEVELOPMENT PHILOSOPHY

Minnesota is blessed with an abundance of high quality resources and, even more importantly, with leaders who have the wisdom and foresight to protect these resources. As a result, Minnesota today has one of the finest state recreation systems in the country. The Department of Natural Resources, with the assistance of concerned lawmakers, conservation and recreation groups, and private citizens, intends to do its utmost to provide planning that will be responsive to the needs of this generation while protecting the birthright of the next.

The management and development philosophy for the Minnesota State Park System consists of two major objectives. The first is the protection of the natural resources within the recreation system. Without this protection, a resource can be destroyed in an alarmingly short period of time. Thus, protection benefits not only future generations, but present-day users as well. The second objective is maximizing the recreation opportunities available to the user, both in terms of quality and variety. It is the Department of Natural Resources position that every citizen should share in the beauty and recreational opportunities of Minnesota's natural resources as well as the responsibility for maintaining and preserving them.

Obviously, there are going to be situations where use and preservation conflict. Every attempt will be made to reconcile these conflicts by the use of responsible management and development techniques. When this is not possible, however, the primary concern must be preservation of the resource. Allowing our resources to deteriorate would not only jeopardize high quality recreation for this generation but for future generations as well. To maintain a high quality recreational experience, it may be necessary to limit the number of people using a unit at a given time or to restrict certain activities within that unit. When this occurs, an attempt will be made to provide these activities at a nearby unit that has a higher tolerance to use.

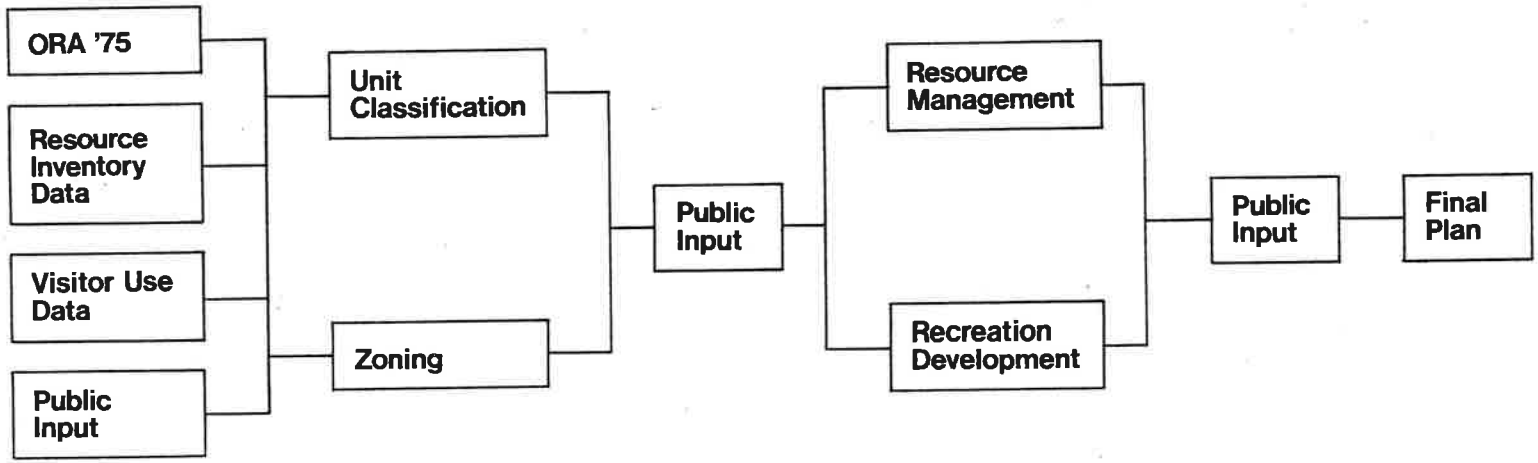
In planning management and development of the various units, the Department of Natural Resources will consider probable future impacts which would affect each unit. In spite of this, unforeseen circumstances are bound to occur. Therefore, each plan should be reviewed periodically to see that it is still relevant in light of current conditions. While a plan can and should be modified if conditions change, nothing should be done that would be detrimental to the objectives set forth in this philosophy.

OUTDOOR RECREATION ACT REVIEW

The Outdoor Recreation Act of 1975 (ORA '75) was enacted by the Minnesota Legislature to "preserve an accurate representation of Minnesota's natural and historical heritage" and to "provide an adequate supply of scenic, accessible, and usable lands and waters to accomodate the outdoor recreation needs of Minnesota's citizens." In an effort to improve long-range planning for the state recreation system, the legislature has directed that management and development plans be prepared for each unit in the system.

ORA '75 also redefined certain recreation unit classifications. For example, the state park classification was divided into Recreational State Parks and Natural State Parks. As a part of the over-all planning process, the classification of each unit will be reviewed to see that it is consistent with the resources in that unit. These plans will be used as a guide for developing management policies and planning recreation facilities in each unit. The ORA '75 also states that after August 1, 1977, no development funding will be permitted for any unit until a management and development plan has been completed and reviewed for that unit. By authorizing this planning program, the legislature has taken a significant step toward building a state recreation system in which every Minnesotan can take great pride.

Planning Process Diagram



Summary of Plan

INTRODUCTION

Afton State Park is located in east central Minnesota in Washington County on the west shore of the St. Croix River, approximately 15 miles north of Hastings. The 7-county metropolitan area is highly urbanized, yet over 50% of the land area is under cultivation, pastured, or abandoned fields. Sixteen different ecological communities occur within the park with old fields being the most prevalent. Afton's landscape varies from broad, rolling fields to steep wooded ravines to the shoreline of the St. Croix.

This management plan for Afton State Park will:

- Provide an inventory of the resources.
- Provide detailed strategy and steps to be taken to best manage both natural resources and recreational development. Specific management recommendations will include:
  - Restoration of the original oak savanna plant communities.
  - Maintenance of a variety of age and structure in plant communities in order to enhance wildlife habitat.
  - Development of trail-side picnicking and camping opportunities.
  - Completion of key parcel acquisition within four years so that the park can officially be opened.

CLASSIFICATION

Afton State Park has been recommended for classification as a natural state park, largely because it is a relatively unspoiled piece of land in a metropolitan area that has virtually no other public areas available for low density, natural experiences.

GOAL

The management goals of Afton State Park are to restore the presettlement plant communities of the area to as natural a state as possible and to provide an opportunity for low intensity nature-oriented recreational experiences easily accessible to residents of the Twin Cities area.

GENERAL OBJECTIVES

To zone Afton State Park, protecting steep slopes and fragile areas from potentially destructive recreational uses

To minimize erosion, improving the water quality of streams within the park

To restore as accurately as possible the original oak savanna - dry prairie ecosystems which existed in the area prior to settlement and land clearing by Europeans

To provide opportunities for low-intensity camping, picnicking, and trail activities

To provide orientation/interpretation services

RESOURCE INVENTORY AND MANAGEMENT

Water Resources

Inventory - The topographic diversity of Afton has resulted in a wide range of depths to the water table. There are several existing domestic wells in the park ranging from 169' to 600'.

The only surficial water bodies within Afton's boundaries are a quarter mile length of Trout Brook and two intermittent streams.

Management - Generally, wells drilled 300' to the Prairie du Chien-Jordan aquifer will produce a sufficient water supply for park users.

Control of erosion on Afton's many steep slopes will prevent sedimentation and siltation of park streams.

Fisheries

Inventory - The intermittent nature of Trout Brook precludes its suitability as a fisheries stream.

Management - Fisheries management in the park will be directed toward providing hike-in fishing access to the St. Croix River.

Soils

Inventory - The majority of the soils in the park pose severe limitations to development because of steepness, surface texture, or depth to bedrock. Some areas within the park have soils suitable for development.

Management - New park facilities will be constructed in areas where the soils are suitable or will be designed to minimize adverse effects on the soils.

Vegetation

Inventory - The park includes 16 various ecological communities. Dominant communities include old fields, agricultural fields, and northern hardwoods. Unique among the vegetational features are: a site near Trout Brook which possesses rich woodland flora; a barren, southwest-facing bluff; and a beach site with white false indigo plants.

Management - The emphasis of management will be the restoration of original plant communities, especially the oak savanna. Prescribed burning will be used as a management tool to maintain the reestablished oak savanna and prairie remnants. There is some oak wilt in the park. Diseased trees will be removed as necessary, to comply with state law.

Wildlife

Inventory - Over 190 species of birds, mammals, reptiles, and amphibians reside within or adjacent to Afton State Park.

Management - Signs of badger activity were found in one of the old fields within the park. Restoration of the oak savanna/prairie communities will enhance conditions for the various rodents on which badgers feed. Artificial nesting holes for wood ducks will be provided until natural cavities form in over-mature trees. Deer populations may need to be reduced if damage to adjacent farm fields becomes a problem. Hunting to reduce the deer population will be done through the issuance of permits and will be limited to hunters using bow and arrow or muzzle-loaded fire arms.

RECREATION INVENTORY AND MANAGEMENT

Existing Development

Significant user data for Afton State Park is not available because the park has not been officially opened. Because of its location on the fringe of the metropolitan area, it is expected to be subject to heavy use when it is developed and open to the public. The functions of a natural state park as defined by the Outdoor Recreation Act 1975 are ". . . primarily for aesthetic, cultural, and educational purposes . . . and shall not . . . accommodate all forms or unlimited volumes of recreational use." Automobiles will be restricted to the entrance road leading to central parking areas. The remainder of the park will be developed for hiking, ski touring, trail-accessible camping, picnicking, and other activities.

Proposed Developments

A centralized visitor center will be constructed at the end of the entrance road with major use areas located around and relatively close to it.

A contact station/park office will be constructed near the entrance to the park to function as a control point.

Group picnic facilities will be provided at the south end of the park.

Individual picnic sites and trail-side picnic areas will be provided in the central and northern areas of the park.

Group camp facilities will be provided at the south end of the park.

Trail camping sites will be developed in the northeast sector.

Swimming facilities will be developed along the St. Croix River near the mouth of Trout Brook.

Boat beaching facilities will be provided in strategic locations along the river.

A multi-use trail will be developed to provide access to the park. If county and local recreational facilities are developed, this trail may connect these facilities with the park.

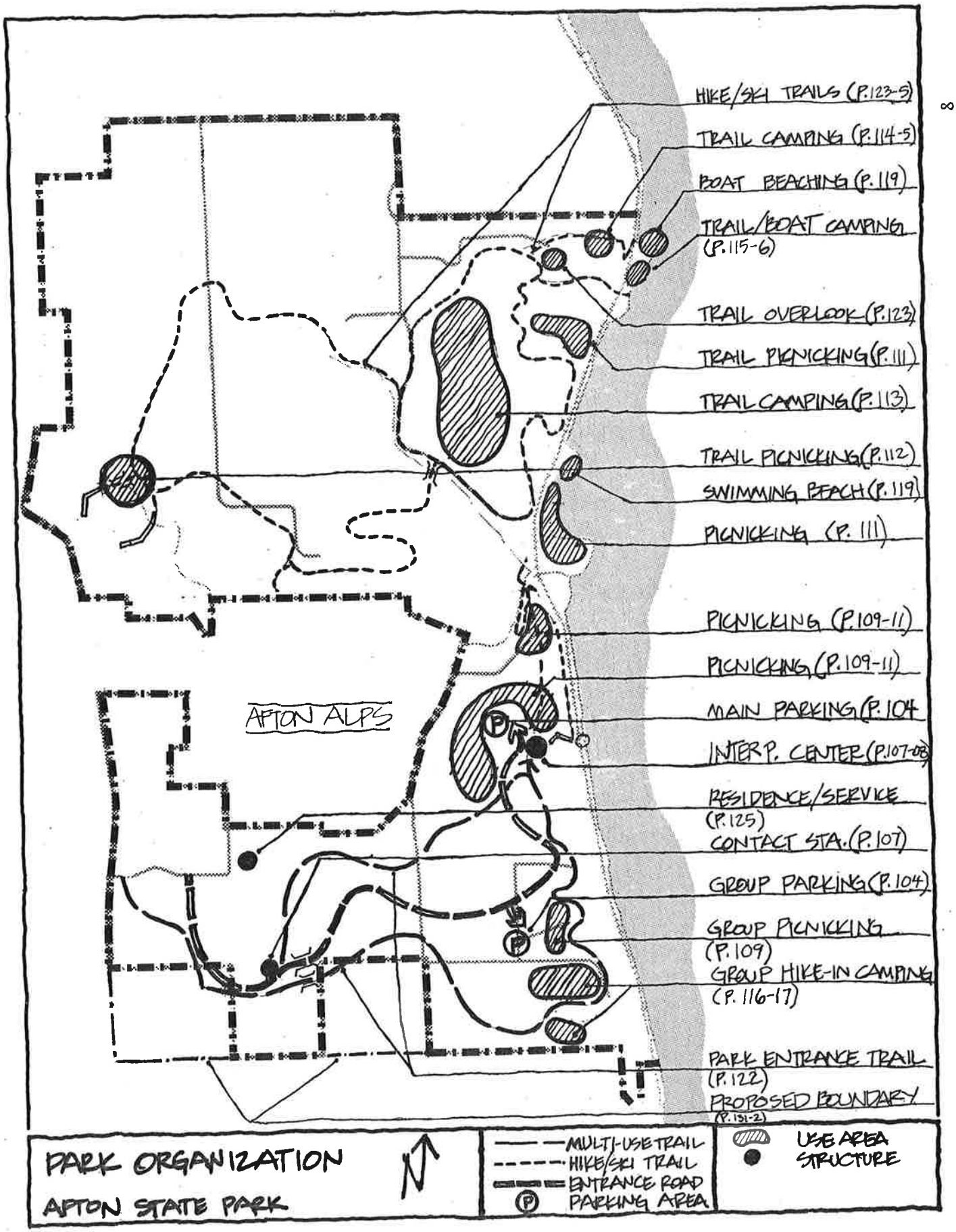
Existing and Proposed Facility Summary

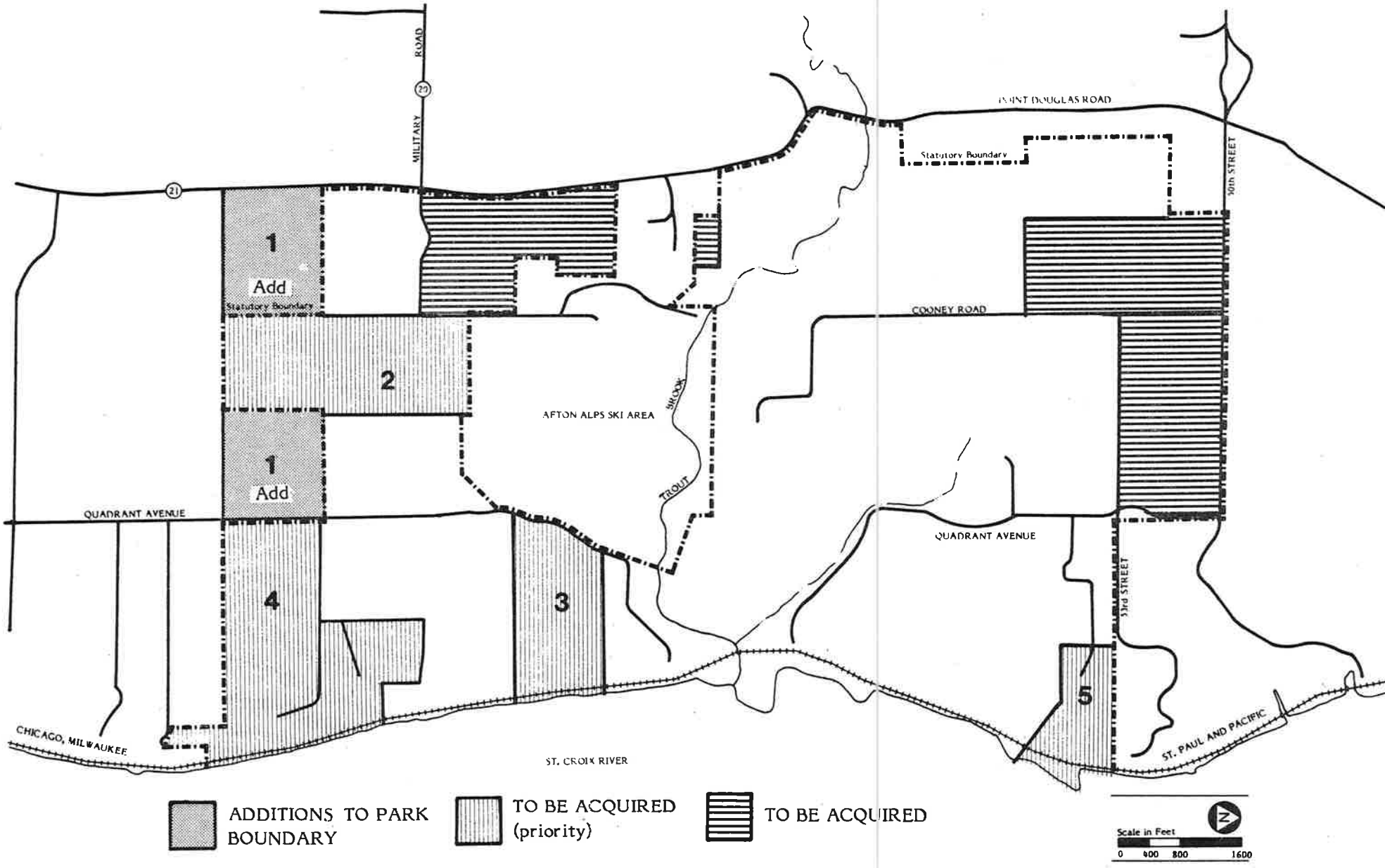
	Present	Proposed
Park Size	1648 acres	1748 acres
Camp sites		
Group Camp	0	26 capacity
Trail Camp	0	60 sites
Picnic Sites		
Group	0	15-30 capacity
Individual	0	125 sites
Trails		
Multi-Use	3 miles	4½ miles
Hiking/Skiing	4 miles	8 miles
Boat Access Points	0	3

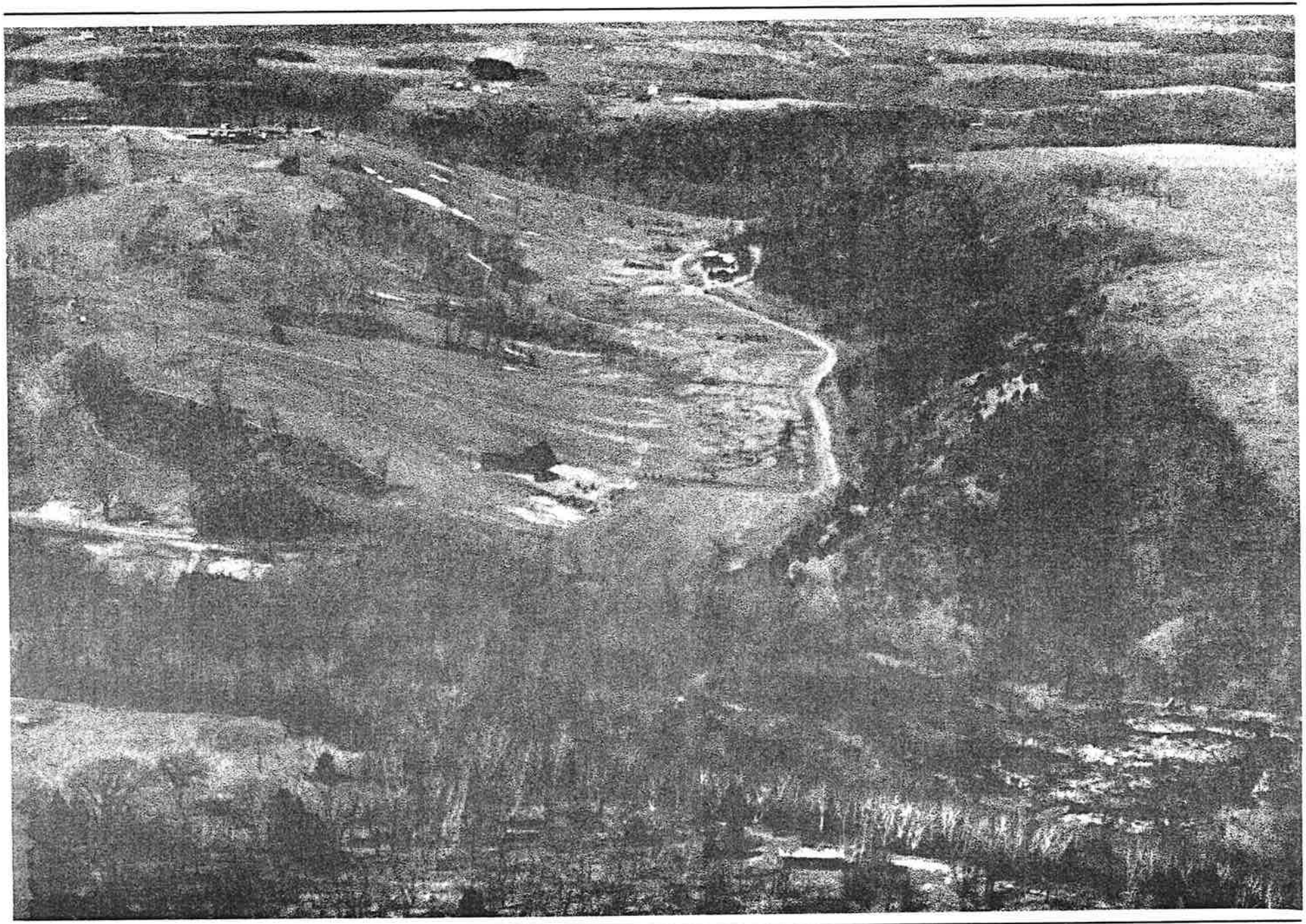
BOUNDARY CHANGES AND ACQUISITION

Approximately 57% of the land in Afton State Park has been purchased by the state. Certain critical parcels in the southern portion of the park have not yet been acquired. Opening of the park is dependent on acquisition of these parcels. It is recommended that acquisition of these key parcels be given top priority and that all avenues of acquisition be pursued to ensure construction of the entrance road and parking facilities by 1981.

About 100 acres are recommended for addition to the park to protect a wooded ravine and provide a buffer between the entrance road and the group camp area and external development.


HIKE/SKI TRAILS (P.123-5)
TRAIL CAMPING (P.114-5)
BOAT BEACHING (P.119)
TRAIL/BOAT CAMPING (P.115-6)
TRAIL OVERLOOK (P.123)
TRAIL PICNICKING (P.111)
TRAIL CAMPING (P.113)
TRAIL PICNICKING (P.112)
SWIMMING BEACH (P.119)
PICNICKING (P.111)
PICNICKING (P.109-11)
PICNICKING (P.109-11)
MAIN PARKING (P.104)
INTERP. CENTER (P.107-08)
RESIDENCE/SERVICE (P.125)
CONTACT STA. (P.107)
GROUP PARKING (P.104)
GROUP PICNICKING (P.109)
GROUP HIKE-IN CAMPING (P.116-17)
PARK ENTRANCE TRAIL (P.122)
PROPOSED BOUNDARY (P.131-2)
APTON ALPS
PARK ORGANIZATION
APTON STATE PARK
MULTI-USE TRAIL
HIKE/SKI TRAIL
ENTRANCE ROAD
PARKING AREA
USE AREA
STRUCTURE


MILITARY ROAD
21
29
SAINT DOUGLAS ROAD
Statutory Boundary
50th STREET
1
Add
Statutory Boundary
2
COONEY ROAD
AFTON ALPS SKI AREA
SILVER
TROUT
1
Add
QUADRANT AVENUE
QUADRANT AVENUE
53rd STREET
4
3
5
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
ADDITIONS TO PARK BOUNDARY
TO BE ACQUIRED (priority)
TO BE ACQUIRED
Scale in Feet
0 400 800 1600



Unit Character

INTRODUCTION

Afton's landscape is varied and interesting. It includes broad, rolling upland fields (originally oak savanna), intricate wooded ravines, and is oriented toward the beautiful St. Croix River. Three major ravines lead down to the river dividing the upland of the park into three major topographic sections. A fourth section, in the middle of the park, contains Afton Alps Ski Resort (not a part of the park) and divides the park into two parts.

Highlights of the park include views of the St. Croix from hills 200+ feet above the river valley, riverside areas including the sand and rock beach along the north half of the park, and the intimate spaces within the wooded ravines, ranging from very enclosed spaces to wider openings surrounded by dramatic hills and bluffs.

The major artificial element within the park boundaries which detracts from its natural character is a high tension power line which passes through the narrow central portion of the park. This creates a major visual, if not biological, impact. Some of the 3+ miles of township roads and cartways are partially sympathetic to the landscape and may ultimately serve some function within the park. There are also five remaining residences in the park.

REGIONAL PERSPECTIVE

The St. Croix River Valley was carved by overflow waters from several large glacial lakes. For a considerable period of time, waters from these sources combined into one huge river causing deep erosion in the lower St. Croix River Valley. An ancient rock ridge at Taylors Falls was more resistant than the surrounding glacial material and sedimentary rocks. As a result, a narrow gorge was cut to form the Dalles of the St. Croix. South of the Dalles, the river cut a wider valley into the softer sedimentary rocks. South of Stillwater, the St. Croix spreads over part of the floodplain to form Lake St. Croix.

The southern part of the St. Croix River Valley was covered by northern hardwoods. Oak openings and barrens, prairies, and big woods communities were intermixed along much of the lower St. Croix. Little of this vegetation remains because of heavy logging during the latter part of the 19th century. The present vegetation is primarily second growth hardwoods such as oak, maple, aspen, birch, and elm. Abandoned fields also make up a substantial acreage.

The major land use in the seven-county metropolitan area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties) is cultivated (31%), with pasture and open fields next (21%). Urbanized areas make up 18% of the land use, open water and marshes cover 9% of the area. The 1975 population was estimated to be 1,928,000, an increase of 54,000 since the 1970 census. The major urban centers are Minneapolis and St. Paul.

The recreational demands of the region are tremendous because of the large numbers of people residing in the area. Fortunately, lakes are abundant and the founding fathers of the two cities saw fit to preserve many of these natural assets in attractive city park systems.

Boating, swimming, canoeing, fishing, and other water-oriented activities are very popular in this area. Downhill skiing and ski touring facilities already exist. Several trail corridors radiate out from the seven-county area. Three of the state's major rivers (the Mississippi, Minnesota, and St. Croix) flow through the region providing ample boating opportunities for either short or extended trips. Afton has the potential for providing a variety of recreational activities, and for being linked to other areas by trails and the St. Croix River.

Data compiled by the Department of Economic Development indicates that the seven metropolitan counties derived $458,440,000 from tourism related expenditures in 1974. This represents approximately 2.5% of the total gross sales within the counties.

In the future, recreational demands will continue to rise in response to increased population and more leisure time. An energy crisis in the future may necessitate seeking recreational activities closer to home. These factors will result in vastly increased pressure being exerted on Afton, requiring careful decision-making and intensive management to protect the resources and the quality of the users' experience.

Sources:

Minnesota State Planning Agency, Development Planning Division, 1975 Pocket Data Book, (Saint Paul: Minnesota State Planning Agency, 1975).

Minnesota State Planning Agency, Office of the State Demographer, Minnesota Population Projections, (Saint Paul: Minnesota State Planning Agency, 1975).

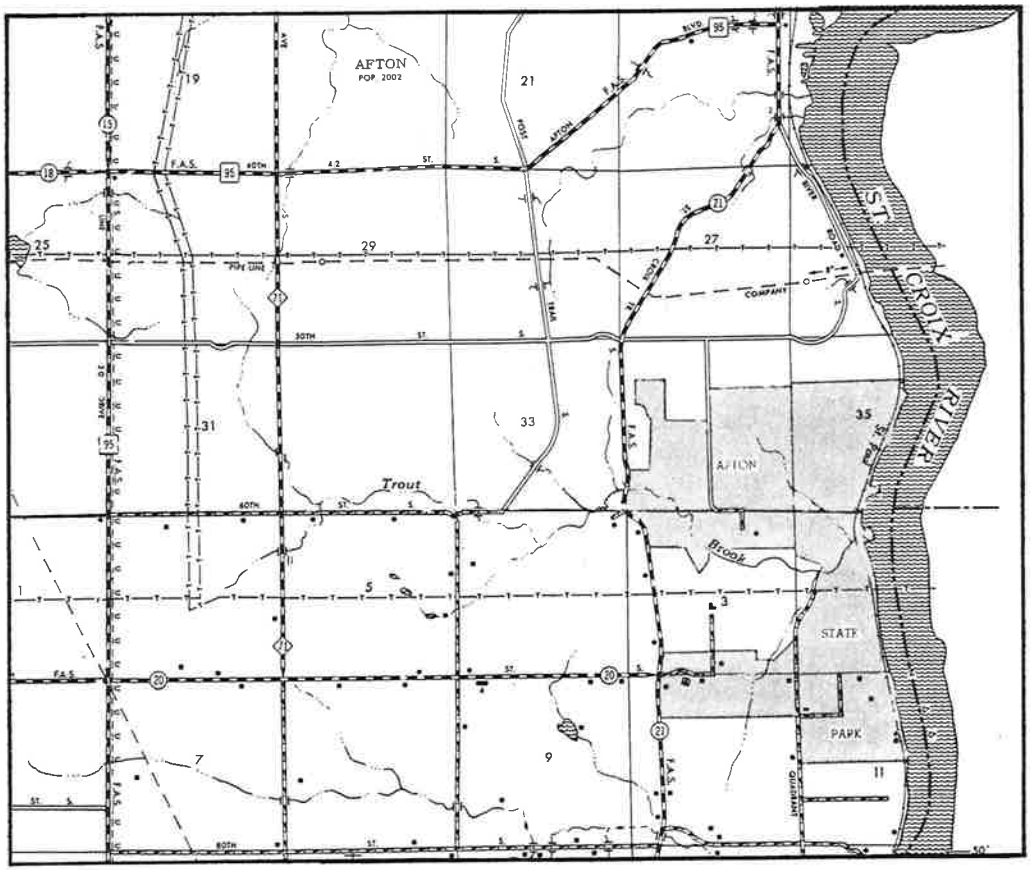
Department of Economic Development, The Economic Distribution of Tourist/Travel Expenditures in Minnesota by Regions and Counties, (Saint Paul: Department of Economic Development, 1975).

State Planning Agency and Center for Urban and Regional Affairs, Wall Map Series: Population Distribution, 1970, (Saint Paul: State Planning Agency and Center for Urban and Regional Affairs, 1973).

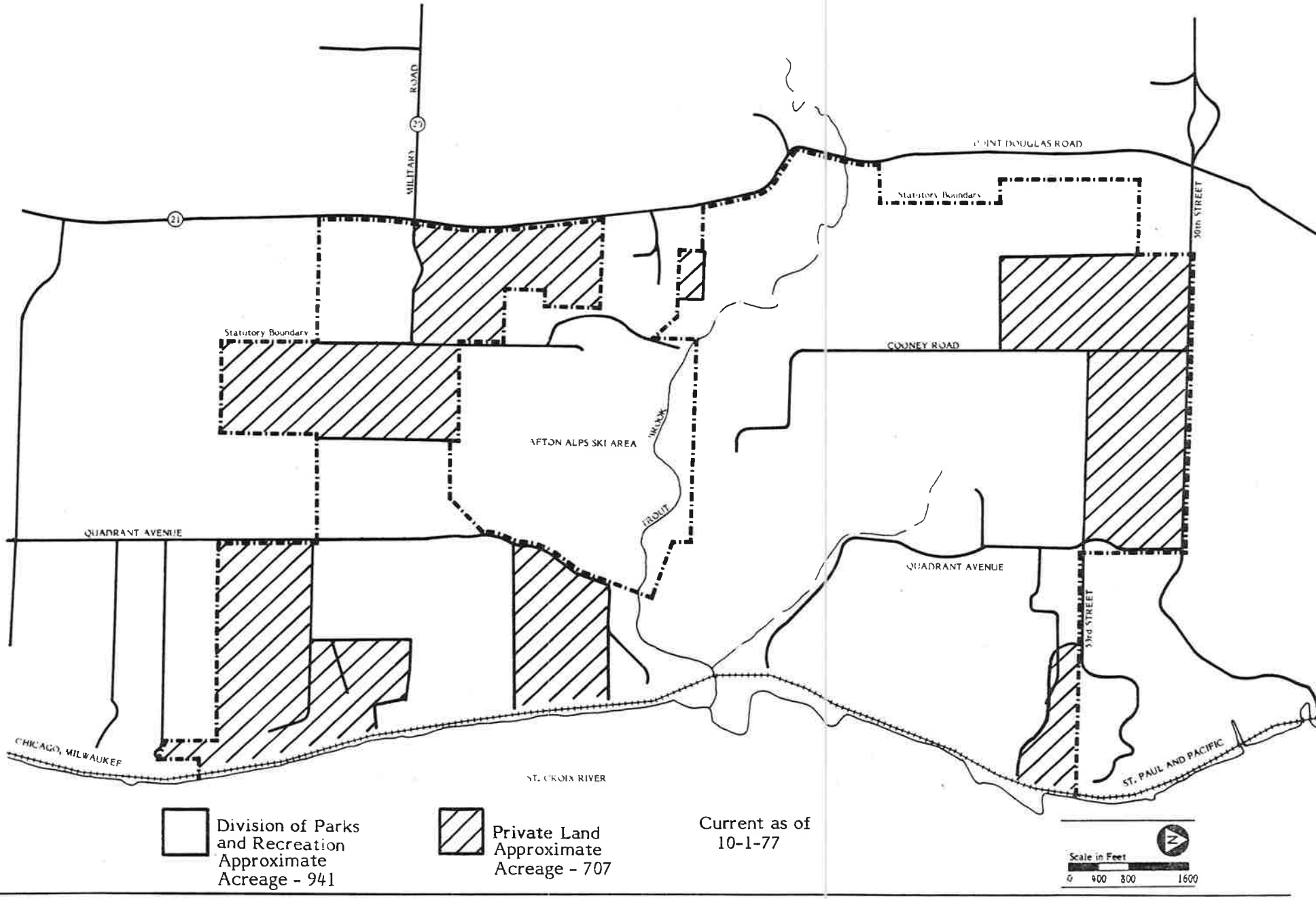
Midwest Planning and Research, Inc., "A Study of the Proposed Afton State Park," 1969.

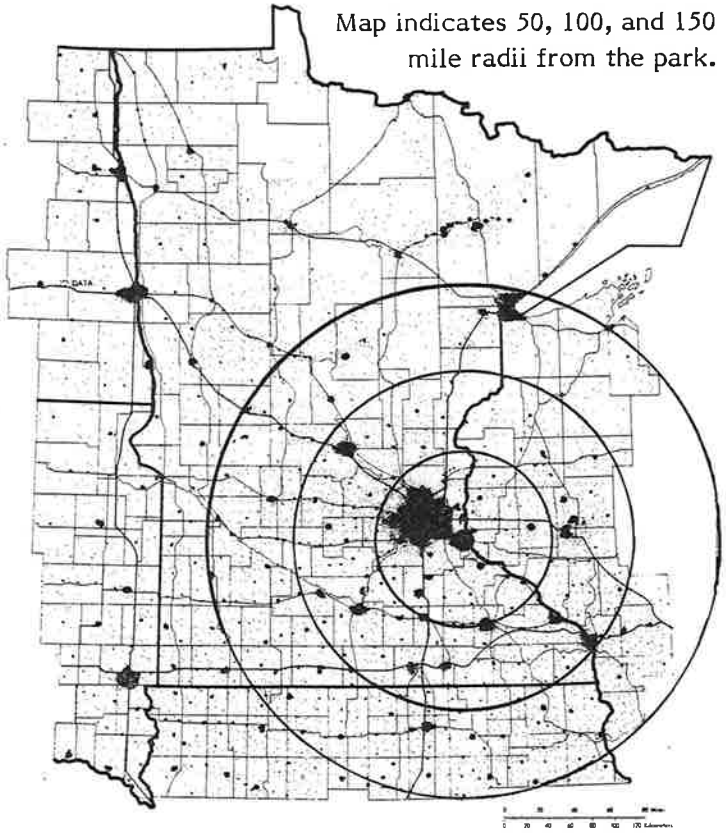
GEOGRAPHICAL PERSPECTIVE

Afton State Park is located in east central Minnesota in Washington County. The park is on the west shore of the St. Croix River, approximately 15 miles north of Hastings. The major east-west highway in the area is I-94/TH 12, which connects St. Paul and Hudson, Wisconsin. TH 95 is the major north-south highway, which links the town of Afton with the other towns along the which is the primary The two accesses to the park are via CSAH 21 from the town of Afton and CSAH 20 which accesses Afton Alps.



Legal Description	Township	Range	All or Part of Sections
	27N	20W	2, 3, 10, 11,
	28N	20W	34, 35

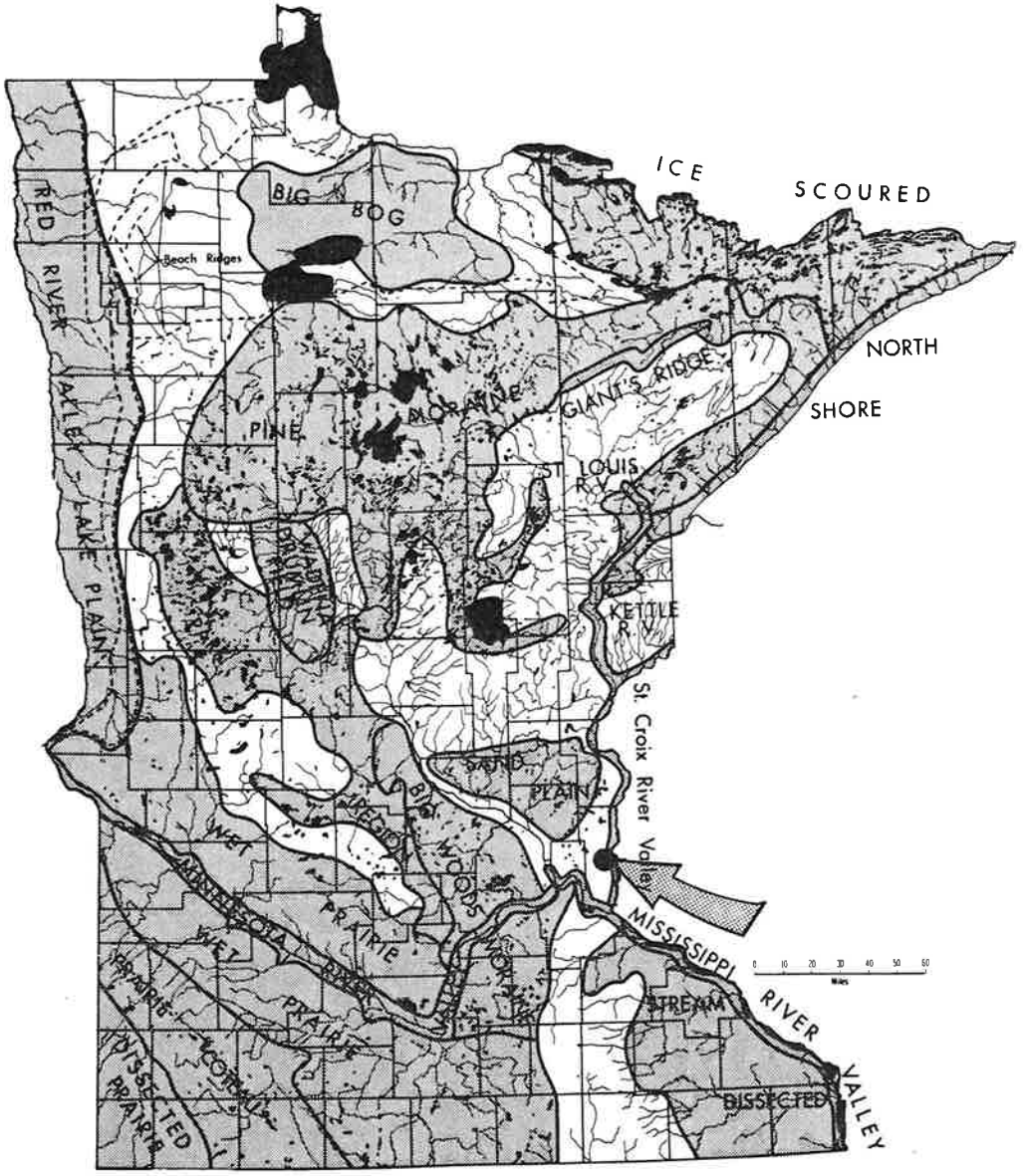

MILITARY ROAD
21
Statutory Boundary
AFTON ALPS SKI AREA
TROUT BROOK
QUADRANT AVENUE
CHICAGO, MILWAUKEE
ST. CROIX RIVER
POINT DOUGLAS ROAD
Statutory Boundary
30th STREET
COONEY ROAD
QUADRANT AVENUE
53rd STREET
ST. PAUL AND PACIFIC
Division of Parks and Recreation Approximate Acreage - 941
Private Land Approximate Acreage - 707
Current as of 10-1-77
N
Scale in Feet
0 400 800 1600



Map indicates 50, 100, and 150 mile radii from the park.

Proximity to Population Centers

	Approximate Population	Distance	Travel Time
Hastings	12,000	15 miles	20 minutes
Twin Cities	744,000	30 miles	40 minutes
Washington, Hennepin, Dakota, Ramsey, and Chisago counties	1,676,000	50 miles	60 minutes



Minnesota Landscape Regions

(Project 80 Staff Report No. 1, July, 1971)

CLIMATE

Afton State Park is subject to Minnesota's continental climate. The state experiences frequent outbreaks of continental polar air throughout the year, with occasional Arctic outbreaks during the cold season. Occasional periods of prolonged heat occur during summer, particularly in the southern portion when warm air pushes northward from the Gulf of Mexico and the southwestern United States. This seasonal variation is almost ideal for a year-around variety of outdoor recreational opportunities.

Afton State Park's regional climate is compared with the statewide range in the following table.

	Afton State Park	Statewide Range	
Average number of days/year below 0°F	38	30	70
Average number of days/year above 90°F	11	5	25
Mean January minimum temperature	2°	10°	6°
Mean January maximum temperature	21°	10°	26°
Mean July minimum temperature	60°	50°	62°
Mean July maximum temperature	84°	72°	86°
Annual average snowfall	40"	40"	70"
Annual average total precipitation	29"	19"	32"

Source:

Kuehnast, Earl L., Minnesota State Climatologist, "Climate of Minnesota," U. S. Department of Commerce Publication No. 60-21, June, 1972.

GEOLOGY

The landscape of Afton State Park was formed by several stages of geological occurrences. Early glaciers laid down a series of deposits in the Twin Cities area in a concave formation called the Twin City Basin. This area was further covered with glacial drift by the last great glacier, the Wisconsin. Afton State Park is located on the east edge of the Twin City Basin where a smaller formation of uplifted substrata, the Hudson-Afton Horst and Anticline, accentuates the height of the basin edge.

The Afton Anticline, an upward fold of rock layers, occurs at the edges of the horst. Evidence of the anticline is visible 1/8 mile east of CSAH 21 in a high cliff along Trout Brook. The formation is also visible on the south edge of the town of Afton in the gorge cut by an intermittent stream. The rock beds at this site are noticeably tilted and the entire formation is upended.

A second major and more visible force creating the landform in this area was stream and river erosion. This influence has strongly dissected the land, creating a variety of ravines, the primary one being the St. Croix Valley. This portion of the valley was cut into the soft sedimentary rock by large amounts of water flowing from glacial lakes Grantsburg, Duluth, and others. As these lakes emptied, the eroding waters slowed down, leaving sand and gravel deposits on the valley floor which are visible today as sandy beaches and sandbars.

The area in the vicinity of Afton State Park is thought to have a fair potential for producing uranium, lead, and zinc, but the geologic reliability of this information is considered to be only fair.

Sources:

Kain, Sister Joan, "Along Two Rivers, A Field Trip Guide," an Independent Study Project for University of Northern Arizona, Flagstaff, May, 1973.

Meineke, David G., DNR Minerals Division, memo: "Major Metals for the Mineral Potential of State Parks," January 27, 1976.

PARK HISTORY

By the late 1960's, because of heavy development pressure from the Twin Cities, opportunities for preserving representative segments of scenic state landscapes such as the St. Croix River Valley were generally assumed to be non-existent.

However, Sam Morgan, who has long been active in the Minnesota Council of State Parks, discovered a largely undeveloped area along the St. Croix. This area near the town of Afton seemed to be a desirable site for a new state park. Investigation by park planners confirmed this analysis and local citizen input was solicited through a park advisory committee.

Concerns about over-crowding, heavy traffic and a possible decrease in the tax base prompted spirited discussions by local residents. These problems were resolved, however, and in 1969 the Minnesota Legislature established Afton State Park. Land acquisition began with securement of three parcels on January 21, 1970 and is now 57% complete. Although the park is as yet virtually undeveloped, and not formally opened, skiers and hikers have begun to use the area in limited numbers.

ADJACENT LAND

Afton State Park is valuable to the surrounding community and landscape in that it represents natural visual relief in an area continually feeling the effects of metropolitan development pressures. There are 2½ miles of St. Croix River shoreline and a little over a mile of CSAH 21 from which the park is visible. The reciprocal relationship also represents opportunities in that the town of Afton, 1½ miles from the northern park boundary, is close enough to provide services for park users–even those who travel on foot or bicycle. The same is true of Afton Alps, which is encircled by the park.

Some things that occur outside the boundaries of the park do have a negative visual and/or noise impact. Afton is especially vulnerable because the park almost completely surrounds Afton Alps. The chairlift towers in Afton Alps, visible from many points throughout the park, represent a significant visual impact on the park. Earth cuts, fills, and clearings for ski runs are also visible from points in the park close to the ski area. These visual impacts are especially obtrusive at a potential CSAH 20 park entrance point. Many of these undesirable views could be screened with vegetation and with judicious placement of park use areas. Noise from snowmaking equipment at Afton Alps, however, may be a more difficult problem. When running, it is audible from nearly every point in the park. It is sometimes operated 24 hours a day, but more often only during the night, from 10:00 p.m. to 8:00 a.m., which represents a lesser conflict for large numbers of park users. It should be pointed out, however, that despite these problems, Afton Alps and the lodging developed adjacent to the park would provide additional complementary facilities to park users, especially during the winter. By carefully screening less desirable views, maximum benefit can be gained from a limited amount of public land.

The main external source of highway noise is from CSAH 21, which carries moderate-speed highway traffic along the west edge of the park.

The St. Croix River, although a source of much beauty for the park, also creates some problems. The high volume of large pleasure boat traffic generates noise and tends to make the river unusable by smaller recreational boats, waterskiers, and fishermen in high-use periods. Potentially the biggest impact on the park is the current practice of day and overnight mooring of houseboats and cruisers along many of the park's beach areas.

The Chicago, Milwaukee, St. Paul, and Pacific Railroad maintains a track running through the park along the river. The visual impact created by the 100-foot, cleared right-of-way is not obtrusive from most points within the park boundaries. However, it does present an interruption to the park's continuity in the riverfront area. Noise disturbance is minimal since the track is only in use twice a day. There is excellent potential for a trail here if the railroad is ever abandoned.

Because of concern over high traffic volumes through the town of Afton and along the narrow winding stretch of Point Douglas Road as it moves up through a ravine outside of town, park visitors arriving by car will be routed to the park from the west on CSAH 20, which passes through miles of rolling agricultural land. Although Point Douglas Road would be a more scenic approach, incidental traffic is probably all that it could handle without being overloaded to a point that might necessitate upgrading. If this were to happen, a valuable driving environment would be lost. To prevent this potential destruction, it may be wise for the local government to protect this road by designating it a scenic parkway.

Classification

INTRODUCTION

In accordance with the Outdoor Recreation Act '75, the Park Planning staff has reviewed the classification of each park user study this biennium. After the park resource inventory was completed for each unit, the Planning staff determined:

A. Which of the eleven classifications from Outdoor Recreation Act '75 was most appropriate for the unit.

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

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

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

Objectives:

To determine the most suitable management direction for a given unit based on its natural resources and recreational potential

To develop a statewide recreation system which will meet the recreational needs of our society without harming natural resources

RECOMMENDED CLASSIFICATION

Afton State Park is recommended for classification as a natural state park.

ALTERNATIVE CONSIDERED

Recreational state park - The resources of Afton State Park will not permit intensive recreational uses by large numbers of people because of the steep slopes along the St. Croix River.

It should be noted that the natural state park classification does not necessarily exclude recreational activities from a park. This classification places management and development emphasis on the perpetuation and interpretation of the natural resources. By the same token, recreational state park classification emphasizes a wide range of recreational activities, but not to the exclusion of interpretive activities or to the point where the natural resources within the unit are damaged.

Criteria

The Outdoor Recreation Act of 1975 requires that a unit substantially satisfy all of the following criteria to qualify as a natural state park:

"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."

"Contains natural resources, sufficiently diverse and interesting to attract people from throughout the state."

"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."

DISCUSSION

The St. Croix River Valley is one of the three major valleys in eastern Minnesota which were carved out by the overflow waters of glacial lakes. With restoration, Afton State Park will accurately represent the character of the St. Croix River Valley Landscape Region.

Within the park 16 different ecological communities have been identified. The area was covered by northern hardwoods at the time of settlement by Europeans. Because of heavy lumbering, little original vegetation remains. The predominant forest type in the park today is northern hardwood regrowth. Agricultural fields in the park can, with intensive management, be restored to natural oak savanna. Vegetation on the bluffs and in the ravines remains, for the most part, undisturbed.

The land in the park was largely protected, in the past, by landowners who acquired the land because of its attractiveness. Acquisition by the state will ensure perpetuation of the resources. The park is also of sufficient size (1,648 acres) to allow protection and perpetuation of most species of wildlife and vegetation communities.

Even though the park has not officially been opened to the public, it is believed that its natural resources are sufficiently diverse to attract people from throughout the state. In addition, the park's location on the major recreational river in eastern Minnesota will further ensure its use on a statewide basis.

Although certain unnatural intrusions such as powerlines and the Afton Alps recreational area occur within and adjacent to the park, the overall character of the unit far outweighs the impact of such intrusions. Furthermore, proper planning and design of the park should minimize the visual impacts of such developments.

PARK GOALS

To restore and maintain the natural resources of the park, thus preserving an accurate representation of the St. Croix River Valley in presettlement condition

To make the park's natural resources available for public enjoyment, education, and use, primarily through low-density, passive recreation which allows opportunities for a reasonable number of people to experience the natural environment in as unaltered a condition as possible

ZONING

Introduction

Before the specific management of Afton State Park can be considered, a zoning concept must be established to evaluate the various management alternatives. General management strategies can then be determined based upon the requirements and restrictions of a particular zone.

Objectives:

To establish a zoning system which formally recognizes the various features of the park and delineates appropriate non-destructive uses

To identify those areas which are suitable for specific uses and establish certain management requirements necessary to provide for overall recreational needs while protecting the park's resources

Management Zoning

A land classification system utilizing six major management zones has been adopted which will permit effective, economical management of the park's resources, centralize park development and use, and protect delicate resources within the park.

Land Classification Zones

To aid in understanding the final zoning concept map, each of the six potential zones has been defined with a description of their prime management objectives. All six management zones may not necessarily be found in each park.

Zone 1 Ecological Protection Zone - The ecological protection zone includes areas having ecological communities which are sensitive to certain uses, require special management or protection, and/or have significant value for research. Areas having unique or endangered wildlife habitat or vegetative communities are included in this zone. Management will be directed toward perpetuating these ecological values. Development will be restricted to interpretive facilities or trails which do not disturb these values. All forms of access may be prohibited when necessary. In certain instances, small structures may be necessary to orient use and protect the habitat.

Potential Ecological Protection Zone (Map, page 29) - Three areas in the park presently contain vegetation unique to this part of the state. One area includes an oak savanna which was burned some time ago and has remnants of prairie vegetation. Adjacent to this area and on the beach of the St. Croix River white false indigo plants exist. This species is becoming rare in Minnesota. Another area of southwest facing bluffs has vegetation which is associated with barren, dry slopes. Species such as paintbrush, smooth cliffbrake (a rather uncommon fern), butterfly weed, green milkweed, and puccoon among others are found on this site. A third site is a dry ravine leading into Trout Brook from the south. The ravine and adjacent hillsides support a very rich decidious woodland flora with maidenhair fern, polybody fern, and ironwood. These areas require special protection to prevent the loss of these plant communities through overuse or improper management.

Zone 2

Outstanding Natural Feature Zone - The outstanding natural feature zone includes areas which are geologically or biologically of statewide significance. These features often are the park's principal resource attractions and will be managed to provide for visitor enjoyment without impairing their quality. Development of restricted forms of recreational facilities may be necessary to allow for enjoyment and interpretation. All development must be compatible with the features of the site to protect its natural character. Resource management will be restricted to restoring the resources and perpetuating their natural characteristics.

Potential Outstanding Natural Features Zone (Map, page 30) - This zone includes the park's two major ravines and their wooded, steep slopes.

Zone 3

Primitive Zone - The primitive zone includes extensive areas of land and water remote from high-density use areas and major development and removed from the external influences of civilization. Development will be restricted to non-riding trails, primitive walk-in campsites, and appropriate interpretive facilities. Resource management will be directed toward restoring and perpetuating the natural environment and the aesthetic character of that environment.

Potential Primitive Zone - Afton State Park is not of adequate size to provide for a primitive experience.

Zone 4

General Environment Zone - The general environment zone includes areas of the park which, while they may be very aesthetically pleasing, do not contain any particularly outstanding natural, historical, or cultural features. These areas may be managed to provide for limited, environmentally compatible recreation; e.g. primitive campsites, riding and non-riding trails, interpretive facilities, roads, and facilities necessary for the health and safety of park visitors. Resource management will be directed toward improving the park recreational experience by improving the natural aesthetic quality of the vegetation and the wildlife habitat. Lakes may be managed to improve recreational fishing. Minor improvements to the resources may be made in order to prevent damage to the soils and vegetation.

Potential General Environment Zone (Map, page 35) - The general environment zone includes those areas in Afton State Park which do not fit the criteria of the other zones.

Zone 5

Historical and Cultural Zone - The historical and cultural zone includes those sites which help to illustrate the historical and prehistorical heritage of the area that should be preserved or restored. Activities should emphasize the interpretive values of the site. Recreational development will be restricted to activites such as non-riding trails, small picnic areas, interpretive facilities, and parking. In some instances, extensive improvements may be necessary to protect the qualities of the site while providing for the use, enjoyment, and interpretation of the significant features. These activities and improvements should be limited to those which will not detrimentally affect the preservation and restoration of these sites, and should be reviewed with the Minnesota Historical Society. All historical or cultural sites should be surrounded by sufficient natural buffers to minimize encroachment from other activities. Natural resource management activities should maintain and perpetuate historical and cultural values while insuring regeneration of native or historically compatible plant and animal species.

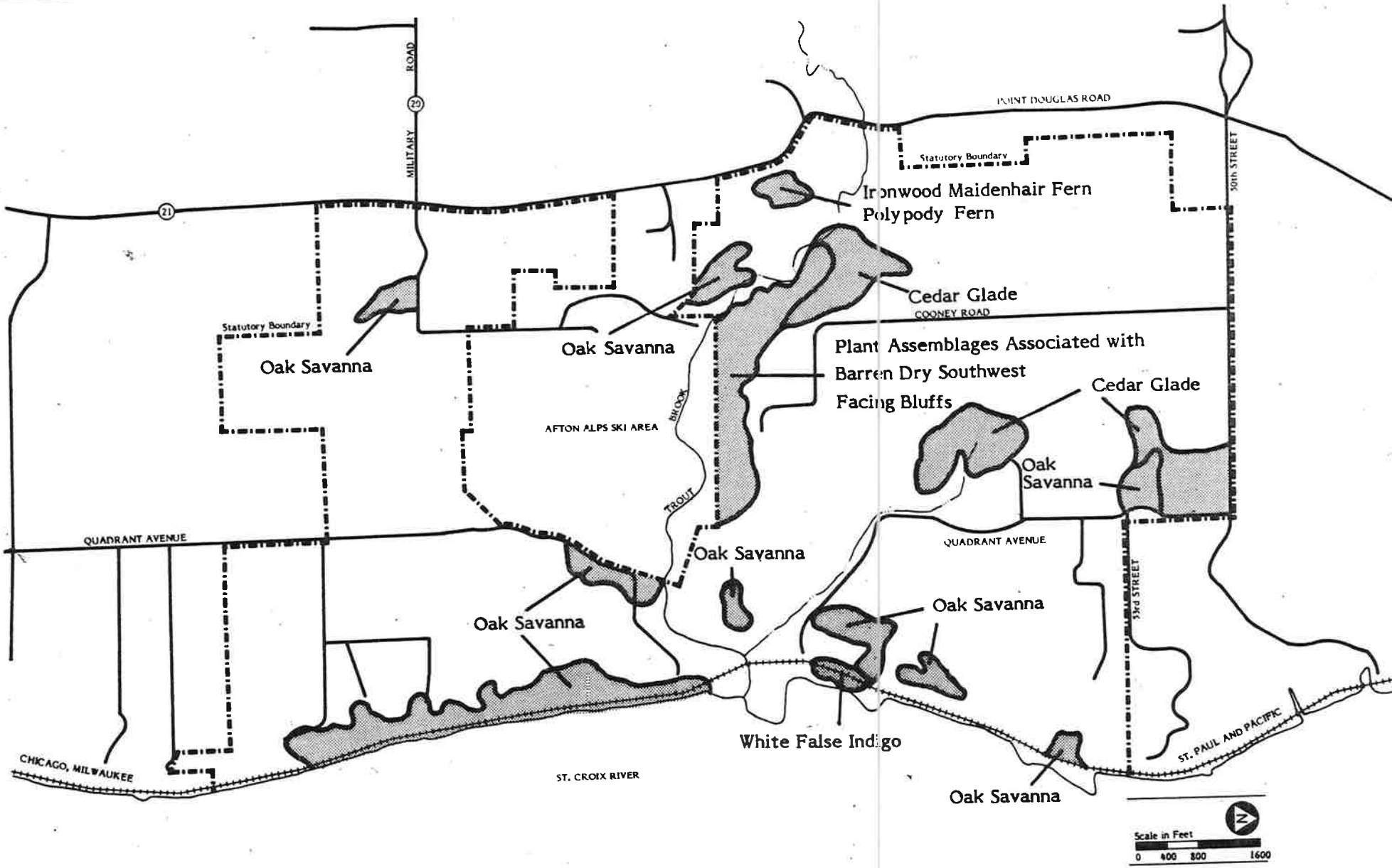
Potential Historical and Cultural Zones (Map, page 31) - Two sites of potential historical and archeological significance have been identified in Afton. A site near the mouth of Trout Brook may have been used as a low water crossing by early settlers. Artifacts indicating prehistoric activity are associated with a second site. Neither site is of statewide significance.

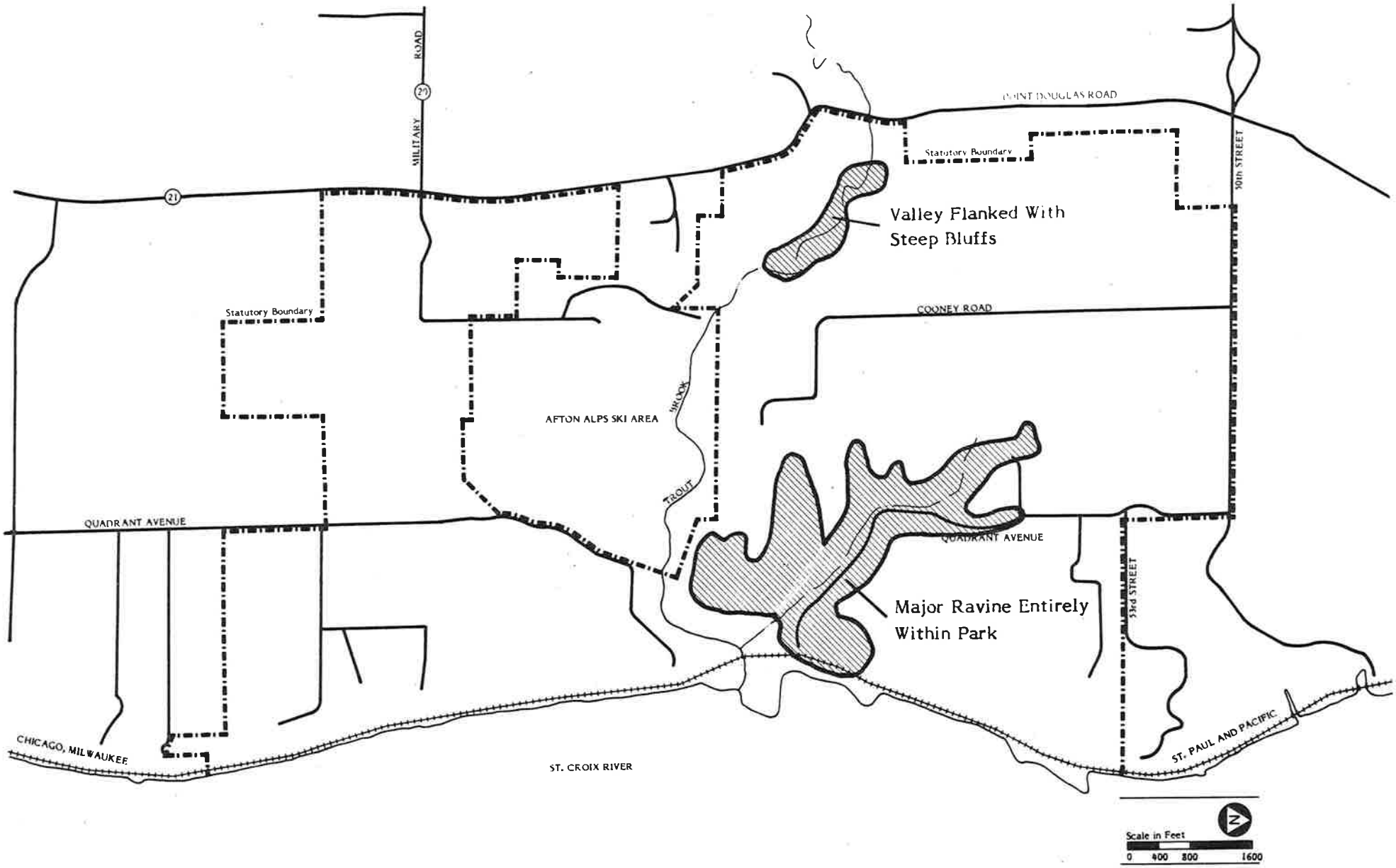
Zone 6 Development Zone - The development zone includes lands and waters where major park development and intensive use, both existing and proposed, has or will substantially alter the environment. This zone will be managed to provide and maintain the level of development necessary to serve the needs of relatively large numbers of visitors and of park administration. Park roads extending beyond this zone may be included in appropriate natural or historical zones through which they pass. Resource management will be directed toward improving the recreational capabilities and characteristics of the environment. However, native vegetation should not be extensively replaced solely for aesthetic reasons.

Potential Development Zones (Map, page 32-34) - Development zones have been identified in Afton based on two criteria: resource sensitivity to use (avoidance of steep slopes, poor soils types, and identified sensitive plant communities), and providing a range of access opportunities to the essential natural qualities of the park (views to river, ravines, and oak savannas) without destroying the most scenic areas with excessive development.

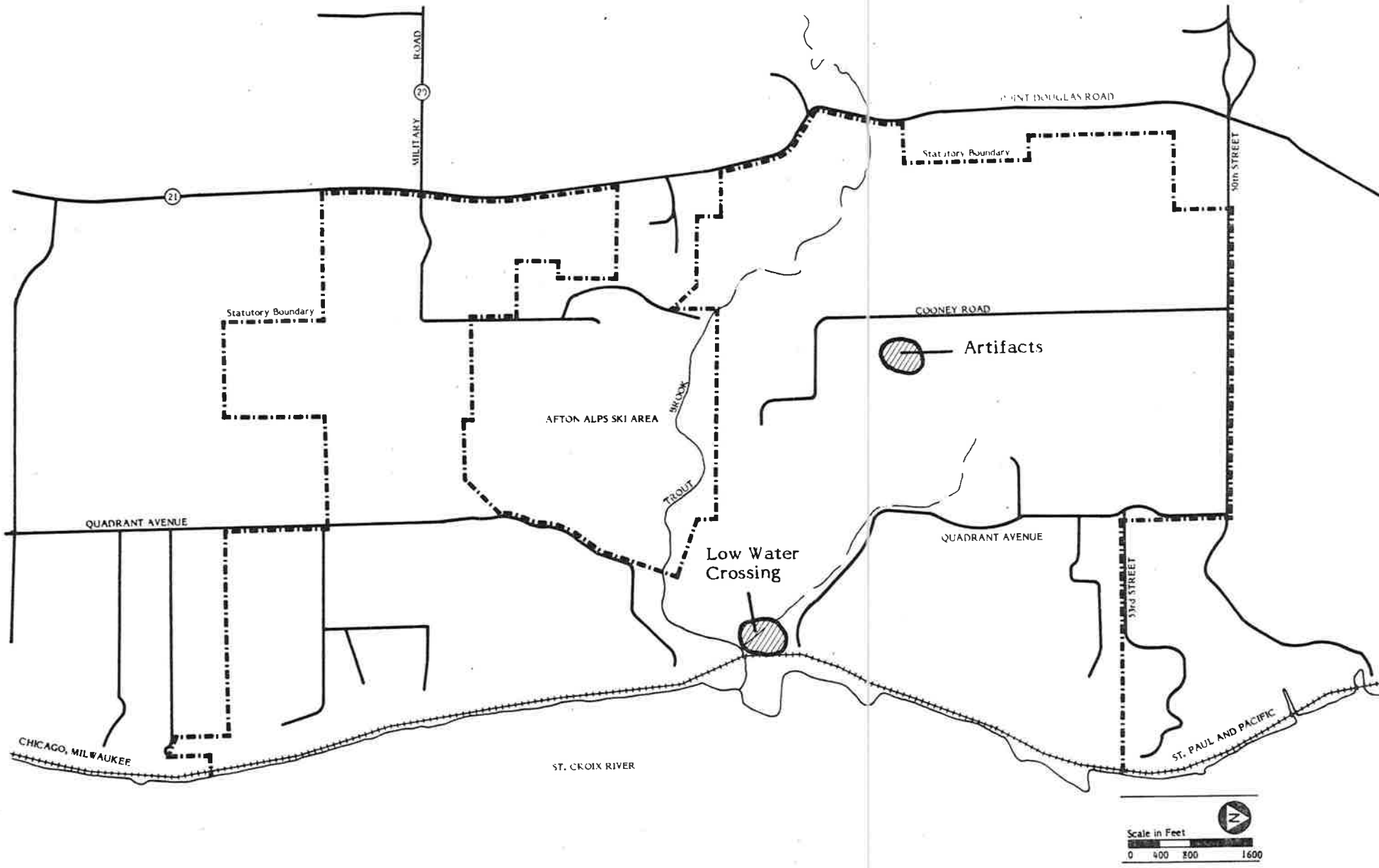
Established Zones

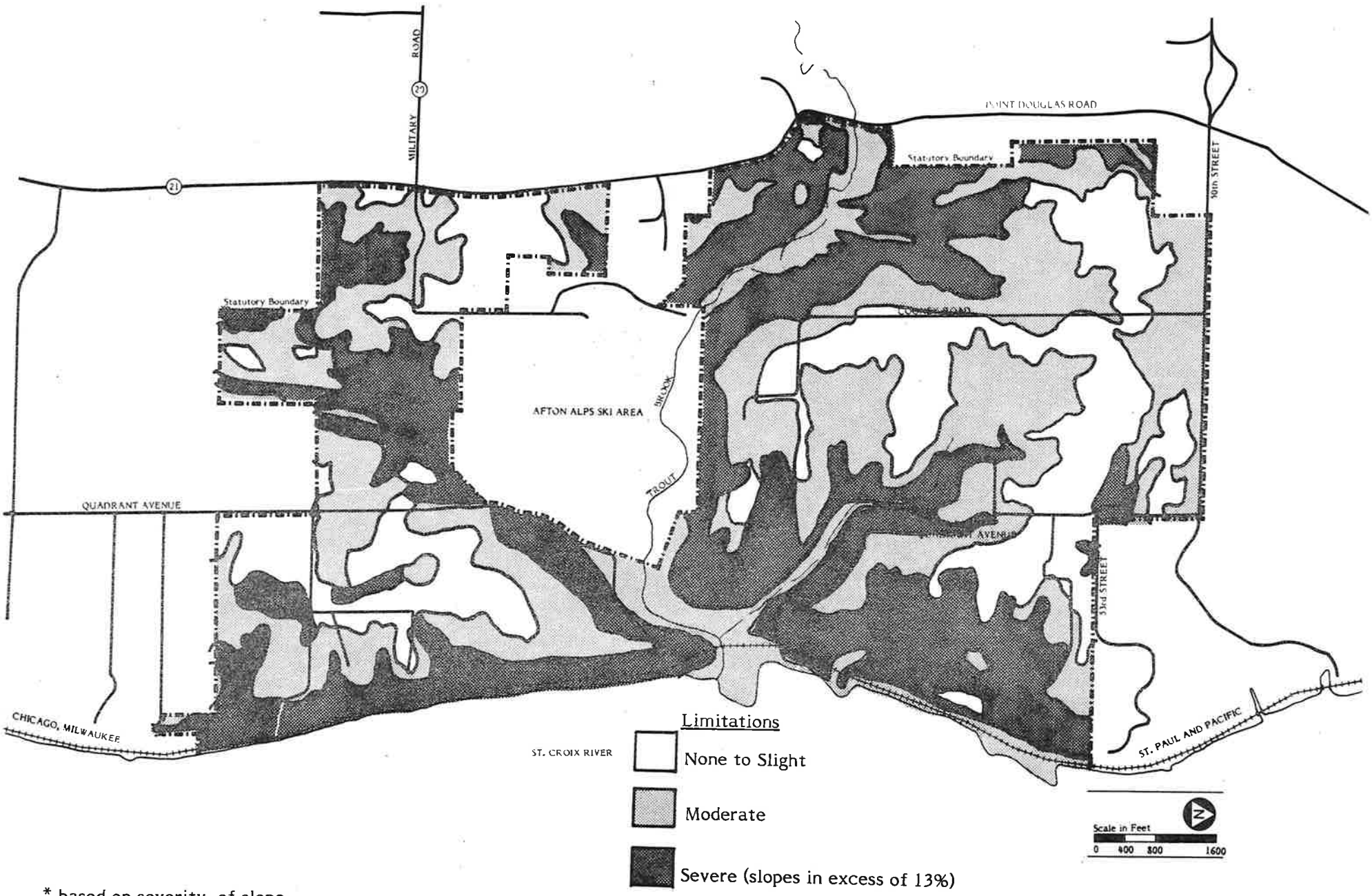
The final zoning map (p. 35) is a composite of all potential zones showing where management decisions have been made to eliminate conflicts between individual zones. This final zoning map will guide the recreation and resource management decision-making process.


MILITARY ROAD
29
21
POINT DOUGLAS ROAD
Statutory Boundary
50th STREET
Ironwood Maidenhair Fern
Polypody Fern
Cedar Glade
COONEY ROAD
Statutory Boundary
Oak Savanna
Oak Savanna
Plant Assemblages Associated with
Barren Dry Southwest
Facing Bluffs
Cedar Glade
AFTON ALPS SKI AREA
TROUT BROOK
Oak Savanna
QUADRANT AVENUE
QUADRANT AVENUE
Oak Savanna
Oak Savanna
Oak Savanna
53rd STREET
White False Indigo
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
Oak Savanna
Scale in Feet
0 400 800 1600
N


MILITARY ROAD
21
POINT DOUGLAS ROAD
Statutory Boundary
30th STREET
Valley Flanked With
Steep Bluffs
Statutory Boundary
COONEY ROAD
AFTON ALPS SKI AREA
BROOK
TROUT
QUADRANT AVENUE
QUADRANT AVENUE
53rd STREET
Major Ravine Entirely
Within Park
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
Scale in Feet
0 400 800 1600
N

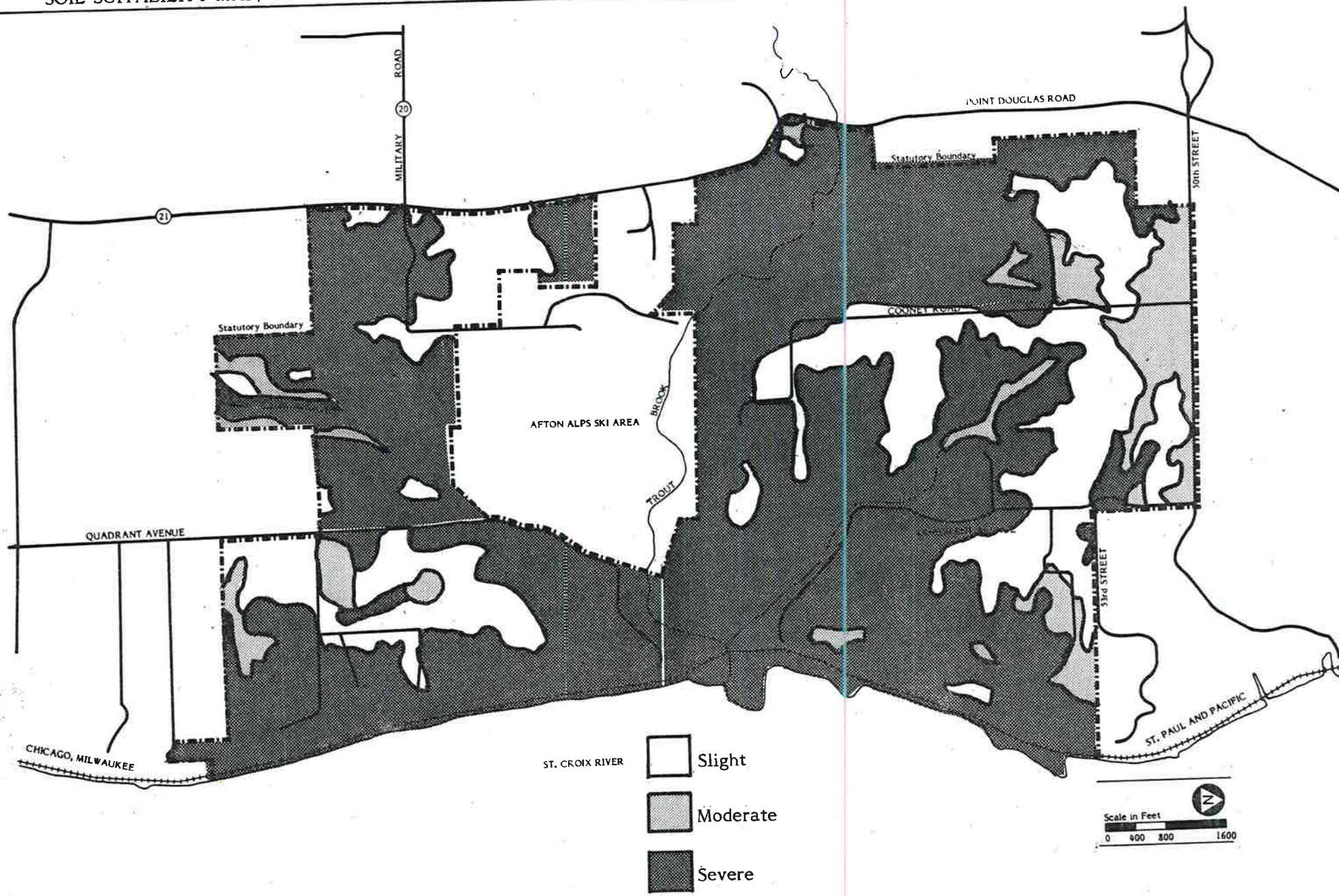
POTENTIAL CULTURAL/HISTORICAL ZONES

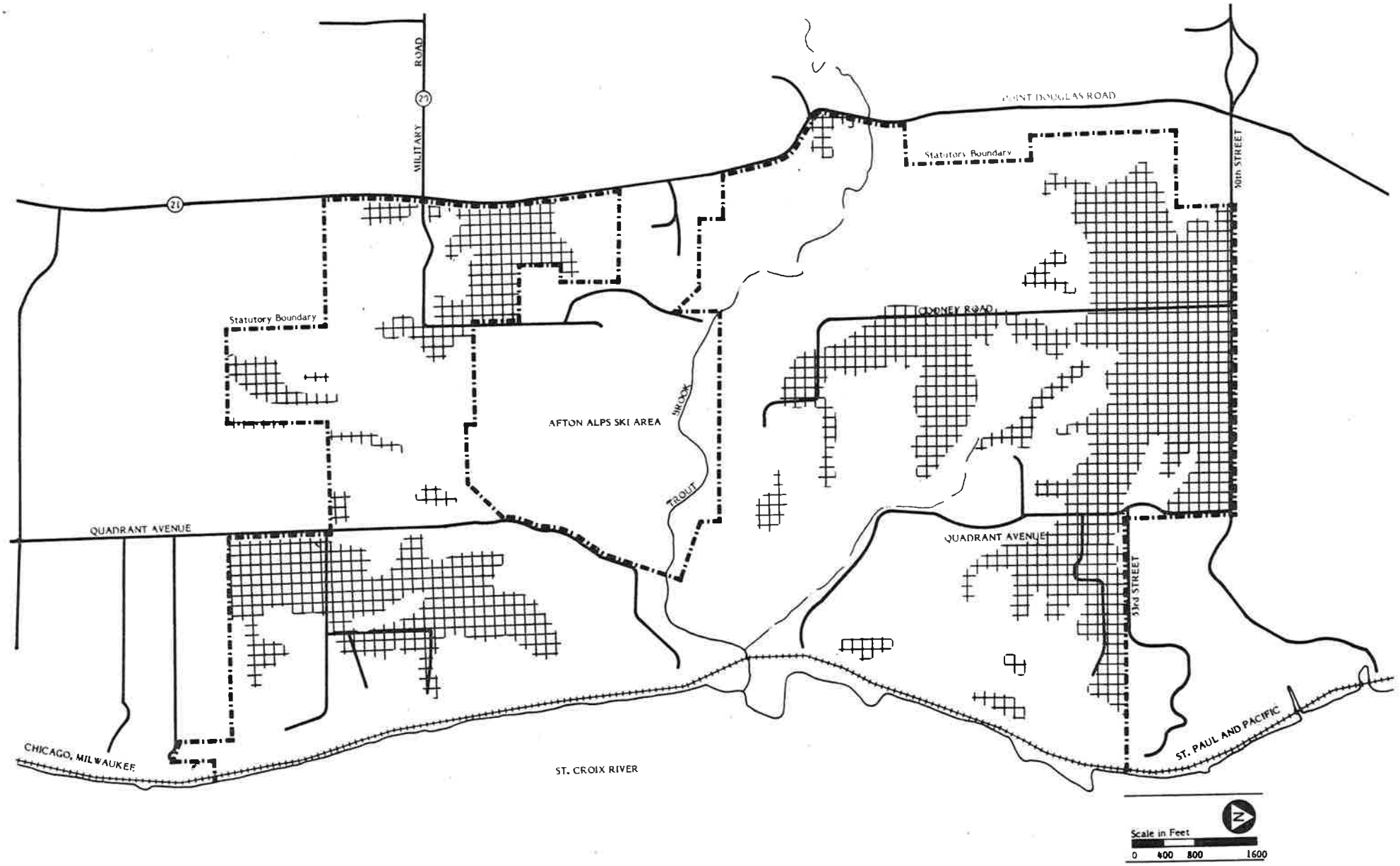




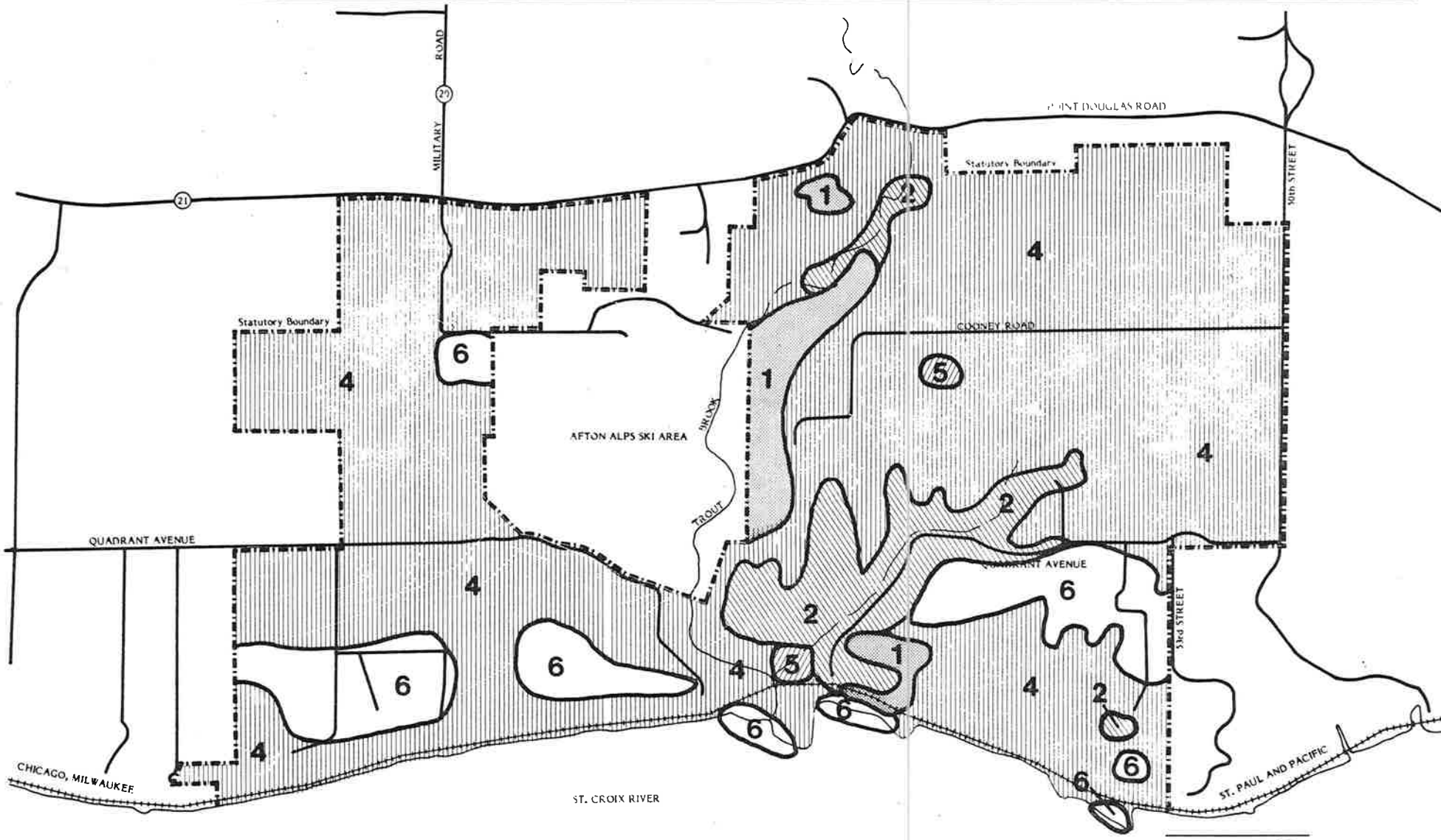
* based on severity of slope

SOIL SUITABILITY MAP/ SEPTIC TANKS AND FILTER FIELDS




MILITARY ROAD
21
POINT DOUGLAS ROAD
Statutory Boundary
30th STREET
Statutory Boundary
CLONEY ROAD
AFTON ALPS SKI AREA
TROUT BROOK
QUADRANT AVENUE
QUADRANT AVENUE
53rd STREET
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
Scale in Feet
0 400 800 1600
N

FINAL ZONING MAP



WATER RESOURCES

Introduction

There are two aspects to water resource management -- underground and surface. In general, groundwater resources are managed to maintain a high quality and supply. Surface water management programs ideally should include total watersheds, not just an individual lake or stream. Unfortunately, few parks encompass total watersheds, therefore, effective management is minimized. By statute, the Division of Parks and Recreation can control surface as well as shoreline use of any lake or stream which is totally within a park's statutory boundary and in state ownership. However, if any parcels along a shoreline are in private ownership, a common agreement must be reached before any effective management techniques may be employed on the water body.

Groundwater Inventory

Afton State Park is situated in an area of the state where glacial materials do not provide adequate groundwater supplies, thus water wells must utilize the deeper Paleozoic bedrock aquifers. Fortunately, three productive aquifers exist in this area: the Prairie du Chien-Jordan aquifer and the Franconia-Ironton-Galesville aquifer, and at greater depth, the Mt. Simon-Hinckley aquifer.

The topographic diversity of Afton State Park, created by extensive geological faulting and uplifting, has resulted in a wide range in depths to water for each aquifer. Existing domestic wells within the park range in depth from a 169 foot Prairie du Chien well to a 600 foot Mt. Simon-Hinckley well. The 169-foot well was completed in fractured limestone but was abandoned because of a possible pollution hazard. The majority of wells are about 300 feet deep and tap the high-capacity Prairie du Chien-Jordan aquifer. The surface of this aquifer extends from an elevation of 675 feet near the St. Croix River, to 725+ feet at the west edge of the park. Although this aquifer generally produces high quality water, some of these wells were found to contain high levels of iron and were subsequently drilled deeper into the Mt. Simon-Hinckley aquifer which contains water with a lower iron content. One of the wells was contaminated, but this was attributed to improper well construction. In areas where the Jordan sandstone has been eroded away, exposing the aquifer to the ground surface, wells have been drilled to depths up to 600 feet.

Assuming an average surface elevation of the park to be 970 feet, the Jordan sandstone should be sufficiently penetrated by 300 foot wells and these wells should satisfy water requirements for the park.

Surface Water Inventory

The main body of water which influences Afton State Park is the lower St. Croix River just below Lake St. Croix. Its location within the Twin Cities metro area, as well as its generally undeveloped character, make it a heavily used recreational boating area. Because it is outside the park boundary, its management is not within the scope of this study. However, the park's two-plus mile frontage on the St. Croix has obvious recreational potential for the park. High water quality also makes this area suitable for other types of water-related recreation.

Because the shoreland in Afton rises away from the river so abruptly, the effects of flooding of the St. Croix on the park are minimized.

The only bodies of water within the statutory boundaries of the park are a quarter-mile length of Trout Brook and two unnamed, intermittent streams.

Trout Brook

Location: S.2-5, 9, 10 T.27N R.20W
S.32-34 T.28N R.20W Washington County

Mouth: S.2 T.27N R.20W Washington County

Source: S.4 T.27N R.20W Washington County

An instantaneous discharge of 0.32 cfs was recorded on September 24, 1974 at 1.9 miles above the mouth.

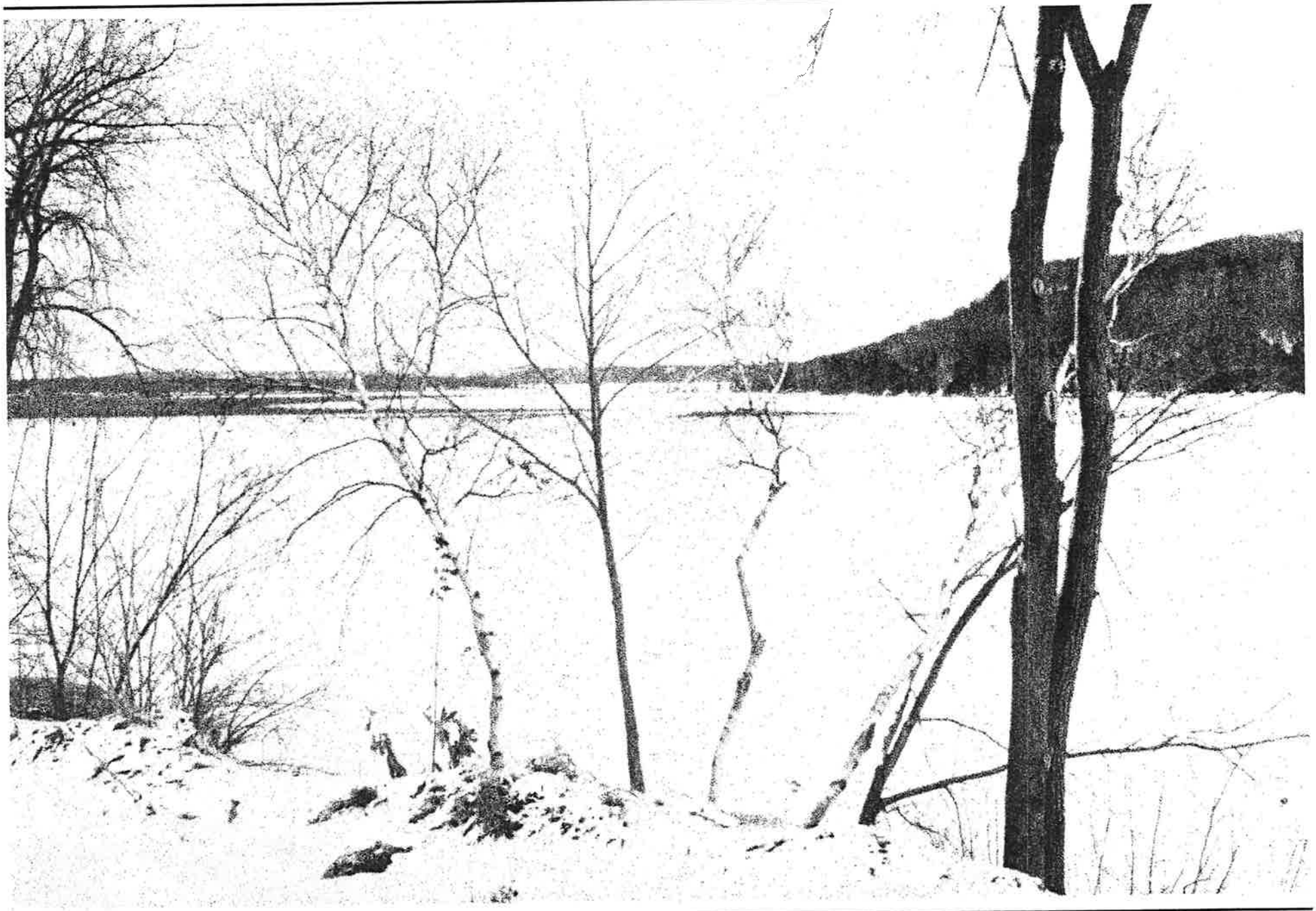
This stream is known to go dry at times, even in the area shown on U.S.G.S. topographic quadrangles as having permanent flow.

Management

Objectives:

To provide high quality drinking water for park users

To minimize excessive erosion in order to improve the water quality of Trout Brook



- Specific Management

The rugged topography of Afton State Park is very susceptible to water erosion if the protective plant cover is destroyed by excessive or improper use. Excessive erosion leads to stream pollution, sedimentation, and siltation. See Soils Management Section, p.47 , for recommendations regarding erosion control. The wells in the park should be drilled into the Jordan sandstone which is about 300 feet below the surface in the Afton area. The water associated with limestone formations must be avoided because of possible pollution hazards. If the Jordan sandstone formation has been eroded away, wells should be drilled at least 600 feet deeper into the Mt. Simon-Hinckley aquifer. The Jordan sandstone locally contains water with a high iron content which may be avoided by utilizing water from deeper aquifers.

Sources:

Memo from James Nye, DNR Central Office Hydrologist to Roy Schultz, DNR Metro Region Hydrologist, January 22, 1976.

Conversation with Dennis Woodward, Groundwater Group, Division of Waters, DNR.

Report by the Departments of Natural Resources of Minnesota and Wisconsin, March, 1973., "St. Croix River Regional Flood Analysis."

FISHERIES

Introduction

The primary goal for any fisheries management program is to maintain the optimum natural fish population that a water body can support. This optimum is determined by such factors as water fertility, oxygen supply, food supply, and water temperature. Periodic fishery surveys are conducted to determine species diversity and the size and condition of fish populations. The results of these surveys then determine the classification and site-specific management goals for a water body.

Inventory

The intermittent nature of Trout Brook precludes its suitability as a fisheries stream. The St. Croix River supports a viable population of 67 species, in spite of the scarcity of aquatic vegetation. The largest flathead catfish recorded in Minnesota (70 pounds) was caught here. Carp is the most abundant species and black crappie, white bass, bluegill, and walleye are the predominant game species. Muskellunge stocking, which began in 1972, is showing strong promise of success. The present small number of lake sturgeon is expected to increase in response to the increased minimum size limit that went into effect in 1967. Existing surveys show no spawning areas in the vicinity of Afton.

Management

Objective:

To provide hike-in fishing access to the St. Croix River.

- Specific Management

Foot trail access for fishing on the St. Croix River will be developed. See Recreation Management Section, p.123 for specific development recommendations.

The fishery management program for the St. Croix River is currently being conducted by Region VI Fisheries staff.

SOILS

Introduction

The soils of a state park are one of its most important basic resources. Soil structure, type, and fertility play an important role in dictating what types of vegetation are presently found in the park or what types of plant communities might logically be reintroduced to approximate pre-settlement vegetation.

Soils data must also be considered when locating park roads, recreational buildings, intensive use areas,(e.g., campgrounds and picnic areas), sewage lagoons, and septic tank filter fields.

Consequently, in developing a park management plan, detailed soils surveys of the park are a necessity. By utilizing this information, environmentally sound, intelligent, management decisions can be made.

Inventory

The soils of Afton State Park vary from silt and sandy loams on the blufftops to rough, broken land on the bluff faces. Sandy beaches occur along the shores of the St. Croix River. The major soil series in the park, Dubuque silt loam, is a well-drained soil with moderate to variable permeability in its various layers. The Dakota loam, Estherville sandy loam, Rosholt sandy loam, and Kingsley sandy loam soils on slopes of less than 8% are the most suitable for most types of park development,(i.e., recreational buildings, picnic areas, camp areas, and septic tank filter fields).

The table (page 44) lists the soil series found in the park and the major characteristics of each. The map (page 45) shows the locations of each series in the park.

Management

Objective:

To locate development on suitable soils

To prevent erosion

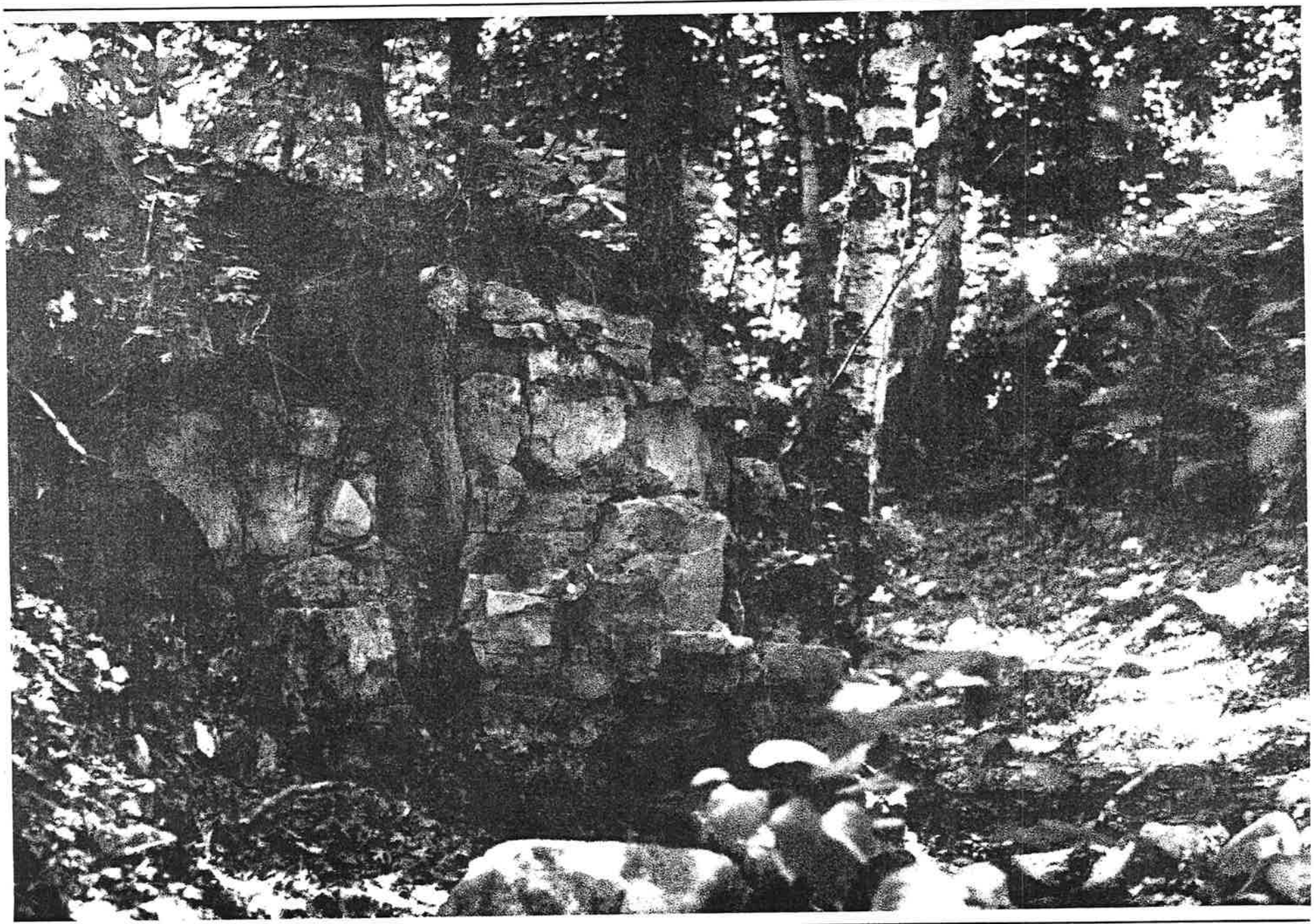


Chart Legend (Soils Suitability/Characteristics Table, p.44

Slight - Limitations for a stated use are minor and can be overcome easily.

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

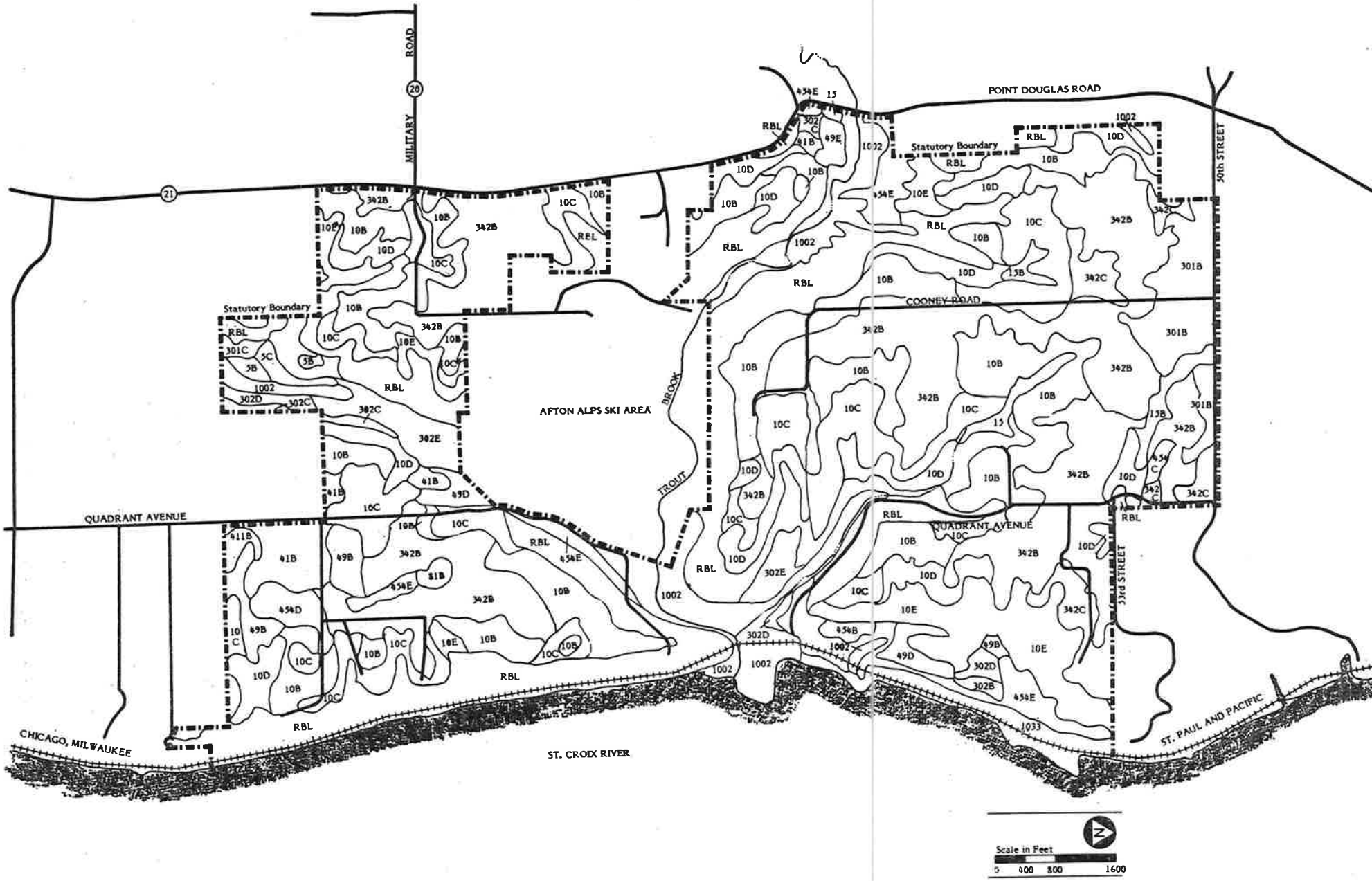
Severe - Limitations for a stated use generally require a major soil reclamation, special design, or intensive maintenance.

*Permeability measured in inches per hour
**Based on buildings with a basement or foundation

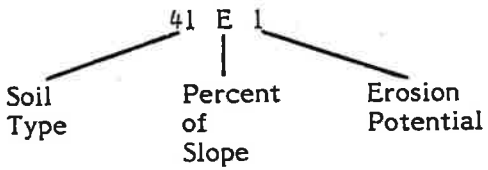
LIMITATIONS

[1]Slope
[2]Surface Texture
[3]Depth to Bedrock
[4]Flooding (Duration & Frequency)
[5]Pollution Potential
[6]Permeability
[7]Water Table
[8]Frost Action
[9]Drainage
[10]Shrink-Swell

Soil Type	Map Code	Slope	Permeability*	Erosion Hazard	Potential Frost Action	Intensive		Paths and Trails	Recreation Buildings**	Sewage Lagoons	Septic Tank Filter Fields
						Picnic Areas	Camp Areas				
Dakota	5B	3-8%	2.0-20.0	Slight	Low	Slight	Slight	Slight	Slight	No Data	Slight[5]
	5C	8-13%	2.0-20.0	Slight	Low	Moderate[1]	Moderate[1]	Slight	Moderate[1]	No Data	Moderate[1]
	5E	18-30%	2.0-20.0	Mod-Sev	Low	Severe[1]	Severe[1]	Severe[1]	Severe[1]	No Data	Severe[1]
Dubuque	10B	3-8%	.06-2.0	Slight	Low	Moderate[2]	Moderate[2]	Slight	Severe[3]	No Data	Severe[3,5]
	10C	8-13%	.06-2.0	Slight	Low	Moderate[1,2]	Moderate[1,2]	Slight	Severe[3]	No Data	Severe[3,5]
	10D	13-18%	.06-2.0	Mod-Sev	Low	Severe[2]	Severe[1]	Moderate[1]	Severe[1,3]	No Data	Severe[3,5]
	10E	18-30%	.06-2.0	Mod-Sev	Low	Severe[2]	Severe[1]	Severe[1]	Severe[1,3]	No Data	Severe[3,5]
Judson	15B	0-8%	0.6-2.0	Slight	Moderate	Moderate[4]	Mderate[4]	Moderate[4]	Moderate[4]	No Data	Mod[6]-Sev[3]
Eastherville	41B	3-8%	2.0-20.0	Slight	Low	Slight	Slight	Slight	Slight	No Data	Slight[6]
Antigo	49B	3-8%	0.6-20.0+	Slight	Moderate	Moderate[3]	Moderate[2]	Slight	Slight	No Data	Slight[6]
	49D	13-18%	0.6-20.0+	Mod-Sev	Moderate	Severe[1]	Severe[1]	Moderate[1]	Severe[1]	No Data	Severe[1]
	49E	18-30%	0.6-20.0+	Mod-Sev	Moderate	Severe[1]	Severe[1]	Severe[1]	Severe[1]	No Data	Severe[1]
Boones	81B	3-8%	6.3-20.0	Slight	Low	Moderate[2]	Moderate[2]	Moderate[2]	Slight	No Data	Slight[6]
Lindstrom	301B,C	3-13%	0.6-2.0	Moderate	High	Moderate	Moderate	Moderate	Moderate	Mod-Sev	Slight
Rosholt	302B	3-8%	0.63-20.0+	Slight	Slight	Slight	Slight	Slight	Slight	No Data	Slight[6]
	302C	8-13%	0.63-20.0+	Slight	Slight	Moderate[1]	Moderate[1]	Slight	Moderate[1]	No Data	Moderate[1]
	302D	13-18%	0.63-20.0+	Mod-Sev	Slight	Severe[2]	Severe[1]	Moderate[1]	Severe[1]	No Data	Severe[1]
	302E	18-30%	0.63-20.0+	Mod-Sev	Slight	Severe[2]	Severe[1]	Severe[1]	Severe[1]	No Data	Severe[1]
Kingsley	342B	3-8%	.6-2.0	Slight	Low	Slight	Slight	Slight	Slight	No Data	Moderate[6]
	342C	8-13%	.6-2.0	Slight	Low	Moderate[1]	Moderate[1]	Slight	Moderate[1]	No Data	Moderate[6]
Waukegan	411B	3-8%	.6-2.0	Slight	Low	Moderate[2]	Moderate[2]	Slight	Slight	No Data	Slight[5]
Mahtomedi	454B	3-8%	High	Slight	Low	Moderate[2]	Moderate[2]	Moderate[2]	Slight	No Data	Slight[5]
	454D	13-18%	High	Mod-Sev	Low	Severe[1]	Severe[1]	Moderate[1]	Severe[1]	No Data	Severe[1]
	454E	18-30%	High	Mod-Sev	Low	Severe[1]	Severe[1]	Severe[1]	Severe[1]	No Data	Severe[1]
Alluvial Land	1002		No Data	Severe	Moderate	Moderate[4]	Mod-Sev[4]	Moderate[4]	Severe[4]	No Data	Severe[4]
Sandy Beaches	1033		Highly Var.	Severe	Low	Severe[4]	Severe[4]	Severe[4]	Severe[4]	No Data	Severe[4]
Rough Broken Lane	RBL	30+%	0.6-2.0	Mod-Sev	Moderate	Severe[1,3]	Severe[1,3]	Severe[1,3]	Severe[1,3]	No Data	Severe[1,3,5]


MILITARY ROAD
20
21
POINT DOUGLAS ROAD
50th STREET
Statutory Boundary
RBL
COONEY ROAD
AFTON ALPS SKI AREA
TROUT BROOK
QUADRANT AVENUE
53rd STREET
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
Scale in Feet
0 400 800 1600

Soils Map Key



Soil Type

See Soils Characteristics/Suitability Chart, p. 44 for identification of soil type.

Percent of Slope

A - 0-2
B - 2-6
C - 6-12
D - 12-18
E - 18-25
F - 25-35

Erosion Potential

1 - None
2 - Slight
3 - Severe

• Specific Management

Ravines - Many scenic ravines have been created throughout the years as a result of natural erosive forces. These ravines give the park its rugged character. The slopes adjacent to these ravines are generally well vegetated and stabilized. No change is recommended for management of water flow in these ravines. Trail placement should be based on careful field studies of the proposed layout. Where trails are to be situated on steep slopes, necessary precautions must be taken to keep hikers on the trail to avoid disrupting established vegetation. Trails should incorporate switchbacks and stairs to minimize erosion potential. See Trails, p.123for further details.

Sewage System Design - Certain soils in Afton State Park have limitations for the use of sewage disposal systems. These soils, especially the Dubuque, Kingsley, and Lindstrom types are highly permeable. Location of sewage disposal systems on such types could result in the pollution of groundwater supplies. Detailed, site-specific studies will be made to determine which sewage waste disposal system would be most appropriate at a given site. Existing public health, pollution abatement, and resource protection regulations will be complied with in locating sanitation facilities.

Site 1 - Afton Alps Ski Area - Although the ski area is outside of the statutory boundaries of the park, meltwater runoff from natural and artificial snow on the ski slopes presents an erosion problem each spring. Area 1 (map, page 47) shows the general location of the major area of concern. Presently, a natural intermittent stream flows at the base of the ski slopes. Afton Alps should be encouraged to correct erosion problems on their land. Technical assistance could be provided by DNR.

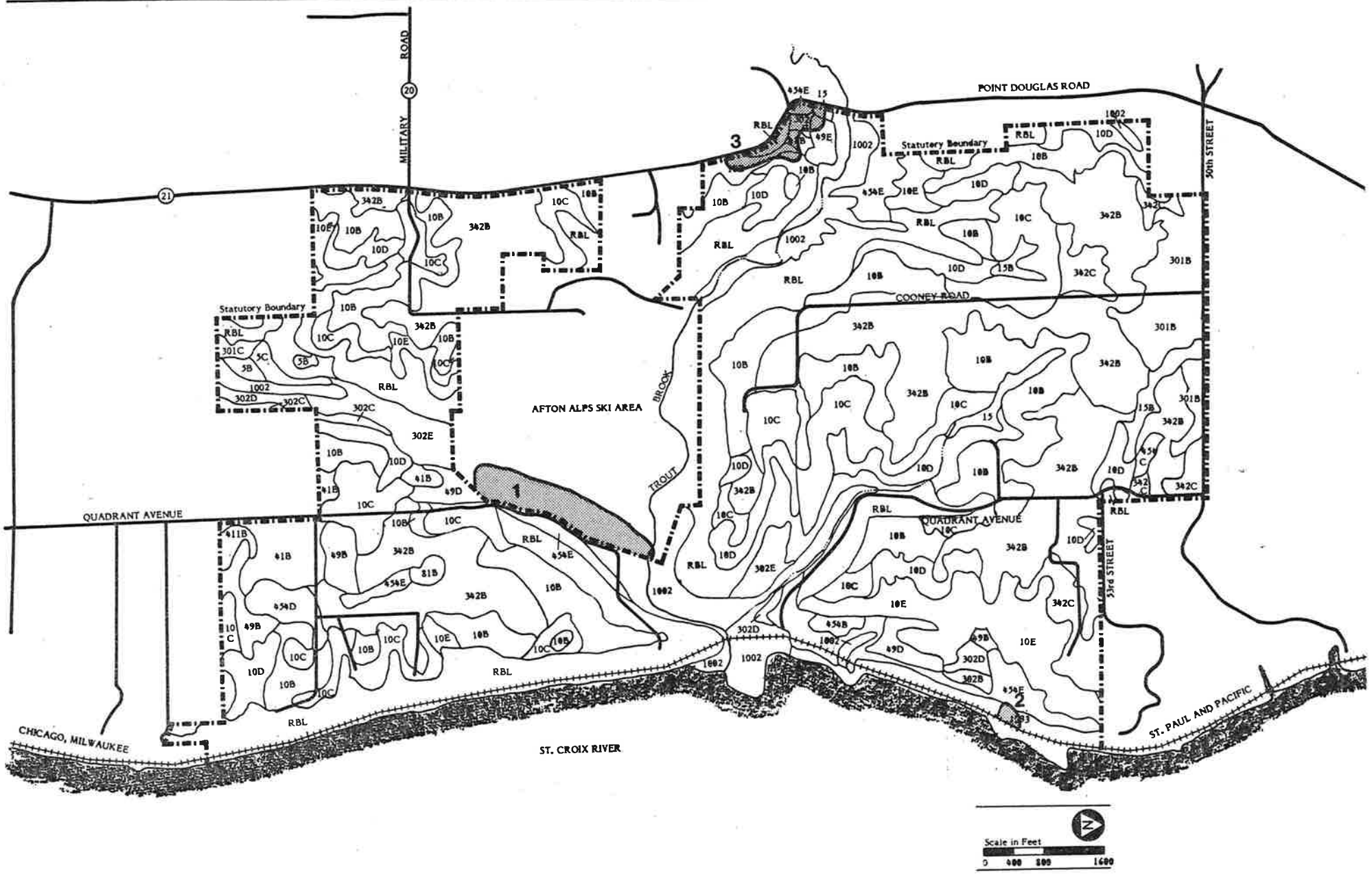
Site 2 - This is a highly erodable, sandy slope which is presently stabilized by various plant species. A scenic overlook is nearby, but its use should not be encouraged because of the unstable nature of the slopes and the propensity of park visitors to take shortcuts down such slopes. As other highly erodable areas are identified, use should be discouraged through a variety of techniques including brush pile placement, use of thorny plant materials for hedgerows, and other natural fencing practices.

Site 3 - This area is presently eroding. It should be stabilized with some quick-growing,deep-rooted vegetation and biodegradable mats if necessary. Once stabilized, the area should be revegetated in accordance with the vegetation management plan to restore the original character of the area.

Cost: $2,500

Source:

Vinar, Kenneth, Soil Scientist, Soils Conservation Service, "Afton State Park Soils Report," 1976.



See p. 47 for the discussion of the three soil management areas.

SOILS MANAGEMENT BUDGET

Biennium

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Erosion Control	$ 4,000	$ 3,000	$ 3,000	$ 4,500	$ 4,500	$ 19,000
Total	$ 4,000	$ 3,000	$ 3,000	$ 4,500	$ 4,500	$ 19,000

VEGETATION

Inventory

To rapidly inventory the vegetation component of a park, a system was devised which would not only categorize vegetation but would also recognize those species of wildlife normally associated with these plant communities. The system used to describe vegetation/wildlife associations is called the Ecological Community System. In designing the system several factors were considered. These factors included existing land use patterns, soil, moisture, plant species composition, physical appearance, (i.e., grassy, brushy, forested, or bare), and the habitat choices of the various species of wildlife commonly found in Minnesota. (See Appendix A)*

Original Vegetation

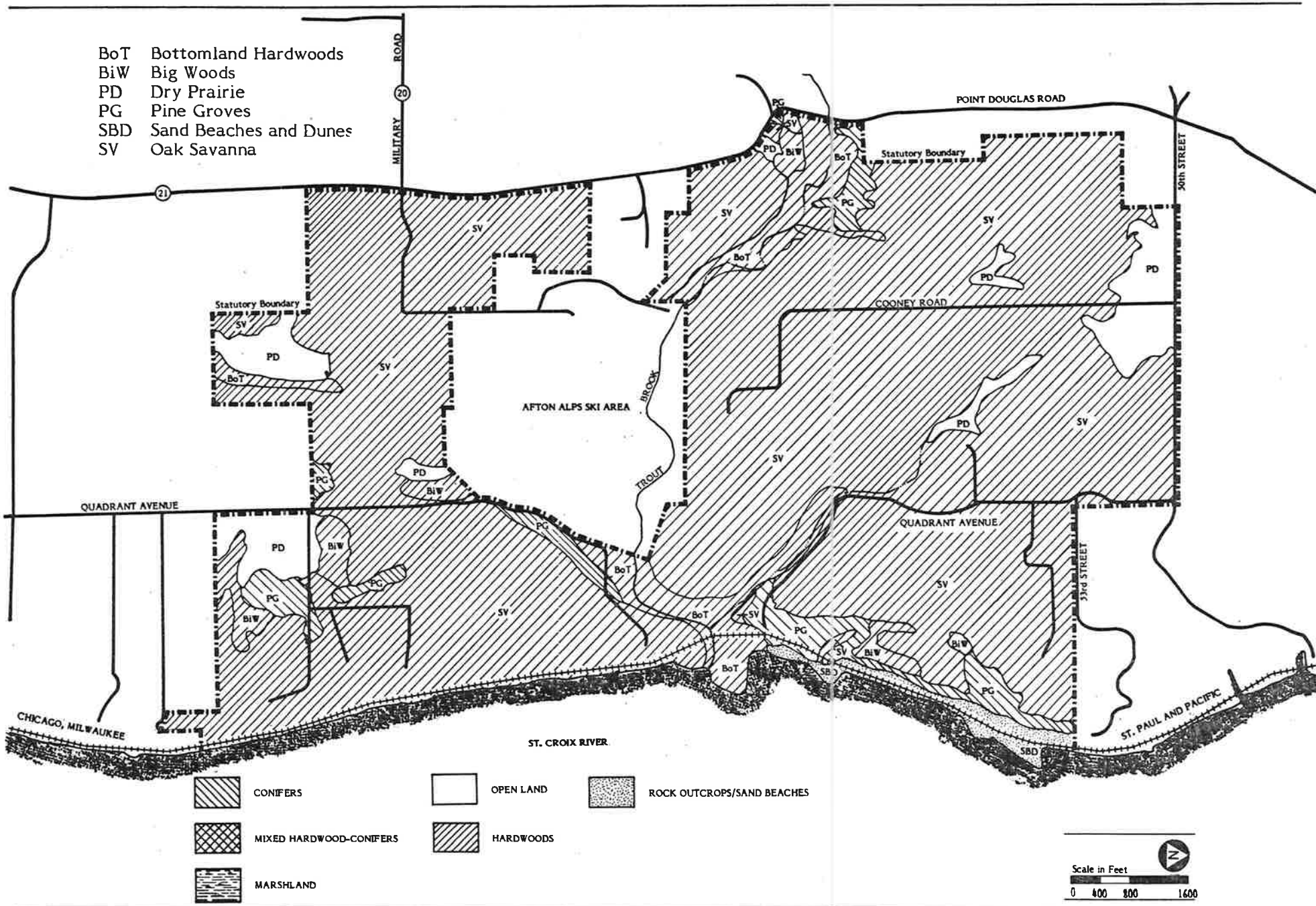
The original vegetation of Afton State Park was predominantly oak savanna (map, page 51). Tree species in this community included red, white, and pin oak, jackpine,and maple. Other less common plant communities were ash-cottonwood in the bottomlands, pine on the river bluffs, maple on the more fertile soils, and tall grass prairie in localized sites. The tall grass prairie/oak community boundaries quite likely fluctuated with the intensity and frequency of prairie fires. In years when fires were severe, causing the oaks to die, the prairie grasses encroached upon their range. During other periods, oaks were able to survive and invade the prairie grass areas.

Based on the character of the soils in Afton State Park, Soil Conservation Service scientists were able to generally indicate the dominant tree species which were responsible for the development and formation of a given soil type. This information is useful to park resource managers in restoring the original character of the park. Dominant tree species components of each of the original ecological communities are listed below. In the restoration process, these species should be planted in clustered groupings, or randomly interspersed. Management programs should also recognize the existence of associated species which, while they are of lesser importance, are also a necessary part of the ecological community.

The Original Vegetation Map (Map, page 51) shows the general location, extent,and distribution of the original communities.

*See note in Table of Contents regarding availability of the appendices which have been printed under separate cover.

ORIGINAL VEGETATION



Dominant species components of original communities: (Curtis, 1959)

Bottomland Hardwoods

Black Ash
Cottonwood
Elm
Silver Maple

Savanna

Red Oak
White Oak
Pin Oak
Bur Oak
Jack Pine
Maple

Dry Prairie

Big Bluestem Grass
Little Bluestem Grass
Pasque Flower
Side-Oats Grama Grass
Leadplant

Big Woods

Sugar Maple
Basswood
White Pine
Red Pine

Pine Groves

Red Pine
White Pine
Jack Pine
White Oak

Very little of the original character of the vegetation remains today. Only the steeper slopes have not been cleared for agriculture, however, they were probably logged or pastured. More detailed field work is necessary to document plant community history.

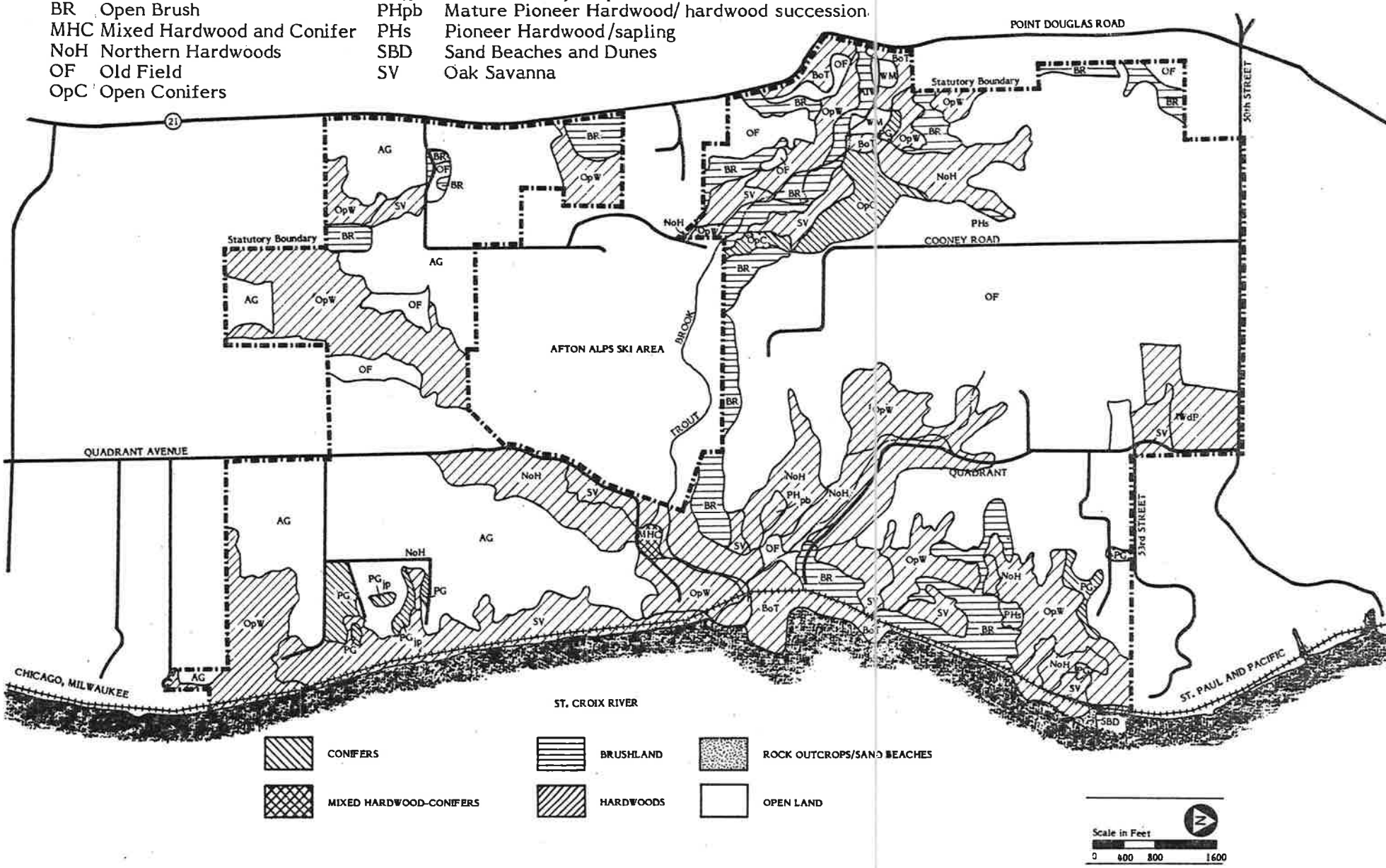
Existing Vegetation

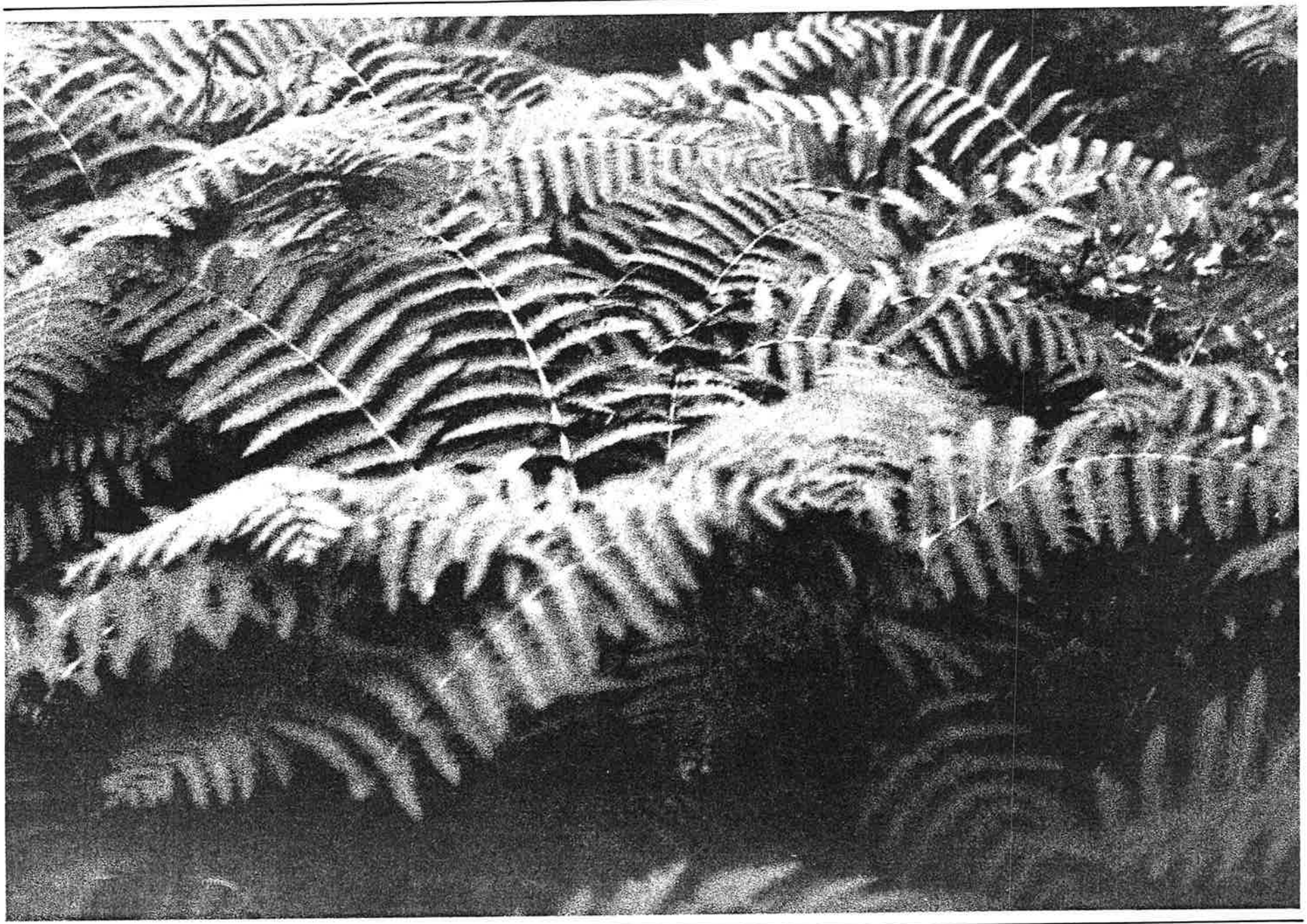
There are 16 existing ecological communities in Afton State Park. The brush understory associated with various upland communities provides an additional habitat type. The dominant communities in Afton State Park include old fields, northern hardwoods, and agricultural fields. Other communities include upland and lowland brush, oak savanna, pine groves, pioneer hardwoods, bottomland hardwoods, open woods, sand beaches, dunes, wet meadows, open conifers, wooded pastures, streams, rivers, and agricultural meadows (map, page 53).

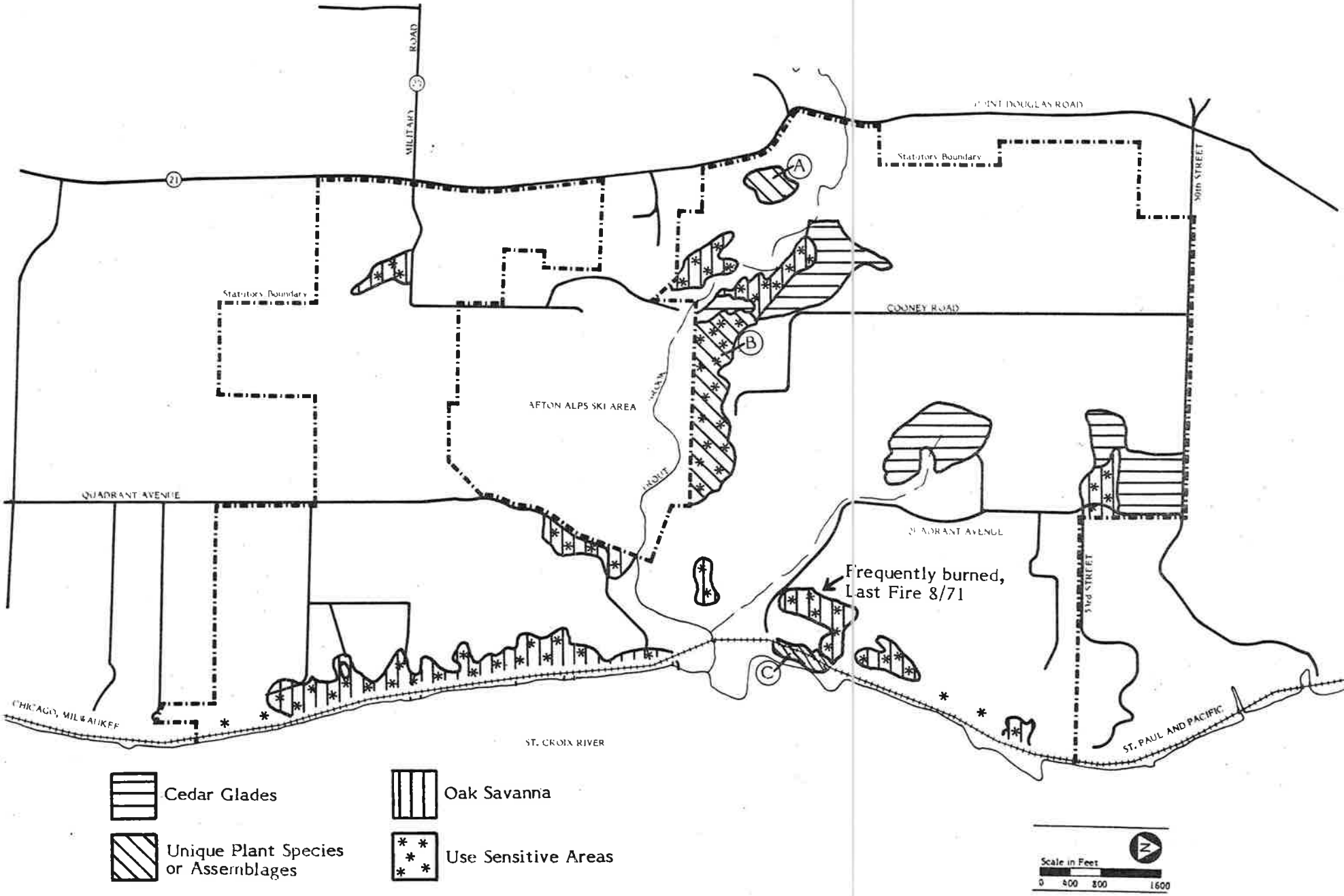
Further detailed information on ground cover is needed to accurately ascertain the general ecological successional patterns of each community.

VEGETATION

AG	Agricultural Land	OpW	Open Woods	WdP	Wooded Pasture
AlW	Alder Willow	PG	Pine Groves	WM	Wet Meadow
BoT	Bottomland Forest	PGjp	Pine Groves /jack pine		
BR	Open Brush	PHpb	Mature Pioneer Hardwood/ hardwood succession		
MHC	Mixed Hardwood and Conifer	PHs	Pioneer Hardwood /sapling		
NoH	Northern Hardwoods	SBD	Sand Beaches and Dunes		
OF	Old Field	SV	Oak Savanna		
OpC	Open Conifers				






MILITARY ROAD
POINT DOUGLAS ROAD
Statutory Boundary
90th STREET
COONEY ROAD
AFTON ALPS SKI AREA
QUADRANT AVENUE
93rd STREET
Frequently burned,
Last Fire 8/71
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
A
B
C
Cedar Glades
Oak Savanna
Unique Plant Species
or Assemblages
Use Sensitive Areas
Scale in Feet
0 400 800 1600
N

Rare, Endangered, or Unusual Species or Communities

Plant species of special interest which merit special management because of unusual or unique values or vulnerability of habitat have been identified by Ownbey (See map, page 55).

Deciduous Woodland Flora - Area A

A dry ravine leads into Trout Brook from the south. The ravine and adjacent hillsides support a very rich deciduous woodland flora including maidenhair fern, polybody fern, and hornbeam.

Hot, Dry Slopes - Area B

This area includes the open slopes north of Trout Brook. These slopes are hot and dry and provide habitat for many prairie species including paintbrush, butterfly weed, green milkweed, and puccoon. Although these plants are not exactly rare, their presence within the park area is worth nothing. Barren, southwest-facing river bluffs in southeastern Minnesota frequently support this assemblage of plants and represent a unique habitat in the state.

Sandy Beach Area - Area C

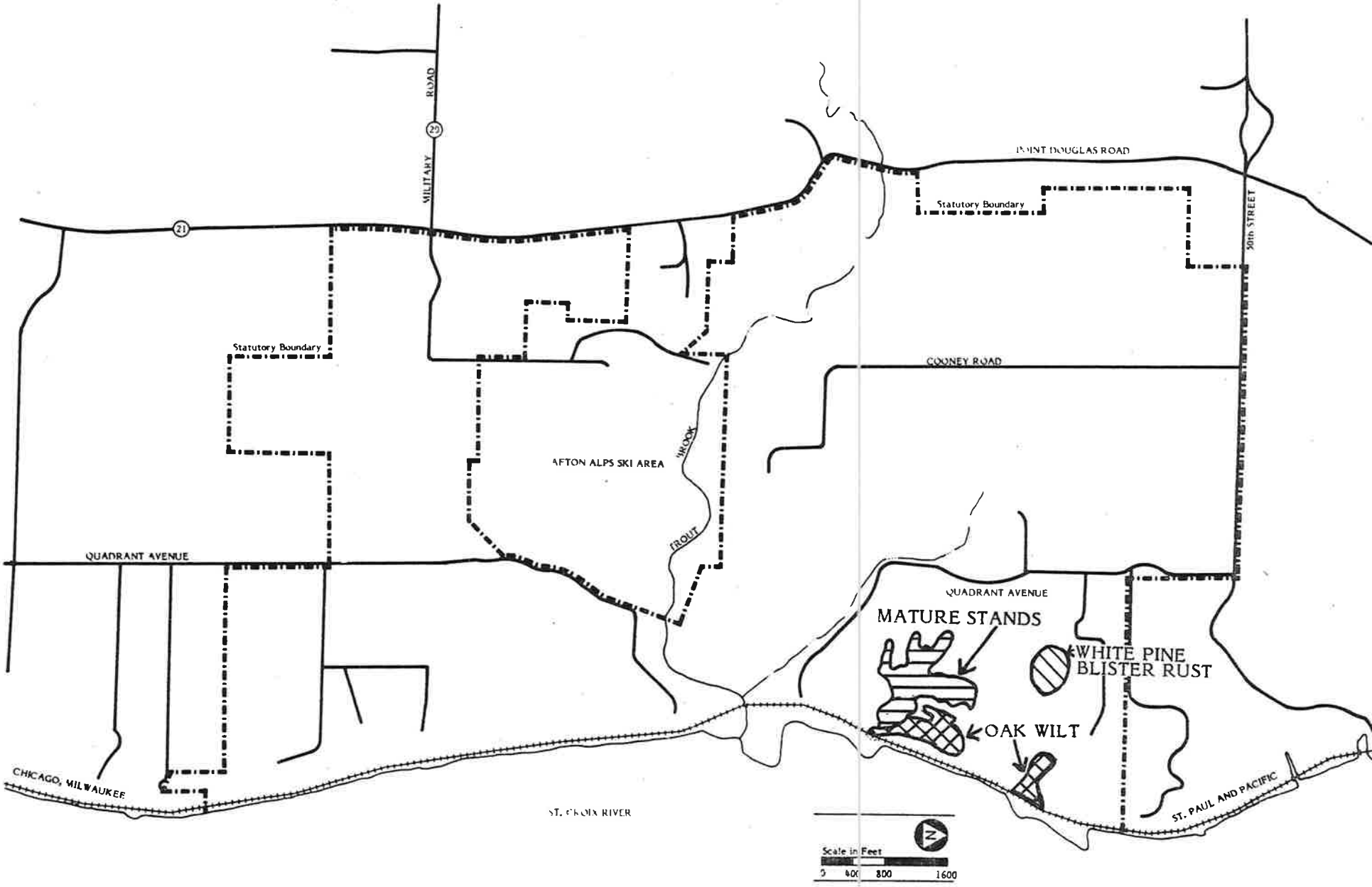
This is a sandy beach area along the shore of the St. Croix River with a few white false indigo plants. This white-flowered legume is becoming quite rare in southern Minnesota.

Oak Savanna

Scattered tracts of oak savanna occur in the park as indicated on the map. They are not true savannas since fire suppression has permitted brush encroachment. These communities, however, are reasonable approximations and proper management should restore them. (See pp.61-63). Moyle recognizes the oak savanna as a community in special need of protection because of its uncommon occurrence.

Cedar Glades

Several old fields and pastures which have red cedar growing in them occur within the park. This species thrives well only under specialized conditions and is highly susceptible to fire


MILITARY ROAD
29
21
POINT DOUGLAS ROAD
Statutory Boundary
50th STREET
Statutory Boundary
COONEY ROAD
AFTON ALPS SKI AREA
TROUT BROOK
QUADRANT AVENUE
QUADRANT AVENUE
MATURE STANDS
WHITE PINE BLISTER RUST
OAK WILT
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
N
Scale in Feet
0
400
800
1600

Old Fields - These plant communities are former agricultural fields which have been abandoned, either because of acquisition by the state or because the land is only marginally productive. Grasses and forbes are the predominant cover although scattered trees and brush may occur. Left unmanaged except for fire control, the old fields will gradually be invaded by oaks and brush, eventually becoming closed canopy stands.

Northern Hardwoods - Northern hardwoods communities generally occupy areas along steep slopes and bluffs which could not profitably or practically be cleared for agricultural purposes. Most of them have been pastured at one time. Shrub and ground cover density is low to moderate. Left unmanaged except for fire control, the northern hardwood community would eventually become a maple community because of the shade tolerance of maple and other associated species.

Agricultural Fields - Agricultural fields presently within the park are generally utilized for corn production. Once abandoned, if natural succession is permitted, weed communities will invade these fields. These abandoned fields will become old field ecosystems and successional patterns will be similar to those discussed for old fields.

Vegetation Analysis

Diseased, Mature, or Over Mature Stands

Virtually all communities which include oak or elm have or will have tree loss due to Dutch elm disease or oak wilt. To date, no control measures to check the disease spread are available. Sanitation cuts only reduce the rate of spread but eventually all elms and most oaks will be lost except for genetically resistant individuals or populations. As of 1978, 1.5% of the elms in river valley habitats in east-central Minnesota have been affected by Dutch elm disease. This percentage could change quickly as the disease gains a stronger foothold in this area. White pine blister rust is also present. (See map, page 57).

Sensitivity to Intensive Use

Vegetated steep slopes or light sandy soils are not suitable for intensive use. Oak savannas should also be protected. These areas are indicated on the map, page 55 .

Toxic Plants

Poison ivy is the only plant in the park which is toxic to humans.

Wildlife/Vegetation Relationships

Appendix B lists ecological communities and wildlife species normally occurring in Minnesota. By studying the matrix, those wildlife species generally associated with a given ecological community may be determined.

Ecological Community Structural Coding System

Appendix C presents an ecological community coding system which describes the structural appearance of these communities. This information is necessary to make management decisions. This data should be gathered for the ecological communities in Afton State Park. Ecological community boundaries should be field checked and the map verified when the additional data is gathered.

Management

Objectives:

To restore the original oak savanna/dry prairie character which existed prior to settlement by Europeans

To implement various management techniques and programs including cutting, burning, and planting in order to enhance wildlife habitat

Vegetation Restoration

Without a program of directed vegetation management, it would take several hundred years for the park to return to its original natural condition. During the interim, undesirable weed communities would invade the agricultural land before eventually being replaced by aspen and/or boxelder. A program of directed management can more quickly bring about restoration of the original oak savanna/dry prairie character of the area. Restoration of destroyed plant communities such as oak savanna or prairie is exceptionally difficult. For this reason it is recommended that one of two options be followed for this restoration project.

Option 1 - Research and restoration conducted by an academic institution

Option 2 - Restoration based on general field information

Alternative I

Implementation of this proposal would require the funding of a long term research project. First the proper restoration techniques would need to be established, and second, the results must be monitored to determine whether or not the proper communities are being restored. It is recommended that an academic research assistantship position be established under the supervision of an individual knowledgeable in oak savanna/dry prairie restoration and management. A second position for a landscape architecture research assistantship should also be established. These individuals would be responsible for developing an overall restoration plan utilizing computer technology. The resulting research must emphasize restoration of original community vegetation. Detailed site designs for the various proposed developments should be included. Any additional expertise regarding oak savanna/dry prairie restoration could be obtained from a private consultant.

Estimated Costs

Research Assistantships (6)	$ 40,000
Research Projects (6)	150,000
Restoration Projects (1,000 acres @ $300/acre)	300,000
	$490,000

Alternative 2

This option would be implemented by DNR staff. Management blocks should not exceed 40 acres in size.

Agricultural land restoration - Management priorities should be placed on converting agricultural land first to prairie and subsequently to the ecological community type indicated on the original vegetation map. Restoration should consist of hand planting or seeding one-acre irregular patches in a mosaic pattern over the entire 40-acre block. These blocks will serve as seed sources for prairie expansion through the use of periodic controlled burning programs. The unplanted portion of agricultural land may be allowed to convert to old field communities. A prairie restoration firm will be able to provide prairie seeds and plants for this project.

Old field restoration - To restore old fields to prairie, it will be necessary to break up the sod layer. Proper tillage techniques should initially be implemented to suppress undesirable weed competition. Following the successful establishment of source plots, a program of periodic controlled burning shall be implemented to enhance the spread of prairie species.

Oak savanna restoration - Successful oak savanna restoration can begin only on established prairie or on soil prepared by the planting of shrubby nitrogen fixing legumes.

a. Restoration alternative 1 - Use of established prairie :

Oaks, especially the red oaks, are generally intolerant of soil conditions associated with sod-burned, grassy fields. To overcome this limitation, the establishment and maintenance of a prairie community for at least ten years to condition and prepare the soil for the introduction of oaks is recommended. During this time, periodic burns should be carried out to encourage the spread of the prairie. If, after this time, oaks have not established themselves naturally, the acorns should then be hand scattered over the area. Partially burying the seed in the litter without disturbing the prairie will increase the germination success rate.

Burning of the prairie should be conducted annually for about 3 years following successful oak establishment to improve chances of survival by strengthening the root system. Fire should then be excluded for about 5 or more years to allow seedlings to attain some height prior to the next burn.

b. Restoration alternative 2 - Use of shrubby legumes:

Nitrogen-fixing shrubs, by their nature "fix" atmospheric nitrogen in small nodules on their roots, and, in this way, increase the amount of nitrogen in the soil. Other plant species interplanted within the community benefit from this, as demonstrated by increased levels of foliar nitrogen for as much as 10 years after the elimination of the shrubby legume. Nitrogen-fixing shrubs which are tolerant of Minnesota's climate are:

Bicolor Lespedeza
Dull-Leaf Indigobush
Fragrant Indigobush
Russian Olive
Black Locust
Downy Indigobush
Autumn Olive
Siberian Pea

Approximately 10 years after the introduction of the shrubs, the area should be mowed off utilizing a rotary brush chopper. The use of fire is preferred over chemical control to further eliminate new sprouts. Following proper site preparation, acorns should be hand scattered.

Burning should be conducted annually for about 3 years to allow the oak seedlings to develop well-established root systems. Fire may be used to spot control shrub competition or undesirable vegetation.

From a management viewpoint, oak is probably the most difficult vegetational community to treat. Natural oak stands tend to be even-aged. The diverse sizes in a stand do not indicate diverse ages, but rather that some trees grew much faster than others. It has been proposed that the oak stands of Wisconsin (and probably Minnesota) were the result of severe fires. This seems logical because usually oak stands are approximately the same age as the length of time the area has been settled. The regeneration of the mature/overmature stands is the highest priority item at present. The program described below can be expected to take 20 or 30 years to complete. The process of natural succession is toward more mesic hardwoods on the better sites (red oak site index 55+) and toward continued oak on the poorer sites. The oak in this park is about evenly divided above and below site index 55. Oak reproduction is very sensitive to competition. On the poorer sites competition is less and the oak is more apt to develop. Because of this sensitivity it is better to use natural reproduction, (usually called advanced reproduction), than planted seedlings. Studies have shown the fastest growth occurs on stump sprouts, the next fastest growth occurs on stool sprouts, with seedlings ranking a very poor third. Stool sprouts are seedlings that have remained alive for many years, dying back annually but developing a good root system. This also points out that oak can survive under an existing canopy, but needs full sunlight to grow faster than the competition. The new trees should be able to grow at least four to six feet the first season if they are to outgrow competition. This also means it is not possible to perpetuate an oak stand by selection cutting but only by clearcutting. This does not mean the entire stand has to be clearcut, but an area sufficient to establish reproduction. These areas should be irregular in shape, about one acre in size and should not be long and narrow as oak reproduction along edges is generally poor. This will allow the entire area to appear diverse in age but still meet the requirements for regenerating the stand.

The reproduction process is further complicated by the past grazing which compacted the soil, eliminating any reproduction present and causing a brushy understory. A one-inch layer of litter is considered ideal for acorn germination but at present the ground is either brushy or covered with a sod layer. Until these two are gone, acorn germination will be very low (even under ideal conditions, it is never extremely high).

Although stump sprouts are the best method, it is doubtful they can be used in these stands. Sprout production is almost non-existent when the trees are over 80 years old.

The lower quality sites will probably be self-sustaining because the competing species need better soil and moisture conditions. If the oak wilt-killed areas are left open they will develop brush species and it could take 50-75 years to get oak reestablished. This type of area should be considered for planting, although artificial means of controlling competition will have to be used. There is no simple method of maintaining an oak type. This is one of the few non-coniferous types in which homogeneity rather than diversity is desirable.

Fire Management Techniques

Fire played an essential role in maintaining the prairie and oak savanna communities. A routine fire management program should be conducted in Afton State Park to maintain the prairie/savanna communities.

Prairie - Following the successful establishment of source plots, a routine program of burning should be established which will effectively encourage the proliferation and spread of prairie communities. Burns should be carried out at intervals of three to five years to maintain the prairie complex. Undesirable weed growth may be suppressed by the use of spot fires.

Oak Savanna - The prairie should be burned the season prior to the planting of oaks to reduce litter. The burn should be timed to precede an anticipated bumper acorn crop. Following the successful establishment of seedlings, fire should be used annually for 3 years. This allows the oaks to develop strong root systems. Once the oak savanna has successfully been established, further burning may be needed to eliminate undersirable species from the groundcover, and reduce litter accumulations.

Other Management Techniques

Recommendations pertaining to the management of specific species or groups of species have been prepared by the district forester. The items discussed include disease problems, mature/overmature stands, carrying capacity, and management possibilities and effects.

a. Oak - Presently there are six major areas of oak wilt in the park and at least one area on the land proposed for acquisition. The trees that have been dead for more than one year do not pose a disease hazard but may be a safety hazard due to their location along roads or trails. Annual monitoring of oak stands and prompt removal of diseased trees should control oak wilt.

   Oak makes up 60% of the wooded area in the park. Of these trees, 21% are overmature, 5% mature, and 74% immature.

   All trees are affected by excessive usage, and oak is one of the more sensitive species. It is impossible, however, to determine how much use will ultimately cause damage to a particular stand. A camping or picnicking area definitely would have an adverse effect, but an area that is open for diverse usage probably would not. There is currently no formula to calculate the number of visitor days that will cause damage.

b. Northern Hardwoods - This timber type is probably less sensitive to use than oak, but the same problems can occur with very heavy use.

This is the classic example of selection system management since the principal species are shade tolerant. Trees that are overmature and are not necessary for wildilfe or aesthetic reasons should be cut to promote more rapid growth of the saplings underneath. The past grazing has eliminated reproduction, but planting of basswood and sugar maple can help overcome this. Both of these species are shade tolerant. Basswood is one of the more prolific sprouters and when cut can be expected to send up many sprouts.

With no management this type can be expected to continue as northern hardwoods. Grazing has inhibited reproduction, therefore the stand will be two-storied. It can be expected that many years will pass before the ground is sufficiently loosened to allow good seed germination, although planting will help this.

c. Bottomland Hardwoods - Except for areas of Dutch elm disease, this type is disease free. The stands should be monitored for signs of disease.

While this type is younger than the other timber types, about one third of it can be called mature. Bottomland hardwoods commonly begin to deteriorate at an earlier age than northern hardwoods.

These trees are quite sensitive to use because they are shallow-rooted and a relatively light use of the area can expose roots. However, the areas themselves tend to limit the use because they usually are the wettest areas of the park.

Bottomland species are generally intolerant of shade. Newly developed seedlings can survive for a year or two under shade but then die. It is important that reproduction occur before opening the stand because weed growth is especially prolific in low areas. Management techniques are, therefore, quite similar to oak management.

If nothing is done the areas will gradually have more and more boxelder and blue beech because these are the more shade-tolerant species. Silver maple and green ash will decrease because they are less tolerant than the other three. Willow and cottonwood are pioneer species that correspond to aspen on the uplands.

d. Red Cedar - This type is generally found on those areas that will not support other trees. There is no disease problem connected with this vegetational type except that it is the co-host for cedar apple rust.

It is doubtful that the trees in these areas are mature, but it probably can be assumed they will last at least 100 years.

There is no management system for this type as it is not a commerical species. Reproduction is accomplished by birds disseminating the seed. Because of the site, competition is not a problem , and they are hardy enough to survive under seemingly adverse conditions.

There are no alternative management techniques in this type. If left, they will constitute habitat areas and provide aesthetic diversity.

e. Protection of White False Indigo - The swimming beach area is also the only habitat for white false indigo in the park. Measures must be taken to protect this habitat while allowing recreational swimming. The beach area should be moved up river, away from the plants. In June, when the plants are flowering and easily identifiable, large rocks should be placed among them. This will discourage park visitors from using the area and disturbing the plants. Existing tree growth need not be removed to provide additional beach space. The overstory should be thinned periodically to encourage the growth of the false white indigo plants. Because poison ivy occurs in association with this species, signs indicating its presence should be placed there. This should effectively keep the public out of the area.

• Specific Management

The table (pages 67-77) and map (page 66) show specific vegetation management units and recommendations. These recommendations should be conducted on an experimental basis on only one or two areas initially. If the techniques prove viable all areas should be managed in this way, contingent on available funding.

Sources:

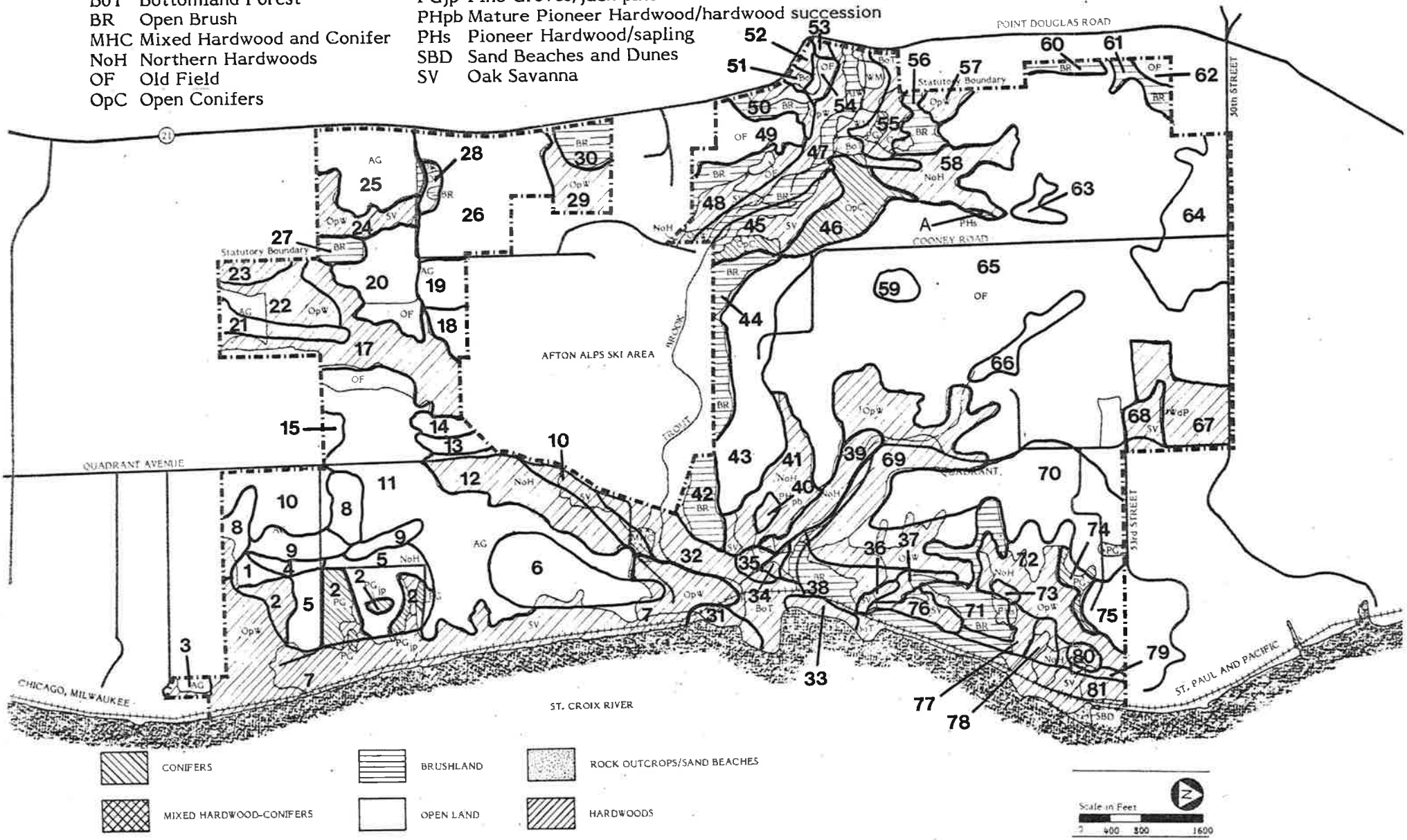
Curtis, J. T., The Vegetation of Wisconsin. (Madison: University of Wisconsin Press, 1959).

Minnesota State Planning Agency, Development Planning Division, 1975 Pocket Data Book, (Saint Paul: Minnesota State Planning Agency, 1975).

Steigler, J. E., A Study of Elm Mortality From Dutch Elm Disease: An Investigation and Establishment of Long Term Study Plots. (Saint Paul: Minnesota Department of Agriculture, 1975).

Moyle, J. B., The Uncommon One, Minnesota Department of Natural Resources, 1975.

AG Agricultural Land
AlW Alder Willow
BoT Bottomland Forest
BR Open Brush
MHC Mixed Hardwood and Conifer
NoH Northern Hardwoods
OF Old Field
OpC Open Conifers
OpW Open Woods
PG Pine Groves
PGjp Pine Groves/jack pine
PHpb Mature Pioneer Hardwood/hardwood succession
PHs Pioneer Hardwood/sapling
SBD Sand Beaches and Dunes
SV Oak Savanna
WdP Wooded Pasture
WM Wet Meadow



See Ecological Community Management Recommendations pp. 67-77 for map code.

Ecological Community Management Recommendations

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
1	Agricultural Land Development Zone	Regenerate to Big Woods	Prepare site initially by planting shrubs. Interplant a random mixture of species on big woods list, p.52, in 10 - 15 years.	$ 250	When Acquired
2	Mixed Types Development Zone	Maintain	Maintain existing species diversity, monitor use to detect deterioration of vegetation. Distribute and disperse use to minimize soil compaction and vegetative deterioration. Continue to implement new techniques useful in site protection and perpetuation	---	"
3	Agricultural Land Open Woods	Plant Shrubby Screen	Allow plants such as aspen and brush to invade and screen outside views.	---	"
4	Agricultural Land Development Zone	Regenerate to Pine Groves	Use standard site preparation techniques, hand plant in random fashion the species on pine grove list, p.52.	500	"
5	Agricultural Land Development Zone	Regenerate to Oak Savanna	Prepare site initially by planting shrubs, interplant in 10 years with species on oak savanna list, p.52.	---	"
6	Agricultural Land Development Zone	Regenerate to Oak Savanna	Portions of this area will serve as a day use area, parking lot and visitor center complex. The oak savanna should be regenerated utilizing the shrub technique. This method will permit screening of individual sites and minimize the adverse effects of excessive soil compaction by foot traffic.	15,000	"

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
7	Oak Savanna Open Woods	Manage as Oak Savanna	Implement oak savanna management techniques.	5,000	"
8	Agricultural Land	Convert to Big Woods	Prepare site initially by planting nitrogen-fixing shrubs in a randomized fashion. Interplant tree species from big woods list in approximately 10 years. A computer generated program may be used to model a dispersed planting schematic.	2,000	1978-79
9	Agricultural Land	Convert to Pine Grove	Use conventional techniques to prepare site, randomly plant to species on pine grove list.	1,000	1978-79
10	Agricultural Land	Convert to Dry Prairie	Implement techniques recommended for prairie establishment and management.	6,000	When Acquired
11	Agricultural Land	Convert to Oak Savanna	Implement procedures for restoration of oak savanna.	6,000 biennium	1980-81 1982-83 1984-85
12	Northern Hardwoods	Convert to Oak Savanna	Convert to savanna by selectively removing those species not on oak savanna list. Implement oak savanna management techniques.	3,000	1980-81
13	Agricultural Land	Convert to Big Woods	Manage as in #8 .	1,000	When Acquired
14	Agricultural Land	Convert to Pine Grove	Manage as in #9 .	1,000	"
15	Agricultural Land	Convert to Pine Grove	Manage as in #9.	1,000	"

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
16	Northern Hardwoods Oak Savanna	Convert to Pine Grove	Selectively cut out hardwoods at 15 year intervals to provide increased light penetration to forest floor. Underplant with species listed under pine groves. Randomly plant in clusters and as individuals throughout stand.	1,000	"
17	Open Woods	Manage as Oak Savanna	Implement oak savanna management techniques.	2,000	"
18	Agricultural Land	Convert to Oak Savanna	Implement oak savanna restoration techniques.	3,000	"
19	Agricultural Land	Manager's Residence Service Area	Use appropriate planting materials and screening techniques to obscure this area from the view of park visitors.	---	"
20	Agricultural Land	Convert to Oak Savanna	Implement oak savanna restoration techniques.	4,500	"
21	Open Woods	Manage for Bottomland Hardwoods	Area surrounding and adjacent to intermittent stream flowing through narrow valley in this area should be managed for bottomland hardwood species. Natural regeneration should be sufficient to restore this stand without any further management. (See also Water Resources Management Section.)	---	"
22	Open Woods, Agricultural	Manage as Oak Savanna	Implement oak savanna restoration and management techniques.	6,000	"
23	Oak Savanna	Maintain	Implement oak savanna management techniques.	1,000	"

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
24	Open Woods Oak Savanna	Maintain	Implement oak savanna management techniques.	1,000	"
25	Agricultural Land	Convert to Oak Savanna	Implement oak savanna restoration techniques.	9,000	"
26	Agricultural Land	Convert to Oak Savanna	Implement oak savanna restoration techniques. Encourage dense growth of vegetation in a 50 yard strip along CSAH 20 and 21.	18,000	"
27	Brush	Maintain as Pioneer Hardwoods	Remove timber at 40-60 year intervals in two separate clearcut operations followed by a prescribed burn to maintain pioneer hardwoods, especially aspen. Hand-planting of aspen may be necessary initially to encourage regeneration.	1,000	"
28	Brush	Maintain as Pioneer Hardwoods	Manage as in #27 .	1,000	"
29	Open Woods	Transition Between Oak Savanna and Pioneer Hardwoods	Allow interspersion of pioneer hardwoods from unit 30 with savanna species of this unit. Reduce burning interval to 30 years or more to allow growth and maturation of pioneer hardwood species. Fire should be used as a management tool as much as possible because of the steepness and extent of the slopes.	4,000	"

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
30	Brush	Manage as Pioneer Hardwoods	Clearcut or burn as appropriate to encourage regeneration of pioneer hardwoods, expecially aspen. Hand planting of aspen may be necessary to encourage regeneration.	2,000	"
31	Bottomland Hardwoods	Passive Management	Allow natural succession to proceed.	---	"
32	Open Woods Bottomland Hardwoods	Manage for Bottomland Hardwoods	Trout Brook valley should be managed to enhance growing conditions for bottomland hardwoods. Natural regeneration should be sufficient to restore and/or maintain this stand.	---	"
33	Development Zone	------	Swimming beach area. A few white false indigo plants occur in this area. Precautions should be taken in designing for the use of the area to be certain that these individual plants and their habitat are protected. (Dr. Gerald Ownbey, a local resident, is familiar with the locations of these plants and should be consulted prior to the detail design phase for this particular site.)	---	"
34	Old Field	Convert to Oak Savanna	Implement oak savanna restoration and management techniques.	2,000 biennium	1980-81 1982-83 1884-85
35	Bottomland Hardwoods	Historic Zone	May have been former low water crossing site. Manage to perpetuate bottomland hardwoods. Natural regneration should be sufficient to maintain the existing community.	---	"

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
36	Bottomland Hardwoods	Maintain	Allow community to regenerate and maintain itself. Remove diseased elms as necessary.	1,000	1978-87
37	Oak Savanna	Manage as Big Woods	Gradually convert to species listed in Big Woods community by random underplanting on the Antigo silt loam (soil type number 49D).	1,000	1980-81
38	Oak Savanna	Convert to Pine Groves	Gradually open this community by a program of selective cutting of sufficient intensity to ensure the the survival of randomly hand planted pine species selected from the pine grove list.	3,000	1980-81
39	Bottomland Hardwoods	Maintain	Allow natural regeneration to maintain and perpetuate the bottomland hardwood community along the bottomland area of this intermittent stream.	1,000	1980-87
40	Pioneer Hardwoods	Maintain	Maintain and perpetuate this paper birch community by a program of clearcutting and prescribed burning.	1,000	1980-81
41	Northern Hardwoods	Convert to Oak Savanna	Convert to oak savanna by selectively removing those species not on oak savanna list. Implement oak savanna management techniques.	3,000 biennium	1980-81 1982-83 1984-85
42	Brush	Maintain	Clearcut or burn as appropriate to maintain scrub brush community.	1,000	1980-81

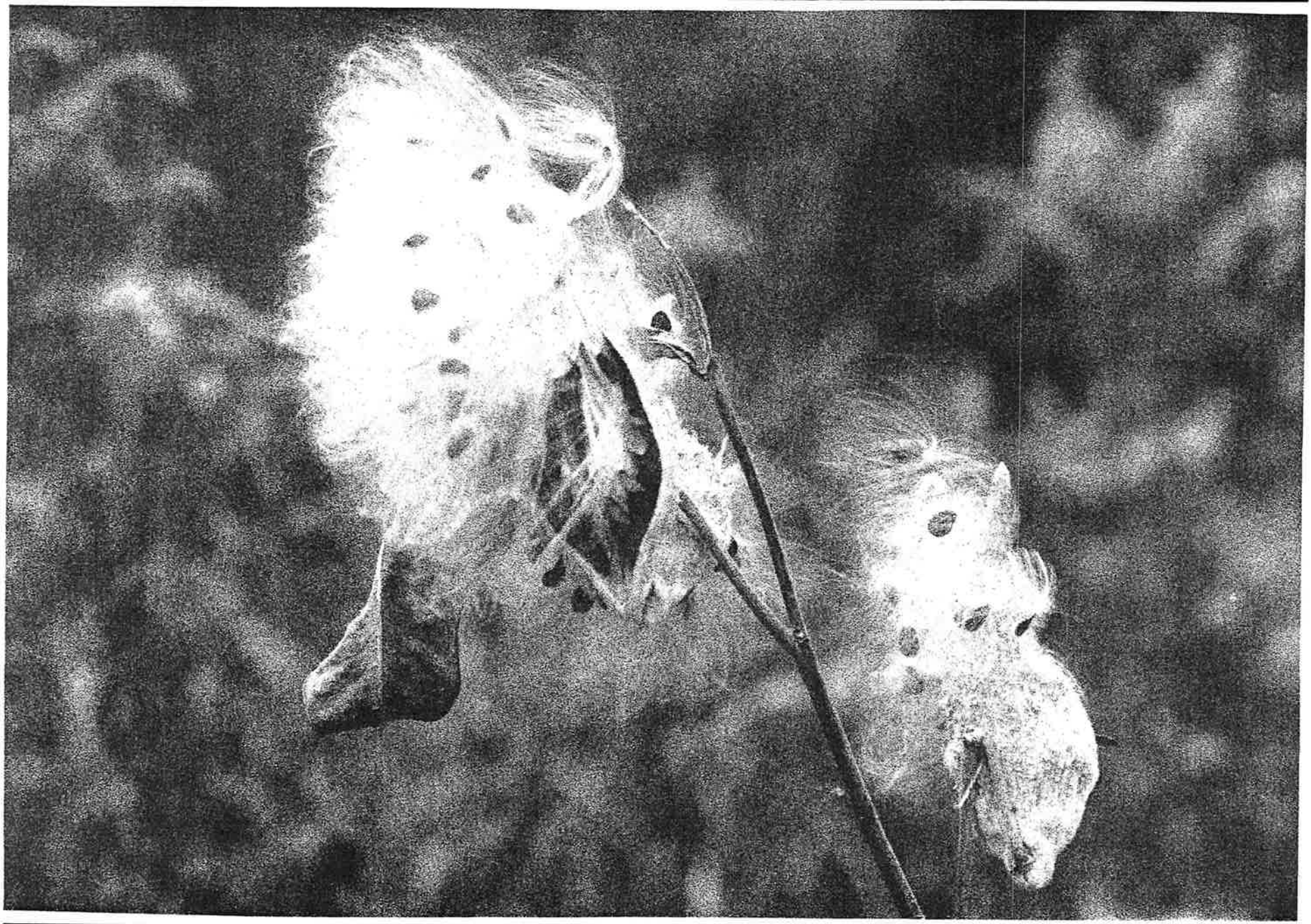
Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
43	Argicultural Land	Pioneer Hardwood Savanna Transition Zone	Manage by rotational cutting and/or burning to provide an intermingling of oak savanna with aspen. Four subunits should be established with burning or clearcutting taking place on one unit every 10-15 years.	9,000	1978-79
44	Brush	Maintain Pioneer Hardwood Species	Clearcut and/or burn to maintain aspen. Manage as two subunits clearcutting one unit every 30 years.	2,000	1978-79
45	Oak Savanna Open Conifer Brush	Maintain	Maintain existing community diversity by periodic burning of the oak savanna. Protect brush from fire to encourage a dense understory.	1,000 biennium	1978-79 1980-81 1982-83
46	Open Conifer	Maintain	Protect from fires which may kill or damage the conifers.	1,000 biennium	1978-87
47	Bottomland Hardwoods	Maintain	Allow natural growth and regeneration to proceed. Some sanitation cuts may be necessary to remove diseased elm trees. Maintain bottomland hardwood community along Trout Brook valley bottom.	1,000 biennium	1978-79 1982-83 1986-87
48	Oak Savanna Old Field Brush	Maintain	Manage as in # 45. Convert old field to oak savanna.	1,000 biennium	1978-79 1980-81 1982-83
49	Old Field	Convert to Oak Savanna	Implement oak savanna restoration techniques.	3,000	1982-83

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
50	Brush	Convert to Oak Savanna	Implement oak savanna restoration techniques. Prepare site by initially burning and cutting to remove brush and mature trees.	2,000	1982-83
51	Brush	Convert to Dry Prairie	Implement prairie restoration management techniques on the appropriate soil types.	1,000	1982-83
52	Bottomland Hardwoods	Convert to Pine Grove	Gradually open community by a program of cutting and burning. Randomly plant an appropriate mixture of conifers on the appropriate soil types.	1,000	1978-79
53	Pioneer Hardwoods	Convert to Oak Savanna	Clearcut area and implement oak savanna restoration techniques.	1,000	1978-79
54	Old Field	Convert to Big Woods	Gradually convert to species on the big woods list by random planting. Initially prepare site by planting nitrogen-fixing shrubs for at least 10 years prior to introduction of big woods species.	1,000	1982-83
55	Wet Meadow, Bottomland Hardwoods Pine Grove	Convert to Wet Prairie, Maintain Bottomland Hardwoods, Pine Groves	Gradually introduce wet prairie plants suitable to soil and site conditions. Periodically burn wet prairies to maintain after establishment. Allow bottomland hardwoods to naturally regenerate and perpetuate community. Selective removal of diseased elms may be necessary. Manage pine stand to improve natural appearance.	3,000	1982-83

Management Unit Number	Ecological Community	Management Practice	Specific Recommendations	Est. Cost	Implement
56	Brush	Manage for Pioneer Hardwoods	Clearcut and/or burn to favor pioneer hardwood communities. Convert to oak savanna in 60 years.	1,000	1980-81
57	Open Woods	Manage as Oak Savanna	Implement oak savanna management techniques.	1,000	1980-81
58	Northern Hardwoods	Manage as Oak Savanna	Gradually convert to oak savanna by a program of selective cutting and burning. Implement oak savanna management techniques. Maintain northern hardwoods on slopes. Maintain small pocket of birch at point A.	4,500	1984-85
59	Old Field	Prehistoric Artifacts	Site with some archeological potential. Manage as in #65.	---	---
60	Brush	Maintain	Allow natural succession to proceed.	---	---
61	Brush	Maintain	Manage as in #60.	---	When Acquired
62	Old Field	Convert to Oak Savanna	Implement oak savanna restoration techniques.	1,500	"
63	Old Field	Convert to Dry Prairie	Implement prairie restoration techniques on appropriate soil types.	2,000	"
64	Old Field	Convert to Dry Prairie	Implement prairie restoration techniques on appropriate soil types.	9,000	"
65	Old Field	Convert to Oak Savanna	Implement oak savanna restoration and management techniques. This area may be managed as a single unit once appropriate management techniques have been tested and time-proven.	150,000	1982-83

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
66	Old Field	Convert to Dry Prairie	Implement prairie restoration techniques on appropriate soil type.	3,000	1984-85
67	Wooded Pasture	Convert to Oak Savanna	Implement oak savanna management techniques. Selectively cut out species which do not conform to oak savanna community.	4,000	When Acquired
68	Savanna	Maintain	Implement oak savanna management techniques.	2,000	"
69	Open Woods	Manage as Oak Savanna	Implement oak savanna restoration and management techniques.	9,000	1984-85
70	Old Field	Development Zone	Manage vegetation community as oak savanna. Provide adequate shrubby plant material to screen hike-in campsites.	16,000	1984-85
71	Brush	Maintain as Pioneer Hardwoods	Clearcut and/or burn to favor pioneer hardwoods,especially aspen. Manage in 3 subunits at 20 year intervals.		
72	Northern Hardwoods	Manage as Oak Savanna	Implement oak savanna restoration techniques. Selectively remove those species formerly not present in an oak savanna community.	6,000	1984-85
73	Northern Hardwoods	Convert to Big Woods	Underplant with plant species associated with a big woods community.	1,000	1984-85
74	Pine Grove	Maintain	Selectively thin stand to present a more randomized growth form.	500	1980-81
75	Old Field	Convert to Oak Savanna	Implement oak savanna restoration techniques.	3,000	When Acquired

Management Unit Number	Ecological Community	Management Practice	Specific Recommentations	Est. Cost	Implement
76	Savanna	Convert to Pioneer Hardwoods/Oak Savanna Transition	High incidence of oak wilt. Conduct sanitation cuts to remove diseased trees. Manage to provide interspersion of aspen and oak savanna by a rotational program of cutting and burning. Two subunits should be established and alternatively managed at 30 year intervals.	3,000	1987-79
77	Open Woods	Convert to Pine Groves	Selectively open stand and interplant in random fashion with conifer species. Allow an intermixture of conifers and hardwoods to persist.	1,000	1982-83
78	Northern Hardwoods	Convert to Pine Groves	High incidence of oak wilt. Allow dead trees to remain to provide habitat for squirrels, woodpeckers and other cavity nesting species. Interplant openings in stand with various conifers species. Initially prepare site by burning.	500	1980-81
79	Northern Hardwoods	Convert to Pine Groves	Manage as in #77.	500	When Acquired
80	Open Woods	Development Zone	This area has an excellent view of the St. Croix River Valley. Appropriate facilities will be provided as described in the recreation management section.	---	---
81	Savanna Brush	Maintain	Periodically burn to maintain oak savanna community. Burn infrequently to allow regeneration of brush.	3,000	When Acquired



VEGETATION MANAGEMENT BUDGET
ALTERNATIVE 1 (page 60)

Biennium

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Research Assistantships (4)	$ 10,000	$ 20,000	$ 10,000			$ 40,000
Research Projects	25,000	50,000	25,000	$ 25,000	$ 25,000	150,000
Restoration Program	50,000	50,000	100,000	75,000	25,000	300,000
Total	$ 85,000	$ 120,000	$ 135,000	$ 100,000	$ 50,000	$ 490,000

ALTERNATIVE 2 (pages 60-61)

Biennium

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Prairie Restoration			$ 1,000	$ 3,000		$ 4,000
Oak Savanna Restoration	$ 1,000	$ 14,000	166,000	11,000		192,000
Oak Savanna Management		1,000		35,500		36,500
Big Woods Management	2,000	1,000	1,000	1,000		5,000
Pine Grove Management	2,000	1,500	1,000			4,500
Pioneer Hardwoods Mgmt.	12,000	1,000			$ 4,000	17,000
Maintain	7,000	7,500	8,000	2,000	2,000	26,500
Funding for newly acquired land	7,000	15,000	10,000	14,000	25,000	71,000
Total	$ 31,000	$ 41,000	$ 187,000	$ 66,500	$ 31,000	$ 356,500

WILDLIFE

Introduction

One of the most intriguing assets of any park is its resident wildlife. Many species are commonplace but unnoticeable because of their elusive or secretive behavior. For many visitors the mere awareness of the presence of wildlife is all that is needed to change a dull, uneventful walk through the brush into a challenging, refreshing stroll through nature's handiwork.

In order to provide such an experience for park users, detailed inventories of park wildlife are needed so that managers are better able to manage habitat to attract certain species or protect habitat which will ensure the continued presence of existing species.

The following wildlife inventory was based on checklists and reports submitted by local residents, "birders", naturalists, area game managers, and park managers. The list is not all inclusive and will continue to be revised and updated as new data are reported.

Inventory

There are 190 species of birds which either reside in or adjacent to Afton State Park or utilize it during the spring and fall migration period. The park also provides habitat for 33 species of mammals and 13 species of reptiles and amphibians. A checklist of species known to occur within or adjacent to the park is presented in the table, pp.82-86.

Certain wildlife species occurring within a park are especially noteworthy because special precautions are required in their management. These species may be sensitive to human activity or have the potential of damaging vegetation and property or they may pose a threat to park visitors. The charts on the following pages list known species and those suspected to be in the area.

Endangered, Threatened, or Rare Species

Species within this group are those which are presently in danger of extinction in Minnesota within the immediate future, species which could become endangered in the foreseeable future in Minnesota but not necessarily throughout their entire range, or species that once resided in Minnesota but have disappeared because of changes in land and water use patterns.

Birds

Migrants

Peregrine falcon

Wildlife Definitions

Abundant - Trained observer may see several individuals in one day during the residency period of the species.

Common - Trained observer may see one or more individuals in one day.

Uncommon - Trained observer may see one individual in the course of one summer.

Rare - Species normally not observed by the trainec observer.

Endangered - Listed in the Federal Register as a threatened or endangered species.

Unknown - Abundance of an individual species in a given park has not been determined.

Permanent Resident - Resident in the park area on a year-round basis.

Summer Resident - Only found in the park area during the summer months, presence may or may not indicate breeding activity.

Migrant - Noramally found in the park area only during the spring or fall migratory season.

Winter Visitant - Normally stop in the area of the park during winter migration.

Uncertain - Seasonal occurrence status is not known for the species in the park area.

Seasonal Inactive - Species is seasonally inactive in the park area, may enter dormancy, hibernation, or aestivation.

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	SEASONAL OCCURRENCE: PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
	Short-billed Dowitcher												
	Long-billed Dowitcher												
	Stilt Sandpiper												
	Buff-breasted Sandpiper												
	Marbled Godwit												
	Hudsonian Godwit												
	American Avocet												
	Wilson's Phalarope												
	Northern Phalarope												
	Parasitic Jaeger												
	GlaucousGull												
●	Herring Gull								●				
●	Ring-billed Gull								●				
	Franklin's Gull												
	Bonaparte's Gull												
●	Forster's Tern								●				
●	Common Tern								●				
●	Caspian Tern				●				●				
●	Black Tern							●					
●	Rock Dove							●					
●	Mourning Dove								●				
●	Yellow-billed Cuckoo								●				
●	Black-billed Cuckoo								●				
●	Screech Owl							●					
●	Great Horned Owl							●					
●	Snowy Owl									●			
	Hawk-Owl												
	Burrowing Owl												
●	Barred Owl									●			
	Great Gray Owl												
●	Long-eared Owl								●				
	Short-eared Owl												
●	Saw-whet Owl							●					
●	Whip-poor-will								●				
●	Common Nighthawk								●				
●	Chimney Swift								●				
●	Ruby-throated Hummingbird								●				
●	Belted Kingfisher							●					
●	Common Flicker								●				
●	Pileated Woodpecker							●					
●	Red-bellied Woodpecker							●					
●	Red-headed Woodpecker								●				
●	Yellow-bellied Sapsucker								●				
●	Hairy Woodpecker							●					
●	Downy Woodpecker							●					
●	Black-backed 3-toed Woodpecker				●					●			
	Northern 3-toed Woodpecker												
●	Eastern Kingbird								●				
	Western Kingbird												
●	Great Crested Flycatcher								●				
●	Eastern Phoebe								●				

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	SEASONAL OCCURRENCE: PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Yellow-bellied Flycatcher							●					
	Acadian Flycatcher												
●	Willow Flycatcher								●				
	Alder Flycatcher												
●	Least Flycatcher								●				
●	Eastern Wood Pewee								●				
●	Olive-sided Flycatcher									●			
●	Horned Lark								●				
●	Tree Swallow								●				
●	Bank Swallow								●				
●	Rough-winged Swallow								●				
●	Barn Swallow								●				
	Cliff Swallow												
●	Purple Martin								●				
	Gray Jay												
●	Blue Jay							●					
	Black-billed Magpie												
●	Common Raven			●						●			
●	Common Crow							●					
●	Black-capped Chickadee							●					
	Boreal Chickadee												
●	Tufted Titmouse							●					
●	White-breasted Nuthatch							●					
●	Red-breasted Nuthatch			●						●			
●	Brown Creeper								●				
●	House Wren								●				
●	Winter Wren									●			
●	Long-billed Marsh Wren			●					●				
	Short-billed Marsh Wren												
●	Mockingbird			●					●				
●	Gray Catbird								●				
●	Brown Thrasher								●				
●	American Robin	●							●				
	Varied Thrush												
●	Wood Thrush								●				
●	Hermit Thrush									●			
●	Swainson's Thrush									●			
●	Gray-cheeked Thrush									●			
●	Veery								●				
●	Eastern Bluebird								●				
●	Blue-gray Gnatcatcher								●				
●	Golden-crowned Kinglet									●			
●	Ruby-crowned Kinglet									●			
●	Water Pipit									●			
	Sprague's Pipit												
●	Bohemian Waxwing			●							●		
●	Cedar Waxwing						●						
●	Northern Shrike										●		
	Loggerhead Shrike												
●	Starling						●						
	Bell's Vireo												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	SEASONAL OCCURRENCE: MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Common Loon	●							●				
	Red-throated Loon												
	Red-necked Grebe												
●	Horned Grebe	●							●				
	Eared Grebe												
●	Western Grebe			●					●				
●	Pied-billed Grebe	●							●				
	White Pelican												
	Double-crested Cormorant												
●	Great Blue Heron		●					●					
●	Green Heron	●						●					
	Cattle Egret												
●	Great Egret		●					●					
●	Black-crowned Night Heron		●					●					
	Yellow-crowned Night Heron												
	Least Bittern												
●	American Bittern		●					●					
●	Whistling Swan					●			●				
●	Canada Goose						●						
	White-fronted Goose												
●	Snow Goose					●			●				
●	Mallard					●	●						
●	Black Duck					●			●				
●	Gadwall								●				
●	Pintail								●				
●	Green-winged Teal								●				
●	Blue-winged Teal							●					
●	American Wigeon								●				
●	Northern Shoveler								●				
●	Wood Duck							●					
●	Redhead								●				
●	Ring-necked Duck								●				
●	Canvasback								●				
●	Greater Scaup								●				
●	Lesser Scaup								●				
●	Common Goldeneye									●			
●	Bufflehead								●				
	Oldsquaw												
	Harlequin Duck												
●	White-winged Scoter		●						●				
	Surf Scoter												
	Black Scoter												
●	Ruddy Duck								●				
●	Hooded Merganser								●				
●	Common Merganser									●			
●	Red-breasted Merganser								●				
●	Turkey Vulture								●				
●	Goshawk									●			
●	Sharp-shinned Hawk									●			
●	Cooper's Hawk							●					
●	Red-tailed Hawk						●						

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	SEASONAL OCCURRENCE: MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Red-shouldered Hawk								●				
●	Broad-winged Hawk								●				
	Swainson's Hawk												
●	Rough-legged Hawk									●			
	Ferruginous Hawk												
●	Golden Eagle				●					●			
●	Bald Eagle												
●	Marsh Hawk								●				
●	Osprey									●			
●	Peregrine Falcon					●				●			
●	Merlin									●			
●	American Kestrel								●				
	Spruce Grouse							●					
●	Ruffed Grouse												
	Greater Prairie Chicken												
	Sharp-tailed Grouse												
	Bobwhite												
●	Ring-necked Pheasant							●					
	Chukar												
	Gray Partridge												
	Sandhill Crane												
	King Rail												
	Virginia Rail												
	Sora												
	Yellow Rail												
	Common Gallinule												
●	American Coot			●					●				
●	Semipalmated Plover								●				
	Piping Plover												
●	Killdeer							●					
	American Golden Plover												
	Black-bellied Plover												
	Ruddy Turnstone												
●	American Woodcock							●					
●	Common Snipe									●			
	Whimbrel												
	Upland Sandpiper												
●	Spotted Sandpiper							●					
●	Solitary Sandpiper								●				
	Greater Yellowlegs												
●	Lesser Yellowlegs								●				
	Willet												
	Red Knot												
	Pectoral Sandpiper												
	White-rumped Sandpiper												
	Baird's Sandpiper												
●	Least Sandpiper									●			
	Dunlin												
●	Semipalmated Sandpiper									●			
	Western Sandpiper												
	Sanderling												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	SEASONAL OCCURRENCE: PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Yellow-throated Vireo								●				
●	Solitary Vireo									●			
●	Red-eyed Vireo								●				
●	Philadelphia Vireo									●			
●	Warbling Vireo								●				
●	Black-and-white Warbler									●			
●	Prothonotary Warbler								●				
●	Golden-winged Warbler				●				●				
●	Blue-winged Warbler								●				
●	Tennessee Warbler									●			
●	Orange-crowned Warbler									●			
●	Nashville Warbler									●			
●	Northern Parula									●			
●	Yellow Warbler								●				
●	Magnolia Warbler									●			
●	Cape May Warbler									●			
	Black-throated Blue Warbler												
●	Yellow-rumped Warbler									●			
●	Black-throated Green Warbler									●			
●	Cerulean Warbler				●				●				
●	Blackburnian Warbler									●			
●	Chestnut-sided Warbler									●			
●	Bay-breasted Warbler									●			
●	Blackpoll Warbler									●			
●	Pine Warbler									●			
●	Palm Warbler									●			
●	Ovenbird									●			
●	Northern Waterthrush								●				
●	Louisiana Waterthrush												
●	Connecticut Warbler									●			
●	Mourning Warbler									●			
●	Common Yellowthroat								●				
●	Wilson's Warbler									●			
●	Canada Warbler									●			
●	American Redstart								●				
●	House Sparrow												
●	Bobolink						●						
●	Eastern Meadowlark							●					
	Western Meadowlark							●					
●	Yellow-headed Blackbird								●				
●	Red-winged Blackbird								●				
●	Orchard Oriole		●						●				
●	Northern Oriole								●				
●	Rusty Blackbird									●			
●	Brewer's Blackbird								●				
●	Common Grackle								●				
●	Brown-headed Cowbird								●				
●	Scarlet Tanager								●				
●	Cardinal								●				
●	Rose-breasted Grosbeak						●						
	Blue Grosbeak								●				

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	SEASONAL OCCURRENCE: PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Indigo Bunting								●				
●	Dickcissel								●				
●	Evening Grosbeak							●					
●	Purple Finch									●			
●	Pine Grosbeak									●			
●	Hoary Redpoll			●						●			
●	Common Redpoll									●			
●	Pine Siskin									●			
●	American Goldfinch							●					
●	Red Crossbill									●			
●	White-winged Crossbill									●			
●	Rufous-sided Towhee								●				
●	Lark Bunting												
●	Savannah Sparrow								●				
●	Grasshopper Sparrow								●				
	Henslow's Sparrow												
	Le Conte's Sparrow												
●	Sharp-tailed Sparrow									●			
●	Vesper Sparrow								●				
	Lark Sparrow												
●	Dark-eyed Junco									●			
●	Tree Sparrow									●			
●	Chipping Sparrow								●				
●	Clay-colored Sparrow								●				
●	Field Sparrow								●				
●	Harris' Sparrow									●			
●	White-crowned Sparrow									●			
●	White-throated Sparrow									●			
●	Fox Sparrow									●			
●	Lincoln's Sparrow									●			
●	Swamp Sparrow									●			
●	Song Sparrow								●				
●	Lapland Longspur												
	Smith's Longspur												
	Chestnut-collared Longspur												
●	Snow Bunting												
●	Harlan's Hawk									●			
●	Bewick's Wren												
●	Carolina Wren												
●	Yellow-breasted Chat												
●	Hooded Warbler												
●	Summer Tanager												
●	Black-headed Grosbeak												

MAMMAL CHECKLIST

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	SEASONAL OCCURRENCE: PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
	Opossum												
●	Eastern Mole		●					●					
●	Star-nose Mole		●					●					
●	Cinereous Shrew		●					●					
	Richardson Shrew												
	Water Shrew												
	Pygmy Shrew												
	Least Shrew												
●	Short-tailed Shrew		●					●					
●	Little Brown Bat		●					●				●	
	Keen Myotis												
●	Big Brown Bat		●					●				●	
	Pipistrelle Bat												
	Silver-haired Bat												
	Red Bat												
	Hoary Bat												
	White-tailed Jackrabbit												
	Snowshoe Hare												
●	Eastern Cottontail Rabbit		●					●					
●	Woodchuck		●					●				●	
	Richardson's Ground Squirrel												
●	Thirteen-lined Ground Squirrel		●					●				●	
	Franklin Ground Squirrel												
	Least Chipmunk												
●	Eastern Chipmunk		●					●				●	
●	Red Squirrel		●					●					
●	Eastern Gray Squirrel		●					●					
●	Fox Squirrel		●					●					
●	Southern Flying Squirrel		●					●					
	Northern Flying Squirrel												
	Northern Pocket Gopher												
●	Plains Pocket Gopher		●					●					
	Pocket Mouse							●					
●	Beaver		●										
	Western Harvest Mouse												
	Northern Grasshopper Mouse												
●	Prairie Deer Mouse		●					●					
	Woodland Deer Mouse												
●	White-footed Mouse		●					●					
	Bog Lemming												
	Northern Bog Lemming												
	Boreal Redback Vole												
●	Meadow Vole		●					●					
	Rock Vole												
	Prairie Vole												
	Pine Vole												
●	Muskrat		●					●					
●	Norway Rat		●					●					
●	House Mouse		●					●					
●	Meadow Jumping Mouse		●					○					
	Woodland Jumping Mouse												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	SEASONAL OCCURRENCE: PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
	Porcupine												
	Black Bear												
●	Raccoon		●					●				●	
	Fisher												
	Marten												
●	Short-tailed Weasel		●					●					
●	Long-tailed Weasel		●					●					
	Least Weasel												
●	Mink		●					●					
	River Otter												
●	Spotted Skunk		●					●					
●	Striped Skunk		●					●				●	
●	Badger		●					●				●	
●	Red Fox		●					●					
●	Gray Fox		●					●					
	Coyote												
	Timber Wolf												
	Canada Lynx												
	Bobcat												
●	White-tailed Deer		●					●					
	Moose												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE: ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	SEASONAL OCCURRENCE: WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Common Snapping Turtle		●					●				●	
	Wood Turtle												
	Map Turtle												
●	Western Painted Turtle	●						●				●	
	Blanding's Turtle												
	False Map Turtle												
	Western Spiny Softshell												
●	Eastern Spiny Softshell		●					●				●	
	Northern Prairie Skink												
	Five-lined Skink												
	Six-lined Racerunner												
●	Northern Red-bellied Snake		●					●				●	
	Texas Brown Snake												
	Northern Water Snake												
●	Eastern Plains Garter Snake	●						●				●	
●	Eastern Garter Snake	●						●				●	
●	Red Sided Garter Snake		●					●				●	
	Plains Hognose Snake												
	Eastern Hognose Snake												
	Blue Racer												
	Eastern Smooth Green Snake												
	Western Smooth Green Snake												
●	Bullsnake		●					●				●	
●	Western Fox Snake		●					●				●	
	Black Rat Snake												
	Eastern Milk Snake												
	Eastern Massasauga												
	Timber Rattlesnake												
●	Mudpuppy		●					●				●	
	Central Newt												
	Jefferson Salamander												
	Eastern Tiger Salamander												
	Gray Tiger Salamander												
	Red-backed Salamander												
	Dakota Toad												
●	American Toad	●						●				●	
	Great Plains Toad												
●	Northern Spring Peeper	●						●				●	
	Eastern Gray Treefrog												
	Blanchard's Cricket Frog												
	Boreal Chorus Frog												
	Western Chorus Frog												
	Pickerel Frog												
	Mink Frog												
●	Northern Leopard Frog	●						●				●	
	Green Frog												
	Wood Frog												

Species of Special Interest

Species within this group include those which are uncommon or locally distributed in Minnesota and are not presently threatened or endangered but which might become so. Also included are those species which presently are not in any particular difficulty but should be closely watched because they have unusual or special values, are of special public interest or because their habitat is especially vulnerable. Special management may be required.

Birds

Seasonal Residents	Migrants
Marsh hawk	Common loon
Bald eagle	Osprey
Great egret	Common tern
Great blue heron	
Pileated woodpecker	

Troublesome Species

Troublesome species include those species of wildlife which as individuals or populations might damage the natural resources of a park, park property, or park visitors.

Mammals

Species	Potential Problems
Bats	May disturb users
Beaver	Overutilization of vegetation, flooding roadways and property
Raccoon	Raiding garbage cans
White-tailed deer	Overbrowsing vegetation, traffic hazard

Reptiles and Amphibians

Most reptiles and amphibians, because of their inherent appearance and because of learned prejudicial fears by the general public, are usually not favorably accepted.

Sensitivity to Humans

Species listed within this group are those which are unusually sensitive to disturbance by human activity. Disturbance during one season or another may result in nest or den abandonment, decrease in territorial size or shift in territorial movement. Such disturbance might be detrimental to the survival of the species in a given area or may have affects over a much larger area.

Mammals

Red fox
Gray fox

Wildlife/Vegetation Relationships

A matrix indicating which given ecological communities each species of wildlife is normally associated with may be found in Appendix B. These associations have important management implications which will be dealt with later in the management section.

Management

Objectives:

To provide habitat suitable for wildlife species utilizing savanna habitat types

To control nuisance animals where they pose a threat to park facilities or visitors

To reduce specific wildlife populations if they pose a significant threat to park vegetation

- Specific Management

Badger: Field inspection of the park has revealed signs of badger activity in Area 1 (map, page 91). Other areas of activity may also exist. Additional field work will be necessary to locate these areas. Normal home range of badgers is less than ¼ mile. A population density of one badger per 2,000 acres over a large area is considered heavy. Badger feed primarily on rodents and prefer open grassland areas with some scattered pockets of brush. Oak savannas are also utilized. Management of the park for a combination of oak savanna/prairie habitat will enhance conditions for the burrowing rodents which badgers feed on. Interpretation of active badger use areas is recommended.

Wood Ducks: The bottomland hardwood community indicated as Area 2 (map, page 92) has an abundance of tree species which presently or potentially can provide cavity nesting areas for wood ducks. Tree species such as basswood, cottonwood, and willow should be allowed to mature so that the aged limbs will be hollowed out by squirrels and woodpeckers and serve as nesting cavities. Mature basswood in other areas of the park, within ¼ mile of the river, should be left standing to provide additional wildlife habitat.

Artificial nest structures for wood ducks may be constructed from slab wood and used to provide temporary nest structures until natural cavities form. Implementation of Recommendation 5, Appendix D should also be used to provide additional nest cavities in Area 2.

Estimated Costs:	30 houses	$1,000
	30 holes	600
Total Cost:		$1,600

Eastern Bluebird: Bluebird nest boxes presently are being provided in portions of the park by a local resident. Artificial nest cavities may be provided by the use of wooden fence posts drilled to create a nest cavity of the proper dimensions. Nest posts should be placed in areas of suitable habitat on an experimental basis. If this proves to be effective, additional nest posts may be placed throughout the park in suitable habitat. Posts of untreated oak wood will guarantee longevity. Eventually, the mature oaks of the savanna should serve to replace the artificial nesting posts.

Estimated Cost:	50 posts (experimental)	$ 750
	1,000 posts	10,000
Total Cost:		$ 10,750

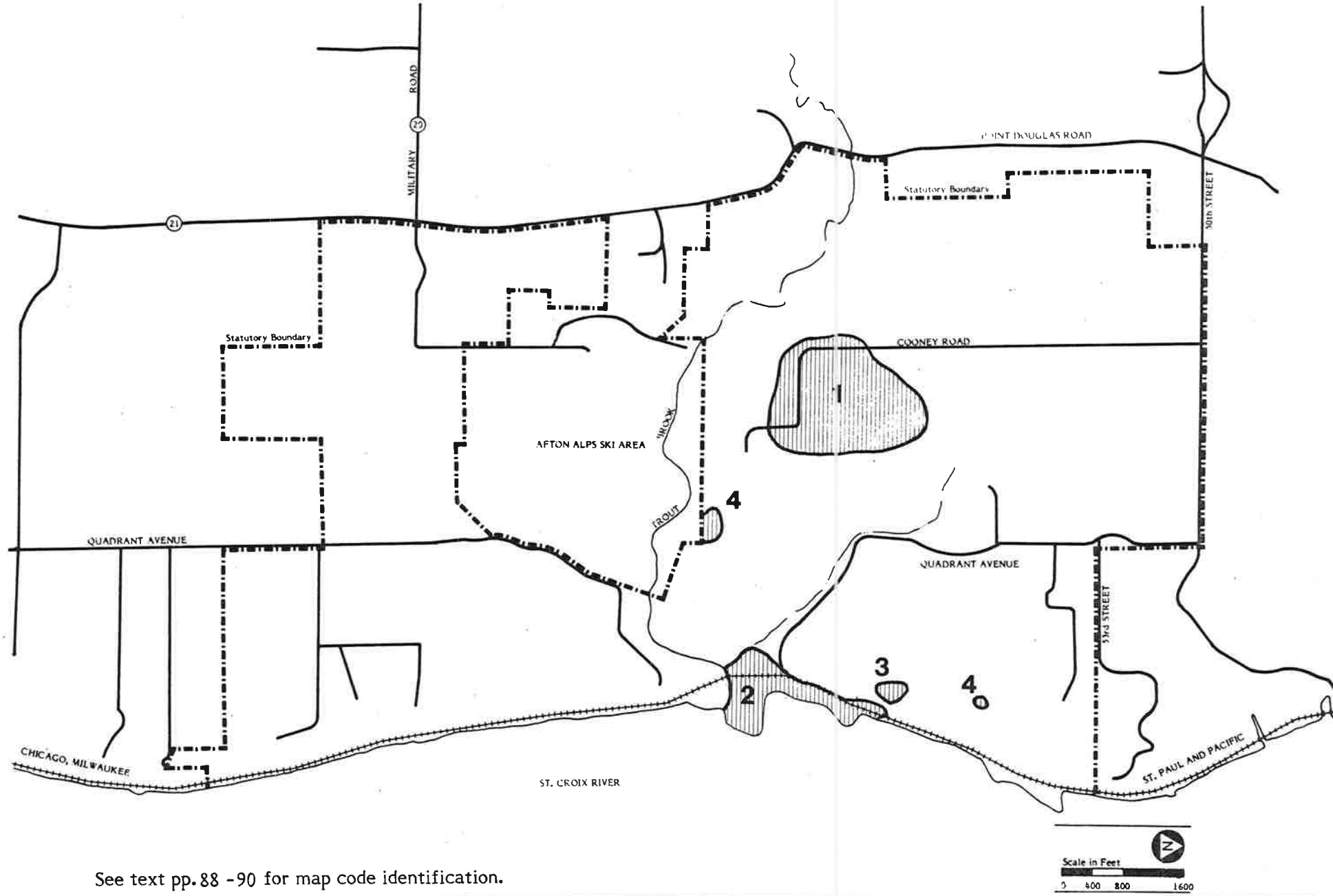
White-tailed Deer: The park is surrounded by agricultural fields which provide deer with a seasonal food supply. Sometimes conflicts arise with local landowners when deer forage in corn fields in the late fall before harvest. Limited deer harvests should be conducted when populations have reached the carrying capacity of the park and are creating nuisance depredation problems. Hunting by permit with bow and arrow or muzzle-loading guns should be allowed. If this does not achieve a desired level of control, a special season designed to increase the kill should be implemented. The area game manager will be responsible for determining the need for a regulated harvest and the number of animals to be removed.

Using food plots on agricultural land outside of the park is an alternative method for reducing depredations. This method, however, artificially increases the carrying capacity and eventually the deer herd would have to be reduced.

Ruffed Grouse: There is ruffed grouse habitat in the park, particularly in the northern half. Ruffed grouse depend very heavily on early successional stages of pioneer hardwoods, particularly on trembling aspen 60 years of age and less, which has a variety of age classes within roughly a 10 acre area.

Currently two active drumming logs have been located within the park (Area 4). These areas may be used as interpretive sites to demonstrate the various components of ruffed grouse habitat. Temporary blinds may be placed near the logs in season to allow park visitors to observe male drumming behavior. Blinds must be carefully placed because the birds are easily frightened from their selected log by the sudden appearance of a strange object. Heavily screened sites 60-70 feet from the log are best. Blinds should be placed sometime in early March to allow the bird to grow accustomed to it. Area 3 (map, page 92) appears to have the necessary qualities of good grouse habitat including aspen and a good density of brush, but appears to lack objects suitable for drumming. Placement of 15 large debarked elm logs (18-20 inches dbh logs, 10 feet long) in high density brush pockets may provide the missing habitat component. Areas should be monitored to check success of this procedure.

Estimated Cost: $750



See text pp. 88 -90 for map code identification.

WILDLIFE MANAGEMENT BUDGET

Biennium

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Bluebird Nest Posts	$ 500	$ 250	*$ 5,000	*$ 2,500	*$ 2,500	$ 10,750
Wood Duck Nests	500	500	400	200		1,600
Ruffed Grouse Habitat	750					750
Total	$ 1,750	$ 750	$ 5,400	$ 2,700	$ 2,500	$ 13,100

*Dependent on success of experiment

CULTURAL AND HISTORICAL RESOURCES

Introduction

Prior to the management of cultural resources, the presence and absence of historical and archaeological sites must be documented and identified. It is then of primary importance to protect known and suspected locations from activities which could adversely affect these irreplaceable and non-renewable cultural resources. Once protected, further excavation, analysis, and interpretation of significant archaeological and historical sites can be developed.

Inventory

Presently, there are no known historical sites of statewide significance in Afton State Park. However, based on a 1974 survey by the state archaeologist, the potential for archaeologically significant sites is rated excellent, and an intensive survey is deemed necessary.

One sight of local interest is a low water crossing (NW¼ NW¼ S2 T27N R17W) over Trout Brook which was used by early settlers before the existing bridge was constructed.

Management

Objective:

To protect and preserve all potential and known prehistoric and historic sites

- Afton Mill

Historic research confirmed that the so called Afton Mill was not located within the boundaries of the park, but was north of the town of Afton on Bolles Creek. An intensive survey is needed to gather additional data. Interpretation would be premature at this time.

Cost estimate for survey: $1,000

• Oliver Charley Homesite

A more recent site, the Oliver Charley farm, lies within the park boundaries and is located in S 35 T 28N R 20W near the site of the present park headquarters. Management of the site should be determined by the interpretive prospectus. Management may include marking the site, displaying the farm implements in the visitor center, and preserving the buildings.

Sources:

Woolworth, Allan, Minnesota Historical Society Project #4091, 1976.

Letter and update to "Prehistoric Archaeological Sites in Minnesota State Parks" from Christy Caine, Acting State Archaeologist, June 3, 1976.

CULTURAL RESOURCES MANAGEMENT BUDGET

Biennium

Management Practice	78-79	80-81	82-83	84-85	86-87	Total
Phase One Survey	$ 1,000					$ 1,000
Total	$ 1,000					$ 1,000

Recreation Management

INTRODUCTION

Careful consideration must be given to future needs of the park user. Although a great deal of data exists concerning disparate elements of the subject, no comprehensive authoritative study on recreational tourism demand within Minnesota is currently available. Trends in travel patterns are now discernible, but estimates of the time period over which this demand develops and of its magnitude are only speculative at this time. Furthermore, published data largely documents what people have done in the past. Only if we assume that these trends will continue can conclusions be drawn. Obviously, this data is not (nor can it be) sensitive to any unpredictable technological changes or political events. For example, the oil embargo created an "energy crisis" overnight. This development and its implications have had a direct impact upon travel patterns.

There are two basic aspects of recreational demand. The first involves measurement of the amount and kind of recreational opportunities/facilities currently demanded by the public (e.g., the size of the park or the number of campsites). The second aspect involves an estimate of latent demand for recreational opportunities/facilities which would exist if citizens were given ample opportunity and adequate conditions to participate in an activity (e.g., the number of handicapped campers that would have utilized campsites if the architectural barriers to their use had been removed).

In the planning for the use and development of state parks, an attempt has been made to anticipate the recreational needs of the public by providing increased recreational opportunities while protecting the park's natural resources.

USER ANALYSIS

Because Afton State Park is located on the fringe of the metropolitan area, is expected to be subject to heavy use when it is developed and open to the public. Because no significant user data for this park exists, the following discussion relates anticipated demand and park conditions to the future use and development.

The combination of relatively small size (1,648 acres), the irregular shape (Afton Alps ski area is in the center), the preponderance of steep slopes, and the metropolitan location of the park all mandate wise and efficient use of available park land in order to best serve park functions. As a natural state park (see Classification, pages21-24) those functions are ". . . . primarily for aesthetic, cultural, and educational purposes . . . and shall not . . . accommodate all forms or unlimited volumes of recreational use." (Outdoor Recreation Act of 1975).

For these reasons, and especially to make best use of space available, it is proposed that automobiles be restricted to the entrance road leading to central parking areas and that the remainder of the park be developed for hiking, cross-country skiing, and trail-accessible camping, picnicking, and other activities.

DEVELOPMENT PHILOSOPHY

Introduction

Physical developments within state parks should be limited to those which are necessary and adequate for management and appropriate park use and enjoyment. Moreover, these necessary facilities should be provided only under carefully controlled safeguards against unregulated and indiscriminate use ensuring the least damage to park resources. To the highest practicable degree, location, design, and materials for facilities should be consistent with the objectives of preserving and conserving the grandeur of the natural environment.

Administrative facilities, including roads and trails, are necessary in all parks for proper management. In most parks, public accommodations, such as campgrounds, are called for so that the public may have adequate opportunity to enjoy and use the unique environments set aside for them.

Such appropriate facilities, if wisely located, designed, and constructed, can serve to protect park resources by focusing and directing the uses of the park. For example, a road, a trail, or a formal campground can serve to channel use within specifically designated locations, thus preventing indiscriminate use of a larger area which could damage or destroy some of the very resources for which the park has been dedicated and set aside.

Facilities can be made compatible with the natural environment; those which are in discord with their surroundings can be avoided. It is the purpose of the administrative policies which guide the DNR in its physical development programs to achieve this objective.

Within economic and natural resource limitations, it is DNR's policy to provide recreational opportunities for all people within the state. However, topographic relief, severe soil conditions, or major physical obstructions in some parks may require an extensive system of "switchbacks", hard surfacing, or bridging which may destroy the natural atmosphere for which the park was established. Therefore, the DNR will concentrate its efforts upon providing accessibility in parks which have the most potential for use by the handicapped. And, keeping in mind the potential of providing the full range of recreational opportunities for all individuals, a systematic approach within the selected parks will be followed in order to remove barriers to the disabled.

All future park buildings and facilities will be accessible and in compliance with the Minnesota State Building Code, Chapter 55. An attempt will be made to upgrade existing park facilities for better accessibility for all individuals including the handicapped, where it is not detrimental to the natural resources.

The attempt by the DNR to provide accessible recreational opportunities for all individuals requires the plans to incorporate the needs and desires of the elderly. Input from the elderly and handicapped will help broaden opportunities and accessibility for all individuals.

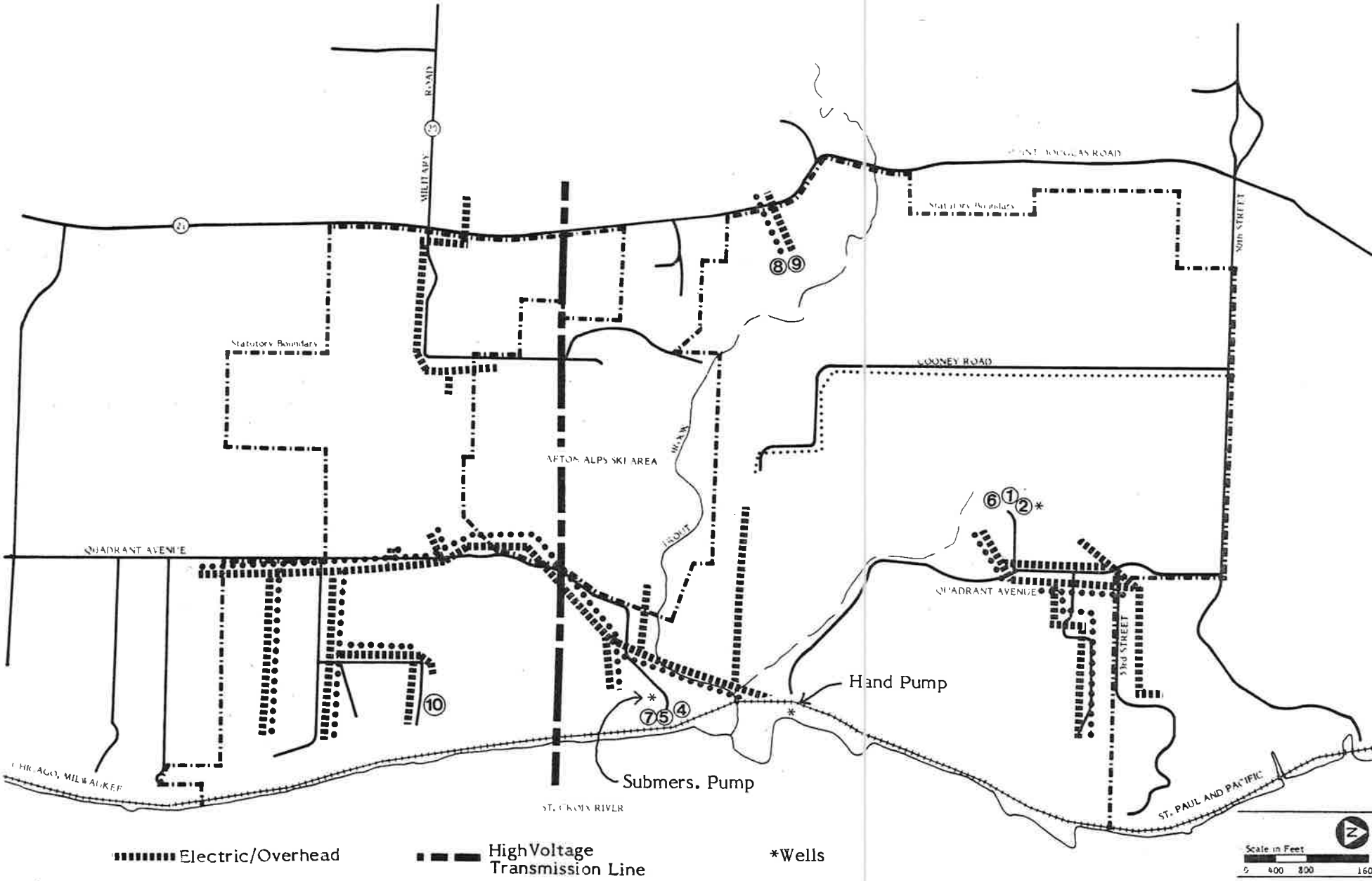
PARK DEVELOPMENT

Utilities and Existing Development

Afton State Park, as one of the newest parks in the state park system, has not been officially opened to the public. At this time, however, approximately six miles of summer hiking and winter ski touring trails, as well as some snowmobile trails, are in use.

Several former dwellings, one of which is in use as a temporary manager's residence, are located within the statutory boundaries and are to be disposed of as detailed in the chart on page 132. Other dwellings have already been removed. A new vault toilet facility has been constructed at the proposed picnic area. On the trail between the proposed beach and picnic areas, a stairway of wood timbers has been constructed.

Existing utilities within the park consist mainly of overhead electric and telephone lines. These should all be removed as land is acquired and replaced with underground service to the interpretive center, the contact station, and the residence/service area. No electric service will be provided at campgrounds and picnic areas, since they are to be maintained as primitive areas with hand-pumped water and self-contained toilets.



Numbers refer to the map codes on the Building Inventory Chart, p. .

Building Inventory

Map Code	Use	Dimensions	Construction	Date Constructed	Condition	Disposition
Maintenance						
1	Shop and garage	24' x 26'	Metal with dirt floor	1940	Poor	Retain temporarily
2	Milk cooler	14' x 20'	Block on concrete slab	1940	Poor	Retain temporarily
3	Storage building	20' x 40'	Brick	1950	Fair	Retain temporarily
Public/Administrative						
4	Shelter building	20' x 30'	Frame on concrete slab	1950	Poor	Retain temporarily
5	Picnic ground sanitation building	23' x 17'			New	Retain
6	Manager's residence (temporary)	32' x 43'	One story frame with asbestos shingle exterior	1950	Poor	Retain temporarily
7	Visitor center (temporary)	45' x 66'	Wood frame with walk-out basement	1950	Fair	Remove
Other						
8	Former residence	29' x 44'	1½ story with basement, wood frame with brick exterior	1961	Good	Remove*
9	Metal shed	20' x 55'	Metal	1940	Poor	Remove
10	Former residence	30' x 40'	Two story wood frame	1930	Fair	Remove

* Not necessary for park use.

Proposed Park Development

Objectives:

The development of Afton State Park is based on the following general objectives:

To develop park facilities according to the limitations and restrictions inherent in the park zoning system

To organize all major park development in a centralized location near the end of the park entrance road with trails radiating out from it into the more remote areas of the park

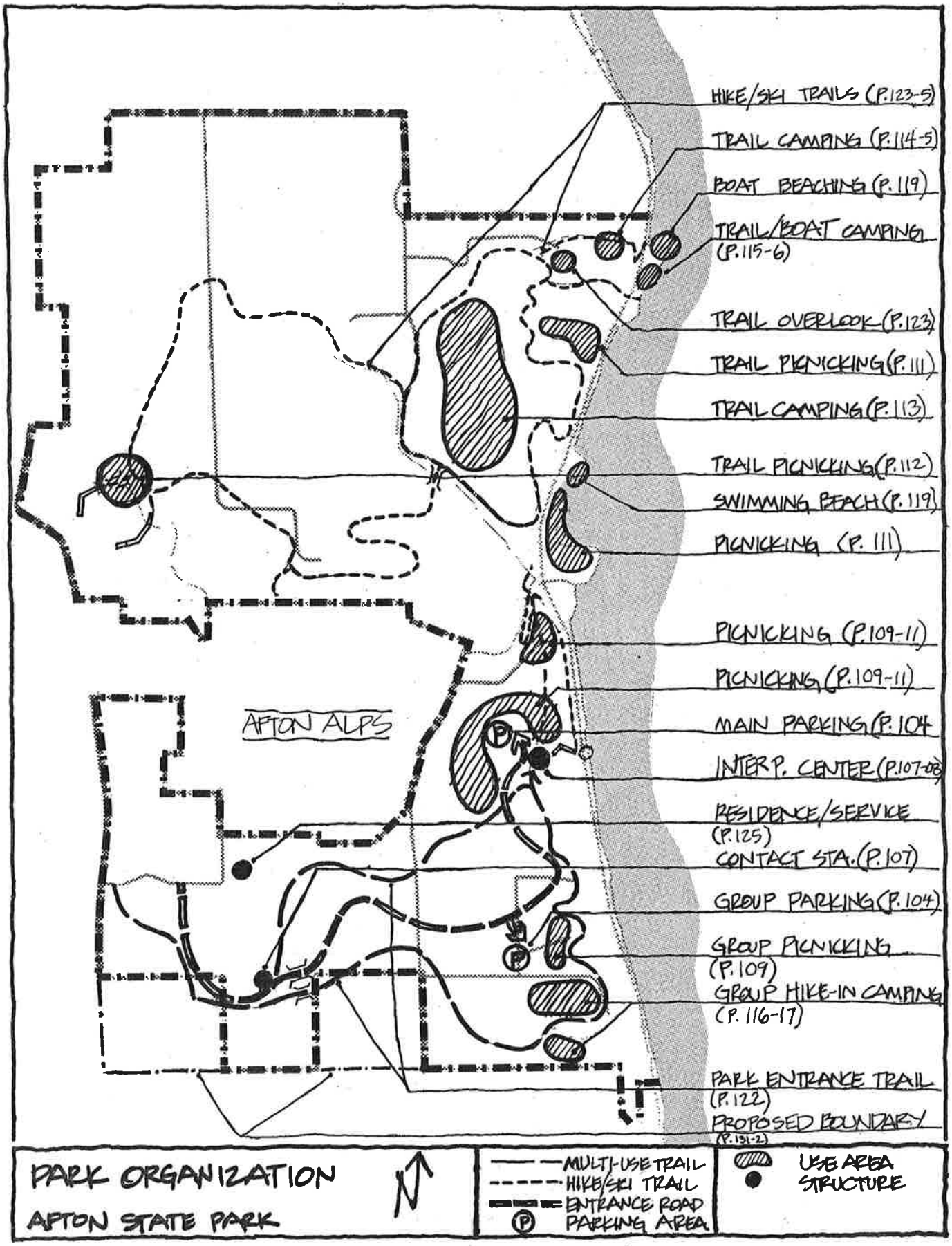
To locate trails on suitable soils along the river and bluff tops and through ravines capitalizing on the most scenic areas of the park

To design and organize the visitor/interpretive center at the hub of the major use area to facilitate park user orientation and education

To restrict automobiles to the park entrance road and centralized major use area because of the small size and topographic diversity of the park

To clearly separate use areas and facilities to prevent conflicts which could result from different levels of privacy/territoriality sought by a wide variety of park users

To reserve the most scenic parts of the park's development areas for facilities which accommodate the greatest variety (most transient) of park users


HIKE/SKI TRAILS (P.123-5)
TRAIL CAMPING (P.114-5)
BOAT BEACHING (P.119)
TRAIL/BOAT CAMPING (P.115-6)
TRAIL OVERLOOK (P.123)
TRAIL PICNICKING (P.111)
TRAIL CAMPING (P.113)
TRAIL PICNICKING (P.112)
SWIMMING BEACH (P.119)
PICNICKING (P.111)
PICNICKING (P.109-11)
PICNICKING (P.109-11)
AFTON ALPS
MAIN PARKING (P.104)
INTER P. CENTER (P.107-08)
RESIDENCE/SERVICE (P.125)
CONTACT STA. (P.107)
GROUP PARKING (P.104)
GROUP PICNICKING (P.109)
GROUP HIKE-IN CAMPING (P.116-17)
PARK ENTRANCE TRAIL (P.122)
PROPOSED BOUNDARY (P.131-2)
PARK ORGANIZATION
AFTON STATE PARK
MULTI-USE TRAIL
HIKE/SKI TRAIL
ENTRANCE ROAD
PARKING AREA
USE AREA
STRUCTURE

- Roads and Parking

Objective: To orient access within the park toward pedestrian trails rather than roads, with centralized parking facilities

Alternative Considered: It has been suggested that more of the park be made accessible through a more extensive road system. That alternative was considered but dropped in the interest of providing more opportunities for nature-oriented recreation for greater numbers of people.

The village of Afton and Denmark township should be encouraged to abandon all through-roads within the park. This will minimize through-park traffic and will be in keeping with the recommended natural state park classification.

Action: Develop parking spaces for 275 cars (map, page 8).

Rationale: Centralized parking facilities which are integrated into the landscape with many small parking bays as opposed to large open lots will be convenient for park users without being visually obtrusive. (Factors such as snowplowing must be taken into consideration in the design of this facility).

Cost: $30,000

Action: Develop a 60-car parking lot to serve group day-use and camping (map, page 8).

Rationale: Will be a convenience for park users.

Cost: $6,000

Action: Work with MTC to bring bus service to park and/or Afton Alps area.

Rationale: Will provide non-automobile access.

Cost: DNR staff time only.

Action: Acquire land for an entrance road corridor (map, page 8).

Rationale: This is an extremely critical step, not only essential for entrance road construction, but for opening the park to public use. This must be given top priority and all avenues of acquisition must be explored.

Cost: To be appraised (acquisition monies).

Action: Develop entrance corridor as indicated on map (page 8).

Carefully design alignment, on site, to descend into the ravine, following existing contours. Align near the river bluff to provide a view of the St. Croix River, and to take advantage of high quality views and environments with short tangents and extensive, intricate curves. Maximum speed of 20 mph is recommended. Use short bridges (of wood) wherever necessary. Pave with asphalt to width of 24 feet with no shoulders or cleared ditches. Build to 9 ton capacity to accommodate future bus access. Use CSAH 21, with its variable contours, as a model. Under no circumstances should this road be built as wide as CSAH standards.

Rationale: An entrance road serves a critical function for a park, as an introductory experience to the essence of the park. It orients and sensitizes visitors to the kinds of experiences available in the park. The design of the road is especially important at Afton. Visitors coming from the long, straight, high speed highway should find a pleasant contrast from this experience once they enter the park.

Cost: $500,000

Action: Acquire land south of existing boundary as discussed in Acquisition and Boundary Section, page 132 in fee or scenic easement as necessary.

Rationale: This land along the road is needed to protect the park from offsite views. It can be expected that land adjacent to a state park will be intensively developed. Since some of this may occur within the view of the entrance road, it would significantly decrease the quality of the entry experience.

Cost: To be appraised (acquisition monies).

Action: Work with adjacent landowners (Afton Alps) to secure scenic easement or fee title to 100' strip within park boundary parallel to CSAH 20. Acquisition of scenic easement must not preclude future fee title purchase.

Rationale: Will increase the quality of the park entrance experience.

Cost: To be appraised.

Action: Plant sizable native trees and shrubs along access and entrance roads. (See Vegetation Management Section, page 70).

Rationale: Vegetation will screen undesirable views, maintaining high aesthetic standards of the park.

Cost: Contingent on land or scenic easement acquisition.

Action: Work with Department of Transportation to place directional signs for park to bring visitors from TH 12 to the park via CSAH 15 and CSAH 20, and from the south via TH 61 to TH 95 to CSAH 20.

Rationale: An agreement was reached with local people not to bring traffic through the town of Afton. This will avoid overloading the scenic CSAH 21 with traffic which would necessitate upgrading it.

Cost: By DOT.

- Visitor Contact and Orientation

Objective: To communicate to park visitors both information needed to find their way around the park and information concerning facilities and features/environments in the park, through use of a visitor contact station, an interpretive center, and maps placed in strategic locations

Alternative Considered: Locating the visitor contact as well as the interpretive/orientation function at the end of the entrance road was considered as a way to minimize capital and staffing costs. This alternative was rejected because of anticipated congestion on busy days and because it was felt that the interpretive/orientation center could be developed to function without the presence of staff.

Action: Construct a contact station with an office for the park manager, (map, page 8).

Rationale: Efficient access control is best achieved close to the entrance.

Cost: $40,000

Action: Place a large, clear, illustrative map of the park outside the contact station which shows landforms and locations of all park facilities.

Rationale: Will provide preliminary visitor orientation.

Cost: $500

Action: Develop a multi-purpose park visitor center which will flexibly provide the following facilities:

(a) picnic shelter/winter warming area (with moveable exterior walls).
(b) self-contained sanitation facilities (approximately 4 toilets).

Because the steep topography and poor soil conditions are generally not conducive to conventional sewage systems, use of self-contained units or systems should be considered. The exact type and details of the facilities to be provided will be defined by the DNR Bureau of Engineering prior to actual development. Among the self-contained systems to be investigated are oil carrier systems, various kinds of composting units, and concrete vault toilets. All applicable standards, criteria, rules, and regulations of the Departments of Natural Resources and Health and of the Pollution Control Agency will be complied with. All subsequent reference to "self-contained sanitation facilities or toilets" should be taken in this context.

(c) small office.
(d) orientation and interpretive displays with large maps and photographs (see Interpretive Plan, page 135).
(e) reverse screen projection facilities for automatic slide shows or movies (see Interpretive Plan, page 135).
(f) display racks for handout brochures and maps (see Interpretive Plan, page 134).
(g) food, drink, and map vending machines.
(h) direct intercom line to manager's office.

The building will be consistent with the architectural theme(page 126) and will comply with all applicable regulations including the DNR "Standards and Criteria for the Lower St. Croix National Scenic Riverway" (NR 2200-2202) which mandates non-intrusion on the riverway vista. The building will be well integrated with blufftop viewing areas with steps and walkways to the river (see below).

Rationale: Concentrating these facilities and information at this location will make them accessible to the majority of park users.

Cost: $180,000

Action: Develop a series of elevated walkways and steps leading down through the ravine to the river.

Structures will be designed to: 1) minimize the disruption of vegetation and topography, 2) keep the structure visually inconspicuous as viewed from the river, and 3) integrate the structure into the natural surroundings.

Rationale: Will visually, psychologically, and physically link the top of the bluff areas with the river. Elevated walkways and steps can accommodate heavy use without resource degradation. This facility will also provide access to visitor center for boat users.

Cost: $50,000

Action: Install small, unobtrusive "you are here" mapboards at strategic points along trails.

Rationale: Will provide needed visitor orientation.

Cost: $2,500

- Picnicking

Objectives: To develop facilities for large group, small group, or individual picnicking

To minimize potential conflicts by separating large group picnicking from individual or small group picnicking

To accommodate both group and individual picnicking on small, autonomous sites, separated by natural vegetation

Alternative Considered: Development of open, mowed picnic grounds was rejected because it would not provide sufficient opportunity to experience the natural environment.

① Action: Develop 3 clusters of 5-10 picnic tables and grills around central council fire rings.

Take advantage of discrete topographic land forms to make each area different from the others. All 3 sites should have views of the river. Reserve open areas for field games. These open areas may relate to each grouping or be common to all 3 groupings.

Rationale: Will allow the area to be used by one or more groups at a time and should accommodate a wide variety of activities.

Cost: $9,000

Action: Develop a picnic shelter near one of the three groupings to accommodate 5-10 tables with a fireplace.

Rationale: Will allow group picnics to be scheduled in advance without fear of inclement weather.

Cost: $50,000

Action: Construct 3 uni-sex self-contained toilets in the group picnic area.

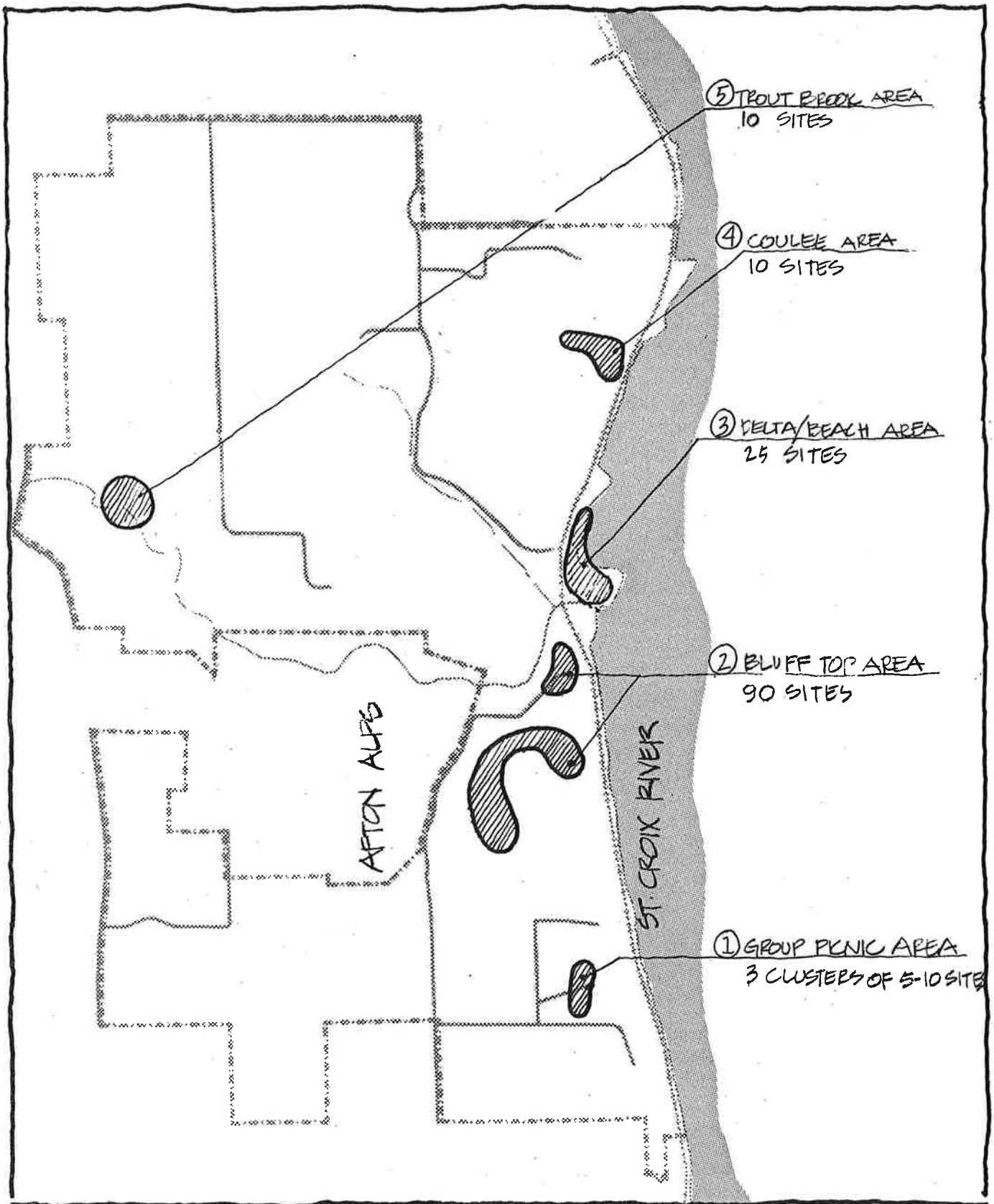
Rationale: Will comply with health regulations.

Cost: $15,000

② Action: Develop in the bluff top area 90 individual picnic sites which are well-spaced and secluded with 1 or 2 tables and a fire ring/grill. A picnic shelter will be developed nearby as part of visitor center. Adjacent open areas will be available for field games.

Rationale: Will consolidate facilities and provide an easily accessible picnic area for visitors to the park.

Cost: $45,000



PICNICKING

AFTON STATE PARK N

Action: Drill a well and construct 4 uni-sex, self-contained toilets in the bluff top area.

Rationale: Will comply with health regulations.

Cost: $27,000

③ Action: In delta beach area, develop 25 individual picnic sites along the shoreline, which are well spaced and secluded with a fire ring and one or two tables.

Rationale: Will consolidate picnic and swimming areas and will provide picnic sites with high quality views of the St. Croix.

Cost: $13,000

Action: Drill a well and construct 2 uni-sex, self-contained toilets in the delta beach area.

Rationale: Will comply with health regulations.

Cost: $10,000

④ Action: Develop 10 highly private picnic sites spaced 150 feet apart in the coulee area with a table and fire ring/grill.

Careful field siting and design, taking advantage of topographic irregularities, vegetation, and views, will give each picnic site an individual character. Develop erosion-controlling steps to provide access to sites located at different elevations.

Rationale: Will provide private picnicking sites in highly scenic areas which can be occupied by individuals or small groups.

Cost: $6,000

Action: Drill a well and construct 2 uni-sex, self-contained toilets in the coulee area.

Rationale: Will comply with health regulations.

Cost: $21,000

⑤ Action: Develop 10 individual picnic sites in the Trout Brook area with one table and fire ring/grill.

Careful field siting and design, taking advantage of topographic irregularities, vegetation, and views, will give each site individual character.

Rationale: Will comply with health regulations.

Cost: $5,000

Action: Drill a well and construct 1 uni-sex, self-contained toilet in the Trout Brook area.

Rationale: Will comply with health regulations.

Cost: $7,000

- Camping

Objectives: To provide the opportunity for park visitors to experience the natural environment on a 24-hour-a-day basis

To ensure that the natural environment, not other occupying parties, is the dominant influence on a campsite

Alternative Considered: Development of car campsites was dismissed as being overly space consumptive, inconsistent with a natural experience in this small metro-area park, and requiring a potentially damaging network of internal roads. This type of facility is provided at other locations in the region.

Individual Camping

Objective: To develop relatively isolated campsites in the three locations for use by individual campers

① Savanna Campground

Action: Develop 40 campsites spaced approximately 175'-225' apart (map, page 114). Each site will include 2 tent pads, a table, and a fire ring/grill.

Wide spacing to be augmented, taking advantage of landform irregularities, vegetation, and views, creating individual character and autonomy for each campsite. Campsites are to be organized within 400' of sanitation, water, and garbage facilities, (see below) and in such a fashion as to minimize random pathways between campsites and central facilities.

Rationale: A great demand for camping facilities is anticipated in this park. The location of this campground was chosen because it is already impacted and concentrates use away from the sensitive natural environments.

Cost: $20,000

Action: Plant sizable native trees and shrubs.

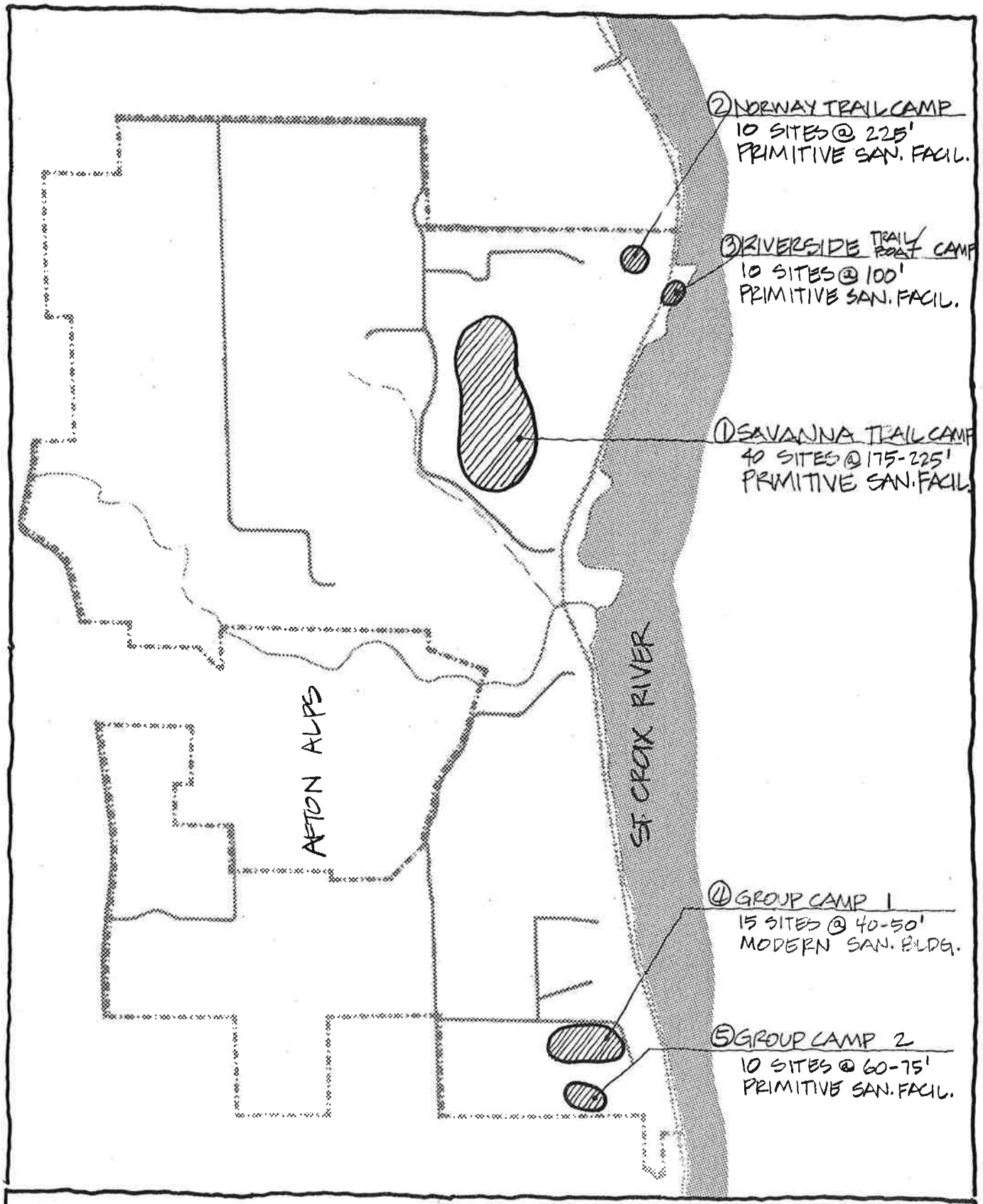
Rationale: Will provide screening between campsites, to help structure pedestrian circulation and to provide shade. This area is currently primarily open field. The general revegetation program (see page 76) will not produce desired results for at least 25-50 years.

Cost: $25,000

Action: Drill a well with hand pump or windmill, construct 5 uni-sex, self-contained toilets.

Rationale: Will comply with health regulations.

Cost: $40,000



CAMPING

APTON STATE PARK N

② Norway Campground

Action: Develop 10 campsites spaced 225' apart (map, page 114). Each site will contain 2 tent pads, a table, and a fire ring/grill.

Wide spacing will be augmented by taking advantage of minor landform irregularities, vegetation, and views, creating individual character and autonomy for each campsite. Campsites will be organized around, and within 400' of sanitation, water, and garbage facilities (see below). Areas will be developed to minimize random pathways between campsites and central facilities.

Cost: $5,000

Action: Drill a well with hand pump, construct 1 uni-sex, self-contained toilet.

Rationale: Will comply with health regulations.

Cost: $20,000

③ Riverside Campground

Action: Develop 10 experimental campsites spaces 100' apart (map, page 114). Each campsite will contain 1 or 2 tent pads, a table, and a fire ring/grill.

Since this area will be available for other uses: day and overnight beaching of boats (see Water Activities: Boating, page 119), and sun-bathing, picnicking, hiking, and beach activities (see Trails Section, page 123), it is critical that campsite development be restricted to the central area of the point as specified, Camping in this area should be limited to 3-5 days. This rule should be in effect before the campground opens. If unmanageable problems develop with this experiemental campground, it should be closed or otherwise modified.

Rationale: Will provide camping opportunities for boaters. Allocating a small part of the river shoreline for camping is justifiable because of the popularity of this type of campsite. Closer spacing of sites and limiting length of stay to 3-5 days, will help minimize user competition for these desirable sites. This location was chosen because it is at the end of the park, and therefore will not create an obstacle to people using the beach. A portion of this point is designated as an authorized overnight boat beaching area. Sanitation and water facilities will be provided as a convenience for boaters.

Cost: $3,000

Action: Drill a well with hand pump, construct 2 uni-sex, self-contained toilets between the campsites and the boat beaching area to the north.

Rationale: Will comply with health regulations.

Cost: $20,000

Group Camping

Objectives: To provide adequate camping facilities for groups or individuals

To provide backup camping facilities for individuals when all the individual sites are occupied.

④ Group Camp 1

Action: Develop approximately 15 sites spaced approximately 40'-50' apart (map, page 114). Each site will include 2 tent pads, a table, and a fire ring/grill.

Sites will be organized around common areas which will include sanitation and garbage facilities, a council fire ring, adjacent open space for field games, views of the river, and access to park entrance trail.

Rationale: Typical church or scout group size is 30+. This campground should provide the flexibility to serve a wide variety of groups.

Cost: $8,000

Action: Drill a well with hand pump, construct 2 uni-sex, self-contained toilets.

Rationale: Will comply with health regulations.

Cost: $35,000

Action: Develop council fire ring.

Rationale: Will provide an area for group programs.

Cost: $1,000

Action: Plant sizable native trees and shrubs.

Rationale: The site is currently an open field. Trees and shrubs will screen campsites and provide shade.

Cost: $2,000

⑤ Group Camp 2

Action: Develop 10 sites spaced 60'-75' apart (map, page 114). Each site will include a tent pad, a table, and a fire ring/grill.

Sites will be organized around common areas which will include sanitation and garbage facilities, a council fire ring, and access to park entrance trail.

Rationale: Typical bike touring group size is 10-20. This group camp would be flexible enough to accommodate a variety of other smaller groups as well.

Cost: $5,000

Action: Drill a well with hand pump or tap, construct 1 uni-sex, self-contained toilet.

Rationale: Will comply with health regulations.

Cost: $6,000

Action: Develop council fire ring.

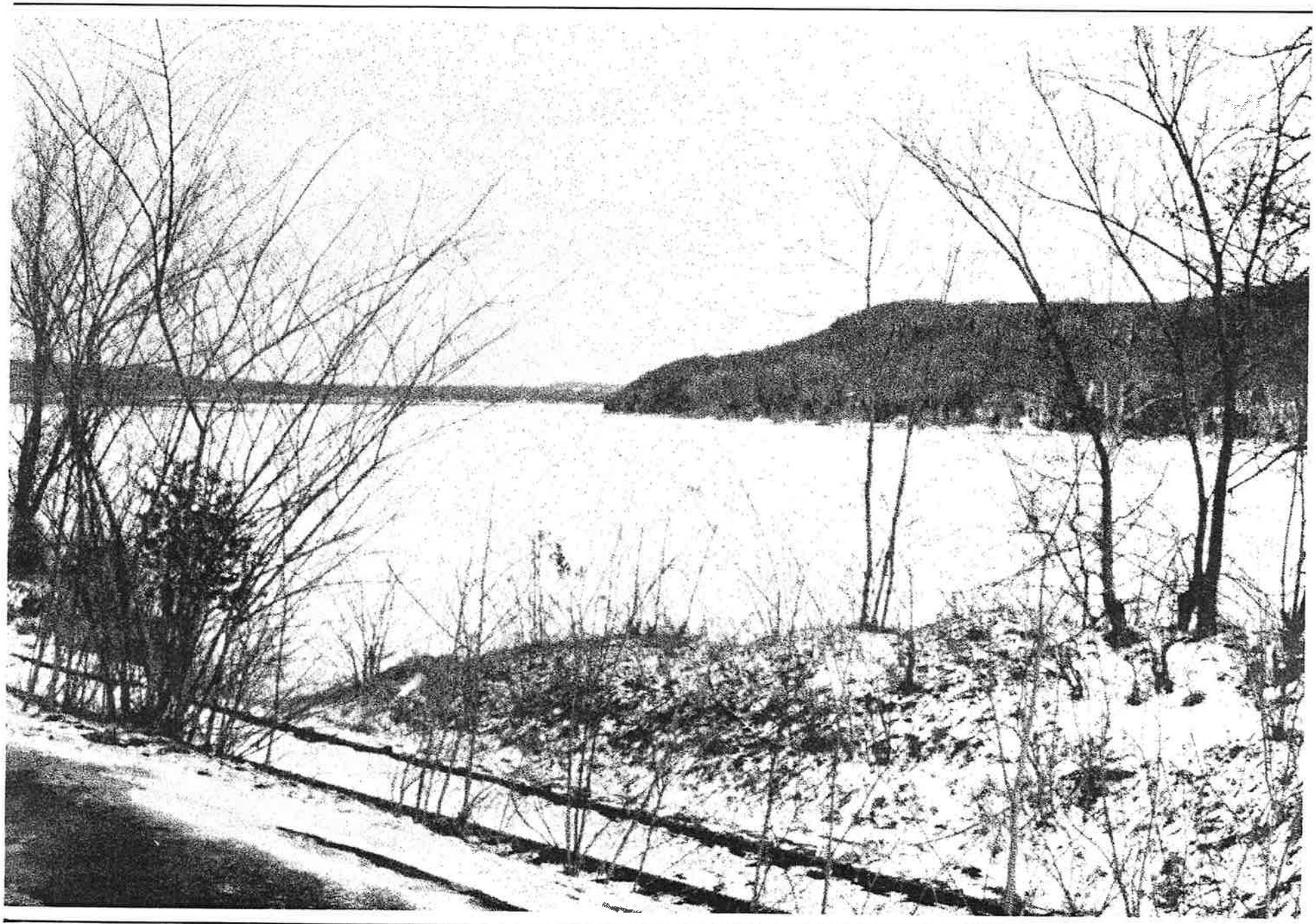
Rationale: Will provide an area for group programs.

Cost: $750

• Water Activities

Objective: To provide high quality opportunities for water-based activities in a trail-access area maintaining a low-density, natural experience

Alternative Considered: Providing car access to water activity use areas was considered, but was rejected because of the overuse that would probably result.



Water Activities: Swimming

Objective: To provide adequate facilities for swimmers

Action: Construct 2 temporary (4 years) self-contained toilets and beach cabanas near the beach and the delta picnic area.

Rationale: Temporary structures will serve interim needs and allow analysis of demand for facilities prior to construction of permanent structures.

Cost: $1,500

Action: Construct well-screened, multi-purpose buildings with good views of the river which will include: changing areas, 4 self-contained toilets, and a small open air picnic shelter which might take the form of a covered deck.
Rationale: Will comply with health regulations and provide informal riverside picnicking opportunities during inclement weather.

Cost: $60,00

Water Activities: Boating

Objective: To provide facilities in the park for boaters

Action: Construct a combination boat mooring dock/viewing deck near the stairway to the interpretive center (map, page 120).

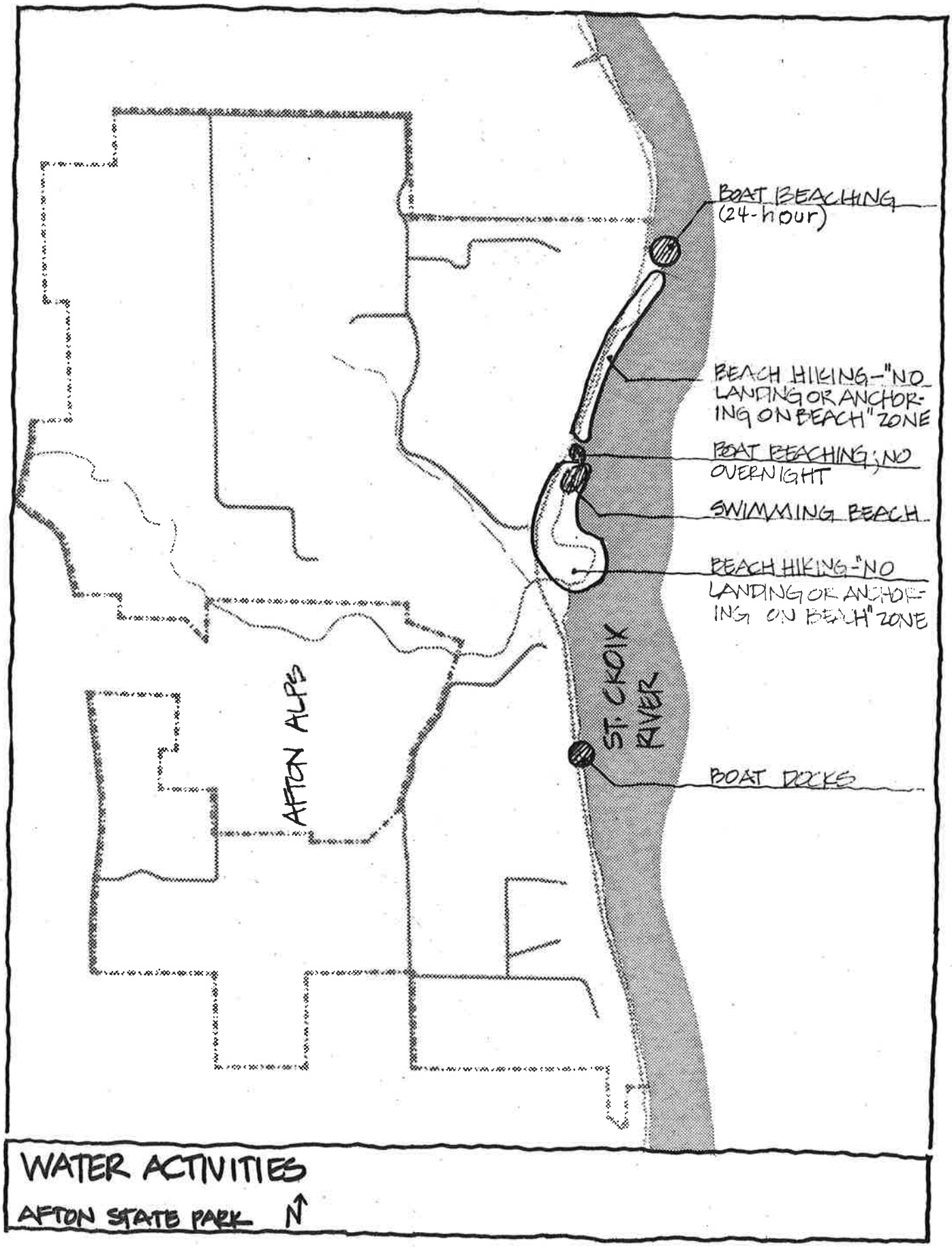
Rationale: Will provide convenient boat access to the park interpretive center and upper picnic areas.

Cost: $10,000

Action: Pending acquisition, designate beach on Stoltze Point (map, page 120) as overnight boat beaching area. Provide 5 tables and fire ring/grills.

Rationale: Will provide a beaching and use area for boaters which will not conflict with other park users.

Cost: $1,500


BOAT BEACHING (24-hour)
BEACH HIKING-"NO LANDING OR ANCHORING ON BEACH" ZONE
BOAT BEACHING; NO OVERNIGHT
SWIMMING BEACH
BEACH HIKING-"NO LANDING OR ANCHORING ON BEACH" ZONE
BOAT DOCKS
ST. CROIX RIVER
AFTON ALPS
WATER ACTIVITIES
AFTON STATE PARK
N

Action: Designate shoreline on north half of park, (map, page 120) as a "no landing or anchoring on beach zone". Sign, as necessary.

Rationale: Large boats tend to monopolize areas where they land limiting use by other park users. This stretch of shoreline provides a good opportunity for beachcombing and hiking, and is a critical component of the proposed park trail system.

Cost: $500

Boat Launch

Because Afton State Park has extensive frontage along the St. Croix River, it has potential as a public boat launching facility. Although this suggestion has merit, there are serious drawbacks. It is the strong recommendation of this plan that no boat launch be developed in Afton State Park for the following reasons:

1. Activity Incompatibility, Site Limitations:

Although there are 2½ miles of river shoreline within park boundaries, there are only two points that have adequate flat land for parking: Stoltze Point and the Trout Brook delta area. Stoltze Point, at the north end of the park, is virtually inaccessible by vehicle because of extremely rugged topography. An agreement has been made with the town of Afton not to develop vehicular access in the northern portion of the park. The Trout Brook delta area would be more easily accessible, but this is a strategic area of the park to be used for low-intensity activities, such as swimming and picnicking. To develop a boat launch in this area would preclude the low-key, low-intensity natural character of the park. Not only are there space limitations, but vehicular access to the river would bring large numbers of people to this beach, making the swimming experience here a duplication of the crowded experience provided by the majority of other public beaches. Moreover, a beach in a natural state park will provide a rare opportunity not available in other intensively used public recreational areas. This type of intense use would jeopardize the integrity of the entire park. The relatively small investment required for a boat launch facility at a location removed from Afton State Park would be a far wiser use of public funds.

2. Potential Water Use Conflicts:

The St. Croix River is extremely popular for recreational boating because of its scenic qualities and proximity to the metropolitan area. As a result, the river is so heavily travelled by large pleasure craft, especially on weekends, that use by small boats and canoes is nearly impossible and potentially dangerous. This potential conflict is somewhat analogous to pedestrians and bicyclists using interstate highways.

3. Potential Overcrowding of River:

The Minnesota-Wisconsin Boundary Area Commission maintains that the already crowded conditions would be aggravated by any additional boat launching ramp in this area. A River User Study is being conducted which should make further recommendations regarding future solutions to this crowding problem.

- Trails

Objectives: To provide trail access to all portions of the park.

To provide trail access to the park from throughout the seven county metropolitan area.

Alternative Considered: Construction of a multiple use (bicycle, snowmobile, ski) trail connecting to River Road and future snowmobile trails was considered. The trail would have run along the north and west park boundaries. This alternative was rejected pending completion of a regional trail plan.

Multi-Use Trail

Action: Develop a 3 mile multi-purpose park entrance loop trail (map, page 124).

This trail will be constructed for hiking, biking, horseback riding, horse and carriage driving, skiing, and snowmobiling. A portion of 8' width of trail will be hard surfaced for bikes. Precise trail alignment will be designed on site to achieve maximum scenic quality by taking advantage of the variety of views. Alignment will consist of a number of curves and few straight stretches. Maximum gradient will be 8% with short sections at 10% allowable where essential. Horizontal and vertical curves, with super-elevation will be designed to occur simultaneously wherever possible. Grading and damage to vegetation (including removal) will be avoided. Hopefully, potential conflicts between users will be minimized or eliminated by use of the curvilinear alignment, discouraging excessive speeds. If it proves necessary, however, additional measures such as designating special-use treadways and posting speed limits will be used.

Rationale: Will provide equal trail access to the park for all trail users, as well as the highest quality, safest possible trail experience.

Cost: $100,000 ($22,000 grading/preparation - $78,000 surfacing)

Action: Develop 2 wooden bridges to cross the intermittent stream (map, page 124).

Cost: $20,000

Hiking and Skiing Trail System

Shortline Trail (½ mile)

Action: Maintain existing trail to provide a link from the bottom of steps from the visitor center to swimming beach and delta picnic area. Maintain primitive character, keeping width to 4-6 feet and surfacing as necessary with natural material.

Rationale: The stretch of shoreline on the north half of the park between Trout Brook and Stoltze Point is a vital link in the trail system within the park. As such, it will be reserved in perpetuity for this use by avoiding any non-compatible temporary occupancy of this area, such as boat beaching. No development.

Cost: $500

East Loop (2½ miles)

Action: Develop East Loop Trail utilizing existing road (map, page 124).

The trail will be primitive in character, 4'-6' wide, surfaced with wood chips. Erosion control bars will be used as necessary. Align trail to take advantage of a variety of environments and views to river. Trail should generally follow ravines and provide access to use areas. Utilize ramps and bridges through ravine areas. Repair existing cut and erosion scars.

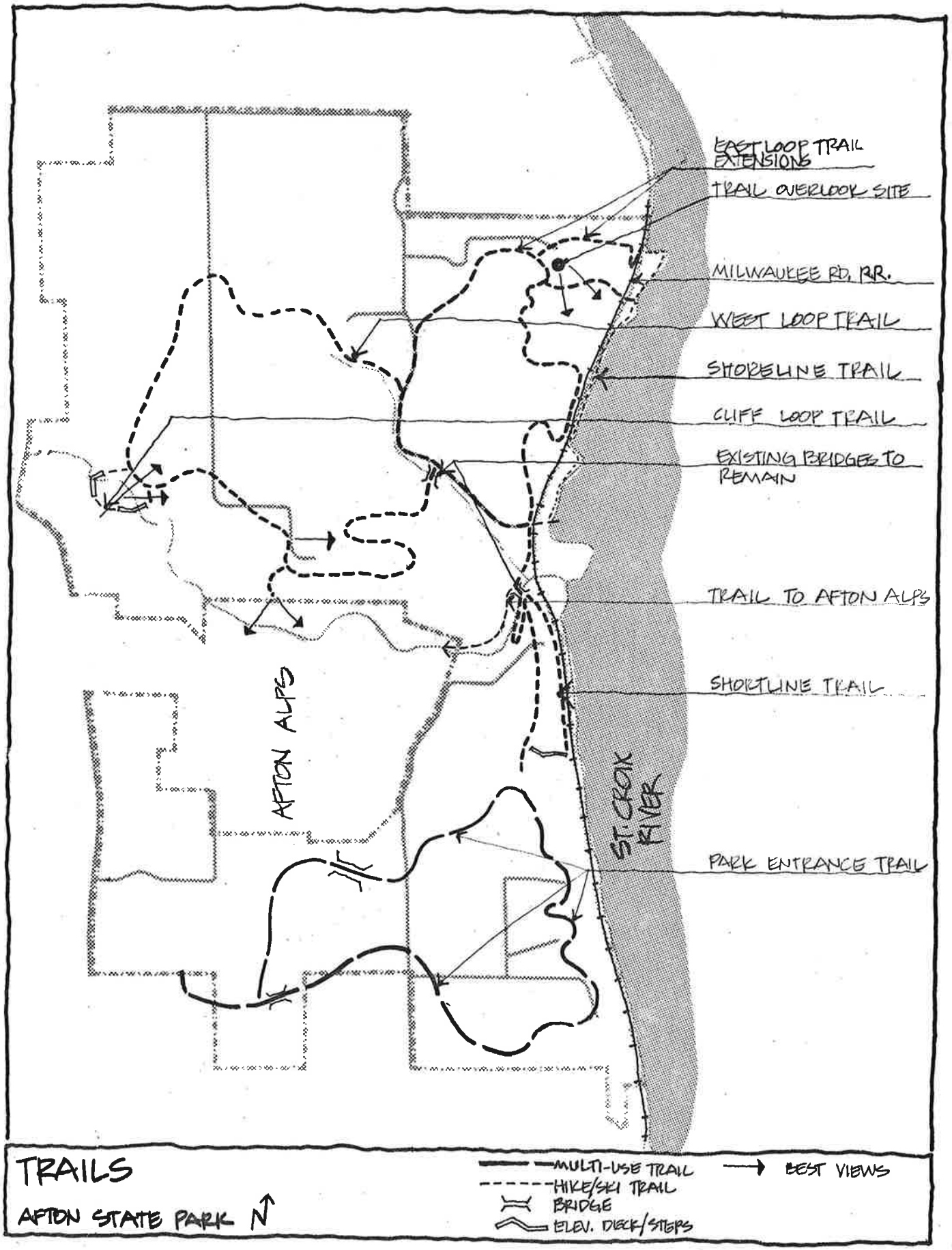
Cost: $25,000

Action: Develop trail overlook as a major destination point for this trail (map, page 124).

Overlook should accommodate as many as ten hiking parties at one time in such a way that each party has a good view and can feel comfortably isolated from the others. Area should be integrated into the natural surroundings.

Rationale: This facility will allow use of an area which has one of the best views in the park.

Cost: $4,000


EAST LOOP TRAIL EXTENSIONS
TRAIL OVERLOOK SITE
MILWAUKEE RD. R.R.
WEST LOOP TRAIL
SHORELINE TRAIL
CLIFF LOOP TRAIL
EXISTING BRIDGES TO REMAIN
TRAIL TO AFTON ALPS
SHORTLINE TRAIL
PARK ENTRANCE TRAIL
AFTON ALPS
ST. CROIX RIVER
TRAILS
AFTON STATE PARK
N
MULTI-USE TRAIL
HIKE/SKI TRAIL
BRIDGE
ELEV. DECK/STEPS
BEST VIEWS

West Loop Trail (3½ miles)

Action: Develop West Loop Trail (map page 124). The existing bridge should be utilized. Trail should follow ravines and draws leading to high points for long distance views. Utilize wood ramps and bridges through ravine areas where needed.

Cost: $35,000

Cliff Loop Trail (¼ mile)

Action: Develop Cliff Loop Trail (map, page 124).

Elevated wooded steps, decks, and bridges should be used through the ravines.

Cost: $30,000

Discussion: The Milwaukee Road Railroad, which passes through the park, may be abandoned in the near future. When this happens, and if the right-of-way is developed as a trail, it will become an integrated and compatible part of the park and surrounding trail system. It should be noted that motorized use of the grade along the northern half of the park would not be compatible with other uses planned in that area, although motorized use of the southern half of the grade may be acceptable.

- Manager's Residence/Service Area

Objectives: To provide residences for the park manager and assistant park manager

To develop a service area near managers' residences to facilitate efficient operation of the park

Action: Remodel the manager's residence.

Cost: $4,000

Action: Construct necessary service buildings, including site work.

Cost: $100,000

Action: Construct assistant manager's residence.

Cost: $50,000

ARCHITECTURAL THEME

An architectural theme will be developed by the Bureau of Engineering in coordination with the Park Planning staff. This theme will be developed for the design of all structures built in public areas of the park.

Objectives:

To facilitate high quality experiences: structures should be designed to compliment activities by allowing access to significant park environments and by modulating views and circulation.

To minimize obtrusiveness/artificiality: structures should be integrated into the landscape through earth-sheltered and underground construction wherever possible, especially in open savanna areas or fills. Natural materials, colors, textures, and forms should be used in above-ground structures. Special emphasis should be put on the relationship between above-ground structures and the natural landscape, such as the use of stilts for structures in wooded ravine areas.

To maximize energy efficiency: structures should be designed to take advantage of the most efficient energy conservation techniques available.

RECREATION MANAGEMENT BUDGET

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Roads/Parking						
Entrance Road		$ 500,000				$ 500,000
Screening		4,000				4,000
Group Area Parking		6,000				6,000
Main Parking		20,000		$ 10,000 If necessary		30,000
Visitor Contact/Orientation						
Contact Station		40,000				40,000
Map		500				500
Interpretive Center			$ 180,000			180,000
Elevated Steps/Decks			50,000			50,000
"You Are Here" Mapboard		2,500				2,500
Picnicking						
Group Picnicking			9,000			9,000
Group Picnicking Shelter				50,000		50,000
Toilets/Water			15,000			15,000
Bluff Top Picnicking		20,000		25,000		45,000
Toilets/Water		27,000				27,000
Delta Beach Picnic Sites			13,000			13,000
Toilets/Water			10,000			10,000
Coulee Area Picnic Sites			6,000			6,000
Toilets/Water			21,000			21,000
Trout Brook Picnic Sites				5,000		5,000
Toilets/Water				7,000		7,000

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Camping						
Group Camp 1						
Campsites			8,000			8,000
Sanitation Building			35,000			35,000
Council Ring			1,000			1,000
Vegetative Screening			2,000			2,000
Group Camp 2						
Campsites				5,000		5,000
Water/Sanitation				6,000		6,000
Council Ring				750		750
Savanna Campground						
Campsites		20,000				20,000
Veg. Screening	$ 10,000	15,000				25,000
Water/Toilets		40,000				40,000
Norway Campground						
Campsites					$ 5,000	5,000
Water/Sanitation					20,000	20,000
Riverside Campground						
Campsites					3,000	3,000
Water/Sanitation					20,000	20,000
Water Activities: Swimming						
Temporary Sanitation/Cabanas		1,500				1,500
Permanent Sanitation Building				60,000		60,000

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Water Activities: Boating						
Interpretive Center Docks			10,000			10,000
Stoltze Point Tables/Grills					1,500	1,500
Designate "No Beaching"					500	500
Trails						
Park Entrance Trail			100,000			100,000
Bridges			20,000			20,000
Shortline Trail			500			500
East Loop Trail		25,000				25,000
Trail Overlook Site		4,000				4,000
West Loop Trail		35,000				35,000
Cliff Loop Trail					30,000	30,000
Manager's Residence Remodel		4,000				4,000
Assistant Manager's Residence					50,000	50,000
Service Buildings		100,000				100,000
Interpretive Program						
Orientation Facilities				19,400		19,400
Education Facilities					25,000	25,000
Total	$ 10,000	$864,500	$480,500	$188,150	$155,000	$ 1,698,150

INTRODUCTION

Boundary changes and acquisition must be considered in the management of any state park. The amount of land necessary to manage a park correctly must be determined and acquired before management can be efficiently carried out.

Objectives:

To insure that the park has sufficient acreage for preservation of natural resources and still provide recreational facilities.

To control all land within the statutory boundary either by fee title (direct ownership) or easement (partial interest).

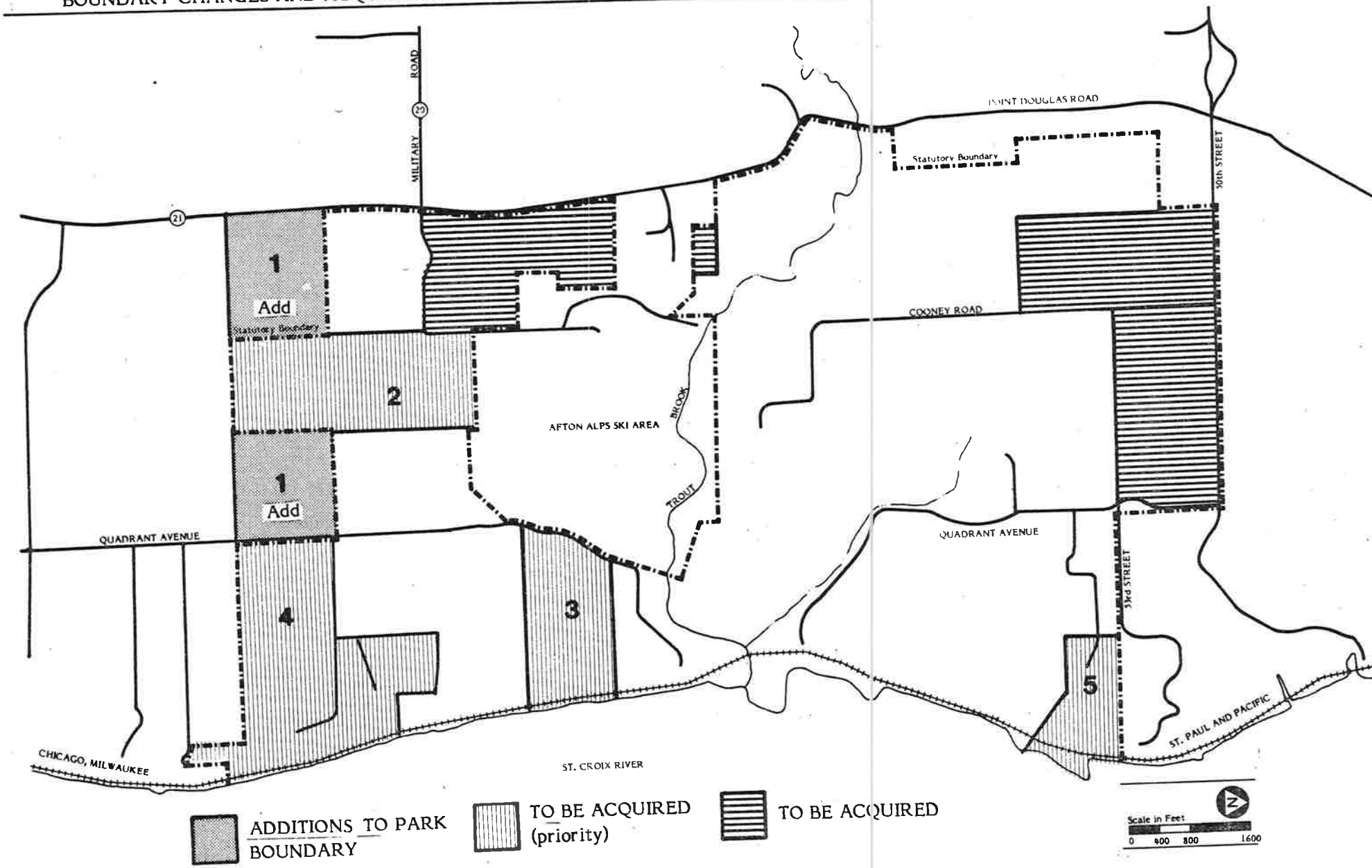
DISCUSSION

Because it would be fiscally and physically impossible to achieve these goals overnight, the following framework will be used in developing boundary adjustments and acquisition priorities:

1. Land needed for preservation of park resources or values.
2. Land needed for development of facilities.
3. Unimproved buffer land needed to prevent threatened development or use which would be incompatible with existing or potential park purposes.

Only 57 percent of the 1,648 acres within the statutory boundary of the park is under the jurisdiction of the Division of Parks and Recreation. The remaining 43 percent is in private ownership. In the past, parcels have been acquired on a willing seller basis. Future acquisition should continue on that basis. Certain parcels of land, however, are essential to the operation of the park including those affecting the park entrance road, contact station, visitor center, group camp, individual day-use area, and group day-use area. Up to the time of the preparation of this document these landowners have not indicated a willingness to sell. A recommendation should be made to the legislature that these parcels be acquired through eminent domain proceedings. A park with the potential and outstanding features of Afton should be made available to the public without any additional delay.

As future recreational needs are identified, further expansion of the park may be warranted. Such an expansion is not foreseeable within the 10-year time span covered in this management plan.


MILITARY ROAD
29
21
POINT DOUGLAS ROAD
Statutory Boundary
50th STREET
1
Add
Statutory Boundary
2
COONEY ROAD
AFTON ALPS SKI AREA
BROOK
TROUT
1
Add
QUADRANT AVENUE
4
3
QUADRANT AVENUE
33rd STREET
5
CHICAGO, MILWAUKEE
ST. CROIX RIVER
ST. PAUL AND PACIFIC
ADDITIONS TO PARK BOUNDARY
TO BE ACQUIRED (priority)
TO BE ACQUIRED
Scale in Feet
0 400 800 1600

Priority of Land Acquisition

Map Code and Order Of Priority (page131)	Rationale
1	These parcels include the proposed park entrance road and the porposed manager's residence. The park cannot be officially opened until this property has been acquired. If land cannot be acquired on a willing seller basis, eminent domain proceedings will be necessary as authorized by the legislature.
2	This area includes the location of a visitor orientation center, a parking lot, a day-use area, and parking lot for the swimming beach. Eminent domain proceedings as authorized by the legislature should be implemented to acquire these parcels.
3	There are some excellent ravines and wooded acreage on these two parcels. A group camp is being planned close to one of the parcels and the entrance road passes near or through the other. Acquisition is recommended to preserve and protect the aesthetic integrity and beauty of the entrance corridor from development.
4	A group camp and group picnic area are proposed at this location.
5	Twenty trail and/or boat camping sites are scheduled for development on this site. Acquisition should proceed on a willing seller basis.
	Remaining unacquired parcels should be purchased on a willing seller basis as available.

Action: Drill a well with hand pump, construct 2 uni-sex, self-contained toilets between the campsites and the boat beaching area to the north.

Rationale: Will comply with health regulations.

Cost: $20,000

Group Camping

Objectives: To provide adequate camping facilities for groups or individuals

To provide backup camping facilities for individuals when all the individual sites are occupied.

④ Group Camp 1

Action: Develop approximately 15 sites spaced approximately 40'-50' apart (map, page 114). Each site will include 2 tent pads, a table, and a fire ring/grill.

Sites will be organized around common areas which will include sanitation and garbage facilities, a council fire ring, adjacent open space for field games, views of the river, and access to park entrance trail.

Rationale: Typical church or scout group size is 30+. This campground should provide the flexibility to serve a wide variety of groups.

Cost: $8,000

Action: Drill a well with hand pump, construct 2 uni-sex, self-contained toilets.

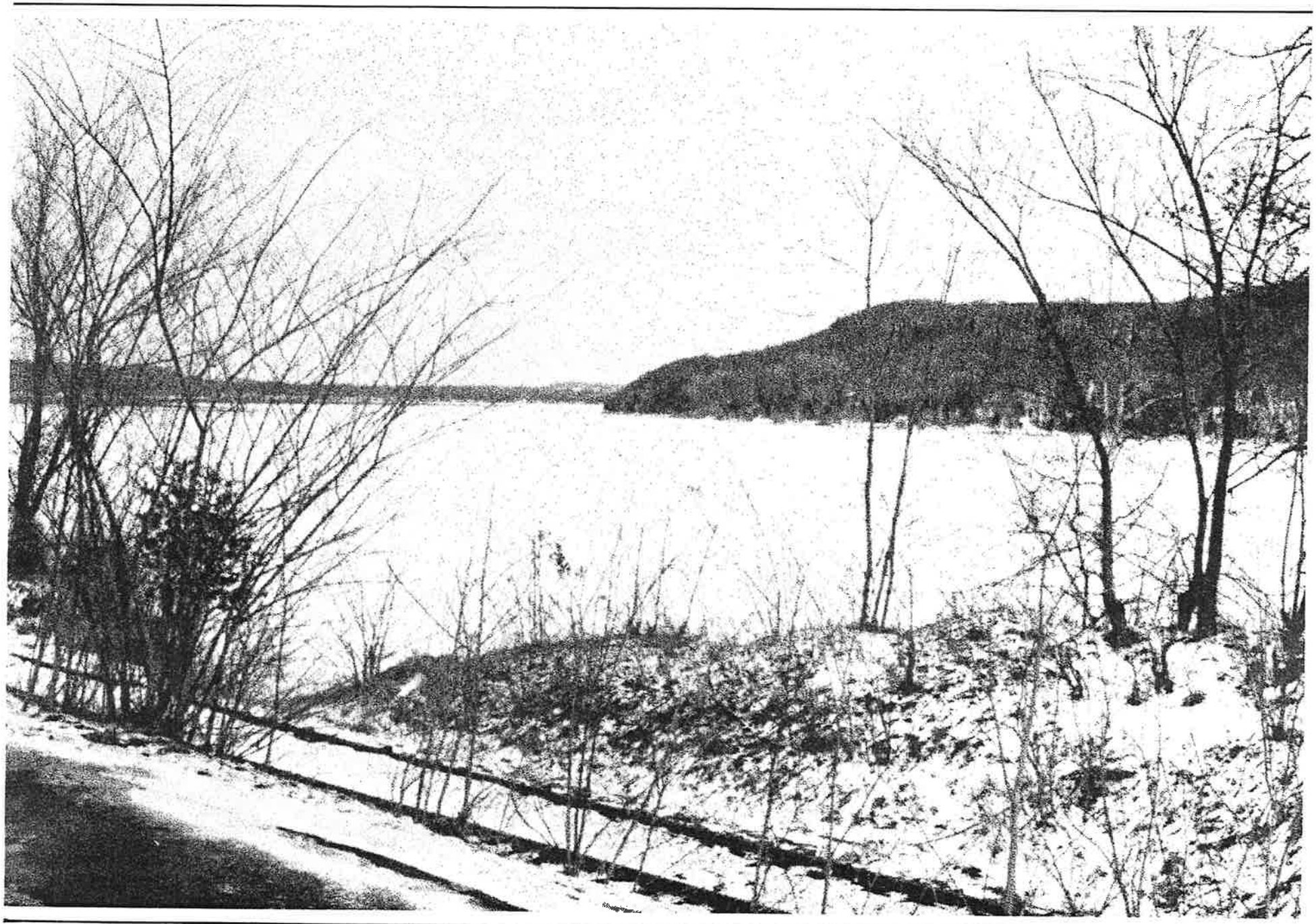
Rationale: Will comply with health regulations.

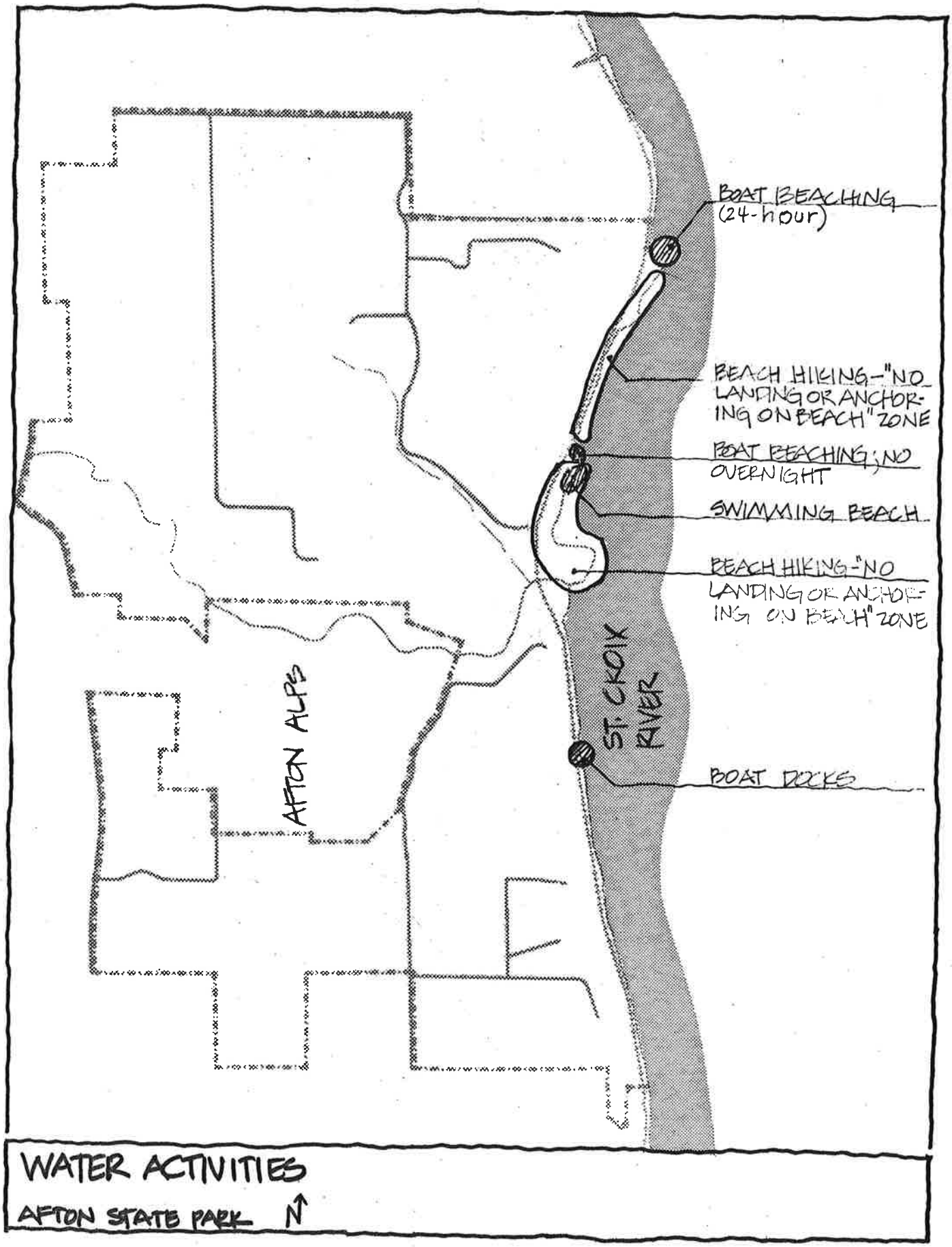
Cost: $35,000

Action: Develop council fire ring.

Rationale: Will provide an area for group programs.

Cost: $1,000




BOAT BEACHING (24-hour)
BEACH HIKING-"NO LANDING OR ANCHORING ON BEACH" ZONE
BOAT BEACHING; NO OVERNIGHT
SWIMMING BEACH
BEACH HIKING-"NO LANDING OR ANCHORING ON BEACH" ZONE
BOAT DOCKS
ST. CROIX RIVER
AFTON ALPS
WATER ACTIVITIES
AFTON STATE PARK
N

3. Potential Overcrowding of River:

The Minnesota-Wisconsin Boundary Area Commission maintains that the already crowded conditions would be aggravated by any additional boat launching ramp in this area. A River User Study is being conducted which should make further recommendations regarding future solutions to this crowding problem.

- Trails

Objectives: To provide trail access to all portions of the park.

To provide trail access to the park from throughout the seven county metropolitan area.

Alternative Considered: Construction of a multiple use (bicycle, snowmobile, ski) trail connecting to River Road and future snowmobile trails was considered. The trail would have run along the north and west park boundaries. This alternative was rejected pending completion of a regional trail plan.

Multi-Use Trail

Action: Develop a 3 mile multi-purpose park entrance loop trail (map, page 124).

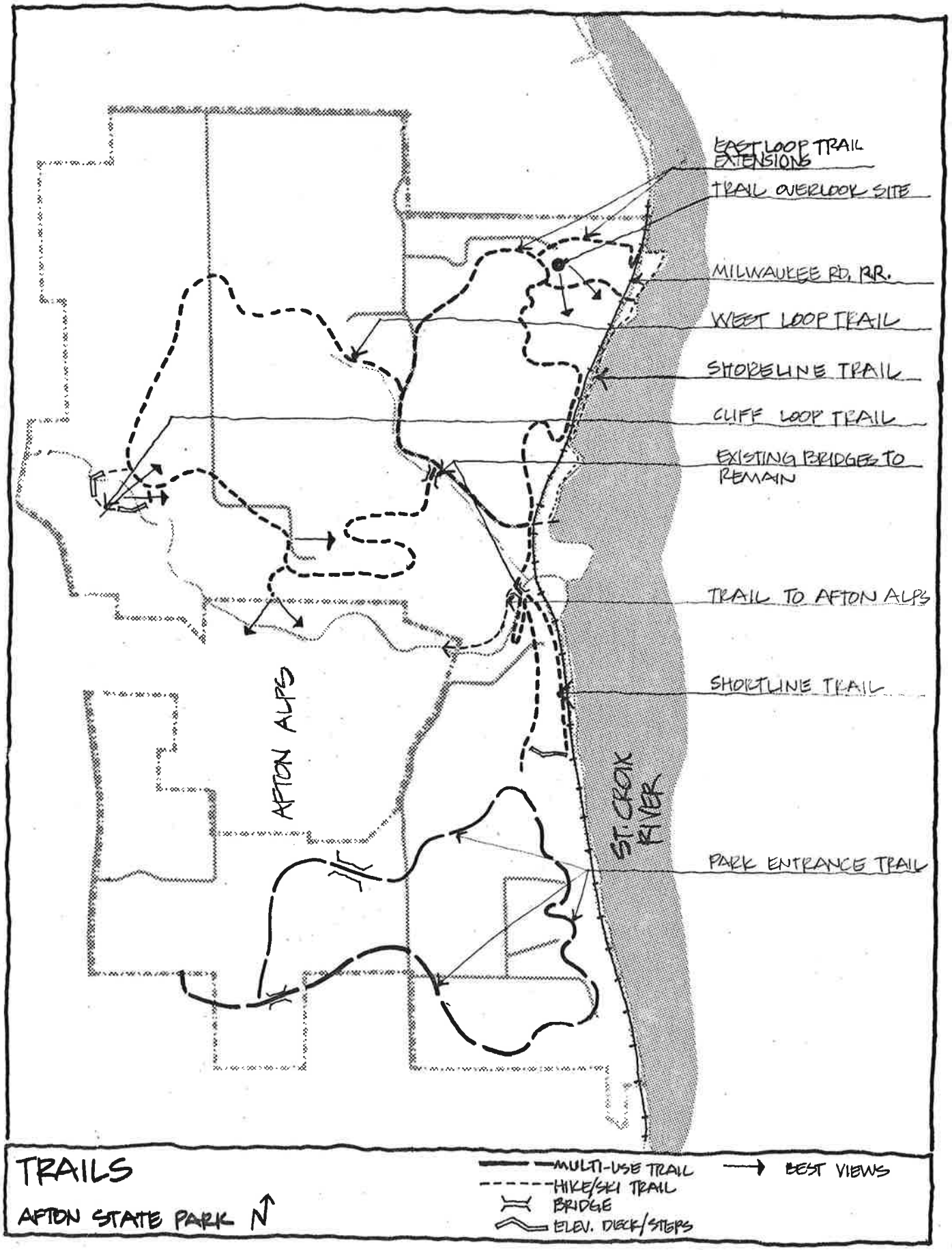
This trail will be constructed for hiking, biking, horseback riding, horse and carriage driving, skiing, and snowmobiling. A portion of 8' width of trail will be hard surfaced for bikes. Precise trail alignment will be designed on site to achieve maximum scenic quality by taking advantage of the variety of views. Alignment will consist of a number of curves and few straight stretches. Maximum gradient will be 8% with short sections at 10% allowable where essential. Horizontal and vertical curves, with super-elevation will be designed to occur simultaneously wherever possible. Grading and damage to vegetation (including removal) will be avoided. Hopefully, potential conflicts between users will be minimized or eliminated by use of the curvilinear alignment, discouraging excessive speeds. If it proves necessary, however, additional measures such as designating special-use treadways and posting speed limits will be used.

Rationale: Will provide equal trail access to the park for all trail users, as well as the highest quality, safest possible trail experience.

Cost: $100,000 ($22,000 grading/preparation - $78,000 surfacing)

Action: Develop 2 wooden bridges to cross the intermittent stream (map, page 124).

Cost: $20,000


EAST LOOP TRAIL EXTENSIONS
TRAIL OVERLOOK SITE
MILWAUKEE RD. R.R.
WEST LOOP TRAIL
SHORELINE TRAIL
CLIFF LOOP TRAIL
EXISTING BRIDGES TO REMAIN
TRAIL TO AFTON ALPS
SHORTLINE TRAIL
PARK ENTRANCE TRAIL
AFTON ALPS
ST. CROIX RIVER
TRAILS
AFTON STATE PARK
N
MULTI-USE TRAIL
HIKE/SKI TRAIL
BRIDGE
ELEV. DECK/STEPS
BEST VIEWS

ARCHITECTURAL THEME

An architectural theme will be developed by the Bureau of Engineering in coordination with the Park Planning staff. This theme will be developed for the design of all structures built in public areas of the park.

Objectives:

To facilitate high quality experiences: structures should be designed to compliment activities by allowing access to significant park environments and by modulating views and circulation.

To minimize obtrusiveness/artificiality: structures should be integrated into the landscape through earth-sheltered and underground construction wherever possible, especially in open savanna areas or fills. Natural materials, colors, textures, and forms should be used in above-ground structures. Special emphasis should be put on the relationship between above-ground structures and the natural landscape, such as the use of stilts for structures in wooded ravine areas.

To maximize energy efficiency: structures should be designed to take advantage of the most efficient energy conservation techniques available.

Action: Drill a well with hand pump, construct 2 uni-sex, self-contained toilets between the campsites and the boat beaching area to the north.

Rationale: Will comply with health regulations.

Cost: $20,000

Group Camping

Objectives: To provide adequate camping facilities for groups or individuals

To provide backup camping facilities for individuals when all the individual sites are occupied.

④ Group Camp 1

Action: Develop approximately 15 sites spaced approximately 40'-50' apart (map, page 114). Each site will include 2 tent pads, a table, and a fire ring/grill.

Sites will be organized around common areas which will include sanitation and garbage facilities, a council fire ring, adjacent open space for field games, views of the river, and access to park entrance trail.

Rationale: Typical church or scout group size is 30+. This campground should provide the flexibility to serve a wide variety of groups.

Cost: $8,000

Action: Drill a well with hand pump, construct 2 uni-sex, self-contained toilets.

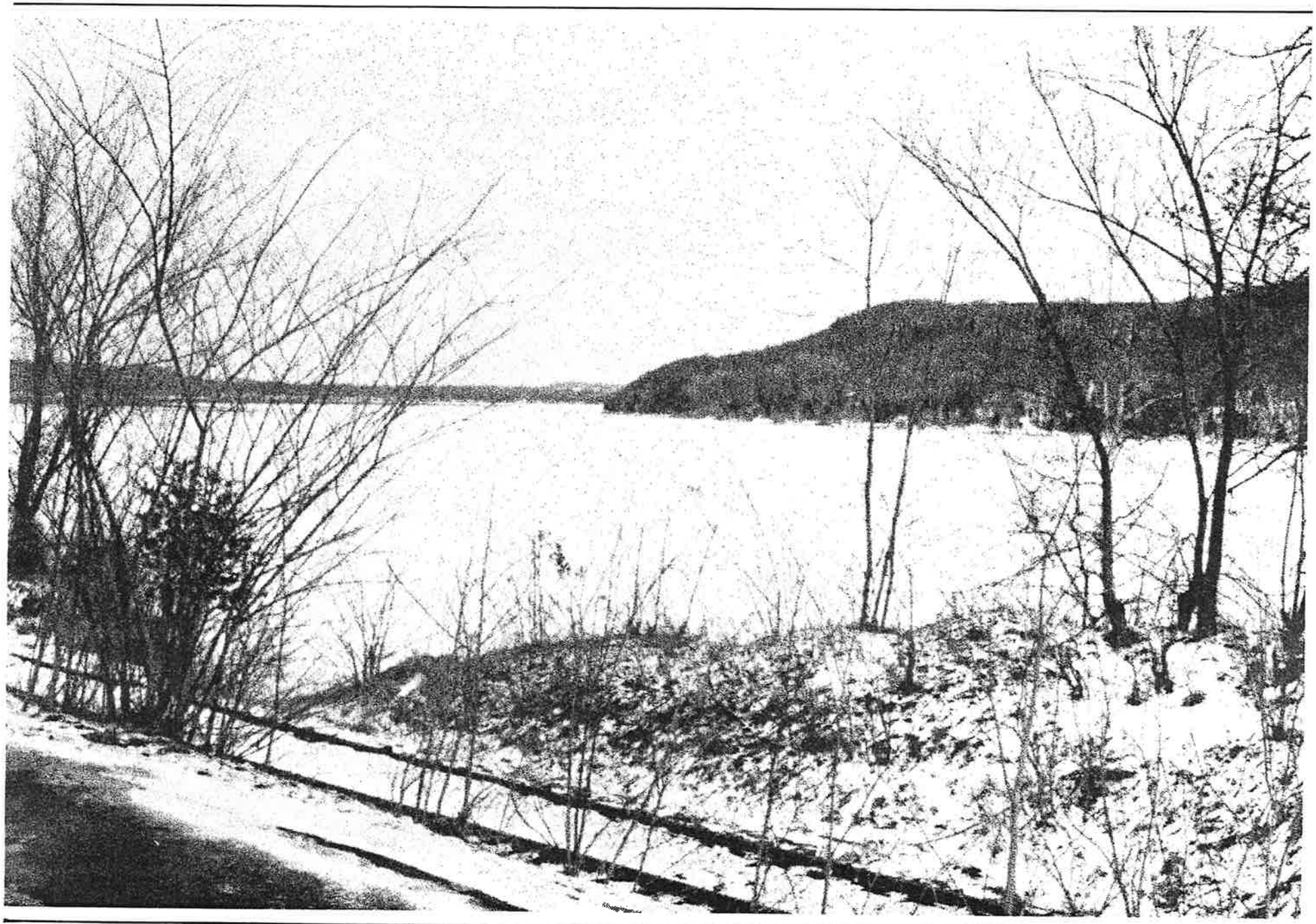
Rationale: Will comply with health regulations.

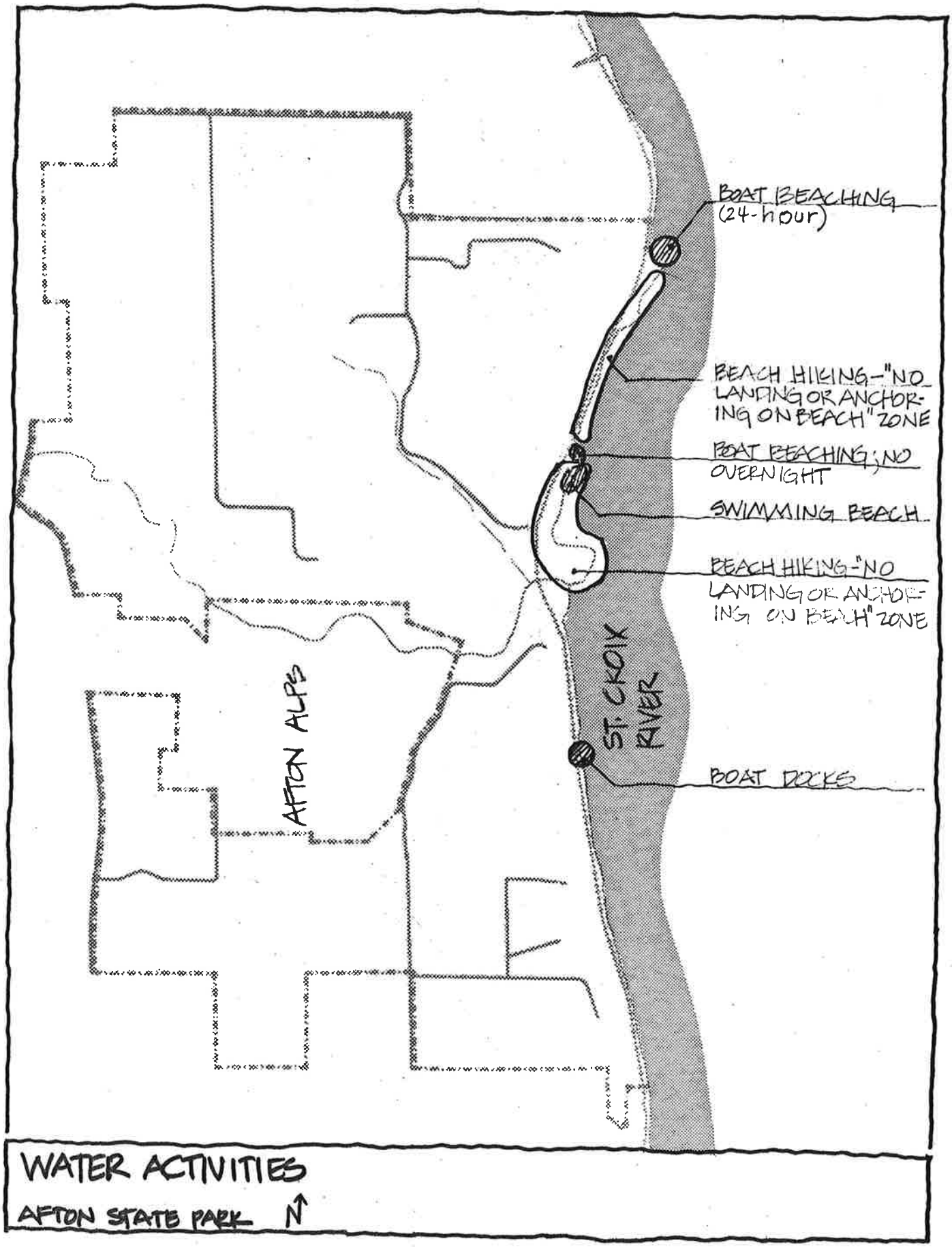
Cost: $35,000

Action: Develop council fire ring.

Rationale: Will provide an area for group programs.

Cost: $1,000




BOAT BEACHING (24-hour)
BEACH HIKING-"NO LANDING OR ANCHORING ON BEACH" ZONE
BOAT BEACHING; NO OVERNIGHT
SWIMMING BEACH
BEACH HIKING-"NO LANDING OR ANCHORING ON BEACH" ZONE
BOAT DOCKS
ST. CROIX RIVER
AFTON ALPS
WATER ACTIVITIES
AFTON STATE PARK
N

3. Potential Overcrowding of River:

The Minnesota-Wisconsin Boundary Area Commission maintains that the already crowded conditions would be aggravated by any additional boat launching ramp in this area. A River User Study is being conducted which should make further recommendations regarding future solutions to this crowding problem.

- Trails

Objectives: To provide trail access to all portions of the park.

To provide trail access to the park from throughout the seven county metropolitan area.

Alternative Considered: Construction of a multiple use (bicycle, snowmobile, ski) trail connecting to River Road and future snowmobile trails was considered. The trail would have run along the north and west park boundaries. This alternative was rejected pending completion of a regional trail plan.

Multi-Use Trail

Action: Develop a 3 mile multi-purpose park entrance loop trail (map, page 124).

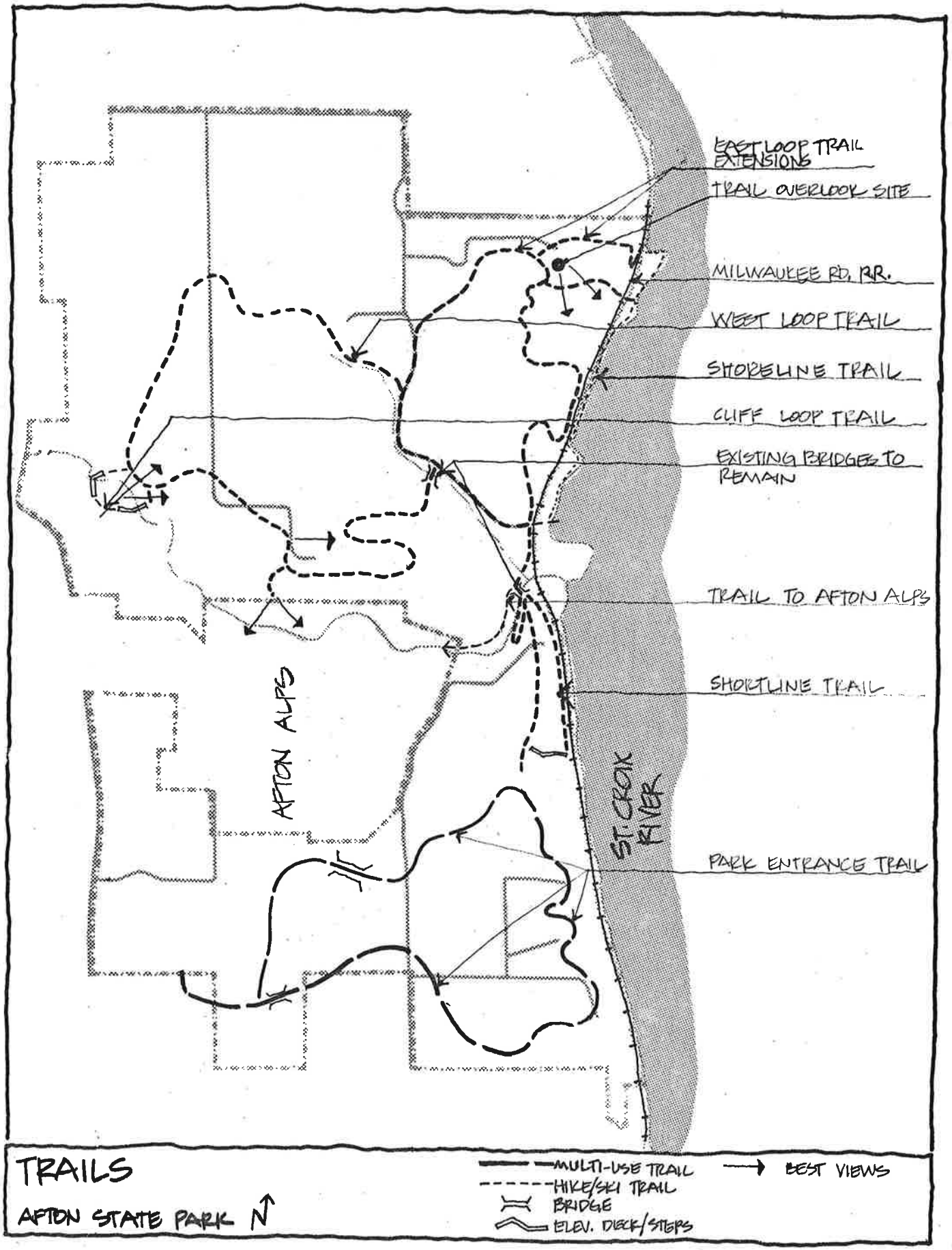
This trail will be constructed for hiking, biking, horseback riding, horse and carriage driving, skiing, and snowmobiling. A portion of 8' width of trail will be hard surfaced for bikes. Precise trail alignment will be designed on site to achieve maximum scenic quality by taking advantage of the variety of views. Alignment will consist of a number of curves and few straight stretches. Maximum gradient will be 8% with short sections at 10% allowable where essential. Horizontal and vertical curves, with super-elevation will be designed to occur simultaneously wherever possible. Grading and damage to vegetation (including removal) will be avoided. Hopefully, potential conflicts between users will be minimized or eliminated by use of the curvilinear alignment, discouraging excessive speeds. If it proves necessary, however, additional measures such as designating special-use treadways and posting speed limits will be used.

Rationale: Will provide equal trail access to the park for all trail users, as well as the highest quality, safest possible trail experience.

Cost: $100,000 ($22,000 grading/preparation - $78,000 surfacing)

Action: Develop 2 wooden bridges to cross the intermittent stream (map, page 124).

Cost: $20,000


EAST LOOP TRAIL EXTENSIONS
TRAIL OVERLOOK SITE
MILWAUKEE RD. R.R.
WEST LOOP TRAIL
SHORELINE TRAIL
CLIFF LOOP TRAIL
EXISTING BRIDGES TO REMAIN
TRAIL TO AFTON ALPS
SHORTLINE TRAIL
PARK ENTRANCE TRAIL
AFTON ALPS
ST. CROIX RIVER
TRAILS
AFTON STATE PARK
N
MULTI-USE TRAIL
HIKE/SKI TRAIL
BRIDGE
ELEV. DECK/STEPS
BEST VIEWS

ARCHITECTURAL THEME

An architectural theme will be developed by the Bureau of Engineering in coordination with the Park Planning staff. This theme will be developed for the design of all structures built in public areas of the park.

Objectives:

To facilitate high quality experiences: structures should be designed to compliment activities by allowing access to significant park environments and by modulating views and circulation.

To minimize obtrusiveness/artificiality: structures should be integrated into the landscape through earth-sheltered and underground construction wherever possible, especially in open savanna areas or fills. Natural materials, colors, textures, and forms should be used in above-ground structures. Special emphasis should be put on the relationship between above-ground structures and the natural landscape, such as the use of stilts for structures in wooded ravine areas.

To maximize energy efficiency: structures should be designed to take advantage of the most efficient energy conservation techniques available.

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Camping						
Group Camp 1						
Campsites			8,000			8,000
Sanitation Building			35,000			35,000
Council Ring			1,000			1,000
Vegetative Screening			2,000			2,000
Group Camp 2						
Campsites				5,000		5,000
Water/Sanitation				6,000		6,000
Council Ring				750		750
Savanna Campground						
Campsites		20,000				20,000
Veg. Screening	$ 10,000	15,000				25,000
Water/Toilets		40,000				40,000
Norway Campground						
Campsites					$ 5,000	5,000
Water/Sanitation					20,000	20,000
Riverside Campground						
Campsites					3,000	3,000
Water/Sanitation					20,000	20,000
Water Activities: Swimming						
Temporary Sanitation/Cabanas		1,500				1,500
Permanent Sanitation Building				60,000		60,000

INTRODUCTION

Boundary changes and acquisition must be considered in the management of any state park. The amount of land necessary to manage a park correctly must be determined and acquired before management can be efficiently carried out.

Objectives:

To insure that the park has sufficient acreage for preservation of natural resources and still provide recreational facilities.

To control all land within the statutory boundary either by fee title (direct ownership) or easement (partial interest).

DISCUSSION

Because it would be fiscally and physically impossible to achieve these goals overnight, the following framework will be used in developing boundary adjustments and acquisition priorities:

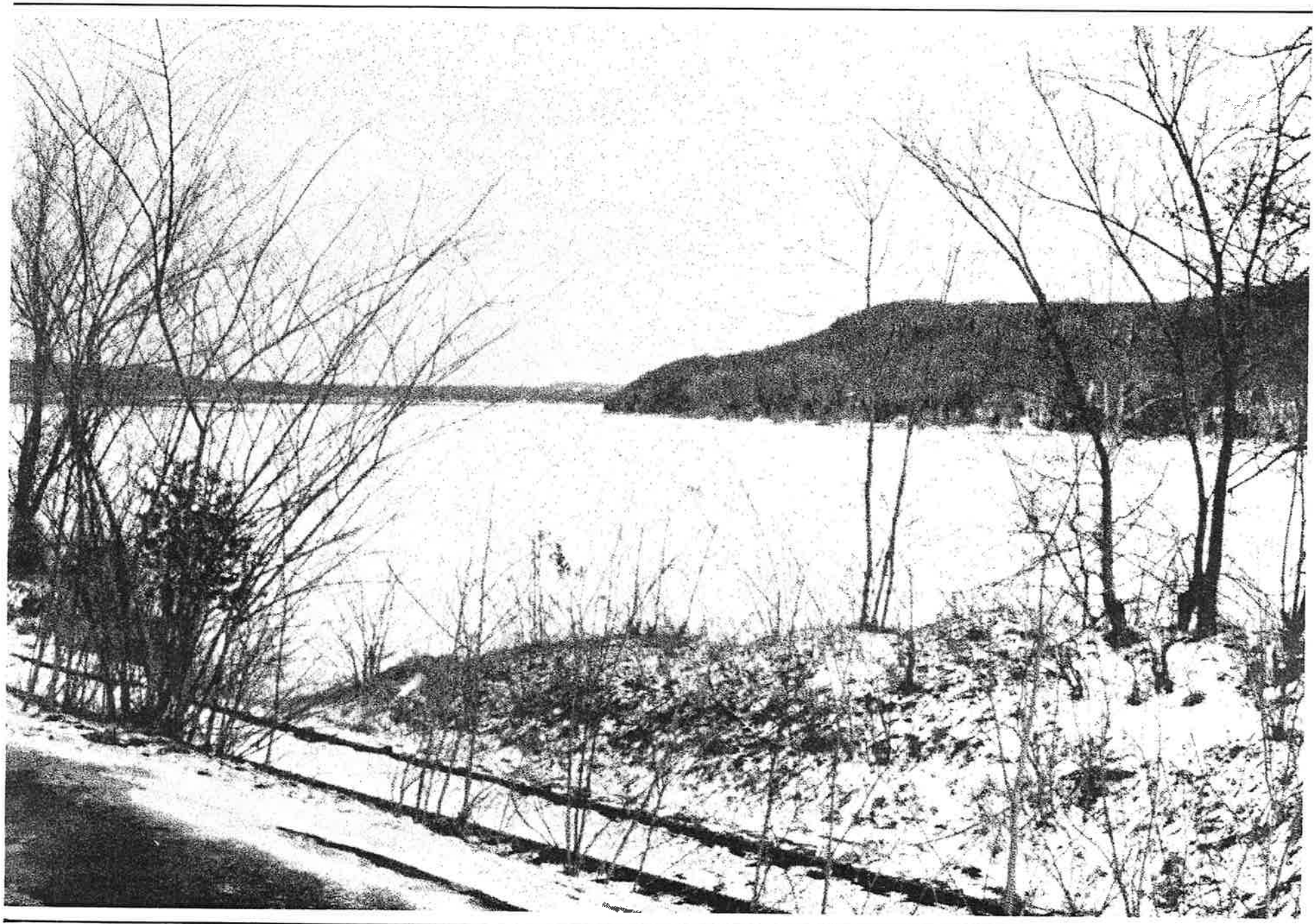
1. Land needed for preservation of park resources or values.
2. Land needed for development of facilities.
3. Unimproved buffer land needed to prevent threatened development or use which would be incompatible with existing or potential park purposes.

Only 57 percent of the 1,648 acres within the statutory boundary of the park is under the jurisdiction of the Division of Parks and Recreation. The remaining 43 percent is in private ownership. In the past, parcels have been acquired on a willing seller basis. Future acquisition should continue on that basis. Certain parcels of land, however, are essential to the operation of the park including those affecting the park entrance road, contact station, visitor center, group camp, individual day-use area, and group day-use area. Up to the time of the preparation of this document these landowners have not indicated a willingness to sell. A recommendation should be made to the legislature that these parcels be acquired through eminent domain proceedings. A park with the potential and outstanding features of Afton should be made available to the public without any additional delay.

As future recreational needs are identified, further expansion of the park may be warranted. Such an expansion is not foreseeable within the 10-year time span covered in this management plan.

Priority of Land Acquisition

Map Code and Order Of Priority (page131)	Rationale
1	These parcels include the proposed park entrance road and the porposed manager's residence. The park cannot be officially opened until this property has been acquired. If land cannot be acquired on a willing seller basis, eminent domain proceedings will be necessary as authorized by the legislature.
2	This area includes the location of a visitor orientation center, a parking lot, a day-use area, and parking lot for the swimming beach. Eminent domain proceedings as authorized by the legislature should be implemented to acquire these parcels.
3	There are some excellent ravines and wooded acreage on these two parcels. A group camp is being planned close to one of the parcels and the entrance road passes near or through the other. Acquisition is recommended to preserve and protect the aesthetic integrity and beauty of the entrance corridor from development.
4	A group camp and group picnic area are proposed at this location.
5	Twenty trail and/or boat camping sites are scheduled for development on this site. Acquisition should proceed on a willing seller basis.
	Remaining unacquired parcels should be purchased on a willing seller basis as available.



3. Potential Overcrowding of River:

The Minnesota-Wisconsin Boundary Area Commission maintains that the already crowded conditions would be aggravated by any additional boat launching ramp in this area. A River User Study is being conducted which should make further recommendations regarding future solutions to this crowding problem.

- Trails

Objectives: To provide trail access to all portions of the park.

To provide trail access to the park from throughout the seven county metropolitan area.

Alternative Considered: Construction of a multiple use (bicycle, snowmobile, ski) trail connecting to River Road and future snowmobile trails was considered. The trail would have run along the north and west park boundaries. This alternative was rejected pending completion of a regional trail plan.

Multi-Use Trail

Action: Develop a 3 mile multi-purpose park entrance loop trail (map, page 124).

This trail will be constructed for hiking, biking, horseback riding, horse and carriage driving, skiing, and snowmobiling. A portion of 8' width of trail will be hard surfaced for bikes. Precise trail alignment will be designed on site to achieve maximum scenic quality by taking advantage of the variety of views. Alignment will consist of a number of curves and few straight stretches. Maximum gradient will be 8% with short sections at 10% allowable where essential. Horizontal and vertical curves, with super-elevation will be designed to occur simultaneously wherever possible. Grading and damage to vegetation (including removal) will be avoided. Hopefully, potential conflicts between users will be minimized or eliminated by use of the curvilinear alignment, discouraging excessive speeds. If it proves necessary, however, additional measures such as designating special-use treadways and posting speed limits will be used.

Rationale: Will provide equal trail access to the park for all trail users, as well as the highest quality, safest possible trail experience.

Cost: $100,000 ($22,000 grading/preparation - $78,000 surfacing)

Action: Develop 2 wooden bridges to cross the intermittent stream (map, page 124).

Cost: $20,000

ARCHITECTURAL THEME

An architectural theme will be developed by the Bureau of Engineering in coordination with the Park Planning staff. This theme will be developed for the design of all structures built in public areas of the park.

Objectives:

To facilitate high quality experiences: structures should be designed to compliment activities by allowing access to significant park environments and by modulating views and circulation.

To minimize obtrusiveness/artificiality: structures should be integrated into the landscape through earth-sheltered and underground construction wherever possible, especially in open savanna areas or fills. Natural materials, colors, textures, and forms should be used in above-ground structures. Special emphasis should be put on the relationship between above-ground structures and the natural landscape, such as the use of stilts for structures in wooded ravine areas.

To maximize energy efficiency: structures should be designed to take advantage of the most efficient energy conservation techniques available.

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Camping						
Group Camp 1						
Campsites			8,000			8,000
Sanitation Building			35,000			35,000
Council Ring			1,000			1,000
Vegetative Screening			2,000			2,000
Group Camp 2						
Campsites				5,000		5,000
Water/Sanitation				6,000		6,000
Council Ring				750		750
Savanna Campground						
Campsites		20,000				20,000
Veg. Screening	$ 10,000	15,000				25,000
Water/Toilets		40,000				40,000
Norway Campground						
Campsites					$ 5,000	5,000
Water/Sanitation					20,000	20,000
Riverside Campground						
Campsites					3,000	3,000
Water/Sanitation					20,000	20,000
Water Activities: Swimming						
Temporary Sanitation/Cabanas		1,500				1,500
Permanent Sanitation Building				60,000		60,000

INTRODUCTION

Boundary changes and acquisition must be considered in the management of any state park. The amount of land necessary to manage a park correctly must be determined and acquired before management can be efficiently carried out.

Objectives:

To insure that the park has sufficient acreage for preservation of natural resources and still provide recreational facilities.

To control all land within the statutory boundary either by fee title (direct ownership) or easement (partial interest).

DISCUSSION

Because it would be fiscally and physically impossible to achieve these goals overnight, the following framework will be used in developing boundary adjustments and acquisition priorities:

1. Land needed for preservation of park resources or values.
2. Land needed for development of facilities.
3. Unimproved buffer land needed to prevent threatened development or use which would be incompatible with existing or potential park purposes.

Only 57 percent of the 1,648 acres within the statutory boundary of the park is under the jurisdiction of the Division of Parks and Recreation. The remaining 43 percent is in private ownership. In the past, parcels have been acquired on a willing seller basis. Future acquisition should continue on that basis. Certain parcels of land, however, are essential to the operation of the park including those affecting the park entrance road, contact station, visitor center, group camp, individual day-use area, and group day-use area. Up to the time of the preparation of this document these landowners have not indicated a willingness to sell. A recommendation should be made to the legislature that these parcels be acquired through eminent domain proceedings. A park with the potential and outstanding features of Afton should be made available to the public without any additional delay.

As future recreational needs are identified, further expansion of the park may be warranted. Such an expansion is not foreseeable within the 10-year time span covered in this management plan.

Priority of Land Acquisition

Map Code and Order Of Priority (page131)	Rationale
1	These parcels include the proposed park entrance road and the porposed manager's residence. The park cannot be officially opened until this property has been acquired. If land cannot be acquired on a willing seller basis, eminent domain proceedings will be necessary as authorized by the legislature.
2	This area includes the location of a visitor orientation center, a parking lot, a day-use area, and parking lot for the swimming beach. Eminent domain proceedings as authorized by the legislature should be implemented to acquire these parcels.
3	There are some excellent ravines and wooded acreage on these two parcels. A group camp is being planned close to one of the parcels and the entrance road passes near or through the other. Acquisition is recommended to preserve and protect the aesthetic integrity and beauty of the entrance corridor from development.
4	A group camp and group picnic area are proposed at this location.
5	Twenty trail and/or boat camping sites are scheduled for development on this site. Acquisition should proceed on a willing seller basis.
	Remaining unacquired parcels should be purchased on a willing seller basis as available.

Interpretive Program

Interpretation is "an educational activity which aims to reveal meanings and relationships through the use of original objects, by first-hand experiences and by illustrative media, rather than simply to communicate factual information" (Freeman Tilden). In this light, the interpretive services program fosters in the public an understanding of park resources and management by:

1. Revealing the kinship of park visitors to the park environment and, by association, their even broader involvement within ecosystems.

2. Illuminating the historic and ongoing impacts of natural forces within the park and upon the people who use them.

3. Assisting park visitors in the discovery of meaningful and satisfying ways in which to enjoy their visits without intruding on the experiences of others or impairing the quality of the park environment.

4. Explaining the mission of the Department, interdisciplinary park management practices and the importance of public participation and support in the operation of this agency.

Interpretive Services will be developed in recognition of the following:

1. All parks are fragile communities of life which can be perpetuated only through careful management.

2. People are a natural and necessary element in park environments, free to enjoy them in non-destructive ways.

3. All natural resource units, and the publics they serve, are tied to one another ecologically, economically, socially and politically.

It is hoped that the people who recreate and learn in the parks will, by experiencing the parks and related interpretive services, derive a better quality of life and gradually increase their environmental awareness. As people are encouraged to think and to feel more about park environments, they can be expected to do more on behalf of these environments. They can also be expected to strengthen their own ties with the land and with our state's cultural heritage.

INTERPRETIVE THEME

The visitor to Afton State Park will find a dramatic contrast to the fast pace of modern life in this area of outstanding scenic beauty overlooking the St. Croix River Valley. Carved by the runoff from glacial lakes, the valley and the park contain sixteen (16) distinct plant communities,from northern hardwoods and oak savannas to sand beaches and a small native prairie. These areas abound in wildlife, with 190 species of birds, 33 species of mammals, and 25 species of reptiles and amphibians. These biological aspects, in combination with the geological setting, provide excellent opportunities for interpretive activities.

INTERPRETIVE FACILITIES

Interpretive facilities will be developed to communicate to the park visitor both general orientation and in-depth educational information. The communication media will primarily be enclosed, vandal-resistant, rear projection audio-visual displays, fixed models, photographs, and dioramas. These techniques will be cost-effective in that they will serve large numbers of people, will be available on demand, and will not require constant staffing. These communication techniques will be supplemented during peak use times by a naturalist who will answer questions and conduct special programs and nature hikes.

Interpretive Facilities: Orientaiton

The following displays will be available in the visitor's center to give the park visitor a general orientation to the park facilities and environment:

1.	A detailed, topographic park model which represents landforms, vegetation types, points of interest, and all developments including trails and individual campsites	$ 12,000
2.	A large aerial-view perspective map of park describing landforms, vegetation types, points of interest, and all developments including trails and individual campsites	2,500
3.	A brochure with reduction of map (as described in item #2) with text/charts describing wildlife, vegetation types, and other descriptive material and photographs for self-guided nature hikes	3,000

4.	Photographs keyed to map (as described in item #2) which illustrate highlights of park facilities and features (material may be rotated seasonally)	300
5.	Automatic slide show(s) 3-4 minutes in length which illustrates highlights of the park (material may be rotated seasonally)	1,000
6.	Direct intercom line to park office and/or house-service area to allow visitors to call in questions to park manager when naturalist is not on duty	500
	Total Cost	$ 19,400

Interpretive Facilities: Education

Special displays to communicate various aspects of the park in greater depth will be developed in various medias, possibly including audio-visual presentations, dioramas, photographs and, brochures. These may be seasonally rotated and will be developed in conjunction with the Interpretive Prospectus.

Approximate Cost: $25,000

Interpretive Prospectus

Detailed procedures for interpretive plan implementation with specifics on costs and phasing will be prepared by the regional naturalist in consultation with the Park Planning staff during the next biennium. The prospectus will include recommendations for research on park ecology, visitor use, oral history and other areas, as well as possible plan modification.

STAFFING AND EQUIPMENT

Introduction

Maintenance is an essential, little noticed, and difficult to finance responsibility of the Parks and Recreation Division. The basic obligation of the state is to maintain the landscape resources and state park facilities in a safe, sanitary, environmentally sound, and aesthetically pleasing condition. These facilities must be operated in a manner that provides maximum use and enjoyment at the least possible cost, consistent with state law. There are four basic aspects to maintenance and operations.

1. Maintenance of the landscape resources for the use and enjoyment of future generations
2. Maintenance of the recreation facilities that provide access to those resources
3. Provision of services to the park visitors for maximum enjoyment of facilities and resources
4. Enforcement of rules and regulations to protect the resources from abuse and to ensure enjoyment of the facilities by park visitors

To accomplish these goals requires: (a) trained staff, (b) sufficient supplies, and (c) proper equipment to maintain efficiency in operation and keep costs to a minimum.

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

A work load analysis of park operating functions has been initiated to ascertain the personnel needs of each park, based upon existing facilities and current operations. This study identifies the man-hours needed to perform each task required for adequate maintenance and operation. Initial results reveal:

1. an extreme shortage of adequate personnel,
2. that due to procedures necessary in hiring seasonal workers, high cost labor employees are used for jobs more appropriate to other job classifications, and
3. that a high percentage of man-hours are related to direct services to the public.

These factors limit the personnel available for proper maintenance of facilities. Extensive development since the inception of the Natural Resources Act of 1963 has been a primary contributor to the widening gap between maintenance and development. From the work load study, standards can be established to determine man-hour operating requirements for future facilities as they are proposed for development, so that sufficient personnel and supplies can be provided. Facilities must be properly designed to meet the needs of the public, while being operational with minimum personnel at the lowest possible cost to the public.

Another contributing factor to the current park operations problem is the heavy reliance on federally funded work programs, such as CETA, N.Y.C., and Green Thumb. The low cost personnel provided by these programs make 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 adequately trained personnel for major public service and maintenance programs using temporary employees only for minor maintenance and special projects.

Enforcement of park rules and regulations is a vital element in the management of state parks. Currently, violations are referred to DNR enforcement officers for follow through on prosecution. Park personnel should have the technical training and tools needed to carry out this responsibility in a manner which will protect the resources from abuse, while educating the visitor to the importance of environmental protection.

One of the major maintenance problems of recreation areas is the extreme impact of large numbers of people concentrating use in specific locations. These areas include campsites, trails, lakeshore, river banks, the area around buildings, and scenic points of interest. This overuse affects the ground cover and frequently exposes tree roots to damage from foot traffic. The eventual result may be erosion, slides, disfigured sites, and even danger to the visitors. Regular maintenance programs with adequate personnel, supplies, and equipment would reduce the damage and consequently prevent major reconstruction expenditures. It will also preserve the aesthetic character by preventing unsightly scars or exposed areas.

The purpose of a maintenance and operations plan is to identify specific problems of each park, establish the basis for solution of those problems, and to specify techniques of management which would decrease the costs of operation. It should make specific recommendations for facilities which will serve the needs of visitors with a minimum of regimentation and provide for ease of maintenance and enforcement. It should also identify basic management duties, establish adequate staffing requirements, and identify supply and equipment needs.

Objective:

To provide adequate staff and equipment to efficiently and effectively operate Afton State Park

Park Administrative Duties and Responsibilities

The park manager at Afton will administer the total park maintenance and operations programs, and implement appropriate segments of this plan under the direct supervision of the park supervisor at DNR Regional Headquarters, St. Paul, Minnesota. This consists of supervising park employees and services, providing law enforcement, providing for interpretive services, maintaining sound public relations, recruiting employees and volunteers, administering other work programs, and assisting in all park operations when possible. These administrative responsibilities limit the time available for actual participation in maintenance and operations activities. Additional full time, seasonal, and part time personnel as specified in the following pages, are necessary to provide adequate public services and fully implement this plan.

Park Activities and Operations

Afton will not be in full operation until a new entrance road is constructed. This will not take place until key parcels of land necessary for the road alignment are acquired, hopefully by the 1980-81 biennium. Until that time, park development will be limited to tree planting and essential sanitation in critical areas. Land restoration and vegetative management will receive the major effort in the interim. Operation will be primarily limited to security and essential maintenance of existing trails and facilities with existing staff. When facilities and roads are developed, the necessary personnel, equipment, and supplies as identified in this section will be required for proper maintenance and operations.

Afton will be a multi-use park concentrating on providing minimum facilities to enhance natural experiences. Emphasis will be placed on trail use, trail access camping, boat access camping,swimming, and interpretation. Vehicle campsites, as an example, will not be provided. Conflicting trail uses will be separated.

Contact Station operation will be necessary 12 months of the year to serve park visitors and provide clerical and administrative services. Services requiring seven day a week operations throughout the year will be permit sales, administration, and enforcement. Other seasonal services include camper registration and information. Contact station personnel include park workers, the park manager, and assistant. Normal operating times are 8:00 a.m. to 10:00 p.m. daily.

Interpretive services will be initially conducted from the interpretive center during summer months by a 3-month naturalist. The park manager will provide this service at other times. In the long-range program, a nine-month naturalist may be required to serve spring and fall visitors such as school groups from the metro area.

Lifeguard services will be provided by one lifeguard at the main beach during June, July, and August. As use increases, additional lifeguards may be necessary to provide protection 7 days per week.

Campsite maintenance and supervision will be a major operational workload. There will be 75 campsites in 5 separate locations, for boaters, hikers, and groups. In order to control this activity and ensure proper compliance with rules, regular patrol will be required by foot, horseback, boat, or vehicle. Security and control will be of special concern after closing hours. The special equipment necessary for patrol, maintenance, and cleaning will be selected by field personnel as funds are appropriated.

Trail activities - Anticipated heavy use of approximately three miles of multi-use and eight miles of separate skiing-hiking trails will generate the need for regular trail maintenance and trail grooming during appropriate seasons of the year. Snow grooming equipment in addition to the above maintenance vehicle will be required and coordinated through the region. Sign installation and replacement costs may be extensive due to theft and vandalism. A detailed signing program will be required to provide orientation for trail users. Ski touring may be heavy as a result of the proximity to Afton Alps Ski area.

Picnic sites will be provided in 5 areas accessible by vehicle, trail, or boat. These will require regular supervision and maintenance.

Boating - Campsites and beaching areas will be designated for boaters to minimize conflicts between boaters and land users. These minimal facilities will continue to provide for boating and camping experiences appropriate to the park classification. Regulation and control of these facilities are the responsibility of the park manager and will require sufficient staff to assist in maintenance and supervision.

Primitive Group Camping will be provided in two areas, available on a priority reservation basis as defined in park policies.

Plan implementation, especially development and resource management projects, will put a heavy workload on park staff in the early stages of construction. Most of the construction funds will be provided from the park development account, however, supervision will be required by park and regional staff.

Garbage and litter collection will be a major problem in the widely dispersed areas. Sufficient personnel and proper equipment are critical to maintaining these facilities in a clean and neat condition. Refuse from remote sites should be brought to vehicle access points and pickups arranged by contract with a local vendor. This will eliminate the need to purchase special compactors for transportation to a landfill.

Enforcement - Close proximity to the metro area will attract a broad variety of visitors. This, combined with the widely dispersed areas, will require effective enforcement of park regulations. A good communication system, proper equipment, and adequate training for the park manager, assistant, and a ranger will be essential to adequately patrol the park.

Firewood - Campfires are a principle part of the camping experience and adequate supples of firewood must be available for use. In order to prevent destruction of trees in remote campsite areas, firewood may have to be delivered to the sites and sold or provided free of charge. Free wood results in the use of large volumes of wood, but will save trees because delivery cannot be determined by site occupancy, but will be done largely during slack periods.

Campsite registration - Many of the walk-in campers will register at the park office when entering the park. However, since the campsites are remote and some are accessible by boat, nightly patrols will be required to ensure full registration and to deliver wood.

Equipment - The items of equipment listed below, when replaced on a regularly scheduled basis, are considered sufficient for the current overall operations of this park, although the needs may change throughout the 10 year projections. Heavy equipment and specialized equipment not listed should be obtained through the regional office. Equipment of the proper size and specifications must be selected on a park by park basis to match the conditions and job being accomplished. Proper up-to-date equipment will reduce the personnel needs, the cost of repairs on old equipment and the cost of maintenance and improvement projects.

1978-87 Projected Equipment Replacement Schedule

Unit	Existing	1978-79	1980-81	1982-83	1984-85	1986-87	Total
1/2 Ton	1976		$4,800			$4,800	$ 9,600
3/4 Ton	None	$ 4,750			$ 6,300		11,050
Tractor w/ loader	1950	9,000					9,000
Mowers, etc.		2,000	4,000	$ 4,200	4,400	4,600	19,200
2-way Radios			10,000				10,000
Interpretive Center Equipment				2,000			2,000
Total		$15,750	$18,800	$ 6,200	$10,700	$9,400	$60,850

Future replacement will be based upon the following general criteria:

- Light maintenance and administrative vehicles: 5 years or 70,000 miles.
- Heavy maintenance equipment: With the limited use received, this equipment could last a long time and be replaced on an individual item basis when necessary or be exchanged through the region for other improved vehicles.
- Small equipment: Mowers and chainsaws need regular replacement with the consistent use received. Other motorized equipment will be purchased and replaced as needed.
- Other equipment: Interpretive, furniture, fixtures, etc. will be purchased as needed.

Personnel Anticipated to be Needed to Operate Future Facilities
Refer to Summary for Biennium and 10 Year Projections (p.143)

① 1980-81 · Construction of the new entrance road, picnic and parking area, contact station, and campsites will create the need for maintenance and operations personnel as follows:

Assistant Manager (12 mo.)	$ 10,400
Two Park Workers (3 mo. ea.) (Contact Station)	3,600
Lifeguard (3 mo.)	1,700
Naturalist (3 mo.)	2,500
Total estimated annual cost	$ 18,200

② 1982-83 · Construction of the interpretive center, picnic sites, primitive group camp, and trails will require:

Additional Naturalist (3 mo.)	$ 2,500
Laborer (6 mo.)	5,000
Additional Lifeguard (3 mo.)	1,700
Park Worker (3 mo.) (Interpretive Center)	1,700
Total estimated annual cost	$ 10,900

③ 1984-85 · Construction of picnic shelter and beach sanitation building will require:

Laborer (3 mo.)	$ 2,500
Park Worker (3 mo.) (Contact Station)	1,700
Total estimated annual cost	$ 4,200

④ 1986-87 · Additional campsites will require:

Laborer (3 mo.)	$ 2,500

MAINTENANCE AND OPERATIONS SUMMARY BUDGET

The figures for the period 1980 through 1987 are estimated projections intended to illustrate the scope of the potential maintenance and operations costs, including the operation of new facilities plus an estimated 10% 2-year salary inflation cost.

		Biennium			
	78-79	80-81	82-83	84-85	86-87
PERSONNEL:					
Existing 76-77 $33,000					
Actual Needs (for current operations based on staffing chart)					
Personnel Costs (from previous biennium)	$33,000	$36,300	$79,000	$110,800	$131,100
Additional Personnel Needs (to operate new facilities)		①36,400	②21,800	③8,400	④5,000
Sub Total	33,000	72,700	100,800	119,200	136,100
10% Salary Inflation	3,300	7,300	10,000	11,900	13,600
TOTAL BIENNIAL PERSONNEL COSTS:	36,300	79,000	110,800	131,100	149,700
SUPPLIES: Administrative Overhead and Expenses (20% of personnel costs)	7,300	15,800	22,200	26,200	29,900
EQUIPMENT: (from equipment schedule)	15,750	18,800	6,200	10,700	9,400
TOTAL PROJECTED BIENNIAL MAINTENANCE AND OPERATIONS COSTS:	$59,350	$113,600	$139,200	$168,000	$189,000
ANNUAL COST BREAKDOWN:	$29,675	$56,800	$69,600	$84,000	$94,500
TOTAL 10 YEAR COST PROJECTION:	$669,150				

TOTAL MANAGEMENT BUDGET

Management Practice	Biennium 78-79	80-81	82-83	84-85	86-87	Total
Water Resources	No anticipated expenditures					
Fisheries	No anticipated expenditures					
Soils	$ 4,000	$ 3,000	$ 3,000	$ 4,500	$ 4,500	$ 19,000
Vegetation (Alt. 2)	31,000	41,000	187,000	66,500	31,000	356,500
Wildlife	1,750	750	5,400	2,700	2,500	13,100
Cultural/Historical	1,000					1,000
Recreation	10,000	864,500	480,500	188,150	155,000	1,698,150
Maintenance and Operations	59,350	113,600	139,200	168,000	189,000	669,150
Contingencies	4,575	89,975	47,915	35,135	10,200	187,800
Total	$111,675	$1,112,825	$863,015	$464,985	$ 392,200	$2,944,700

Grand Total

Implementation

OVERALL AUTHORITIES

DIVISION OF PARKS AND RECREATION

General

Once the management plan has been completed and approved, it will become the responsibility of the director of Parks and Recreation (hereafter referred to as the director) to insure proper implementation of the concepts established in 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 insure that the plan is kept current, remains on schedule, and becomes a reality.

In order to insure the accomplishment of this cooperative planning and implementation effort, the following responsibilities have been established and must be followed.

Specific Requirements

The director and staff will:

1. Coordinate and administer field operations as delegated by the assistant commissioner of operations
2. Develop and administer all 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. 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 the plan (e.g., responsibilities relating to contracts and force account project)
4. In coordination with DNR legislative liaisor, 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 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 DNR's federal grant specialists in order 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 modifications to the concepts established in the approved plan will be processed through the Office of Planning and Research. 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 and Research cannot come to an agreement on the requested change, the director will then submit the request to the commissioner's Planning and Environmental Review Board (PERB) which will formulate the final recommendation to be submitted to the commissioner's Executive Council
9. Assign responsibilities and funding for implementation of the development program to BOE for contracts and to the regional staff for 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 to the Office of Planning and Research so that the progress of implementation can be monitored

REGIONAL OFFICE

General

The regional administrator and staff will supervise the physical implementation programs for the approved plans as established by the division.

Specific Requirements

1. The regional administrator will assign qualified staff to help 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. The regional park supervisor will supervise and direct the park manager to insure that the management plan is implemented correctly.
3. The regional park supervisor will regularly field inspect all development in the park.
4. The regional park supervisor will submit written reports as necessary to keep the regional administrator and the director informed on the progress of development and any problems encountered.

PROCEDURES

DEVELOPMENT

The development procedure for the Division of Parks and Recreation can be broken down into two categories: (1) contract, and (2) force account.

Contract

Director initiates project by preparing a program, which complies with the management plan.

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

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

BOE prepares detailed drawings and specifications and submits them to the director.

Director approves drawings and specifications, insuring compliance with management plan objectives and goals, and re-submits them to the BOE.

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

Force Account

Director initiates project by preparing the program, complying with the management plan.

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

Director assigns funds to regional administrator.

Regional administrator directs regional park supervisor and necessary staff to implement program.

Regional park supervisor may:

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

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

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.

Supervision over the project will be the responsibility of regional, divisional, or BOE staff, depending on the complexity of the specific project.

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

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

RESOURCE MANAGEMENT

The resource management program for the Division of Parks and Recreation is also broken down into contract and force account categories.

Contract

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

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

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

Force Account

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

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

Director assigns funds to regional administrator.

Regional administrator directs regional park supervisor and necessary resource management staff to implement program.

Director supervises and monitors the program.

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

Director approves the completed project.

Regional park supervisor and resource staff prepare detailed resource implementation program.

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

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

Assign the park manager and field personnel to implement program

Prepare contracts to be let to local contractors or consultants to implement program

Regional staff supervises project.

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

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

MAINTENANCE AND OPERATIONS

The Division of Parks and Recreation will provide the regional staff with necessary direction to maintain and operate state parks as a statewide system. The director will establish rules and regulations pursuant to the ORA '75 for administering state parks. In addition, training courses and 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. The following illustrates the general operation and maintenance procedures:

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

The regional park supervisors, directed by the regional administrator, will follow policies, guidelines, and statewide procedures, of the Division of Parks and Recreation as well as commissioner's orders.

The regional park supervisor will provide the necessary supervision and direction to the park managers to insure that park maintenance and operation policies, guidelines, and procedures are followed.

It will be the responsibility of the park manager, under the supervision of the regional park supervisor, to maintain and operate all park facilities.

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